



NASA SP-7041 (16)

EARTH RESOURCES

A CONTINUING BIBLIOGRAPHY WITH INDEXES

CASE FILE
COPY

ISSUE 16

JANUARY 1978

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7041(16)

Earth Resources

Pages 207-278

JANUARY 1978

PREVIOUS EARTH RESOURCE BIBLIOGRAPHIES

Remote Sensing of Earth Resources	(NASA SP-7036(01))
Earth Resources	(NASA SP-7041(01))
Earth Resources	(NASA SP-7041(02))
Earth Resources	(NASA SP-7041(03))
Earth Resources	(NASA SP-7041(04))
Earth Resources	(NASA SP-7041(05))
Earth Resources	(NASA SP-7041(06))
Earth Resources	(NASA SP-7041(07))
Earth Resources	(NASA SP-7041(08))
Earth Resources	(NASA SP-7041(09))
Earth Resources	(NASA SP-7041(10))
Earth Resources	(NASA SP-7041(11))
Earth Resources	(NASA SP-7041(12))
Earth Resources	(NASA SP-7041(13))
Earth Resources	(NASA SP-7041(14))
Earth Resources	(NASA SP-7041(15))

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company

EARTH RESOURCES

**A Continuing Bibliography
With Indexes
Issue 16**

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced between October 1, 1977 and December 31, 1977

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA)*



Scientific and Technical Information Office

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C.

JANUARY 1978

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price code E05 (\$9 00 domestic, \$18 00 foreign)

INTRODUCTION

The technical literature described in this continuing bibliography may be helpful to researchers in numerous disciplines such as agriculture and forestry, geography and cartography, geology and mining, oceanography and fishing, environmental control, and many others. Until recently it was impossible for anyone to examine more than a minute fraction of the earth's surface continuously. Now vast areas can be observed synoptically, and changes noted in both the earth's lands and waters, by sensing instrumentation on orbiting spacecraft or on aircraft.

This literature survey lists 543 reports, articles, and other documents announced between October 1 and December 31, 1977 in *Scientific and Technical Aerospace Reports (STAR)*, and *International Aerospace Abstracts (IAA)*

The coverage includes documents related to the identification and evaluation by means of sensors in spacecraft and aircraft of vegetation, minerals, and other natural resources, and the techniques and potentialities of surveying and keeping up-to-date inventories of such riches. It encompasses studies of such natural phenomena as earthquakes, volcanoes, ocean currents, and magnetic fields, and such cultural phenomena as cities, transportation networks, and irrigation systems. Descriptions of the components and use of remote sensing and geophysical instrumentation, their subsystems, observational procedures, signature and analyses and interpretive techniques for gathering data are also included. All reports generated under NASA's Earth Resources Survey Program for the time period covered in this bibliography will also be included. The bibliography does not contain citations to documents dealing mainly with satellites or satellite equipment used in navigation or communication systems, nor with instrumentation not used aboard aerospace vehicles

The selected items are grouped in nine categories. These are listed in the Table of Contents with notes regarding the scope of each category. These categories were especially chosen for this publication, and differ from those found in *STAR* and *IAA*

Each entry consists of a standard bibliographic citation accompanied by an abstract. The citations and abstracts are reproduced exactly as they appeared originally in *STAR*, or *IAA*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the variation in citation appearance.

Under each of the nine categories, the entries are presented in one of two groups that appear in the following order:

- IAA* entries identified by accession number series A77-10,000 in ascending accession number order,

- STAR* entries identified by accession number series N77-10,000 in ascending accession number order.

After the abstract section, there are five indexes:

- subject, personal author, corporate source, contract number and report/accession number

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A77-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc (AIAA), as follows. Paper copies are available at \$5 00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche⁽¹⁾ are available at the rate of \$1 50 per microfiche for documents identified by the # symbol following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum airmail postage to foreign countries is \$1 00. Please refer to the accession number, e.g., (A77-10119), when requesting publications.

STAR ENTRIES (N77-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Price codes are given in the tables on page vii of the current issue of *STAR*.

Microfiche⁽¹⁾ is available regardless of age for those accessions followed by a # symbol.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Unit.

NOTE ON ORDERING DOCUMENTS. When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$3 00 price, for those documents identified by a # symbol.)

Avail NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

(1) A microfiche is a transparent sheet of film 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail ERDA Depository Libraries Organizations in U S cities and abroad that maintain collections of Energy Research and Development Administration reports, usually in microfiche form, are listed in *Nuclear Science Abstracts*. Services available from the ERDA and its depositories are described in a booklet, *Science Information Available from the Energy Research and Development Administration* (TID-4550), which may be obtained without charge from the ERDA Technical Information Center

Avail Univ Microfilms Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation

Avail USGS Originals of many reports from the U S Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction

Avail HMSO Publications of Her Majesty's Stationery Office are sold in the U S by Pendragon House, Inc (PHI), Redwood City, California. The U S price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI

Avail BLL (formerly NLL) British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL)

Avail ZLDI Sold by the Zentralstelle fur Luftfahrtokumentation und -Information, Munich, Federal Republic of Germany, at the price shown in deutschmarks (DM)

Avail Issuing Activity, or Corporate Author, or no indication of availability Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document

Avail U S Patent Office Sold by Commissioner of Patents, U S Patent Office, at the standard price of 50 cents each, postage free

Other availabilities If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
750 Third Ave
New York, N Y 10017

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents
U S Patent Office
Washington, D C 20231

Energy Research and Development
Administration
Technical Information Center
P O Box 62
Oak Ridge, Tennessee 37830

ESA-Space Documentation Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P O Box 569, S E 1
London, England

NASA Scientific and Technical Information
Facility
P O Box 8757
B W I Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Office (NST-6)
Washington, D C 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U S Government Printing Office
Washington, D C 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd
Tylers Green
London, England

U S Geological Survey
1033 General Services Administration
Building
Washington, D C 20242

U S Geological Survey
601 E Cedar Avenue
Flagstaff, Arizona 86002

U S Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U S Geological Survey
Bldg 25, Denver Federal Center
Denver, Colorado 80225

Zentralstelle für Luftfahrt-doku-
mentation und -Information
8 München 86
Postfach 880
Federal Republic of Germany

TABLE OF CONTENTS

Subject Categories

Abstracts in this Bibliography are grouped under the following categories

page

01 AGRICULTURE AND FORESTRY

Includes crop forecasts, crop signature analysis, soil identification disease detection harvest estimates range resources, timber inventory, forest fire detection and wildlife migration patterns

207

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

Includes land use analysis, urban and metropolitan studies, environmental impact, air and water pollution, geographic information systems and geographic analysis

215

03 GEODESY AND CARTOGRAPHY

Includes mapping and topography

221

04 GEOLOGY AND MINERAL RESOURCES

Includes mineral deposits, petroleum deposits, spectral properties of rocks, geological exploration and lithology

229

05 OCEANOGRAPHY AND MARINE RESOURCES

Includes sea-surface temperature, ocean bottom surveying imagery, drift rates sea ice and icebergs, sea state, fish location

235

06 HYDROLOGY AND WATER MANAGEMENT

Includes snow cover and water runoff in rivers and glaciers, saline intrusion drainage analysis, geomorphology of river basins, land uses, and estuarine studies

243

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

Includes film processing computer technology, satellite and aircraft hardware, and imagery

249

08 INSTRUMENTATION AND SENSORS

Includes data acquisition and camera systems and remote sensors

265

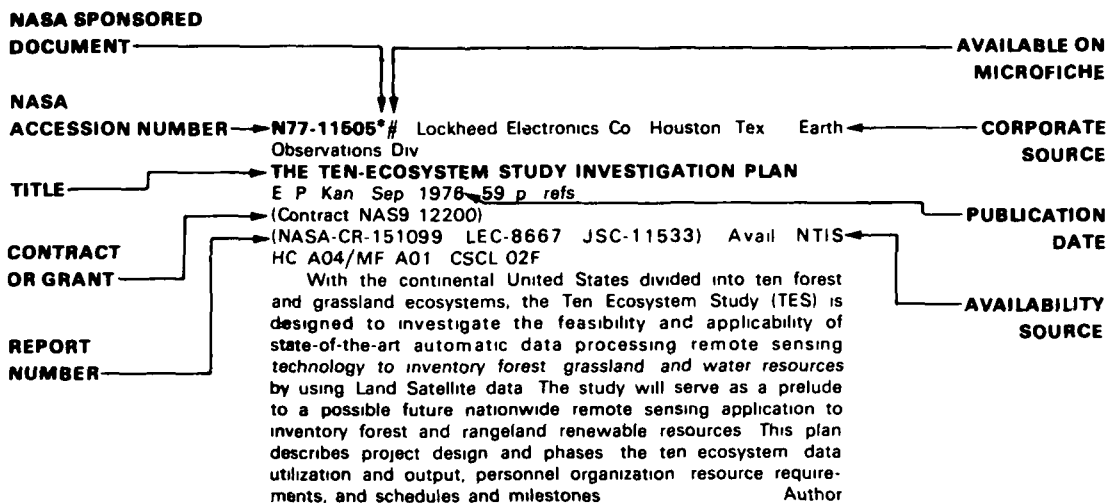
09 GENERAL

Includes economic analysis

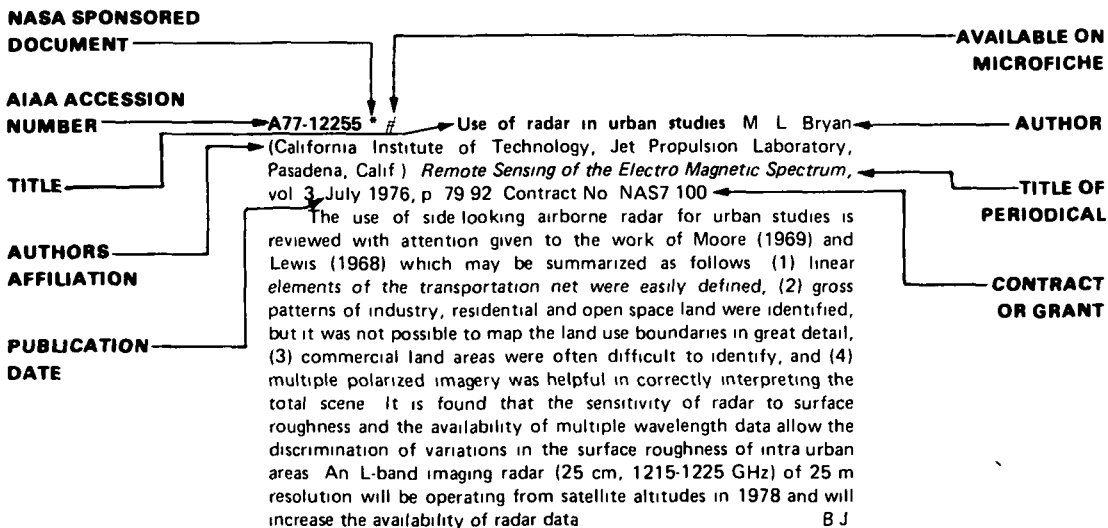
273

SUBJECT INDEX	A-1
PERSONAL AUTHOR INDEX	B-1
CORPORATE SOURCE INDEX	C-1
CONTRACT NUMBER INDEX	D-1
REPORT/ACCESSION NUMBER INDEX	E-1

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



EARTH RESOURCES

A Continuing Bibliography (Issue 16)

JANUARY 1978

01

AGRICULTURE AND FORESTRY

Include crop forecasts crop signature analysis soil identification disease detection harvest estimates range resources timber inventory forest fire detection and wildlife migration patterns

A77-41178 Scattering of radio waves by an underlying surface covered with vegetation V A Andrianov, N A Armand, and I N Kibardina (*Radiotekhnika i Elektronika*, vol 21, Sept 1976, p 1816-1821) *Radio Engineering and Electronic Physics*, vol 21, Sept 1976, p 12 16 7 refs Translation

Results of experimental measurements of spectral power density of signals scattered from a forest region are described The experiment was performed for three types of wooded areas with different types of trees birch, alder, and pine An exponential relation was obtained for the spectral density of the scattered signal as a function of frequency for small differences between the scattered spectral components and the incident carrier frequency, and a power law dependence was found for large frequency differences The width of the spectra of the scattered signal depends on both the wind velocity and the type of vegetation P T H

A77-41256 Plant growth and soil humidity above wall remnants - Preliminary results of a soil test as a contribution to aerial-picture archeology (Pflanzenwachstum und Bodenfeuchte über Mauerresten - Vorläufige Ergebnisse eines Bodenversuchs zur Luftbildarcheologie) D Lorenz and W Solter (Deutscher Wetterdienst, Agrarmeteorologische Forschungsstelle, Bonn, West Germany) *Bildmessung und Luftbildwesen*, vol 45, July 1, 1977, p 113-118 8 refs In German

Archeological investigations conducted with the aid of aerial photography are partly based on differences between the appearance of the surface above old wall remnants and the appearance of the surrounding area These differences are the result of the effect of the underlying wall structure upon the vegetation cover An investigation was conducted concerning the influence of wall remnants in and under the ground on the soil humidity and the growth of certain cereals as a function of the weather characteristics The effects of the wall remnants on the vegetation can be related to the restriction of the root growth of the plants and also to a reduced ground-water content of the soil layers above the wall remnants The investigation has the objective to clarify the relative importance of the two factors However, the currently available data are not yet sufficient for a definite answer regarding this question G R

A77-42015 * Theory for passive microwave remote sensing of near-surface soil moisture E G Njoku (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) and J-A Kong (MIT, Cambridge, Mass) *Journal of Geophysical Research*,

vol 82, July 10, 1977, p 3108-3118 19 refs NSF Grant No 76 01654, Contracts No JPL-95324, No NAS7 100

The theory of microwave thermal emission from a nonscattering half space medium is developed for application to regions with nonuniform subsurface soil-moisture and temperature variations A coherent stratified model is presented which is valid for nonuniform temperature profiles and rapidly varying moisture profiles, under which conditions the commonly used emissivity and radiative-transfer approaches become inaccurate For naturally occurring profiles the stratified model gives more accurate results than the other approaches at frequencies below about 4 GHz Experimental results from ground-based radiometric observations of a controlled target area compare systematically with brightness temperatures predicted from the theoretical model to within approximately 10 K Results of dielectric-constant measurements of the sand are given at seven frequencies in the microwave range and for moisture contents in the range from 0% to 30% by volume By using this model, the thermal microwave emission spectrum is computed for a number of representative moisture and temperature profiles in the frequency range from 0.25 to 25 GHz (Author)

A77 43804 * Radar system specifications for hydrology and agriculture F T Ulaby, P P Bativala, and T F Bush (University of Kansas Center for Research, Inc, Lawrence, Kan) In *Western Electronic Show and Convention*, Los Angeles, Calif, September 14-17, 1976, Technical Papers North Hollywood, Calif, Western Periodicals Co, 1976, p 4/3 1 to 4/3 12 12 refs Contracts No NAS9-10261, No NAS9 14052

Using truck-mounted radar spectrometers, an experimental program was conducted from 1971 to 1976 to define radar system specifications for hydrological and agricultural applications Data were acquired over the 1-18 GHz region, 0 deg (nadir) to 70 deg range and for all linear polarization combinations The discussion here concerns radar parameters for crop classification and for soil moisture determination B J

A77-44465 Ground truth measurements for thermal infrared remote sensing F J Bonn (Sherbrooke, Universite, Sherbrooke, Canada) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1001 1007 19 refs Research supported by the National Research Council of Canada, Defence Research Board of Canada, and Quebec Department of Education

Since 1971, field measurements have been made in order to establish interpretation keys for remotely sensed thermal infrared radiation in the 9.5 to 11.5 micrometer spectral range The infrared radiation emitted by different land surfaces has been measured with a Barnes PRT5 radiometer and compared with different environmental parameters (solar radiation, net radiation, air and soil temperature at various depths, air and soil moisture, etc) The parameters that give the closest correlation with the remotely sensed thermal radiation vary with the type of vegetable cover and with the seasons The best correlations are obtained with soil surface temperature over bare soil and with air temperature at half the canopy height over vegetated areas Seasonal variations of regression

01 AGRICULTURE AND FORESTRY

coefficients between soil surface temperatures and remotely sensed thermal radiation are higher on vegetated areas than on bare soil

(Author)

A77-44469 # **Distinguishing saline from non-saline rangelands with Skylab imagery** J H Everitt, A H Gerbermann, and J A Cuellar (U S Department of Agriculture, Agricultural Research Service, Weslaco, Tex) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1041-1047 20 refs

A flight line in Starr County, Texas, was used to test the feasibility of distinguishing saline from non-saline rangelands when using very small-scale (1 3,000,000) Skylab satellite imagery Film optical density readings were made on six different films (four black-and-white, one conventional, and one infrared color) using various film/filter combinations Differentiating between saline and non saline rangelands was possible by using microdensitometry on black-and white Skylab imagery (Author)

A77-44470 # **Aerial photographic detection of imported fire ant mounds** L R Green, J K Olson (Texas A & M University, College Station, Tex), W G Hart, and M R Davis (U S Department of Agriculture, Citrus Insects Research Laboratory, Weslaco, Tex) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1051-1057 9 refs

Studies conducted in the Texas coastal plains from July 1971 through August 1972 demonstrated that mounds of the red imported fire ant, *Solenopsis invicta* Buren, can be detected on color, color infrared (CIR), and black-and-white infrared (BWIR) aerial photographs of ant infested land Analysis of aerial photographs taken with a modified Fairchild K-37 camera and a Hasselblad camera showed that up to 90 percent of the total imported fire ant mounds present in our research plots could be visually detected on photographs having scales of 1 2000 CIR and BWIR film types appear to be superior to regular color film in terms of our ability to visually detect fire ant mounds on resulting photographs December proved to be the optimum month for detecting red imported fire ant mounds in Texas with the aerial camera systems used in the study (Author)

A77-44471 * # **Resolution of grass canopy biomass classes** C J Tucker (NASA, Goddard Space Flight Center, Greenbelt, Md) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1059-1067 9 refs NSF Grants No GB-31862X2, No GB-41233X, No BMS-73-02027A02

Analysis of variance methods has been applied to in situ grassland spectral reflectance data in order to determine the classes or levels of total wet biomass that can be resolved spectrally by a single narrow band measurement Ground-truth clipping of blue grama grass plots was performed immediately following spectral reflectance measurements at 91 wavelength intervals which were 0 005 microns apart over the spectral range from 0 350 to 0 800 microns It was found that the photographic infrared region of 0 750 to 0 800 microns could be used to distinguish three classes or levels of total wet biomass Four or five classes, particularly at higher biomass levels, could not be distinguished by this technique M L

A77-44898 # **Remote sensing of productive moisture stored in the soil (Distantionnoe opredelenie zasov produktivnoi vlagi v pochve)** K Ia Kondrat'ev, Iu I Rabinovich, E M Shul'gina, and V V Melent'ev (Glavnaia Geofizicheskaiia Observatoriia, Leningrad, USSR) *Meteorologiya i Gidrologiya*, June 1977, p 78 89 17 refs In Russian

The influence of physical soil parameters on the thermal radio emission of the soil at wavelengths between 0 8 and 18 cm is studied The effectiveness of using microwave radiometers for remote sensing of soil moisture is demonstrated, and a two parameter technique for remote sensing of productive and total moisture in the upper, 1 m thick, soil layer from an aircraft is proposed Some results obtained with this technique are analyzed V P

A77-45748 # **Surface temperature and albedo observations as tools for soil moisture and crop yield estimation** J L Hatfield

(California, University, Davis, Calif), R J Reginato, S B Idso, and R D Jackson (U S Water Conservation Laboratory, Phoenix, Ariz) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 8 p 6 refs*

Remotely sensed surface temperatures and albedo have been found to be good inputs for methods of estimating evapotranspiration and crop yield A concept of cumulative stress degree days (SDD) is developed for wheat at Phoenix, Arizona and Davis, California and the SDD concept is based on comparisons of midafternoon surface temperature and air temperature (Author)

A77-45749 # **On winter wheat yield from Landsat and Landsat follow-on satellites** J C Harlan, Jr (Texas A & M University, College Station, Tex) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4 p*

The feasibility of determining winter wheat yield from earth observation satellites is discussed Data from four crop years are analyzed for selected locations in the southern Great Plains region High-resolution spectral data of commercial wheat fields are used to simulate data from Landsat data (including actual Landsat data and data from projected improved Landsat spacecraft) A standard procedure developed for treating all Landsat data is described V P

A77-45754 # **Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat (Etude de l'évolution de la réflectance d'un blé d'hiver dans les 4 bandes MSS de Landsat)** G Guyot and P Malet (Institut National de la Recherche Agronomique, Montfavet, Vaucluse, France) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 9 p 7 refs* In French

A77-45756 # **Forest fire fuel mapping from Landsat** M Goldberg (Ottawa, University, Ottawa, Canada) and P Kourtz (Department of Environment, Forest Fire Research Institute, Ottawa, Canada) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 6 p*

The present paper deals with the design of a system which uses Landsat imagery to plot and update forestry maps for forest fire control purposes The data contained in the maps are intended for use as input data to a computer forest fire control model The computer maps will supply up-to-date information on forest cover with regard to fuel type, as well as information on forest resources, roads, and slash areas The relevant properties of Landsat are briefly outlined, and earlier Landsat-based experiments are reviewed A design of a computer data base system for using Landsat imagery for the purposes under consideration is proposed V P

A77-45758 # **A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological DCP network** G Frayse (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 12 p 17 refs*

The application of satellite data analysis to crop yield forecasting in the European Economic Community (EEC) is discussed, with emphasis on linking conventional survey and meteorological information to the satellite data Meteorological data obtained from satellites, including solar energy measurements and surface temperature measurements to determine evapotranspiration levels, are considered The high-repetitivity data from Argos and Meteosat, together with thermal infrared measurements from Tiros-N and Meteosat and the low-repetitivity but high-resolution information from Landsat-3, are suggested for use in an integrated satellite data collection system in Western Europe An experiment to test regional crop yield forecasts based on this system is proposed J M B

A77-45765 * # **Effective use of Landsat for range monitoring and management - An example on a regional scale** D W Deering, J C Harlan, J W Rouse, Jr, and R H Haas (Texas A & M University, College Station, Tex) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4 p 5 refs* Contracts No NAS5-21857, No NAS5-20796

Some results of a study undertaken in the Great Plains region to evaluate the use of Landsat for monitoring rangeland ecosystems are briefly summarized. A vegetation parameter, the Transformed Vegetation Index (TVI), was developed as a green biomass indicator. It was determined that for rangelands with good vegetative cover, and which are not heavily infested with brush, green biomass can be estimated in increments of 250-300 kg/ha with a 95% probability. At least five levels of range feed conditions can be mapped with TVI data using the MSS Band 6 P T H

A77-45780 # Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture A K Binder (United Nations, Food and Agriculture Organization, Rome, Italy) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 10 p*

A77-45795 # Utilization of the spatial variability of reflectance for rice phenologic stages determination A Agazzi (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy), P Malet (Institut National de la Recherche Agronomique, Montfavet, Vaucluse, France), and S Russo (Istituto Sperimentale per la Cerealicoltura, Vercelli, Italy) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 10 p*

A method for monitoring the phenological stages of developing rice through an analysis of Landsat data is given. Structural models for the growth and development of annual plants, as well as the biological and physical significance of variations in growth rate, are discussed. Reduction of the Landsat data to create a beta distribution of reflectance measurements is considered, analysis of the variance and skewness of the distribution is suggested as a means for detecting phenological stages J M B

A77-45798 # Implementation of a crop condition monitoring system A B Park, A C Aaronson, R E Fries, and P E Buchman (GE Earth Resources Analysis and Management Center, Beltsville, Md) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 35 p 7 refs*

A description is presented of the capabilities and characteristics of various Landsat based crop production prediction systems. A crop condition monitoring center in Iowa was established to assess the utility of using Landsat data to monitor corn production. Attention is given to center characteristics, aspects of drought alarm identification, and drought alarm assessment. A Landsat based crop production prediction system recently designed for the Ministry of Agriculture in Argentina is also discussed, taking into account the development of a stratum and area yield model and the operational phase of the system. The data systems required by an operational system for crop inventory studies and crop monitoring are also considered G R

A77-45814 # Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data (Améliorations possibles des modèles statiques et dynamiques de prévision de récolte par les données de télédétection). P Malet (Institut National de la Recherche Agronomique, Montfavet, Vaucluse, France) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 11 p 18 refs. In French*

It appears that for most field cultures, crop yields cannot be predicted by remote sensing alone, and support from agroclimatic models is required. In the present paper, a number of existing models developed for estimating crop yields are critically reviewed, showing that the climatological areas for which these models hold are nowhere clearly defined. Some aspects of using remote sensing to obtain a precise definition of such areas, in particular with respect to surface temperature and actual evapotranspiration, are examined V P

A77-45817 * # The large area crop inventory experiment - A major demonstration of space remote sensing. R B MacDonald and

F G Hall (NASA, Johnson Space Center, Houston, Tex) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 43 p 10 refs*

The NASA-US Department of Agriculture Large Area Crop Inventory Experiment (LACIE), aimed at using multispectral remote sensing data from Landsat 1 and 2 to generate accurate annual global crop production forecasts, is discussed. The forecasts take into account meteorological conditions as well as yield and acreage, and may be used to increase the discrimination of US harvest estimates down to regional levels and to provide more accurate early-season predictions. Sample problems involving the determination of wheat harvests and the monitoring of drought conditions are described. Difficulties related to misidentification of abnormally-developing plantations, the automatic classification of homogeneous spectral groups, the computerized generation of colored maps, and the estimation of yields during years when exceptional meteorological conditions prevail are also considered. Samples of Landsat-generated classification maps for Western US and for the Saratov, USSR crop regions are given J M B

A77-45834 # Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe. J Dejace, S Galli de Paratesi, J Megier, and W Mehl (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 20 p 9 refs*

An experiment comparing Landsat data and aerial reconnaissance surveys of typical southern European ecological systems is described. The surveillance, conducted in France and Italy, was aimed at identification, classification and acreage estimation of crop and forestry lands. In particular, the assessment of rice acreage, the recognition and inventory of poplar plantations, and the discrimination between chestnut and beech forests was found to be feasible through reduction of the satellite data. Rice varieties were analyzed through airborne reconnaissance scanning. Reduction of satellite imagery to classifiable pixels, and the computer techniques and times involved are considered. Comparison with ground reference maps shows acceptable levels of accuracy in most satellite determinations J M B

A77-45840 # Satellite climatology and its role in agriculture P K Rao (NOAA, National Environmental Satellite Service, Washington, D C) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 14 p*

The kinds of climatological data that can be derived from satellite information are considered. Current satellite systems provide information on the cloud amount and distribution, vertical distribution of temperature and humidity, outgoing longwave radiation and reflected solar radiation to space from the earth atmosphere system, surface temperature distribution, wind distribution, snow and ice cover and boundaries. Several radiation fluxes including the solar energy reaching the ground, the energy reflected upward from the surface, and the outgoing IR can be determined. It is noted that techniques have to be developed to extract and parametrize satellite information before the data can be integrated into crop models. M L

A77-45844 * # Toward fully automated agricultural inventory from satellites S G Ungar, J Wasilewsky, and P Zeitz (NASA, Goddard Institute for Space Studies, New York, N Y) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4 p*

Conventional approaches to inventories from satellites rely heavily on the judgment of image analysts, who 'train' the computer classification program. The fully automated approach to this problem, described in the present paper, eliminates the need for human judgment in training the computer, by using fully automated techniques for selecting spectral characteristics and classification parameters to optimize agreement with ground truth in specified test areas V P

A77-45847 * # Landsat - Current and future capabilities for agriculture L S Walter (NASA, Goddard Space Flight Center, Earth

01 AGRICULTURE AND FORESTRY

Survey Applications Div., Greenbelt, Md.) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4 p*

The potential of the Landsat spacecraft in applications related to agriculture is demonstrated by the examples of assessing the damage to the Brazilian coffee crop due to freezing temperatures on July 17-18, 1975, and damage assessment in the state of Iowa, following a tornado which struck a corn and soybean producing region on June 13, 1976. Some techniques which have been used to measure snow covers on the basis of Landsat data are also noted. The advantages that are expected to accrue from the installation of sophisticated equipment on the third and fourth Landsat spacecraft, scheduled to be launched in 1978 and 1981, respectively, are reviewed. V P

A77-46638 **Monitoring crops and forests from space** H L Hill (U.S. Department of Agriculture, Foreign Agricultural Service, Washington, D.C.), F P Weber (U.S. Department of Agriculture, Forest Service, Houston, Tex.), and G F Hart (U.S. Department of Agriculture, Statistical Reporting Service, Washington, D.C.) In *New themes for space: Mankind's future needs and aspirations, Proceedings of the Bicentennial Space Symposium, Washington, D.C., October 6-8, 1976* San Diego, Calif., American Astronautical Society, 1977, p. 195-207. 9 refs (AAS 76-054)

The use of Landsat imagery to monitor crop and forest inventories is described. Applications include crop production statistics, foreign crop production estimates, nationwide forest and rangeland inventory, and monitoring for plant diseases. Two experimental programs are discussed. The Large Area Crop Inventory Experiment (LACIE), started in 1974, is an experiment to test the technical feasibility and cost-effectiveness of utilizing Landsat data along with meteorological, climatological, and historical data to predict wheat production on a country-by-country basis. The success of LACIE is evaluated. The Forestry Applications Program, started in 1976, has been involved in land-use planning, soils resource inventory, preparing a photointerpretation guide for forest resource inventories, and other projects. M L

A77-46734 **Remote sensing in ecological botany** B V Vinogradov *Remote Sensing of Environment*, vol 6, no 2, 1977, p 83-94. 17 refs. Translation

The remote cartography of vegetation, conducted with aerial and space images with a scale of from 1:1000 to 1:30,000,000, is discussed. Phytomass can be measured by comparing the dependence of the phytocenometric characteristics with the magnitude of the remotely obtained signal. Phenology and dynamics are revealed by the optical comparison of successive images. Basing structural ecological studies on spatial and factorial integration of ecosystems on single remotely sensed images is considered. B J

A77-46738 * **Applications of Suits spectral model to wheat** J E Chance (Pan American University, Edinburg, Tex.) *Remote Sensing of Environment*, vol 6, no 2, 1977, p 147-150. 5 refs. Grant No. NSG-9033

Canopy reflectance calculations for a spring type Mexican wheat, Penjamo, are compared with published data on Scout winter wheat. Good agreement exists between model calculations and experimental data in the spectral range, 500 nm to 750 nm, suggesting that the model parameters for wheat can be applied to different cultivars of wheat in the same growth stage. Wheat canopy reflectance is dependent upon surface soil type and this dependency is examined with the Suits' spectral model. In this particular growth stage wheat reflectance is shown to be nearly independent of soil reflectance in the visible wavelengths and progressively dependent at longer wavelengths in the infrared. (Author)

A77-47438 **Forest inventory of western Washington by satellite multi-stage sampling** J D Nichols (ESL, Inc., Sunnyvale, Calif.), R A Harding, R B Scott, and J R Edwards (State of

Washington, Dept. of Natural Resources, Olympia, Wash.) In *American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings* Falls Church, Va., American Society of Photogrammetry, 1976, p. 180-217. 10 refs.

Criteria and techniques developed in the conceptualization and organization of a computer-assisted forestry and land-use survey using satellite imagery and ground truth are described. Sample sizing and multistage sampling procedures, generation of algorithms for a mask file, the organization of the entire project, correlation procedures, survey plan outlines, selection of primary and secondary sampling units, and introduction of land ownership data are described. Types of forest and non-forest categories to be interpreted in the imagery are delineated and discussed in the body of the article and in an appendix. Tasks remaining for completion of the project are outlined. R D V

A77-47439 **Douglas County forest cover condition mapping and forest volume inventory** L W Aggers and E B Kelley (Oregon State, Dept. of Forestry, Salem, Ore.) In *American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings* Falls Church, Va., American Society of Photogrammetry, 1976, p. 218-229.

The organization and implementation of a project involving mapping of regional forest cover and timber volume inventory are described. Classification of types of forest cover and related features (brush, clearcuts), vegetative treatment classes, broad species classes, and aerial photo interpretation techniques are discussed. Satellite digital data, conventional aerial photo interpretive data, and ground data on ownership and use will be treated in a statistically-linked combined approach. R D V

A77-47440 * **A canopy-related stratification of a Southern pine forest using Landsat digital data** D L Williams (NASA, Goddard Space Flight Center, Earth Resources Branch, Greenbelt, Md.) In *American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings* Falls Church, Va., American Society of Photogrammetry, 1976, p. 231-239. 5 refs.

An investigation was undertaken to determine if a consistent stratification of a Southern pine forest could be obtained by using Landsat multispectral scanner data to assess crown closure. Winter and summer Landsat scenes of the North Carolina coastal region were analyzed individually and then registered and merged to take advantage of temporal changes in the forest canopy. Three levels of pine crown closure were accurately delineated. The applicability of this stratification as supplemental input to a forest inventory system is also discussed. (Author)

A77-47441 **Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study** Y J Lee (Canadian Forestry Service, Pacific Forest Research Centre, Victoria, British Columbia, Canada) In *American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings* Falls Church, Va., American Society of Photogrammetry, 1976, p. 240-250. 6 refs.

A77-47442 **Techniques for estimating flood-produced crop damage using aerial photography** M P McAdams (Iowa Geological Survey, Iowa City, Iowa) In *American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings* Falls Church, Va., American Society of Photogrammetry, 1976, p. 251-266. 9 refs.

Aerial photography methods useful, singly or in combination, in assessment of various modes and intensities of flood damage are

examined Time-sequential color IR techniques are found highly suitable for studying types of crops/croplands flooded, acreage of cropland flooded, number of acres and types of crops replanted The normal expected yield of the flooded cropland can be found from a combination of remote sensing and recorded data on soils and crop yield Acres of cropland flooded and yield of cropland flooded when destruction was less than 100% can be assessed via aerial photography, while the yield of the replanted crops is best found from historical yield data R D V

A77-47443 Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho M R Packer (Idaho, Dept of Water Resources, Boise, Idaho) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings Falls Church, Va, American Society of Photogrammetry, 1976, p 267-272 5 refs

A77-47450 * A new computer approach to map mixed forest features and postprocess multispectral data E P Kan (Lockheed Electronics Co, Inc, Aerospace Systems Div, Houston, Tex) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings Falls Church, Va, American Society of Photogrammetry, 1976, p 386-401 9 refs Contract No NAS9-12200

A computer technique for mapping mixed softwood and hardwood stands in multispectral satellite imagery of forest regions is described The purpose of the technique is to obtain smoother resource maps useful in timber harvesting operations The computer program relies on an algorithm which assesses the size and similarity of adjacent sections on satellite imagery (Landsat-1 data is used) and constructs, through an iteration of the basic algorithm, a more general map of timber mixtures, eliminating the mottled appearance of the raw imagery Despite difficulties in the experimental analysis of a Texas forest, apparently due to relatively low resolution of the Landsat data, the computer classification approach outlined is suggested as a generally applicable method of creating serviceable maps from multispectral imagery J M B

A77-47477 * Integration of land-use data and soil survey data T L Cox (South Dakota State University, Brookings, S Dak) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1127-1133 7 refs Grant No NGL-42-003-007

Approaches are discussed for increasing the utility of remotely sensed interpretations through the use of a computer-assisted process which provides capabilities for merging several types of data of varying formats The resulting maps and summary data are used for planning and zoning in a rapidly developing area (34,000 ha) adjacent to the Black Hills in South Dakota Attention is given to the data source, data digitization, and aspects of data handling and analysis G R

A77-49511 * Significance of vegetation in interpreting thermal radiation from a terrestrial surface R A Sutherland and J F Bartholic (Florida, University, Gainesville, Fla) *Journal of Applied Meteorology*, vol 16, Aug 1977, p 759-763 13 refs Contract No NAS10-8774

The regions between crop rows are modeled as infinitely long diffuse cavities Geometrical view factors are calculated, accounting for reflected radiation emanating internal to the cavity and from the background sky A 'cavity' emissivity dependent on local geometry is defined to allow for correcting apparent temperatures to true temperatures The total emissivity appropriate for correcting aircraft thermal data is then calculated by averaging all emissivity components to account for soil, crop, and background It is shown that even for the lowest crop and vegetation emissivities, if the crop height-to-spacing ratio is greater than unity, the composite emissivity is greatly increased, giving rise to a decreased error in remotely sensed temperature data (Author)

A77-50800 # A comparative analysis of methods for compiling isolinear maps of forest cover (Sravnitel'nyy analiz metodov sostavleniya izolineinykh kart lesistosti) V A Cherviakov *Geodeziya i Kartografiya*, July 1977, p 56-60 6 refs In Russian

The precision and laboriousness of the grid method and the sliding circle methods for compiling isolinear maps of the percentage forest cover were compared Experiments showed that the latter method was preferable, its flexibility permitted greater precision and detail in mapping for a set period of time The use of isolinear maps of the percentage forest cover is considered M L

A77-51568 Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites C Francois and Y Kerr (Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, Toulouse, France) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-ST-03* 14 p 5 refs

A theoretical model is developed of the variation of soil temperature during the daylight hours, as a framework for interpretation of data to be collected by the European geosynchronous satellite Meteosat Results predicted by the model are compared against data collected by the American geosynchronous satellite SMS (data referable to western Africa, 48 hr in August 1974) The article addresses derivation of the equations in the model, simulation procedures, selection of the site to be observed, and data analysis procedures R D V

N77-28560*# Environmental Research Inst of Michigan, Ann Arbor

WHEAT PRODUCTIVITY ESTIMATES USING LANDSAT DATA Progress Report, 16 Feb - 15 May 1977

Richard F Nalepka, John Colwell, Principal Investigators, and Daniel P Rice 15 May 1977 9 p refs ERTS (Contract NAS5-22389)

(E77-10181, NASA-CR-153915 ERIM-114800-35-L) Avail NTIS HC A02/MF A01 CSCL 05B

N77-28557*# Kanner (Leo) Associates Redwood City, Calif **TAXONOMIC CLASSIFICATION OF SOILS USING DIGITAL INFORMATION FROM LANDSAT DATA HUAYLLAMARCA AND EUCALIPTUS AREAS M S Thesis - Bolivia Univ** Samuel Quiroga Quiroga Washington NASA Jul 1977 96 p refs Transl into ENGLISH of Clasificacion Taxonomica de Suelos Utilizando Inform Digital de Datos LANDSAT-Area Huayllamarca y Eucaliptus Cochabamba (Bolivia) (Contract NASw-2790)

(NASA-TM-75029) Avail NTIS HC A05/MF A01 CSCL 08M

The applicability of LANDSAT digital information to soil mapping is described A compilation of all cartographic information and bibliography of the study area is made LANDSAT MSS images on a scale of 1 250 000 are interpreted and a physiographic map with legend is prepared The study area is inspected and a selection of the sample areas is made A digital map of the different soil units is produced and the computer mapping units are checked against the soil units encountered in the field The soil boundaries obtained by automatic mapping were not substantially changed by field work The accuracy of the automatic mapping is rather high Author

N77-30551*# California Univ Berkeley Space Sciences Lab

DETERMINING THE USEFULNESS OF REMOTE SENSING FOR ESTIMATING AGRICULTURAL WATER DEMAND IN CALIFORNIA Semiannual Report, 1 Jan - 30 Jun 1977

Robert N Colwell, Principal Investigator 30 Jun 1977 69 p refs Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 ERTS

(Grant NsG-2207)

(E77-10191 NASA-CR-154258 SSL-Ser-18-Issue-59) Avail NTIS HC A04/MF A01 CSCL 08H

The author has identified the following significant results The manual interpretation phase designed to estimate the irrigated

01 AGRICULTURE AND FORESTRY

acreage of the Sacramento Valley is essentially complete. It was accomplished through the analysis of multirate LANDSAT color composite prints. A two sampling scheme using a sampling frame of clusters and stratification by agricultural practice and county boundary was designed to provide the data to calculate the multiphase estimate, variance, standard deviation, and relative error as well as sample correlation coefficients for each county. Results have included individual date classifications into crop type and condition associated classes and summaries of the area of each type. These classes can be aggregated into estimates for irrigated versus nonirrigated acreage. A two date overlay study was also produced indicating ground and crop condition sequence, a product aimed at predicting total irrigated acreage, small grain and multicropped acreage.

N77-30552*# Food and Agriculture Organization of the United Nations, Rome (Italy)

THE APPLICATION OF ERTS IMAGERY TO THE FAO/UNESCO SOIL MAP OF THE WORLD Final Report

Raoul J. Dudal and Andre J. Pecrot, Principal Investigator, 15 May 1977, 5 p. Sponsored by NASA ERTS.

(E77-10192, NASA-CR-154261) Avail NTIS HC A02/MF A01 CSCL 08M

The author has identified the following significant results. It was concluded that direct identification and mapping of the various soil degradation forms and intensities from the color composite imagery was generally difficult, if not impossible. The imagery, however, provided valuable information on some main environmental criteria which could be used in connection with other available field data to assess actual soil degradation and estimate soil degradation hazards.

N77-30564*# National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

THE LARGE AREA CROP INVENTORY EXPERIMENT: AN EXPERIMENT TO DEMONSTRATE HOW SPACE-AGE TECHNOLOGY CAN CONTRIBUTE TO SOLVING CRITICAL PROBLEMS HERE ON EARTH

Aug 1977, 16 p. ref. (NASA-TM-74832, JSC-11854) Avail NTIS HC A02/MF A01 CSCL 02C

The large area crop inventory experiment is being developed to predict crop production through satellite photographs. This experiment demonstrates how space age technology can contribute to solving practical problems of agriculture management. Author

N77-30569*# Arkansas Univ., Pine Bluff. **IDENTIFICATION OF CROPS IN CENTRAL ARKANSAS USING VISUAL AND INFRARED SPECTRAL REFLECTANCE SIGNATURES**

1977, 12 p. Revised. (Grant NSG-9002) (NASA-CR-151495) Avail NTIS HC A02/MF A01 CSCL 02C

The spectral reflectance signatures of principle crops of central Arkansas were calibrated. Data were collected by conducting ground based reflectance signatures at well controlled test sites. Data collected were primarily for soybeans; therefore, additional measurements are essential to the acquisition of significant results. Author

N77-30570*# National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

THE LARGE AREA CROP INVENTORY EXPERIMENT: A MAJOR DEMONSTRATION OF SPACE REMOTE SENSING

R. B. MacDonald and F. G. Hall, Jun 1977, 49 p. refs. Presented at W. Nordberg Mem. Symp. on Contrib. of Space Observ. to Global Food Inform. Systems, Tel-Aviv, Israel, 8-10 Jun 1977. Sponsored by COSPAR/IAMP (IUGG), FAO and WMO. (NASA-TM-74840, COSPAR-D 2.3) Avail NTIS CSCL 02C

Strategies are presented in agricultural technology to increase the resistance of crops to a wider range of meteorological conditions in order to reduce year-to-year variations in crop production. Uncertainties in agricultural production, together with

the consumer demands of an increasing world population, have greatly intensified the need for early and accurate annual global crop production forecasts. These forecasts must predict fluctuation with an accuracy, timeliness and known reliability sufficient to permit necessary social and economic adjustments with as much advance warning as possible. Author

N77-30574*# National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

LACIE WHEAT YIELD MODELS FOR THE USSR

Clarence M. Sakamoto (Center for Climatic and Environmental Assessment, Columbia, Mo.) and Sharon K. LeDuc (Center for Climatic and Environmental Assessment, Columbia, Mo.), Jun 1977, 55 p. refs.

(NASA-TM-74834, JSC-11343, LACIE-00430-Rev-A, TN-77-2) Avail NTIS HC A04/MF A01 CSCL 02C

A quantitative model determining the relationship between weather conditions and wheat yield in the USSR was studied to provide early reliable forecasts on the size of the USSR wheat harvest. Separate models are developed for spring wheat and for winter. Differences in yield potential and responses to stress conditions and cultural improvements necessitate models for each class. Author

N77-30575*# National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

LACIE YIELD-WEATHER REGRESSION MODELS FOR THE CANADIAN PRAIRIES

Feb 1976, 26 p. refs. Sponsored in part by USDA. Prepared in cooperation with NOAA.

(NASA-TM-74833, LACIE-00433, JSC-11658) Avail NTIS HC A03/MF A01 CSCL 02C

Most of the variability in wheat production is due to weather fluctuations. Climatic differences within the region account for a large portion of the variability in yields for different parts of the region. Separate regression models were developed for each of the areas indicated. Author

N77-30576*# National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

LACIE WHEAT YIELD MODELS FOR THE UNITED STATES, REVISION A

Jun 1977, 23 p. Sponsored in part by USDA. Prepared in cooperation with NOAA.

(NASA-TM-74835, LACIE-00431-Rev-A, JSC-11656) Avail NTIS HC A02/MF A01 CSCL 02C

Crop/weather models for wheat have been developed for the Great Plains region of the United States. The enclosed maps indicate the areal coverage of the various models for spring (durum and other spring) and winter wheat. The given regions are the combination of several climatic divisions and many times comprise an entire state. Author

N77-30578# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil)

USEFULNESS OF THE LANDSAT 1 DATA IN THE IMPLEMENTATION, CONTROL, AND MONITORING OF THE CATTLE FARM PROJECTS IN THE SOUTHEASTERN AMAZON REGION. MS Thesis

Armando Pacheco DosSantos and Evelyn Marcia Leao DeMoraes, Novo Jun 1977, 228 p. refs. In PORTUGUESE ENGLISH summary.

(INPE-1044-TPT/056) Avail NTIS HC A11/MF A01

LANDSAT images were used to evaluate the natural resources of the Amazon region. Vegetation, drainage, topographic conditions, road systems, and deforestation were considered. Deforested areas were mapped and the quality of pasture lands determined in order to find suitable areas for cattle. Results show that LANDSAT images can be used very efficiently to map different kinds of natural vegetation, forested drainage networks, topographic conditions, and road networks. Areas being deforested were successfully monitored and evaluated. Author

N77-31559*# Columbia Univ., New York, Dept. of Geography

APPLICATION OF DIGITAL ANALYSIS OF MSS DATA TO AGRO-ENVIRONMENTAL STUDIES Semiannual Progress Report

Kempton E Webb Colin J High, and Jerry C Coiner Principal Investigators 28 Feb 1977 202 p refs Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 ERTS (Grant Nsg-5080) (E77-10204 NASA-CR-153969) Avail NTIS HC A10/MF A01 CSCL 02C

N77-31566*# Texas A&M Univ. College Station Remote Sensing Center

APPLIED REGIONAL MONITORING OF THE VERNAL ADVANCEMENT AND RETROGRADATION (GREEN WAVE EFFECT) OF NATURAL VEGETATION IN THE GREAT PLAINS CORRIDOR Quarterly Progress Report, 13 Apr - 13 Jul 1977

J W Rouse Jr, Principal Investigator 13 Jul 1977 9 p ERTS (Contract NAS5-20796) (E77-10212 NASA-CR-154796) Avail NTIS HC A02/MF A01 CSCL 08F

N77-31567*# Dartmouth Coll., Hanover, N H AN INVESTIGATION OF AGRICULTURAL AND OTHER EARTH RESOURCES PARAMETERS USING LANDSAT AND OTHER REMOTE SENSING DATA Semiannual Status Report, 1 Jan - 30 Jun 1977

Robert E Huke, Vincent M Malmstrom, Charles L Drzke Robert C Reynolds Richard W Birnie and Richard E Stoiber, Principal Investigators 30 Jun 1977 24 p refs ERTS (E77-10213, NASA-CR-154797) Avail NTIS HC A02/MF A01 CSCL 08F

N77-31573*# Mekong Committee Secretariat Bangkok (Thailand)

AGRICULTURE/FORESTRY HYDROLOGY Final Report, Mar. 1975 - Jun 1977

W J VanderOord, Principal Investigator Jul 1977 204 p refs Sponsored by NASA, ERTS (E77-10219 NASA-CR-154802, Rept-6) Avail NTIS HC A10/MF A01 CSCL 05B

The author has identified the following significant results The main vegetation units of the lower Mekong basin and the land development conditions were mapped by interpretation of LANDSAT 1 data By interpretation of various shades of gray on satellite images, it was possible to map the density of the vegetation cover Study of seasonal variations makes it possible to distinguish between mainly deciduous forests In the Mekong basin area these are generally related to the vegetation cover density

N77-31576*# California Univ Berkeley Space Sciences Lab

AN INVENTORY OF IRRIGATED LANDS FOR SELECTED COUNTIES WITHIN THE STATE OF CALIFORNIA BASED ON LANDSAT AND SUPPORTING AIRCRAFT DATA Final Report, 15 Apr 1975 - 15 Jan 1977

Robert N Colwell, Principal Investigator 15 Jan 1977 61 p refs Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls S D 57198 ERTS (Contract NAS5-20969) (E77-10222 NASA-CR-154805, SSL-Ser-18-Issue-50) Avail NTIS HC A04/MF A01 CSCL 08B

The author has identified the following significant results (1) Goals of the irrigated lands project were addressed by the design and implementation of a multiphase sampling scheme that was founded on the utilization of a LANDSAT-based remote sensing system (2) The synoptic coverage of LANDSAT and the eighteen day orbit cycle allowed the project to study agricultural test sites in a variety of environmental regions and monitor the development of crops throughout the major growing season (3) The capability to utilize multitemporal imagery is crucial to the reliable estimation of irrigated acreage in California where

multiple cropping is widespread and current estimation systems must rely on single data survey techniques (4) In addition the magnitude of agricultural acreage in California makes estimation by conventional methods impossible

N77-31578# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil)

UTILIZATION OF LANDSAT IMAGES IN THE MONITORING AND CONTROL OF THE CATTLE FARM PROJECTS ESTABLISHED IN THE AMAZON REGION

Armando Pacheco DosSantos and Evelyn Marcia Leao deMoraes Novo Jul 1977 29 p refs In PORTUGUESE ENGLISH Summary (INPE-1075-NTE/101) Avail NTIS HC A03/MF A01

LANDSAT system capability was evaluated for monitoring deforestation in cattle farms established in the Amazon region Assessment of pasture quality was also within the scope of the work Automatic and visual methods were used to quantitatively determine the deforested areas Author

N77-31584*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex

LARGE AREA CROP INVENTORY EXPERIMENT (LACIE) PHASE 2 EVALUATION REPORT

Jul 1977 76 p (NASA-TM-74937 JSC-11694, LACIE-00453) Avail NTIS HC A05/MF A01 CSCL 02C

Documentation of the activities of the Large Area Crop Inventory Experiment during the 1976 Northern Hemisphere crop year is presented A brief overview of the experiment is included as well as phase two area yield and production estimates for the United States Great Plains Canada, and the Union of Soviet Socialist Republics spring winter wheat regions The accuracies of these estimates are compared with independent government estimates Accuracy assessment of the United States Great Plains yardstick region based on a through blind sight analysis is given and reasons for variations in estimating performance are discussed Other phase two technical activities including operations exploratory analysis reporting methods of assessment phase three and advanced system design, technical issues, and developmental activities are also included Author

N77-31591# Oak Ridge National Lab Tenn THEORY AND ANALYSIS OF VEGETATION PATTERN Ph D Thesis

C T Kelsey F G Goff and D Fields Jan 1977 167 p refs (Contract W-7405-eng-26) (EDFB/IBP-76/3) Avail NTIS HC A08/MF A01

Distortion in indirect gradient ordination was investigated and a technique less subject to distortion was developed that maintains a direct relationship between ecological differences between vegetation elements and ordination distances between those elements The procedure was tested through application to species joint occurrence data (presence and absence data) from two adjacent physiographic regions the Cumberland Plateau and the Ridge and Valley regions of Tennessee ERA

N77-32561*# Bethune-Cookman Coll Daytona Beach, Fla GENERALIZED VEGETATION MAP OF NORTH MERRITT ISLAND BASED ON A SIMPLIFIED MULTISPECTRAL ANALYSIS Final Report, 1 Nov 1976 - 30 Apr 1977

P Poonai, W J Floyd and M A Rahmani 30 Apr 1977 24 p refs (Grant NGR-10-200-001) (NASA-CR-155006) Avail NTIS HC A02/MF A01 CSCL 08B

A simplified system for classification of multispectral data was used for making a generalized map of ground features of North Merritt Island Subclassification of vegetation within broad categories yielded promising results which led to a completely automatic method and to the production of satisfactory detailed maps Changes in an area north of Happy Hammocks are evidently related to water relations of the soil and are not associated with the last winter freeze damage which affected mainly the mangrove species likely to reestablish themselves by natural

01 AGRICULTURE AND FORESTRY

processes A supplementary investigation involving reflectance studies in the laboratory has shown that the reflectance by detached citrus leaves of wavelengths lying between 400 microns and 700 microns, showed some variation over a period of seven days during which the leaves were kept in a laboratory atmosphere Author

N77-32565*# National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt, Md
USE OF NEAR INFRARED/RED RADIANCE RATIOS FOR ESTIMATING VEGETATION BIOMASS AND PHYSIOLOGICAL STATUS
C J Tucker Jul 1977 46 p refs Submitted for publication (NASA-TM-X-71388 X-923-77-183) Avail NTIS HC A03/MF A01 CSCL 08F

The application of photographic infrared/red (ir/red) reflectance or radiance ratios for the estimation of vegetation biomass and physiological status were investigated by analyzing in situ spectral reflectance data from experimental grass plots Canopy biological samples were taken for total wet biomass total dry biomass, leaf water content dry green biomass, dry brown biomass, and total chlorophyll content at each sampling date Integrated red and photographic infrared radiances were regressed against the various canopy or plot variables to determine the relative significance between the red photographic infrared, and the ir/red ratio and the canopy variables The ir/red ratio is sensitive to the photosynthetically active or green biomass, the rate of primary production, and actually measures the interaction between the green biomass and the rate of primary production within a given species type The ir/red ratio resulted in improved regression significance over the red or the ir/radiances taken separately Only slight differences were found between ir/red ratio, the ir-red difference, the vegetation index, and the transformed vegetation index The asymptotic spectral radiance properties of the ir red, ir/red ratio, and the various transformations were evaluated Author

N77-32570# Army Electronics Command Fort Monmouth, NJ
ANALYSIS OF OBSERVED SOIL SKIN MOISTURE EFFECTS ON REFLECTANCE
S E Taylor, J M Davis, and J B Mason Jun 1977 28 p refs (AD-A041859, ECOM-5822) Avail NTIS HC A03/MF A01 CSCL 08/13

A light reflectance device has been applied to various soil surfaces, and the results have been correlated to independent measurements of skin moisture content Results show that for the configuration used moisture effects are masked by those of surface texture Modifications are recommended Author (GRA)

N77-33563*# Purdue Univ Lafayette, Ind Lab for Applications of Remote Sensing
[APPLICATIONS OF REMOTE SENSING] Annual Technical Summary Report, 1 Jun. 1976 - 31 May 1977
D A Landgrebe Principal Investigator 1977 61 p refs Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (Contract NAS9-14970) (E77-10183, NASA-CR-151451 T-1314/5 MA-657T) Avail NTIS HC A04/MF A01 CSCL 05B

N77-33567*# Food and Agriculture Organization of the United Nations Rome (Italy)
THE APPLICATION OF ERTS IMAGERY TO THE FAO/UNESCO SOIL MAP OF THE WORLD Final Report
Raoul J Dudal and A J Pecrot Principal Investigators 15 May 1977 4 p Sponsored by NASA ERTS (E77-10236 NASA-CR-155026) Avail NTIS HC A02/MF A01 CSCL 08B

The author has identified the following significant results It was concluded that direct identification and mapping of the various soil degradation forms and intensities from the color composite imager was generally difficult if not impossible The imagery however provided valuable information on some main environmental criteria which can be used in connection with other available

field data to assess actual soil degradation and estimate soil degradation hazards

N77-33573*# Nebraska Univ Lincoln Conservation and Survey Div
APPLICATION OF LANDSAT IMAGERY IN LAND USE INVENTORY AND CLASSIFICATION IN NEBRASKA Final Report, 10 Mar 1975 - 10 Mar 1977
Marvin P Carlson and Paul M Seevers Principal Investigators 10 May 1977 107 p Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (Contract NAS5-20814) (E77-10242 NASA-CR-155032) Avail NTIS HC A06/MF A01 CSCL 08B

N77-33574*# Tokyo Univ (Japan)
INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN OBSERVATION OF PRESENT STATE OF AGRICULTURAL LAND-USE BY ANALYSING LANDSAT DATA
Takakazu Maruyasu Principal Investigator and Shigechika Hayashi (National Agricultural Experiment Station Hokkaido Japan) [1977] 19 p Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (E77-10243 NASA-CR-155033) Avail NTIS HC A02/MF A01 CSCL 02C

The author has identified the following significant results Species and ages of grasses in pastures were identified and soils were classified into several types using LANDSAT data This data could be used in a wide area of cultivation reclamation or management planning on agricultural land

N77-33575*# Tokyo Univ (Japan)
INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN INVESTIGATION OF THE ECOLOGICAL ENVIRONMENT INDEX FROM OBSERVATION OF THE REGIONAL VEGETATION COVER AND THEIR GROWING CONDITION Final Report
Takakazu Maruyasu Principal Investigator and Iwao Nakajima (Ministry of Agriculture and Forestry Tokyo Japan) Aug 1977 28 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (E77-10244 NASA-CR-155034) Avail NTIS HC A03/MF A01 CSCL 04B

The author has identified the following significant results Practical use of recognition results of LANDSAT data as the base map of the field survey or the retouching work of vegetation and land use has the effective benefit to cut down the cost labor and time lower than 10% of a conventional method Correct and detailed vegetation maps were prepared using combined interpretation of repetition of data of different seasons at warm and temperate forested areas

N77-33576*# Tokyo Univ (Japan)
AN ANALYSIS ON VEGETATION COVER BY USING LANDSAT MSS DATA
Takakazu Maruyasu Principal Investigator and Shunji Murai [1977] 11 p Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (E77-10245 NASA-CR-155035) Avail NTIS HC A02/MF A01 CSCL 08F

ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

Includes land use analysis urban and metropolitan studies environmental impact air and water pollution, geographic information systems and geographic analysis

A77-40639 EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions R E Lee, Jr and F V Duffield (U S Environmental Protection Agency, Research Triangle Park, N C) *Air Pollution Control Association, Journal*, vol 27, July 1977, p 631-635 25 refs

A brief summary of sulfuric acid review conference sponsored by the EPA automotive Catalyst Research Program held recently at Hendersonville, N C is presented Emissions characterization research indicated that in-use catalyst-equipped vehicles emit low levels of H₂SO₄, averaging 2.7 mg/mile for 49-state cars and 25 mg/mile for California cars Research on measurement methodology for H₂SO₄ and other sulfate compounds has led to the development of several promising techniques based on selective volatilization In-roadway and off roadway monitoring programs are providing sulfate data which can lead to improved mathematical predictive models Acute toxicity studies to date indicate that morphological, biochemical, physiological, and pharmacological alterations due to inhaled H₂SO₄ alone do not appear to occur at levels less than 1 mg/cu m However, striking effects are noted with combinations of H₂SO₄ and other pollutants The need for long term chronic H₂SO₄ exposure studies was identified by participants (Author)

A77-40675 Air monitoring survey design K E Noll (Illinois Institute of Technology, Chicago, Ill) and T L Miller (Enviro-Measure, Knoxville, Tenn) Ann Arbor, Mich , Ann Arbor Science Publishers, Inc , 1977 302 p 112 refs \$22 50

Mathematical models for predicting air quality are considered along with general procedures for air monitoring survey design, air pollution regimes, site selection for air monitoring near line sources, site selection for air monitoring background concentrations, and site selection for air monitoring near point sources Attention is also given to aspects of air sample collection, analytical methods for measuring air pollutants, air monitoring instrument calibration, air monitoring hardware, planning meteorological surveys, meteorological measurements, questions of air quality summaries and data presentations, and air quality data evaluation G R

A77-40758 # Radar detection of sea surface oil pollution (Radiolokatsionnye obnaruzheniya nefrianykh zagriaznenii morskoi poverkhnosti). Iu M Galaev, A I Kalmykov, A S Kurekin, Iu A Lementa, B A Nelepo, I E Ostrovskii, A P Pichugin, V V Pustovoienko, and Iu V Terekhin (Akademiia Nauk Ukrainskoi SSR, Institut Radiofiziki i Elektroniki, Kharkov, Akademiia Nauk Ukrainskoi SSR, Morskoi Gidrofizicheskii Institut, Sevastopol, Ukrainian SSR) *Akademiia Nauk SSSR, Izvestiia, Fizika Atmosfery i Okeana*, vol 13, Apr 1977, p 406-414 12 refs In Russian

A77-41110 # Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-6, 1974 (Formirovanie i raspad poiasa energichnykh elektronov, inzhektirovannykh vo vremia burii 4-6 Iul'ia 1974 g.) L M Kovrygina, E N Sosnovets, and L V Tverskaia (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Geomagnetizm i Aeronomiia*, vol 17, May-June 1977, p 519-521 8 refs In Russian

A77-41255 Surface temperature and vegetation distribution in Freiburg im Breisgau - Two-component pictures as an aid in

the evaluation of MSS data (Oberflächentemperatur und Vegetationsverteilung in Freiburg i Br - Zweikomponentenbilder als Hilfsmittel bei der Auswertung von MSS-Daten) H Gossmann and W Nubler (Freiburg, Universität, Freiburg im Breisgau, West Germany) *Bildmessung und Luftbildwesen*, vol 45, July 1, 1977, p 105-113 16 refs In German

The thermal differentiation of an urban area during the midday heating phase is considered and related to an image of vegetation distribution This approach makes it possible to estimate the effect of vegetation-cover differences on the maxima of surface and air temperature The data concerning the vegetation cover were obtained with the aid of a multispectral line-scanning device which was carried by an aircraft Surface and air temperatures were measured at 50 ground-control points The reported investigation involved a point-wise superposition of the temperature and the vegetation maps as a basis for a study of the significance of the vegetation for the thermal budget of the considered urban area G R

A77-41420 An important ground surface sink for atmospheric nitrous oxide K A Brice, A E J Eggleton, and S A Penkett (Atomic Energy Research Establishment, Harwell, Oxon, England) *Nature*, vol 268, July 14, 1977, p 127-129 20 refs Research supported by the Department of the Environment

Measurements of N₂O concentrations at 5 m above ground level indicate a regular diurnal variation with a minimum recorded in the early hours of the morning and a maximum in the late afternoon or evening Since concentrations of sulfur dioxide, ozone, and peroxyacetyl nitrate follow the same diurnal pattern, and these gases are known to be absorbed at ground level surfaces, it is suggested that the ground surface serves as a sink for atmospheric nitrous oxide Atmospheric N₂O is the source of nitric oxide which is the main natural agent for the destruction of ozone M L

A77-41749 # Measurement of the temperature distribution on urban surfaces T Saito, H Taniguchi, T Sonoda, Y Tashiro, and E Ishida *Hokkaido University, Faculty of Engineering, Bulletin*, July 1977, p 27-38 In Japanese, with abstract in English

This paper presents the results of measurements of the temperature on the surface areas of the City of Sapporo Measurements were conducted in June-July, 1976, and remote sensing using a multispectral scanner and a thermographic camera provided the temperature distribution Surface temperatures in the central district of the city were about 20 C higher than in the green zones in the suburbs, although the temperature showed considerable local differences Systematic arranging of wide green zones in the urban area is found necessary to maintain the comfortable thermal environment for people residing in the city (Author)

A77-42255 Environmental monitoring D S Barth, G B Morgan, and E A Schuck (U S Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Las Vegas, Nev) In *Advances in environmental science and technology* Volume 7 New York, Wiley Interscience, 1977, p 279-314 20 refs

An overview of environmental monitoring is offered The purposes of monitoring are considered, with attention to trend monitoring, ambient-source linked monitoring and exposure monitoring The future directions of monitoring are discussed Monitoring sensors and methods, the design of integrated monitoring networks, and the applications of integrated monitoring networks are examined Present monitoring activities are described, and attention is directed to the quality assurance aspects of monitoring M L

A77-42853 Estimation of natural pollution loads from streamflow measurements in remote catchments T Singh and Y P Kalra (Department of the Environment, Northern Forest Research Center, Edmonton, Alberta, Canada) *Water, Air, and Soil Pollution*, vol 7, Jan 1977, p 111-116 11 refs

In a study conducted in Marmot Creek Basin (total area 9.40 sq km) situated in the Rocky Mountains of Alberta, equations were developed to obtain gross estimates of the total inorganic solutes

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

dislodged from three forest catchments on a monthly and annual basis. The least square regression coefficient range of the equations was 99% or greater, indicating excellent fit in all cases. The equations are suitable for in situ estimation of the pollution loads directly from streamflow measurements, especially for remote catchments.

(Author)

A77-43080 **Diurnal oscillation of the area of cloudiness associated with tropical storms** S P Browner, W L Woodley, and C G Griffith (NOAA, National Hurricane and Experimental Meteorology Laboratory, Coral Gables, Fla.) *Monthly Weather Review*, vol 105, July 1977, p 856-864 15 refs

Satellite IR imagery of tropical storms (SMS-I, two storms in 1974 and six in 1975) was studied with scanning false-color densitometry and false-color image enhancement, to discern any diurnal oscillations of the storm cirrus cloud cover. The max/min cloudiness area ratio was 1.65. Maximum area was attained at about 1700 local mean solar time (LMST) and minimum area at 0300 LMST. Conditions for area measurements and tests to rule out spurious diurnal oscillations (associated with satellite instrumentation or processing of image data) are described. Ocean surface temperature data are taken into account. The amplitude of the cloudiness area oscillation is inversely proportional to the intensity of the storm, and a time-dependent shorter-period oscillation is superimposed on the diurnal oscillation. (Author)

A77-43376 **Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes** J D Husar, R B Husar, E S Macias (Washington University, St Louis, Mo.), W E Wilson, J L Durham, W K Shepherd (U.S. Environmental Protection Agency, Chemistry and Physics Laboratory, Research Triangle Park, N.C.), and J A Anderson (Meteorology Research, Inc., Altadena, Calif.) *Atmospheric Environment*, vol 10, no 8, 1976, p 591-595 22 refs. U.S. Environmental Protection Agency Grants No R-802815, No R-803896

A77-43416 # **Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short-wave radio emission (Predvaritel'nye rezul'taty izmerenii vysotnogo raspredeleniia neodnородnostei ionosfery, vzbuzhdaemykh moshchnym korotkovolnovym radiozlučheniem)** E E Mitakova, E N Miasnikov, and A V Rakhlin (Nauchno Issledovatel'skii Radiofizicheskii Institut, Gorki, USSR) *Radiofizika*, vol 20, no 6, 1977, p 939, 940. In Russian.

A77-44235 **Field and particle observations in the magnetotail related to the reconnection process** A Nishida (Tokyo, University, Komaba, Japan). In *Physics of solar planetary environments*, Proceedings of the International Symposium on Solar Terrestrial Physics, Boulder, Colo., June 7-18, 1976. Volume 2. Washington, D.C., American Geophysical Union, 1976, p 572-581. 16 refs.

Measurements made by the Explorer 34 and OGO 5 satellites in the magnetotail showed bursts of electrons above 0.5 MeV and southward turnings of the magnetotail field in close association with the observation of the expansion phase of a magnetospheric substorm. Beyond 15 earth radii, increases in particle fluxes occurred after the onset of the expansion phase. Below 15 earth radii, enhancements start roughly at the expansion phase onset time, the enhancements being preceded by gradual flux decreases. The production of MeV electrons occurs without significant dawn-dusk asymmetry. The briefness of the duration of the energetic electron burst means that these electrons are produced at the reconnection line only at the earliest epoch of the near tail reconnection. It is proposed that inductive type impulsive electric fields are responsible for the acceleration of electrons. P T H

A77-44240 **The cold plasma throughout the magnetosphere** K I Gringauz (Akademiia Nauk SSSR, Institut Kosmicheskikh Issledovani, Moscow, USSR). In *Physics of solar planetary environments*, Proceedings of the International Symposium on

Solar-Terrestrial Physics, Boulder, Colo., June 7-18, 1976. Volume 2. Washington, D.C., American Geophysical Union, 1976, p 672-684. 21 refs.

A review of results of plasmasphere studies and of cold plasma measurements between the plasmapause and the magnetopause published mainly in 1974-1976 is given. The Prognostic satellite data are presented which give evidence of a quiet plasmasphere asymmetry in the noon-midnight direction. In the plasmasphere there exists an inner 'cold' zone and an outer 'hot' zone, the thermal structure and dimensions of which depend on geomagnetic activity and its prehistory. The 'cold' ion density between the plasmapause and the magnetopause is less than 1 per cu cm. The question of coupling between the plasmasphere and regions of enhanced cold plasma density beyond the plasmapause should be regarded as unsolved at present. (Author)

A77-44613 **Air monitoring with tunable lasers** E D Hinkley (Laser Analytics, Inc., Lexington, Mass.) *Environmental Science and Technology*, vol 11, June 1977, p 564-567. 5 refs.

Tunable laser monitoring of atmospheric pollutants is discussed. The properties and potential monitoring applications of several tunable lasers, such as dye, optical parameter oscillator, semiconductor diode, spin-flip-Raman, and high-pressure gas lasers, are described. Monitoring schemes that use differential absorption, including those involving cooperative reflectors or remote detectors, natural or topographic reflectors, aerosol backscattering, or heterodyne detection, are described. Calibration of the differential absorption detectors is mentioned, demonstration experiments involving a remote sensing technique for ambient air monitoring, as well as methods using natural target backscattering, aerosol backscattering, or heterodyne detection are also considered. J M B

A77-44614 **Optical systems unravel smog chemistry** J N Pitts, Jr (California, University, Riverside, Calif.), B J Finlayson-Pitts (California State University, Fullerton, Calif.), and A M Winer (Statewide Air Pollution Research Center, Riverside, Calif.) *Environmental Science and Technology*, vol 11, June 1977, p 568-573. 7 refs. Research supported by the U.S. Environmental Protection Agency, California Air Resources Board, University of California, California State University, and NSF.

Methods of identifying and measuring intermediate products in photochemical smog are described. In particular, the use of ultra violet tunable lasers in detecting ambient hydroxyl radicals is discussed. Photodecomposition processes such as the dissociation of ozone or formaldehyde can also be monitored using the tunable lasers. In addition, the application of Fourier transform-infrared (FT-IR) spectrometers with Michelson interferometers to the detection of several labile molecular species in ambient air is considered. Advantages of FT-IR spectrometers, including high degree of optical throughput, accuracy of frequency determination, and capacity to gather information at all infrared frequencies simultaneously, are reviewed, experiments dealing with the nitrogen/carbon balance in smog chamber studies, olefin oxidation reactions, and the detection of species such as formic acid, nitric acid and ammonia in photochemical smog are described. J M B

A77-44997 **Radiation in the atmosphere** Edited by H-J Bolle (Munich, Universität, Munich, West Germany). Princeton, N.J., Science Press, 1977. 661 p. \$45.

Aerosols in the troposphere are considered and a description of the chemical, physical, and radiation properties of aerosols is provided, taking into account the dominance of tropospheric sulfate in modifying solar radiation, the formation and transport of light-scattering aerosols in the St. Louis urban plume, and scattering measurements of atmospheric aerosol particles in several size ranges. Attention is also given to stratospheric aerosols, remote sensing and problems of aerosol inversion, clouds and radiation, radiative transfer in polluted atmospheres, radiative transfer in scattering atmospheres, radiative transfer in the ocean and the ocean-atmosphere systems, remote sounding of the upper atmosphere, remote sensing of the atmosphere, lidar sounding of the atmosphere, ground reflection and

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

ground truth, radiation and climate, the longwave radiation field and radiation climatology, the results of major field experiments, and solar radiation
G R

A77-45731 # The sensitivity requirements for the determination of desert aerosols from space J H Joseph (Tel Aviv University, Tel Aviv, Israel), S T Shipley, P J Guetter, and J A Weinman (Wisconsin, University, Madison, Wis) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4 p 7 refs*

A77-46293 Sulphur dioxide discharge from Mount Etna R Haulet, P Zettwoog (Commissariat à l'Énergie Atomique, Service Technique d'Études de la Pollution dans l'Atmosphère et dans les Mines, Fontenay-aux-Roses, Hauts-de-Seine, France), and J C Sabroux (CNRS, Centre des Faibles Radioactivités, Gif sur Yvette, Essonne, France) *Nature*, vol 268, Aug 25, 1977, p 715-717 11 refs Centre National de la Recherche Scientifique Grant No RCP-215

A remote-sensing optical correlation spectrometer, which compares a high-contrast reference spectrum with the molecular absorption spectrum of a gas mixture, was used to monitor the sulfur dioxide discharge from Mount Etna during conditions of normal activity. The measurements indicate a mean SO₂ flow rate of 3740 tons per day, which is very much higher than the rates of SO₂ outgassing reported for other volcanoes. The oxidation rate of SO₂ in the volcanic plume during atmospheric diffusion, as well as the apparent characteristics of the degassing process for Etna magma are discussed. The value of the remote sensing spectrometer technique in detecting changes in eruptive activity is also considered
J.M.B

A77-46298 Airborne measurements of air pollution over Denmark and the adjacent seas N Z Heidam (Atomenergi-kommissionens Forsøgsanlæg Riso, Roskilde, Denmark) *Tellus*, vol 29, Aug 1977, p 345-355 13 refs

Airborne measurements of concentrations of gaseous and particulate sulphur and of Aitken nuclei were performed as part of an international project to assess the role of long-range transport of air pollution in Europe. A description is given of the measuring equipment installed in the aircraft and some of the results are presented and discussed. A definite correlation was found between the concentrations of sulphate and sulphur dioxide, moreover, during different pollution episodes the relations between these substances were almost identical. It was also found that the concentration of Aitken nuclei correlated well with the concentration of sulphur dioxide, but that the correlation with sulphate concentration was dubious. In quite remote areas, such as over the ocean, under meteorological conditions favourable to long-range transport, it was found that pollution levels can be comparable to those encountered in large cities
(Author)

A77-46735 * A study of density fronts and their effects on coastal pollutants V Klemas and D F Polis (Delaware, University, Newark, Del) *Remote Sensing of Environment*, vol 6, no 2, 1977, p 95-126 17 refs NSF Grant No GI-41896, Contracts No NAS5-21937, No NAS5-20983

Density fronts represent regions of extremely high gradient or discontinuity in various parameters of physical interest, the most important being the water velocity and density fields. Such fronts strongly influence pollutant dispersion, by capturing oil slicks and other pollutants concentrated in surface films and drawing them down into the water column. Satellites, aircraft and boats were used to study the behavior of different types of fronts in Delaware Bay and their effect on pollutants in order to provide a basis for improving an oil drift and spreading model. Landsat satellites provided the most effective means of determining the location and extent of frontal systems over all portions of the tidal cycle. Satellite observations of flood-associated fronts on the New Jersey side of the Bay and ebb associated fronts on the Delaware side agreed with boat measurements and model predictions
(Author)

A77-46766 Satellite monitoring of atmospheric gases A R Barringer and J H Davies (Barringer Research, Ltd, Toronto, Canada) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p 178-183

The potential of satellite monitoring for scanning large areas of the atmosphere in order to collect data on the regional distribution of pollution is described. Correlation spectroscopy, a technique used in the determination of gaseous pollutants by passing light beams through the atmosphere, is suggested as a possible method for satellite monitoring. Remote sensing of air quality and optical correlation techniques for gas remote sensing are described. Correlation spectroscopy is discussed in detail, including various procedural methods and the instruments used in each. Applications of airborne and satellite mounted remote sensors are proposed, including the possibility to estimate the total vertical burden
S C S

A77-47080 Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea M A Kropotkin and T Iu Sheveleva (Leningradskii Elektrotekhnicheskii Institut, Leningrad, USSR) (*Kvantovaya Elektronika /Moscow*), vol 4, Apr 1977, p 911-913) *Soviet Journal of Quantum Electronics*, vol 7, Apr 1977, p 513-515 6 refs Translation

A77-47433 The use of Landsat imagery in urbanized area studies B J Colner (U.S. Department of Commerce, Bureau of the Census, Washington, D.C.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 15-27

This paper discusses the application of Landsat imagery to the delineation of urbanized area (UA) limits. Various Landsat imagery products, such as black and white and false-color positive prints and transparencies were used in this study. The drawing of Landsat UA boundaries was aided by the utilization of the appropriate 1970 Bureau of the Census Metropolitan Map Series sheets. The Bureau of the Census Block Statistics Reports (1970) were used to determine the population within the observed Landsat UA boundaries. The Landsat UA's were measured using a density slicer's electronic planimeter. Comparisons were made between the Census UA's and the Landsat UA's relative to their areas and population densities
(Author)

A77-47434 * Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data J W Christenson (NASA, Goddard Space Flight Center, Earth Resources Branch, Greenbelt, Md.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p. 28-33.

A77-47689 # Application of the polarization effect to the remote detection of oil slicks on the sea surface (Primenenie effekta polarizatsii dlia tseli distantsionnogo obnaruzheniia plenok nefti na poverkhnosti moria) A A Buznikov, G A Ivanian, K Ia Kondrat'ev, and D V Pozdniakov In Radiation studies in the atmosphere Leningrad, Gidrometeoizdat, 1976, p 21-26 11 refs In Russian

A77-48669 # Urban and regional land use change detected by using Landsat data W J Todd (Technicolor Graphic Services, Inc, Sioux Falls, S Dak) *US Geological Survey, Journal of Research*, vol 5, Sept-Oct 1977, p 529-534 6 refs

The Atlanta Regional Commission and the Earth Resources Observation Systems Data Center participated in a demonstration of the use of Landsat digital data to detect land use change in the Atlanta, Ga., area. Temporal overlays combining Landsat band-5 data from October 1972 and 1974 were made by using the General Electric Image 100 system. The 1972 data were divided by the 1974 data, and low ratios indicate areas where land use and land cover had

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

changed. These low ratios were classified into a land use-change theme. A classification based on the use of the four bands of the multispectral scanner data, taken in 1974, yielded six land use categories: (1) Commercial-industrial multifamily, (2) single family residential, (3) cleared land, (4) open space, (5) forested land, and (6) water. These six 1974 categories and the change theme were combined to determine changes between 1972 and 1974. (Author)

A77-49186 **Stratospheric CH₄, HCl and ClO and the chlorine-ozone cycle** M Ackerman, D Frimout, and C Muller (Institut d'Aeronomie Spatiale de Belgique, Brussels, Belgium) *Nature*, vol 269, Sept 15, 1977, p 226, 227 19 refs

Evaluations of atmospheric methane levels indicate a lower value than previously posited, suggesting that chlorine may have a greater effect on stratospheric ozone balance than previously suspected. HCl and ClO, two elements of the chlorine-ozone cycle, have been measured in the stratosphere and an equation has been derived to express their relation. CH₄ determination, using infrared absorption spectrometry, has been used to derive methane mixing ratios used in the evaluation of the NCl/ClO equation in order to study the effect of these data on the chlorine-ozone cycle. C S S

A77-49397 * **The effect of the atmosphere on the classification of satellite observations to identify surface features** R S Fraser (NASA, Goddard Space Flight Center, Atmospheric and Hydro-spheric Applications Div., Greenbelt, Md.), O P Bahethi (Computer Sciences Corp., Silver Spring, Md.), and A H Al Abbas (State Organization of Minerals, Baghdad, Iraq) *Remote Sensing of Environment*, vol 6, no 3, 1977, p 229-249 12 refs

The effect of differences in atmospheric turbidity on the classification of Landsat 1 observations of a rural scene is presented. The observations are classified by an unsupervised clustering technique. These clusters serve as a training set for use of a maximum-likelihood algorithm. The measured radiances in each of the four spectral bands are then changed by amounts measured by Landsat 1. These changes can be associated with a decrease in atmospheric turbidity by a factor of 1.3. The classification of 22% of the pixels changes as a result of the modification. The modified observations are then reclassified as an independent set. Only 3% of the pixels have a different classification than the unmodified set. Hence, if classification errors of rural areas are not to exceed 15%, a new training set has to be developed whenever the difference in turbidity between the training and test sets reaches unity. (Author)

A77-50161 **Computer assisted correlation spectrometer for the remote sensing of air pollution** D Onderdelinden and L Strackee (Rijks Instituut voor de Volksgezondheid, Bilthoven, Netherlands) *Review of Scientific Instruments*, vol 48, July 1977, p 752-756 10 refs

A correlation spectrometer for the remote sensing of SO₂ and NO₂ gas burdens in the atmosphere has been developed. The instrument, utilizing natural skylight as its light source, is interfaced to a minicomputer operating in a real time system that controls the scanning monochromator and the data acquisition on disk memory. The main advantage of this approach is that baseline shifts due to spectral variation of the skylight can be eliminated computationally. (Author)

A77-50997 **Selective modulation radiometry for remote detection of gaseous pollutants (Radiometre à modulation selective pour la détection à distance de polluants gazeux)** J Laurent (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France) (*Mesures-Régulation-Automatisme*, vol 42, July-Aug 1977, p 39-46) *ONERA, TP no 1977-111, 1977 (p 39-46) 9 p 13 refs* In French. Ministère de la Qualité de la Vie. Contract No 75-02123, Commission of the European Communities Contract No CEE 132/75-1-ENVF

A new radiometer permitting the remote detection of gaseous pollutants is described. The basic organization of the device is suitable for emission and absorption measurements in the UV,

visible, or IR range. A procedure for computing modulation efficiency values and a theoretical calculation for a case of simple selectivity are presented. Applications of the method are considered, and UV measurements of SO₂ obtained by using sky light as the source are examined. M L

A77-51438 **Remote sensing methods of interpretation of anthropogenic changes of environment** V P Burov, E V Glushko, I G Ermakov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-130* 16 p

Photographs obtained during the Salyut 4 mission from a height of 340 km were used to distinguish land areas whose appearance has been determined by human activities. The appearance of the following types is described: field, garden and plantation, meadow and pasture, forest, water, mining, energy producing and industrial, urban, and recreational. The identifying features which permit recognition of eight subtypes of the field type are considered; these subtypes refer to land watered or irrigated by different procedures, or to land which is no longer irrigated. The analysis of image structure is discussed, and the significance of image tones is examined. It is concluded that the interpretation of space photographs permits the determination of land use. M L

A77-51439 **Environmental pattern change as revealed by Landsat MSS data** K Tsuchiya (National Space Development Agency of Japan, Tokyo, Japan) and H Ochiai (Toba National Merchant Marine College, Toba, Japan) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-131* 12 p

The environmental pattern change of land and sea surfaces are studied based on the MSS data of Landsat 1 and 2. The analysis of land used in Nagoya and Toyohashi areas located in central Japan indicates a large change of land use took place between 1972 and 1975. Land use change is especially large in the periphery and suburbs of Nagoya. Out of an area of 350 sq km in the Nagoya District, 5.79 and 3.20% were transformed into new urban and open areas, respectively, from forest, agricultural and suburban areas. Red tide was found to increase in the Seto Inland Sea. A small vortex of approximately 40 km in diameter was found off the tip of Kii Peninsula on the periphery of Kuroshio, a large warm ocean current. The vortex was revealed by the red tide driven into it. (Author)

N77-28379# California Univ Santa Barbara Geography Remote Sensing Unit

SUMMARY EVALUATION OF THE OFFSHORE TARGET DETECTION CAPABILITIES OF APS-94D AND COR RADAR SYSTEMS Final Report, May - Jul 1976

John E Estes and Steven P Kraus Dec 1976 120 p

(Contract DOT-CG-63898-A)

(AD-A036245, USCG-D-125-76) Avail NTIS HC A06/MF A01 CSDL 17/9

Flight test of an APS-94D real aperture and coherent-on-receive (COR) synthetic aperture radar were conducted by the Coast Guard in three locations of southern and central coastal California between May 19-21 1976. The Geography Remote Sensing Unit provided comprehensive ground truth support coincident with radar overflights. Imagery from the APS-94D and COR radar sets was interpreted and evaluations of the target detection capabilities and resolution characteristics of the two systems conducted. The analysis included both man-made targets and natural seep oil slicks. Author (GRA)

N77-28574# Aeronutronic Ford Corp Newport Beach Calif Aeronutronic Div

REMOTE MONITORING OF NITRIC OXIDE BY GAS-FILTER CORRELATION TECHNIQUES Final Report, Jun 1973 Jun 1976

Darrell E Burch and David A Gryvnak Nov 1976 81 p refs (Contract EPA-68-02-0766)

(PB-265455/6 U-6252 EPA-600/2-76-277) Avail NTIS HC A05/MF A01 CSDL 14B

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

The feasibility of remotely monitoring the concentration of nitric oxide (NO) in the effluent of industrial stacks has been investigated analytically and experimentally in the laboratory. The type of instrument considered employs two or more gas-filter cells that contain different amounts of NO. Radiant energy emitted by the hot gas in the effluent is measured after it has passed either through one of the gas filter cells or through a neutral density filter. By comparing the amounts of energy received through each of the filters it is possible to determine the concentration of NO in the presence of a moderate amount of continuum emitting material such as small particles. GRA

N77-28625# Radian Corp., Austin, Tex
EXPERIMENTAL AND THEORETICAL STUDIES OF SOLID SOLUTION FORMATION IN LIME AND LIMESTONE SO₂ SCRUBBERS, VOLUME 1 Final Report
Benjamin F Jones, Philip S Lowell and Frank B Meserole
Oct 1976 75 p refs
(Contract EPA-68-02-1883)
(PB-264953/1 EPA-600/2-76-273a-Vol-1) Avail NTIS HC A04/MF A01 CSCL 07D

A coprecipitation product has been suggested to explain the mechanism by which sulfate could be precipitated from a scrubber solution subsaturated with respect to calcium sulfate. The existence of a calcium sulfate/calcium sulfite solid solution has been confirmed experimentally and a theoretical formulation has been established. Calcium sulfite hemihydrate was precipitated under controlled laboratory conditions from solutions subsaturated in calcium sulfate. Specific chemical analysis and infrared spectroscopic techniques were used to identify sulfate in the solids. GRA

N77-29723# National Environmental Satellite Service Washington D C
A RELATIONSHIP BETWEEN WEAKENING OF TROPICAL CYCLONE CLOUD PATTERNS AND LESSENING OF WIND SPEED

James B Lushine Mar 1977 20 p refs
(PB-267392/9, NOAA-TM-NESS-85 NOAA-77041805) Avail NTIS HC A02/MF A01 CSCL 04B

A comparison between tropical cyclone intensity estimates from airborne reconnaissance data and from satellite photographs was made for all tropical systems in the North Atlantic Ocean, Caribbean Sea, and Gulf of Mexico. For the results suggest that the Dvorak technique for estimating maximum surface winds in tropical cyclones be modified. It is recommended that the delay of 24 hours between cloud pattern weakening and the lessening of the estimated maximum surface wind speed currently in use be reduced to 12 hours. GRA

N77-30555*# Science Applications Inc., La Jolla, Calif
DETERMINATION OF AEROSOL CONTENT IN THE ATMOSPHERE FROM LANDSAT DATA Progress Report, 1 Feb - 24 Jul 1977

M Griggs Principal Investigator 25 Jul 1977 11 p ref ERTS
(Contract NAS5 20899)
(E77-10195 NASA-CR-154260 SAI-77-793-LJ PR-9 PR-10) Avail NTIS HC A02/MF A01 CSCL 04A

N77-30563*# Purdue Univ., Lafayette, Ind., Lab for Applications of Remote Sensing
EVALUATION OF CHANGE DETECTION TECHNIQUES FOR MONITORING COASTAL ZONE ENVIRONMENTS

R A Weismiller Principal Investigator S J Kristof D K Scholz P E Anuta and S M Momin 22 Jun 1977 24 p refs EREP
(Contract NAS9-14016)
(E77-10203 NASA-CR-151482 LARS-Inform-Note-062277) Avail NTIS HC A02/MF A01 CSCL 08J

The author has identified the following significant results: Four change detection techniques were designed and implemented for evaluation: (1) post classification comparison change detection; (2) delta data change detection; (3) spectral/temporal change

classification; and (4) layered spectral/temporal change classification. The post classification comparison technique reliably identified areas of change and was used as the standard for qualitatively evaluating the other three techniques. The layered spectral/temporal change classification and the delta data change detection results generally agreed with the post classification comparison technique results; however, many small areas of change were not identified. Major discrepancies existed between the post classification comparison and spectral/temporal change detection results.

N77-30586# International Geographical Union Commission on Geographical Data Sensing and Processing
DIGITAL GEOGRAPHIC DATA HANDLING ACTIVITIES IN THE U.S. GEOLOGICAL SURVEY Interim Report
Mar 1976 374 p refs
(Grant DI-14-08-0001-G-215)
(PB-266663/4) Avail NTIS HC A16/MF A01 CSCL 08F

Computer applications involving geographical data are presented. The descriptive elements include system name, contact, division, branch, objective, method, data manipulation, geographic reference data, volume, products, and outputs, and state of development. Two tables summarize the system descriptions and the data volumes. GRA

N77-30646# Colorado State Univ., Fort Collins, Dept of Atmospheric Science
AEROSOL IN THE GATE AREA AND ITS RADIATIVE PROPERTIES

K Ya Kondratyev, O D Barteneva, L I Chapursky, A P Chernenko, V S Grishechkin, L S Ivlev, V A Ivanov, V I Korzov, V B Lipatov, M A Prokofyev et al Jun 1976 123 p refs Prepared by Leningrad (A A Zhdanov) State Univ
(Grant NOAA-04-6-158-44036)
(PB-265264/2 Paper-247 NOAA-77020207)
ISSN-0067-0340) Avail NTIS HC A06/MF A01 CSCL 13B

Preliminary results of a research program conducted by Main Geophysical Observatory scientists during the GARP Atlantic Tropical Experiment were outlined. Origin and characteristic features of the dust layer were studied. Inferences of microphysical and optical characteristics of the dust aerosol made from ship data are presented. Chemical analyses of aerosols showed a high content of metals. GRA

N77-30663# Environmental Monitoring and Support Lab Las Vegas Nev

AIR QUALITY DATA FOR THE NORTHEAST OXIDANT TRANSPORT STUDY, 1975 Final Report

G W Siple, C K Fitzsimmons, J J VanEe, and K F Zeller Mar 1977 106 p refs
(PB-267545/2 EPA-600/4-77-020) Avail NTIS HC A06/MF A01 CSCL 13B

A survey was conducted in the northeastern region of the U.S. to assess the transport of oxidant and oxidant precursors through the area. A description of the monitoring system, considerations involved in the operation of the system, and a presentation of the data collected by the system are included. GRA

N77-31297# Utah Univ., Salt Lake City, Lab of Environmental Radioactivity

COMPARATIVE LEVELS OF ENVIRONMENTAL RADIOACTIVITY IN UTAH FROM INDUSTRY AND FALL OUT: A REPORT OF RADIOECOLOGICAL INVESTIGATIONS OF AIRBORNE RADIOACTIVITY IN THE UTAH ENVIRONMENT Progress Report, 1 Jul 1972 - 30 Jun 1973

1973 194 p refs
(Contract E(26-1)-0462)
(UERL-2) Avail NTIS HC A09/MF A01

Radioactivity in air, vegetation, soil, and wild animals in Utah was determined, and results are presented. Methods for continuous measurement of the daughter products of radon and thoron were developed and used for calculations of the integrated dose to the lungs of humans. ERA

02 ENVIRONMENTAL CHANGES AND CULTURAL RESOURCES

N77-31587# Rhode Island Univ Kingston Dept of Chemistry

IDENTIFICATION OF OIL SLICKS BY INFRARED SPECTROSCOPY Final Report, 1 Feb 1974 - 15 Aug 1976

Chris W Brown Patricia F Lynch, and Mark Ahmadjian Aug 1976 301 p refs

(Grant DOT-CG-81-74-1099)

(AD-A040975, USCG-D-19-77 CGR/DC-5/77) Avail NTIS HC A14/MF A01 CSCL 17/5

This investigation evaluated the applicability of infrared spectroscopy to identifying sources of oil spills, using computer methods for matching spectra Eighty-five different oils of all types were 'weathered' for two weeks in at least two of four weathering grids Two of the grids were located on Narragansett Bay (one in the Bay and one onshore), and two at the University's Kingston laboratory (one inside, and one on the roof) Spectral data on approximately 900 weathered oil samples were digitized and stored in computer data files to form a library of weathered oils These were then compared to some 300 spectra of their unweathered sources by a computer ratio method The investigation showed that infrared spectroscopy coupled with computer analysis is a useful technique for identifying the source of spilled oil By using artificial weathering techniques the correct source of a spill can be identified by infrared with a high probability when samples are collected within one week of the original spill GRA

N77-31598# National Oceanic and Atmospheric Administration Boulder Colo Office of the Director (ERL)

AN ADVECTION-DIFFUSION MODEL OF THE DOMES TURBIDITY PLUMES

Wilmot N Hess and Walter C Hess Nov 1976 29 p refs (PB-268713/5 NOAA-TR-ERL-382, OD-13 NOAA-77051813) Avail NTIS HC A03/MF A01 CSCL 08J

A physical model using advection of the sediment plus horizontal diffusion plus settling of the fines by Stokes Law is used to calculate several cases of plume behavior Typical surface plume densities are less than 1 milligram/liter except quite near the mining ship The benthic blanket produced by the bottom plume will typically have thicknesses of less than 100 micrograms/sq cm GRA

N77-32566*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

A REDUCTION IN AG/RESIDENTIAL SIGNATURE CONFLICT USING PRINCIPAL COMPONENTS ANALYSIS OF LANDSAT TEMPORAL DATA

Darrel L Williams and F Yates Borden (Penn State Univ, University Park) Jul 1977 14 p refs Submitted for publication

(NASA-TM-X-71387, X-923-77-182) Avail NTIS HC A02/MF A01 CSCL 08B

Methods to accurately delineate the types of land cover in the urban-rural transition zone of metropolitan areas were considered The application of principal components analysis to multirate LANDSAT imagery was investigated as a means of reducing the overlap between residential and agricultural spectral signatures The statistical concepts of principal components analysis were discussed as well as the results of this analysis when applied to multirate LANDSAT imagery of the Washington, D C metropolitan area Author

N77-33555*# Tokyo Univ (Japan)

INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN CLASSIFICATION OF SHORELINES Final Report

Takakazu Maruyasu and Taisuke Watanabe, Principal Investigators (Maritime Safety Agency, Tokyo, Japan) 10 Aug 1977 11 p Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS

(E77-10224 NASA-CR-155014) Avail NTIS HC A02/MF A01 CSCL 04B

N77-33562*# Tokyo Univ (Japan)

ENVIRONMENTAL CHANGE PATTERN IN CENTRAL JAPAN AS REVEALED BY LANDSAT DATA

Takakazu Maruyasu, Principal Investigator, Kiyoshi Tsuchiya (National Space Development Agency, Tokyo, Japan), and Hiroaki Ochiai (Toba National Merchant Marine Coll, Toba-city, Japan) [1977] 10 p refs Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS

(E77-10231, NASA-CR-155021) Avail NTIS HC A02/MF A01 CSCL 04B

The author has identified the following significant results A patched cirrus reported by weather stations was hardly recognizable by the eye in LANDSAT MSS data of a three year time lapse The cloud cover affected radiance values significantly in band 4 while its effect was minimal in bands 6 and 7 (near infrared spectra) The cross correlation coefficient analysis between the two images indicated that the highest value obtained in central Japan was 0.963 for the area where little change occurred in land use over the 3 yr period An analysis of land use in Nagoya showed little change in the metropolitan area while a fairly large change occurred in the northern periphery of the city where large scale housing projects are located

N77-33579*# National Aeronautics and Space Administration Langley Research Center Langley Station Va

A SUMMARY OF THE TEST PROCEDURES AND OPERATIONAL DETAILS OF AN OCEAN DUMPING POLLUTION MONITORING EXPERIMENT CONDUCTED 7 OCTOBER 1976

Warren D Hypes J W Wallace and E A Gurganus Aug 1977 31 p refs

(NASA-TM-74066) Avail NTIS HC A03/MF A01 CSCL 08B

A remote sensor experiment was conducted at a sewage sludge dump site off the Delaware/Maryland coast Two aircraft serving as remote sensor platforms flew over the dump site during a sludge dump One aircraft carried a multispectral scanner and the other aircraft carried a rapid scanning spectrometer Data from sea-truth stations were collected concurrent with overpasses of the aircraft All sensors were operational and produced good digital data Author

N77-33768# National Environmental Satellite Service Washington, D C

ATLANTIC TROPICAL AND SUBTROPICAL CYCLONE CLASSIFICATION FOR 1976

D C Gaby J B Lushine B M Mayfield S C Pearce, K O Poteat and F E Torres Apr 1977 21 p refs

(PB-269674/8 NOAA-TM-NESS-87 NOAA-77052401) Avail NTIS HC A02/MF A01 CSCL 04B

Estimates of locations and maximum sustained winds of all tropical and subtropical cyclones in the North Atlantic Ocean the Caribbean Sea and the Gulf of Mexico were made The estimates were compared with the National Hurricane Center's best tracks data to establish the measure of accuracy achieved The average difference between satellite locations and best track locations was approximately 17 nautical miles with a standard deviation of about 14 nautical miles The accuracy in estimating the maximum sustained wind showed an average absolute difference of about 8 knots an average algebraic difference of minus 4 knots and a standard deviation of about 9 knots GRA

GEODESY AND CARTOGRAPHY

Includes mapping and topography

A77-40824 * # Spaceborne earth applications ranging system /SPEAR/ F O Vonbun, W D Kahn, P D Argentiero, and D W Koch (NASA, Goddard Space Flight Center, Greenbelt, Md) *Journal of Spacecraft and Rockets*, vol 14, Aug 1977, p 492-495

A technique is discussed for the accurate (i.e., to within fractions of centimeters per year) detection of earth surface motions utilizing the latest space technology. It is shown that, over a six-day period and assuming a 50% cloud cover (i.e., as experienced over the past few years of laser operation), by using spaceborne precision ranging systems, intersite distances on the order of 5 to 15 km (dependent mostly on the beam width of the laser) can be determined in the vertical and horizontal components, with errors in the 0.5- to 1.5-cm range. These errors are almost independent of ground survey errors up to 0.25 m and orbit errors up to 200 m. A spaceborne laser ranging system is assumed to range to two or more ground emplaced retroreflectors. This can be done either in a simultaneous or nonsimultaneous mode. Hardware is under development for the latter technique. (Author)

A77-40897 # Some results of investigating the electric field with the Interkosmos 10 satellite S I Klimov (Akademii Nauk SSSR, Institut Kosmicheskikh Issledovaniy, Moscow, USSR) and V E Korepanov (Akademii Nauk Ukrainskoi SSR, Fiziko-Mekhanicheskii Institut, Lvov, Ukrainian SSR) *Studia Geophysica et Geodaetica*, vol 21, no 2, 1977, p 200-204 15 refs

The electric field experiment on Interkosmos 10 was conducted to investigate the electric field fluctuations between the magnetosphere and ionosphere, the dependence of fluctuation amplitudes on height, local time and geomagnetic parameters, and the distribution of longitudinal electric fields. Fluctuations of the electric field were measured in the range 0.01-70 Hz. B J

A77-41001 # Analysis of the accuracy of determining coordinates of points by the orbital method (Ob analize tochnosti opredeleniia koordinat punktov orbital'nym metodom) V V Boikov *Geodeziia i Kartografiia*, May 1977, p 17-22. In Russian

Fundamental questions for a theory of an analytical method of estimating the accuracy of the orbital method in constructing geodesic nets are studied. Analysis of the normal equations of orbital geodesy shows the importance of eliminating the correlation between the initial conditions and the positions of the points where measurements to the satellites are made. This correlation can be made negligibly small by using a large number of points, distributing them uniformly along the satellite path in both directions, and fulfilling certain other conditions. P T H

A77-41002 # Most favorable time for determining azimuth from solar observations (Naivgodneishee vremia dlia opredeleniia azimuta iz nabludeniia solntsa) V N Gan'shin and V. N Malishevskii *Geodeziia i Kartografiia*, May 1977, p 23-25. In Russian

An analysis of the formulas for the mean square error of determination of azimuth from solar observations reveals the most favorable time for observing the sun. Nomograms are given for determining the optimal solar elevation given the declination of the center of the sun and the latitude of the point of observation. P T H

A77-43388 Gravity potential resulting from cylindrical structures of finite length (Potentiel de gravité dû à des structures cylindriques d'extension limitée) G Desvignes (Paris VI, Université,

Paris, France) *Académie des Sciences (Paris), Comptes Rendus, Série B - Sciences Physiques*, vol 285, no 1, July 4, 1977, p 21-23. In French

A method is presented for computing the gravity potential of cylindrical bodies of finite length. The method permits the quantitative interpretation of the geoid based on data from satellites. The satellite data and gravimetric determinations are compatible with the hypothesis of Arabian plate subduction towards the Northeast. M L

A77-43572 # On the problem of the nature of the anomalous magnetic field and its interpretation V N Belugina, V N Lugovenko, V P Portnova, A V Pchelkin (Akademii Nauk SSSR, Institut Zemnogo Magnetizma, Ionosfery i Rasprostraneniia Radio voln, Akademi gorodok, USSR), I P Karpeev, and I Iu Sheneider (Kazakhskii Nauchno-Issledovatel'skii Institut Mineral'nogo Syr'ia, Alma Ata, Kazakh SSR) *Gerlands Beitrage zur Geophysik*, vol 86, no 3, 1977, p 222-226

Median values for estimates of distances between the fractures of the earth's crust are compared with median values for the mean distances between magnetic anomalies, as determined from data obtained by satellites. A good correlation is found for the three cases studied, the Siberian Platform, the West Siberian Plate, and Kazakhstan. The distances range from 46 to 56 km. Maps of the root mean square values and the mathematical expectation of the regional anomalous magnetic field component averaged over 500 x 500 sq km are provided, and are said to be similar to the map of the residual field determined at low satellite level. It is suggested that these similarities between two kinds of data indicate that the anomalous magnetic field mainly reflects the distribution of the magnetic masses near the upper surface of the earth's magnetoactive layer. M L

A77-43577 Automatic correction of position error by means of a digital correlation of surface structures (Automatische Korrektur von Positionsfehlern durch digitale Korrelation von Oberflächenstrukturen) Mr Hessel and Mr Eckl (Messerschmitt-Bolkow-Bohm GmbH, Munich, West Germany) *Ortung und Navigation*, no 2, 1977, p 63-89 17 refs. In German

A navigation system is considered which involves the comparison of actual images of the earth's surface features with reference images. Location would be determined by the correlation maximum. A simulation procedure is described which would determine the characteristics of such a system, choose a suitable correlation algorithm, and estimate the necessary computational and storage capacity. The results of this simulation procedure are presented. M L

A77-44594 * Antarctic topography from balloons N Levanon (Tel Aviv University, Tel Aviv, Israel), P R Julian (National Center for Atmospheric Research, Boulder, Colo.), and V E Suomi (Wisconsin University, Madison, Wis.) *Nature*, vol 268, Aug 11, 1977, p 514-516 2 refs. Research supported by the US-Israel Binational Science Foundation, NASA, and NSF

A description is presented of an investigation involving the collection of Antarctic ice sheet surface topography data by means of balloons, floating at an altitude of about 12.5 km, which traversed the Antarctic during its 1975 summer. These balloons were part of 411 constant density balloons launched in the Southern Hemisphere during the Tropical Wind, Energy conversion and Reference Level Experiment. The three sensors carried by each balloon included a radio altimeter, a pressure sensor, and an ambient temperature sensor. Data transmitted by a balloon are received by a measuring system on board the Nimbus 6 satellite. A synoptic map is presented of the 150 mbar pressure surface at 1200 GMT, December 11, 1975. G R

A77-44780 Electro-optical systems and requirements in cartography H Carr (US Army, Engineer Topographic Laboratories, Fort Belvoir, Va.) In *Electro-optical Systems Design Conference and International Laser Exposition*, New York, N.Y., September 14-16, 1976, Proceedings of the Technical Program

03 GEODESY AND CARTOGRAPHY

Chicago, Industrial and Scientific Conference Management, Inc., 1976, p 339 346

Electro-optical systems employed by the U S Army Engineering Topographic Laboratories are discussed, with emphasis on electro optical applications to cartography Digital scanning and plotting of color separations and cartographic features are considered, the use of electro optical devices for producing, storing and retrieving micro filmed copies of color topographic maps is also described In particular, development of a laser scanner-projector for microfilm map application, and an optical disc drive for storing large terrain data bases on easily-retrieved optical media is mentioned The automatic extraction of cartographic data from aerial photography and applications of sensing array technology to data analysis and map production are also reviewed J M B

A77-45787 # Ocean geodesy based on GEOS-3 satellite altimetry data R J Anderle (U S Navy, Naval Surface Weapons Center, Dahlgren, Va) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper* 16 p 10 refs

GEOS 3 satellite short pulse radar altimetry observations typically have a random error of about 60 cm for a one tenth second averaging time Smoothing by a Wiener filter or a sequential filter yields a precision of about 20 cm The radial component of satellite position determined solely from Doppler observations is accurate to 150 cm, but by comparing computed geoid heights at points where satellite subtracks intersect, geoid traces accurate to 60 cm can be obtained when satellite subtracks are 60 miles apart Under these conditions, geoids can be constructed for which the average values over 300 mile squares will agree with the true averages to 25 cm while the averages over 60 miles will be accurate to 50 cm, corresponding mean gravity anomalies can be obtained accurate to 3 mgal over 300 mile squares or 5 mgal over 60 mile squares Geoids have been constructed in the area of Australia and mean gravity anomalies have been obtained in the calibration area between Bermuda and the East Coast of the United States (Author)

A77-45800 # Rangeland recovery in an enclosure - Satellite and ground observations J Otterman, Y Waisel, and A Imber (Tel Aviv University, Tel Aviv, Israel) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper* 13 p 7 refs Research supported by the United States Israel Binational Science Foundation

The effects on the earth's surface of forming an 5.5 x 5.5 km enclosure in the arid region of Sinai are studied, through numerical analysis of Landsat imagery (from computer compatible digital tapes) and ground observations The removal of the anthropogenic pressures over a period of about two years resulted in a marked decrease of reflectivities in the visible and reflective infrared, for an overall reduction of surface albedo by 10 percent It is suggested that the spectral reflectivities of terrain, both for the enclosure and for Sinai can be represented to the first approximation as due to the reflectivities, in part of bare soil and in part of debris The calculated surface cover fraction by debris can be regarded as a measure of rangeland recovery This debris fraction is 0.21 for Sinai and 0.35 for the enclosure (for August, 1976) (Author)

A77-45821 * # Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment N Levanon (Tel Aviv University, Tel Aviv, Israel), P R Julian (National Center for Atmospheric Research, Boulder, Colo), and V E Suomi (Wisconsin University, Madison, Wis) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper* 6 p Research supported by the United States Israel Binational Science Foundation, NASA, and NSF

Many TWERLE balloons floating at an altitude of about 12.5 km, traversed the Antarctic during its 1975/6 summer The balloons' positions were accurately determined by the Nimbus-6 satellite, which also received their sensors' data radio altimeter, pressure and temperature Subtracting the altimeter readings from the calculated balloon altitude above sea-level (a.s.l.) provides the Antarctic surface elevation at the balloon subtrack The balloon altitude a.s.l. is calculated from daily synoptic maps covering latitudes south of 45 deg S These maps are prepared using the regular radiosonde network supplemented by four times as many TWERLE balloons (Author)

A77-46270 * Reduction and treatment of magnetic anomalies of crustal origin in satellite data B K Bhattacharyya (U S Geological Survey, Denver, Colo) *Journal of Geophysical Research*, vol 82, Aug 10, 1977, p 3379-3390 9 refs Research sponsored by the U S Geological Survey and NASA

The problem of proper reduction and treatment of the residual total magnetic field observed on satellite orbits is studied The reduction procedure used for Pogo satellite data is reviewed, and a procedure is presented for reducing the residual total field observed on satellite orbits to a spherical surface Several examples based on selected models are provided to demonstrate the accuracy of the formulas developed for continuation of the satellite data from an irregular to a spherical surface This procedure is tested on a set of Pogo data covering the area that contains the Bangui magnetic anomaly in central Africa A technique is also given for determining the field components on a spherical surface and calculating the total field in any fixed direction of the geomagnetic field F G M

A77-46525 * Gravimetric geoid in the Northwest Pacific Ocean A B Watts and A R Leeds (Lamont-Doherty Geological Observatory, Palisades, N Y) *Geophysical Journal*, vol 50, no 2, Aug 1977, p 249-277 40 refs Contracts No N00014 75-C 210, No NAS6-2519

A total of 3708 1 x 1 deg free air gravity anomaly averages have been used to construct a new 1 x 1 deg gravimetric geoid of the Northwest Pacific Ocean The 1 x 1 deg averages are based on a compilation of 147,000 surface ship and pendulum gravity measurements Difference geoid undulations range from a maximum of +19 m over the Hawaiian ridge to a minimum of -31 m over the junction of the Kuril and Aleutian trenches The Hawaiian swell is associated with a geoidal high of up to +15 m with wavelengths of about 2200 km and the topographic rises seaward of deep-sea trenches are associated with geoidal highs of up to 4 m with wavelengths of about 220 900 km The agreement between the gravimetric geoid and Skylab-4 and Geos-3 altimeter data is close for wavelengths greater than about 300 km but poor for shorter wavelengths (Author)

A77-47370 Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, New Mexico State University, Las Cruces, N Mex., October 12-14, 1976. Volumes 1 & 2 Symposium sponsored by the U S Defense Mapping Agency and NOAA Las Cruces, N Mex., New Mexico State University, 1976 Vol 1, 461 p, vol 2, 452 p Price of two volumes, \$20

The application of satellite Doppler methods to geodetic surveying is discussed, with attention given to data reduction processes, error analysis and receiver characteristics, as well as to individual geodetic survey programs in Canada, the United States, Antarctica and New Guinea Topics of the papers include the U S Navy Navigation Satellite Tracking Network, point positioning using precise satellite ephemerides, translocation techniques for analysis of ionospheric refraction and ephemeris errors, atmospheric drag analyses, determination of earth's polar motion using Doppler data, the Doppler satellite positioning program of the U S Geodetic Survey, variations in Doppler position determinations due to differences in computerized data reduction programs, comparison of Doppler positioning with results of transcontinental traverse surveys, and a comparative analysis of several commercially available portable Doppler receivers J M B

A77-47375 # Doppler positioning by the short arc method D C Brown (DBA Systems, Inc., Melbourne, Fla) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 97-120, 122-140 23 refs

The short-arc method of satellite Doppler positioning, which provides rms accuracies in relative positioning to the order of 0.25 m for about 40 satellite passes, is described The short-arc data reduction system, which relies on the broadcast ephemeris rather than the precise ephemeris employed by the point positioning

technique, is reviewed, the versatility and power of the short-arc method is discussed. Adjustments of the orbital state vectors which are used in short arc correction procedures are also considered. Potential applications of the short-arc method to monitoring crustal motion, as well as to high accuracy surveying, are mentioned. In addition, a short-arc Geceiver network covering central North America which would yield accuracies in geodetic positioning on the order of a few tenths of a meter is proposed. J M B

A77-47376 # DMATC Doppler determination of polar motion B R Bowman and C F Leroy (U S Defense Mapping Agency, Topographic Center, Washington, D C) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 141-157 15 refs

Bi-daily Doppler pole determinations obtained from Doppler data processed by the Defense Mapping Agency Topographic Center (DMATC) are used to study the phenomenon of polar motion. The Maximum Entropy Method of spectral analysis (Burg, 1967) is used to analyze the precision and frequency of polar motion computed from DMATC data. The analysis indicates that the high-frequency spectrum (4 to 20 days per cycle) is dominated by periodicities determined by Doppler orbit computations with inadequate resonance terms for earth's gravity field, after removal of the resonance effects, a standard deviation of 0.4 m in the pole values is found. In the low frequency spectrum, the analysis shows that the annual effect and Chandler Wobble dominate. Smaller amplitude periodicities occurring at 1.3, 2.0, 2.5, and 4.0 cycles per year are also discussed. J M B

A77-47377 # MEDOC experiment or the French Polar Motion Project B Guinot (Bureau International de l'Heure, Paris, France) and F Nouel (Toulouse, Centre Spatial, Groupe de Recherches de Geodesie Spatiale, Toulouse, France) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 159-174. Research supported by the Centre National de la Recherche Scientifique

The French Polar Motion Project (MEDOC), which will make determinations of the earth's polar motion based on data obtained from the U S Defense Mapping Agency Topographic Center (DMATC) during 1977 and 1978, is discussed. Data reduction techniques employed by MEDOC, which are different than those used by the polar motion studies conducted by DMATC, are described, the MEDOC station network, geopotential model, and a Doppler data reprocessing program which conflates an analytical satellite orbit computation for a long arc with a pass-by pass analysis, are also considered. J M B

A77-47378 # Satellite technology applied to Antarctic Mapping Program W R MacDonald (U S Geological Survey, Reston, Va) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 175-185 7 refs. NSF supported research

Doppler positioning systems employing Geocivers were used to obtain geographic survey information over a wide area (approximately 870,000 square km) of Antarctica. The surveying program relied on air transportation to set up 31 Geociver stations, with the aim of establishing a data base which, in conjunction with Landsat-1 imagery, would allow for creation of maps having a scale of 1:1,000,000. Training of survey personnel and procedures for setting up and calibrating the Geocivers are described. It is concluded that the use of air transportation to establish the Doppler stations provided an economical mapping technique. J M B

A77-47379 # The Canadian Doppler satellite network J Kouba and J D Boal (Geodetic Survey of Canada, Ottawa, Canada) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 187-206 22 refs

The Doppler surveying program of the Geodetic Survey of Canada, involving more than 150 receiver stations with an average separation of 300 km, is described. Data reduction techniques which permit the use of both precise satellite ephemerides (for high global accuracy) and broadcast ephemerides (for improvement of relative accuracy), are discussed. Methods used to screen out erroneous and poor-quality data from the field stations are also considered. The hardware and mathematical modeling employed by the Geodetic Survey of Canada are compared with equipment and reduction methods used by the U S National Geodetic Survey and Naval Surface Weapons Center. The agreement for 30-pass samples was found to be within 0.70 m in latitude and longitude, a relative accuracy of about 0.10 m from several days of simultaneous observations is projected for the Canadian system. J M B

A77-47380 # The National Geodetic Survey Doppler satellite positioning program W E Strange and L D Hothem (NOAA, National Geodetic Survey, Rockville, Md) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 207-227 26 refs

The use of Doppler satellite positioning in the adjustment of the North American Datum, scheduled to be completed by the U S National Geodetic Survey in 1983, is discussed. The aim of the adjustment program is to relate all geodetic networks, such as that established by transcontinental geodimeter traverse data, to a common geocentric coordinate system with an accuracy of one to two meters. Methods for fixing longitude, latitude and altitude of Doppler survey stations are reviewed, statistical analysis of the combined errors in elevation above sea level and in astrogodetic geoid height suggests a standard deviation equal to 0.54 m prevails. The Doppler survey results are also used to determine distortions occurring in the North American Datum established by the U S Geodetic Survey in 1927. J M B

A77-47381 # Applications of Doppler satellite systems in remote regions in and near Australia D McLuskey (Department of Defence, Royal Australian Survey Corps, Canberra, Australia) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 229-234

Doppler survey operations employing Geocivers to map inaccessible areas of New Guinea and Indonesia are discussed. Methods of computation, based on the point positioning technique using precise ephemerides, are described, geodetic surveying and acquisition of mapping control are considered. Problems related to the integration of Doppler survey data into previously-established mapping networks are also mentioned. It is concluded that low-cost surveying of inaccessible regions can be accomplished by a limited number of skilled personnel with the Doppler satellite positioning system. J M B

A77-47382 # Doppler survey equipment - Background, requirements, and trends T A Stansell, Jr (Magnavox Government and Industrial Electronics Co, Torrance, Calif) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 1. Las Cruces, N Mex, New Mexico State University, 1976, p 249-277 10 refs

Geodetic survey instruments for use in satellite Doppler surveying are discussed. In particular, development of the various genera-

03 GEODESY AND CARTOGRAPHY

tions of Geoceivers, portable geodetic survey devices which record the integral of the Doppler frequency over relatively long time intervals, is described, receiver design characteristics affecting accuracy, including oscillator stability, receiver time delay, Doppler count precision, signal-to-noise ratio and antenna pattern, are also mentioned. Advanced geodetic survey techniques, involving such innovations as a *three-dimensional multipass point positioning program* operated in a minicomputer, simplified receiver electronics and alternative data logging methods, are considered. In addition, built-in self-testing capabilities and maintenance properties of the Geoceivers are described. J M B

A77-47383 # A critical analysis of field operations using portable, unattended Doppler satellite instrumentation P D Rodgers (JMR Instruments, Inc., Chatsworth, Calif.) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 279-301

A geodetic survey instrument for use in satellite Doppler positioning is discussed, with emphasis on its portability, resistance to environmental hazards and capacity to operate in an automatic, unattended mode. In addition to the basic receiver unit, a translocation error detection program that can be operated by surveyors in the field, and an all-environment cassette reader with multiple function capability, such as data duplication in the field, are described. A miniature low-power battery-operated processor which permits position computations to be conducted in the field is also mentioned. J M B

A77-47384 # Standardization of Doppler point positioning results J D Love (U S Defense Mapping Agency, Topographic Center, Washington, D C) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 303-313, 315-342

Standardization of receiver station installation techniques for surveys conducted using Doppler geodetic point positioning is discussed. Documentation required for a Doppler receiver station established by the U S Defense Mapping Agency Topographic Center includes citation of existing geodetic control marks, a station occupation report with photographs of all station markers, survey diagrams and photoidentification material showing the location of the station. Standard procedures for installing Geoceivers are also given. J M B

A77-47387 # Development of Doppler activity at I R O E L Ciruolo and L Mezzani (Istituto di Ricerca sulle Onde Elettromagnetiche, Florence, Italy) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 377-387

A Doppler tracking station established in Florence, Italy is described, and its operation in the European Doppler Observation Campaign (EDOC) of May, 1975 and as a cooperating station in the U S Navy Navigation Satellite Tracking Network since February, 1975 is discussed. The receivers, Doppler digitizers and station clock in use at the tracking facility are considered, time and frequency standards and data reduction processes are also mentioned. Several solutions for the position of the station, including one obtained through EDOC, are given. A maximum variance of 2.9 m in the coordinates is found. J M B

A77-47388 # Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid R H Rapp and R Rummel (Ohio State University, Columbus, Ohio) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N

Mex., New Mexico State University, 1976, p 389-397 14 refs. Research supported by the Ohio State University Research Foundation, Contract No F19628-76-C-0010

A77-47389 # Results from portable Doppler receivers using broadcast and precise ephemerides C F Leroy (U S Defense Mapping Agency, Topographic Center, Washington, D C) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 399-416

Point positioning determinations based on data from a Geociever and three other commercially available portable Doppler receivers are compared, precise ephemerides or satellite broadcast ephemerides were employed in the data reduction processes. It was found that all four receivers yielded comparable positioning accuracy when the precise ephemerides were used. However, when broadcast ephemerides were employed, errors of as much as 12 meters were noted. Solutions relying on a large number of satellite passes or a selected satellite broadcast ephemeris also produced results that were significantly less accurate than the precise ephemeris determinations. Recommendations relating to the standardization of recording media, codes and formats of the receivers are made. J M B

A77-47390 # Methodology and field tests of GDOP - A geodetic computation package for the short arc adjustment of satellite Doppler observations C Boucher (Institut Geographique National, Paris, France) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 417-426 8 refs

A77-47391 # Geometric positioning via satellite of a drilling platform in the North Sea A R Dennis (Analytical Technology Laboratories, Inc., Gaithersburg, Md) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 1* Las Cruces, N Mex., New Mexico State University, 1976, p 427-452

A77-47392 # Relating Doppler datum to ordnance survey datum M R Richards (Ordnance Survey of Great Britain, Southampton, England) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 2* Las Cruces, N Mex., New Mexico State University, 1976, p 453-460

The national triangulation network is briefly described and the necessity for the use of satellite-Doppler observations, in the context of an established precise triangulation, is considered. A comparison is made between existing available Doppler observations and coordinates derived from the triangulation. Refinements of transformation parameters are investigated and discussed. Future plans for derivation of translations with greater precision are noted. (Author)

A77-47397 # Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations H L White (U S Defense Mapping Agency, Aerospace Center, St Louis Air Force Station, Mo) In *Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex., October 12-14, 1976 Volume 2* Las Cruces, N Mex., New Mexico State University, 1976, p 551-576

The computer program used for Doppler point positioning applications at the Defense Mapping Agency Aerospace Center (DMAAC) is an adaptation of the computer program developed for this purpose by the Naval Surface Weapons Center (NSWC). Within this program, an a priori sigma or standard error can be input for the tropospheric refraction correction as well as a sigma limit for the mean clock correction. Computations were made to show the effect on Geociever derived positions of varying these constraints for data

elevation angle cutoffs of five and ten degrees. Comparisons are also made for two positions derived independently by DMAAC and by the National Geodetic Survey (NGS) using different data sets and computer programs. In addition, tests were made to evaluate the feasibility of using a Standard Tropospheric Model (STM) in lieu of observed weather data (Author)

A77-47399 # Effect of Geociever observations upon the classical triangulation network R E Moose and S W Henriksen (NOAA, National Geodetic Survey, Rockville, Md) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 591-655 7 refs

This paper investigates the use of Geociever observations as a means of improving triangulation network adjustment results. A test network of real data is used in this study, which is comprised of 32 separate projects and contains 838 first-order and 489 second order stations in the states of Mississippi, Louisiana, and Alabama. Statistics are provided on a sequence of adjustments of this network in which the number of azimuth, base line, and Geociever observations were systematically varied. From an analysis of this sequence of adjustments, three important conclusions are made. First, the most effective separation for Geociever observations is about 250 km and greater. Second, there is a limit to the improvement in the a posteriori standard error that Geociever observations can effect in a triangulation network. Third, Geociever observations are an effective means of controlling distortions in the local network. The theory of how Geociever observations combine with the classical observations is explained (Author)

A77-47400 # Updating survey networks - A practical application of satellite Doppler positioning J F Dracup (NOAA, National Geodetic Survey, Rockville, Md) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 657-674 6 refs

The use of Doppler positions to update survey networks in Alaska was evaluated. Features of the Alaska Peninsula Network are described, and the test procedure is explained. The test suggests that networks of the type studied can be updated by judicious use of Doppler positions. The procedure can be used in areas that have experienced seismic disturbances unless local crustal motion has occurred. It is thought that use of Doppler positioning will lead to improvements in scale and orientation, and also provide a method for updating positions located on land masses which shifted as a block (Author)

A77-47401 # Adjustment of terrestrial networks using Doppler satellite data M G Tanenbaum (US Navy, Naval Surface Weapons Center, Dahlgren, Va) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 675-706 14 refs

The Doppler 9D system is analyzed for the purpose of ascertaining the form of Doppler normal equations which might contribute to combined satellite-survey adjustments. Data from preliminary experiments testing the consistency of satellite and survey data in joint adjustments are presented. Systematic and random errors in Doppler determined positions are discussed, and Doppler normal equations for geodetic uses are proposed. It is suggested that these equations are most naturally expressed by simulated observations of station positions. Geodimeter survey results and Doppler positions were found to be consistent, and data refinement based on simultaneous adjustment of terrestrial and Doppler satellite data is recommended (Author)

A77-47404 # Introduction to the workshop on polar motion P Melchior (Observatoire Royal de Belgique, Uccle, Belgium)

In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 747-754, Discussion, p 755-762

The use of the Doppler effect for determining polar motion is discussed. The concept of the Conventional International Origin is examined. It is suggested that improved determinations of polar motion and UT1 would provide an increased understanding of internal earth processes such as core-mantle coupling, the excitation and damping processes of the free Chandler component, and information as to the existence or nonexistence of a forced secular motion of the pole. Polar motion measurements are considered with attention to accuracy and precision, the time period over which averaging can be carried out, and the geographic location of the stations (Author)

A77-47406 # Application of Doppler satellite tracking system for polar motion studies in Canada J A Orosz and J Popelar (Department of Energy, Mines and Resources, Gravity and Geodynamics Div, Ottawa, Canada) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 783-792 6 refs

The use of Doppler satellite tracking stations to obtain data for use in polar motion studies is described. Data from astronomical observations and Doppler satellite observations are compared. Simultaneous satellite and astronomical observations show approximately the same dispersion of the mean daily coordinates. The satellite results do not indicate apparent seasonal variations which are characteristic for the astronomical observations (Author)

A77-47407 # Doppler data transmission and handling at the Geodetic Institute of Uppsala M O'Shaughnessy (Uppsala, University, Uppsala, Sweden) In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 793, 794

Careful planning of Doppler data processing is urged. Three different ways of handling data are distinguished: real time computer processing in the field, pseudo-real time processing which involves sending data by phone for processing in the office, and processing data at a later time back in the office. Techniques used in an actual case of pseudo real time processing are described, and advantages and possible hazards of the procedure are considered (Author)

A77-47409 # Errors of Doppler positions obtained from results of transcontinental traverse surveys B K Meade In Satellite Doppler positioning, Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 813-830

Point to point inversed distances in space were computed, and distances based on Doppler data or on preliminary results from the high precision transcontinental traverse survey network of the US were compared in order to obtain error estimates of Doppler results. The average chord distance difference, Doppler minus transcontinental traverse, was 0.50 m for 15 lines in a north-south direction and 0.65 m for 25 lines in an east-west direction. The results are in agreement with standard errors from previous Doppler observations. Azimuths calculated from Doppler data were converted to geodetic azimuths referred to the Clarke 1866 Spheroid and, along with distances from the transcontinental traverse, were used to compute position closures of the six loops of the traverse net. The correction of space azimuth determinations is discussed (Author)

A77-47410 # Determination of North American Datum 1983 coordinates of map corners T Vincenty (NOAA, National Geodetic Survey, Rockville, Md) In Satellite Doppler positioning,

03 GEODESY AND CARTOGRAPHY

Proceedings of the International Geodetic Symposium, Las Cruces, N Mex, October 12-14, 1976 Volume 2 Las Cruces, N Mex, New Mexico State University, 1976, p 831 838

The paper describes the use of Doppler data to predict approximate changes in the coordinates of map corners in the conversion from the North American Datum 1927 (NAD 27) to the North American Datum 1983 (NAD 83) system. The validity of the prediction depends on ellipsoid parameters, the scale of Doppler data, and the longitude origin of Doppler data. The computer program and mathematical formulas used to correct Doppler geocentric coordinates are examined, and mean shift values of the x, y, and z coordinates for the conterminous states and for Alaska are provided. M L

A77-49327 Free-air gravity anomalies in the world's oceans and their relationship to residual elevation J R Cochran (Lamont-Doherty Geological Observatory, Palisades, N Y) and M Talwani (Columbia University, Palisades, N Y) *Geophysical Journal*, vol 50, no 3, Sept 1977, p 495 552 106 refs NSF Grants No GA-312, No GA-668, No GA-894, No GA 1434, No GA-1523, No GP-5392, No GA-17761, No GV-23334, No GA 12825, No GV-27472, No GA-27281, No OPP 74-02238, No DES-71 00214, Contracts No Nonr-266(48), No Nonr-266(79), No N00014-67-A0108 0004, No N00014-75-C 0210

Five-by-five degree average free-air gravity anomalies over much of the earth's oceans were compiled, comparison of the compiled data with global gravity combination solutions employing satellite measurements were found to show some discrepancies. In particular, it was necessary to use surface data to investigate in detail the relationship of the gravity field to surface features at wavelengths of less than 4000 km. Mid ocean ridges, which are characterized by a gravity maximum, are analyzed. An empirical gravity-age relationship, compatible with thermal models of the lithosphere, was used in conjunction with the free-air anomalies to obtain residual gravity anomalies. A correlation is found between the residual gravity anomalies and similarly derived residual depth anomalies, especially for features such as off-ridge volcanism. J M B

A77-50685 # Foundations of space geodesy (Osnovy kosmicheskoi geodezii) I I Krasnorylov and Iu V Plakhov Moscow, Izdatel'stvo Nedra, 1976 216 p 75 refs In Russian

The book discusses coordinate systems and time measurements used in space geodesy, and the basic theory of satellite motion including Keplerian movements and perturbations in satellite motion, as well as information regarding ephemeris determination. The basic elements of satellite spherical astronomy are described (such as passage through meridian and parallel tracking points) as are various methods and equipment for satellite tracking procedures (including photographic, Doppler, laser, and radio ranging observations), and methods for preliminary result assessment. Attention is given to geometrical and dynamic problems of space geodesy (e.g., the determination of earth's ellipsoidal parameters via satellite, and calculation of resonant perturbations) along with an evaluation of the basic findings obtained by space geodesy, and perspectives for future research. S C S

A77-50692 Contour determination from digital terrain models G Halsey New South Wales, University, Thesis, 1975 130 p 49 refs

The automated production of contour maps based on digital terrain models (DTM) is discussed. DTM contouring techniques, involving data point collection from aerial reconnaissance imagery, the interpolation of height values onto a grid and the contouring of the grid points, are reviewed, with emphasis on the application of computer methods where possible. A sample mapping operation which treated sections of discontinuous or rough terrain is described. The adaptation of digital terrain modeling to such civil engineering problems as airport design is also considered. J M B

A77-51334 * Geodetic measurements on the ocean A G Mourad (Battelle Columbus Laboratories, Columbus, Ohio) (*Tropi-*

cal Conference on Marine Geodesy, University of Illinois, Urbana, Ill, June 28-30, 1976) *Marine Geodesy*, vol 1, no 1, 1977, p 3-35 90 refs Research supported by the Battelle Memorial Institute and NASA

This paper covers the topic of marine geodesy, its goals, and applications. Specifically discussed are position determination and establishment of geodetic control on the ocean bottom, ocean surface, and subsurface, and the determination of the geoid, a vertical reference surface. The various techniques used in position determination (including satellite, airborne, radio, inertial and acoustic techniques) are assessed in terms of accuracy, coverage, and contribution to the solution of specific problems associated with position and control. The results of several marine geodetic control experiments are presented. Classical techniques for the determination of the geoid are discussed and assessed, as are new techniques such as satellite altimetry. The outlook for marine geodetic measurements in the ocean is outlined in terms of what is being planned or considered for the next decade, and several recommendations are made. (Author)

A77-51335 Mean sea level and the marine geoid - An analysis of concepts I Fischer (Defence Mapping Agency, Washington, D C) (*Conference on Geodetic Measurements in the Ocean, University of Illinois, Urbana, Ill, June 28-30, 1976*) *Marine Geodesy*, vol 1, no 1, 1977, p 37 59 19 refs

The current ambition to achieve a 10 cm marine geoid focuses attention on the interdisciplinary problem of relating oceanographic to geodetic measurements, and on the apparent conflict between them along the United States' coasts. The concepts underlying the comparisons in this conflict are analyzed, and shown to leave a possibility of diffusing the deadlock by more precise reformulations. Concepts which have been equated in practical applications under less stringent accuracy requirements need to be refined and related more precisely through interdisciplinary efforts. An example is given of a geodetic utilization of density differences in the ocean, akin to but not the same as the idea of steric leveling, in order to highlight the similarity and dissimilarity between some geodetic and oceanographic ideas. (Author)

A77-51424 The role of geodetic techniques in remote sensing the surface dynamics of the oceans R S Mather and R Coleman (New South Wales, University, Sydney, Australia) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-87* 20 p 17 refs Research supported by the Australian Research Grants Committee

A considerable amount of satellite remote-sensed data is available for quantifying the surface dynamics of the oceans. The evaluation of quasi-stationary parameters is made difficult by the fact that all the available data is related to the sea surface and not the geoid to better than plus or minus m. A procedure is outlined for circumventing this problem. It is concluded that satellite altimetry data alone cannot provide parameters of use in quantifying ocean circulation features with wavelengths less than 1, where 1 is the shortest wavelength in the earth's geopotential which contributes to the orbital perturbations of near-earth satellites above the noise level of the tracking data, with the proviso that a global network of the latter is available. Data for 12 sets of overlapping passes of Geos-3 altimetry in the Tasman and Coral Seas off eastern Australia are analyzed with a view to ascertaining whether a basis exists for studying ocean circulation features with wavelengths less than 1 and which vary rapidly with time. (Author)

N77-28197# Naval Surface Weapons Center, Dahlgren, Va Dept of Warfare Analysis
OCEAN TIDES IN THE EQUATIONS OF MOTION OF THE TERRA SYSTEM OF COMPUTER PROGRAMS FOR SATELLITE GEODESY Final Report
W Groeger and R Manrique Dec 1976 41 p refs
(AD-A038291 NSWC/DL-TR-3535) Avail NTIS
HC A03/MF A01 CSCL 08/3

An algorithm is specified for the Newtonian attraction which the ocean tide exerts on artificial satellites of the earth. Only

the semidiurnal lunar tide is presently considered. But it is indicated how various other spectral components of the fluid tide may be accounted for if desired. The algorithm starts from a table for the global tide amplitudes and phase angles. It proceeds by approximating the gravitational potential exterior to the earth caused by the tidal bulge by that of a system of point masses on the ocean surface. For the sake of flexibility, separate computational schemes are described for the potential and the perturbing acceleration, the former being independent of the latter. This is to facilitate investigations which may eventually be conducted such as studies of the shape of the tidal bulge.

Author (GRA)

**N77-28688# National Geodetic Survey, Rockville, Md
RECENT ELEVATION CHANGE IN SOUTHERN CALIFORNIA**

S R Holdahl Feb 1977 26 p refs
(PB-265940/7, NOAA-TM-NOS-NGS-7 NOAA-77031802)
Avail NTIS HC A03/MF A01 CSCL 08G

Velocities of elevation change for two time periods were determined from Southern California leveling data. Two periods were selected for study: 1906 through 1962 and 1959 through 1976. The study area extends from San Pedro north to latitude 35.5 degrees, and between longitudes 117 degrees and 119.5 degrees. The shape of the fitted velocity surface for the latter epoch agrees with the original uplift established by Castle et al (1976) with the exception that no eastern termination is evidenced within the study area. The velocity surface for the earlier time period shows negligible subsidence of 1 mm/yr at Palmdale, increasing to 9 mm/yr at Bakersfield. The 11 mm/yr maximum uplift velocity determined for the period 1959 through 1976 is approximately twice the corresponding standard deviation. Weighted velocities, extracted from tidal records at six stations on the coast, were used to provide input for absolute height change.

GRA

**N77-29585 California Univ., Los Angeles
THE ORTHOPHOTO AND ORTHOPHOTOMAP CHARACTERISTICS, DEVELOPMENT AND ASPECTS OF CARTOGRAPHIC COMMUNICATION Ph D Thesis**

Johnny Russell Jensen 1976 176 p
Avail Univ Microfilms Order No 77-7673

Controlled experiments were developed to determine if there is a statistically significant difference in the ability of map readers to extract the following types of information from large scale photogrammetric linemaps versus large scale orthophotomaps: (1) tabular and integrative data; (2) magnitude estimation of horizontal distance; (3) magnitude estimation of rectangular area; and (4) magnitude estimation of polygon area. Independent variables examined in this study include: (1) map type (planimetric linemap, orthophotomap, inverted-pseudoscopic orthophotomap); (2) map reader background (laymen, cartographer, photointerpreter); (3) map scale (1:2000, 1:4000, 1:8000); landscale (Urban, suburban, rural); and (4) map reader confidence and preference.

Dissert Abstr

N77-29595# Centre National d Etudes Spatiales Toulouse (France)

IDENTIFICATION OF NETWORKS IN SPACE GEODESY BY SHORT ORBITAL ARCS (SHORT-ARC METHOD) [IDENTIFICATION DE RESEAUX EN GEODESIE SPATIALE PAR UTILISATION D'UNE TECHNIQUE D'ARCS ORBITAUX COURTS (METHODE SHORT-ARC)]

Jean Pierre Carrou Dec 1976 35 p refs In FRENCH, ENGLISH summary
(CNES-NT-61) Avail NTIS HC A03/MF A01

The short-arc method provides a means of obtaining geodetic networks by use of satellite-to-station measurements. The accuracy of the method depends on a good estimate of orbital perturbations. Local arcs of the orbit are adjusted to reduce perturbations effects. The station positions and the orbital parameters of each arc are adjusted simultaneously. The associated software as well as the first results obtained using simulated data are discussed.

Author (ESA)

N77-29596# Centre National d Etudes Spatiales Toulouse (France)

DETERMINATION OF THE GEOLITE POLYHEDRON BY THE SHORT-ARC METHOD [OBTENTION DU POLYEDRE GEOLITE PAR LA METHODE SHORT-ARC]

Jean-Pierre Carrou Jan 1977 18 p In FRENCH, ENGLISH summary
(CNES-NT-65) Avail NTIS HC A02/MF A01

The first phase of the Geolite system is to establish a world reference system by means of a basic polyhedron with a station at each apex. Until now this polyhedron was obtained by using a geometrical mode of treatment requiring a satellite altitude of 4000 km and a network of 36 stations. The short arc method was experimented and it has been found that with some assumptions on accuracy of earth model potential it is possible to obtain such a polyhedron with only 10 stations and a satellite altitude of 1500 km which is compatible with the possibilities of the European launcher Ariane.

Author (ESA)

N77-29702# Air Force Geophysics Lab Hanscom AFB, Mass Meteorology Div

ATLAS OF PROBABILITIES OF SURFACE TEMPERATURE EXTREMES PART 2 SOUTHERN HEMISPHERE Final Report

Paul Tattelman and Arthur J Kantor 27 Dec 1976 28 p refs

(AF Proj 8624;
(AD-A038237 AFGL-TR-77-0001-Pt-2 AFGL-ERP-588-Pt-2)
Avail NTIS HC A03/MF A01 CSCL 04/2

The method for calculating warm and cold temperature extremes described in Part I for the Northern Hemisphere, is used in this report (Part II) for an analogous presentation in the Southern Hemisphere. A bias in the estimates of cold temperature extremes for the Southern Hemisphere is discussed and evaluated in this report resulting in development of a new set of regression equations to depict cold temperature extremes. The resulting Southern Hemisphere maps of the 1-, 5-, and 10-percent warm temperatures and the 1-, 5-, 10- and 20-percent cold temperatures for the warmest and coldest months respectively are presented. Parts I and II of this report together provide a global representation of warm and cold surface temperature extremes for use in systems design and operation.

Author (GRA)

**N77-30553*# Geological Survey Reston Va
OVERALL EVALUATION OF LANDSAT (ERTS) FOLLOW ON IMAGERY FOR CARTOGRAPHIC APPLICATION Progress Report, 1 Apr 1976 - 1 Jul 1977**

Alden P Colvocoresses Principal Investigator 1 Jul 1977 18 p refs ERTS
(NASA Order S-543-47A)
(E77-10193 NASA-CR-154262) Avail NTIS
HC A02/MF A01 CSCL 08B

The author has identified the following significant results: LANDSAT imagery can be operationally applied to the revision of nautical charts. The imagery depicts shallow seas in a form that permits accurate planimetric image mapping of features to 20 meters of depth where the conditions of water clarity and bottom reflection are suitable. LANDSAT data also provide an excellent simulation of the earth's surface for such applications as aeronautical charting and radar image correlation in aircraft and aircraft simulators. Radiometric enhancement, particularly edge enhancement, a technique only marginally successful with aerial photographs has proved to be high value when applied to LANDSAT data.

**N77-32564*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md
GEODETIC AND ASTROMETRIC MEASUREMENTS WITH VERY LONG BASELINE INTERFEROMETRY Ph D Thesis MIT**

Douglas Scott Robertson Aug 1975 188 p refs
(Grant NSF EAR-74-22712)
(NASA-TM-X-71395 X-922-77-228) Avail NTIS
HC A09/MF A01 CSCL 08B

The use of very-long-baseline interferometry (VLBI) observations for the estimation of geodetic and astrometric parameters is discussed. Analytic models for the dependence of delay and

03 GEODESY AND CARTOGRAPHY

delay rate on these parameters are developed and used for parameter estimation by the method of weighted least squares. Results are presented from approximately 15,000 delay and delay-rate observations obtained in a series of nineteen VLBI experiments involving a total of five stations on two continents. The closure of baseline triangles is investigated and found to be consistent with the scatter of the various baseline-component results. Estimates are made of the wobble of the earth's pole and of the irregularities in the earth's rotation rate. Estimates are also made of the precession constant and of the vertical Love number for which a value of 0.55 ± 0.05 was obtained. Author

N77-32669# Maryland Univ., College Park Computer Science Center

EXTRACTION OF TOPOLOGICAL INFORMATION FROM DIGITAL IMAGES

Azriel Rosenfeld Jun 1977 37 p refs
(Grant AF-AFOSR-3271-77)

(AD-A042125, AFOSR-77-0806TR, TR-547) Avail NTIS HC A03/MF A01 CSCL 14/5

Geographic information is commonly derived from remote sensor imagery. The images are digitized and segmented in categories of interest, such as terrain or land use types. The regions resulting from this segmentation process can then be individually labelled, using connected component analysis or refinements of it. Polygonal boundary chains can be constructed for each of these regions and the topological relationships among the regions can also be extracted. GRA

N77-32571# Control Data Corp Minneapolis Minn Digital Image Systems Div

DIGITAL CARTOGRAPHIC STUDY AND BENCHMARK Interim Technical Report

D J Panton Jul 1977 75 p refs

(Contract DAAG53-75-C-0195)

(AD-A043156, IR-4, ETL-0093) Avail NTIS HC A04/MF A01 CSCL 08/2

This report is the fourth in a series of Interim Technical Reports that cover the development and implementation of a stereo matching algorithm that can be used in automatic terrain data collection. In particular, the results of Phase D of the contract are contained herein. The primary purpose of this Phase was to generalize the algorithm that was developed under Phases A, B, and C to handle more uncontrolled cases of central perspective photography and to lay the groundwork for handling non-central perspective photography. Previous developments and algorithm logic modifications have been reported in a rather piecemeal fashion over the first three Phases. This report combines all these developments into a consistent description of the matching algorithm as it appears to date, including the modifications of Phase D. Author (GRA)

N77-33139# Air Force Inst of Tech, Wright-Patterson AFB, Ohio School of Engineering

GRAVITY MODELING FOR PRECISE TERRESTRIAL INERTIAL NAVIGATION

Robert M Edwards Jun 1977 157 p refs

(AD-A042419) Avail NTIS HC A08/MF A01 CSCL 17/7

A historical perspective of gravity modeling for terrestrial navigation is presented. The traditional ellipsoidal model is explained, and the consequent errors are discussed. The propagation of these errors into navigation estimation errors is presented. A brief survey of advanced modeling methods and the pertinent theory is presented. The system design problem of selecting an advanced gravity model is presented as a scenario to motivate the proposed research. To address this problem, a new theoretical analysis technique is developed. This technique includes the effects of navigation error propagation, the statistics of the anomalous field (the residual after ellipsoidal or other reference field modeling), the statistics of gravity survey errors, and the advanced gravity modeling. These effects are combined to yield a measure of system performance cost as reflected in the navigation error state covariance due to gravity modeling errors acting alone. This report contains references to 82 items

in the open literature pertinent to this subject area

Author (GRA)

N77-33588*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md **PRECISION SURVEYING USING VERY LONG BASELINE INTERFEROMETRY**

J W Ryan T A Clark R Coates C Ma (Md Univ, College Park) D S Robertson (Natl Geodetic Survey) B E Corey (MIT Cambridge) C C Counselman (MIT Cambridge) I I Shapiro (MIT Cambridge) J J Wittels (MIT Cambridge) and H F Hinteregger (NEROC Haystack Obs) Sep 1977 19 p Presented at Ann Meeting of the Am Soc of Civil Engr San Francisco, 17-21 Oct 1977

(NASA-TM-X-71405 X-922-77-242) Avail NTIS HC A02/MF A01 CSCL 08B

Radio interferometry measurements were used to measure the vector baselines between large microwave radio antennas. A 124 km baseline in Massachusetts between the 36 meter Haystack Observatory antenna and the 18 meter Westford antenna of Lincoln Laboratory was measured with 5 mm repeatability in 12 separate experiments. Preliminary results from measurements of the 3928 km baseline between the Haystack antenna and the 40 meter antenna at the Owens Valley Radio Observatory in California are presented. Author

04
**GEOLOGY AND MINERAL
RESOURCES**

Includes mineral deposits petroleum deposits spectral properties of rocks geological exploration and lithology

A77-41024 Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting (Sur la détermination du moment de mesure favorable et l'interprétation des résultats en prospection thermique archéologique) A Tabbagh (CNRS, Centre de Recherches Géophysiques, Pouilly-sur Loire, Nièvre, France) (*International Union of Geodesy and Geophysics, General Assembly, 16th, Grenoble, France, Aug 25-Sept 6, 1975*) *Annales de Géophysique*, vol 33, Jan June 1977, p 243 253 9 refs In French

A77-43014 * Rare accessory uraninite in a Sierran granite K G Snetsinger (NASA, Ames Research Center, Space Sciences Div., Moffett Field, Calif) and G Polkowski (LFE Corp., Richmond, Calif) *American Mineralogist*, vol 62, 1977, p 587, 588 5 refs

One grain of uraninite was found in a single thin-section of Sierran granite Electron and ion microprobe analysis were used to determine the composition Since the U-Pb age calculated for the uraninite does not differ greatly from the K-Ar age of the unit in which it occurs, it is suggested that the mineral is primary and not reworked from a preexisting rock No uraninite has been detected in heavy mineral concentrates from other rocks of the local area M L

A77-44467 * Landsat imagery for surface-mine inventory A T Anderson (NASA, Goddard Space Flight Center, Greenbelt, Md), D Schultz, N Buchman (General Electric Co., Beltsville, Md), and H M Nock (Maryland Geological Survey, Westernport, Md) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1027-1036 7 refs

The feasibility of using Landsat imagery for routine monitoring of surface mining and reclamation was tested in a two-county (1541 sq km) area of western Maryland Two digital analysis methods were studied The first, a four band analysis distinguishing various strip mine associated classes and conditions, proved useful, but has limited extendibility over a seasonal or annual period In the second approach, a band-ratio method was developed for measuring disturbed surface areas, and it proved to be both temporally and geographically extendible For mines ranging between 31 and 244 acres, the measurement accuracy of total affected acreage was 92% The use of Landsat satellite data together with multilevel sampling of aircraft and field verification inspections has shown that multispectral analysis of digital data is an effective means of monitoring the progress of surface mining operations M L

A77-44468 Geologic applications of Landsat imagery A Iranpanah (Teheran, University, Teheran, Iran) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 1037-1040. 5 refs

Three Landsat I multispectral scanner band 7 images which were used to delineate major geologic features in north-central Iran are presented The images were interpreted by visual techniques Structural-lineament maps of the area are provided, and geological features, including a major fault and two depressions, are described M L

A77-45269 * Morphology and physical parameters of a solar flare J B Smith, Jr (NOAA, Space Environment Laboratory,

Boulder, Colo), R M Wilson (NASA, Marshall Space Flight Center, Huntsville, Ala), and W Henze, Jr (Teledyne Brown Engineering, Huntsville, Ala) *Astrophysical Journal, Part 2 - Letters to the Editor*, vol 216, Sept 1, 1977, p L79-L82 15 refs Contract No NAS8 31908 NASA Order H-12261-B

The chromospheric and coronal morphology of the flare of June 15, 1973, (1B/M3) in NOAA active region 131 (McMath 12379) is discussed, and results of quantitative analysis of Skylab soft X-ray observations of the event are presented H-alpha and white-light observations reveal evidence of emerging flux near the site of the H-alpha flare onset Preflare and early flare filament activity and its spatial and temporal correlation with the flare are discussed Spatially resolved soft X-rays are compared with H alpha and magnetic-field measurements Full-disk high temporal-resolution soft X-ray flux measurements and time profiles of the resultant temperature and density calculations are also presented which yield a peak temperature of about 14.2 million K and a peak electron density of approximately 3.5 deg 10 to the -10th power per cu cm and show a preflash phase temperature rise to about 9 million K The peak values should be compared with the respective values of approximately 25 million K and 4.5 by 10 to the -10th power per cu cm deduced from the spatially resolved data (Author)

A77-47176 Skylab photography for geological mapping C Maffi and C J Simpson *BMR Journal of Australian Geology and Geophysics*, no 2, 1977, p 7-19 25 refs

Skylab spacecraft stereoscopic photography of the Alice Springs and Snowy Mountains regions of Australia was studied by conventional photogeological techniques to assess its usefulness in geological mapping In the arid Alice Springs region, which has well exposed sedimentary rocks and relatively simple structures, broad rock units can be differentiated and correlated, and rock trends, joints and folds interpreted with the same accuracy as that shown on the 1 500,000 scale geological map of the region The distribution of Cretaceous travertine and other surficial materials can be interpreted with sufficient reliability to allow up-dating of 1 250,000 scale geological maps In the more humid Snowy Mountains region, where the geology-to-morphology relationships are complex and varied, little lithological information can be obtained only Tertiary volcanic rocks and alluvium can be identified and outlined with confidence The Skylab photographs proved more useful for structural interpretations faults, lineaments and joint trends can be detected Several circular structures can be related to features of igneous origin. Statistical analysis of linear features revealed a direct relationship between known structural trends and linear features annotated on low resolution Skylab photographs (Author)

N77-28549 Columbia Univ New York
SPECTRORADIOMETRIC DETECTION AND MAPPING OF AREAS ENRICHED IN FERRIC IRON MINERALS USING AIRBORNE AND ORBITING INSTRUMENTS Ph D Thesis
William Collins 1976 129 p
Avail Univ Microfilms Order No 77-8248

An airborne spectroradiometer system was developed to take simultaneous 500 channel measurements of ground targets in the spectral regions between 4,250 Å and 10,000 Å Survey flights with the instrument over an exposed hydrothermal alteration zone prove the value of high resolution aircraft measurements to complement LANDSAT surveys The high resolution data are necessary for determining the spectral properties of target materials for establishing that these spectral properties are unique and will remain unique in the low spectral resolution LANDSAT data, and for accurately determining the nature and magnitude of spectral differences among targets under the broadband configuration Field measurements from the aircraft are spatially integrated over contiguous 18 meter square fields of view along flight lines planned to cover both background and altered rock assemblages
Dissert Abstr

N77-28551*# Earth Satellite Corp Washington, D C
APPLICATION OF LANDSAT-2 DATA TO THE IMPLEMENTATION AND ENFORCEMENT OF THE PENNSYLVANIA

04 GEOLOGY AND MINERAL RESOURCES

SURFACE MINING CONSERVATION AND RECLAMATION ACT Final Report, Mar 1975 - May 1977

Orville R Russell Principal Investigator, David A Nichols and Richard Anderson May 1977 77 p refs Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 ERTS (Contract NAS5-21998) (E77-10184 NASA-CR-153916) Avail NTIS HC A05/MF A01 CSCL 08I

The author has identified the following significant results Evaluation of LANDSAT imagery indicates severe limitations in its utility for surface mine land studies Image stripping resulting from unequal detector response on satellite degrades the image quality to the extent that images of scales larger than 1 125,000 are of limited value for manual interpretation Computer processing of LANDSAT data to improve image quality is essential, the removal of scanline stripping and enhancement of mine land reflectance data combined with color composite printing permits useful photographic enlargements to approximately 1 60 000

N77-28554*# Kentucky Dept of Natural Resources and Environmental Protection Frankfort

A FEASIBILITY ANALYSIS OF THE EMPLOYMENT OF SATELLITE IMAGERY TO MONITOR AND INSPECT SURFACE MINING OPERATIONS IN WESTERN KENTUCKY, VOLUME 1 Final Report

Birney R Fish Principal Investigator Jan 1977 196 p refs Sponsored by NASA ERTS (E77-10189 NASA-CR-153918) Avail NTIS HC A09/MF A01 CSCL 08I

The author has identified the following significant results Surface mining violation estimates were scaled by scores assigned by ten inspectors from western Kentucky to each violation A sensitivity analysis was made by varying the violation costs, costs were varied by using three different average durations These durations were (1) best estimated duration (2) longest possible duration as restricted by the one year permit renewal and bond release regulations, and (3) shortest possible duration when inspections were made If a social cost cannot be reduced then the value of the social cost is irrelevant Indications from the increased inspection rate of 1975 were that the total amount of fines collected per year remains constant independent of the increased detection rate

N77-28555*# Kentucky Dept of Natural Resources and Environmental Protection Frankfort

A FEASIBILITY ANALYSIS OF THE EMPLOYMENT OF SATELLITE IMAGERY TO MONITOR AND INSPECT SURFACE MINING OPERATIONS IN WESTERN KENTUCKY VOLUME 2 APPENDICES Final Report

Birney R Fish Principal Investigator Jan 1977 115 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 ERTS (E77-10190 NASA-CR-153919) Avail NTIS HC A06/MF A01 CSCL 08I

N77-28652 Catholic Univ of America Washington, D C INTERPRETATION OF AEROMAGNETIC ANOMALIES BETWEEN LATITUDES 37 DEG N AND 38 DEG N IN THE EASTERN AND CENTRAL UNITED STATES Ph D Thesis

Isidore Zietz 1976 76 p Avail Univ Microfilms Order No 77-3704

An aeromagnetic map across the eastern and central United States reflects the regional structure and lithology of the magnetic crystalline rocks The major crustal units that are delineated are the Appalachian Mountain system, the buried southwesterly extension of the Grenville province the prominent fault zones across Kentucky southern Illinois, and Missouri the igneous rocks of the St Francois Mountains and vicinity and the buried belt of lowgrade metamorphic rocks in southeastern Kansas The map also reveals a serious of conspicuous, essentially east-trending magnetic lineaments anomaly trends and breaks in anomaly pattern along the entire survey area Most of these east-

trending features coincide in part with Phanerozoic surface faults, deflections in structural pattern, or the presence of intrusive rocks some of the lineaments have no surface expression

Dissert Abstr

N77-28656 South Carolina Univ Columbia UPPER MESOZOIC MAGNETOSTRATIGRAPHY Ph D Thesis

Thomas J Schmitt 1976 65 p Avail Univ Microfilms Order No 77-6780

The upper Mesozoic polarity history of the Earth's magnetic field as derived from the marine magnetic anomalies radiometrically dated paleomagnetic sites and a sequence of biostratigraphically dated marine carbonates from Tunisia were compared The radiometric survey served to date major changes in field behavior The gross field behavior determined by that survey was used as a check on the reliability of the carbonate study The magtostratigraphy of the carbonates established biostratigraphic ages for the anomalies and determined the fine scale history of the field lost from the marine magnetic anomalies due to attenuation

Dissert Abstr

N77-29586 Purdue Univ Lafayette Ind SURFACE AND STRUCTURAL PROPERTIES OF PLYGORSKITE Ph D Thesis

George Emerson VanScovoc 1976 94 p Avail Univ Microfilms Order No 77-7544

Infrared spectra of the coordinated water in palygorskite were studied at different degrees of exchange of deuterons and protons The single peaks observed for the bending fundamental of isotopically diluted H₂O and D₂O show that all the coordinated water molecules are equivalent as suggested by Bradley's structure determination Response of palygorskite films to the angle of orientation indicated one of the OH stretching modes to have its transition moment nearly perpendicular to the [100] plane The orientation effect results from one of the protons on each of the coordinated water molecules forming a hydrogen bond directed towards the hexagonal holes of oxygens formed by the Si-O-Si connections between the amphibole chains and it explains the distorted character of this water Dissert Abstr

N77-29592 Cornell Univ, Ithaca, N Y PHOTO-GEOLOGY AND REMOTE SENSING SYSTEMS FOR LOCATING ORE DEPOSITS Ph D Thesis

Linda Susan Zall 1976 227 p Avail Univ Microfilms Order No 77-8419

The geologic nature of the more economically significant ore deposits, summaries of their occurrence and applied photo-geology and remote sensing techniques of mineral exploration in a known mineralized test area were investigated Photo-geology was utilized to investigate the bedrock and structural geology of the Zacatecas district, Zacatecas Mexico where mineralization occurs as epithermal vein deposits in Tertiary acidic volcanics Significant radial and peripheral fracture patterns, thought to be related to caldera collapse, were identified and delineated on 1 25 000 scale black-and-white stereo aerial photographs and subjected to a detailed analysis The known mines were found to be related to favorable structures and lithologies located on or near to major fracture zones or fracture intersections, related to the radial-peripheral patterns

Dissert Abstr

N77-29672*# National Aeronautics and Space Administration, Washington, D C JOINT DOCUMENT CONCERNING GEOLOGICAL STUDIES FROM 1971 - 1975

Aug 1977 27 p refs Prepared in cooperation with the Acad of Sciences Moscow (NASA-TM-78318) Avail NTIS HC A03/MF A01 CSCL 08G

In 1971, a joint Soviet-American Working Group on Remote Sensing of the Natural Environment was established It was organized into a number of discipline panels one of which was on geology Membership on this panel came from the Geological Survey of the United States and from the Institute of Geology of the U S S R Academy of Sciences and Ministry Geology of the U S S R During the period 1971-1975, this panel conducted

coordinated research in the use of space remote sensing data in the field of geology. A summary of that coordinated research effort is presented. Author

N77-30289*# National Aeronautics and Space Administration Goddard Inst for Space Studies, New York
SPACE TECHNOLOGY IN THE DISCOVERY AND DEVELOPMENT OF MINERAL AND ENERGY RESOURCES
 Paul D Lowman *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol* May 1977 p 197-199 refs
 Avail NTIS HC A13/MF A01 CSCL 08G

Space technology applied to the discovery and extraction of mineral and energy resources is summarized. Orbital remote sensing for geological purposes has been widely applied through the use of LANDSAT satellites. These techniques also have been of value for protection against environmental hazards and for a better understanding of crustal structure. B L P

N77-30658*# Purdue Univ Lafayette Ind Lab for Applications of Remote Sensing
ERTS MULTISPECTRAL IMAGE TRANSFORMATIONS FOR GEOLOGICAL LINEAMENT ENHANCEMENT
 Paul E Anuta, Principal Investigator and Bijan Mobasserri 25 Feb 1975 22 p refs. Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 EREP
 (Contract NAS9-14016 Grant NGL-15-005-112)
 (E77-10198 NASA-CR-151468 LARS-Inform-Note-022575)
 Avail NTIS HC A02/MF A01 CSCL 08G

N77-30589# Bureau of Mines, Pittsburgh Pa Mining and Safety Research Center
METHODS OF DETERMINING THE ORIENTATIONS OF BEDROCK FRACTURE SYSTEMS IN SOUTHWESTERN PENNSYLVANIA AND NORTHERN WEST VIRGINIA
 B M Bench, W P Diamond and C M McCulloch 1977 52 p refs
 (PB-266769/9, BM-RI-8217) Avail NTIS HC A04/MF A01 CSCL 08I

Photolineaments from stereoscopic examination of vertical aerial photographs, and those found by the Ronchi grating study of aerial photoindex sheets are described and discussed. They are compared with the trends of oriented fracture systems procured by measuring the compass direction of joints in bedrock. The relative reliability of the methods is shown and the results are presented in graphical, tabular and written form. Analyses of field measurements of strikes of bedrock joints in the project area indicate for the most part two intersecting sets of major joints oriented N 76 degrees W - N 15 degrees E and N 57 degrees W - N 27 degrees E. The analyses of lineaments determined by stereoscopic examination of aerial photographs show dominant trends of lineament zones of weakness to be an average on N 65 degrees W - N 20 degrees E. Analysis of lineaments found by Ronchi grid viewing of aerial photoindex sheets indicate dominant trends of N 70 degrees W - N 27 degrees E. GRA

N77-31579# Instituto de Pesquisas Espaciais Sao Jose dos Campos (Brazil)
GEOLOGIC MAPPING OF THE GOIAS QUADRANGLE BASED ON THE MULTISPECTRAL IMAGES TRANSMITTED BY LANDSAT 1 SATELLITE. M.S. Thesis [MAPEAMENTO GEOLOGICO DA FOLHA GOIAS AO MICIONSIMO BASEADO EM IMAGENS LANDSAT-1]
 Edison Crepani and Paulo Roberto Martini Jul 1977 111 p refs. In PORTUGUESE. ENGLISH summary
 (INPE-1071-TPT/058) Avail NTIS HC A06/MF A01

The usefulness of the multispectral images transmitted by the LANDSAT-1 (formerly ERTS-1) spacecraft, for regional geological mapping is demonstrated. Besides using conventional imagery use was also made of photographs from the SKYLAB Program and of computer compatible tapes (CCT's) automatically analysed in the IMAGE-100 (I-100) equipment. Eventually

black and white 70 mm transparencies were used. The selection of the Goias Quadrangle is due to the good quality of the orbital data available and to the acknowledged geological complexity with multiple stratigraphic units and different geotectonic environments. Author

N77-31581# Instituto de Pesquisas Espaciais Sao Paulo (Brazil)
GEO MORPHOLOGIC MAPPING BY MEANS OF LANDSAT IMAGES [MAPEAMENTO GEOMORFOLOGICO ATRAVES DE IMAGENS DO LANDSAT]
 Evlyn Marcia Leao DeMoraes Novo and Maria Amelia Leite Soares DoNascimento Jul 1977 24 p refs. In PORTUGUESE, ENGLISH summary
 (INPE-1076-NTE/102) Avail NTIS HC A02/MF A01

The selected test site was the area covered by the Belo Horizonte Chart. This area was chosen because it presents a variety of geomorphologic aspects that allows for the establishment of a procedure for image interpretation. The results showed that it is possible to characterize the main geomorphologic features by means of LANDSAT image analysis. A map was constructed which can be used as an aid in further studies leading to the establishment of evolution models for landscape. Author

N77-31582# Instituto de Pesquisas Espaciais Sao Jose dos Campos (Brazil)
TECTONIC SKETCH MAP OF NORTHERN MINAS GERAIS BASED ON LANDSAT IMAGES [ESBOCO TECTONICO DO NOTRE DE MINAS GERAIS BASEADO EM IMAGENS LANDSAT]
 Roberto Pereira DaCunha and Juercio Tavares DeMattos Jul 1977 29 p refs. In PORTUGUESE. ENGLISH summary
 (INPE-1078-NTE/104) Avail NTIS HC A03/MF A01

The results obtained from the interpretation of LANDSAT data for regional geological investigation are presented. RADAR imagery, aerial photographs and aeromagnetic maps were also used. Automatic interpretation using LANDSAT CCT's was carried out in the I-100 equipment. A tectonic map was constructed of an area of about 143 000 sq km, in the central portion of Minas Gerais and eastern Goias States known as potentially rich region in mineral resources. Author

N77-31590# California State Dept of Transportation, Sacramento
REMOTE IDENTIFICATION OF GEOLOGIC MATERIALS BY MULTISPECTRAL TECHNIQUES. AN EVALUATION OF APPLICABILITY TO HIGHWAY PLANNING IN CALIFORNIA. Final Report
 James Gamble Sep 1976 45 p refs. Sponsored by Federal Highway Admin
 (PB-267137/8 FHWA-CA-TL-2117-76-57) Avail NTIS HC A03/MF A01 CSCL 08M

The remote classification of terrain features and natural materials at a California test site obtained by multisensor scanner and computer assisted processing techniques is compared to a detailed geologic map that served as ground truth for evaluating classification accuracy. The purpose of the study was to determine if the multispectral method of remotely discriminating natural materials had practical application for highway and environmental planning, and for route selection. GRA

N77-31594# Army Cold Regions Research and Engineering Lab, Hanover N H
NUMERICAL STUDIES TO AID INTERPRETATION OF AN AIRBORNE VLF RESISTIVITY SURVEY
 Steven A Arcone Apr 1977 18 p refs
 (AD-A039904, CRREL-77-5) Avail NTIS HC A02/MF A01 CSCL 08/7

Airborne resistivity surveys which use the wavelilt phenomena of radiowaves are used as a preliminary exploration technique to find suitable areas for either engineering investigations or geologic reconnaissance explorations. Survey results are usually presented as resistivity flight line profiles or as contour maps from which the interpretation or site selection process must be initiated. To aid in this process and provide additional understanding of the correlation between data obtained from airborne and

04 GEOLOGY AND MINERAL RESOURCES

ground surveys an analysis was performed to determine a very-low-frequency airborne systems response to modelled resistivity anomalies assumed to occur at the surface of an idealized flat earth. Some of the assumptions used to simplify the analysis were based on the results of past surveys. The influences of survey altitude, anomaly size and average ground resistivity upon airborne resistivity patterns were analyzed. The results show that the average resistivity of a region plays an important role in suppressing large resistivity contrasts for anomalies of approximately 1 sq km area. Curves are presented to separate the effects of resistivity contrast and anomaly size, and two examples are given to demonstrate how these curves may be applied to the results of actual surveys. Author (GRA)

N77-31725# Montana Dept of Health and Environmental Sciences, Helena

ALLUVIAL VALLEY FLOORS IN EAST-CENTRAL MONTANA AND THEIR RELATION TO STRIPPABLE COAL RESERVES. A RECONNAISSANCE REPORT

Jack Schmidt Jan 1977 148 p refs
(PB-267280/6 EPA-908/4-77-001) Avail NTIS
HC A07/MF A01 CSCL 081

The chief purpose of the project was the preliminary assessment of the impact of a prohibition against mining alluvial valley floors on the coal resources of portions of Dawson, Garfield, McCone and Richland Counties Montana. A secondary purpose was the assessment of some of the physical and land use characteristics of these areas and their importance to the local farming and ranching economy. Field work, data compilation, and report preparation were accomplished in less than five months. GRA

N77-31995# Aerospace Corp El Segundo, Calif Materials Science Lab

CARBON OCCURRENCE OF LINEAR FORMS IN NATURAL GRAPHITE Interim Report

A Greenville Whittaker 15 Apr 1977 13 p refs
(Contract F04701-76-C-0077)
(AD-A039520, TR-0077(2250-10)-2 SAMSO-TR-77-94) Avail
NTIS HC A02/MF A01 CSCL 20/2

A study of several natural carbon formations, from geographical locations ranging from Celyon to California, revealed that the carbons contain small amounts of linear carbon forms, e.g. chaotite, alpha carbyne, and beta carbyne. The results indicate that these 'rare' carbon forms have worldwide distribution and, as with diamond, are prevented from transformation to graphite by a high kinetic barrier. Author (GRA)

N77-32580*# Comision Nacional del Espacio Exterior, Mexico City (Mexico)

COMPREHENSIVE STUDY OF LEON-QUERETARO AREA Progress Report

Humberto Ramos Moreno Principal Investigator Jul 1977 4 p
Sponsored by NASA ERTS
(E77-10208, NASA-CR-153972) Avail NTIS
HC A02/MF A01 CSCL 08F

N77-32578# Utah Univ, Salt Lake City Dept of Geology and Geophysics

GRAVITY AND GROUND MAGNETIC SURVEYS OF THE CENTRAL MINERAL MOUNTAINS, UTAH, VOLUME 6 Final Report. M.S. Thesis

Terry J Crebs and K Cook Dec 1976 149 p refs
(Grant NSF AER-74-01043)
(PB-268423/1, NSF/RA-760753-Vol-6) Avail NTIS
HC A07/MF A01 CSCL 081

Data from gravity and ground magnetic surveys made over the central part of the Mineral Mountains and vicinity, Utah, were compiled as a terrain-corrected Bouguer gravity anomaly map. Gravity features include generally northward trending gravity contours with gradients along the margins of the Mineral Range, and a northward-trending gravity high along the western flank of the Mineral Range. GRA

N77-33570*# Missouri Dept of Natural Resources Rolla
STRUCTURAL LINEAMENT AND PATTERN ANALYSIS OF MISSOURI, USING LANDSAT IMAGERY Final Report, Mar 1975 - Aug 1977

James A Martin and Geza Kisvarsanyi Principal Investigators
Sep 1977 151 p refs Original contains color imagery Original
photography may be purchased from the EROS Data Center
Sioux Falls S D ERTS
(Contract NAS5-20937)
(E77-10239 NASA-CR-155029) Avail NTIS
HC A08/MF A01 CSCL 08B

The author has identified the following significant results. Major linear circular and arcuate traces were observed on LANDSAT imagery of Missouri. Lineaments plotted within the state boundaries range from 20 to nearly 500 km in length. Several extend into adjoining states. Lineament plots indicate a distinct pattern and in general reflect structural features of the Precambrian basement of the platform. Coincidence of lineaments traced from the imagery and known structural features in Missouri is high thus supporting a causative relation between them. The lineament pattern apparently reveals a fundamental style of the deformation of the intracontinental craton. Dozens of heretofore unknown linear features related to epigenetic movements and deformation of this segment of the continental crust were delineated. Lineaments and mineralization are interrelated in a geometrically classifiable pattern.

N77-33734# Los Alamos Scientific Lab, N Mex
ELECTRON MICROPROBE ANALYSES OF MINERALS IN PRECAMBRIAN ROCKS AT THE LOS ALAMOS SCIENTIFIC LABORATORY GEOTHERMAL TEST SITE, TEMEZ MOUNTAINS, NEW MEXICO

Stephen N Ehrenberg and Priscilla C Perkins Feb 1977 15 p
refs
(Contract W-7405-eng-36)

(LA-6895-MS) Avail NTIS HC A02/MF A01
Electron microprobe analyses are presented for plagioclase, biotite, hornblende, magnetite, microcline, and chlorite in core samples from Granite Test Hole One at the Los Alamos Geothermal Test Site. The analyses and accompanying petrographic descriptions characterize material exposed to artificial hydrothermal systems in laboratory experiments. Plagioclase in granitoid rocks exhibits significant compositional variation (albite rims on calcic oligoclase) and alteration to sericite and epidote. ERA

N77-34070*# Science Applications, Inc, Pasadena, Calif
Planetary Science Inst

GEOLOGIC INVESTIGATION OF MERCURY DATA AND THE SUBSEQUENT MAPPING AND EXPLANATION OF THE QUADRANGLE AREA H-12 Final Report

Karl R Blasius 15 Aug 1977 18 p refs
(Contract NASw-2900)
(NASA-CR-155159) Avail NTIS HC A02/MF A01 CSCL
03B

The origin of scraps and ridges mapped in the H-12 region of Mercury are discussed. These features apparently are of non-impact origin and show distinctly non-random patterns of distribution and orientation. These patterns cannot be simply related to selective enhancement of visibility by lighting conditions, global stresses of spin down or interior cooling, or local uplifts or subsidences. Suggestions are made that the origin of these structures may lie outside the region of Mercury photographed or the scarps and ridges may have formed by reactivation of faults or joints bounding pre-existing crystal blocks. Author

N77-34073*# Science Applications, Inc, Pasadena Calif
GEOLOGY ORBITER COMPARISON STUDY

James A J Cutts, Karl R Blasius, Donald R Davis, Kevin D Pang, and David C Shreve Aug 1977 137 p refs
(Contract NASw-2613)
(NASA-CR-155056 SAI-1-120-399-S1) Avail NTIS
HC A07/MF A01 CSCL 03B

Instrument requirements of planetary geology orbiters were examined with the objective of determining the feasibility of applying standard instrument designs to a host of terrestrial targets. Within the basic discipline area of geochemistry,

gamma-ray X-ray fluorescence and atomic spectroscopy remote sensing techniques were considered. Within the discipline area of geophysics, the complementary techniques of gravimetry and radar were studied. Experiments using these techniques were analyzed for comparison at the Moon, Mercury, Mars and the Galilean satellites. On the basis of these comparative assessments, the adaptability of each sensing technique was judged as a basic technique for many targets, as a single instrument applied to many targets, as a single instrument used in different mission modes, and as an instrument capability for nongeoscience objectives.

Author

Page intentionally left blank

OCEANOGRAPHY AND MARINE RESOURCES

Includes sea-surface temperature ocean bottom surveying imagery drift rates sea ice and icebergs sea state fish location

A77-40792 # Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 (Retranslatsiia okeanograficheskoi informatsii s avtomaticheskoi buikovoi stantsii pri pomoshchi ISZ 'Kosmos-426') A G Kolesnikov, B A Nelepo, V M Kovtunenکو, S V Dotsenko, and A A Eroshko (Akademiia Nauk Ukrainskoi SSR, Morskoi Gidrofizicheskii Institut, Sevastopol, Ukrainian SSR) *Akademiia Nauk SSSR, Doklady*, vol 234, May 1, 1977, p 49-52 In Russian

A two-way radio link in short and ultrashort wave bands was established between the satellite Kosmos-426 and an automatic buoy station complex on the Black Sea The automatic station was designed to operate in ten different regimes, measuring basic oceanographic parameters (current direction and speed, water temperature and conductivity) and meteorological parameters (air temperature and humidity, wind speed and direction, atmospheric pressure) at a variety of intervals Both the satellite and the buoy station complex were controlled from a tracking and receiving stations, where data transmitted from the buoy complex via the satellite were received and processed C K D

A77-40796 # Method of compilation of chemical-element maps of insufficiently observed ocean aquators (K metodike postroeniia kart khimicheskikh elementov dlia akvatorii okeana, nedostatochno osveshchenoi nabludeniiami) A G Kolesnikov, A I Ermolenko, A A Novoselov, and I F Timchenko *Morskoe Gidrofizicheskoe Issledovanie*, no 3, 1976, p 5-16 6 refs In Russian

This paper describes a method for the computerized mapping of element distributions in ocean areas on the basis of an objective analysis of ocean data The distribution of oxygen in the tropical Atlantic is calculated as an example The method has been used in compilation of chemical-element maps for the international ICITA atlas B J

A77-40798 # The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration (Pole prozrachnosti na glubine 30 m tropicheskoi Atlantiki i soglasovanie ego s polem kontsentratsii fosfatov) N A Sorokina, G G Neumin, and S M Solodova *Morskoe Gidrofizicheskoe Issledovanie*, no 3, 1976, p 31-38 7 refs In Russian

An attempt is made to construct a chart of the directed light attenuation index at a depth of 30 m in the tropical Atlantic using methods based on minimization of the mean-square error The 'one-point' adjustment of the fields of the directed light attenuation index to the concentration of phosphates is also carried out after performing the optimal interpolation of initial values of elements in the nodes of a regular net (Author)

A77-40812 # New formulas of the radiation balance of the ocean-atmosphere system (Novye formuly radiatsionnogo balansa sistemy okean atmosfer) N A Timofeev *Morskoe Gidrofizicheskoe Issledovanie*, no 4, 1976, p 84-91 18 refs In Russian

The radiation balance of the ocean atmosphere system is formulated in terms of atmospheric temperature and cloud cover on the basis of actinometric measurements and meteorological satellite data Values of climatological radiative fluxes are studied for different seasons and latitudes B J

A77-40815 # Use of ultrasound for the investigation of small-scale turbulence in the ocean (O primeneni ul'trazvuka dlia issledovaniia melkomasshtabnoi turbulentnosti v okeane) A V Volkova *Morskoe Gidrofizicheskoe Issledovanie*, no 4, 1976, p 112-118 8 refs In Russian

An expression is obtained for acoustic scattering on turbulent inhomogeneities of temperature and velocity of turbulent flow in the ocean Semiempirical hypotheses are used to establish the functional relationship between acoustic scattering and mean gradients of temperature and velocity The development of a probe of ocean turbulence using principles of ultrasonic scattering is discussed B J

A77-40821 # Expedition of the 12th cruise of the research vessel 'Akademik Vernadskii' (Ekspeditsiia 12 go reisa NIS 'Akademik Vernadskii') G G Neumin and V A Urdenko *Morskoe Gidrofizicheskoe Issledovanie*, no 4, 1976, p 164-174 In Russian

Attention is given to the 12th cruise of the 'Akademik Vernadskii' whose purpose was to investigate a system of currents in the equatorial Pacific Some preliminary results are presented, including the zonal components of current velocities, the distribution of isolines of temperature, and the vertical distribution of the photoattenuation index, salinity, temperature and conditional density B J

A77-41403 # Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry (Otsenka vozmozhnosti indikatsii tolshchiny zasnezhennogo ledianogo pokrova arkticheskikh morei metodami I-K radioimetrii) V V Bogorodskii and E A Martynova (Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby SSSR, Arkticheskii i Antarktiticheskii Nauchno-Issledovatel'skii Institut, Leningrad, USSR) *Akademiia Nauk SSSR, Doklady*, vol 234, May 21, 1977, p 548-551 5 refs In Russian

A77-41918 Tracking a Gulf Stream ring with a free drifting surface buoy P L Richardson (Woods Hole Oceanographic Institution, Woods Hole, Mass), R E Cheney (U S Naval Oceanographic Office, Washington, D C), and L A Mantini (Pittsburgh, University, Pittsburgh, Pa) *Journal of Physical Oceanography*, vol 7, July 1977, p 580-590 10 refs NSF Grant No OCE-75 08765

A newly developed free drifting buoy was used to measure the movement of a Gulf Stream ring The buoy is a 4.5 m long PVC tube with a foam-filled flotation collar and is tracked by satellite The buoy, launched in a young ring at 36 deg 15' N, 58 deg 00' W, moved in a series of loops with a period of 54 h, radius of 25 km, and speed of 75 cm/sec The ring moved northeast with an average speed of 9 cm/sec for two months Evidence is presented which suggests that the ring coalesced with the Gulf Stream near 53 deg W It is suggested that rings may coalesce with the Gulf Stream more frequently than previously believed M L

A77-42563 # Remote sensing of the oceans from space - Achievements, problems, and prognosis O K Huh (Louisiana State University, Baton Rouge, La) *Astronautics and Aeronautics*, vol 15, July-Aug 1977, p 54-66 12 refs

Remote sensing of the oceans by Tiros, Nimbus, and more recently, the National Oceanic and Atmospheric Administration (NOAA) and Defense Meteorological satellites is discussed, with emphasis on thermal infrared studies of coastal zones of the U S Refinements in infrared sensors, some of which have too wide a range and are too susceptible to atmospheric suppression of temperature gradients, are described A combination of aerospace technology and in situ sensors can yield data on atmospheric, sea surface, and subsurface flow conditions at less cost than surface-ship operations, this is especially true for coastal zones, where horizontal ocean gradients are most marked and accurate sensing is most readily obtainable Sample analyses of some currently available imagery are given, and innovations in sensory capacity are considered For example, the Seasat-A satellite, scheduled for launch in 1978, will be capable of providing geodetic, topographic, and sea-state informa-

tion, as well as enhanced penetration in low-visibility conditions

J M B

A77-42730 * **Experimental remote sensing of subsurface temperature in natural ocean water** D A Leonard, B Caputo, R L Johnson (Computer Genetics Corp., Wakefield, Mass.), and F E Hoge (NASA, Wallops Flight Center, Wallops Island, Va.) *Geophysical Research Letters*, vol 4, July 1977, p 279-281 5 refs NASA-Navy-supported research

The first successful depth-resolved remote sensing measurements of subsurface ocean water temperature were obtained by spectral analysis of the 3400 per cm O-H stretching Raman band of liquid water. Raman spectral data were obtained from a research vessel at various depths from the surface to 10 meters below the surface in a tidal estuary. The temperature inferred from the spectra was consistent with ground truth temperature to within the shot noise limited accuracy of plus or minus 2 C. The performance of a future fully developed airborne laser Raman water temperature measurement system is estimated on the basis of these first tests. P T H

A77-43689 # **The annual cycle of the Gulf Loop Current. I - Observations during a one-year time series** G A Maul (NOAA, Atlantic Oceanographic and Meteorological Laboratories, Miami, Fla.) *Journal of Marine Research*, vol 35, Feb 1977, p 29-47 34 refs

The Gulf Loop Current is that portion of the Gulf Stream System which connects the Yucatan Current and the Florida Current in the eastern Gulf of Mexico. An experiment to test the annual cycle proposed by Leipper (1970) was conducted from August, 1972, through September, 1973. Twelve pathlines of the 22 C isotherm at 100 m depth were made from Yucatan to the Florida Keys at 36-day intervals in conjunction with a satellite oceanography project. The sequence of pathlines shows an annual cycle of penetration into the eastern Gulf that is in phase with the historical annual cycle of current speeds and transports of the Gulf Stream, and is also reflected in tide gage sea-level records taken between Key West, Havana, and Progreso. The data suggest that an excess inflow of Yucatan Current water of 4 million cubic meters per sec over outflow of Florida Current water in the upper 500 m is required to make the Loop Current grow, the outflow required to maintain static sea level conditions in the Gulf is postulated to be into the Caribbean Sea through the Yucatan Strait below this reference level. Separation of an anticyclonic eddy appears to be part of the annual cycle, which is shown to have great year-to-year variability. (Author)

A77-45612 # **The icebergs of the North Atlantic (Les icebergs de l'Atlantique Nord)** J Darchen (Météorologie Nationale, Paris, France) *La Météorologie*, Mar 1977, p 145-170 15 refs In French

A panoramic survey is presented of iceberg morphology, generating ('calving') mechanisms, the career of icebergs from calving to final meltdown, trajectories and drift history, frequency of appearance on maritime routes, attempts to combat (accelerate melting of) icebergs, reconnaissance and patrol of icebergs from ships, aircraft, and satellites, and drift predictions. Greenland, home of most parent glaciers, is treated as a continent, fjords and parent glaciers in (mostly NW) Greenland are described at length. Pre-Titanic and post-Titanic maritime practices regarding iceberg hazards are recounted. Effects of contrasting ocean and air temperatures on the evolution of protruding and submerged iceberg parts, differential density and temperature effects on iceberg drift, and methods and instruments for monitoring iceberg growth/melting and iceberg drift are discussed. R D V

A77-45732 * # **The depression of remotely-sensed surface temperatures by a dust-laden tropical atmosphere** J H Joseph *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 5* p 15 refs Grant No NsG-1057

A77-45771 # **Remote sensing potential for increasing yields of latent fisheries resources** D L Cram (Department of Industry, Sea Fisheries Branch, Sea Point, Republic of South Africa)

COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 28 p 36 refs

A remote sensing program for the detection of latent resources in the Southern Ocean (krill) and in coastal regions off Africa and Antarctica (kelp) is discussed. The potential of both satellite (Landsat, Nimbus, NOAA, etc.) and aerial sensors and their role in developing latent fisheries are investigated, with particular reference to the location and evaluation of surface shoaling pelagic fish stocks. Approaches towards the development of a fisheries surveillance system, using both satellites and aircraft, are considered, taking account of scientific and jurisdiction aspects. B J

A77-45815 # **Methods for optimising airborne LLLTV detection of fish induced plankton bioluminescence.** O G Malan (South African Council for Scientific and Industrial Research, National Physical Research Laboratory, Pretoria, Republic of South Africa), D L Cram, and J J Agenbag (Department of Industries, Sea Fisheries Branch, Sea Point, Republic of South Africa) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4* p

The low light level television (LLLTV) camera equipment used to assess the stock tonnage of pilchard in a shoal is described. The aerial method is based on the observation on moonless nights of the bioluminescence of plankton when disturbed by the movement of the pilchard shoal. The total surface area covered by the shoal is determined by a gridded aerial survey, this information is combined with information from simultaneous acoustic soundings (to determine shoal thickness and density) and also information from sample catches to calculate the tonnage. Optimization methods for obtaining LLLTV data are discussed with attention to spectral discrimination, image motion compensation, and the advantages of startling fish by flashing light. M L

A77-45827 * # **Applications of space observations to the management and utilization of coastal fishery resources** A J Kemmerer, K J Savastano (NOAA, National Fisheries Engineering Laboratory, Bay Saint Louis, Miss.), and K H Faller (NASA, Earth Resources Laboratories, Bay Saint Louis, Miss.) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 16* p 14 refs

Information needs of those concerned with the harvest and management of coastal fishery resources can be satisfied in part through applications of satellite remote sensing. Recently completed and ongoing investigations have demonstrated potentials for defining fish distribution patterns from multispectral data, monitoring fishing distribution and effort with synthetic aperture radar systems, forecasting recruitment of certain estuarine-dependent species, and tracking marine mammals. These investigations, which are reviewed in this paper, have relied on Landsat 1 and 2, Skylab-3, and Nimbus-6 supported sensors and sensors carried by aircraft and mounted on surface platforms to simulate applications from Seasat-A and other future spacecraft systems. None of the systems are operational as all were designed to identify and demonstrate applications and to aid in the specification of requirements for future spaceborne systems. (Author)

A77-45852 # **The remote sensing of chlorophyll** R C Smith and K S Baker (California, University, La Jolla, Calif.) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 12* p 35 refs Contract No NOAA UCSD-5-35406, Grant No NOAA 04-6 158-44033

The spectral diffuse attenuation coefficient for irradiance, $K_{sub T}(\lambda)$, is a measure of the bio-optical state of ocean waters that is both physically and biologically meaningful. From an analysis of oceanic spectral irradiance and pigment concentration data, the specific spectral attenuation due to phytoplankton was determined and shown to be consistent with laboratory measurements of the diffuse absorption coefficient of various lot cultures of phytoplankton. Also, $K_{sub T}(\lambda)$ was shown to be a linear function of the chlorophyll like pigment concentration. The upwelling spectral reflectance from ocean waters can be expressed as a function of $K_{sub T}(\lambda)$ and the backscattering coefficient. Reflectance

ratios, chosen to correspond to bandwidths of the Nimbus G Coastal Zone Color Scanner, are presented as a function of the chlorophyll-like pigment concentration for varying concentrations of scattering (Author)

A77-45901 * A theory of sea scatter at large incident angles H L Chan (U S Naval Weapons Center, China Lake, Calif) and A K Fung (University of Kansas Center for Research, Inc , Lawrence, Kan) *Journal of Geophysical Research*, vol 82, Aug 20, 1977, p 3439-3444 17 refs Contract No NAS9-13642

Radar sea scatter at large incident angles (30 deg or greater) is investigated using a model which takes into account theoretically-calculated small- and large-scale wave perturbations as well as measured sea surface slope densities and sea spectra obtained from empirical observations Effects of incident angle, polarization, frequency, wind speed and anisotropic characteristics of the sea surface may be studied by application of the model In particular, it is found that the increase in backscattering coefficients with wind velocity is due primarily to the growth of the sea spectrum and secondarily to the interaction between small- and large-scale perturbations Furthermore, differences in upwind and downwind observations may be attributed to anisotropic properties of the sea spectrum Theoretical findings derived from the model are compared with experimental data, and good agreement is found J M B

A77-45907 Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence R A Neville and J F R Gower (Environment Canada, Institute of Ocean Sciences, Patricia Bay Victor, British Columbia, Canada) *Journal of Geophysical Research*, vol 82, Aug 20, 1977, p 3487-3493 23 refs Research supported by the National Research Council of Canada

An aerial reconnaissance technique for measuring phytoplankton concentrations in lakes and oceans which relies on detection of the chlorophyll alpha fluorescence line at 685 nm is discussed The method thus avoids the inaccuracies to which green/blue ratio spectral detection are subject The spectrometer used in the survey, a high red sensitivity silicon diode device, was mounted in the aircraft so as to view the water surface at the Brewster angle, a polarizer could then be used to reduce reflected sky light Line height of the chlorophyll reflectance is shown to be proportional to an average of the chlorophyll concentration in the upper 5 m of the water as determined by measurements made from a launch The method is expected to function well for aerial reconnaissance up to an altitude of 1200 m, and to provide data on chlorophyll concentrations down to at least 2 mg per cubic meter J M B

A77-45953 Acoustical oceanography Principles and applications C S Clay (Wisconsin, University, Madison, Wis) and H Medwin (U S Naval Postgraduate School, Monterey, Calif) New York, Wiley Interscience, 1977 560 p 116 refs \$27 50

An acoustical view of the sea is presented and sound waves and Huygens' principle are considered, taking into account impulsive disturbances, Huygens' principle, continuous wave disturbances, multiple continuous wave sources, a multiple source analysis using complex numbers, the reflection of spherical waves, wave propagation, solutions of the wave equation, reflection and transmission coefficients for plane wave signals, and reflection and transmission at thin layers Attention is also given to sound transmission in the ocean, operating characteristics of sonar systems, scattering and absorption by bodies and bubbles, measurements of fish and other life in the sea, seismic and acoustic measurements of the sea floor, long-range sound transmission in a waveguide, scatter and reflection of sound at rough surfaces, and signals, filters, and random functions G R

A77-46185 # Effective electrical parameters of incipient forms of sea ice sheet and crust (Effektivnye elektricheskie parametry nachal'nykh vidov morskogo ledianogo pokrova i nilasa) V V Bogorodskii and G P Khokhlov (Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby SSSR, Arkticheskii i Antarkticheskii Nauchno-Issledovatel'skii Institut, Leningrad, USSR) *Zhurnal Tekhnicheskoi Fiziki*, vol 47, June 1977, p 1294-1300 7 refs In Russian

A77-46186 # Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range (Anizotropiia dielektricheskoi pronitsaemosti i udel'nogo pogloshcheniia Arkticheskogo drefuiushchego l'da v diapazone SVCh) V V Bogorodskii and G P Khokhlov (Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby SSSR, Arkticheskii i Antarkticheskii Nauchno-Issledovatel'skii Institut, Leningrad, USSR) *Zhurnal Tekhnicheskoi Fiziki*, vol 47, June 1977, p 1301-1305 8 refs In Russian

A77-46275 Seasat-A and Nimbus-G potential applications to marine meteorology and oceanography J W Sherman and A A Loomis (World Meteorological Organization, Technical Conference on the Applications of Marine Meteorology to the High Seas and Coastal Zone Development, Geneva, Switzerland, Nov 22-26, 1976) *Marine Observer*, vol 47, July 1977, p 114-122

The potential applications of Seasat-A and Nimbus-G satellites to marine meteorology and oceanography are presented, highlighting the Seasat-A mission toward observing ocean surface features, and the Nimbus-G mission for studying atmospheric pollution as well as oceanographic observation The orbit characteristics of Seasat A (non-sun-synchronous 800-km altitude with an inclination of 108 degrees) and Nimbus-G (955-km altitude sun-synchronous) are given along with descriptions of the microwave instrumentation, including sensor specifications and parameters of the altimeter, microwave scatterometer, synthetic aperture radar, and microwave radiometer Marine applications of both satellites are listed, and those relating to environmental monitoring are discussed, such as surface wind and chlorophyll-a experimentation Geodesy experiments, often requiring corrections for environmental variables, are reviewed S C S

A77-46300 Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope J R E Lutjeharms (South African National Oceanographic Grid Survey, Pretoria, Republic of South Africa) *Tellus*, vol 29, Aug 1977, p 375-381 19 refs Research sponsored by the South African Council for Scientific and Industrial Research

A77-47175 Long waves in the eastern equatorial Pacific Ocean - A view from a geostationary satellite R Legeckis (NOAA, National Environmental Satellite Service, Washington, D C) *Science*, vol 197, Sept 1977, p 1179-1181 11 refs

During 1975, westward-moving long waves with a period of about 25 days and a wavelength of 1000 kilometers were observed at a sea surface temperature front in the equatorial Pacific on infrared images obtained by a geostationary environmental satellite system The absence of these waves during 1976, and the above-average equatorial sea surface temperatures during 1976, may be related to a decrease in the southeasterly trade winds during that year (Author)

A77-47272 # Observations of the power and directional spectrum of ocean surface waves L A Regier (MIT, Cambridge, Mass) and R E Davis (California, University, La Jolla, Calif) *Journal of Marine Research*, vol 35, Aug 1977, p 433-451 15 refs

A77-47451 * Interpretation key for SAR /L-band/ imagery of sea ice M L Bryan (California Institute of Technology, Jet Propulsion Laboratory, Radar and Microwave Radiometry Section, Pasadena, Calif) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash , September 28 October 1 1976, Proceedings

Falls Church, Va , American Society of Photogrammetry, 1976, p 406-435 34 refs Contract No NAS7-100

An interpretation key, similar to those previously developed for use with aerial photography and other remotely sensed data, was developed for L-band (25 cm) radar imagery collected over the Arctic Ocean Data from April, August, and October were considered The procedure for developing a valid interpretation key for operation use involves substituting time for space Open water situations (polynyas, leads, flaws), examples of unconsolidated ice (frazil, slush, brash), thin ice (nilas), and annual ice (first year, multi-year ice) situations are examined It is suggested that the

05 OCEANOGRAPHY AND MARINE RESOURCES

interpretation key will enhance the use of side looking airborne radar data in the qualitative photo interpretation mode M L

A77-47452 Seasonal aerial survey of southern California kelp beds M R Mel (Earth Science Consulting and Technology, Costa Mesa, Calif) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings

Falls Church, Va., American Society of Photogrammetry, 1976, p 436-450 15 refs

An aerial survey of kelp beds is described, and ecological factors affecting the growth of *Macrocystis*, the kelp organism, are discussed. Color infrared aerial photographs were used to map seasonal changes in the distribution of kelp beds off the coast of southern California and the offshore islands between August, 1975 and April, 1976. Small format (70 mm) cameras were used to obtain photographs approximately every three months for a coastline distance of over 600 miles. The computer-processed data provide listings of the area of each kelp patch, computation of absolute and percent change for the area of each kelp bed, and maps showing differences between sequential surveys. Preliminary results indicate that peak acreage of surface-exposed kelp is achieved in the summer with gradual elimination of marginal kelp beds during the winter storm period.

M L

A77-47961* All-weather ice information system for Alaskan Arctic coastal shipping R T Gedney, R J Jirberg, R J Schertler, R A Mueller, T L Chase, I Kramarchuk, L A Nagy, R A Hanlon, and H Mark (NASA, Lewis Research Center, Cleveland, Ohio) *Annual Offshore Technology Conference, 9th, Houston, Tex., May 2-5, 1977, Paper 13 p 7* refs

A77-48329 Huelva Front and Malaga, Spain, eddy chain as defined by satellite and oceanographic data R E Stevenson (U S Navy, Office of Naval Research, Pasadena, California, University, La Jolla, Calif) *Deutsche Hydrographische Zeitschrift*, vol 30, no 2, 1977, p 51-53

The earth-orbital mission of Skylab 2, in July 1973, provided the first information regarding a number of significant oceanographic features in the Atlantic Bight of Spain. These features were subsequently studied during the Apollo/Soyuz Test Project (ASTP). During ASTP, ships and aircraft from the U S Navy acquired oceanographic data along the track of the Apollo spacecraft in the Spanish Bight. The oceanographic features detected include a strong ocean front, named Huelva Front, a large shallow eddy, and an eddy chain.

G R

A77-49194 Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 W V Burt (Oregon State University, Corvallis, Ore) and E M Agee (Purdue University, West Lafayette, Ind) *Boundary-Layer Meteorology*, vol 12, Aug 1977, p 3 24 22 refs NSF Grants No OCD 71-00271, No OCD-75-00220-A05

The paper reports on the observational findings from the analysis of buoy measurements and satellite imagery associated with the cold air outbreak and accompanying mesoscale cellular convection (MCC) over the East China Sea in the vicinity of the Kuroshio current during the period 14-18 February 1975. Solar radiation data at the buoy site show distinctly the passage of open and closed cells. A critical air-sea temperature difference of -5 C for the occurrence of MCC was substantiated. The time required for passage of solar radiation peaks coupled with buoy wind speed data gave a closed cell diameter of 28 km, comparable to estimates from satellite photographs. Empirical estimates of sensible heat flux suggest that closed cells can be associated with strong surface heating.

P T H

A77-49453 # Diagnostic calculation of the world ocean horizontal circulation (Diagnosticheskie raschety gorizonta'noi tsirkulatsii vod mirovogo okeana) V N Stepanov, A S Sarkisian, Iu

L Demin, V N Drozdov, R P Bulatov, L I Galerkin, and A D Shcherbinin *Morskoe Gidrofizicheskie Issledovaniia*, no 1, 1977, p 34-46 8 refs In Russian

Sarkisian (1966) has proposed a linearly diagnostic model of horizontal circulation which takes into account the bottom relief, the contours of the ocean shores, the flow rates at the 'liquid interfaces', and the annual water densities. In the present paper, the model is used to calculate the horizontal circulation within the vertical column of the world ocean. Charts are presented of the anomaly of the reduced pressure at the surface and at depths of 1000, 2000, and 4000 m, and the vector field of surface flows and flows at depths of 1000, 2000, and 4000 m.

V P

A77-49459 # Methods of detecting froth regions on oceans from remote measurements of thermal radio emission (Metody obnaruzheniia shtormovykh zon v okeane po distantsionnym izmereniam radioteplovogo izlucheniia) B A Nelepo and V S Suetin *Morskoe Gidrofizicheskie Issledovaniia*, no 1, 1977, p 95-102 9 refs In Russian

A77-50273 Advection in the Peru current as observed by satellite K Wyrtki (Hawaii, University, Honolulu, Hawaii) *Journal of Geophysical Research*, vol 82, Sept 20, 1977, p 3939-3943 11 refs NSF supported research

Two years of satellite derived maps of sea surface temperature are used to evaluate their oceanographic applications and to study advection in the eastern part of the subtropical gyre of the South Pacific Ocean. The advance and retreat of a tongue of cool water stretching from the coast of Chile to the northwest under the southeast trade winds are analyzed and explained as advection. The time history of the development of this cool tongue is described, and its different behavior during the two years is related to the 1976 El Niño event. During 1976, advection in the subtropical gyre was much weaker than during the year before. It is concluded that satellite derived surface temperature maps form an important new tool in the analysis and monitoring of the time changes of large scale thermal features at the surface of the ocean.

(Author)

A77-50972 Subtractive HISS radar K Izuka (Toronto, University, Toronto, Canada) *IEEE, Proceedings*, vol 65, July 1977, p 1081-1083

A new concept has been introduced into the Holographic Ice Surveying System (HISS) radar. Subtraction of the top surface contribution from the total signal scattered by the ice affords a significant expansion of the radar dynamic range. The peak associated with the bottom of the lossy ice, otherwise buried deep in noise, now can be detected.

(Author)

A77-51258 Oceanic polar front in the Drake Passage - Satellite observations during 1976 R Legeckis (NOAA, National Environmental Satellite Service, Suitland, Md) *Deep-Sea Research*, vol 24, 1977, p 701-704

The considered observations were made with the aid of the National Oceanic and Atmospheric Administration's polar orbiting satellite near Drake Passage. Thermal infrared data with a spatial resolution of 1 km and a temperature sensitivity of 0.5 C were obtained. The satellite measurements were made to evaluate the feasibility of a use of high resolution satellite data for the study of the oceanic polar front in conjunction with simultaneous ship observations. A thermal infrared image obtained on September 9, 1976 over the Drake passage is presented. The polar front, a relatively warm eddy, and the edge of the ice floes are indicated. Another graph shows the positions of the polar front, as determined from the location of large sea surface temperature gradients.

G R

A77-51422 Multiband survey as a method to study suspension distribution in the sea I A Labutina and G A Safianov (Academy of Sciences, Intercosmos Council, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-84* 11 p 8 refs

Suspension distributions in both the Black Sea in the vicinity of the pre-estuary sea coast of the Kodori River and in Lake Baikal in the vicinity of the Selenga River were determined by means of recurrent multiband aerial surveys. Blue, green, red, and near infrared band photographs were obtained. The appearances of the suspension fields are described, and the information supplied by photographs at different wavelengths is explained.

M L

A77-51574 Oceanic tide determination by satellite S Daillet (Groupe de Recherches de Géodésie Spatiale, Toulouse, France) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-ST-10* 12 p 7 refs

Minute perturbations of satellite orbital motion by variable forces set in motion by oceanic tides are utilized to analyze and measure tidal parameters. Only long-wavelength tidal parameters yield to this approach, and those parameters are related to lunar secular acceleration. The satellite orbital motion perturbation method thereby provides data on lunar bulge (lunar semimajor axis) and on the importance of oceans in dissipating the energy associated with the earth-moon system. A three-step numerical procedure is outlined, and graphs are presented of data spectral analysis. More complete global coverage by laser tracking stations and further improvements in laser precision could yield more precise solutions, and also information on the earth's core derived from diurnal tidal data.

R D V

N77-28564*# National Aeronautics and Space Administration Langley Research Center, Langley Station Va
REMOTELY SENSED AND LABORATORY SPECTRAL SIGNATURES OF AN OCEAN-DUMPED ACID WASTE
Beverly W Lewis and Vernon G Collins Washington Jul 1977 38 p refs
(NASA-TN-D-8467 L-11373) Avail NTIS HC A03/MF A01 CSDL 13B

An ocean-dumped acid waste plume was studied by using a rapid scanning spectrometer to remotely measure ocean radiance from a helicopter. The results of these studies are presented and compared with results from sea truth samples and laboratory experiments. An ocean spectral reflectance signature and a laboratory spectral transmission signature were established for the iron-acid waste pollutant. The spectrally and chemically significant component of the acid waste pollutant was determined to be ferric iron.

Author

N77-28566# National Environmental Satellite Service Washington, D C
NOAA PROGRAM DEVELOPMENT PLAN FOR SEASAT-A RESEARCH AND APPLICATIONS
Mar 1977 97 p refs
(PB-265414/3 NOAA-77030210) Avail NTIS HC A05/MF A01 CSDL 22B

A program development plan is written for marine applications of NASA's SEASAT-A spacecraft designed for launch in 1978. SEASAT-A is the first space research platform dedicated to ocean science and application. Specific objectives are (1) explore, map and chart the global ocean and its living resources (2) manage use and conserve those resources (3) describe monitor and predict conditions in the atmosphere, ocean sun and space environment, (4) issue warnings against impending destructive natural events (5) develop beneficial methods of environmental modification and (6) assess the consequences of inadvertent environmental modification over a period of time.

GRA

N77-28567# Naval Postgraduate School Monterey, Calif
A PHOTOGRAPHIC RECONNAISSANCE OF THE MICRORELIEF IN THE MONTEREY AND CARMEL SUBMARINE CANYONS, CALIFORNIA M S Thesis
John Alexander Jensen Dec 1970 143 p refs
(AD-A039370) Avail NTIS HC A07/MF A01 CSDL 08/10

Over 500 underwater photographs were taken in the Monterey and Carmel submarine canyons for the purpose of studying their microrelief. The pictures indicated that a variety of biological and physical differences exist not only within each canyon but

also between the two nearby canyons. In Monterey Canyon are to be found fine grain sediments which have been very actively churned by benthic organisms. Few rock outcrops were noted and definitive evidence of current activity in the form of ripple marks was observed in only one region. Carmel Canyon included generally coarser grain material than Monterey Canyon and showed a marked absence of active burrowing. A large number of rock outcrops was observed and there appeared to be extensive current activity throughout most of the canyon. Author (GRA)

N77-29333 Kansas Univ., Lawrence
ACTIVE MICROWAVE MEASUREMENT OF SEA-SURFACE WINDS FROM SPACE Ph D Thesis
James Douglas Young 1976 422 p
Avail Univ Microfilms Order No 77-2296

Backscatter measurements by the S-193 radiometer scatterometer aboard Skylab and associated data were analyzed to evaluate the accuracy of winds estimated from backscatter measurements. The results show that scattering at off nadir angles of 30 deg to 50 deg can be used for surface wind anemometry from about 4 m/sec up to the highest wind speeds observed about 30 m/sec. The spatial frequency content of these measurements was also analyzed. The S-193 measurements studied were from a tropical hurricane, a tropical storm and many extratropical wind systems. For most S-193 observations an estimate of the local surface winds (ground truth) was determined using conventional measurements and estimation procedures used by meteorologists.

Dissert Abstr

N77-29383# Office of Telecommunications Boulder, Colo Inst for Telecommunications Sci
AN ANALYSIS OF THE MARITIME HIGH-FREQUENCY SINGLE-SIDEBAND VOICE COMMUNICATION SYSTEM FOR THE NORTH ATLANTIC AND THE SOUTH PACIFIC, VOLUME 1
Jean E Adams and William A Kissick Mar 1977 137 p
(PB-265850/8, OTR-77-113-Vol-1) Avail NTIS HC A07/MF A01 also avail in set of 3 reports PC E09, PB-265849-SET CSDL 17B

Frequency trade-off for both the North Atlantic region and the South Pacific region for the world-wide HF voice communication system was studied. A complement of five shore stations for the Atlantic region six for the Pacific region, and six frequencies (4, 6, 8, 12, 16, and 22 MHz) are considered. Maps of circuit reliabilities and tables of areas of coverage are produced for two each of seasonal diurnal and solar activity conditions. Based on these analyses the best groups of two, three, and four frequencies are identified. The Atlantic region and the Pacific region are considered independently.

GRA

N77-29384# Office of Telecommunications Boulder, Colo Inst for Telecommunication Sci
AN ANALYSIS OF THE MARITIME HIGH-FREQUENCY SINGLE-SIDEBAND VOICE COMMUNICATION SYSTEM FOR THE NORTH ATLANTIC AND THE SOUTH PACIFIC, VOLUME 2

Jean E Adams and William A Kissick Mar 1977 180 p
(PB-265851/6, OTR-77-113-Vol-2) Avail NTIS HC A09/MF A01 also avail in set of 3 reports PC E09, PB-265849-SET CSDL 17B

For abstract, see N77-29383

N77-29385# Office of Telecommunications Boulder, Colo Inst for Telecommunication Sci
AN ANALYSIS OF THE MARITIME HIGH-FREQUENCY SINGLE-SIDEBAND VOICE COMMUNICATION SYSTEM FOR THE NORTH ATLANTIC AND THE SOUTH PACIFIC, VOLUME 3

Jean E Adams and William A Kissick Mar 1977 188 p
(PB-265852/4, OTR-77-113-Vol-3) Avail NTIS HC A09/MF A01 also avail in set of 3 reports PC E09, PB-265849-SET CSDL 17B

For abstract see N77-29383

05 OCEANOGRAPHY AND MARINE RESOURCES

N77-30442*# Applied Science Associates, Inc Apex N C
**MICROWAVE BACKSCATTERING THEORY AND ACTIVE
REMOTE SENSING OF THE OCEAN SURFACE** Final Report,
20 Jan 1976 - 20 Jan 1977

G S Brown and L S Miller Aug 1977 38 p refs
(Contract NAS6-2520)
(NASA-CR-141423) Avail NTIS HC A03/MF A01 CSCL
08J

The status is reviewed of electromagnetic scattering theory relative to the interpretation of microwave remote sensing data acquired from spaceborne platforms over the ocean surface. Particular emphasis is given to the assumptions which are either implicit or explicit in the theory. The multiple scale scattering theory developed during this investigation is extended to non-Gaussian surface statistics. It is shown that the important statistic for the case is the probability density function of the small scale heights conditioned on the large scale slopes; this dependence may explain the anisotropic scattering measurements recently obtained with the AAFE Radsat. It is noted that present surface measurements are inadequate to verify or reject the existing scattering theories. Surface measurements are recommended for qualifying sensor data from radar altimeters and scatterometers. Additional scattering investigations are suggested for imaging type radars employing synthetically generated apertures. Author

N77-30447*# National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
**VISIBLE AND INFRARED IMAGING RADIOMETERS FOR
OCEAN OBSERVATIONS**

W L Barnes Jul 1977 44 p refs Presented at AGARD
Lecture Series No 88 Oslo Norway 2-11 Oct 1977
(NASA-TM-X-71374, X-941-77-168) Avail NTIS
HC A03/MF A01 CSCL 14B

The current status of visible and infrared sensors designed for the remote monitoring of the oceans is reviewed. Emphasis is placed on multichannel scanning radiometers that are either operational or under development. Present design practices and parameter constraints are discussed. Airborne sensor systems examined include the ocean color scanner and the ocean temperature scanner. The coastal zone color scanner and advanced very high resolution radiometer are reviewed with emphasis on design specifications. Recent technological advances and their impact on sensor design are examined. Author

N77-30707*# National Aeronautics and Space Administration
Langley Research Center Langley Station Va
**COASTAL WAVE MEASUREMENTS DURING PASSAGE OF
TROPICAL STORM AMY**

W Douglas Morris Apr 1977 38 p
(NASA-TM-74060) Avail NTIS HC A03/MF A01 CSCL 08C

Aerial photographic and laser profilometer data of waves generated by tropical storm Amy are presented. The data mission consisted primarily of two legs: one in the direction of the wind waves and the second along the direction of swell propagation using Jennette's Pier at Nags Head, North Carolina as a focal point. At flight time Amy's center was 512 nmi from shore and had maximum winds of 60 knots. The storm's history is presented along with a satellite photograph showing the extent of the storm on the day of the flight. Flight ground tracks are presented along with sample aerial photographs of the wave conditions showing approximate wavelength and direction. Sample wave energy spectra are presented both from the laser profilometer onboard the aircraft and from the Corps of Engineers Research Center (CERC) shore gauge at Nags Head, North Carolina. Author

N77-31561*# Norsk Polarinstitutt Oslo
**SEA ICE STUDIES IN THE SPITSBERGEN-GREENLAND
AREA** Final Report

Torgny E Vinje, Principal Investigator Aug 1977 47 p refs
Sponsored by NASA. Original contains imagery. Original
photography may be purchased from the EROS Data Center,
Sioux Falls S D 57198 ERTS
(E77-10206, NASA-CR-153976) Avail NTIS
HC A03/MF A01 CSCL 08L

The author has identified the following significant results. This investigation indicates unexpected great variation in drift velocity of ice in the Fram Strait. During calm weather the southward directed speed was observed to be 10 cm/s at 81 deg N at the end of April 1976. About a week later during conditions with northerly moderate winds, the speed increased to about 20 cm/s. It was also possible, for the first time to determine the drift velocity at various positions across the Fram Strait. A predominance of parallelogram-like floes was observed during the early spring, and for the whole period April-July there seems to be a minimum areal coverage of floes of an average size of about 60 sq km.

N77-31597# Inter-American Tropical Tuna Commission La Jolla,
Calif

**COMPARISON OF NOAA 3-4 VHRR IMAGERY AND
LANDSAT MULTI-SPECTRAL SCANNER IMAGES WITH
MARINE RESOURCE MEASUREMENTS** Final Report

Merritt R Stevenson Forrest R Miller and Robert G Kirkham
Dec 1976 124 p refs
(Grant NOAA-04-6-158-44043)
(PB-268674/9, NOAA-77051117) Avail NTIS
HC A06/MF A01 CSCL 08J

A comparison of satellite-derived data with observations made aboard the Natl Marine Fisheries Service research vessel are discussed, particularly the procedures used for processing shipboard data. Results in the analysis of LANDSAT-1 Multi-Spectral Scanner (MSS) data over the Gulf of California are given. Careful evaluation of MSS data showed the need for further software development and computer programs were written to correct for image skew for both compressed and full resolution imagery. A cooperative coastal zone ocean color experiment is also reviewed. The details of processing the raw very high resolution radiometer infrared (VHRRIR) data are discussed as are the results of a comparison of VHRRIR data and sea truth data. GRA

N77-31767# Instituto de Pesquisas Espaciais Sao Jose dos
Campos (Brazil)

**SIMULATION OF OCEAN CURRENTS COMPARED TO
OCEANOGRAPHIC AND REMOTE SENSOR DATA IN THE
CABO FRIO AREA M S** Thesis [SIMULACAO DA
RESSURGENCIA COMPARADA COM DADOS OCEANOGR-
AFICOS E DE SENSORES REMOTOS EM CABO FRIO]

Keiko Tanaka Jul 1977 124 p refs In PORTUGUESE ENGLISH
summary
(INPE-1085-TPT/061) Avail NTIS HC A06/MF A01

A linear mathematical model is presented to simulate wind induced currents over the continental shelf. Calculations were performed by means of a digital computer, corresponding to a test area. The coastal currents are first obtained in three dimensions, and then the horizontal divergence and the vertical component of the velocity are calculated. The results were found to be correlated with oceanographic data obtained in situ and with data of the thermal sensor. The simulation showed the existence of stronger SW horizontal currents in the depth range of 100 to 110 m. These currents were identified in the thermal image, by the presence of a strip of cold water oriented in the SW direction. Author

N77-33562 Oregon State Univ Corvallis
**STEREOPHOTOGRAMMETRIC RECONNAISSANCE OF
OCEAN WAVE/SEA ICE INTERACTION** Ph D Thesis

David Elam Amstutz 1977 172 p
Avail Univ Microfilms Order No 77-15364

Full scale measurements of pertinent parameters of ocean wave/sea ice interactions were obtained using an airborne laser to accurately measure the flying altitude of two aircraft over the East Greenland Drift Stream, south of Denmark. Descriptive analysis of the stereophotogrammetric data obtained shows that the ocean wave attenuation is dependent upon the floe size and concentration of the ice canopy. Wave scattering is the primary process accounting for the measured attenuation of wave amplitude. The scattering process has a maximum effect for wavelength (λ) when the diameter (d) of the floes of greatest concentration is a ratio (d/λ) is greater than

03 -04 Wavelengths of greatest relative amplitude, for which floe diameters were too small to scatter using the d/λ criteria were observed to attenuate rapidly with increasing penetration of the ice canopy Dissert Abstr

N77-33558*# Tokyo Univ (Japan)
INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN. UTILIZATION OF LANDSAT-2 DATA FOR FISHERIES

Takakazu Maruyasu and Taisuke Watanabe, Principal Investigators
 10 Aug 1977 17 p Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS
 (E77-10227, NASA-CR-155017) Avail NTIS
 HC A02/MF A01 CSCL 04B

The author has identified the following significant results
 MSS data provided extensive and simultaneous information about marine environmental conditions, such as the shift of the Kuroshio, fall and rise of coastal water mass, distribution of water masses, locations of vortex and current nps, exchanges of water between embayment and open ocean effluent rivers, fertility of plankton, red tide, pollution, etc

N77-33559*# Tokyo Univ (Japan)
APPLICATION OF LANDSAT MSS DATA TO THE STUDY OF OCEANOGRAPHICAL ENVIRONMENT

Takakazu Maruyasu, Principal Investigator, Kiyoshi Tsuchiya (National Space Development Agency, Tokyo, Japan), Hiroaki Ochiai (Toba National Merchant Marine Coll., Mieken Japan) and Kaname Takeda (Science and Technology Agency Tokyo Japan) [1977] 13 p refs Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS
 (E77-10228, NASA-CR-155018) Avail NTIS
 HC A02/MF A01 CSCL 08J

The author has identified the following significant results
 LANDSAT MSS data of a three year time lapse indicate change of sea surface condition in Seto Inland Sea and coastal region The red tide which formerly concentrated in the bay or inland sea now extends into an open sea A small ocean vortex similar to mesoscale atmospheric vortex is revealed by the band 4 image of the satellite data A manual photographic method applied to a single band image of MSS is effective in detecting sea surface pollution

N77-33560*# Tokyo Univ (Japan)
SIGNIFICANT APPLICATIONS OF LANDSAT-2 MSS DATA TO MARINE ENVIRONMENT

Takakazu Maruyasu, Principal Investigator and Hiroaki Ochiai (Toba Merchant Marine Coll., Mieken, Japan) [1977] 22 p refs Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS
 (E77-10229, NASA-CR-155019) Avail NTIS
 HC A02/MF A01 CSCL 08J

N77-33561*# Tokyo Univ (Japan)
GENERAL PATTERN OF THE TURBID WATER IN THE SETO-INLAND SEA EXTRACTED FROM MULTISPECTRAL IMAGERIES BY THE LANDSAT-1 AND 2

Takakazu Maruyasu, Principal Investigator and Kantaro Watanabe (Tokai Univ., Japan) [1976] 21 p refs Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS
 (E77-10230, NASA-CR-155020) Avail NTIS
 HC A02/MF A01 CSCL 08J

The author has identified the following significant results
 Each distribution pattern of turbid water changes with the time in accordance with daily tides seasonal variation of tides, and occasional rainfall Two cases of successfully repeated LANDSAT observations for the same sea regions suggested a general pattern of turbid water could be extracted for each region Photographic and digital processes were used to extract patterns of turbid water separately from the cloud and smog-layer in MSS 4, 5 and 7 imageries A mosaic of image-masked imageries

displays a general pattern of turbid water for almost the entire Seto Inland Sea No such pattern was extracted for the Aki-Nada south of Hiroshima City where the water is fairly polluted, nor for the Iyo-Nada where the water is generally clearer than in other regions of the Seto Inland Sea

N77-33563*# Tokyo Univ (Japan)
INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN. INVESTIGATION OF VARIATIONS IN THE PROMINENT OCEANIC CURRENT, KUROSHIO
Final Report

Takakazu Maruyasu and Daitaro Shoji, Principal Investigators (Maritime Safety Agency Tokyo, Japan) Aug 1977 25 p Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS
 (E77-10232, NASA-CR-155022) Avail NTIS
 HC A02/MF A01 CSCL 04B

The author has identified the following significant results It was confirmed that band 4 and 5 had some information as to the sea surface, such as spreading of coastal waters or eddy-like motion of surface water It was concluded that the front line along the coast from Kumano-nada to Shiono-misaki in the monochromatic prints and in the pseudocolor images was a boundary between coastal waters and offshore water Most of Ise Bay was covered by polluted water, having salinity values less than 30‰ high water color scale of 6 to 8, and transparency less than 5 m

N77-33587*# California Univ Santa Barbara Dept of Geography

EVALUATION OF OCEAN COLOR SCANNER (OCS) PHOTOGRAPHIC AND DIGITAL DATA SANTA BARBARA CHANNEL TEST SITE, 29 OCTOBER 1975 OVERFLIGHT
 Steven P Kraus John E Estes Michael R Kronenberg and Earl J Hajic 18 Oct 1977 54 p refs
 (Grant NsG-5106)
 (NASA-CR-155171) Avail NTIS HC A04/MF A01 CSCL 20F

A summary of Ocean Color Scanner data was examined to evaluate detection and discrimination capabilities of the system for marine resources oil pollution and man-made sea surface targets of opportunity in the Santa Barbara Channel Assessment of the utility of OCS for the determination of sediment transport patterns along the coastal zone was a secondary goal Data products provided 1975 overflight were in digital and analog formats In evaluating the OCS data automated and manual procedures were employed A total of four channels of data in digital format were analyzed as well as three channels of color combined imagery and four channels of black and white imagery In addition 1 120 000 scale color infrared imagery acquired simultaneously with the OCS data was provided for comparative analysis purposes Author

N77-33779# National Weather Service, Silver Spring Md
 Oceanographic Services Branch
GULFSTREAM MONTHLY PUBLICATIONS, JANUARY-DECEMBER 1976 VOLUME 2, NUMBERS 1-12
Monthly Report

Diane Moravsek, ed 1976 87 p refs
 (PB-268216/9 NOAA-76071404) Avail NTIS
 HC A05/MF A01 CSCL 08C

Selected satellite imageries from the NOAA-4 satellite are presented The satellite imageries show gulf stream activity The data included generally gives information on bathythermograph data and sea surface temperatures GRA

Page intentionally left blank

HYDROLOGY AND WATER MANAGEMENT

Includes snow cover and water runoff in rivers and glaciers
saline intrusion drainage analysis geomorphology of river
basins land uses and estuarine studies

A77-42874 Integrated management of water resources (La gestion intégrée des ressources en eau) Y Emsellem *La Houille Blanche*, vol 32, no 2-3, 1977, p 243-251, Discussion, p 252 In French

A planification scheme for water resources in France for the period 1970-2000 is presented, and its development is discussed in detail. An extensive data base covering indicators in five major areas: technological developments in water management, economic activity, demography, land management and environmental factors - has been used to obtain a framework within which the effects of strategies reflecting different goals and priorities regarding the balance between need for water in quantities sufficient for industrial, agricultural, and domestic use, and need to protect the quality of water resources can be evaluated. C K D

A77-42875 Methodological aspects of the optimum management of multiple-use reservoirs (Aspects méthodologiques de la gestion optimale des réservoirs à buts multiples) J Bernier (Laboratoire National d'Hydraulique, Chatou, Yvelines, Electricité de France, Direction des Études et Recherches, Paris, France) *La Houille Blanche*, vol 32, no 2-3, 1977, p 253-257, Discussion, p 262, 263 5 refs In French

The theory of reservoir management developed by Masse (les Reserves et la Regulation de l'Avenir, 1946) is presented in heuristic form. For free operation this theory is based on the premise that in the optimum case the value of each volume of water used is equal to the value of an identical volume of water stocked. The limitations of this method are examined, and an example is analyzed. C K D

A77-45200 # Landscape indication of natural processes from spacecraft photographs (Landschaftnaia indikatsiia prirodnykh protsessov po materialam s'emki iz kosmosa) E A Vostokova and I K Abrosimov *Geodeziia i Kartografiia*, June 1977, p 58-62 6 refs In Russian

The Landscape indication method was used to interpret photographs obtained by spacecraft for the purpose of studying natural processes associated with surface and subsurface water. Karst subrosion was investigated, and the advantages of photographs obtained by spacecraft in comparison with photographs obtained by aircraft are considered. The procedure for interpreting photographs is explained, and the applicability of the method for detecting changes caused by human activity is examined. M L

A77-47447 * Analysis of some hydrologic variables on the north slope of Alaska using passive microwave, visible and near infrared imagery. D K Hall (NASA, Goddard Space Flight Center, Hydrology and Oceanography Branch, Greenbelt, Md) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings. Falls Church, Va, American Society of Photogrammetry, 1976, p 344-361 11 refs

A77-47453 * A Landsat study of water quality in Lake Okeechobee. J C Gervin (NASA, Kennedy Space Center, Cocoa Beach, Fla) and M L Marshall. In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceed-

ings. Falls Church, Va, American Society of Photogrammetry, 1976, p 451-476 6 refs

This paper uses multiple regression techniques to investigate the relationship between Landsat radiance values and water quality measurements. For a period of over one year, the Central and Southern Florida Flood Control District sampled the water of Lake Okeechobee for chlorophyll, carotenoids, turbidity, and various nutrients at the time of Landsat overpasses. Using an overlay map of the sampling stations, Landsat radiance values were measured from computer compatible tapes using a GE image 100 and averaging over a 22-acre area at each station. These radiance values in four bands were used to form a number of functions (powers, logarithms, exponentials, and ratios), which were then compared with the ground measurements using multiple linear regression techniques. Several dates were used to provide generality and to study possible seasonal variations. Individual correlations were presented for the various water quality parameters and best fit equations were examined for chlorophyll and turbidity. The results and their relationship to past hydrological research were discussed. (Author)

A77-47454 Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography. L M Caron, J M Minor, and M P Meyer (Minnesota, University, St Paul, Minn) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings. Falls Church, Va, American Society of Photogrammetry, 1976, p 477-484

A77-47455 Development and testing of operational flood mapping techniques. B E Hoyer, M P McAdams, and G R Hallberg (Iowa Geological Survey, Iowa City, Iowa) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings. Falls Church, Va, American Society of Photogrammetry, 1976, p 485-498 9 refs

The development and testing of operational flood mapping and boundary detection techniques in Iowa, using low-altitude aerial photography is discussed with particular reference to post-crest color infrared (CIR) imagery, and possible applications of satellite imagery. It was found that the 0.7 to 1.1 micron band is the portion of the electromagnetic spectrum most suited for flood mapping, and that color infrared film is the best material for this technique. The accuracy of the photointerpreted boundary was determined by comparing several points on an interpreted boundary with the position of a contour line representing flood crest elevation. Analyses of the test results show that CIR imagery may be applied with great accuracy for up to seven days after the flood crest. Drawbacks of the technique, including problems encountered in urban areas caused by asphalt cover, and suggestions for its implementation are given, such as film and filter choice, and the scale of imagery. S C S

A77-47456 Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water, marsh, and wetlands. B C Hanson and R K Moore (University of Kansas Center for Research, Inc, Lawrence, Kan) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash, September 28-October 1, 1976, Proceedings. Falls Church, Va, American Society of Photogrammetry, 1976, p 499-505

A77-51280 * Value of Landsat in urban water resources planning. T J Jackson (Kentucky, University, Lexington, Ky) and R M Ragan (Maryland, University, College Park, Md) *American Society of Civil Engineers, Water Resources Planning and Management Division, Journal*, vol 103, May 1977, p 33-46 20 refs Grant No NSG-5017

The reported investigation had the objective to evaluate the utility of satellite multispectral remote sensing in urban water resources planning. The results are presented of a study which was conducted to determine the economic impact of Landsat data. The

06 HYDROLOGY AND WATER MANAGEMENT

use of Landsat data to estimate hydrologic model parameters employed in urban water resources planning is discussed. A decision regarding an employment of the Landsat data has to consider the tradeoff between data accuracy and cost. Bayesian decision theory is used in this connection. It is concluded that computer-aided interpretation of Landsat data is a highly cost-effective method of estimating the percentage of impervious area. G R

A77-51285* **Test of Landsat-based urban hydrologic modeling** T J Jackson (Kentucky, University, Lexington, Ky), R M Ragan (Maryland, University, College Park, Md), and W N Fitch (Water Resources Engineers, Inc, Springfield, Va) *American Society of Civil Engineers, Water Resources Planning and Management Division, Journal*, vol 103, May 1977, p 141-158 18 refs Grant No NsG-5017

A description is presented of the Fourmile Run Study which has been conducted to evaluate Landsat remote sensing as a method of defining input parameters required by urban hydrologic planning models. The evaluation was a part of water resource planning investigations concerning the Fourmile Run Watershed. The investigations involved an examination of the relationship between urban development and flooding for the Fourmile Run Basin. The study indicates that Landsat data provide a suitable source of land cover data for investigations conducted at the planning level. An estimation of the percentage of impervious area on the basis of Landsat data is less expensive than a use of aerial photos in planning studies. Only limited success could be achieved when Landsat data were used for smaller areal units. G R

A77-51423 **Danube Delta dynamics study by means of remote sensing** V I Kravtsova, L A Ushakova, and T I Chekalina (Academy of Sciences, Intercosmos Council, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-86* 13 p

Photographs obtained by the American Satellite Landsat I (ERTC) at a scale of 1:1,000,000 were used to study the Danube River Delta. The three principal branches, called Bratuls, are easily seen in the photographs obtained September 4, 1972 in four spectral bands. Different types of plavnies, or coastal marshes, which are the most prevalent feature, can be distinguished, and several features, including vegetation and agricultural areas, lakes with different amounts of turbidity, and sandy areas can be detected by comparing photographic images obtained at different wavelengths. A procedure for comparing the patterns revealed by earlier photographs with the pattern shown in the satellite photographs, thus permitting the study of the evolution of the Delta, is described. M L

N77-28463# Tennessee Univ Knoxville Water Resources Research Center

APPLICATION OF A TRANSIENT FLOW MODEL TO COORDINATE URBAN STORM RUNOFF DATA WITH FLOW IN A RECEIVING RESERVOIR M S Thesis

David A Summers Dec 1976 46 p refs (Contract DI-14-34-0001-6044) (PB-265204/8, W77-05931 OWRT-A-043-TENN11) Avail NTIS HC A03/MF A01 CSCL 13B

The Simulated Open Channel Hydraulics (SOCH) mode a mathematical transient flow model was applied to an urban storm-water runoff investigation. A method was sought by which the model could be used to coordinate streamflow in Fort Loudoun reservoir with water quality data taken shortly after precipitation events. Several methods of coordinating data and flow were conceived and tested. After encountering several problems in using the SOCH model it was decided that the best use of the model was to guide sampling by following a single slug of water as it passed through Knoxville into Fort Loudoun reservoir under conditions of runoff. GRA

N77-28563*# Northern Prairie Wildlife Research Center, Jamestown, N Dak

APPLICATION OF LANDSAT SYSTEM FOR IMPROVING METHODOLOGY FOR INVENTORY AND CLASSIFICATION OF WETLANDS Progress Report, 1 Apr - 30 Jun 1977

David S Gilmer and J Colwell Principal Investigators 15 Jul 1977 7 p refs ERTS (NASA Order S-54049-A) (E77-10188 NASA-CR-153917) Avail NTIS HC A02/MF A01 CSCL 08B

N77-28563*# National Aeronautics and Space Administration Langley Research Center, Langley Station, Va **REMOTE WATER MONITORING SYSTEM Patent Application**

David C Grana and David P Haynes inventors (to NASA) Filed 4 Aug 1977 20 p (NASA-Case-LAR-11973-1 US-Patent-Appl-SN-821681) Avail NTIS HC A02/MF A01 CSCL 08H

A remote water monitoring system is described that integrates the functions of sampling, sample preservation, sample analysis, data transmission and remote operation. The system employs a floating buoy carrying an antenna connected by lines to one or more sampling units containing several sample chambers. Receipt of a command signal actuates a solenoid to open an intake valve outward from the sampling unit and communicates the water sample to an identifiable sample chamber. Such response to each signal receipt is repeated until all sample chambers are filled in a sample unit. Each sample taken is analyzed by an electrochemical sensor for a specific property and the data obtained is transmitted to a remote sending and receiving station. Thereafter the samples remain isolated in the sample chambers until the sampling unit is recovered and the samples removed for further laboratory analysis. Author

N77-28568# Army Engineer Waterways Experiment Station, Vicksburg Miss Hydraulics Lab

SEASONAL VARIATIONS IN GREAT LAKES DESIGN WAVE HEIGHTS LAKE ERIE Final Report, Feb - Oct 1976

Donald T Resio, Rebecca M Brooks and Charles L Vincent Mar 1977 85 p refs (AD-A039153 WES-MP-H-76-21) Avail NTIS HC A05/MF A01 CSCL 04/2

Tables of 5-day extremal parameters are presented, along with a methodology for the calculation of design wave heights for variable intervals of time during the year. A brief description of the Great Lakes Climatology is included to provide a meteorological context for the wave height variations throughout the year. Author (GRA)

N77-28571# National Oceanic and Atmospheric Administration, Ann Arbor, Mich Great Lakes Environmental Research Lab

LAKE ST CLAIR HYDROLOGIC TRANSFER FACTORS Frank H Quinn Jul 1976 22 p refs (PB-266420/9 NOAA-TM-ERL-GLERL-10, NOAA-77032904) Avail NTIS HC A02/MF A01 CSCL 08H

Monthly hydrologic transfer factors were developed for Lake St Clair to aid in the comparison and coordination of St Clair and Detroit River monthly flows. The transfer factor is defined as the sum of the monthly precipitation and runoff minus the evaporation and change in storage. Each of the hydrologic constituents were determined independently from available data. GRA

N77-29587 Cornell Univ, Ithaca, NY **THE DETERMINATION OF REGIONAL EVAPOTRANSPIRATION USING REGULARLY RECORDED DATA AND THE BOUNDARY LAYER TRANSFER COEFFICIENTS** Ph.D Thesis

John Anthony Mawdsley 1976 158 p Avail Univ Microfilms Order No 77-8363

A procedure to determine the evapotranspiration from a region even when the water supply to the surface may be limiting, using only regularly recorded meteorological data is presented. It was applied at one location in the USA for four years; the results are presented and compared with other independently obtained evapotranspiration data. Most other currently used methods for determining evapotranspiration either require special

instrumentation to be installed at the site or are empirical and have no firm physical base. The formulation is derived from general similarity arguments applied to the two sublayers of the atmospheric boundary layer, the surface layer and the outer layer coupled with the assumption that a matched layer exists where the profiles are valid simultaneously. The formulation is expressed in the form of a Dalton equation with a boundary layer transfer coefficient
Dissert Abstr

N77-29722# National Environmental Satellite Service, Washington, D C

WINTER SNOW-COVER MAPS OF NORTH AMERICA AND EURASIA FROM SATELLITE RECORDS, 1966 - 1976

Michael Matson Mar 1977 36 p refs
(PB-267393/7, NOAA-TM-NESS-84 NOAA-77041804) Avail
NTIS HC A03/MF A01 CSCL 04B

Weekly snow and ice cover charts of the Northern Hemisphere based on satellite data were averaged to create monthly mean snow cover maps of North America and Eurasia for the months of December through March 1966 - 1976. A ten year mean snow cover map for each winter month also was prepared. Included on each monthly mean winter snow-cover map is a month by month analysis of all ten years of data
GRA

N77-30288# National Aeronautics and Space Administration
Goddard Inst for Space Studies New York

APPLICATIONS OF SPACE TECHNOLOGY TO WATER RESOURCES MANAGEMENT

V V Salomonson *In its* Poc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 195-196

Avail NTIS HC A13/MF A01 CSCL 08H

Space technology transfer is discussed in terms of applying visible and infrared remote sensing measurement to water resources management. Mapping and monitoring of snowcovered areas, hydrologic land use and surface water areas are discussed using information acquired from LANDSAT and NOAA satellite systems
B L P

N77-30545 Maryland Univ College Park
THE VALUE OF LANDSAT DATA IN URBAN WATER RESOURCES PLANNING Ph D Thesis

Thomas Joseph Jackson 1976 251 p
Avail Univ Microfilms Order No 77-10406

The economic value of LANDSAT multispectral satellite remote sensing in urban water resources planning was investigated. Parameters of the hydrologic simulation model STORM were related to the watershed percent of impervious area. Experiments were conducted to quantify the error encountered in estimating the percent of impervious area from LANDSAT data. The results indicate that errors are small when drainage areas of approximately two square miles or larger are involved
Dissert Abstr

N77-30554# California State Dept of Water Resources
Sacramento

MONITORING WATER QUALITY BY REMOTE SENSING Final Report, Jun 1975 - Mar 1977

Randall L Brown Principal Investigator Jul 1977 58 p refs
Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 ERTS (Contract NAS5-20945)

(E77-10194 NASA-CR-154259) Avail NTIS
HC A04/MF A01 CSCL 08H

The author has identified the following significant results. A limited study was conducted to determine the applicability of remote sensing for evaluating water quality conditions in the San Francisco Bay and delta. Considerable supporting data were available for the study area from other than overflight sources, but short-term temporal and spatial variability precluded their use. The study results were not sufficient to shed much light on the subject but it did appear that with the present state of the art in image analysis and the large amount of ground truth needed, remote sensing has only limited application in monitoring water quality
Author (GRA)

N77-30557# Geological Survey Miami, Fla Water Resources Div

WATER-MANAGEMENT MODELS IN FLORIDA FROM ERTS-1 DATA Final Report

A L Higer, Principal Investigator R H Rogers, A E Coker, and E H Cordes (Bendix Aerospace Systems Div Ann Arbor) Feb 1975 44 p Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 ERTS

(NASA Order S-70243-AG)

(E77-10197 NASA-CR-154264) Avail NTIS
HC A03/MF A01 CSCL 08H

The author has identified the following significant results. The usefulness of ERTS 1 to improving the overall effectiveness of collecting and disseminating data was evaluated. ERTS MSS imagery and in situ monitoring by DCS were used to evaluate their separate and combined capabilities. Twenty data collection platforms were established in southern Florida. Water level and rainfall measurements were collected and disseminated to users in less than 2 hours, a significant improvement over conventional methods. The operational theory of the technique are described together with details of the procedure. An example application of the technique to the analysis of tidal shoreline length is given with a breakdown of manpower requirements
Author

N77-30568# South Dakota State Univ, Brookings Remote Sensing Institute

INVENTORY OF WETLAND HABITAT USING REMOTE SENSING FOR THE PROPOSED OAAE IRRIGATION UNIT IN EASTERN SOUTH DAKOTA

Robert G Best, Donald G Moore and Victor I Myers [1977] 40 p refs

(Grant NGL-42-003-007)

(NASA-CR-153412) Avail NTIS HC A03/MF A01 CSCL 08H

An inventory of wetlands for the area included in the proposed Oahe irrigation project was conducted to provide supplemental data for the wildlife mitigation plan. Interpretation techniques for inventoring small wetlands in the low relief terrain of the Lake Dakota Plain were documented and data summaries included. The data were stored and tabulated in a computerized spatial data analysis system
Author

N77-30571# California Univ Santa Barbara Dept of Geography

REMOTE SENSING APPLICATIONS TO HYDROLOGIC MODELING Semiannual Report

Jeff Dozier, John E Estes, David S Simonett, Robert Davis, James Frew, Danny Marks, Karl Schiffman, Mary Souza, and Ellen Witebsky Sep 1977 27 p refs

(Grant NSG-5155)

(NASA-CR-154842) Avail NTIS HC A03/MF A01 CSCL 08H

An energy balance snowmelt model for rugged terrain was devised and coupled to a flow model. A literature review of remote sensing applications to hydrologic modeling was included along with a software development outline
Author

N77-30581# Army Cold Regions Research and Engineering Lab, Hanover N H

REMOTE SENSING OF ACCUMULATED FRAZIL AND BRASH ICE IN THE ST LAWRENCE RIVER

Arnold M Dean, Jr Apr 1977 26 p refs

(AD-A039905 CRREL-77-8) Avail NTIS HC A03/MF A01 CSCL 08/12

A broadbanded impulse radar system was used for aerial detection of accumulated frazil and brash ice in a 9.5-km reach of the St Lawrence River near Ogden Island. The remote sensing and data reduction system developed for the project provided data sufficient for production of a contour map having 1-ft intervals. With this contour map, the accumulation pattern of frazil and brash ice could be analyzed. Recommendations are given for improving the performance of the aerial profiling system
Author (GRA)

06 HYDROLOGY AND WATER MANAGEMENT

N77-30587# Arizona Water Resources Research Center Tucson
RAINFALL INFILTRATION CHARACTERISTICS FOR A SEMI-ARID WATERSHED SOIL M S Thesis

John Gray Morse 1976 86 p refs
(Contract DI-14-31-0001-3503)
(PB-267723/5 W77-08206, OWRT-A-027-ARIZ(1)) Avail
NTIS HC A05/MF A01 CSCL 08M

Rainfall infiltration characteristics for a semi-arid watershed soil were studied. The soil examined was obtained from Page Ranch 25 miles north of Tucson, AZ. Laboratory infiltration tests were conducted on reconstructed soil profiles similar to those on the watershed. A mathematical model of infiltration was used to simulate the infiltration process. Results from infiltration tests conducted on site at the watershed during a previous research study were also simulated using the infiltration model. Laboratory and field infiltration tests were conducted using a realistic rotating disk rainfall simulator. Single- and dual-source gamma ray attenuation techniques were used to obtain soil moisture measurements within the laboratory soil profiles. By changing the saturated conductivity of the upper soil layer it was also possible to simulate the infiltration process on a grass-covered plot. GRA

N77-30593# Purdue Univ Lafayette Ind Inst for Research
in the Behavioral, Economic, and Management Sciences
IMPLEMENTATION OF A DECISION SUPPORT FOR REGIONAL WATER QUALITY PLANNING

R C Bonczek C W Holsapple and A B Whinston Oct
1976 43 p refs
(Contract DI-14-34-0001-6076)
(PB-267342/4 Paper-570 W77-07812 OWRT-B-080-IND(4))
Avail NTIS HC A03/MF A01 CSCL 13B

The Generalized Planning System is presented as a framework for the implementation of decision support systems concerned with any of a broad variety of decision applications. The particular application treated here relates to regional water quality planning. The principal considerations are a data base facility that accommodates information in a semantic network a technique for model formulation and the automatic interfacing of data with models by means of a non-procedural mapping language. GRA

N77-31668*# California Univ, Davis Dept of Electrical
Engineering

A STUDY OF THE USE OF REMOTE SENSING DATA IN HYDROLOGIC ENGINEERING MODELS Progress Report

V R Algazi and M Suk, Principal Investigators Jan 1977
41 p refs Original contains imagery Original photography
may be purchased from the EROS Data Center Sioux Falls
S D 57198 ERTS
(Grant Nsg-5092)
(E77-10214, NASA-CR-152574) Avail NTIS
HC A03/MF A01 CSCL 08H

N77-31669*# California Univ Berkeley Space Sciences
Lab

AN INTEGRATED STUDY OF EARTH RESOURCES IN THE STATE OF CALIFORNIA USING REMOTE SENSING TECHNIQUES Semiannual Progress Report

Robert N Colwell Principal Investigator 31 May 1977 314 p
refs Original contains imagery Original photography may be
purchased from the EROS Data Center Sioux Falls S D 57198
ERTS

(Grant NGL-05-003-404)
(E77-10215, NASA-CR-154798, SSI-Ser-18-Issue-44) Avail
NTIS HC A14/MF A01 CSCL 08B

The author has identified the following significant results. The effects on estimates of monthly volume runoff were determined separately for each of the following parameters: precipitation, evapotranspiration, lower zone and upper zone tension water capacity, imperviousness of the watershed and percent of the watershed occupied by riparian vegetation, streams and lakes. The most sensitive and critical parameters were found to be precipitation during the entire year and springtime evapotranspiration.

N77-31574*# Army Construction Engineering Research Lab,
Champaign, Ill

INVESTIGATION OF THE EFFECTS OF CONSTRUCTION AND STAGE FILLING OF RESERVOIRS ON THE ENVIRONMENT AND ECOLOGY PREPROJECT BASELINE Final Report

R E Riggins, Principal Investigator and J R Anderson May
1977 44 p refs Original contains color imagery Original
photography may be purchased from the EROS Data Center
Sioux Falls, S D 57198 ERTS
(NASA Order S-53875)
(E77-10220 NASA-CR-154803, CERL-TR-N-24) Avail NTIS
HC A03/MF A01 CSCL 08H

The author has identified the following significant results. LANDSAT imagery can be used effectively as a baseline for detection of environmental change, resulting from construction of a major inland reservoir. Forest cover can be observed adequately on two-band composite enlargements at a scale of 1 130,000. Forest cover delineated on LANDSAT enlargements compares accurately with ground truth at a scale of 1 250,000. A dual image mapping technique superimposing winter, summer and spring scenes using the zoom transfer scope facilitates the determination. The same technique can be used to detect changes in the project area, resulting from construction activities. High altitude aircraft imagery can also be used to interpret changes in land use and forest type. Construction operations can be more clearly detailed on the air photos than on LANDSAT imagery.

N77-31592# Edgerton Germeshausen and Grier, Inc Las Vegas
Nev

DEVELOPMENT OF SNOW WATER EQUIVALENT SURVEY METHODS USING AIRBORNE GAMMA MEASUREMENTS Progress Report, Jan - Sep 1975

A Fritzache and C Jupiter 17 Oct 1975 28 p refs
(Contract EY-76-C-08-1183)
(EGG-1183-1677) Avail NTIS HC A03/MF A01

Airborne techniques for measurement of the water equivalent of snow and soil moisture are described. The work included a series of snow and soil moisture surveys and development of a new detector and data acquisition system. The status of this work is summarized here together with a review of plans for the immediate future. ERA

N77-32558 Colorado State Univ, Fort Collins
STOCHASTIC MODELING OF INTERMITTENT DAILY HYDROLOGIC SERIES Ph D Thesis

Jerson Kelman 1976 183 p
Avail Univ Microfilms Order No 77-12043

A general model for description and samples generation of daily precipitation was developed. The basic assumption is that precipitation is a result of censoring a nonintermittent continuous-value process. Classical techniques for modeling the persistence in this latter process are then applied. The continuous-value process admits an immediate extension to multivariate cases. Specific tests related to stationarity and serial independence of the process were formulated. The model was tested with a series of several gauging stations. In general the results were satisfactory. A model for description and samples generation of daily streamflow was also developed with satisfactory results. Dissert Abstr

N77-32567*# Mitre Corp Bedford, Mass METREK Div
RADIATIVE TRANSFER MODEL FOR REMOTE SENSING OF SUSPENDED SEDIMENTS IN WATER

A Ghovanlou Feb 1977 78 p refs
(NASA Order L-88328 Contract F19628-77-C-0001 AF Proj
8195)
(NASA-CR-145145, MTR-7433) Avail NTIS
HC A05/MF A01 CSCL 08H

An analytical study in the area of radiative transfer in the turbid water media is described. The modeling methodology described is based on Monte Carlo simulation approach. Author

N77-32575# North Carolina State Univ Raleigh Center for Marine and Coastal Studies

AN EXPERIMENTAL INVESTIGATION OF SOME COMBINED FLOW SEDIMENT TRANSPORT PHENOMENA

Larry Bliven Norden E Huang and Gerald S Janowitz Feb 1977 153 p refs

(Grant NOAA-04-6-158-44054)

(PB-269672/2 UNC-SG-77-04 NOAA-77060203) Avail NTIS HC A08/MF A01 CSCL 08G

Sediment transport and the resulting topographic features generated by combined wave and steady flow conditions were studied by laboratory experiments. A dimensional analysis of the sediment and fluid variables was performed to identify the pertinent nondimensional parameters. A generalized expression was introduced to describe the ripple number spectra as a function of the sediment and flow characteristics for both local equilibrium and equilibrium states. The net sediment transport rate was linearly related to the stream power available at the top of the bottom boundary layer as proposed. GRA

N77-32579# Dow Chemical Co, Freeport Tex

ENVIRONMENTAL ASSESSMENT OF GEOPRESSURED WATERS AND THEIR PROJECTED USES Final Report

J S Wilson, J R Hamilton, J A Manning and P E Muehlberg Apr 1977 99 p refs

(Contract EPA-68-02-1329)

(PB-268289/6 EPA-600/7-77-039) Avail NTIS HC A05/MF A01 CSCL 08I

Potential uses of the deep geopressured reservoirs of Texas and Louisiana Gulf Coast sedimentary basins are considered along with environmental aspects. Also taken into account are the projected resulting emissions of such uses, other impacts upon the land, the present stage of development and projections of future developmental plans. Author

N77-33566*# Texas A&M Univ College Station Remote Sensing Center

SPECTRAL MEASUREMENT OF WATERSHED COEFFICIENTS IN THE SOUTHERN GREAT PLAINS Progress Report, 1 Mar - 31 May 1977

Bruce J Blanchard, Principal Investigator Jun 1977 19 p ERTS

(Contract NAS5-22534)

(E77-10225 NASA-CR-155015 RSC-3273-7) Avail NTIS HC A02/MF A01 CSCL 08H

N77-33572*# Norwegian Water Resources and Electric Power Board Oslo

SNOWMAPPING IN SOUTHERN NORWAY BY USE OF LANDSAT IMAGERY Final Report

Helge Odegaard and Johnny Skorve, Principal Investigators 25 May 1977 28 p. Sponsored by NASA. Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S D. ERTS

(E77 10241 NASA-CR-155031) Avail NTIS HC A03/MF A01 CSCL 08L

The author has identified the following significant results: During the summer seasons of 1975 and 1976 the snow cover was successfully monitored and measured in four basins. By use of elevation distributions for these basins combined with the measured snow cover percentage, the equivalent snow line altitude was calculated. The basins were Boevra, Jostedal, Olden, and Breim.

N77-33592# Oak Ridge National Lab Tenn

TEHM A TERRESTRIAL ECOSYSTEM HYDROLOGY MODEL

D D Huff, R J Luxmoore, J B Mankin and C L Begovich Apr 1977 160 p refs

(Contract W-7405-eng-26 Contracts NSF INA-AG-199)

(EDFB-IBP-76-8 ORNL-NSF-EATC-27) Avail NTIS HC A08/MF A01

The terrestrial ecosystem hydrology model (TEHM) which combines mechanistic models for climatic and hydrologic processes with vegetation properties is discussed. The model is

able to explicitly simulate interception and throughfall, infiltration, root zone evaporation, transpiration, and drainage, plant and soil water potential, unsaturated and saturated subsurface flow, surface runoff, and open channel flow. It is also possible to use the TEHM with models for forest stand biomass dynamics and chemistry and exchange of heavy metals to study the transport and fate of trace contaminants at a watershed scale. Emphasis was placed on objective, physically based methods. When simulations of interception loss, soil moisture content, and base flow and storm flow were compared with observation, the overall adequacy of the model was assessed. For user convenience, the documentation includes a complete discussion of input formats, example data input sets, output summaries, and a microfiche listing of the complete source deck. ERA

N77-33595# Oklahoma State Univ Stillwater Dept of Agricultural Economics

PREDICTING CHANGES IN LAND-USE PATTERNS RESULTING FROM WATER RESOURCE INVESTMENT USING A NONSTATIONARY MARKOV PROCESS Final Technical Report, 1 Jul 1974 - 28 Feb 1977

H E Drummond 1977 131 p refs

(Contract DI-14-31-0001-5105)

(PB-269409/9 W77-09268 OWRB-B-030-OKLA(1)) Avail NTIS HC A07/MF A01 CSCL 13B

Changes in land use patterns in the immediate vicinity of Keystone and Pine Creek reservoir projects in eastern Oklahoma are evaluated using stationary and nonstationary Markov chain procedures. The objective of the procedure is to estimate the net or differential change in land use patterns caused by the development of the water resources development project. Pre-project growth patterns are extrapolated into the future to estimate what the land use pattern would have been if the project had not occurred. The difference between these estimates and observed land use patterns is the estimated net impact of the project. By evaluating both pre-project and post-project land use change patterns, it is possible to determine the future differential land use changes associated with the project development. GRA

Page intentionally left blank

Page intentionally left blank

DATA PROCESSING AND DISTRIBUTION SYSTEMS

Includes film processing computer technology satellite and aircraft hardware and imagery

A77-40514 * Determination of ocean wave heights from synthetic aperture radar imagery A Jain (California Institute of Technology, Jet Propulsion Laboratory, Space Sciences Div., Pasadena, Calif) *Applied Physics*, vol 13, Aug 1977, p 371-382 24 refs Contract No NAS7-100

A calculation is presented for the cross-correlation of the radar images obtained by processing the same signal data over different portions of the chirp spectrum bandwidth as a function of the center frequency spacings for these portions This is shown to be proportional to the square of the product of the characteristic function for ocean wave heights and the pupil function describing the chirp spectrum bandwidth used in the processing Measurements of this function for ocean wave imagery over the coast of Alaska, the North Atlantic, and Monterey Bay, California, and correlation with the significant wave heights reported from ground truth data indicate that the synthetic aperture radar instrument can be used for providing wave height information in addition to the ocean wave imagery (Author)

A77-40818 # Center for collection and processing of data from automatic buoy stations (Tsentr sbora i obrabotki informatsii s avtomaticheskikh buikovykh stantsii) A A Eroshko, G A Korzhan, I B Pavlovskii, V A Prisekin, and Iu T Shchetinin *Morskoe Gidrofizicheskoe Issledovanie*, no 4, 1976, p 137-143 5 refs In Russian

This paper describes a facility for the collection and processing of data from a network of automatic buoy stations designed for the autonomous and synchronous acquisition of ocean data As an example a buoy station for the investigation of small-scale oceanic processes is considered A description is given of the different subsystems of the facility and a data processing scheme is presented B J

A77-41088 # The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite (Vneshniaia granitsa radiatsionnykh pojasov po dannym sputnikha 'Kosmos-426') S N Kuznetsov, G B Lopatina, and V G Stolpovskii (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Geomagnetizm i Aeronomiia*, vol 17, May-June 1977, p 403-409 20 refs In Russian

Positional variations in the outer boundaries of the radiation belts in magnetically quiet periods were studied in terms of the magnetic time, the orientation of the interplanetary magnetic field, and the angle of inclination of the geomagnetic dipole towards the sun-earth line Data obtained from the Cosmos-426 satellite were used Geometric activity and diurnal variation are considered with respect to magnetic time M L

A77-41796 The Skylark sounding rocket programme D N Hoare (British Aircraft Corp., Ltd, London, England) In Australian Astronautics Convention, Perth, Australia, August 27-30, 1975, Proceedings Perth, Astronautical Society of Western Australia, Inc., 1977, p 145-153

The Skylark sounding rocket was first launched from the Woomera rocket range in 1957 Since that date, some 250 Skylarks have been launched in Australia with a wide variety of scientific experiments During this time, Skylark has been continually developed to give increased performance and more accurate pointing

stabilized payloads In 1972 the prototype version of an earth-resource rocket was launched from Woomera The Skylark rocket carried multispectral cameras to an altitude of about 250 km and the payload, when recovered, provided imagery of a large part of southern Australia Skylark rockets are also launched in conjunction with satellites, and B A C are currently engaged in various satellite activities including development of Geos, whose results will be correlated with firings of Skylark and other rockets (Author)

A77-42295 * OGO 5 observations of Pc 5 waves - Particle flux modulations S Kokubun, M G Kivelson, R L McPherron, C T Russell (California, University, Los Angeles, Calif), and H I West, Jr (California, University, Livermore, Calif) *Journal of Geophysical Research*, vol 82, July 1, 1977, p 2774-2786 42 refs ERDA sponsored research, NSF Grants No DES 74-23464, No GA-34148, Contract No N00014 69-A-200-4016, Grant No NGR 05 007 004

An investigation is conducted concerning the modulations of particle fluxes associated with Pc 5 waves in the region beyond the plasmopause A study of thermal flux modulations indicates that some of the density enhancements observed are not spatial structures but are spurious features caused by temporal flux variations associated with hydromagnetic waves A resonance model of the energetic particle flux modulations is discussed Energetic particle modulations are also considered The reported observations reveal that modulations are dominant at energies of about 100 keV for electrons and at 100 keV to 1 MeV for protons This may indicate that the bounce resonance interaction is not important for Pc 5 waves G R

A77-42312 Observations of high latitude protons H H Sauer (NOAA, Space Environment Laboratory, Boulder, Colo), W C Lin, and H-E Lin (NOAA, Space Environment Laboratory, Prince Edward Island, University, Charlottetown, Canada) *Journal of Geophysical Research*, vol 82, July 1, 1977, p 2887-2891 7 refs National Research Council of Canada Grants No A 2425, No A 4480

The NOAA 2 satellite has observed the occurrence of relatively isotropic fluxes of protons with energies of 0.27 MeV and above in the evening sector of the polar caps on over 90 passes during the period December 1972 through December 1973 These protons have been observed at intensities of more than 100,000/sq cm s or MeV with power law spectral indices in the range of 5 to -7 Their similarity of characteristics and occurrence identify them with corresponding impulsive proton bursts occurring in the dusk magnetotal reported by others (Author)

A77-42621 # Interplanetary magnetic field in the ecliptic plane and auroral activity (Mezhplanetnoe magnitnoe pole v ploskosti ekliptiki i aktivnost' poliarnykh sianii) Ia I Fel'dshtein, G V Starkov, P V Sumaruk, and N F Shevnina In Investigation of upper-atmospheric radiation Ashkhabad, Izdatel'stvo Ylym, 1976, p 40-51 28 refs In Russian

A77-43815 * Data management in pattern recognition and image processing systems A L Zobrist and N A Bryant (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) In Western Electronic Show and Convention, Los Angeles, Calif September 14-17, 1976, Technical Papers (A77-43801 20-33) North Hollywood, Calif, Western Periodicals Co., 1976, p 13/3-1 to 13/3-4 5 refs

Data management considerations are important to any system which handles large volumes of data or where the manipulation of data is technically sophisticated A particular problem is the introduction of image-formatted files into the mainstream of data processing application This report describes a comprehensive system for the manipulation of image, tabular, and graphical data sets which involve conversions between the various data types A key characteristic is the use of image processing technology to accomplish data management tasks Because of this, the term 'image-based information system' has been adopted (Author)

A77-44464 * Construction and interpretation of a digital inertia image A R Gillespie and A B Kahle (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 983-1000 24 refs Contract No NAS7-100

An image representing the thermal inertia in the vicinity of Pisgah Crater and Lavic Lake in Southern California has been generated from visible, near IR, and thermal images taken from aircraft Construction of the thermal inertia image required radiometric calibration and geometric rectification of the acquired images as well as registration to a topographic map The Kahle thermal model used in the construction of the thermal inertia image requires specification of albedo, topographic slope and slope azimuth, diurnal temperature range and local meteorological conditions Albedo information was derived from the visible image, digital topographic information was computed from digitized stereo aerial photographs, and thermal ranges were calculated by subtracting the predawn from the afternoon thermal image data Our computed values of thermal inertia were in close agreement with published values for similar surface materials Thermal inertia provides complementary information to conventional images of reflected solar radiation for use in lithologic mapping (Author)

A77-44587 Discernible lineaments in Landsat images of Lebanon (Alignements decelables sur des images Landsat du Liban) M F Davie (Universite des Sciences et de la Technologie d'Alger, Constantine, Algeria) *Institut Français du Pétrole, Revue*, vol 32, May-June 1977, p 463-475 33 refs In French

Data from Landsat 1 and 2 are used to provide a more precise map of the topography of Lebanon than was obtainable with conventional aerial photography A method for resolving data into significant individual lineaments is reviewed, and the usefulness of these lineaments in determining morphological, vegetative and hydrographic features is discussed The direction and length of the lines are analyzed for the entire region, as well as for several smaller areas within the region The analysis permits conclusions regarding fault-lines and fractures, karst topography, hydrographic and erosional features, and the continuation of certain submarine features on the mainland J M B

A77-44900 # Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean (Osobennosti oblachnykh skoplenii vnutritropicheskoi zony konvergentsii basseina Indiskogo Okeana) E K Semenov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Meteorologiya i Gidrologiya*, June 1977, p 99-109 27 refs In Russian

In the present paper, charts of recurrence periods of cloud formations in the intertropical convergence zone are plotted for January and July 1970 through 1973 from daily cloud-cover photographs obtained by meteorological satellites The regional characteristics of the cloud structure are studied, along with the seasonal migration and the annual variability of the spatial-temporal characteristics of cloudiness in the intertropical convergence zone Some aspects of the summer monsoon phenomenon are examined V P

A77-45305 Optical detection of atmospheric U-238 decay products J E Solomon (US Naval Ocean Systems Center, San Diego State University, San Diego, Calif) *Journal of Applied Physics*, vol 48, Aug 1977, p 3588-3592 20 refs ERDA supported research

This paper investigates the feasibility of a lidar remote sensing system in the detection of atmospheric U-238 decay products The most likely target species are lead and bismuth The effective scattering cross sections for Pb and Bi are calculated to be 1.09×10 to the 15th and 3.54×10 to the 17th sq cm, respectively, for the relevant optical transitions System operating characteristics are calculated and displayed in graphical form It should be possible to detect concentration levels of atomic lead as small as 5-10 atoms cu cm at a range of 200 m, under rather modest transmitter and receiver requirements (Author)

A77-45459 Digital image processing for a better recognition of the terrestrial surface in Morocco (Digitale Bildverarbeitung zum besseren Erkennen der Erdoberfläche in Marokko) K A Ulbricht (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Nachrichtentechnik, Oberpfaffenhofen, West Germany) and P Hoppe (Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, West Germany) *DFVLR-Nachrichten*, July 1977, p 849-851 In German

A description is presented of an investigation involving the employment of digital image processing techniques in an evaluation of Landsat data concerning central Morocco, including the Landsat picture No 1551 10244 of January 25, 1974 Particular attention is given to a test area located to the south of Meknes The techniques employed include ratio procedures and methods utilizing linear combinations of various spectral ranges The results which can be obtained by means of these techniques are illustrated with the aid of pictures The geological structure of the investigated areas is discussed G R

A77-45726 # Influence of the atmosphere on the contrast of the Landsat images Y J Kaufman (Tel Aviv University, Tel Aviv, Israel) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 5* p 9 refs

Contrast calculation is considered in terms of the radiation transfer in a plane-parallel atmosphere An approximation of the intensity of radiation is derived, based on a two stream approximation of the flux Analytical and numerical results are compared Approximated analytical expressions for the intensity of radiation in a plane parallel atmosphere with uniform Lambertian ground surface are used to calculate the contrast in two cases the contrast between two large areas, and the contrast between a small object and its large surrounding background M L

A77-45739 # Satellite observations of protons involved in the generation of IPDP and Pc 1 R E Horita (NOAA, Space Environment Laboratory, Boulder, Colo, Victoria, University, Victoria, British Columbia, Canada), J N Barfield (NOAA, Space Environment Laboratory, Boulder, Colo), R R Heacock (Alaska, University, Fairbanks, Alaska), and J Kangas (Oulu, University, Oulu, Finland) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 4* p Research supported by the National Research Council of Canada, University of Victoria, Ministère des Affaires Étrangères, NSF Grant No ATM-71-00617

In the present paper, 15 observed IPDP (intervals of pulsations of diminishing periods) and eight unstructured Pc 1 events, identified from ground based recordings, are correlated with particle data from Explorer 45 Typically, energetic protons were recorded at the satellite at times that coincided with IPDP or Pc 1 events, the lower energy protons lagging behind the higher energy protons, due to drift dispersion The energy of the protons responsible for the generation of IPDP and Pc 1 events is calculated, along with the location of the source region, for each of the 23 events observed The results correlate well with theoretical predictions according to which IPDP and Pc 1 are generated by proton cyclotron instability at times where westward drifting protons with energies between 1 and 100 keV approach the plasmopause V P

A77-45860 The semi-annual variation in thermospheric air density from January 1972 to April 1975. D M C Walker (Royal Aircraft Establishment, Farnborough, Hants, England) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 18* p 10 refs

A77-46056 Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm B V Rezhnev and V G Vorob'ev (Akademii Nauk SSSR, Poliarnyi Geofizicheskii Institut, Murmansk, USSR) (*Geomagnetizm i Aeronomiya*, vol 16, Sept-Oct 1976, p 889-894) *Geomagnetism and Aeronomy*, vol 16, no 5, 1976, p 433-435 16 refs Translation

A77-46386 # Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm (Variatsii potokov elektronov s energiei W/e greater than 0.7 MeV vblizi granitsy radiatsionnogo poiasa vo vremia magnitosfernoi subburi) E A Ginzburg, A. B Malyshev, and N F. Mal'tseva *Kosmicheskie Issledovaniia*, vol 15, July-Aug 1977, p 573-578 12 refs. In Russian.

A77-46733 A comparative study of cloud classification techniques. J A Parikh (Maryland, University, College Park, Md) *Remote Sensing of Environment*, vol. 6, no 2, 1977, p 67-81 10 refs Contract No F44620-72-C-0062

The purpose of this study was to determine the importance of infrared vs visual features, textural vs spectral features, hierarchical vs single-stage decision logic, and quadratic vs linear discriminant functions for classification of NOAA-1 visible and infrared tropical cloud data Both a four-class problem, in which cloud types were grouped into (1) 'low', (2) 'mix', (3) 'cirrus', and (4) 'cumulonimbus' classes, and a three-class problem, in which the 'mix' class was excluded, were analyzed The addition of at least one visual spectral feature to infrared spectral features improved the ability of the classifier to recognize all cloud classes except 'low' Combining textural features with spectral features did not significantly improve classification results achieved using only spectral features For the four-class problem, a classification accuracy of 91% was obtained by using a two-stage variation of a single-stage, maximum likelihood classifier For the three-class problem, classification accuracies of 98% were obtained using either single-stage or hierarchical decision logic and either quadratic or linear discriminant functions (Author)

A77-46737 Feasibility study in using multiband photography for studies in geomorphology, soils and land use R S Murthy, S Pandey, L R Hirekerur (Indian Council of Agricultural Research, National Bureau of Soil Survey and Land Use Planning, New Delhi, India), and N V M Unni (Department of Space, Space Applications Centre, Ahmedabad, India) *Remote Sensing of Environment*, vol 6, no 2, 1977, p 139-146

Remotely-sensed multiband imagery, covering 64 sq km between latitudes 18 deg 28 min 30 sec-18 deg 34 min 45 sec N and longitudes 74 deg 20 min-74 deg 23 min 15 sec E, has been interpreted The climate of the region studied is semi-arid tropical with an annual precipitation of 50 cm The aerial photography, comprised of color infrared (CIR) and black and-white infrared with 0.5 to 0.9 micron spectral band, and conventional panchromatic with 0.5 to 0.72 micron spectral band, was interpreted by conventional stereoscopic analysis based on tone, texture, pattern, shape, and size The area was divided into 12 geomorphic units, confirmed from ground survey, and a soil map showing soil series associations was prepared and interpreted The imagery was interpreted for the delineation of land use patterns The IR false color and the black-and-white imagery on the scale of 1:25,000, with adequate ground surveys and checks, is useful for delineating second-order geomorphic units, soils at the level of association of series, and broad land-use classification (Author)

A77-46755 A syntax-directed method for land-use classification of Landsat images J Keng and K S Fu (Purdue University, West Lafayette, Ind) In *Image science mathematics, Proceedings of the Symposium*, Monterey, Calif, November 10-12, 1976

North Hollywood, Calif., Western Periodicals Co., 1977, p 261-265 6 refs Contract No F30602-75-C-0150

The syntax-directed method involves the following steps An inference process is applied to a set of training imagery data to infer a set of grammatic rules which in turn formalizes a syntactic model Based on this model, a set of most probable window patterns (which are generated by the grammar) is implemented to analyze the test images and to recognize the objects of interest The method, implemented by the LOGICAL programming technique, is applied to experiments involving highway, river and bridge recognition on Landsat images B J

A77-46763 The use of photographic imagery in earth resources studies E S Owen-Jones and B J Chandler (Bedford College, London, England) (*British Interplanetary Society, Symposium on European Participation in Earth Resources /Space/ Projects*, University College, London, England, Apr 9, 1975.) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p 163-167

Different classification techniques of photographic imagery obtained by the Skylark rocket and the Skylab satellite are discussed Specifically, applications relating to agricultural crop-type analysis using the Skylark rocket, and natural terrain classification with respect to mineralization using the Skylab satellite are presented. A survey of the problems encountered and the results obtained, as well as a description of the technique for boundary detection are included. SCS

A77-46764 The relative performance of some unsupervised clustering techniques for the per-field classification of Landsat data A C Armstrong (East Anglia, University, Norwich, England) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p 168-171 8 refs

Three algorithms for the per-field analysis of Landsat data are described. Methods of generating per-field data sets are briefly outlined, and the performance of the three algorithms discussed. At any given spatial scale, the traditional hierarchical algorithm produces better classifications than a multi-pass iterative technique, which is in turn better than a single pass chain algorithm. However, the computation requirements of these algorithms is such that for large data sets, the hierarchical technique is too expensive, and the iterative technique always more expensive than the chain (Author)

A77-46765 Inflight performance evaluation of satellite remote sensor data by ground-based measurements R Hulstrom, L Adams, and L Oldham (Martin Marietta Aerospace, Denver, Colo.) (*Eurospace Conference, 6th, Monte Carlo, Monaco, Oct 13-16, 1975.*) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p. 172-177

During the Skylab/EREP SL2, SL3, and SL4 missions, detailed spectroradiometric and atmospheric measurements were made at several selected ground sites/targets in order to provide data for evaluating the performance of the EREP S191, S192, and S190A sensor systems The measurements/analyses and sites consisted of two types that can be classified in terms of wavelength regions, visible and near infrared (Author)

A77-46769 Data reduction and information extraction for remotely sensed images O E Morgan (Plessey Radar Research Centre, Havant, Hants, England) (*Eurospace Conference, 6th, Monte Carlo, Monaco, Oct 13-16, 1975.*) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p 193-200 25 refs

The Data Structure Library (DSL), a computer system which may be used with many types of data for the interpretation of images by the processing of algorithms and the selection and optimization of sensors is described with particular regard to its relevance to the Spacelab mission. The inadequacies of the present day system of information extraction from images is contrasted to the DSL method which is presented in detail The need for the optimization of Spacelab sensors is demonstrated, and suggestions for experimentation in order to develop task-dependent sensing packages, and task-dependent preprocessing are presented These experiments concern the discrimination and assessment of crops and of soil moistures on a subregional scale SCS

A77-46790 Sarlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads J P Guignard (Thomson CSF, Paris, France) and H Mooney (British Aircraft Corp, Ltd, London, England) In *Space and energy, Proceedings of the Twenty-sixth International Astronautical Congress*, Lisbon, Portugal, September 21-27, 1975 Oxford and New York, Pergamon Press, 1977, p 387-399 6 refs

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

An attempt is made to report on a preliminary study of side-looking radar systems for Spacelab earth-observation payloads (Sarlab). The use of Spacelab as a link between present as well as planned experimental earth-resources aircraft programs and an operational automatic satellite, such as the proposed Synthetic Aperture Radar Satellite (Sarsat), is examined. Sarsat design characteristics are summarized, and attention is given to such Sarlab features as beam orientation, on-board preprocessing, antenna structure, beam steering, monopulse systems, orbits, and payloads. Possible improvements of the basic payloads are considered along with the performance of advanced side-looking radar systems and compatibility between Sarlab and Spacelab. The applicability of Sarlab concepts to the Sarsat design is briefly evaluated. F G M

A77-47031 Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season. R A Houze, Jr and C-P Cheng (Washington, University, Seattle, Wash.) *Monthly Weather Review*, vol 105, Aug 1977, p 964-980. 21 refs. NSF Grant No. ATM-74-14830-A01.

Radar echo patterns observed daily during GATE have been analyzed to determine their mean characteristics and variations over the summer season. The characteristics analyzed were average echo areas, maximum heights, durations, number of high-intensity cores, motions, formation and dissipation modes, and orientations of echo lines. Small echoes less than 100 sq km in area dominated the total number of echoes while echoes larger than 1000 sq km in area accounted for most of the area covered by precipitation. Echo height, duration, and number of embedded cores were all positively correlated with echo area, and the most intense echo cores were found in the largest echoes, indicating that echo regions greater than 10,000 sq km in area were the areas of most enhanced convection. During late summer, the convection in these large echoes was enhanced. Lower tropospheric winds appeared to control echo motions. (Author)

A77-47039 Meso-beta scale features observed in surface network and satellite data. R A Maddox (NOAA, Atmospheric Physics and Chemistry Laboratory, Boulder, Colo.) *Monthly Weather Review*, vol 105, Aug 1977, p 1056-1059.

A77-47179 # Photographic methods of studying the earth from space (Fotograficheskie metody issledovaniia zemli iz kosmosa). Iu M Chesnokov. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 16-23. In Russian.

The development of satellite borne photographic systems for sensing the earth surface in the visible and near infrared ranges is considered. Ways of increasing the information content of space-borne photographs and methods of choosing optimal parameters of the photographic equipment are described. Photographic systems are compared with other satellite-borne remote sensors of the earth surface. B J

A77-47180 # Operational means for obtaining spaceborne video data in the optical range (Operativnye sredstva polucheniia kosmicheskoi videoinformatsii opticheskogo diapazona). G A Avanesov. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 24-34. 13 refs. In Russian. The paper examines operational systems for obtaining satellite remote sensing data on two-dimensional distributions of reflected and emitted radiation at the earth surface. These include TV systems, optical scanner systems in the visible and near infrared and a number of hybrid systems. The basic design principles of these systems are described and a comparative analysis of their parameters, possible fields of application and prospects of development is presented. B J

A77-47181 # Systems analysis and optical scanning methods (Analiz sistem i metodov opticheskogo skanirovaniia). G A

Avanesov, V Iu Artem'ev, A G Sychev, V I Tarnopol'skii, and Iu K Khodarev. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 34-56. 9 refs. In Russian. The paper describes optical scanners for the remote sensing of earth resources, which are used to obtain data on the two-dimensional distributions of radiation reflected and emitted at the earth surface. Attention is given to criteria used to design optical components and radiation detectors and to select a principle of scanning operation. Characteristics of measured emissions, optical systems, scanning principles are all considered. B J

A77-47184 # The possibility of remote sensing of the earth surface using radio-physical systems (Vozmozhnosti distantsionnogo issledovaniia poverkhnosti zemli pri pomoshchi radiofizicheskikh sistem). V S Etkin and E A Sharkov. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 99-109. 44 refs. In Russian. The operation of satellite microwave systems (radar and radio thermal emission) for the sensing of earth resources is illustrated by examples involving the remote sensing of land and ocean surfaces. The necessity of combining multifrequency radar, microwave radiometer, and optical (visible and infrared) systems for the solution of some sensing problems is examined. Attention is given to microwave radiometry for investigating the spectral-statistical properties of fluctuation fields of the brightness temperature of land and ocean surfaces. B J

A77-47185 # Consideration of the atmosphere in problems of the satellite sensing of earth resources (Uchet atmosfery v zadachakh izuchenii prirodnykh resursov zemli iz kosmosa). M S Malkevich. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 110-130. 20 refs. In Russian. In the satellite remote sensing of earth resources, the atmosphere is considered as a source of interference, distorting radiation from the earth surface (as represented by the atmospheric transfer function) and as an object of study. Three basic problems of remote sensing involving the consideration of atmospheric effects are treated: (1) photography and TV imaging of objects on the earth surface, which vary rapidly in space and time (i.e., geological and geographical formations), (2) the study of natural formations which vary rapidly in space and time, and (3) the study of atmospheric parameters such as moisture content and impurity concentration. B J

A77-47186 # The selection of spectral ranges for sensing earth resources (O vybore spektral'nykh diapazonov dlia issledovaniia zemnykh resursov). M B Averintsev and Iu L Biriukov. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 131-137. 5 refs. In Russian. A procedure is developed for selecting spectral ranges for the remote sensing of earth resources on the basis of experimental data on satellite-borne multispectral photography. The technique employs statistical methods and a pattern recognition method involving the separation of objects in feature space. A way to identify objects, not readily identifiable due to instrument inaccuracies, is proposed. B J

A77-47187 # Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems (Garmonicheskii analiz spektral'noi iarkosti prirodnykh ob'ektov dlia vybora s'emochnikh sistem pri mnogoazhal'noi s'emke). V A Kottsov and Iu I Fivenskiu. In *Space studies of earth resources. Methods and means of measurement and data processing*.

Moscow, Izdatel'stvo Nauka, 1976, p 137-144. In Russian.

A77-47188 # Optimization of identifiable characteristics of objects during multispectral photography (Optimizatsiia deshifrovannykh kharakteristik ob'ektov pri mnogozonal'nom fotografirovanii) V A Kottsov In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 145-151 In Russian

A77-47189 # The principles of photometry theory in relation to spaceborne photography of the earth (Osnovy teorii fotometrii pri fotonabludenii iz kosmosa) L M Matusevich In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 151-169 26 refs In Russian

A mathematical model for the photometric transformation of the optical characteristics of photographic images of natural objects is considered in relation to the satellite-borne photography of earth resources and to the development of techniques of photometric photography Attention is given to the use of photometry in illuminating the microfeatures of an optical image and to the relation of the illumination of a photograph and the illumination during the exposure of a sensitogram B J

A77-47190 # The problem of the accuracy of photometric measurements of a spectrally differentiated image (K voprosu o tochnosti fotometricheskikh izmerenii spektral'no-differentsirovannogo izobrazheniia) Iu N Kuznetsov and Iu I Fivenskii In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 169-178 In Russian

A77-47191 # Technology of the thematic automated processing of video data (Tekhnika tematicheskoi avtomatizirovannoi obrabotki videoinformatsii) G A Avanesov, Ia L Ziman, and Iu K Khodarev In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 179-188 5 refs In Russian

The paper considers the thematic interpretive processing (which is the final stage of processing and determines its effectiveness) of aerial and satellite remote sensing data on earth resources Attention is given to the design of standard digital computer systems for the processing of such video data and to the development of more efficient processing equipment B J

A77-47193 # Digital system for the processing of video data for the purpose of studying earth resources (Tsifrovaia sistema obrabotki videoinformatsii dlia tseli issledovaniia prirodnykh resursov) V K Ziobin, A A Anurkin, V V Ereemeev, and E P Korolev In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 209-225 10 refs In Russian

The paper describes the development and utilization of a digital system for processing video earth-resources data. The system consists of a digital computer and an input-output device realized on the basis of reconstructed high-current phototelegraph equipment Attention is given to the structure of the system, the organization of data exchange between the computer and the input-output device, and the general and special software B J

A77-47194 # Some types of preliminary processing of video data (Nekotorye vidy predvaritel'noi obrabotki videoinformatsii). V. I Borisenko, A V Bykov, and L S Chesalin In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 225-234 5 refs In Russian.

The paper considers computer techniques for the preliminary processing of remotely sensed video data on earth resources. Particular attention is given to computer programs for the processing of aerial multispectral video data The processing and synthesis of,

conditional-color images are considered Hardware and software aspects are reviewed B J

A77-47195 # Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources (Voprosy fotogrammetricheskoi obrabotki kosmicheskikh fotosnimkov na baze EVM i sushchestvuiushchikh priborov v interesakh issledovaniia prirodnykh resursov) G B Gonin and N S Ramm In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 235-245 19 refs In Russian

A77-47196 # Analytical methods of the coordinate connection of video data, obtained for purposes of sensing earth resources (Analiticheskie metody koordinatnoi privyazki videoinformatsii, poluchaemoi v tseliakh issledovaniia zemnykh resursov) Ia L Ziman, V A Krasikov, and V G Sobchuk In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 246-251. In Russian

A77-47197 # Methodological problems of multispectral photography from Soyuz-12 (Metodicheskie voprosy mnogozonal'nogo fotografirovaniia s kosmicheskogo korablia 'Soyuz-12') B S Dunaev, V S Savost'ianov, and Iu I Fivenskii In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 252-261 8 refs In Russian

The paper describes the Soyuz-12 experiment involving multispectral photography of the earth surface, providing a detailed characterization of instrumentation and giving attention to the selection of spectral channels and the photometric calibration of the instruments Methods of chemical and radiometric processing of photographs are reviewed and attention is paid to the determination of the spectral brightness, brightness coefficients, and image contrast of photographed objects Problems of statistical image-processing and color image synthesis are addressed The study of earth resources using the analysis of multispectral distributions of brightness is considered B J

A77-47198 # Satellite-borne radio-physical studies of the earth atmosphere and surface (Radiofizicheskie issledovaniia atmosfery i poverkhnosti zemli s ISZ) A E Basharinov, B G Kutuza, and A M Shutko In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 262-275 18 refs In Russian

Experiments on Cosmos 243 and 384, devoted to the investigation of geophysical characteristics from measurements of radio emissions from the earth atmosphere and surface described The effectiveness of using microwave radiometry in studying the atmosphere and surface on a planetary scale is demonstrated Results of Soviet experiments are compared with those carried out on Nimbus 5 and Skylab B J

A77-47199 # Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources (Samoletnye laboratorii i opyt ikh ispol'zovaniia pri obrabotke metodov i sredstv distantsionnykh issledovaniia zemnykh resursov) Ia L Ziman, M Iu Sazhko, and V S Tsitovich In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 275-280 In Russian

A77-47205 # Control of spacecraft for sensing earth resources and monitoring the ambient medium (Upravlenie kosmicheskimi apparatami dlia izucheniia prirodnykh resursov i kontroliia okruzhaiushchei sredy) A A Bol'shoi In Space studies of earth resources Methods and means of measurement and data processing

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

Moscow, Izdatel'stvo Nauka, 1976, p 316-328

In Russian

Several key concepts associated with satellite remote sensing of earth resources are defined, including flight control of spacecraft, command and monitoring systems, computer control and processing centers and flight control centers. Attention is given to task volume relating to command and monitoring systems and to the basic operations of flight control centers. The Priroda-type system for the control of remote sensing satellites is described, and a block diagram of interacting information flow in this system is presented. B J

A77-47255 **Simulation of remote data acquisition systems**
W F Campbell (Mitre Corp., McLean, Va.) In Annual Simulation Symposium, 10th, Tampa, Fla., March 16-18, 1977, Record of Proceedings Tampa, Fla., Annual Simulation Symposium, Long Beach, Calif., IEEE Computer Society, 1977, p 261-277

Digital simulation was extensively utilized to design and predict the performance capabilities of a 'global' remote data acquisition system (RDAS) similar to the ERTS/Landsat data collection subsystem. Operational features of the RDAS components were specified through parametric tradeoffs and implementation cost considerations. The recommended RDAS is comprised of three subsystems: earth-based data collection platforms with sensing and transmission capabilities, four orbiting spacecraft to receive and relay platform transmissions, and mobile ground-based receiving/processing stations. The expected grade-of-service for the RDAS is 0.95 for a six-hour period, with the capability for priority/emergency reporting on a two-hour basis. (Author)

A77-47276 **Problems in infrared spectroscopy of the atmosphere (Voprosy infrakrasnoi spektroskopii atmosfery)** Edited by A M Brounshtein Leningrad, Gidrometeoizdat (Glavnaia Geofizicheskaya Observatoriia imeni A I Voeikova, Trudy, No 369), 1976. 180 p. In Russian

The papers deal with applications of IR spectroscopy to problems involving the total amounts of various atmospheric constituents, spectral transmittance in IR atmospheric windows, water-vapor continuum absorption in the IR, and the origin of atmospheric IR radiation. Topics include optical methods for determining the total CO and CO₂ contents in a vertical atmospheric column, the total CO₂ content in a vertical column given by a direct absorption calculation, optimum filter properties for optical measurement of atmospheric CO₂ content, and an experimental study of atmospheric spectral transmittance in the 8-12-micron window. Other contributions discuss water-vapor continuum absorption in the 8-12-micron window, atmospheric spectral transmittance in 2-13-micron windows along ground-level horizontal paths, water-vapor contributions to atmospheric transmission in 8-13-micron windows, and atmospheric transmission in the IR under different meteorological conditions. F G M

A77-47435 **A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image** M L Heinrich, R D Mower, and G E Johnson (North Dakota University, Grand Forks, N Dak.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 34-49. Research supported by the University of North Dakota and Argonne National Laboratory.

A77-47436 **Landsat MSS imagery - A thematic mapping base** F Adams (Guelph University, Guelph, Ontario, Canada) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 50-55. 6 refs.

Advances in orthophotography and satellite imagery and their implementation in the design and production of thematic maps incorporating the satellite image as a mapping base are discussed. Three aspects of multispectral scanner (MSS) imagery valuable in cartography are emphasized: (1) the large areal extent of single images with homogeneous density gradient, (2) near-orthogonality of the imagery, (3) availability in a time series with short waiting time (from satellite to user). A classification of thematic (weighted) maps is presented. The feasibility of exploiting low-cost satellite imagery in the production of small- to medium-scale photomaps is noted. R D V

A77-47437 **On-line analytics for close-range photogrammetry** V Kratky (National Research Council, Ottawa, Canada) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 58-73. 7 refs.

Analytical on-line systems are shown to be well suited for close-range photogrammetry. The basics of this type of photogrammetric processing are reviewed and a general formulation presented which allows for most universal applications. A suitable computer program developed for the on-line solutions in close-range photogrammetry is described and its versatile functions illustrated in several practical examples. (Author)

A77-47445 **Advances in digital sensor simulation** M B Faintich (Defense Mapping Agency, Aerospace Center, St. Louis, Mo.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 283-302.

Use of digital data bases to simulate radar patterns with indication of land-use data (culture and terrain data) and for the simulation of sensor performance is described. The program is recommended as a valuable editing and analysis tool for production and refinement of digital data bases. The data bases are intended for support to F-111A simulators, providing an improved low-level radar training capability with digitally generated radar landmass images. Generation of reference scenes from this or other data bases is considered for microwave radiation sensors and low-light-level television sensors. R D V

A77-47446 **Geometric evaluation of Skylab S-192 conical scanner imagery** R C Malhotra (Iowa State University of Science and Technology, Ames, Iowa) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 322-343. 8 refs.

Imagery produced by Skylab S-192 multispectral conical scanner (MSCS) was evaluated for geometric fidelity (in two and three dimensions) and sensor pointing accuracy. The performance of the Skylab Earth Resources Experiment Package (EREP) hardware was monitored and algorithms were developed for imagery evaluation and for generating registered data tapes. Two mathematical models were elaborated for geometric evaluation of S-192 MSCS imagery data: the three-dimensional evaluation provides results on the accuracy of tabulations, pointing accuracy of the sensor, and time correlations; the two-dimensional evaluation reproduces S-192 digital data on a screening film. R D V

A77-47449 **An interactive minicomputer image processing system for remote sensing applications** N K Baker, P J Henrikson (Aerospace Corp., Los Angeles, Calif.), F P Weber, and R Liston (US Forest Service, Rosslyn, Va.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings Falls Church, Va., American Society of Photogrammetry, 1976, p 373-385.

This paper describes an inexpensive digital image processing and display system developed by the US Forest Service with contract support from The Aerospace Corporation. The system has been designed to support a wide range of earth resource applications including, land use analysis, vegetation (species) identification, inventory of forests and rangelands, and detection and analysis of insect and disease infestations. Results are presented for a typical application of change detection and forest stand impact analysis for Mountain Pine beetle infestations in the Ponderosa Pine ecosystem of the Black Hills National Forest in western South Dakota. (Author)

A77-47448 Interactive processing of MSS data - A usable system for moderately-sized computer systems. P S Kelley (Mankato State University, Mankato, Minn.) In American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings. Falls Church, Va., American Society of Photogrammetry, 1976, p 362-372. 19 refs. Research supported by the Mankato State University.

The current status of education with respect to digital methods is examined and the characteristics of present-day digital remote sensor processing systems are considered, taking into account proprietary or proprietary-type systems, software systems implemented on a large computer system, and stand alone self-contained software systems which are usable on a variety of computer systems. It is found that the Algorithm Simulation Test and Evaluation Program (ASTEP) is the only available off-the-shelf system which is truly user-oriented and compatible with computer systems which are usually found in moderately-sized colleges and universities. G R

A77-47476 Optical power spectrum analysis. Scale and resolution effects. J C Leachtenauer (Boeing Aerospace Co., Seattle, Wash.) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1117-1125. 11 refs.

Three sets of large- and medium-scale panchromatic aircraft photos were analyzed, to determine the applicability of optical power spectrum analysis and to investigate the effects of scale/resolution differences. For each image sample measurement, 64 data points were produced. The first 32 defined relative power as a function of spatial frequency. The second 32 defined relative power as a function of direction. Comparisons of scale/resolution effects were conducted with the aid of the values. Multidiscriminant analysis routines designed to test classification accuracy were also considered. Reasonable success was achieved in classifying land use on photos at three different scales. G R

A77-47478 Testing land-use map accuracy. J L van Genderen (Fairey Surveys, Ltd., Maidenhead, Berks., England) and B. F. Lock (Salisbury College of Advanced Education, Adelaide, Australia) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1135-1137. 5 refs.

A description is presented of a simple yet reliable method for determining the most appropriate sample size acceptable for valid statistical testing of remote sensing land-use accuracy. For any sample point, it is to be shown whether the remote sensing attribution to a class within the classification is correct or in error. The sampling strategy considered provides a reliable framework for testing the accuracy of any remote sensing image interpretation-based land-use classification using the minimum number of sample points possible. G R

A77-47479 Proposed parameters for an operational Landsat. A P Colvocoresses (US Geological Survey, Reston, Va.) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1139-1145. 15 refs.

Criteria for the operational mode are considered. It is suggested that an operational test of at least 10 years, based on proven Landsat parameters is needed for a full evaluation of Landsat earth sensing. Certain parameters of Landsat-1 and -2 are to be modified for operational use. However, the changes apply to the sensing system

rather than the orbital parameters. Fundamental criteria for an operational Landsat are related to the full availability of data on a global basis, economic practicality, and continuity with respect to Landsat-1, 2, and -C. Attention is given to sensor type, wavebands, quantizing level, sampling frequency, sensor weight, sensor power requirements, expected sensor life, and aspects of satellite orbit. G R

A77-47481 Corrected Landsat images using a small computer. A N Williamson (US Army Engineer Waterways Experiment Station, Vicksburg, Miss.) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1153-1159.

Experience has shown that large computer facilities are not necessarily a prerequisite for converting Landsat computer-compatible tapes to scene-corrected and map-corrected images. A technique is discussed in which these tasks are accomplished on a small computer with 16,000 words of magnetic core storage and two disk storage units. (Author)

A77-47690 # Some aspects of the calculation of the thermal radio emission from ice- and snow-type stratified structures by a computer-aided flow graph technique (*Voprosy rascheta teplovogo radioizlucheniia mnogosloynnykh struktur tipa l'da i snega metodom orientirovannykh grafov s primeneniem EVM*). M D Raev, E A Sharkov, T A Shiriaeva, and V S E'tkin. In Radiation studies in the atmosphere. Leningrad, Gidrometeoizdat, 1976, p 27-36. 9 refs. In Russian.

A77-47697 # Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges (*Distantionnoe issledovanie prirodnykh obrazovanii po izmeneniiu koeffitsientov iarkosti v uzkiikh spektral'nykh intervalakh*). K Ia Kondrat'ev, O B Vasil'ev, O M Pokrovskii, and G A Ivanian. In Radiation studies in the atmosphere. Leningrad, Gidrometeoizdat, 1976, p 98-114. 9 refs. In Russian.

Three quantitative methods are discussed for analyzing the information content of the spectral reflection characteristics of earth formations for use in the optimal selection of spectral ranges for satellite-based surveys at wavelengths between 0.4 and 2.5 microns. A four-lens camera designed to measure luminance factors of earth resources in narrow spectral ranges is discussed. V P

A77-47974 Accuracy models for bundle block triangulation (*Genauigkeitsmodelle fur die Bundelblocktriangulation*). H Ebner (Munich, Technische, Universitat, Munich, West Germany), K Krack, and E Schubert. *Bildmessung und Luftbildwesen*, vol 45, Sept 1, 1977, p 141-148. 13 refs. In German.

Accuracy models for bundle block triangulation are derived on the basis of the results obtained in a large number of schematic adjustment calculations. Mean values and maximum values of the theoretical standard deviations of adjusted block coordinates are used as accuracy criteria. The obtained models provide a description regarding the dependence of the accuracy evaluation parameters on a number of project parameters. The project parameters considered include focal length, accuracy of image coordinates, image scale, sideward overlap, block size, and control distribution. G R

A77-49291 * The application of Fourier transform spectroscopy to the remote identification of solids in the solar system. H P Larson and U Fink (Arizona, University, Tucson, Ariz.) *Applied Spectroscopy*, vol 31, Sept-Oct 1977, p 386-402. 41 refs. Grants No NGR-03-002-332, No NSG-7070.

The techniques of Fourier transform spectroscopy combined with large aperture telescopes and advances in detector technology now permit infrared (at a wavelength greater than 1 micron) observations of the surfaces of small solar system objects such as asteroids and satellites. The results demonstrate that this activity can produce important new compositional information related to the origin and evolution of the solar system. The detection of water ice in Saturn's rings and on some of the satellites of Jupiter and Saturn confirm expectations that ices are important mineralogical compo-

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

nents in the chemistry of the outer solar system. More recent studies of the mineralogical composition of the surfaces of asteroids provide a new observational link to the origin of meteorites and the early thermal history of the solar system. These results have been dependent upon supporting laboratory studies of the spectral behavior of ices and minerals to define the potential, and limitations, of the method. Since many of the astronomical observations have been exploratory in nature, prospects are good that continued refinement of the techniques will lead to additional insights.

(Author)

A77-49394 Visible and near-infrared reflectance of beach sands. A study on the spectral reflectance/grain size relationship. D. J. Leu (Delaware University, Newark, Del.) *Remote Sensing of Environment*, vol 6, no 3, 1977, p 169-182. 23 refs. Contract No. N0014-74-C-0273.

A77-49395 Interpretation of airborne spectral reflectance measurements over Georgian Bay. J. R. Miller, S. C. Jain, N. T. O'Neill (York University, Toronto, Canada), W. R. McNeil (W. R. McNeil and Associates, Inc., Toronto, Canada), and K. P. B. Thomson (Canada Centre for Remote Sensing, Ottawa, Canada). *Remote Sensing of Environment*, vol 6, no 3, 1977, p 183-200. 18 refs. Department of Supply and Services Contract No. 0554-0078.

Airborne spectral measurements were made along three flight lines over Georgian Bay in August and October 1974. Spectral data were collected in the wavelength regions 0.44 to 0.46, 0.55 to 0.59, 0.68 to 0.70, and 0.72 to 0.75 micron using a four-channel spectral scanning photometer. The airborne spectral-reflectance curves over several stations were compared with subsurface volume reflectance measurements made during a ship cruise. These comparisons permitted an evaluation of the water surface-reflection effects on the airborne data. The airborne spectral-reflectance curves are then interpreted using a two-flow radiative-transfer model to derive chlorophyll-concentration line profiles. Correlation coefficients between calculated and ship-measured chlorophyll data range from 0.810 to 0.984.

(Author)

A77-49905 * Simulation of the effects of hard limiting on image quality of synthetic aperture radar. R. G. Lipes and S. A. Butman (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In *International Telemetering Conference*, Los Angeles, Calif., September 28-30, 1976, Proceedings, Pittsburgh, Pa., Instrument Society of America, 1976, p 591-601. 14 refs. Contract No. NAS7-100.

Starting with a magnetic tape of a scene viewed by the Landsat satellite, the radar return of reflectors whose average intensity matched that of the picture elements in the scene has been simulated. The returns were processed in three ways: normally or with no quantization, with a procedure simulating IF hard limiting, and with a procedure simulating video (baseband) hard limiting. For each type of processing an image for a one, two, and four-look system has been developed. It was found that IF limiting is slightly better than video limiting, while both can be reasonable trade-offs of image quality for reduced data rates when the number of looks is four or less. These conclusions are supported by photographs representing the different processing techniques.

(Author)

A77-50317 Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4. M. N. Markov, G. M. Grechko, A. A. Gubarev, Iu. S. Ivanov, and V. S. Petrov (*Kosmicheskie Issledovaniia*, vol 15, Jan-Feb 1977, p 125-128). *Cosmic Research*, vol 15, no 1, July 1977, p 102-105. 12 refs. Translation.

A77-50443 Remote investigations of the environment from space and problems of space data handling. L. M. Mitnik, Iu. E. Sidorov, and S. V. Solonin (Leningradskii Gidrometeorologicheskii Institut, Leningrad, USSR). (*International Astronautical Federation, International Astronautical Congress, 26th, Lisbon, Portugal, Sept*

21-27, 1975). *Acta Astronautica*, vol 4, July-Aug 1977, p 769-787. 15 refs.

The possibility of remote sensing of the environment by active and passive methods of observations at microwave, infrared (IR), and visible wavelengths is discussed. The conclusion is reached that it is necessary to conduct complex measurements and expedient to use microwave sounding. A generalized scheme of remote sensing is presented. A problem of statistic synthesis of algorithms of classification of data observed and a problem of estimating environmental parameters under conditions of a priori uncertainty are considered. A general outline of the problem of solution selection, a data summary and a brief description of methods used to overcome a priori uncertainty are given. Examples of synthesis of algorithms classification, with the efficiency of these, and structural schemes of appropriate devices are presented.

(Author)

A77-50447 * Digital technique for generating synthetic aperture radar images. W. J. van de Lindt (IBM Corp., Federal Systems Div., Houston, Tex.). *IBM Journal of Research and Development*, vol 21, Sept 1977, p 415-432. 10 refs. Contract No. NAS9-1435D.

This paper describes a digital processing method applicable to a synthetic aperture radar, to be carried by the space shuttle or by satellites. The method uses an earth-fixed coordinate system in which corrective procedures are invoked to compensate for errors introduced by the satellite motion, earth curvature, and wavefront curvature. Among the compensations discussed are those of the coordinate system, skewness, roll, pitch, yaw, earth rotation, and others. The application of a Fast Fourier Transform in the numerical processing of the two-dimensional convolution is discussed in detail.

(Author)

A77-50799 # The possibility of using Fourier spectra in aerial photography (O vozmozhnosti ispol'zovaniia spektrov Fur'e v aerofotografii). O. A. Gerasimova and A. A. Lozovskii. *Geodeziia i Kartografiia*, July 1977, p 37-42. 7 refs. In Russian.

The use of coherent techniques in photogrammetry is considered, and the suitability of Fourier spectra for the analysis of photographic images and thermal and radar representations is studied. The quality of aerial negatives was evaluated by use of Fourier spectra measurements. Some aspects of the use of Fourier spectra, such as deciphering, generalizing, quality evaluation, and image improvement, are discussed.

M. L.

A77-50966 Theory and application of wave propagation and scattering in random media. A. Ishimaru (Washington University, Seattle, Wash.). *IEEE, Proceedings*, vol 65, July 1977, p 1030-1061. 196 refs. NSF Grant No. ENG-74-23540, Contract No. F19628-74-C-005, Grant No. NIH-GM-16436.

Current work on wave propagation and scattering in random (continuous or discontinuous) media is reviewed. The atmosphere, ocean, and biological media with randomly time varying and space-varying parameters, and propagation and scattering of EM, optical, and acoustic waves in those media, are emphasized. Waves in randomly distributed scatterers, waves in random continua, and remote sensing of random media are discussed. Approximate solutions and multiple scattering theories pertinent to transport theory, propagation characteristics of intensities, wave fluctuations, pulse propagation and pulse scattering, coherence bandwidth and coherence time of communication channels through random media are addressed. Application of inversion techniques to ill-posed remote sensing problems is dealt with.

R. D. V.

A77-51432 Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics. D. N. Mishev and T. K. Ianev (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Kosmicheski Izsledvaniia, Sofia, Bulgaria). *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-113*. 5 p. 5 refs.

Multidimensional vectors are employed in devising discriminant transformations to filter out errors in spectral reflectance imagery.

classification. In particular, autocorrelation transformations, which are capable of filtering out additive constants, as well as linear transformations applicable to noise filtering, are considered. The transformations are evaluated in terms of a risk function which takes into account the probability of classification errors in analyzing natural formations (i.e., forests) from spectral reflectance data.

J M B

A77-51433 A high-resolution multispectral scanner for earth observation (Caméra multispectrale à haute résolution spatiale pour l'observation de la terre). G. Otrio (Centre National d'Etudes Spatiales, Toulouse, France) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-115* 31 p. In French.

Design of a scanning system for earth observation in the visible, near infrared and thermal infrared spectral ranges is discussed. The scanner, which has a spatial resolution of 20 m and a scanning field of plus or minus 17 deg (plus or minus 120 km), is a static system, involving the 'push-broom' technique instead of a sweep system. Selection of a telescope for the scanner, performance of the optical system, and problems associated with detector noise are reviewed, the satellite for which the scanning system was developed is also described.

J M B

A77-51434 New developments in microwave remote sensing. J. W. Rouse, Jr. (Texas A & M University, College Station, Tex.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-117* 25 p. 17 refs.

Applications of microwave remote sensing for surveying earth resources are described with attention to measurements of soil moisture, vegetation, snow, and watershed. Techniques used in the study of soil moisture include passive microwave measurements, L band radiometer, and dual-polarization measurement, the uncertainty as to the 'depth of penetration' of the microwaves complicates the interpretation of soil measurement data. Limitations of Landsat data for discriminating crops are summarized. Scattering theory research is briefly described, and the implications of changes in backscatter for measurement techniques are considered. Planned projects involving Seasat and spaceborne imaging radar are described.

M L

A77-51435 The progress in microwave radiation investigations of continental covers during 1967-1977. N. A. Armand, A. E. Basharinov, and A. M. Shutko (Academy of Sciences, Intercosmos Council, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-118* 24 p. 20 refs.

Microwave radiation theory and observations pertinent to the development of techniques for measuring continental cover are described. The manner in which moisture content, soil temperature profiles, vegetative cover, and the degree of water mineralization affect the microwave radiation spectrum of continental areas is examined, and the results of a comparison of Cosmos-243 data and Nimbus-5 data are explained. Some peculiarities of microwave radiation in the polar regions are reported. Several examples of brightness temperature data and their variation with respect to water content are presented.

M L

A77-51436 A multidisciplinary lidar system - Aims, technology, missions. E. F. Achtermann, E. Weber (Dornier-System GmbH, Friedrichshafen, West Germany), W. Renger (Deutsche Forschungs- und Versuchsanstalt für Luft und Raumfahrt, Institut für Physik der Atmosphäre, Oberpfaffenhofen, West Germany), and W. Wiesemann (Battelle-Institut, Frankfurt am Main, West Germany) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-125* 10 p.

The uses of light detection and ranging system (lidar) are examined. Lidar can measure metal vapors and trace gases, reflection coefficients of the earth surface, and wind velocities within the atmosphere. A 'multidisciplinary' airborne lidar is described which

will detect both aerosols by the backscattering of light and pollution by determining the reduction of transmitted light caused by resonant absorption by the pollutants. A model mission to be conducted by a highflying jet includes operation over a 60 by 60 sq km industrial region (Ruhr) with a grid distance of 5 km, flight altitude 3500 m, operation over a 50 by 50 sq km urban region (Munich), and a one flight track of 250 km over a mixed industrial and agricultural region. Proposed Spacelab lidar design and missions are also discussed.

M L

A77-51437 Application of Landsat satellite imagery in assessing the regional geological, structural, environmental and groundwater conditions in the Qattara depression area, Egypt. E. M. El Shazly, M. A. Abdel Hady, M. A. El Ghawaby, S. M. Khawasik, and M. M. El Shazly (Remote Sensing Center, Cairo, Egypt) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-128* 15 p. 9 refs.

A77-51633 Monitoring coastal development pressure - Examples of the application of remote sensing technique II. D. Garofalo and F. J. Wobber *Functional Photography, vol 12, Sept 1977, p 26-30*.

The use of remote sensing to monitor second level response to development and environmental pressure on the New Jersey coast is discussed with reference to the following developmental areas: extractive industries, expanded road networks, shore protection structures and waste disposal systems. It is found that small scale aircraft and spacecraft imagery provides useful synoptic data for establishing broad indices of environmental quality and for evaluating environmental pressure in response to changing land use. Low altitude aerial photography can be used to perform detailed investigations of the environment, once problem areas are identified from high altitude platforms. A number of aerial photographs are presented.

B J

N77-28552*# Sheffield Univ (England) **A METHODOLOGY FOR PRODUCING SMALL SCALE RURAL LAND USE MAPS IN SEMI-ARID DEVELOPING COUNTRIES USING ORBITAL IMAGERY** Final Report. J. L. vanGenderen, Principal Investigator and B. F. Lock. Dec 1976. 313 p. refs. Sponsored by NASA. Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S. D. 57198. EREP (E77-10187, NASA-CR-151173). Avail. NTIS HC A14/MF A01 CSCL 08B.

The author has identified the following significant results: Results have shown that it is feasible to design a methodology that can provide suitable guidelines for operational production of small scale rural land use maps of semiarid developing regions from LANDSAT MSS imagery using inexpensive and unsophisticated visual techniques. The suggested methodology provides immediate practical benefits to map makers attempting to produce land use maps in countries with limited budgets and equipment. Many preprocessing and interpretation techniques were considered but rejected on the grounds that they were inappropriate mainly due to the high cost of imagery and/or equipment or due to their inadequacy for use in operational projects in the developing countries. Suggested imagery and interpretation techniques consisting of color composites and monocular magnification proved to be the simplest, fastest and most versatile methods.

N77-28560*# Kansas Univ Center for Research, Inc. Lawrence Remote Sensing Lab **RADAR SYSTEMS FOR A POLAR MISSION, VOLUME 1**. R. K. Moore, J. P. Claassen, R. L. Erickson, R. K. T. Fong, M. J. Komen, J. McCauley, S. B. McMillan, and S. K. Parashar. Feb 1977. 89 p. refs. (Contract NAS5-22325) (NASA-CR-152510, RSL-TR-291-2-Vol-1). Avail. NTIS HC A05/MF A01 CSCL 08H.

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

The application of synthetic aperture radar (SAR) in monitoring and managing earth resources is examined. Synthetic aperture radars form a class of side-looking airborne radar often referred to as coherent SLAR which permits fine-resolution radar imagery to be generated at long operating ranges by the use of signal processing techniques. By orienting the antenna beam orthogonal to the motion of the spacecraft carrying the radar a one-dimensional imagery ray system is converted into a two-dimensional or terrain imaging system. The radar's ability to distinguish - or resolve - closely spaced transverse objects is determined by the length of the pulse. The transmitter components, receivers, and the mixer are described in detail. Author

N77-28561*# Kansas Univ. Center for Research, Inc., Lawrence Remote Sensing Lab

RADAR SYSTEMS FOR A POLAR MISSION, VOLUME 2 Final Report

R. K. Moore, J. P. Claassen, R. L. Erickson, R. K. T. Fong, B. C. Hanson, M. J. Komen, S. B. McMillan, and S. K. Parashar. Jun 1976. 117 p. refs.

(Contract NAS5-22384)

(NASA-CR-152511, RSL-TR-291-2-Vol-2) Avail NTIS HC A06/MF A01 CSCL 08H

For abstract see N77-28560

N77-28562# Swedish Space Corp. Solna **QUICK-LOOK CAPABILITY IN A EUROPEAN EARTH RESOURCES SATELLITE DATA NETWORK Final Report**

15 Apr 1977. 152 p. refs.

(Contract ESA-SC/128-HQ)

(FU15-4) Avail NTIS HC A08/MF A01

The Swedish satellite data processing system is analyzed to identify user requirements for quick-look data in the area covered by the planned European network and to assess the elements required for an optimum quick-look system to meet user requirements within the planned network. Author

N77-28685# Naval Postgraduate School, Monterey, Calif. **A THREE PLATFORM EXPERIMENT ON OPTICAL TURBULENCE IN THE MARINE BOUNDARY LAYER M.S. Thesis**

Richard Henry Paine. Mar 1977. 67 p. refs.

(AD-A039789) Avail NTIS HC A04/MF A01 CSCL 04/1

An observational experiment was conducted in the marine boundary layer off the California coast involving optical turbulence measurements. The measurements were made from a ship, a tethered kite, and two C-135 aircraft. Measured values of $C(n)$ squared from the surface to levels above the marine inversion were related to the synoptic weather situation. $C(n)$ squared values were observed to be maximum in the inversion. Near surface $C(n)$ squared values, measured from two levels on the ship, exhibited expected diurnal changes. Overall, $C(n)$ squared values measured optically (scintillation) and meteorologically (from $C(T)$ squared measurements) compared satisfactorily. $C(n)$ squared profiles estimated from surface observed values using a z to the $-4/3$ power assumed distribution appeared to define the mean measured profile. GRA

N77-28709# National Oceanic and Atmospheric Administration, Boulder, Colo., Atmospheric Physics and Chemistry Lab. **CHARACTERISTICS OF MESO-BETA-SCALE DEEP CONVECTION OVER THE EASTERN TROPICAL ATLANTIC**

Lee R. Hoxit. May 1976. 19 p. refs.

(PB-266955/4 NOAA-TR-ERL-366 APCL-38

NOAA-77041314) Avail NTIS HC A02/MF A01 CSCL 04B

Infrared imagery of SMS/GOES satellites is used to estimate the temporal and spatial variability of isolated mesoscale convective systems over the tropical Eastern Atlantic for a study period (July 17 - Sept 6 1974) that includes most of the GATE experimental period. The region along 10 degrees N experiences the greatest frequency of these storms. A pronounced diurnal variation is found in the times of initial development with maximum frequencies near midnight. Typical life cycles encompass roughly 5-10 hours. The data suggest a tendency for these systems to develop in regions of low-level convergence and mid-tropospheric divergence. GRA

N77-28827*# Texas A&M Research Foundation, College Station, Dept. of Mathematics

IMAGE ANALYSIS LIBRARY SOFTWARE DEVELOPMENT Final Report, 2 Feb 1976 - 31 May 1977

L. F. Guseman, Jr. and Jack Bryant. 31 May 1977. 13 p. refs.

(Contract NAS9-14904)

(NASA-CR-151469) Avail NTIS HC A02/MF A01 CSCL 09B

The Image Analysis Library consists of a collection of general purpose mathematical/statistical routines and special purpose data analysis/pattern recognition routines basic to the development of image analysis techniques for support of current and future Earth Resources Programs. Work was done to provide a collection of computer routines and associated documentation which form a part of the Image Analysis Library. Author

N77-29591*+ National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

LANDSAT NON-US STANDARD CATALOG, 1 APRIL 1977 THROUGH 30 APRIL 1977

30 Apr 1977. 146 p.

(NASA-TM-74828 GSFC/LN-C/004, NTISUB/C/139-004)

Avail NTIS HC A07 CSCL 05B

The Non-U.S. Standard Catalog lists imagery acquired by LANDSAT 1 and 2 which has been processed and input to the data files during the referenced month. Data, such as date acquired, cloud cover, and image quality are given for each scene. The microfilm roll and frame on which the scene may be found is also given. Author

N77-29593*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

LANDSAT NON-US STANDARD CATALOG, 1 MAY 1977 - 31 MAY 1977

31 May 1977. 113 p.

(NASA-TM-74825 GSFC/LN-C/005, NTISUB/C/139-005)

Avail NTIS HC A06/MF A01 CSCL 05A

Information regarding the availability of LANDSAT imagery processed and input to the data files by the NASA Data Processing Facility is published on a monthly basis. The U.S. Standard Catalog includes imagery covering the continental United States, Alaska, and Hawaii. The Non-U.S. Standard Catalog identifies all the remaining coverage. Sections 1 and 2 describe the contents and format for the catalogs and associated microfilm. Section 3 provides a cross-reference defining the beginning and ending dates for LANDSAT cycles. Sections 4 and 5 cover LANDSAT-1 and LANDSAT-2 coverage, respectively. Author

N77-29594*# General Electric Co., Beltsville, Md. **LANDSAT Operations Control Center**

LANDSAT-1 AND LANDSAT-2 FLIGHT EVALUATION REPORT, 23 OCTOBER 1976 TO 23 JANUARY 1977

22 Feb 1977. 232 p. refs.

(Contract NAS5-21808)

(NASA-CR-152577 Rept-77SDS4204) Avail NTIS HC A11/MF A01 CSCL 22A

Performance analyses for LANDSAT 1 and 2 launched respectively in 1972 and 1975 are reported. Operational controls are evaluated as well as orbital parameters and various subsystems. Both satellites continue to perform their missions normally in spite of past minor operational malfunctions. BLP

N77-29599# Environmental Systems Research Inst., Redlands, Calif.

DIMECNV A SYSTEM FOR CONVERTING SCANNER-DIGITIZED MAPPING DATA TAPES TO POLYGON FORMAT

20 Dec 1976. 35 p. Sponsored in part by Geol. Survey, Reston, Va.

(PB-266438/1) Avail NTIS HC A03/MF A01 CSCL 08B

Land use maps, correlative census and county boundary maps, drainage basin maps, and geologic maps were produced. To demonstrate the system's capability, color transparencies and black-and-white printouts of the Montgomery County, Maryland, and Fairfax County, Virginia, land use maps were produced by playing the digitized data through plotting devices. Documenta-

tion of the computer conversion program is provided with this project
GRA

N77-29601*# National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
LANDSAT US STANDARD CATALOG, 1 APRIL 1977 - 30 APRIL 1977

30 Apr 1977 97 p
(NASA-TM-74776 GSFC/LU-C/004, NTISUB/C/138-004)
Avail NTIS HC A05/MF A01 CSCL 05B

The U S Standard Catalog lists U S imagery acquired by LANDSAT 1 and 2 which has been processed and input to the data files during the referenced month Data such as date acquired cloud cover and image quality are given for each scene The microfilm roll and frame on which the scene may be found is also given
Author

N77-29679# Air Force Geophysics Lab, Hanscom AFB Mass
Optical Physics Div

SATELLITE TEMPERATURE SOUNDING OF THE ATMOSPHERE GROUND TRUTH ANALYSIS

Robert A McClatchey 19 Nov 1976 40 p refs

(AF Proj 7670)

(AD-A038236 AFGL-TR-76-0279 AFGL-AFSG-356) Avail
NTIS MF A01 CSCL 04/2

Defense Meteorological Satellite measurements of the upwelling radiation in the sounder channels of the 15 micrometer CO2 band have been compared with calculations for a number of clear atmospheric conditions Great care was used to ensure that complete radiosonde and rocketsonde data coincident in space and time were available The methods of transmittance and radiance calculations are described and the results compared directly with the satellite measurements The results indicate a systematic discrepancy in all but one channel Calculations in general exceeded the measured radiances
Author (GRA)

N77-29729*# Kanner (Leo) Associates, Redwood City Calif
IDENTIFICATION OF 180 MILLION YEARS OLD, PROBABLY UNCHANGED MELANINE

K Beyermann and D Hasenmaier Washington NASA Jul 1977 10 p refs Transl into ENGLISH from Z fuer Anal Chem (Wiesbaden) vol 266 1973 p 202-205
(Contract NASw-2790)

(NASA-TM-75132) Avail NTIS HC A02/MF A01 CSCL 06C

The comparison of the infrared spectra of recent sepi melanine and of the content of the ink sac of fossilized cuttlefish indicates that the 180 million years old substance is unchanged melanine Both substances behave identically on heating Other procedures for identification of melanine are surveyed critically
Author

N77-30290*# National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville Ala

DATA MANAGEMENT FOR EARTH OBSERVATIONS

George F McDonough *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol* May 1977 p 201-210

Avail NTIS HC A13/MF A01 CSCL 05B

The management of NASA earth observation data is discussed User requirements are identified as well as means to facilitate data acquisition It is shown that LANDSAT data can be preprocessed to condense data into a more accessible format thus reducing data acquisition costs
J H

N77-30443*# Applied Science Associates, Inc, Apex NC
INITIAL DEVELOPMENT OF A METHOD OF SIGNIFICANT WAVEHEIGHT ESTIMATION FOR GEOS-III

G S Hayne Aug 1977 13 p refs

(Contract NAS6-2520)

(NASA-CR-141425) Avail NTIS HC A02/MF A01 CSCL 08C

The numerical method by which ocean surface significant waveheight estimates are produced from the GEOS-3 radar altimeter data is described Four parameters characterizing the expected radar mean return waveform are determined from the

altimeter's sixteen sample-and-hold waveform samplers through use of an iterative, least squares approach One of the four parameters is a risetime term which has contributions from both the transmitted radar pulse width and the rms ocean surface height, the estimated significant waveheight is extracted from this risetime The noise character of the estimation process leads to occasional negative significant waveheight estimates and the origin of these nonphysical negative results is discussed Possible modifications and areas for additional investigation are indicated
Author

N77-30546 Pennsylvania State Univ University Park
PROCEDURES FOR THE SYSTEMATIC EVALUATION OF REMOTE SENSOR PERFORMANCE AND QUANTITATIVE MISSION PLANNING Ph D Thesis

Lewis Edwin Link 1976 288 p

Avail Univ Microfilms Order No 77-9569

Analytical models that allow control of the variables that influence the imagery produced by photographic and thermal IR scanning sensor systems were developed Formulation from these models of simple tools for planning photographic and thermal IR remote sensing missions was made
Dissert Abstr

N77-30547 Pennsylvania State Univ University Park
BHATTACHARYYA DISTANCE AS A FEATURE SELECTION METHOD FOR MULTISPECTRAL DATA Ph D Thesis

Seon Jong Chung 1976 207 p

Avail Univ Microfilms Order No 77-9539

A compact form expression of the Bhattacharyya distance function for the general case of K classes was derived and tested as a criterion for measure of separability among classes and was used in the feature selection of the multidimensional remote sensing data This expression was obtained from the definition of the Bhattacharyya coefficient by taking the integral of the product of all the probability density functions for K classes The newly derived distance provides a more a compact and workable function formula for determining the Bhattacharyya distance in the K class case than the existing average form Bhattacharyya distance and was shown to yield good results for future selection application to the multispectral digital data
Dissert Abstr

N77-30548*# Purdue Univ Lafayette Ind Lab for Applications of Remote Sensing

[APPLICATIONS OF REMOTE SENSING, VOLUME 1] Final Technical Report, 1 Jun 1976 - 31 May 1977

D A Landgrebe Principal Investigator 31 May 1977 196 p Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 EREP (Contract NAS9-14970)

(E77-10182 NASA-CR-151454)

Avail NTIS

HC A09/MF A01 CSCL 05B

The author has identified the following significant results ECHO successfully exploits the redundancy of states characteristics of sampled imagery of ground scenes to achieve better classification accuracy reduce the number of classifications required and reduce the variability of classification results The information required to produce ECHO classifications are cell size cell homogeneity cell-to-field annexation parameters input data and a class conditional marginal density statistics deck

N77-30549*# Purdue Univ Lafayette Ind Lab for Applications of Remote Sensing

[APPLICATIONS OF REMOTE SENSING, VOLUME 3] Final Technical Report, 1 Jun 1976 - 31 May 1977

D A Landgrebe, Principal Investigator 1977 78 p refs Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls S D 57198 EREP (Contract NAS9-14970)

(E77-10185 NASA-CR-151452)

Avail NTIS

HC A05/MF A01 CSCL 05B

The author has identified the following significant results Of the four change detection techniques (post classification comparison delta data spectral/temporal and layered spectral

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

temporal) the post classification comparison was selected for further development. This was based upon test performances of the four change detection method straightforwardness of the procedures and the output products desired. A standardized modified supervised classification procedure for analyzing the Texas coastal zone data was compiled. This procedure was developed in order that all quadrangles in the study area would be classified using similar analysis techniques to allow for meaningful comparisons and evaluations of the classifications.

N77-30550*# Purdue Univ Lafayette Ind Lab for Applications of Remote Sensing

[APPLICATIONS OF REMOTE SENSING, VOLUME 2] Final Technical Report, 1 Jun 1976 - 31 May 1977

D A Landgrebe Principal Investigator 1977 93 p refs Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 EREP (Contract NAS9-14970)

(E77-10186 NASA-CR-151453) Avail NTIS HC A05/MF A01 CSCL 05B

The author has identified the following significant results. The overall spectral response of the strata measured by a mean vector and covariance matrix for each stratum did not show differences among the LACIE phase 3 strata using the machine clustering procedures. This was expected since the large strata gave rise to broad normal distributions with a great deal of overlap. The static stratification of Kansas contains strata which are small in size. The distributions for these strata are not as broad as those based on the LACIE phase 3 partitions but there is still some confusion since strata from different categories are not spectrally distinct.

N77-30556*# Geological Survey Reston Va
LAND USE MAPPING AND MODELLING FOR THE PHOENIX QUADRANGLE Progress Report, 1 Jul 1972 - 19 Apr 1974

John L Place Principal Investigator 19 Jun 1974 34 p refs Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 ERTS

(NASA Order S-70243-AG) (E77-10196 NASA-CR-154263) Avail NTIS HC A03/MF A01 CSCL 08B

The author has identified the following significant results. The mapping of generalized land use (level 1) from ERTS 1 images was shown to be feasible with better than 95% accuracy in the Phoenix quadrangle. The accuracy of level 2 mapping in urban areas is still a problem. Updating existing maps also proved to be feasible especially in water categories and agricultural uses however expanding urban growth has presented with accuracy. ERTS 1 film images indicated where areas of change were occurring thus aiding focusing-in for more detailed investigation. ERTS color composite transparencies provided a cost effective source of information for land use mapping of very large regions at small map scales.

N77-30559*# Atomic Energy Commission Dacca (Bangladesh)
INVESTIGATIONS USING DATA FROM LANDSAT-2 Quarterly Report, Apr - Jun 1977

Anwar Hossain, Principal Investigator Jul 1977 7 p refs Sponsored by NASA ERTS

(E77-10199 NASA-CR-154265) Avail NTIS HC A02/MF A01 CSCL 05B

N77-30560*# Guelph Univ (Ontario)
LANDSAT/BANGLADESH PROJECT

Richard Protz and A Hossain Principal Investigators 17 May 1977 12 p refs Sponsored by NASA ERTS

(E77-10200 NASA-CR-154266) Avail NTIS HC A03/MF A01 CSCL 05B

N77-30561*# Atomic Energy Commission Dacca (Bangladesh)
REMOTE SENSING AND SATELLITE SURVEYING IN BANGLADESH A BACKGROUND PAPER ON THE LATEST POSITION OF THE STATUS OF REMOTE SENSING AND SATELLITE SURVEYING IN BANGLADESH

Anwar Hossain, Principal Investigator 1977 6 p Sponsored by NASA ERTS

(E77-10201 NASA-CR-154267) Avail NTIS HC A02/MF A01 CSCL 05B

N77-30562*# Atomic Energy Commission Dacca (Bangladesh)
ESCAP INTER-GOVERNMENTAL MEETING ON REMOTE SENSING AND SATELLITE SURVEYING

Anwar Hossain Principal Investigator 1977 40 p Meeting held at Bangkok 7-13 Jun 1977 Sponsored by NASA ERTS (E77-10202 NASA-CR-154268) Avail NTIS

HC A03/MF A01 CSCL 05B

N77-30565*# Missouri Dept of Natural Resources Rolla
REMOTE SENSING APPLICATIONS TO MISSOURI ENVIRONMENTAL RESOURCES INFORMATION SYSTEM Annual Report, 15 Jan 1976 - 15 Jan 1977

Robert E Myers 15 Jan 1977 85 p

(Contract NAS8-31766) (NASA-CR-150340) Avail NTIS HC A05/MF A01 CSCL 08F

An efficient system for retrieval of remotely sensed data to be used by natural resources oriented agencies and a natural resources data system that can meet the needs of state agencies were studied. To accomplish these objectives natural resources data sources were identified and study of systems already in operation which address themselves to the more efficient utilization of natural resources oriented data was prepared. Author

N77-30566*# Missouri Univ Rolla Dept of Minerals Petroleum and Geological Engineering

APPLICATION TRANSFER ACTIVITY IN MISSOURI Annual Progress Report, 5 Jan 1976 - 5 Jan 1977

David J Barr Jan 1977 74 p refs Original contains color illustrations

(Contract NAS8-31767) (NASA-CR-150341) Avail NTIS HC A04/MF A01 CSCL 05B

Land use mapping of Missouri from LANDSAT imagery was investigated. Land resource classification included the inventory of mined land accomplished with infrared aerial photography plus topographic geologic and hydrologic maps. B L P

N77-30567*# Arizona Univ Tucson Office of Arid Lands Studies

APPLIED REMOTE SENSING PROGRAM (ARSP) Annual Report, FY 1976 - 1977

David A Mouat Jack D Johnson and Kenneth E Foster Jun 1977 56 p refs

(Grant NGL-03-002-313) (NASA-CR-153413 OALS-Bull-15 AR-5) Avail NTIS HC A04/MF A01 CSCL 05B

Descriptions of projects engaged by the Applied Remote Sensors Program in the state of Arizona are contained in an annual report for the fiscal year 1976-1977. Remote sensing techniques included thermal infrared imagery in analog and digital form and conversion of data into thermograms. Delineation of geologic areas surveys of vegetation and inventory of resources were also presented. B L P

N77-30577*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md

LAND USE/LAND COVER MAPPING (1:25000) OF TAIWAN, REPUBLIC OF CHINA BY AUTOMATED MULTISPECTRAL INTERPRETATION OF LANDSAT IMAGERY

Quo-Cheng Sung and Lee D Miller Aug 1977 182 p refs Submitted for publication

(NASA-TM-X-71382 X-923 77-210) Avail NTIS HC A09/MF A01 CSCL 08B

Three methods were tested for collection of the training sets needed to establish the spectral signatures of the land classification, and (4) layered spectral/temporal change classification. The post classification comparison technique reliably identified areas of change and was used as the standard for qualitatively evaluating the other three techniques. The layered

spectral/temporal change classification and the delta data change detection results generally agreed with the post classification comparison technique results however many small areas of change were not identified Major discrepancies existed between the post classification comparison and spectral/temporal change detection results

N77-30579# Air Force Academy Colo
DETERMINATION OF TRUE ELEVATIONS FROM AERIAL PHOTOGRAPHS Final Report
 Charles L Smith Mar 1977 29 p refs
 (AD-A039356 USAFA-TR-77-3) Avail NTIS
 HC A03/MF A01 CSCL 14/5

There are many problems involved in the determination of accurate elevations from tilted photographs Plotting machines such as the Wild A-7 are able to compensate for tilt and provide accurate elevations however these machines are expensive and not available to many researchers This report describes a set of procedures and a computer program for the determination of ground elevations to the same general degree of accuracy as that obtained with plotting machines The procedures involve parallax measurements and location of points within a stereoscopic model Author (GRA)

N77-30583# Army Engineer Topographic Labs Fort Belvoir, Va
THE USE OF ARRAY ALGEBRA IN TERRAIN MODELING PROCEDURES
 Ronald L Magee Oct 1976 83 p refs
 (AD-A040619 ETL-0094) Avail NTIS HC A05/MF A01 CSCL 08/6

Array algebra a new technique that finds the least-squares fit of a model equation to a set of ordered data is investigated as a possible replacement for the current conventional least-squares polynomial-fitting technique Both techniques are described and analyzed within the context of their applicability to current terrain modeling procedures and are compared for computational efficiency This analysis specifically considers increasing the number of model polynomial terms (up to 256 terms) and discusses the impact of array algebra upon future R and D activities involving these high order polynomials Author (GRA)

N77-30592*# National Aeronautics and Space Administration
 Goddard Space Flight Center Greenbelt Md
LANDSAT US STANDARD CATALOG, 1-31 MAY 1977
 31 May 1977 82 p
 (NASA-TM-74859 GSFC/LU-C/005 NTISUB/C/138-005)
 Avail NTIS HC A05/MF A01 CSCL 05B

The catalog lists US imagery acquired by LANDSAT 1 and 2 which has been processed and put in to the data files during May 77 Data, such as date acquired cloud cover and image quality are given for each scene The microfilm roll and frame on which the scene may be found is also given Author

N77-31585*# Colorado Univ Boulder Inst of Arctic and Alpine Research
APPLICATION OF LANDSAT DATA TO DELIMITATION OF AVALANCHE HAZARDS IN MONTANE COLORADO Final Report, 28 Feb. 1975 - 28 Apr 1977
 Daniel H Knepper Jr Principal Investigator Jun 1977 122 p refs
 Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls, S D 57198 ERTS
 (Contract NAS5-20914)
 (E77-10211 NASA-CR-153975) Avail NTIS
 HC A06/MF A01 CSCL 08L

The author has identified the following significant results Many avalanche hazard zones can be identified on LANDSAT imagery, but not consistently over a large region Therefore regional avalanche hazard mapping using LANDSAT imagery, must draw on additional sources of information A method was devised that depicts three levels of avalanche hazards according to three corresponding levels of certainty that active avalanches occur The lowest level, potential avalanche hazards, was defined by delineating slopes steep enough to support avalanches at

elevations where snowfall was likely to be sufficient to produce a thick snowpack The intermediate level of avalanche hazard was interpreted as avalanche hazard zones These zones have direct and indirect indicators of active avalanche activity and were interpreted from LANDSAT imagery The highest level of known or active avalanche hazards was compiled from existing maps Some landslides in Colorado were identified and, to a degree delimited on LANDSAT imagery, but the conditions of their identification were highly variable Because of local topographic geologic, structural, and vegetational variations there was no unique landslide spectral appearance

N77-31570*# Ecole Practique des Hautes Etudes Paris (France)
THE FRENCH ATLANTIC LITTORAL AND THE MASSIF ARMORICAIN, PART 1 Final Report, Jan 1975 - Mar 1977

Fernand Verger Principal Investigator, Jean-Marie Monget, O Guerin R M Poisson and Y Thomas Mar 1977 148 p refs
 Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls, S D 57198 ERTS
 (E77-10216, NASA-CR-154799 Rept-3) Avail NTIS
 HC A07/MF A01 CSCL 08F

The author has identified the following significant results For interpretation of Isle of Jersey imagery two types of taxons were defined according to their variability in time On the whole taxons with a similar spectral signature were opposed to those with strongly varying spectral signature The taxon types were low diachronic variations and strong diachronic variation Imagery interpretation was restricted to the landward part of the Fromentine area including the sand beaches which were often difficult to spectrally separate from the barren coastal dunes in the southern part of Noirmoutier Island as well as along the Breton marsh From 1972 to 1976 sandbanks reduced in area Two high river discharge images showed over a two year period an identical outline for the Bilho bank to seaward whereas upstream the bank has receded in the same time to a line joining Paimboeuf to Montoir The Brillantes bank has receded at both ends partly due to dredging operations in the access channel to Donges harbor

N77-31571*# Ecole Practique des Hautes Etudes Paris (France)
THE FRENCH ATLANTIC LITTORAL AND THE MASSIF ARMORICAIN, PART 3 Final Report

Fernand Verger Principal Investigator Jean-Yves Scanvic, and Jean-Marie Monget Jan 1977 23 p refs
 Sponsored by NASA ERTS
 (E77-10217 NASA-CR-154800 Rept-3) Avail NTIS
 HC A02/MF A01 CSCL 08F

The author has identified the following significant results An original map of lineaments of the Armorican Massif and the Vendean platform was prepared Validity of spatial information through comparison with maps of various kinds such as geological, geophysical morphological etc, was verified It was confirmed that LANDSAT images in many cases, reflect data on deep phenomena which were only accessible geophysically and by means of borings Tectonic domains were outlined, and known lineaments were extended

N77-31575*# TRW Systems Group, Redondo Beach Calif
EXPERIMENTAL STUDY OF DIGITAL IMAGE PROCESSING TECHNIQUES FOR LANDSAT DATA Final Report, Apr 1974 - Jan 1976

S S Rifman Principal Investigator W B Allendoerfer, R H Caron, L J Pemberton D M Mckinnon, G Polanski and K W Simon Jan 1976 162 p refs
 Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 ERTS
 (Contract NAS5-20085)
 (E77-10221 NASA-CR-152552 TRW-26232-6004-TU-01)
 Avail NTIS HC A08/MF A01 CSCL 08B

The author has identified the following significant results Results are reported for (1) subscene registration (2) full scene rectification and registration, (3) resampling techniques (4) and ground control point (GCP) extraction Subscenes (354 pixels x

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

234 lines) were registered to approximately 1/4 pixel accuracy and evaluated by change detection imagery for three cases (1) bulk data registration, (2) precision correction of a reference subscene using GCP data, and (3) independently precision processed subscenes. Full scene rectification and registration results were evaluated by using a correlation technique to measure registration errors of 0.3 pixel rms throughout the full scene. Resampling evaluations of nearest neighbor and TRW cubic convolution processed data included change detection imagery and feature classification. Resampled data were also evaluated for an MSS scene containing specular solar reflections.

N77-31580# Instituto de Pesquisas Espaciais Sao Jose dos Campos (Brazil)

THERMAL MAPPING OF THE SEA SURFACE USING VHRR COMPUTERIZED IMAGES OF THE NOAA SERIES OF SATELLITES M S Thesis [MAPEAMENTO TERMICO DA SUPERFICIE DO MAR UTILIZANDO IMAGENS DIGITALIZADAS VHRR DOS SATELITES DA SERIE NOAA] Luiz Toshio Takaki Jul 1977 80 p refs In PORTUGUESE ENGLISH summary

(INPE-1072-TPT/059) Avail NTIS HC A05/MF A01

A methodology for attainment of satelliteborne thermal mapping of the sea surface is presented. The images were obtained by means of the VHRR-IR (Very High Resolution Radiometer, Thermal Infrared) of the NOAA (National Oceanic and Atmospheric Administration) series of satellites. The following steps were taken initially: the main principles involved in the construction of a thermal map are presented. A brief description of the equipment and data processing utilized is given, including an approach to preprocess the data. It follows a detailed description of the construction of a thermal map and its radiometric angular correction. Main experimental results are presented and finally suggestions for future work in the field of thermal mapping of sea surface are given. Author

N77-31583*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

AN INTERACTIVE COLOR DISPLAY FOR MULTISPECTRAL IMAGERY USING CORRELATION CLUSTERING Patent Application

Richard E Haskell, inventor (to NASA) (Oakland Univ., Rochester, Michigan) Filed 8 Sep 1977 28 p Sponsored by NASA (Contract NAS9-14195)

(NASA-Case-MS-C-16253-1 US-Patent-Appl-SN-831631) Avail NTIS HC A03/MF A01 CSCL 20F

A method and apparatus for processing multispectral data is provided which permits an operator to make parameter level changes during processing of the data. The system is directed to production of a color classification map on a video display in which a given color represents a localized region in multispectral feature space. Interactive controls permit an operator to alter the size and change the location of these regions, permitting the classification of such regions to be changed from a broad to a narrow classification. NASA

N77-31588# Pattern Analysis and Recognition Corp Rome N Y

ADVANCED DIGITAL EXPLOITATION TECHNIQUES (ADET) Final Technical Report

George E Forsen, Frank H Feng, Michael J Gilotte, John C Lietz, and Dennis J Lucey Apr 1977 252 p (Contract F30602-75-C-0141)

(AD-A040769 PAR-77-3 RADC TR-77-145) Avail NTIS HC A12/MF A01 CSCL 15/4

This effort developed and tested certain digital techniques that are applicable to the problem of tactical target detection using multispectral aerial photography. In addition, key algorithms were provided for the Digital Interactive Complex for Image Feature Extraction and Recognition (DICIFER) located at RADC. Algorithms were designed and implemented to provide the capability for normalizing digitized image data. These include the following areas: radiometric and geometric corrections for the Computer Eye Digitization device; point-spread function correction and registration program embellishments. A general

purpose image-combinations program was also provided. A major task of this effort was the development of sensor/sun position and atmospheric correction programs. Experimental efforts included the digitization of multispectral imagery and generation of ground truth data. Automatic classification logic was designed and tested on a limited data set. This logic was successful in separating camouflaged tactical targets from vegetative backgrounds. Author (GRA)

N77-31702# Naval Research Lab., Washington, D C
INTERACTION BETWEEN STEADY NON-UNIFORM TWO-DIMENSIONAL CURRENTS AND DIRECTIONAL WIND-GENERATED GRAVITY WAVES WITH APPLICATIONS FOR CURRENT MEASUREMENTS Final Report

Davidson T Chew and Paul Bey May 1977 34 p refs (AD-A040600 NRL-MR-3508) Avail NTIS HC A03/MF A01 CSCL 20/4

Interactions between steady non-uniform two-dimensional currents and directional gravity waves are studied for the case of a random wave field which is actively generated by the wind. Directional wave number spectrum in the form suggested by Phillips, Kitaigorodskii, Pierson-Moskowitz, and Longuet-Higgins-Cartwright-Smith is used as the basic spectral form for zero current conditions. Modified spectral functions under the influence of current are found by solving the kinematic wave conservation equation and the energy balance equation with the method of characteristics. By using this particular method, one can solve the problems of two-dimensional wave-current interactions by either specifying U and wave energy, E , or specifying wave number vector, k , and E , for every point space x . The remote sensing techniques are suggested to be the best and the most convenient feasible way of measuring these parameters for inferring the current field. Thus, the changes in wave characteristics, in the form of directional wave spectra, can readily be numerically calculated as the directional wind-generated gravity waves encounter the steady non-uniform two-dimensional currents. Using the remote sensing techniques which are capable of observing these changes in waves over a large area, one will be able to infer the magnitude and the direction of the current encountered. This particular method of inferring current field has great potential benefits in global applications. GRA

N77-31726+ National Environmental Satellite Service Washington, D C

KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO 5 4 ENVIRONMENTAL SATELLITE IMAGERY, FEBRUARY 1977

Sep 1977 89 p refs (KMRD-5.4 NOAA-S/T-77-2953) Avail NTIS HC A05

Daily mosaics are presented for the Northern and Southern Hemispheres. They were prepared from data swaths by a scanning radiometer on the NOAA 2, 3, 4, and 5 satellites. Author

N77-31762# North Carolina State Univ., Raleigh
THE CITIZEN'S GUIDE TO NORTH CAROLINA'S SHIFTING INLETS

Simon Baker Mar 1977 36 p (Grant NOAA-04-6-058-44054) (PB-268736/6 UNC-SG-77-08, Information-2, NOAA-77051101) Avail NTIS HC A03/MF A01 CSCL 08F

This pamphlet is intended for the use of citizens who do not have a scientific or engineering background. Aerial photographs are marked to show the numerous significant changes in the position and size of barrier islands and inlets caused by various coastal processes. GRA

N77-31827*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
DIGITAL OVERLAYING OF THE UNIVERSAL TRANSVERSE MERCATOR GRID WITH LANDSAT DATA DERIVED PRODUCTS

Marcellus H Graham (NASA, Earth Resources Labs, Slidell, La) Sep 1977 45 p refs (NASA-TM-58200) Avail NTIS HC A03/MF A01 CSCL 09B

Picture elements of data from the LANDSAT multispectral scanner are correlated with the universal transverse Mercator grid.

In the procedure, a series of computer modules was used to make approximations of universal transverse Mercator grid locations for all picture elements from the grid locations of a limited number of known control points and to provide display and digital storage of the data. The software has been written in FORTRAN 4 language for a Varian 70-series computer.

Author

N77-32389# Cologne Univ (West Germany)
SATELLITE-BORNE MONITORING OF ATMOSPHERIC AND SURFACE CHARACTERISTICS AFFECTING THE PROPAGATION OF MICROWAVES IN THE TROPOSPHERE
 E Raschke /n AGARD EM Propagation Characteristics of Surface Mater and Interface Aspects Jun 1977 4 p refs

Avail NTIS HC A11/MF A01

Some possibilities were examined to observe and monitor on a global scale such atmospheric and surface properties which affect the propagation of microwaves in the troposphere. These are the fields of atmospheric temperature, moisture, pressure and also of precipitating clouds, the sea state, ice and snow cover, and the soil moisture. A manifold of satellite techniques was developed in the last years, primarily for meteorological applications. They may provide useful information for estimating the atmospheric transfer properties for the microwave region. However, the existence of the ducting inversion layers near the ground might be only indirectly detectable from them.

Author

N77-32390# Ludwig-Maximilians-Universitat, Munich (West Germany) Inst fuer Allgemeine und Angewandte Geophysik
DISTRIBUTION OF ELECTRICAL RESISTIVITY ON CONTINENTAL AREAS
 V Haak, M Beblo, and A Berkold /n AGARD EM Propagation Characteristics of Surface Mater and Interface Aspects Jun 1977 18 p refs

Avail NTIS HC A11/MF A01

The electrical resistivity of the earth was investigated by several geophysical methods. The resistivity distribution in the uppermost kilometers on continental areas as inferred from such measurements turned out to be rather inhomogeneous. Generally a correlation between the distribution of resistivity and the distribution of the geological units as displayed on geological maps exists.

Author

N77-32559 Georgia Univ, Athens
PROCESSING OF MAP INFORMATION IN A MINICOMPUTER Ph.D Thesis
 Oscar Pablo GarciaVidal 1976 141 p

Avail Univ Microfilms Order No 77-12381

The documentation for a computer system called Map Assembly and Processing System (MAPS) is presented. MAPS is a package that can be used for input, processing and display of land classification maps and associated numerical information. MAPS uses the polygon method to obtain a computer representation of a map. With this method the map is considered as a partition of the plane into regions delimited by boundaries that are approximated by polygonal lines. The sequences of vertices of these polygonals represent the map in the computer. Arcs-pieces of boundary that separate two regions are the basic units or building blocks for the system. The system can produce maps consisting of any subset of the arcs of the original map. Specifications for map preparation may be conditions on numerical data associated with the regions of the base map. In general, processing of a source map will involve a map data file and a numerical data file.

Dissert Abstr

N77-32572# Army Engineer Waterways Experiment Station, Vicksburg, Miss
ACQUISITION OF TERRAIN INFORMATION USING LANDSAT MULTISPECTRAL DATA. REPORT 1 CORRECTION OF LANDSAT MULTISPECTRAL DATA FOR EXTRINSIC EFFECTS Technical Report, Sep 1975 - Jun 1976
 Horton Struve, Warren E Grabau and Harold W West Jun 1977 55 p refs
 (DA Proj 4A0-61101-A-91D)

(AD-A042999, WES-TR-M-77-2-1) Avail NTIS
 HC A04/MF A01 CSCL 15/4

This report provides an analytical capability for correcting the spectral data, as received by LANDSAT, to radiance values at ground level. Variations in the radiance values as influenced by atmospheric effects, terrain geometry and shadows are coupled together to form a single equation that converts the radiance values of images obtained at different times to a common datum.

Author (GRA)

N77-32574# Utah Univ, Salt Lake City Dept of Geology and Geophysics
EARTHQUAKE SURVEYS OF THE ROOSEVELT HOT SPRINGS AND THE COVE FORT AREAS, UTAH, VOLUME 4 Final Report
 T L Olson and R B Smith Oct 1976 94 p refs
 (Grants NSF AER-74-01043)
 (PB-268421/5, NSF/RA-760752) Avail NTIS
 HC A04/MF A01 CSCL 081

Forty-nine days of earthquake monitoring around the Roosevelt Hot Springs KGRA during 1974 and 1975 indicates little earthquake activity and no correlation with the Hot Springs area. Marked earthquake activity however, was located 25 km east within the Cove Fort-Sulphurdale KGRA. A total of 163 earthquakes were located from the two surveys. Focal depths for the Cove Fort area were shallow with 75% of the activity less than 5 km in depth. The maximum calculated depth was 16 km. Composite fault plane solutions in the Cove Fort area showed normal faulting with generally east-west trending T-axes. A high b-value of 1.27 and a statistical analysis using the Kolomogorov model of event occurrence imply swarm-like activity near Cove Fort. Consistently positive P-wave residuals of up to 0.10 sec and detectable S-wave attenuation of ray paths across the Mineral Range are suggestive of the possibility of an upper-crustal zone of high attenuation that is perhaps related to the source of heat of the Roosevelt Hot Springs KGRA.

N77-32651 Iowa Univ, Iowa City
WAVE-PARTICLE INTERACTIONS IN THE EVENING MAGNETOSPHERE DURING GEOMAGNETICALLY DISTURBED PERIODS Ph.D Thesis
 Roger Russell Anderson 1976 134 p

Avail Univ Microfilms Order No 77-13050

Correlated wave and particle measurements obtained on the equatorially orbiting S3-A satellite show that chorus and other whistler-mode very low frequency emissions are associated with enhanced fluxes of anisotropic low energy electrons injected into the magnetosphere from the plasma sheet during geomagnetically disturbed periods. The upper cutoff frequency of the whistler-mode spectra increases with increasing pitch angle anisotropy of the cyclotron resonant electrons. Growth rate calculations using the observed electron pitch angle distributions and intensities show good agreement between the calculated and observed whistler-mode spectra.

Dissert Abstr

N77-33557*# Department of Agricultural Technical Services, Pretoria (South Africa)
MONITORING THE EXTENT AND OCCURRENCE OF FIRE IN THE DIFFERENT VELD TYPES OF SOUTH AFRICA WITH PARTICULAR REFERENCE TO ITS ECOLOGICAL ROLE AND ROLE IN RANGE MANAGEMENT Final Report
 Denzil Edwards Principal Investigator Aug 1977 71 p refs
 Sponsored by NASA ERTS
 (E77-10226, NASA-CR-155016) Avail NTIS
 HC A04/MF A01 CSCL 08F

The author has identified the following significant results: Veld burning was recorded from LANDSAT imagery covering approximately 75 million ha or 62% of the surface of the eastern part of South Africa. All basic data on the location, areas, and numbers of burns for 10 biomes composed of 67 veld types, are available on 1:250,000 and 1:500,000 map overlays and are summarized on small scale maps showing fire distribution and amount burned in classes per 15 minute square of latitude and longitude. Veld burning is not randomly distributed, but is almost continuous over a broad belt widest in the north and narrowing|southeastwards and then southwestwards between

07 DATA PROCESSING AND DISTRIBUTION SYSTEMS

the eastern escarpment and the sea. It is shown that over almost the whole area the overall pattern of veld burning is clearly marked out as early as July in midwinter subsequent development being merely an intensification of the pattern.

N77-33569*# Brevard County Planning Dept Merritt Island Fla

LANDSAT PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA Final Report, 12 Feb 1975 - 11 Feb 1977

John W Hannah Principal Investigator Garland L Thomas Fernando Esparza (NASA Kennedy Space Center) and James J Millard (NASA Kennedy Space Center) Apr 1977 215 p refs Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS

(Contract NAS5-20907)

(E77-10238 NASA-CR-155028 BCPD-L2 8) Avail NTIS HC A10/MF A01 CSCL 08B

N77-33583*# Kanner (Leo) Associates Redwood City Calif SPACE STUDIES OF EARTH RESOURCES METHODS AND MEANS OF MEASUREMENTS AND PROCESSING OF INFORMATION

Yu K Khodarev ed Ya L Ziman ed G A Avanesov ed Yu M Benilov ed A A Bolshoy ed V V Yegorov ed Yu M Shtarkov ed and Yu M Chesnokov ed Washington NASA Aug 1977 441 p refs Transl into ENGLISH of the book Kosmicheskkiye Issledovaniya Zemnykh Resursov Metody i Sredstva Izmereniy Obrabotki Informatsii Moscow Nauka Press 1976 p 1-384

(Contract NASw-2790)

(NASA-TT-F-17544) Avail NTIS HC A19/MF A01 CSCL 08F

Techniques used in aerial and space remote sensing of natural resources and the transmission and processing of such data are discussed. Methods for measuring terrestrial object radiation (reflected solar and its own) in the visible infrared and microwave frequencies are explored. Principles of space system design for studying natural resources are presented as well as the requirements for the devices and their orbits. Questions of international law and cooperation in relation to earth observation studies from space are considered. Author

N77-33586*# Texas A&M Univ College Station Remote Sensing Center

FEASIBILITY STUDY OF MICROPROCESSOR SYSTEMS SUITABLE FOR USE IN DEVELOPING A REAL-TIME FOR THE 4.75 GHz SCATTEROMETER Final Report, 11 May - 10 Aug 1977

10 Aug 1977 56 p refs

(Contract NAS9-15311)

(NASA-CR-151522 RSC-3556-1) Avail NTIS HC A04/MF A01 CSCL 09B

A class of signal processors suitable for the reduction of radar scatterometer data in real time was developed. The systems were applied to the reduction of single polarized 13.3 GHz scatterometer data and provided a real time output of radar scattering coefficient as a function of incident angle. It was proposed that a system for processing of C band radar data be constructed to support scatterometer system currently under development. The establishment of a feasible design approach to the development of this processor system utilizing microprocessor technology was emphasized. Author

N77-33590*# North Carolina State Univ Raleigh Dept of Geosciences

APPLICATION OF SATELLITE REMOTE SENSING TO NORTH CAROLINA DEVELOPMENT OF A MONITORING METHODOLOGY FOR TROPHIC STATES OF LAKES IN NORTH CAROLINA Final Report

Charles W Welby and Robert E Holman 1 Aug 1977 118 p refs

(Contract NAS8-31984)

(NASA-CR-150419) Avail NTIS HC A06/MF A01 CSCL 08H

Conjunctive study of four shallow coastal plain lakes in northeastern North Carolina and their LANDSAT-2 images demonstrates that it is possible to differentiate between the lakes and their respective trophic states on the basis of the multispectral scanner imagery. The year-long investigation established that monitoring of the trophic states of the lakes on a seasonal basis through application of color additive imagery enhancement techniques is possible. Utilizing a standard setting of the color additive viewer an investigator can normalize the imagery to an internal standard of constant reflectance characteristics. By comparison of the false color renditions with a standard interference color chart combined with brightness measurements made on the viewer screen one can relate the lake reflectances to their trophic states. Two or more bands of the imagery are required and the present study established that for the lakes studied Band 5 and Band 6 form a good combination. Author

N77-33591*# Computer Sciences Corp Los Angeles Calif EARTH RESOURCES TECHNOLOGY SYSTEM STAND-ALONE SOFTWARE PACKAGE DESCRIPTION AND USER'S GUIDE

W W Chu 11 Sep 1975 61 p refs

(Contract NAS5-11999)

(NASA-CR-152598 CSC/TM-75/6145) Avail NTIS HC A04/MF A01 CSCL 09B

A users guide and program description for the ERTS-B Stand-Alone Software Package is presented. This package was developed to compute the Keplerian elements at the descending node, the Brouwer Mean Elements at the node, the averaged Brouwer Mean Elements and other orbital parameters for the orbits of the Earth Resources Technology Satellite (ERTS). The typical input for the program is an ephemeris file which resulted from a definitive orbit generated over a two day arc using the Cowell option in the Definitive Orbit Determination System (DODS) or the Goddard Trajectory Determination System (GTDS). Author

INSTRUMENTATION AND SENSORS

Includes data acquisition and camera systems and remote sensors

A77-40813 # Optimal calibration of remote sensors using time averaging (Optimal'naiia kalibrovka distantsionnykh priborov s primeneniem vremennogo osredneniia) S V Dotsenko and L G Salivon *Morskoe Gidrofizicheskoe Issledovanie*, no 4, 1976, p 92-99 In Russian

This paper discusses a method for calibrating a remote sensor from the reading of a contact point sensor, this procedure permitting a significant reduction in calibration error. Calibration is performed using time realization of the measured field, obtained with a contact sensor in a specified time interval and corrected B J

A77-40999 # The use of remote sensing to study earth resources (Izucheniye prirodnykh resursov zemli metodami distantsionnogo zondirovaniia) G T Beregovoi and Iu P Kienko *Geodeziia i Kartografiia*, Apr 1977, p 1-9 In Russian

The use of such remote sensors as photographic systems, TV systems, infrared scanners, passive superhigh-resolution radiometers, and radar for the study of earth resources is reviewed. Particular attention is given to satellite remote-sensing and future directions in the application of space technology to the study of earth resources are considered B J

A77-41228 # Model for profile of topside ionosphere K B Serafimov (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Kosmicheski Izsledvaniia, Sofia, Bulgaria) *Bolgarskaia Akademiia Nauk, Doklady*, vol 30, no 4, 1977, p 539-542 10 refs

A model for the electron density profile of the topside ionosphere is described and compared with the Chapman model. A procedure for estimating the value of the step indicator is derived. Data obtained from satellite readings are taken into account in the evaluation of the model M L

A77-41795 Earth studies from satellite-borne sensors. F Honey (Commonwealth Scientific and Industrial Research Organization, Perth, Australia) In Australian Astronautics Convention, Perth, Australia, August 27-30, 1975, Proceedings Perth, Astronautical Society of Western Australia, Inc., 1977, p 141-143

The measurement of electromagnetic (optical) properties of terrestrial materials using satellite-borne sensors shows promise in earth resources evaluation and monitoring. Several scanner systems will be described and applications of the data and imagery generated will be discussed (Author)

A77-41895 * Very-high resolution far infrared measurements of atmospheric emission from aircraft B Carli, D H Martin, E F Puplett (Queen Mary College, London, England), and J E Harries (Aeronautical Research Council, National Physical Laboratory, Teddington, Middx., England) *Optical Society of America, International Conference and Winter School on Submillimeter Waves and Their Applications, 2nd, San Juan, P.R., Dec 6-11, 1976* *Optical Society of America, Journal*, vol 67, July 1977, p 917-921 15 refs. Research sponsored by the European Space Agency and NASA

Instrument problems and technical results are discussed for an experiment in which an absolute spectrometric radiometer was flown aboard a NASA aircraft at altitudes of 33,000 to 41,000 ft to measure atmospheric emission in the spectral range from 5 to 40 kayser with a resolution of about 0.03 kayser apodized. The

instrument used was actually a polarizing interferometer, and the atmosphere was observed at fixed zenith angles constant to within plus or minus 0.1 deg. The only problem noted was the spoilage of some interferograms by spikes due to electrical interference from the aircraft radio transmission system. A spectrum of the atmospheric emission brightness temperature obtained with real-time calibration is examined, and the spectral resolution, S/N ratio, and total instrument efficiency are evaluated. The experimental S/N ratio is estimated to be between 40 and 100 F G M

A77-42288 Fluctuations of the auroral zone current system and geomagnetic pulsations K Wilhelm, J W Munch, and G Kremser (Max-Planck-Institut fur Aeronomie, Katlenburg, West Germany) *Journal of Geophysical Research*, vol 82, July 1, 1977, p 2705-2716 13 refs

Recordings of P_1 and P_2 pulsations obtained on a short-distance network of magnetometer stations were used to investigate the relationship between fluctuations of the auroral zone currents and geomagnetic pulsations. During the early part of the substorm expansion phase the pulsations of the D and H components are decoupled from each other at all stations. Similarly, the pulsations of the D components are not significantly correlated at stations with separation distances of approximately 100 km. For this interval the pulsations of the H component are interpreted as being predominantly the magnetic effect of fluctuations of the auroral electrojet, and the pulsations of the D component as being a consequence of fluctuations of Birkeland sheet currents. The conclusion can be drawn from these observations that the Birkeland currents are not directly connected in the north-south direction. Thus a considerable east-west component of the currents is required in order to maintain current continuity in the ionosphere. These effects disappear in the late expansion phase and early recovery phase (Author)

A77-42620 # Fast detection of 10,830-A helium emission (Bystraiia registratsiia gelievoi emissii 10830 A) P Ia Sukhoivanenko and N I Fedorova In Investigation of upper atmospheric radiation Ashkhabad, Izdatel'stvo Yilm, 1976, p 33-39 12 refs In Russian

Preliminary results are presented for observations of He I 10,830-A emission performed using a highly sensitive IR spectrograph with an exposure time of 6 min. Cases are discussed in which the observed He I emission was scarcely distorted by superposition of hydroxyl emission. The diurnal variation in He I emission intensity is found to indicate an evening-morning asymmetry that is tentatively attributed to additional excitation of He atoms in the pre-morning hours by a photoelectron flux moving along a force tube from a magnetically conjugate region. The relation between He I emission intensity and the presence of visible aurorae produced by electrons having energies in the keV range is examined F G M

A77-43401 # Investigation of the natural environment using radio-physical methods /Review/ (Issledovanie prirodnoi sredy radiofizicheskimi metodami /Obzor/) N A Armand, A E Basharinov, and A M Shutko (Akademiia Nauk SSSR, Institut Radiotekhniki i Elektroniki, Moscow, USSR) *Radiofizika*, vol 20, no 6, 1977, p 809-841 166 refs In Russian

The paper discusses the microwave (radiometric and radar) investigation of the earth surface. Attention is given to the study of the physical and chemical properties of the ocean surface, sea surface states and variations of the sea level, ice and snow cover, soil moisture, vegetation, and geology B J

A77-43483 # Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus 6 PMR results I Hirota and J J Barnett (Oxford University, Oxford, England) *Royal Meteorological Society, Quarterly Journal*, vol 103, July 1977, p 487-498 16 refs. Research supported by the Science Research Council and the Natural Environment Research Council

08 INSTRUMENTATION AND SENSORS

The temperature field of the northern hemisphere mesosphere during the mid-winter of 1975/1976 is described by the use of radiance observations made by the Pressure Modulator Radiometer (PMR) on the Nimbus 6 satellite. A month's average of the radiance field indicates that planetary waves of wavenumbers one and two are of significant amplitude in the winter hemisphere up to the highest level observed by the PMR (approximately 85 km). These waves show a westward tilt of wave axis with height, and the maximum amplitude is observed in the middle mesosphere to the north of the polar-night westerly jet. Time series analysis of the zonal mean radiance during the period of a minor stratospheric warming in early 1976 indicates that the stratospheric and lower mesospheric temperature increases with time in the higher latitudes to the north of 30 deg N, associated with the amplification of wavenumber one, while the upper mesospheric temperature decreases with time at all latitudes. A rough estimate is also given of the time change of the mid-latitude mean zonal wind during the period of the warming. (Author)

A77-43576 The electromagnetic autonavigation system /the EMAN system/ (Das Elektromagnetische Autonavigationssystem /EMAN-System/) A Seeger *Ortung und Navigation*, no 2, 1977, p 1 10. In German.

An apparatus used for electromagnetic direction and velocity determination is described. The principle of its operation involves the Hall effect and induction. The device is intended for use in flights that would require readjustment of the magnetic compass gyroscopic compass system, or in situations when that system is not convenient. M L

A77-45197 A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting. E Max and S T Eng (Chalmers Tekniska Hogskola, Goteborg, Sweden) *Optical and Quantum Electronics*, vol 9, Sept 1977, p 411-418. Research supported by the Styrelsen for Teknisk Utveckling.

A77-45224 * Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States. D W Hillger and T H Vonder Haar (Colorado State University, Fort Collins, Colo.) *Journal of Applied Meteorology*, vol 16, July 1977, p 715-726. 18 refs. U S Department of the Interior Contract No 6-07-DR-20020, Grant No NGR-06-002-102.

The ability to provide mesoscale temperature and moisture fields from operational satellite infrared soundings over the United States is explored. High-resolution sounding information for mesoscale analysis and forecasting is shown to be obtainable in mostly clear areas. An iterative retrieval algorithm applied to NOAA-VTPR radiances uses a mean radiosonde sounding as a best initial-guess profile. Temperature soundings are then retrieved at a horizontal resolution of about 70 km, as is an indication of the precipitable water content of the vertical sounding columns. Derived temperature values may be biased in general by the initial-guess sounding or in certain areas by the cloud correction technique, but the resulting relative temperature changes across the field when not contaminated by clouds will be useful for mesoscale forecasting and models. The derived moisture, affected only by high clouds, proves to be reliable to within 0.5 cm of precipitable water and contains valuable horizontal information. Present-day applications from polar-orbiting satellites as well as possibilities from upcoming temperature and moisture sounders on geostationary satellites are noted. (Author)

A77-45803 # Satellite observations as 'ground truth' for climate models. G Ohring and S Adler (Tel Aviv University, Tel Aviv, Israel) *COSPAR, Plenary Meeting, 20th, Tel Aviv, Israel, June 7-18, 1977, Paper 8* p 18 refs.

It is shown that satellite observations can be very helpful in verifying and improving the specification of boundary conditions or input parameters for climate models. A zonally averaged numerical model is used to simulate certain features of the annual mean climate of the Northern Hemisphere, and satellite observations are employed to assist in the specification of cloudiness, cloud optical depths, and

snow/ice albedos. Comparisons are made between computed and observed mean annual zonal surface and 500-mb temperatures, computed snow/ice albedos and those obtained from two different sets of satellite observations, model and satellite-observed terrestrial IR emission, as well as computed clear-sky albedo and that estimated from satellite observations. Reasons for discrepancies between calculated and observed values are discussed, and possible adjustments of the input parameters on the basis of the satellite data are suggested which can either eliminate or reduce the differences.

F G M

A77-45945 Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction. R D Sharp, R G Johnson, and E G Shelley (Lockheed Research Laboratories, Palo Alto, Calif.) *Journal of Geophysical Research*, vol 82, Aug 1, 1977, p 3324-3328. Contract No N00014 72-C-0234.

O(+) ions with energies of approximately 1 keV have been observed flowing upward out of the ionosphere with a pitch-angle distribution having a minimum along the magnetic-field direction and maxima in about the 130-140 deg range. The measurements were obtained with an energetic-ion mass-spectrometer experiment on the satellite 1976-65B at an altitude of about 7600 km in the northern dayside polar cusp. The data are interpreted as resulting from a mechanism which accelerates ambient ionospheric ions in a direction perpendicular to the geomagnetic field. (Author)

A77-46768 Computing residuals in geothermal research by I R scanning. A M Tonelli (ARCO, Milan, Italy) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p 187-192.

The thermal phenomena related to the presence of geothermal sources is examined stressing the increase in the local smoothing of temperature variations in time and space due to an increase of thermal inertia, a minimum in the distribution of the normalized gradients, the minimum variation of entropy, and the minimum shift of the thermal baricenters. The smoothing technique involves applications of infra-red scanning to both rectified and non-rectified images. The effect of geothermal heat on thermal inertia is discussed, and a method for its analysis is suggested. S C S.

A77-47200 # Space experiment simulation using an aircraft laboratory (Modelirovanie kosmicheskogo eksperimenta s pomoshch'iu samoletnoi laboratorii). G A' Avanesov, I V Barinov, V D Glazkov, Ia L Ziman, and V I Tarnopol'skii. In *Space studies of earth resources. Methods and means of measurement and data processing*. Moscow, Izdatel'stvo Nauka, 1976, p 280-290. 6 refs. In Russian.

A two-year program devoted to the airborne simulation of procedures of satellite remote sensing of earth resources is reviewed. The structure of the airborne system is described with attention given to remote sensors, preliminary and thematic processing equipment, and recording instruments. A functional diagram of the airborne system is presented and an optical system for the multispectral scanning system and a system for separating radiative fluxes are considered. Use of simulation data in elaborating ground-based means of data processing and interpretation is discussed. B J

A77-47201 # Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories (SVCh-radiometricheskie issledovaniia zemnykh pokrovov i akvatorii s borta samoletov-laboratorii). L F Borodin, A A Kurskaia, and A M Shutko. In *Space studies of earth resources. Methods and means of measurement and data processing*. Moscow, Izdatel'stvo Nauka, 1976, p 290-296. In Russian.

The following geophysical uses of aerial microwave radiometry are considered: determination of sea states and temperatures, studies of soil moisture, detection of regions of geothermal activity, forest fire mapping, sea and land ice reporting, and determination of soil density gradients. Attention is given to specific recordings of radio thermal emission signals and radio brightness data in the spectral range 0.8-30 cm. B J

A77-47204 # Selection of satellite orbits for the sensing of earth resources (Vybor orbit ISZ dlia issledovaniia prirodnykh resursov zemli) S D Grishin, I F Zhuravlev, V T Lisovoi, V K Saul'skii, and V M Surikov In Space studies of earth resources Methods and means of measurement and data processing Moscow, Izdatel'stvo Nauka, 1976, p 310-316 In Russian

Criteria for selecting orbits for remote-sensing satellites are considered These involve resolution requirements of onboard equipment, solar illumination conditions and minimum time requirements for the global survey It is found that a sun-synchronous orbit, additionally fulfilling the requirement of quasi-geosynchronicity, is the most suitable for remote sensing satellites Methods for computing the height and inclination of sun synchronous orbits are considered B J

A77-47480 * The display of Landsat data at large scales by matrix printer G I Ballew and R J P Lyon (Stanford University, Stanford, Calif) *Photogrammetric Engineering and Remote Sensing*, vol 43, Sept 1977, p 1147-1150 Grant No NsG-5050

A77-47687 Radiation studies in the atmosphere (Radiatsionnye issledovaniia v atmosfere) Edited by K. Ia Kondrat'ev and N E Ter-Markariants Leningrad, Gidrometeoizdat (Glavnaia Geofizicheskaia Observatoriia imeni A I Voeikova, Trudy, No 363), 1976 120 p, In Russian

The book deals with theoretical and experimental studies of radiative processes in the atmosphere Methods of calculating thermal radiation fields in planetary atmospheres, and methods of calculating the thermal radio emission of stratified ice structures are critically analyzed Other topics covered include atmospheric attenuation models, remote study of earth formations on the basis of measurements of their luminance factors, determination of cloud cover characteristics from measurements of the self-radiation of clouds, analysis of the dynamic mode of a sandwich radiation receiver, and a study (and comparison) of absolute bolometric pyrhelometers V P

A77-47696 # Some results of radiometric measurements onboard Cosmos 243 (Nekotorye rezul'taty radioteplolokatsionnykh izmerenii na ISZ 'Kosmos-243') V D Stepanenko, B D Panin, A S Gurvich, V N Kozlov, and D T Mateev In Radiation studies in the atmosphere Leningrad, Gidrometeoizdat, 1976, p 91-97 5 refs In Russian

Processed radiometric data obtained above continents are analyzed The statistical brightness temperature characteristics of various underlying surfaces are examined, along with the emissivity of these surfaces and other data obtained at wavelengths of 0.8, 1.35, 3.4, and 8.5 cm V P

A77-48269 * Microwave spectroscopic imagery of the earth D H Staelin, P W Rosenkranz (MIT, Cambridge, Mass), F T Barath, E J Johnston, and J W Waters (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) *Science*, vol 197, Sept 2, 1977, p 991-993 Contract No NAS5-21980

The microwave spectrometer on the Nimbus 6 satellite has produced the first microwave spectral images of the earth It has yielded global maps of (1) atmospheric temperature profiles, (2) the distributions of water vapor and liquid water over ocean, and (3) the coverage and type of ice and snow The method has potential for operational synoptic monitoring (Author)

A77-48451 * Ozone monitoring with an infrared heterodyne radiometer R T Menzies (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) and R K Seals, Jr (NASA, Langley Research Center, Hampton, Va , NASA, Washington, D C) *Science*, vol 197, Sept 23, 1977, p 1275-1277 17 refs Contract No NAS7 100

Measurements of the total burden and of the concentration versus-altitude profiles of ozone have been made with a ground based

heterodyne radiometer at Pasadena, California The measurements were made in the 9.5-micron wavelength region, where a strong ozone infrared absorption band exists The radiometer measured solar absorption at selected wavelengths with a spectral resolution of 0.001 reciprocal centimeter, equivalent to the half-width of an ozone absorption line at the 10-millibar altitude level A carbon dioxide laser served as the local oscillator This technique can be used to gather important data on both tropospheric and stratospheric ozone, which are not readily accessible with other remote-sensing techniques (Author)

A77-49295 A method to obtain diffuse reflectance measurements from 10 to 30 microns using a Cary 171 spectrophotometer J B Gillespie and J D Lindberg (US Army, Atmospheric Sciences Laboratory, White Sands Missile Range, N Mex) *Applied Spectroscopy*, vol 31, Sept-Oct 1977, p 463-465 10 refs

A technique is described for using a Cary 171 spectrophotometer over the 10 to 30 micron spectral interval to obtain diffuse reflectance measurements The cell space spheres were covered with pure grade quenched sulfur powder to increase measurement precision Two applications of the method illustrate its applicability (1) a spectrum of ground gypsum crystal in the 2.6 to 3.0 micron spectral range, and (2) a spectrum of a layer of hectorite clay in the 1.0 to 3.0 micron spectral range S C S

A77-49775 Electronic surveying and navigation S H Laurila (Hawaii, University, Honolulu, Hawaii) New York, Wiley-Interscience, 1976 557 p 111 refs \$24.95

The book presents a didactic survey of modern electronic surveying and navigation techniques Instrumentation, supporting mathematical theory, and underlying electronic principles are covered Specific navigational systems (Decca, Omega, Loran-A and Loran-C, Doppler, satellite aided positioning, and laser navigation aids are discussed Numerous specialized range-measuring and distance-measuring instruments of interest (geodimeters, tellurometers, adaptation of retired and obsolete radar and position-fixing systems to various surveying needs) are discussed separately The book combines the functions of textbook and reference book on the subjects covered R D V

A77-49886 * 120 MB/S and 240 MB/S bit synchronizer-signal conditioners for NASA high data rate applications J S Gray (Harris Corp, Melbourne, Fla) In International Telemetry Conference, Los Angeles, Calif, September 28-30, 1976, Proceedings Pittsburgh, Pa, Instrument Society of America, 1976, p 358-368 Contract No NAS5-20998

Two bit synchronizer-signal conditioners (BSSC) developed for NASA high data rate applications such as earth resources monitoring are described One BSSC is centered at 120 Mb/s and the other at 240 Mb/s These subsystems are featured out of the total hardware developed because the BSSC is such a key subsystem in determining overall system statistical performance These units represent an evolution of high data rate BSSC's available at low data rates Numerous inputs/outputs, control functions, indicators, plus the ability to minimize the effects of various signal perturbations are provided Examples of allowed perturbations are input level variations, bit rate variance static and dynamic, baseline, transition density, bandlimiting, etc , as well as noise Emphasis in the past has been primarily concerned only with noise (Author)

A77-50135 DFVLR mobile lidar system C Werner and H Herrmann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Physik der Atmosphäre, Oberpfaffenhofen, West Germany) *Review of Scientific Instruments*, vol 48, Mar 1977, p 247-251 16 refs

A mobile ruby lidar system was designed for measuring smokestack emissions from distances up to 5 km The Newton telescope has an aperture ratio of 1.45, the elevation angle of the instrument is varied between 4 and 90 deg and the azimuth between 0 and 360 deg The paper describes the design and principle of

08 INSTRUMENTATION AND SENSORS

operation of the system and gives attention to the lidar container and data handling procedures Preliminary test results show that the system can be used quite universally for measurements of aerosol

B J

A77-50175 Compact high-pressure electron-beam-controlled laser system N W Harris, F O'Neill, and W T Whitney (U S Navy, Naval Research Laboratory, Washington, D C) *Review of Scientific Instruments*, vol 48, Aug 1977, p 1042-1046 27 refs

The design of a cold-cathode electron gun and its integration into a small high-pressure gas laser system are described The gun has produced current densities up to four amps per square cm for pulse durations of about one microsec full-width at half-maximum The gun and the laser chamber together are compact enough to mount on an optical table This system has been used to achieve multiatmosphere operation of a number of molecular gas lasers, including CO₂, N₂O, CS₂, CO, and C₂H₂ systems (Author)

A77-50274 Microwave radiometric detection of corona from chaff within thunderstorms W D Rust (NOAA, Boulder, Colo) and P R Krehbiel (New Mexico Institute of Mining and Technology, Socorro, N Mex) *Journal of Geophysical Research*, vol 82, Sept 20, 1977, p 3945-3950 13 refs NOAA supported research, NSF Grant No DES 72-01371

A microwave radiometer that operates at a frequency of 3 GHz has been used on board an aircraft to determine the presence of radiation generated by corona from within both untreated control thunderstorms and thunderstorms in which 10-cm chaff was released There was no sustained radiation recorded from the control storms Sustained radiation was detected, however, when chaff was dispersed within thunderstorms This indicates that chaff seeding results in the production of corona discharge that causes a discharging current to flow within the thunderstorm For a typical example from measurements made on a relatively small, isolated thunderstorm the total current from corona intercepted by the receiving antenna beam is estimated to have been between 12 and 25 A, with a resulting current, based on a simple analysis, of 0 070-0 140 A available for discharging the thunderstorm (Author)

A77-50724 # Barometric frequency-compensated altimeter-automaton (Barometricheskii chastotno-kompensatsionnyi vysotomer-avtomat) V A Polevoi *Geodeziia i Kartografiia*, Aug 1977, p 23-30 In Russian

The paper describes an automatic frequency-compensated altimeter, suitable for relief mapping and geological surveys, which operates on the principles of barometric leveling The altimeter, employing natural barometric frequency-height levels, automatically determines the constant component of atmospheric pressure which depends on latitude and the absolute heights of the surface points studied, and indirectly measures the alternating component which depends on the temperature and moisture of the atmosphere The system requires one reference station and one or more mobile measurement-stations B J

A77-50976 SO₂ detection using thermal radiation at 53 53 GHz rotational resonance T Hidaka (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan) *IEEE, Proceedings*, vol 65, July 1977, p 1095, 1096 5 refs

The feasibility of a new SO₂ detection technique exploiting radio astronomical methods is discussed A mm-wavelength Dicke radiometer fashioned using a simple homodyne receiver and ferrite modulator detects thermal radiation by SO₂ at rotational resonance in the mm range Remote sensing of SO₂ among atmospheric constituents and pollutants is rendered feasible R D V

A77-51569 Some scientific applications of the low-g accelerometer Cactus J P Villain (Centre d'Etudes et de Recherches Geodynamiques et Astronomiques, Grasse, Alpes-Maritimes, France) *International Astronautical Federation, International Astronautical*

Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-ST-05 10 p 7 refs

The Cactus accelerometer, which has an accuracy at perigee of better than 1 percent and is capable of detecting small-amplitude neutral wave structures with mean wavelengths of about 600 km, is discussed Data obtained from the accelerometer, launched on board the Castor satellite in 1975, have been subjected to mathematical filtering to isolate small-scale neutral density waves in the altitude range 270 to 320 km, statistical studies of the wave behavior as a function of local solar time, latitude, geomagnetic activity indices, relative and absolute amplitude of the density variations are reported Possible applications of the Cactus accelerometer to measuring the solar constant, the earth albedo, or to piloting a space probe powered by a solar sail are also mentioned J M B

N77-28378# Georgia Inst of Tech Atlanta Engineering Experiment Station
ENVIRONMENT AND RADAR OPERATION SIMULATOR Quarterly Report, 1 Jul - 30 Sep 1976
S N Cole A R Clayton E R Flynt R C Michelson B S Rice and E S Sjoberg Dec 1976 22 p
(Contract DAAB07-74-C-0272. DA Proj 1S7-62703-DH-93) (AD-A036656 ECOM-74-0272-9 QR-9) Avail NTIS HC A02/MF A01 CSCL 17/9

This report summarizes activities during the ninth quarter of a program sponsored by the U S Army Electronics Command (ECOM) directed toward the design of an Environment and Radar Operation Simulator (EROS) Work has continued on the three major subsystems of EROS the digital hardware, the software and the analog hardware Included in this report are descriptions of the completed units, the progress in documentation, and a statement about the remaining units to be completed

Author (GRA)

N77-28467*# Old Dominion Univ Research Foundation Norfolk Va Dept of Physics and Geophysical Sciences
THREE FIELD TESTS OF A GAS FILTER CORRELATION RADIOMETER Interim Report
Shirley A Campbell, Joseph C Casas and Estelle P Condon Jul 1977 41 p refs
(Grant NsG-1127)
(NASA-CR-153931 TR-PGSTR-AP77-57) Avail NTIS HC A03/MF A01 CSCL 14B

Test flights to remotely measure nonurban carbon monoxide (CO) concentrations by gas filter correlation radiometry are discussed The inferred CO concentrations obtained through use of the Gas Filter Correlation Radiometer (GFCR) agreed with independent measurements obtained by gas chromatography air sample bottle analysis to within 20 percent The equipment flown on board the aircraft the flight test procedure, the gas chromatograph direct air sampling procedure and the GFCR data analysis procedure are reported Author

N77-28556*# National Scientific Labs Inc, Falls Church, Va
FREQUENCY REQUIREMENTS FOR ACTIVE EARTH OBSERVATION SENSORS Final Report
May 1977 109 p refs Prepared for JPL
(Contract JPL-954669)
(NASA-CR-153939) Avail NTIS HC A06/MF A01 CSCL 05B

The foundation and rationale for the selection of microwave frequencies for active remote sensing usage and for subsequent use in determination of sharing criteria and allocation strategies for the WARC-79 are presented Author

N77-28565# Army Electronics Command Fort Monmouth N J
EFFECTS OF CLOUD PARTICLES ON REMOTE SENSING FROM SPACE IN THE 10-MICROMETER INFRARED REGION
Richard D H Low Jan 1977 55 p refs
(AD-A038502 ECOM-5811) Avail NTIS HC A04/MF A01 CSCL 17/3

This report describes the derivation of the radiative transfer equation and its solution by the Gauss-Seidel iteration method. On the basis of microphysical and climatological considerations, four cloud models representing one stratus type and three cumulus types were investigated as to their optical properties and the thickness requirements for blackbody radiation. Findings are as follows: (1) Reflection in the 10-micrometer infrared region is negligible, (2) Given the same microstructure, a cloud appears more black in the windows of the 11- to 13-micrometer region than in any other windows in this infrared region, (3) In satellite work, cloud emissivity (or transmissivity) should be calculated on the basis of upwelling radiances, and (4) Cloud liquid water content may be a better parameter in defining thickness requirement for blackbody radiation. GRA

N77-28679# Air Force Geophysics Lab., Hanscom AFB, Mass
CRYOGENIC SPECTROMETRY FOR THE MEASUREMENT OF AIRGLOW AND AURORA

A T Stair Jr 1976 8 p refs Submitted for Publication
(AD-A036220, AFGL-TR-77-0042) Avail NTIS
HC A02/MF A01 CSCL 14/2

The status and history of liquid nitrogen and helium cooled optical sensors are reviewed with summary details on those instruments developed and data obtained by this laboratory and our principal contractors. A liquid nitrogen cooled field widened interferometer spectrometer covering the spectral range 1 - 2.5 micrometer has been developed to operate on the ground and has the best NESR (Noise Equivalent Spectral Radiance) of all developed sensors. Atmospheric emissions limit the advantages of cryogenic technology for ground based observations at longer wavelengths. Aircraft and balloon-borne systems are discussed but emphasis is placed on the rocket-borne sensors developed and flown under the ICECAP program sponsored by the Defense Nuclear Agency (DNA) and the AFGL. The low resolution spectrometers use circular variable filters (CVF) as the spectral resolution element. The high resolution spectrometer is an interferometer cooled with supercritical helium. GRA

N77-28684# Airborne Instruments Lab, Deer Park, N.Y.
IHR (INFRARED HETERODYNE RADIOMETER) FOR LOW ALTITUDE TEMPERATURE RETRIEVAL Annual Report, Apr 1976 - Apr 1977

I Rubinstein Apr 1977 37 p refs
(Contract N00014-76-C-0721)
(AD-A039861, AIL-C618-1) Avail NTIS HC A03/MF A01
CSCL 04/1

A technique for obtaining accurate temperature and humidity profiles with a grazing-angle up-looking radiometer has been investigated. The profiling technique is based on information retrievals which are obtained from difference-Kernel functions generated from pairs of high spectral resolution radiometric channels. Spatially selective information can be generated from such functions with the required accuracy for retrieving temperature gradients at the lower altitude atmospheric levels. GRA

N77-28690# Avco-Everett Research Lab, Everett, Mass
ATMOSPHERIC TRANSMITTANCE MODELING FOR TEMPERATURE AND WATER VAPOR USING SATELLITE INFRARED DATA

B Kivel Dec 1976 46 p refs
(Contract NOAA-6-35161)
(PB-266414/2, NOAA-77032919) Avail NTIS
HC A03/MF A01 CSCL 04B

It is suggested that the standard deviation in the difference between inferred atmospheric properties and ground truth observations might be reduced by using specific models depending on auxiliary data and averaging the parameters in the models over limited classes of data. A simple model is found for broad ocean areas with minimal cloud cover that gives values of the atmospheric temperature on the average to about one degree with a 4K standard deviation. The model also gives on the average the correct value of the water mixing ratio with a standard deviation in the ratio of derived to measured of 44%. GRA

N77-29125# Transportation Systems Center, Cambridge, Mass
ILS GLIDE SLOPE PERFORMANCE PREDICTION MULTIPATH SCATTERING Final Report, Jul 1975 - Mar 1976
S Morin, D Newsom, and M Scotto Dec 1976 81 p ref
(AD-A035298, DOT-TSC-FAA-76-16, FAA-RD-76-216) Avail
NTIS HC A05/MF A01 CSCL 07/7

A mathematical model has been developed which predicts the performance of instrument landing glide slope systems subject to multipath scattering and the effects of irregular terrain contours. The model is discussed in detail and then applied to a test case for purposes of illustration. A complete listing of all computer programs has been appended to the report. Author

N77-29258# Ohio Univ., Athens, Dept of Chemistry
ON-LINE MEASUREMENT OF THE INFRARED SPECTRA OF GAS CHROMATOGRAPHIC ELUENTS Final Report, 20 Jan 1975 - 19 Jan 1976

Peter R Griffiths Dec 1976 23 p refs
(Grant EPA-R-803517)
(PB-265570/2, EPA-600/4-76-061) Avail NTIS
HC A02/MF A01 CSCL 14B

- Techniques for increasing the sensitivity of the interface between a gas chromatograph and a rapid scanning Fourier transform infrared spectrometer have been developed. A single beam system in which a triglycine sulfate detector is used to measure the interferogram has been designed and constructed. Identifiable infrared spectra of submicrogram quantities eluting from a gas chromatograph have been measured without trapping the sample. A double beam configuration has also been designed. GRA

N77-30572*# National Aeronautics and Space Administration
Lyndon B Johnson Space Center, Houston, Tex
A PROCEDURE FOR DETECTION AND MEASUREMENT OF INTERFACES IN REMOTELY ACQUIRED DATA USING A DIGITAL COMPUTER

Kenneth H Faller (NASA Earth Resources Lab, Slidell, La) Jul 1977 32 p refs Original contains color illustrations
(NASA-TR-R-472, JSC-S-467) Avail NTIS HC A03/MF A01
CSCL 05B

A technique developed and evaluated for the detection and measurement of surface feature interfaces in remotely acquired data is described. A computer implementation of this technique has been effected to automatically process categorized data derived from various sources such as the LANDSAT multispectral scanner and other scanner type sensors. The basic elements of the operational theory of the technique are described together with details of the procedure. An example application of the technique to the analysis of tidal shoreline length is given with a breakdown of manpower requirements. Author

N77-30588# Bureau of Mines, Denver, Colo
REMOTE TRANSDUCER BASED ON COHERENT MIXING OF BACKSCATTERED LASER LIGHT

Robert A Bruce 1977 19 p refs
(PB-266771/5, BM-RI-8220) Avail NTIS HC A02/MF A01
CSCL 14B

A motion transducer based on coherent mixing of laser light backscattered from rough surfaces is evaluated in terms of sensitivity, bandwidth, and range. Tests made with a prototype composed of a 4-mw HeNe laser, a silicon avalanche photodiode, and a 15cm aperture telescope demonstrate that remote measurements with reasonable bandwidth and accuracy are feasible at distances up to 100 meters. GRA

N77-30591# Environmental Research and Technology, Inc
Concord, Mass
STUDY OF NEAR-INFRARED SNOW REFLECTANCE USING SKYLAB S192 MULTISPECTRAL SCANNER DATA Final Report

James C Barnes and Clinton J Bowley Mar 1977 54 p refs
(Contract NOAA-6-35201)
(PB-267504/9, ERT-1474-F) Avail NTIS HC A04/MF A01
CSCL 08L

08 INSTRUMENTATION AND SENSORS

Digital tape data (computer compatible tapes) from the Skylab S192 multispectral scanner are analyzed to examine further the characteristics of snow reflectance in the near infrared portion of the spectrum. The tapes used in the study are from four Skylab passes crossing mountainous terrain in the western United States, three in the late spring from the Skylab-4 mission and one in the late spring from the Skylab-2 mission. In each case the snow conditions are assessed through interpretation of the accompanying Skylab photography, snow reports and meteorological data. The results of the investigation show that the reflectance over a uniform snowpack is significantly lower in the near infrared than in the visible or red infrared portions of the spectrum. GRA

N77-30676 Pennsylvania State Univ., University Park
A STUDY OF WATER VAPOR MEASUREMENT IN THE STRATOSPHERE AND MESOSPHERE USING MICROWAVE TECHNIQUES Ph D Thesis

Richard L Longbotham 1976 416 p
Avail Univ Microfilms Order No 77-9697

An investigation of water vapor measurement in the stratosphere and mesosphere using both the 22 and 183 GHz spectral lines in emission and absorption is accomplished. A spherically stratified earth atmospheric model is incorporated including the Voigt line shape for resonant lines, five water vapor density profiles ranging from one to ten parts per million, and the effects of other atmospheric gases and refraction. A design study of a microwave radiometer capable of extremely high spectral resolution (100 KHz) is presented and used to simulate both upward- and outward-looking balloon experiments, as well as a limb-viewing experiment performed from a satellite in a 200 km orbit. Dissert Abstr

N77-30683* National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt, Md
MAGSAT A SATELLITE FOR MEASURING NEAR EARTH MAGNETIC FIELDS

R A Langel, R D Regan (Geol Survey, Reston Va), and J P Murphy (NASA, Washington) Jul 1977 21 p refs Presented at 3rd Gen Sci Assembly of the Intern Assoc of Geomag and Aeronomy Seattle 22 Aug - 3 Sep 1977 (NASA-TM-X-71370, X-922-97-199) Avail NTIS HC A02/MF A01 CSCL 08N

Magsat, designed for making measurements of the geomagnetic vector field, is evaluated. For accurate vector measurements the attitude of the fluxgate magnetometer will be determined to about 15 arc-seconds. Expected measurement accuracy will be 6 (gamma) in each component and 3 in magnitude. The Magsat data will be applied to solid earth studies including modeling of the Earth's main magnetic field, delineation of regional magnetic anomalies of crustal origin and interpretation of those anomalies in terms of geologic and geophysical models. An opportunity will be presented to the scientific community to participate in data use investigations. Author

N77-31467* Wisconsin Univ., Milwaukee Dept of Geological Sciences
MARINE GEOPHYSICAL INSTRUMENTATION Final Report, 1 Apr. 1970 - 30 Jun 1976

Richard J Old 31 Dec 1976 117 p refs
(Contract N00014-67-A-0128-0016)
(AD-A040048) Avail NTIS MF A01 CSCL 17/10

In 1970 development was started on three marine geophysical instrumentation systems: a seismic recording and display system, a digital magnetometer system, and a magnetometer-gradiometer velocity system. In 1974, development was started on a Hydraulic-Pneumatic Water Gun. This report summarizes the development effort on each of these systems. Author (GRA)

N77-31593* Thomson-CSF Velizy (France) Div Tubes Electroniques

EVALUATION OF SPACE APPLICATION PROBLEMS OF A DECIMILLIMETER CARCINOTRON Final Report [EVALUATION DES PROBLEMS D'UTILISATION SPATIALE D'UN CARCINOTRON DECIMILLIMETRIQUE]

J P Desne D Grauleau G Kantorowicz P Palluel M

Pontvianne and A M Shroff May 1977 134 p refs Partly in FRENCH partly in ENGLISH partly in GERMAN (Contract ESTEC-2925/76-NL-AK) (RT-1814, ESA-CR(P)-963) Avail NTIS HC A07/MF A01

The operation of a carcinotron as a local oscillator in a spaceborne far infrared heterodyne detection experiment was examined. A new model of the carcinotron was developed and tested allowing broadband tunability in the 0.95-0.75 mm range, delivering the minimum 10 mW output power and having an improved power consumption with respect to previously existing tubes. Problems reviewed are: configuration of the power supplies, mass volume, stabilization, mass reduction and vibrations, thermal map of the tube and cooling, stray magnetic field, cathode emission in view of operating lifetime. ESA

N77-32373* Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany) Inst fuer Flugfunk und Mikrowellen

MICROWAVE SCATTERING AT THE SEA SURFACE
Volker Stein 23 Mar 1977 63 p refs In GERMAN, ENGLISH summary Report will also be announced as translation (ESA-TT-422) (DLR-FB-77-09) Avail NTIS HC A04/MF A01, DFVLR Cologne DM 27 40

In sensing the ocean surface with microwave methods from a remote platform such as aircraft, satellite or Spacelab the problem arises to describe the interaction between electromagnetic wave and water wave in an analytic form. The total electrodynamic processes can be represented in compact form by the radar cross section. For the derivation of this quantity a classification of surface models with different roughness scales is carried out. This face model is described in more detail because it is suited to describe composite surfaces and hydrodynamic interaction processes. The most important constituent in this model is the average radar cross section per unit area of a station surface with small scale roughness. This quantity is derived for the case of a perfectly conducting time invariant surface by solving the boundary value problem under approximate realization of the boundary condition. Only zero-order and first order terms in the random coefficients of the surface function are taken into account. The extended radar cross section formulas are cited from literature for a lossy and a time varying surface as well as for depolarization phenomena. Author (ESA)

N77-32568* Stanford Univ., Calif Dept of Applied Earth Sciences

FIELD MAPPING FOR HEAT CAPACITY MAPPING DETERMINATIONS GROUND SUPPORT FOR AIRBORNE THERMAL SURVEYS Final Report

R J P Lyon Jun 1976 98 p refs
(Grant Nsg-5050)
(NASA-CR-152587 SU-TR-76-3) Avail NTIS HC A05/MF A01 CSCL 08G

Thermal models independently derived by Watson, Outcalt, and Rosema were compared using similar input data and found to yield very different results. Each model has a varying degree of sensitivity to any specified parameter. Data collected at Pisgah Crater-Lavic Lake was re-examined to indicate serious discrepancy in results for thermal inertia from Jet Lab Propulsion Laboratory calculations, when made using the same original data sets. Author

N77-32666* Air Force Geophysics Lab., Hanscom AFB, Mass EXCEDE 2

Robert R O'Neil, Edward T P Lee, A T Stair, Jr and James C Ulwick 21 Dec 1976 30 p refs
(AF Proj 2310)
(AD-A042491 AFGL-TR-76-0308 AFGL-ERP-586) Avail NTIS HC A03/MF A01 CSCL 04/1

EXCEDE is a program designed to study atmospheric infrared emissive processes induced by a rocketborne electron accelerator in the altitude range 80 to 140 km. The primary scientific interest is the investigation of the detailed production and loss processes of various excited electronic and vibrational states resulting in optical and infrared emission as energetic primary

electrons and their secondary and all subsequent generation electrons are stopped in the atmosphere. The electron-induced optical and infrared emissions simulate natural auroral processes with the very significant advantage that the dosing conditions of electron energy and power, deposition volume and altitude, and dosing duration are parameters that may be controlled and monitored. To date, three payloads have been launched in the EXCEDE series of artificial auroral experiments. The program status is reviewed and a follow on experiment, EXCEDE II, is described. Both rocket-based and ground-based imaging and spectro-radiometric instruments are proposed. The feasibility of the scientific approach, the magnitude of the atmospheric emissions, the capabilities of ground-support systems, and the engineering design of the proposed experiment are extensions of the technology base established in the earlier EXCEDE launches.

Author (GRA)

N77-32669# Stanford Research Inst., Menlo Park, Calif
HIRIS EXPERIMENT - CHATANIKA RADAR RESULTS
Progress Report, Jan. - Dec. 1976

Theodore M Watt Jan 1977 38 p refs

(Contract DNA001-77-C-0042)

(AD-A042183, SRI-TR-9, DNA-4229T) Avail NTIS
 HC A03/MF A01 CSCL 04/1

Results of the Chatanika DNA 617 Radar support of the HIRIS rocket experiment are presented, along with magnetometer, and all-sky camera data to give a more complete picture of ionospheric processes. The HIRIS experiment took place on 1 April 1976, beginning at 0805 20 UT. The purpose of the experiment was to measure IR emissions in an aurorally disturbed ionosphere. The Chatanika radar was operated in support of the rocket experiment from 0626 UT to 0821 UT. Radar data acquired during the HIRIS experiment are presented in this report. Background electron densities in the vicinity of the rocket trajectory ranged between 30 000 and 300 000 cc. During the background measurement period (-0745 UT) the peak of the auroral-E layer appeared to be above the trajectory apogee with electron densities at all altitudes fluctuating with time. Horizontal gradients in density were observed from about 0700 to 0730 UT and seemed consistent with a density enhancement moving geomagnetically west. During the elevation-scan measurements just prior to launch the peak of the ionization layer varied from 100 to 120 km and ionization density continued to fluctuate with time. Vector quantities measured during the prelaunch background period were indicative of the active conditions present during the experiment. Conductivities, current densities, neutral winds and electric fields all tended to be unipolar during the measurement period, but exhibited large peaks centered at about 0640 and 0730 UT.

GRA

N77-32679# National Oceanic and Atmospheric Administration,
 Boulder, Colo. Wave Propagation Lab
MICROCOMPUTER-CONTROLLED ACOUSTIC ECHO
SOUNDER

Edward J Owens Apr 1977 85 p refs

(PB-268033/8, NOAA-TM-ERL-WPL-21 NOAA-77050104)

Avail NTIS HC A05/MF A01 CSCL 04B

This system was designed, fabricated, and tested using modern digital methods. The major advances of replacing the typically troublesome facsimile recorder with a dot-matrix line printer using special characters called tonels and the development of a new and novel method of digital Doppler signal processing using a real covariance technique are presented in detail. The ecosonde is capable of monitoring and displaying in real time the temperature fluctuations, turbulent velocity inhomogeneities, and vertical wind profile of the planetary boundary layer to a height of 680 meters and includes a microcomputer, a high-speed line printer and various author-designed and constructed digital and analog circuits. User control of various system parameters and a wide choice of display possibilities make this a versatile and desirable atmospheric research tool. A literature survey of atmospheric sounding using acoustic methods is presented.

GRA

N77-32684 Oklahoma Univ., Norman
HYGROMETRIC SODAR Ph.D Thesis

Edward Williams Lindsay Jr 1976 134 p

Avail Univ Microfilms Order No 77-12747

A technique to remotely sense water vapor in the atmosphere by acoustic means was developed theoretically. The available information concerning the physical acoustics of the atmosphere is reviewed including information not previously applied to sodar problems. Past developments in the field of remote sensing of meteorological variables especially water vapor, are briefly described. The Relaxation Frequency Method (RFM) is presented as the basis for a hygrometric sodar (the technique can also remotely measure temperature). A statistical analysis is made of the RFM.

Dissert Abstr

N77-33577*# Applied Science Associates, Inc., Apex, N C
INVESTIGATION OF THE APPLICATIONS OF GEOS-3
RADAR ALTIMETER DATA IN REMOTE SENSING OF LAND
AND SEA FEATURES

Lee S Miller Aug 1977 94 p refs

(Contract NAS6-2520)

(NASA-CR-141428) Avail NTIS HC A05/MF A01 CSCL 171

A number of GEOS-3 passes over the Atlantic Ocean and Southeastern U S are examined. Surface-truth and radar altimeter data comparisons are given in terms of surface correlation length, signal fluctuation characteristics and altitude tracker dynamic response. Detailed analyses are given regarding spatial resolution and its dependency on angular backscatter behavior. These analyses include data from passes over ocean (diffuse scatter) land (large body scatter) and mirror-like inland water areas (pseudo-specular scatter). Altimeter data are examined for a pass over a large reservoir and marsh area of differing water levels. This geometry represents a stepchange in altitude which is usable in determination of the transient response of the tracker. The extent to which pulse-length limited operation pertains over-land is examined. A Wiener filter altitude algorithm is discussed which permits specification of tracker variance and geoidal spectral characteristics during operation.

GRA

N77-33581*# Lockheed Electronics Co Houston Tex Aero-
 space Systems Div
SENSOR PERFORMANCE REPORT, VOLUME 4 (S-190A)
Final Report

R A Mendlowitz Sr and P D Lloyd Mar 1975 132 p

(Contract NAS9-12200)

(NASA-CR-151528 LEC-5789) Avail NTIS

HC A07/MF A01 CSCL 14B

A summary of efforts expended to determine the radiometric accuracy and signal to noise ratio achieved by the S190A multispectral camera is reported. The technique used was to computer model the photographic system and to compare theoretical results to known or measured radiometric values. The two sources used as known targets for radiometric evaluation were the film broadband sensitometry and the lunar disc. From the analysis it appears feasible to attain an accuracy of 10% or better in radiometric accuracy. This however is contingent on contemporaneously exposing the target and spectral sensitometry.

Author

N77-33582*# Lockheed Electronics Co Houston Tex Aero-
 space Systems Div
S-191 SENSOR PERFORMANCE EVALUATION Final
Report

C L Hughes Jun 1975 76 p refs

(Contract NAS9-12200)

(NASA-CR-151527 LEC-5778)

Avail NTIS

HC A05/MF A01 CSCL 14B

A final analysis was performed on the Skylab S-191 spectrometer data received from missions SL-2 SL-3 and SL-4. The repeatability and accuracy of the S-191 spectroradiometric internal calibration was determined by correlation to the output obtained from well-defined external targets. These included targets on the moon and earth as well as deep space. In addition the accuracy of the S-191 short wavelength autocalibration was flight checked by correlation of the earth resources experimental package S-191 outputs and the Backup Unit S-191 outputs after viewing selected targets on the moon.

Author

08 INSTRUMENTATION AND SENSORS

N77-33589*# Alabama Univ University Dept of Geology
and Geography

**APPLICATION OF REMOTE SENSING FOR PLANNING
PURPOSES Final Report, May 1976 - Jul 1977**

Travis H Hughes ed Jul 1977 82 p refs Prepared in
cooperation with The Geological Survey of Alabama
(Contract NAS8-31979)

(NASA-CR-150418) Avail NTIS HC A05/MF A01 CSCL
05B

Types of remotely sensed data are many and varied but all are primarily dependent on the sensor platform and the kind of sensing system used. A sensor platform is the type of aircraft or satellite to which a sensing system is attached; each platform has its own inherent advantages and disadvantages. Selected attributes of several current or recently used platforms are outlined. Though sensing systems are highly varied, they may be divided into various operational categories such as cameras, electromechanical scanners, and radars. Author

09 GENERAL

Includes economic analysis

A77-41635 # Space methods for investigating the environment (Kosmicheskie metody izucheniia prirodnoi sredy) B V Vinogradov Moscow, Izdatel'stvo Mysl', 1976 288 p 411 refs In Russian

Techniques and instrumentation for studying the environment from a variety of space platforms, including ballistic missiles, manned spacecraft and orbiting laboratories and satellites are discussed. Methods used for the analysis of satellite imagery are outlined. The use of remote-sensed information in oceanography, cartography, and meteorology is examined, together with applications in agriculture, pollutant monitoring, and land use planning. C K D.

A77-43699 Managerial applications of a 4-year regional program in remote sensing D B Fuller, D M Harman, and K B Fuller (Maryland, University, Frostburg, Md.) *Coastal Zone Management Journal*, vol 3, no 2, 1977, p 183-196 7 refs

A study was conducted to determine the degree of regional utilization of remote sensing data from the NASA Wallops four-year old Chesapeake Bay Ecological Program. Forty-three managerial agencies utilized the data in more than 80 projects related to regional management. User and project emphases were categorized on a primary and secondary basis. The results of the study indicate that remote sensing is being practically applied to the accomplishment of a diverse variety of managerial objectives by a significant proportion of the public agencies of the middle-Atlantic states. (Author)

A77-43806 Aerosat program - System and status. J A Scardina (FAA, Systems Research and Development Service, Washington, D.C.) In *Western Electronic Show and Convention*, Los Angeles, Calif., September 14-17, 1976, Technical Papers North Hollywood, Calif., Western Periodicals Co., 1976, p 9/1-1 to 9/1-8

A general description is given of the Aerosat program, its background, objectives, institutional arrangements, and current status. Attention is given to the international program structure, the Aerosat system configuration, spacecraft characteristics, satellite channel specifications, the test and evaluation program, and the program schedule. B J.

A77-46636 Europe's need for better information on natural resources and environment. J. Bodechtel (Zentralstelle für Geo-Photogrammetrie und Fernerkundung, Munich, West Germany) and J. Plevin (ESA, Paris, France). In *New themes for space Mankind's future needs and aspirations, Proceedings of the Bicentennial Space Symposium*, Washington, D.C., October 6-8, 1976 San Diego, Calif., American Astronautical Society, 1977, p. 167-179. (AAS 76-055)

European uses of satellite remote sensing data are discussed. Data would aid the inventorying of agricultural resources and the monitoring of water resources management and changes in landscape features. The characteristics of a satellite program that would supply desired data are examined. It is suggested that two principal tasks at present are to familiarize European users with satellite remote sensing data, and to identify and prepare optimum European contributions to the future space and ground segments. The roles of the European earth resources satellite data network (Earthnet), Spacelab experiments, and automatic satellite programs in accomplishing these tasks are analyzed. The manner in which a European satellite program would aid developing countries and participate in global monitoring programs is considered. M L.

A77-46637 * Quo vadis, remote sensing. F C Billingsley (California Institute of Technology, Jet Propulsion Laboratory,

Pasadena, Calif.) In *New themes for space Mankind's future needs and aspirations, Proceedings of the Bicentennial Space Symposium*, Washington, D.C., October 6-8, 1976. San Diego, Calif., American Astronautical Society, 1977, p. 181-194 (AAS 76-057)

The use of satellite remote sensing data for resource management is discussed. The evaluation of the need for management data is reviewed, and some legislative programs which require the monitoring of environmental resources are summarized. Several characteristics of data used in the monitoring of dynamic processes are analyzed, and the implications of routine processing of extensive remote sensing data for the development of a new world view are considered. M L.

A77-46748 Remote sensing - Satellite analyses of earth resources K Joels (Oklahoma State University, Stillwater, Okla.) *Mercury*, vol 6, July-Aug 1977, p 13-16

The diverse functions of remote sensing satellites observing earth's resources are described. Landsat monitoring, using infrared sensors, synoptic monitoring, and other devices, is described in terms of its investigation of the major factors of the human ecosystem, including agriculture and food supply, meteorology, resources geology, and hydrology. Applications of satellite monitoring in ecology, such as studying strip mining, deforestation, water and reservoir projects, are discussed. Future projects for Seasat are suggested including the analysis of ocean currents, sea storms, and temperature patterns. The control and elimination of global environmental problems is suggested as the most important role of remote sensing satellites. S C S.

A77-46767 Monitoring from satellites L P White (General Technology Systems, Ltd, Hounslow, Middx, England) (*Eurospace Conference, 6th, Monte Carlo, Monaco, Oct 13-16, 1975.*) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p. 183-186, 200 25 refs

The present day role of earth observation by satellite is discussed with regard to both the advantages and limitations of the existing systems. In addition to the current programs of meteorological, resource mapping, and geophysical observation, the possibility for environmental monitoring is proposed. Possible future applications for the use of satellite data are listed including those related to purely environmental issues, such as oceanology, pollution of air and water, and disaster warning, as well as subjects of global monitoring such as the monitoring of aerosols, biomass studies, and coastal zone management, which are of interest to international organizations. The article is concluded with remarks regarding the procedure for benefit assessment and cost-benefit analysis. S C S.

A77-47177 Space studies of earth resources: Methods and means of measurement and data processing (Kosmicheskie issledovaniia zemnykh resursov. Metody i sredstva izmereniia i obrabotki informatsii) Edited by Iu K Khodarev Moscow, Izdatel'stvo Nauka, 1976 384 p In Russian

Attention is given to the satellite remote sensing of earth resources, emphasizing the optimization of photographic systems, computer systems and algorithms for the processing of remote sensing data, and problems connected with designing remote sensing systems. Particular papers are presented on passive and active radio and radar methods for remotely sensing the earth surface, multi-spectral photography from Soyuz 12, the selection of satellite orbits for remote sensing experiments, the photometric processing of satellite photographs and legal questions associated with satellite remote sensing. B J.

A77-47178 # Space studies and the sensing of earth resources (Kosmicheskie issledovaniia i izuchenie prirodnykh resursov zemli) R Z Sagdeev In *Space studies of earth resources: Methods and means of measurement and data processing* Moscow, Izdatel'stvo Nauka, 1976, p 9-15 In Russian

09 GENERAL

The satellite remote sensing of earth resources is discussed with reference to rational resources management and protection of the environment. Attention is given to scientific (applied and theoretical) and economic problems which can be solved by the use of satellite remote sensing. The technology of sensors that record radiation emitted and reflected from the earth surface and atmosphere is briefly reviewed. B J

A77-47183 # Radio-physical methods of sensing the earth surface and prospects of their development (Radiofizicheskie metody v issledovaniiakh zemnykh pokrovov i perspektivy ikh razvitiia) N A Armand, A E Basharinov, L F Borodin, and A M Shutko. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 81-98. 42 refs. In Russian.

Various methods of the satellite-borne radio sensing of earth resources are discussed, including active (backscatter) radar sounding of the earth surface, active subsurface sounding, and passive microwave sounding. The application of radio remote sensing (both passive and active) to the fields of oceanography, hydrology, glaciology, agriculture, forestry and geology is examined. The optimal combination of radio sensing with optical sensing is considered. B J

A77-47202 # General principles for the design of a space system for sensing earth resources and monitoring the state of the ambient medium (Obshchie printsipy postroeniia kosmicheskoi sistemy dlia issledovaniia zemnykh resursov i kontroliia sostoiianiia okruzhaiushchei sredy) A V Gankevich. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 297-302. In Russian.

In Russian

A77-47203 # Requirements for space techniques of the sensing of earth resources and possible types of satellites (Trebovaniia k kosmicheskim sredstvam dlia issledovaniia prirodnykh resursov zemli i vozmozhnye tipy ISZ) G R Uspenskii. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 303-310. In Russian.

An iterative approach is taken to the total problem of satellite remote sensing. It involves the decomposition of the total problem to a number of subsets that correspond to satellites on different orbits. The solution to the total problem is found with reference to user requirements, estimation of technical and economic indices, and comparative analysis and selection with a view towards subsequent optimization. B J

A77-47207 # Aerospace polygons, problems of investigation and the structure of ground-based observations (Aerokosmicheskie poligony, zadachi issledovaniia i sostav nazemnykh nabludeniia) I S Garelik, A M Grin, and D G Tsvetkov. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 333-347. 7 refs. In Russian.

An aerospace polygon, as defined by aerial and space remote sensing, is a limited region of the earth surface, representative in terms of physical and geographic conditions for a given area. It is desirable that the polygon have a typical set of natural resources, which are modified by the natural and anthropogenic environment. The polygon must be accessible to ground-truth expeditions and be well charted. This paper explores the necessity of setting up a system of such polygons in the USSR. Particular attention is given to the organization of ground expeditions in aerospace polygons. B J

A77-47208 # Problems concerning the dissemination of space information for the sensing of earth resources and resources management (Voprosy rasprostraneniia kosmicheskoi informatsii dlia izucheniiia prirodnykh resursov zemli i upravleniia prirodopol'zovaniem) Iu V Zonov. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 347-366. 36 refs. In Russian.

Dissemination of satellite remote sensing data is considered with reference to user requirements concerning the content and structure of these data, and to the effects of these requirements on the structure of dissemination in the USSR. Attention is given to such user-related factors as territoriality, data resolution, scan scope, scan repeatability, time of data flow, complexity of data, types of data representation to users, and the interrelationship of subscriber requirements. Two hypothetical systems of space information dissemination are compared. B J

A77-47209 # Legal questions associated with satellite remote sensing and prospects of international cooperation in this field (Pravovye voprosy issledovaniia resursov zemli iz kosmosa i perspektivy mezhdunarodnogo sotrudnichestva v etoi oblasti). V S Vereshchetin. In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 366-375. 12 refs. In Russian.

It is debated whether the natural resources of a country can be remotely sensed without its consent and how this information is to be used. The drafting of international documents, under the aegis of the United Nations, pertaining to the legal aspects of satellite remote sensing is discussed. A general review of the status and current tendencies of international cooperation in the field of satellite remote sensing is presented. B J

A77-47432 American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Convention, Seattle, Wash., September 28-October 1, 1976, Proceedings. Falls Church, Va., American Society of Photogrammetry, 1976. 572 p. \$10.00.

Contributions are grouped under the headings: land use imagery and mapping, close-range photogrammetry, 200 years of surveying and photogrammetry, applications to forestry and croplands, control and simulation systems, local cadastral surveys, applications in aerospace, remote sensing, water resources and environmental conservation, orthophoto systems and automation. Digital generation of data, computer-assisted image enhancement, applications of photogrammetry to medicine (X-ray photogrammetry, close-range photogrammetry of amputated stumps), computer-assisted forest land classification, estimates of crop damage by floods, and computer-interactive photogrammetry displays are among the particular topics treated. R D V

A77-48651 # A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme. P Brunt, L P White, and L W Steines (General Technology Systems, Ltd., Hounslow, Middx., England). *ESA Journal*, vol 1, no 2, 1977, p 129-143. 13 refs. Research supported by the European Space Agency.

A methodology is developed for the identification and quantification of benefits from a European Remote-Sensing Satellite Programme. The methodology also covers the definition of programme objectives, the selection of geographical areas of application, the assessment and choice of 'ideal' sensor packages and spacecraft configuration, and the identification of sensing programmes. A brief example of the methodology applied to the problem of desert locust control is presented. (Author)

A77-50689 Workshop for a French Program of Spacelab Utilization, Avoriaz, Haute-Savoie, France, April 13-16, 1976, Proceedings (Journées d'Etude pour un Programme Français d'Utilisation du Spacelab, Avoriaz, Haute-Savoie, France, April 13-16, 1976, Proceedings). Workshop sponsored by the Centre National d'Etudes Spatiales, Toulouse, Centre National d'Etudes Spatiales, 1977. 409 p. In French.

French plans for the utilization of Spacelab are discussed, with attention given to research programs in the areas of astronomy, solar physics, geophysics, space medicine and materials sciences, as well as to technological problems associated with the operation of the Space Shuttle and Spacelab. Financial considerations, the selection of astronauts and scientists, and the role of Spacelab research in the

French space program are also reviewed. Subjects of the experiments include radioastronomy, infrared, ultraviolet and gamma-ray studies, climatology, the stratosphere, earth's gravitational potential, the surface state of the oceans, the locomotor, immunological and cardiovascular systems of humans, cellular biology, cartographic studies, surveys of dynamic processes in earth's atmosphere, crystal growth, the physics of fluids, and studies involving alloys and composites J M B

A77-51500* Remote-area health care delivery through space technology - STARPAHC N Belasco, R S Johnston, J C Stonesifer, and S L Pool (NASA, Johnson Space Center, Houston, Tex.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-255* 17 p 17 refs

A joint NASA/HEW project called Space Technology Applied to Rural Papage Advanced Health Care (STARPAHC) has been developed to deliver quality health care to inhabitants of remote geographical areas. The system consists of a hospital based support control center, a fixed clinic, a mobile clinic, and a referral center with access to specialists via television links to the control center. A strategically located relay station routes television, voice, and data transmissions between system elements. A model system has been installed on the Papage Indian Reservation in Arizona, and is undergoing a 2-year evaluation. The system has been shown to be both effective and cost-efficient, and applications of the concept are planned for future manned spacecraft flights. S C S

A77-51549 Some legal problems of remote sensing of earth from outer space V D Bordunov *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper SL-77-20* 7 p

Legal limits on the dissemination of satellite remote sensing data are proposed. A criterion for distinguishing between data to be freely distributed and data to be distributed only with the consent of the nations observed is given. In particular, it is suggested that global-scale information with a scale from several hundreds of meters to several kilometers and regional-scale information with a spatial resolution from 30 to 50 meters be made available to all users. However, access to local-scale data with a very high resolution, which may be applied to the solution of economic problems in agriculture, geology, forestry and land use, should be controlled by the nations subjected to the surveys. J M B

A77-51556 Physics, uses and regulation of the geostationary orbit, or, ex facto sequitur lex L Perek (United Nations, Outer Space Affairs Div., New York, N.Y.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper SL-77-44* 25 p 18 refs

The regulation of geostationary satellites is discussed, with attention given to such physical constraints as the necessary launch and stationkeeping propulsion, the oblateness of earth, the ellipticity of the equator, and solar radiation pressure, as well as to associated problems, including saturation of the geostationary orbit, saturation of the frequency spectrum for communications, and interruption of communications due to solar interference. A list of satellites with periods between 1420 and 1450 minutes launched up to July, 1977 is given, and geostationary satellites to be launched from 1977 to 1988 are also discussed. Applications of the satellites to communications, meteorology, earth resources monitoring, navigation and aircraft control systems, astronomy and solar power systems are described. J M B

N77-28548*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston, Tex
SKYLAB EXPLORES THE EARTH
Washington 1977 531 p refs Original contains color illustrations (NASA-SP-380) Avail NTIS MF A01 SOD HC \$17.50 CSCL 08F

The quality and the quantity of photographic and observational data that could be acquired by the crew of the many types of earth features when supported by multidisciplinary scientific training before lift-off, by real-time science mission planning, and by a comprehensive onboard set of procedures, maps, and photographs are evaluated. The visual observations experiment aimed the following: (1) determine the types of surface, air, and water phenomena the crew could visually identify from the Skylab orbit; (2) determine what visual observations supplemented by photography, could be accomplished to support scientific investigations; (3) explore the use of several data parameters in the study of multidisciplinary areas; and (4) determine the type of crew training necessary to perform the visual observations desired by scientists. Author

N77-28559# Lockheed Missiles and Space Co., Palo Alto, Calif
SOIUZ-22 A NEW CONTRIBUTION TO SPACE GEOGRAPHY
V V Ivanov and E D Sulidi-Kondratyev [1977] 2 p Transl into ENGLISH from Priroda (Moscow) no 3 1977 p 21
Avail NTIS HC A02/MF A01 National Translation Center, John Crerar Library Chicago, Ill 60616

The use of space photographs in the detection of earth resources and discontinuous tectonics is evaluated. I M

N77-28987*# National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
MULTIPURPOSE INTERACTIVE NASA INFORMATION SYSTEMS (MINIS)
Jun 1977 45 p
(NASA-TM-78124) Avail NTIS HC A03/MF A01 CSCL 05B

The Multipurpose Interactive NASA Information System was developed to provide remote, interactive information retrieval capability for various types of data bases to be processed on different types of small and medium size computers. Use of the system for three different data bases is described: (1) LANDSAT photo look-up, (2) land use and (3) census/socioeconomic. Each of the data base elements is shown together with other detailed information that a user would require to contact the system remotely to transmit inquiries on commands, and to receive the results of the queries or commands. Author

N77-30590# National Academy of Sciences - National Research Council, Washington D C Board on Science and Technology for International Development
RESOURCE SENSING FROM SPACE PROSPECTS FOR DEVELOPING COUNTRIES Final Report
Mar 1977 210 p refs
(Contract AID/CSD-2584)
(PB-264171/0 IR/BOSTID-77/23) Avail NTIS
HC A10/MF A01 CSCL 08F

Current and prospective applications of interest to the developing countries, implications for long-term governance of a remote sensing system and desirable technical cooperation initiatives are examined. GRA

N77-31048# White House Washington D C
AERONAUTICS AND SPACE REPORT OF THE PRESIDENT 1976 ACTIVITIES
[1977] 113 p
Avail NTIS MF A01, SOD HC

The development and utilization of aeronautical and aerospace technologies by various U.S. agencies and scientific organizations during the bicentennial year are summarized. Appendices list U.S. spacecraft records from 1957 successful launches in 1976, the history of U.S. and Soviet manned space flights, U.S. launch vehicles, and various space budgets. A R H

N77-31560*# California Univ Berkeley Space Sciences Lab
APPLICATION OF REMOTE SENSING TO SELECTED PROBLEMS WITHIN THE STATE OF CALIFORNIA Annual Progress Report
Robert N Colwell Michael Cosentino John E Estes and Leonard W Bowden Principal Investigators 1 May 1977 123 p refs

09 GENERAL

Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D 57198 ERTS

(Grant NsG-7220)
(E77-10205, NASA-CR-153970 SSL-Ser-18-Issue-52) Avail NTIS HC A06/MF A01 CSCL 08F

The author has identified the following significant results Computer-assisted classification of LANDSAT data resulted in ten spectrally unique classes The average vegetation composition associated with each computer class is described and results of analysis of variance are given to determine if the class composition was significantly different Flood flow data will be used in the flood plain management program, peak flood flow information will also be used in the flood insurance program LANDSAT data will be used by Kern County for reviewing proposed subdivisions and building construction

N77-31562*# National Research Council, Bangkok (Thailand)
THAILAND NATIONAL PROGRAMME OF THE EARTH RESOURCES TECHNOLOGY SATELLITE Final Report, Jun 1975 - Jul 1977

Sanga Sabhasri, Principal Investigator Jul 1977 123 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D 57198 ERTS

(E77-10207, NASA-CR-153971) Avail NTIS HC A06/MF A01 CSCL 08B

The author has identified the following significant results Accomplishments include the identification of a series of active alluvial fans along the margins of the Central Plain, the compilation of crop resources maps of central and eastern Thailand, and evaluation of the Purdue/LARS printout using unsupervised mode of an area near Bangkok Results from LANDSAT 1 imagery and ground truth survey showed that Thailand existing forest in 1973 covered an area of approximately 37% of total land area The last countrywide survey using aerial photographs at 1 60 000 scale conducted in 1961 gave the figure of 58% Experience has shown many advantages of LANDSAT imagery over the conventional aerial photography in locating faults and fractures in the preparation of tectonic maps Several rock types can also be identified from LANDSAT imagery

N77-31563*# Ohio Dept of Economic and Community Development, Columbus
DEVELOPMENT OF MULTI-DISCIPLINARY ERTS USER PROGRAM IN THE STATE OF OHIO Quarterly Progress Report

Paul E Baldrige, Principal Investigator 10 Mar 1977 2 p ERTS

(Contract NAS5-22399)
(E77-10209, NASA-CR-153973, QPR-7) Avail NTIS HC A02/MF A01 CSCL 05B

N77-31564*# Ohio Dept of Economic and Community Development, Columbus

DEVELOPMENT OF A MULTI-DISCIPLINARY ERTS USER PROGRAM IN THE STATE OF OHIO Quarterly Progress Report

Paul E Baldrige, Principal Investigator 10 Jun 1977 3 p ERTS

(Contract NAS5-22399)
(E77-10210, NASA-CR-153974, QPR-8) Avail NTIS HC A02/MF A01 CSCL 05B

The author has identified the following significant results Although the analysis of the results of presently - used methodology has showed inadequate correlation between the land use change and the various socio-economic factors, a system of analysis was produced that will aid in the future work in this area pointing out the adequacy of the land use data for producing models of desired accuracy This testing methodology is applicable to other LANDSAT/land use interpretation systems

N77-31577*# Georgia Inst of Tech Atlanta Engineering Experiment Station
LANDSAT INFORMATION FOR STATE PLANNING Final Technical Information

N L Faust and G W Spann (Metrics, Inc) Jun 1977 72 p refs Original contains color illustrations

(Contract NAS8-30653)
(NASA-CR-150378) Avail NTIS HC A04/MF A01 CSCL 05B

The transfer of remote sensing technology for the digital processing of LANDSAT data to state and local agencies in Georgia and other southeastern states is discussed The project consists of a series of workshops, seminars, and demonstration efforts, and transfer of NASA-developed hardware concepts and computer software to state agencies Throughout the multi-year effort, digital processing techniques have been emphasized classification algorithms Software for LANDSAT data rectification and processing have been developed and/or transferred A hardware system is available at EES (engineering experiment station) to allow user interactive processing of LANDSAT data Seminars and workshops emphasize the digital approach to LANDSAT data utilization and the system improvements scheduled for LANDSATs C and D Results of the project indicate a substantially increased awareness of the utility of digital LANDSAT processing techniques among the agencies contracted throughout the southeast In Georgia, several agencies have jointly funded a program to map the entire state using digitally processed LANDSAT data Author

N77-32549*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

NASA WORKSHOP ON SOLAR-TERRESTRIAL STUDIES FROM A MANNED SPACE STATION

1977 42 p ref Workshop held at Logan, Utah, 14-16 Feb 1977

(NASA-CP-2024) Avail NTIS HC A03/MF A01 CSCL 04A

The mechanism of the solar radiation and its effect on the environment are discussed These interdisciplinary discussions were expected to expose typical instrumentation requirements in the exploration of the solar and terrestrial system in such manner as to make it a significant factor in the proper management of the use of the earth's limited resources I M

N77-32564*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

INTRODUCTION. MAN AND HIS TOTAL ENVIRONMENT

In its NASA Workshop on Solar-Terrest Studies from a Manned Space Station 1977 5 p

Avail NTIS HC A03/MF A01 CSCL 13B

Environmental changes and the utilization of finite resources are analyzed Beyond the satisfaction of basic physical needs, the advancement of civilization toward an ever-improving quality of life is likewise dependent upon man's interaction with his entire environment This larger system is controlled externally by electromagnetic and particle energy from the sun and internally by the dynamic interchange of energy between the solid earth, oceans, the atmosphere, and the magnetosphere This exchange of energy that determines the structure of the earth's environmental system is evaluated Author

N77-32562# Committee on Commerce Science, and Transportation (U S Senate)

EARTH RESOURCES AND ENVIRONMENTAL INFORMATION SYSTEM ACT OF 1977

Washington GPO 1977 350 p refs Hearings on S 657 before Subcomm on Sci, Technol and Space of the Comm on Commerce, Sci, and Transportation, 95th Congr 1st Sess, 24-25 May, 13-14 Jun 1977
(GPO-93-604) Avail SOD

Statements and testimony are presented by government officials and industry spokesmen regarding the establishment of an operational earth resources and environmental information system based on remote sensing experimental satellite systems developed by NASA Discussion also concerns continuance of research and development by NASA to set up the space segment of the system, and the establishment of the data handling segment G D H

N77-33551*+ New Mexico Univ. Albuquerque Technology Application Center

LITERATURE REVIEW OF THE REMOTE SENSING OF NATURAL RESOURCES Quarterly Report, Jul. - Sep 1977 Charles B Fears, ed and Michael H Inglis, ed 1977 197 p Sponsored by NASA

(NASA-CR-155190, QR-3) Avail NTIS for foreign requestors only Domestic orders, Univ of New Mexico, Tech Application Center Albuquerque HC \$10 00 CSCL 05B

Abstracts of 596 documents related to remote sensors or the remote sensing of natural resources by satellite aircraft or ground-based stations are presented Topics covered include general theory, geology and hydrology agriculture and forestry, marine sciences, urban land use and instrumentation Recent documents not yet cited in any of the seven information sources used for the compilation are summarized An author/key word index is provided Author

N77-33554*# Purdue Univ Lafayette Ind Lab for Applications of Remote Sensing

APPLICATION OF REMOTE SENSING TECHNOLOGY TO THE SOLUTION OF PROBLEMS IN THE MANAGEMENT OF RESOURCES IN INDIANA Semiannual Status Report, 1 Dec. 1976 - 31 May 1977

R A Weismiller and R P Mroczynski, Principal Investigators 31 May 1977 19 p Original contains imagery Original photography may be purchased from the EROS Data Center, Sioux Falls, S D ERTS

(Grant NGL-15-005-186) (E77-10223, NASA-CR-154983) Avail NTIS HC A02/MF A01 CSCL 05A

The author has identified the following significant results The Lydick, South Bend West, South Bend East, and Osceola quadrangles were successfully classified into twenty-six cover types with a high degree of accuracy The ability of this computer-assisted classification system to delineate various stages of urban development, from heavy industry to new suburban development, was of particular interest to the planning commission The classification is clearly more beneficial than the existing agricultural soils and topographic maps, because it shows the current ground cover conditions all on one map It shows how an area is developing along with the specific type and location of new development The classification also shows at a glance whether development is taking place in an area suitable for development or if growth is taking place in prime agricultural land areas of poor foundation material or other places where development is not desirable

N77-33564*# Department of Scientific and Industrial Research, Wellington (New Zealand) Physics and Engineering Lab

SEISMOTECTONIC, STRUCTURAL, VOLCANOLOGIC, AND GEOMORPHIC STUDY OF NEW ZEALAND; INDIGENOUS FOREST ASSESSMENT IN NEW ZEALAND; MAPPING, LAND USE, AND ENVIRONMENTAL STUDIES IN NEW ZEALAND, VOLUME 1 Final Report

Mervyn C Probine, Richard P Suggate, Michael G McGreevy, and Ian F Stirling, Principal Investigators Sep 1977 140 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center, Sioux Falls S D ERTS

(E77-10233, NASA-CR-155023, Rept-587-Vol-1) Avail NTIS HC A07/MF A01 CSCL 08B

The author has identified the following significant results Results of the atmospheric extinction measurements show clearly the greater opacity of the atmosphere in MSS band 4 which is due to Rayleigh scattering Atmospheric water vapor absorbs strongly in a wide region between 900 nm and 1000 nm, and this results in a consistently higher extinction coefficient than would otherwise be expected in MSS band 7 The short term fluctuations tend to be greater in band 7 than in the other bands, and this effect is probably due to variations of water vapor concentration in the instrument line of sight These high extinction coefficients and short term fluctuations in band 7 were observed at Menindee which is in a semi-desert region in western New South Wales

N77-33565*# Department of Scientific and Industrial Research Wellington (New Zealand) Physics and Engineering Lab

SEISMOTECTONIC, STRUCTURAL, VOLCANOLOGIC, AND GEOMORPHIC STUDY OF NEW ZEALAND, INDIGENOUS FOREST ASSESSMENT IN NEW ZEALAND, MAPPING, LAND USE, AND ENVIRONMENTAL STUDIES IN NEW ZEALAND, VOLUME 2 Final Report

Mervyn C Probine Richard P Suggate Michael G McGreevy and Ian F Stirling Principal Investigators Sep 1977 133 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS

(E77-10234, NASA-CR-155024, Rept-587-Vol-2) Avail NTIS HC A07/MF A01 CSCL 08B

The author has identified the following significant results Ship detection via LANDSAT MSS data was demonstrated In addition information on ship size orientation and movement was obtained Band 7 was used for the initial detection followed by confirmation on other MSS bands Under low turbidity as experienced in open seas the detection of ships 100 m long was verified and detection of ships down to 30 m length theorized High turbidity and sea state inhibit ship detection by decreasing S/N ratios The radiance effect from snow of local slope angles and orientation was also studied Higher radiance values and even overloading in three bands were recorded for the sun-facing slope Local hot spots from solar reflection appear at several locations along transect D-C in Six Mile Creek Basin during September 1976

N77-33566*# Department of Scientific and Industrial Research Wellington (New Zealand) Physics and Engineering Lab

SEISMOTECTONIC, STRUCTURAL, VOLCANOLOGIC, AND GEOMORPHIC STUDY OF NEW ZEALAND, INDIGENOUS FOREST ASSESSMENT IN NEW ZEALAND, MAPPING, LAND USE AND ENVIRONMENTAL STUDIES IN NEW ZEALAND, VOLUME 3 Final Report

Mervyn C Probine Richard P Suggate Michael G McGreevy and Ian F Stirling Principal Investigators Sep 1977 187 p refs Sponsored by NASA Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS

(E77-10235, NASA-CR-155025, Rept-587-Vol-3) Avail NTIS HC A09/MF A01 CSCL 08B

The author has identified the following significant results The present resolution of LANDSAT precludes its use for topographic mapping at scales larger than 1 250 000 Encouraging potential was displayed for environmental and land use studies at scales up to 1 100 000

N77-33568*# South Dakota State Univ Brookings

APPLICATION OF REMOTE SENSING IN SOUTH DAKOTA TO PROVIDE ACCURATE INVENTORIES OF AGRICULTURAL CROPS, ENHANCE CONTRAST IN PHOTOGRAPHIC PRODUCTS, MONITOR RANGELAND HABITAT LOSS, MAP ASPEN, AND PREPARE HYDROGEOLOGIC SURVEYS Annual Progress Report, 1 Jul 1976 - 30 Jun 1977

Victor I Myers Principal Investigator K J Dalsted R G Best J R Smith J C Eidsenck F A Schmer A S Andrawis and P H Rahn 30 Jun 1977 99 p refs Original contains color imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS

(Grant NGL-42-003-007) (E77-10237, NASA-CR-155027, SDSU-RSI-77-08) Avail NTIS HC A05/MF A01 CSCL 02C

The author has identified the following significant results Digital analysis of LANDSAT CCTs indicated that two discrete spectral background zones occurred among the five soil zone K-CLASS classification of corn revealed that accuracy increased when two background zones were used compared to the classification of corn stratified by five soil zones Selectively varying film type developer and development time produces higher contrast in reprocessed imagery Interpretation of rangeland and cropped land data from 1968 aerial photography and 1976 LANDSAT imagery indicated losses in rangeland habitat Thermal imagery was useful in locating potential sources of sub-surface water and geothermal energy estimating evapotranspiration, and inventorying the land

09 GENERAL

N77-33571*# Arizona Univ Tucson Office of Arid Lands Studies

APPLIED REMOTE SENSING PROGRAM (ARSP) Final Report.

1 Jul 1977 16 p Sponsored by NASA Original contains imagery Original photography may be purchased from the EROS Data Center Sioux Falls S D ERTS (E77-1024C NASA-CR-155030) Avail NTIS HC A02/MF A01 CSCL 08B

N77-33578*# National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala

EARTH RESOURCES-REGIONAL TRANSFER ACTIVITY CONTRACTS REVIEW

J Bensko Jr J L Daniels S W Downs Jr N L Jones R R Morton and C T Paludan Aug 1977 95 p refs (NASA-TM-78130) Avail NTIS HC A05/MF A01 CSCL 05B

A regional transfer activity contracts review held by the Earth Resources Office was summarized Contracts in the earth resources field primarily directed toward applications of satellite data and technology in solution of state and regional problems were reviewed A summary of the progress of each contract was given in order to share experiences of researchers across a seven state region The region included Missouri Kentucky Tennessee Mississippi Alabama Georgia and North Carolina Research in several earth science disciplines included forestry limnology water resources land use geology and mathematical modeling The use of computers for establishment of information retrieval systems was also emphasized Author

N77-33580*# Old Dominion Univ Norfolk Va

THE ROLE OF AEROSPACE TECHNOLOGY IN AGRICULTURE THE 1977 SUMMER FACULTY FELLOWSHIP PROGRAM IN ENGINEERING SYSTEMS DESIGN

Sep 1977 279 p refs Program held at Hampton Va 6 Jun - 19 Aug 1977 sponsored in part by Am Soc for Eng Educ

(Grant NGT-47-003-028) (NASA-CR-145218) Avail NTIS HC A13/MF A01 CSCL 02C

Possibilities were examined for improving agricultural productivity through the application of aerospace technology An overview of agriculture and of the problems of feeding a growing world population are presented The present state of agriculture of plant and animal culture and agri-business are reviewed Also analyzed are the various systems for remote sensing particularly applications to agriculture The report recommends additional research and technology in the areas of aerial application of chemicals of remote sensing systems of weather and climate investigations and of air vehicle design Also considered in detail are the social legal economic and political results of intensification of technical applications to agriculture Author

N77-33584*# ECON Inc Princeton N J
A COST BENEFIT EVALUATION OF THE LANDSAT FOLLOW-ON PROGRAM

15 Sep 1976 135 p refs (Contract NASw-2558) (NASA-CR-155156 FR-76-102-3) Avail NTIS HC A07/MF A01 CSCL 05C

Results are presented of a benefit and cost study for the LANDSAT Follow-on system with a thematic mapper The analysis shows that the present worth of the benefits exceeds the present worth of the costs by a factor between 6.5 and 13 using a 10 percent discount rate and an infinite horizon for both This study focuses only on major demonstrated applications conservatively evaluated No benefits have been included except where a definite need for the information has been shown a mechanism for disseminating the information has been defined a technical capability has been demonstrated and a defensible method of evaluating the economic worth has been developed This approach has meant that certain applications with definite promise and substantial likely benefits could not be evaluated or assigned any benefits Mention is made of these areas however either in the appropriate subject chapter or in the final chapter on non-quantified benefits Author

N77-33585*# General Electric Co Philadelphia Pa
A STUDY OF SELECTED ENVIRONMENTAL QUALITY REMOTE SENSORS FOR FREE FLYER MISSIONS LAUNCHED FROM THE SPACE SHUTTLE

Harold W Goldstein and R N Grenda Aug 1977 66 p refs (Contract NAS1-13815) (NASA-CR-145252 DOC-77SDS4246) Avail NTIS HC A04/MF A01 CSCL 05B

The sensors were examined for adaptability to shuttle by reviewing pertinent information regarding sensor characteristics as they related to the shuttle and Multimission Modular Spacecraft environments This included physical and electrical characteristics data output and command requirements attitude and orientation requirements thermal and safety requirements and adaptability and modification for space The sensor requirements and characteristics were compared with the corresponding shuttle and Multimission Modular Spacecraft characteristics and capabilities On this basis the adaptability and necessary modifications for each sensor were determined A number of the sensors were examined in more detail and estimated cost for the modifications was provided Author

N77-33697# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany) Inst fuer Physik der Atmosphaere

SIGNIFICANCE OF ENVIRONMENTAL RESEARCH TASKS AT THE GERMAN AVIATION AND SPACE RESEARCH INSTITUTE [DIE BEDEUTUNG DER AUFGABEN DER UMWELTFORSCHUNG IN DER DFVLR]

D Paffrath [1976] 32 p refs In GERMAN (DLR-IB-553-75/5) Avail NTIS HC A03/MF A01

General problems of environmental research in the near and far future are presented, and the environmental research program of the Federal Republic of Germany is discussed The proposed activities of the German Aviation and Space Society task force Flight Technique and Environment Research will cover flight noise emission of noxious gases from engines, atmospheric investigations, remote sensing of the earth, ecology, structural research and communal technique ESA

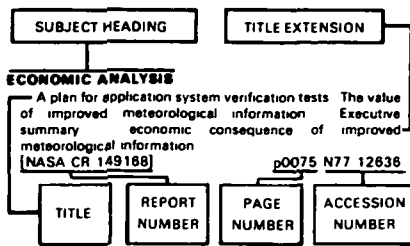
N77-34049*# National Aeronautics and Space Administration, Washington, D C

SPINOFF 1977. AN ANNUAL REPORT

James J Haggerty Jan 1977 117 p Original contains color illustrations (NASA-TM-74908) Avail NTIS MF A01, SOD HC \$3 10 CSCL 05B

Direct and indirect benefits of space technology are reviewed Applications in medicine, agriculture, solar energy technology, transportation, and other fields are discussed J LH

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content the title extension is added separated from the title by three hyphens. The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section (of this supplement). If applicable a report number is also included as an aid in identifying the document. Under any one subject heading the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

A

ABSORPTION SPECTRA

Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451

ABSORPTION SPECTROSCOPY

Air monitoring with tunable lasers p0216 A77-44613

ABSORPTIVITY

Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0237 A77-46188

ABSTRACTS

Literature review of the remote sensing of natural resources --- bibliography [NASA-CR-165190] p0277 N77-33551

ACCELEROMETERS

Some scientific applications of the low-g accelerometer Cactus --- neutral density wave detection in upper earth atmosphere [IAF PAPER 77-ST 05] p0268 A77-51589

ACCURACY

Applications of remote sensing volume 1 [E77-10182] p0259 N77-30548

ACOUSTIC PROPAGATION

Theory and application of wave propagation and scattering in random media p0256 A77-50986

ACOUSTIC SCATTERING

Use of ultrasound for the investigation of small-scale turbulence in the ocean p0235 A77-40815

Theory and application of wave propagation and scattering in random media p0256 A77-50986

ACOUSTIC SOUNDING

Use of ultrasound for the investigation of small-scale turbulence in the ocean p0235 A77-40815

Acoustical oceanography Principles and applications --- Book p0237 A77-45953

Microcomputer-controlled acoustic echo sounder [PB-288033/8] p0271 N77-32679

ADVECTION

Advection in the Peru current as observed by satellite p0238 A77-50273

AERIAL PHOTOGRAPHY

Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514

Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255

Plant growth and soil humidity above wall remnants Preliminary results of a soil test as a contribution to aerial-picture archeology p0207 A77-41256

Construction and interpretation of a digital inertia image -- of Pisgah Crater and Latic Lake in Southern California p0250 A77-44484

Aerial photographic detection of imported fire ant mounds p0208 A77-44470

Electro-optical systems and requirements in cartography p0221 A77-44780

Methods for optimising airborne LLLTV detection of fish induced plankton bioluminescence --- Low Light Level TV p0236 A77-45815

Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-48737

Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439

Techniques for estimating flood-produced crop damage using aerial photography p0210 A77-47442

Interpretation key for SAR /L-band/ imagery of sea ice p0237 A77-47451

Seasonal aerial survey of southern California kelp beds p0238 A77-47452

Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454

Development and testing of operational flood mapping techniques p0243 A77-47455

Optical power spectrum analysis - Scale and resolution effects -- for land use photomapping classifications p0255 A77-47476

Integration of land use data and soil survey data p0211 A77-47477

Accuracy models for bundle block triangulation p0255 A77-47974

The possibility of using Fourier spectra in aerial photography p0256 A77-50799

Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633

Determination of true elevations from aerial photographs [AD-A039356] p0261 N77-30579

Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-268769/8] p0231 N77-30589

Coastal wave measurements during passage of tropical storm Amy [NASA TM-74060] p0240 N77-30707

Advanced Digital Exploration Techniques (ADET) [AD-A040769] p0262 N77-31588

The citizen's guide to North Carolina's shifting inlets [PB-268736/6] p0262 N77-31762

AERIAL RECONNAISSANCE

Remote sensing potential for increasing yields of latent fisheries resources p0236 A77-45771

Radio-physical methods of sensing the earth surface and prospects of their development p0274 A77-47183

Technology of the thematic automated processing of video data p0253 A77-47191

Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources p0253 A77-47199

Space experiment simulation using an aircraft laboratory p0266 A77-47200

Aerospace polygons problems of investigation and the structure of ground-based observations p0274 A77-47207

Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395

AERONAUTICAL ENGINEERING

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities - technology development and utilization p0275 N77-31048

AEROSPACE ENGINEERING

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

Aeronautics and space report of the President 1978 activities --- technology development and utilization p0275 N77-31048

AGROMETEOROLOGY

A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological D C P network --- Data Collection Platform p2028 A77-45758

AIR LAND INTERACTIONS

The depression of remotely-sensed surface temperatures by a dust-laden tropical atmosphere p0236 A77-45732

AIR NAVIGATION

The electromagnetic autonavigation system /the EMAN system/ p0266 A77-43576

Automatic correction of position error by means of a digital correlation of surface structures - for air navigation p0221 A77 43577

AIR POLLUTION

EPA & Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77 40639
Air monitoring survey design - - Book

p0215 A77-40675
Environmental monitoring --- integrated network design and applications p0215 A77-42255

Air monitoring with tunable lasers p0218 A77-44613

A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting p0286 A77-45197

Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77-46298

Satellite monitoring of atmospheric gases p0217 A77-46766

Stratospheric CH₄ HCl and ClO and the chlorine-ozone cycle p0218 A77-49186

DFVLR mobile lidar system --- for air pollution monitoring p0267 A77-50135

Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50181

Selective modulation radiometry for remote detection of gaseous pollutants p0217 A77-50997

[ONERA TP NO 1977-111] p0218 A77-50997

Three field tests of a gas filter correlation radiometer [NASA-CR-153931] p0288 A77-28467

Experimental and theoretical studies of solid solution formation in lime and limestone SO₂ scrubbers volume 1 [PB-284953/1] p0219 N77-28625

Aerosol in the GATE area and its radiative properties [PB-285264/2] p0219 N77-30648

Air quality data for the Northeast oxidant transport study 1975 p0219 N77-30683

[PB-287545/2] p0219 N77-30683

AIR QUALITY

Air monitoring survey design --- Book p0215 A77-40675

AIR SAMPLING

Particulate sulfur analysis Application to high time resolution aircraft sampling in plumes p0216 A77-43376

AIR TRAFFIC CONTROL

Aerosat program - System and status p0273 A77-43806

AIR WATER INTERACTIONS

New formulas of the radiation balance of the ocean-atmosphere system p0235 A77-40812

Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 --- Air Mass Transformation Experiment p0238 A77-49194

AIRBORNE EQUIPMENT

Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0265 A77-41895

Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77-46298

A multidisciplinary lidar system - Aims technology missions [IAF PAPER 77 125] p0257 A77 51436

Development of snow water equivalent survey methods using airborne gamma measurements [EGG-1183-1877] p0248 N77-31592

AIRCRAFT INSTRUMENTS

The electromagnetic autonavigation system /the EMAN system/ p0266 A77-43576

AIRGLOW

Cryogenic spectrometry for the measurement of airglow and aurora [AD-A038220] p0289 N77 28679

ALASKA

Updating survey networks - A practical application of satellite Doppler positioning p0225 A77-47400

Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery p0243 A77-47447

All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961

ALGEBRA

The use of array algebra in terrain modeling procedures [AD-A040619] p0261 N77-30583

ALGORITHMS

The relative performance of some unsupervised clustering techniques for the per field classification of Landsat data p0251 A77-46764

ALLUVIUM

Alluvial valley floors in east-central Montana and their relation to strippable coal reserves A reconnaissance report [PB-287280/8] p0232 N77-31725

AMAZON REGION (SOUTH AMERICA)

Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region [INPE-1044-TPT/056] p0212 N77-30578

Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region [INPE-1075-NTE/101] p0213 N77-31578

ANNUAL VARIATIONS

The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite p0249 A77-41088

The annual cycle of the Gulf Loop Current 1. Observations during a one-year time series p0236 A77-43889

The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817

The semi-annual variation in thermospheric air density from January 1972 to April 1975 p0250 A77 45860

Seasonal aerial survey of southern California kelp beds p0238 A77-47452

ANTARCTIC REGIONS

Antarctic topography from balloons p0221 A77-44594

Remote sensing potential for increasing yields of latent fisheries resources p0236 A77-45771

Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77-45821

Satellite technology applied to Antarctic Mapping Program p0223 A77-47378

Oceanic polar front in the Drake Passage - Satellite observations during 1976 p0238 A77 51258

ARCHAEOLOGY

Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting p0229 A77-41024

Plant growth and soil humidity above wall remnants Preliminary results of a soil test as a contribution to aerial-picture archeology p0207 A77-41256

ARCTIC OCEAN

Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0237 A77 46186

Interpretation key for SAR /L-band/ imagery of sea ice p0237 A77-47451

All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961

Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552

ARCTIC REGIONS

Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry p0235 A77-41403

Sea ice studies in the Spitsbergen-Greenland area [E77-10206] p0240 N77-31561

ARIANE LAUNCH VEHICLE

Determination of the Geole polyhedron by the short-arc method [CNES-NT-65] p0227 N77-29596

ARID LANDS

Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region p0222 A77-45800

A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery [E77 10187] p0257 N77-28552

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas p0213 N77-31566

Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona [E77-10240] p0278 N77-33571

ARIZONA

Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748

Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500

Land use mapping and modelling for the Phoenix Quadrangle [E77-10198] p0260 N77-30556

Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0260 N77-30567

Rainfall infiltration characteristics for a semi-arid watershed soil [PB 287723/5] p0248 N77 30587

Spectral measurement of watershed coefficients in the southern Great Plains --- Texas Arizona and New Mexico [E77-10225] p0247 N77-33556

Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona [E77-10240] p0278 N77-33571

ARKANSAS

Identification of crops in Central Arkansas using visual and infrared spectral reflectance signatures [NASA-CR-151495] p0212 N77-30569

ASIA

Winter snow-cover maps of North America and Eurasia from satellite records 1966 - 1976 [PB-287393/7] p0245 N77-29722

ASTRONOMICAL SPECTROSCOPY

The application of Fourier transform spectroscopy to the remote identification of solids in the solar system p0255 A77-49291

ATLANTA (GA)

Urban and regional land use change detected by using Landsat data p0217 A77-48669

ATLANTIC OCEAN

Method of compilation of chemical-element maps of insufficiently observed ocean aquators p0235 A77-40796

The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798

Aerosat program System and status p0273 A77-43806

The icebergs of the North Atlantic p0236 A77-45612

Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope p0237 A77-46300

Radar characteristics of tropical convection observed during GATE Mean properties and trends over the summer season p0252 A77-47031

Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272

Huelva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data p0238 A77-48329

The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

Oceanic polar front in the Drake Passage - Satellite observations during 1976 p0238 A77-51258

Characteristics of meso-beta-scale deep convection over the eastern tropical Atlantic [PB 266955/4] p0258 N77-28709

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/8] p0239 N77-29383

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 -- North Atlantic ocean reliability maps [PB 265851/8] p0239 N77 29384

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 --- South Pacific ocean reliability maps [PB-265852/4] p0239 N77-29385

A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/9] p0219 N77 29723

Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77 33768

ATMOSPHERIC ATTENUATION

Consideration of the atmosphere in problems of the satellite sensing of earth resources p0252 A77-47185

ATMOSPHERIC CHEMISTRY

Optical systems unravel smog chemistry p0216 A77-44614

ATMOSPHERIC CIRCULATION

Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus 6 PMR results -- Pressure Modulator Radiometer p0285 A77-43483

Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77 45821

A three platform experiment on optical turbulence in the marine boundary layer [AD-A039789] p0258 N77-28685

Characteristics of meso-beta-scale deep convection over the eastern tropical Atlantic [PB-266955/4] p0258 N77-28709

ATMOSPHERIC COMPOSITION

An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420

Optical detection of atmospheric U 238 decay products -- determination of Pb and Bi scattering cross sections [PB-266955/4] p0250 A77-45305

Satellite monitoring of atmospheric gases p0217 A77-46766

Stratospheric CH₄ HCl and ClO and the chlorine-ozone cycle p0218 A77-49186

Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555

ATMOSPHERIC DENSITY

The semi-annual variation in thermospheric air density from January 1972 to April 1975 p0250 A77-45860

Some scientific applications of the low-g accelerometer Cactus --- neutral density wave detection in upper earth atmosphere [IAF PAPER 77-ST-05] p0288 A77-51569

ATMOSPHERIC DIFFUSION

Air quality data for the Northeast oxidant transport study 1975 [PB-267545/2] p0219 N77-30663

ATMOSPHERIC EFFECTS

The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

ATMOSPHERIC HEATING

The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731

ATMOSPHERIC MODELS

Model for profile of topside ionosphere p0265 A77-41228

Satellite observations as ground truth for climate models p0286 A77-45803

Atmospheric transmittance modeling for temperature and water vapor using satellite infrared data [PB-266414/2] p0269 N77-28690

ATMOSPHERIC MOISTURE

Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States
p0288 A77 45224

ATMOSPHERIC OPTICS

Influence of the atmosphere on the contrast of the Landsat images
p0250 A77 45728
Problems in infrared spectroscopy of the atmosphere --- Russian book
p0254 A77 47276

ATMOSPHERIC PHYSICS

Some results of investigating the electric field with the Interkosmos 10 satellite
p0221 A77 40897
Atmospheric transmittance modeling for temperature and water vapor using satellite infrared data
[PB-266414/2] p0269 N77-28690
NASA Workshop on Solar-Terrestrial Studies from a Manned Space Station
[NASA-CP-2024] p0276 N77-32549
EXCEDE 2
[AD-A042491] p0270 N77-32666

ATMOSPHERIC PRESSURE

Barometric frequency-compensated altimeter-automaton
p0268 A77-50724

ATMOSPHERIC RADIATION

New formulas of the radiation balance of the ocean-atmosphere system
p0235 A77-40812
Very-high-resolution far-infrared measurements of atmospheric emission from aircraft
p0265 A77-41895
Radiation in the atmosphere --- Book
p0216 A77-44997

Environmental change pattern in central Japan as revealed by LANDSAT data
[E77-10231] p0220 N77-33562

ATMOSPHERIC REFRACTION

Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations
p0224 A77-47397

ATMOSPHERIC TEMPERATURE

Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States
p0266 A77-45224

Meso-beta scale features observed in surface network and satellite data
p0252 A77-47039

IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval
[AD-A039861] p0269 N77-28684

Satellite temperature sounding of the atmosphere Ground truth analysis
[AD-A039236] p0259 N77-29679

Environmental change pattern in central Japan as revealed by LANDSAT data
[E77-10231] p0220 N77-33562

ATTENUATION COEFFICIENTS

The remote sensing of chlorophyll --- in upper ocean layer
p0236 A77-45852

AURORAL SPECTROSCOPY

Cryogenic spectrometry for the measurement of airglow and aurora
[AD-A038220] p0269 N77-28679

AURORAL ZONES

Fluctuations of the auroral zone current system and geomagnetic pulsations
p0265 A77-42288

AUROBAS

Interplanetary magnetic field in the ecliptic plane and auroral activity
p0249 A77-42621
HIRIS experiment - Chetanka radar results
[AD-A042183] p0271 N77-32669

AUSTRALIA

The Skylark sounding rocket programme
p0249 A77-41796
Ocean geodesy based on GEOS-3 satellite altimetry data
p0222 A77-45787
Skylab photography for geological mapping
p0229 A77-47176

Applications of Doppler satellite systems in remote regions in and near Australia
p0223 A77-47381
ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh
[E77-10202] p0260 N77-30562

AUTOMATIC FLIGHT CONTROL

The electromagnetic autonavigation system /the EMAN system/
p0266 A77-43576

AVALANCHES

Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado
[E77-10211] p0261 N77-31565

AZIMUTH

Most favorable time for determining azimuth from solar observations
p0221 A77-41002

B**BACKSCATTERING**

Active microwave measurement of sea-surface winds from space
p0239 N77-29333
Remote transducer based on coherent mixing of backscattered laser light
[PB-266771/5] p0269 N77-30688

BALLOON SOUNDING

Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment
p0222 A77-45821

BALLOON-BORNE INSTRUMENTS

Antarctic topography from balloons
p0221 A77-44594

BALTIC SEA

Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea
p0217 A77-47080

BANGLADESH

Investigations using data from LANDSAT 2
[E77 10189] p0260 N77-30559
LANDSAT/Bangladesh project
[E77 10200] p0260 N77-30560

Remote sensing and satellite surveying in Bangladesh A background paper on the latest position of the status of remote sensing and satellite surveying in Bangladesh -- Bay of Bengal
[E77 10201] p0260 N77-30561

ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh
[E77 10202] p0260 N77-30562

BAYS (TOPOGRAPHIC FEATURES)

Remote sensing and satellite surveying in Bangladesh A background paper on the latest position of the status of remote sensing and satellite surveying in Bangladesh - Bay of Bengal
[E77 10201] p0260 N77-30561

Evaluation of change detection techniques for monitoring coastal zone environments
[E77-10203] p0219 N77-30563

Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries
[E77-10227] p0241 N77-33558

Application of LANDSAT MSS data to the study of oceanographical environment --- Seto Inland Sea
[E77-10228] p0241 N77-33559

Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas
[E77-10229] p0241 N77-33560

General pattern of the turbid water in the Seto-inland sea extracted from multispectral imageries by the LANDSAT 1 and 2
[E77-10230] p0241 N77-33561

BEACHES

Visible and near infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship
p0258 A77-49394

BENARD CELLS

Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 -- Air Mass Transformation Experiment
p0238 A77-49194

BIBLIOGRAPHIES

Literature review of the remote sensing of natural resources --- bibliography
[NASA-CR-155190] p0277 N77-33551

BIOLUMINESCENCE

Methods for optimising airborne LLLTV detection of fish induced plankton bioluminescence --- Low Light Level TV
p0236 A77-45815

BIT SYNCHRONIZATION

120 MB/S and 240 MB/S bit synchronizer-signal conditioners for NASA high data rate applications
p0267 A77-49886

BLACK HILLS (SD-WY)

Integration of land-use data and soil survey data
p0211 A77-47477

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys
[E77-10237] p0277 N77-33568

BLACK SEA

Retranslation of oceanographic information from an automatic buoy station via Kosmos-426
p0235 A77-40792

Multiband survey as a method to study suspension distribution in the sea
[IAF PAPER 77-84] p0238 A77-51422

Danube Delta dynamics study by means of remote sensing
[IAF PAPER 77-88] p0244 A77-51423

BOUNDARY LAYERS

The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients
p0244 N77-29587

BRAZIL

Landsat - Current and future capabilities for agriculture
p0209 A77-45847

Geologic mapping of the Goias quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite
[INPE-1071-TP/058] p0231 N77-31579

Geomorphologic mapping by means of LANDSAT images
[INPE-1076-NTE/102] p0231 N77-31581

Tectonic sketch map of northern Minas Gerais based on LANDSAT images
[INPE-1078-NTE/104] p0231 N77 31582

Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area
[INPE-1065-TPT/061] p0240 N77 31757

BRIGHTNESSES

Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems
p0252 A77-47187

BRIGHTNESS TEMPERATURE

Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces
p0267 A77-47698

BRUSH (BOTANY)

Application of remote sensing to selected problems within the state of California
[E77-10205] p0275 N77-31560

BUOYS

Retranslation of oceanographic information from an automatic buoy station via Kosmos-426
p0235 A77 40792

Center for collection and processing of data from automatic buoy stations
p0249 A77 40818

Tracking a Gulf Stream ring with a free drifting surface buoy
p0235 A77-41918

C**C BAND**

Feasibility study of microprocessor systems suitable for use in developing a real-time for the 4.75 GHz scatterometer
[NASA-CR-151522] p0264 N77 33586

CADASTRAL MAPPING

The use of Landsat imagery in urbanized area studies
p0217 A77 47433

Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data
p0217 A77 47434

CALCIUM OXIDES

Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1
[PB-264953/1] p0219 N77 28255

CALIBRATING

Optimal calibration of remote sensors using time averaging
p0265 A77-40813

CALIFORNIA

Rare accessory uraninite in a Sierran granite
p0229 A77-43014

Construction and interpretation of a digital inertia image --- of Pisgah Crater and Lavinia Lake in Southern California
p0250 A77-44484

Surface temperature and albedo observations as tools for soil moisture and crop yield estimation
p0208 A77-45748

Seasonal aerial survey of southern California kelp beds
p0238 A77-47452

Ozone monitoring with an infrared heterodyne radiometer
p0267 A77-48451

Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems
[AD-A036245] p0218 N77-28379

Determining the usefulness of remote sensing for estimating agricultural water demand in California
[E77-10191] p0211 N77-30551

Monitoring water quality by remote sensing
[E77-10194] p0245 N77-30554

Determination of aerosol content in the atmosphere from LANDSAT data
[E77-10195] p0219 N77-30555

Application of remote sensing to selected problems within the state of California
[E77-10205] p0275 N77-31560

An integrated study of earth resources in the state of California using remote sensing techniques
[AD-A036245] p0246 N77-31569

An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data
[E77-10222] p0213 N77-31576

Remote identification of geologic materials by multispectral techniques An evaluation of applicability to highway planning in California
[PB-267137/8] p0231 N77-31590

Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight
[NASA-CR-155171] p0241 N77-33587

Precision surveying using very long baseline interferometry
[NASA-TM-X-71405] p0228 N77-33588

CANADA

Estimation of natural pollution loads from streamflow measurements in remote catchments
p0215 A77-42853

Forest fire fuel mapping from Landsat
p0208 A77-45756

The Canadian Doppler satellite network
p0223 A77-47379

Application of Doppler satellite tracking system for polar motion studies in Canada
p0225 A77-47406

Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study
p0210 A77-47441

LACIE Yield-weather regression models for the Canadian prairies
[NASA-TM-74833] p0212 N77-30575

Large Area Crop Inventory Experiment (LACIE) Phase 2 evaluation report
[NASA-TM-74937] p0213 N77-31584

CAPIES (LANDFORMS)

Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope
p0237 A77-46300

CARBON

Carbon Occurrence of linear forms in natural graphite
[AD-A039520] p0232 N77-31995

CARBON DIOXIDE LASERS

- Use of a carbon dioxide laser in remote detection of petroleum of pollution at sea p0217 A77-47080
- CARBON DIOXIDE**
Three field tests of a gas filter correlation radiometer [NASA-CR-153931] p0268 N77-28487
- CARCINOGENESIS**
Evaluation of space application problems of a decimillimeter carcinotron --- far infrared heterodyne detection [RT-1814] p0270 N77-31593
- CARIBBEAN SEA**
A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/9] p0219 N77 29723
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768
- CATALYTIC**
EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77-40639
- CELESTIAL GEOLOGY**
Analysis of the accuracy of determining coordinates of points by the orbital method p0221 A77-41001
Gravity potential resulting from cylindrical structures of finite length p0221 A77-43388
Relating Doppler datum to ordnance survey datum p0224 A77-47392
Introduction to the workshop on polar motion --- satellite determination by Doppler effect p0225 A77-47404
Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47406
Foundations of space geodesy --- Russian book p0226 A77-50685
- CHEMICAL ELEMENTS**
Method of compilation of chemical-element maps of insufficiently observed ocean aquifers p0235 A77-40796
- CHICAGOPEAKE BAY (UC)**
Managerial applications of a 4-year regional program in remote sensing p0273 A77 43699
- CHINA**
Land use/land cover mapping (1 25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery [NASA-TM-X-71382] p0260 N77-30577
- CHIRP SIGNALS**
Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514
- CHLOROPHYLL**
The remote sensing of chlorophyll --- in upper ocean layer p0236 A77-45852
Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
- CHROMOSPHERE**
Morphology and physical parameters of a solar flare p0229 A77 45269
- CIRROUS CLOUDS**
Diurnal oscillation of the area of cloudiness associated with tropical storms p0216 A77-43080
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
- CITIES**
The use of Landsat imagery in urbanized area studies p0217 A77-47433
Urban area delineation and detection of change along the urban rural boundary as derived from Landsat digital data p0217 A77-47434
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576
- CLASSIFICATION**
A syntax-directed method for land-use classification of Landsat images p0251 A77-46755
Applications of remote sensing volume 1 [E77-10182] p0259 N77-30548
- CLAY**
Comprehensive study of Leon-Queretaro area - Mexico [E77 10208] p0232 N77-32560
- CLIMATE**
LACIE Yield-weather regression models for the Canadian prairies [NASA-TM-74833] p0212 N77-30575
TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP-76-8] p0247 N77-33592
- CLIMATOLOGY**
New formulas of the radiation balance of the ocean-atmosphere system p0235 A77-40812
Satellite observations as ground truth for climate models p0266 A77-45803
Satellite climatology and its role in agriculture p0209 A77-45840
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
The application of ERTS imagery to the FAO/Unesco soil map of the world [E77-10236] p0214 N77-33567

CLINICAL MEDICINE

- Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500
- CLOUD COVER**
Diurnal oscillation of the area of cloudiness associated with tropical storms p0216 A77-43080
Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean p0250 A77-44900
Key to meteorological records documentation no 5 4 Environmental satellite imagery February 1977 [KMRD-5 4] p0262 N77-31726
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
- CLOUD PHOTOGRAPHY**
A comparative study of cloud classification techniques p0251 A77-46733
- CLOUDS (METEOROLOGICAL)**
Effects of cloud particles on remote sensing from space in the 10-micrometer infrared region [AD-A038502] p0268 N77 28565
Aerosol in the GATE area and its radiative properties [PB 265264/2] p0219 N77 30846
- COAL**
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77-28551
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] p0231 N77-30589
Alluvial valley floors in east-central Montana and their relation to strippable coal reserves A reconnaissance report [PB 267280/6] p0232 N77-31725
- COASTAL ECOLOGY**
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43699
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827
Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633
- COASTAL PLAINS**
Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469
- COASTAL WATER**
A study of density fronts and their effects on coastal pollutants p0217 A77-46735
Application of LANDSAT MSS data to the study of oceanographic environment --- Seto Inland Sea [E77-10228] p0241 N77-33559
Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560
Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563
- COASTS**
Mean sea level and the marine geoid - An analysis of concepts p0226 A77-51335
Applications of remote sensing volume 3 [E77-10185] p0259 N77-30549
Investigations using data from LANDSAT-2 [E77-10199] p0260 N77-30559
Evaluation of change detection techniques for monitoring coastal zone environments p0219 N77-30563
Coastal wave measurements during passage of tropical storm Amy [NASA-TM 74060] p0240 N77-30707
The French Atlantic littoral and the Massif Armoncaire part 1 --- Island of Jersey Fromentine Loire Estuary and Mont Saint-Michel Bay [E77-10216] p0261 N77-31570
Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77 10223] p0277 N77-33554
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77 10227] p0241 N77-33558
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
- COLD CATHODE**
Compact high-pressure electron-beam-controlled laser system p0268 A77-50175
- COLD PLASMA**
The cold plasma throughout the magnetosphere p0216 A77-44240
- COLOR PHOTOGRAPHY**
Electro-optical systems and requirements in cartography p0221 A77-44780
A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435

COLORADO

- Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado [E77-10211] p0261 N77-31566
- COMPUTER GRAPHICS**
LANDSAT planning applications in east central Florida [E77-10238] p0264 N77-33569
- COMPUTER INFORMATION SECURITY**
Interactive processing of MSS data - A usable system for moderately-sized computer systems p0255 A77-47448
- COMPUTER PROGRAMS**
Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195
Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47397
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
Image analysis library software development [NASA-CR-151468] p0258 N77-28827
DIMECNV A system for converting scanner-digitized mapping data tapes to polygon format [PB-266438/1] p0258 N77-29599
Processing of map information in a minicomputer p0263 N77 32559
- COMPUTER SYSTEMS DESIGN**
Interactive processing of MSS data - A usable system for moderately-sized computer systems p0255 A77-47448
- COMPUTER TECHNIQUES**
Method of compilation of chemical-element maps of insufficiently observed ocean aquifers p0235 A77-40796
The relative performance of some unsupervised clustering techniques for the per-field classification of Landsat data p0251 A77-46764
On-line analytics for close-range photogrammetry p0254 A77-47437
Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study p0210 A77-47441
Corrected Landsat images using a small computer p0255 A77 47481
Some aspects of the calculation of the thermal radio emission from ocean snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690
- COMPUTERIZED SIMULATION**
Satellite observations as ground truth for climate models p0268 A77 45803
Simulation of the effects of hard limiting on image quality of synthetic aperture radar -- onboard Landsat satellite p0256 A77 49905
Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites [INPE-1072-TPT/059] p0262 N77-31560
Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area [INPE-1085-TPT/061] p0240 N77 31757
- COMPUTERS**
Earth resources technology system standalone software package Description and users guide [NASA-CR-152598] p0264 N77-33561
- COMPONENTS**
Radiation in the atmosphere --- Book p0216 A77-44997
Satellite Doppler positioning Proceedings of the International Geodetic Symposium New Mexico State University Las Cruces N Mex October 12-14 1976 Volumes 1 & 2 p0222 A77-47370
American Society of Photogrammetry and American Congress on Surveying and Mapping Fall Convention Seattle Wash September 28 October 1 1976 Proceedings p0274 A77 47432
Workshop for a French Program of Spacelab Utilization Avonaz Haute-Savoie France April 13-16 1976 Proceedings p0274 A77-50889
- CONGRESSIONAL REPORTS**
Earth Resources and Environmental Information System Act of 1977 [GPO-93-604] p0276 N77-32562
- CONICAL SCANNING**
Geometric evaluation of Skylab S-192 conical scanner imagery p0254 A77-47446
- CONTINENTAL SHELF**
Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area [INPE-1085-TPT/061] p0240 N77-31757
An experimental investigation of some combined flow sediment transport phenomena [PB-269872/2] p0247 N77-32575
- CONTINENTS**
Distribution of electrical resistivity on continental areas p0263 N77-32390
- CONTOUR**
Contour determination from digital terrain models -- Book p0226 A77-50892
- CONVECTION CLOUDS**
Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031

CONVECTION CURRENTS

Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 -- Air Mass Transformation Experiment p0238 A77-48194

COORDINATE TRANSFORMATIONS

Analytical methods of the coordinate connection of video data, obtained for purposes of sensing earth resources p0263 A77-47196

CORN

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

COSMOS SATELLITES

Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces p0267 A77-47698

COST ANALYSIS

A cost benefit evaluation of the LANDSAT follow-on program [NASA-CR-155156] p0278 N77-33584

CROP GROWTH

Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748

A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological D.C.P. network --- Data Collection Platform p0208 A77-45758

Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77-45795
Implementation of a crop condition monitoring system p0209 A77-45798

Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data p0208 A77-45814

Wheat productivity estimates using LANDSAT data --- Kansas [E77-10181] p0211 N77-28550

The large area crop inventory experiment An experiment to demonstrate how space-age technology can contribute to solving critical problems here on earth [NASA-TM-74832] p0212 N77-30564

The large area crop inventory experiment A major demonstration of space remote sensing [NASA-TM-74840] p0212 N77-30570

LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77-30576

CROP IDENTIFICATION

Radar system specifications for hydrology and agriculture p0207 A77-43804

Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-48754

Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834

Applications of Suits spectral model to wheat p0210 A77-48738

Techniques for estimating flood-produced crop damage using aerial photography p0210 A77-47442

Identification of crops in Central Arkansas using visual and infrared spectral reflectance signatures [NASA-CR-151495] p0212 N77-30569

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

Application of LANDSAT imagery in land use inventory and classification in Nebraska - Lower and Upper Niobrara area and Sheridan County [E77-10242] p0214 N77-33573

CROP INVENTORIES

On winter wheat yield from Landsat and Landsat follow-on satellites p0208 A77-45749

The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817

Toward fully automated agricultural inventory from satellites p0209 A77-45844

Landsat - Current and future capabilities for agriculture p0209 A77-45847

Monitoring crops and forests from space [AAS 76-054] p0210 A77-46838

CROP VIGOR

Landsat - Current and future capabilities for agriculture p0209 A77-45847

CROPS

LACIE Yield-weather regression models for the Canadian prairies [NASA-TM-74833] p0212 N77-30575

CRUDE OIL

Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea p0217 A77-47080

CRYOGENIC EQUIPMENT

Cryogenic spectrometry for the measurement of airglow and aurora [AD-A036220] p0269 N77-28679

CRYSTAL STRUCTURE

Surface and structural properties of polygorskite p0230 N77-28586

Carbon Occurrence of linear forms in natural graphite [AD-A039520] p0232 N77-31895

CUMULUS CLOUDS

Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031

CURRENT DISTRIBUTION

Interaction between steady wind-uniform two-dimensional currents and directional wind-generated gravity waves with applications for current measurements [AD-A040600] p0282 N77-31702

CURRENT SHEETS

Fluctuations of the auroral zone current system and geomagnetic pulsations p0285 A77-42288

CYCLONES

A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/8] p0219 N77-29723

Atlantic tropical and subtropical cyclone classification for 1976 [PB-269874/8] p0220 N77-33768

CYLINDRICAL BODIES

Gravity potential resulting from cylindrical structures of finite length p0221 A77-43388

D**DAMS**

Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline --- Missouri [E77-10220] p0246 N77-31574

DATA ACQUISITION

Data management for earth observations p0259 N77-30290

DATA COLLECTION PLATFORMS

A European yield forecasting Agromet system A proposal to use Meteosat and Landsat 3 data in correlation with a meteorological D.C.P. network --- Data Collection Platform p0208 A77-45758

Simulation of remote data acquisition systems p0254 A77-47255

Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557

DATA MANAGEMENT

Data management in pattern recognition and image processing systems p0249 A77-43815

Digital system for the processing of video data for the purpose of studying earth resources p0253 A77-47193

Data management for earth observations p0259 N77-30290

Earth resources-regional transfer activity contracts review [NASA-TM 78130] p0278 N77-33578

DATA PROCESSING

Center for collection and processing of data from automatic buoy stations p0249 A77-40818

Data reduction and information extraction for remotely sensed images p0251 A77-46769

Technology of the thematic automated processing of video data p0253 A77-47191

Space experiment simulation using an aircraft laboratory p0266 A77-47200

DMATC Doppler determination of polar motion p0223 A77-47376

Doppler data transmission and handling at the Geodetic Institute of Uppsala p0225 A77-47407

Remote investigations of the environment from space and problems of space data handling p0256 A77-50443

Quick-look capability in a European earth resources satellite data network [FU15-4] p0258 N77-28562

Digital geographic data handling activities in the U.S. geological survey [PB-266863/4] p0219 N77-30586

An interactive color display for multispectral imagery using correlation clustering [NASA-CASE-MSC-16253-1] p0262 N77-31583

Space studies of earth resources Methods and means of measurements and processing of information [NASA-TT-A-17544] p0264 N77-33583

DATA REDUCTION

Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77-45795

Reduction and treatment of magnetic anomalies of crustal origin in satellite data p0222 A77-48270

Data reduction and information extraction for remotely sensed images p0251 A77-46769

MEDOC experiment on the French Polar Motion Project -- based on Doppler observation of Transit satellite p0223 A77-47377

Remote sensing of accumulated frazil and brash ice in the St. Lawrence River [AD-A039905] p0245 N77-30581

DATA SAMPLING

Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438

Testing land-use map accuracy p0255 A77-47478

Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77 10244] p0214 N77-33575

DATA SYSTEMS

Data reduction and information extraction for remotely sensed images p0251 A77-46769

120 MB/S and 240 MB/S bit synchronizer-signal conditioners for NASA high data rate applications p0287 A77-49886

DATA TRANSMISSION

Doppler data transmission and handling at the Geodetic Institute of Uppsala p0225 A77-47407

DECISION MAKING

Implementation of a decision support for regional water quality planning [PB-267342/4] p0246 N77-30593

DEEP SCATTERING LAYERS

Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690

DELAWARE RIVER BASIN (UR)

A study of density fronts and their effects on coastal pollutants p0217 A77-48735

DELTA

Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-86] p0244 A77-51423

Monitoring water quality by remote sensing [E77-10194] p0245 N77-30554

DENMARK

Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77-46298

DESERTS

The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731

Application of remote sensing to selected problems within the state of California [E77-10206] p0275 N77-31560

DIFFRACTION PATTERNS

The possibility of using Fourier spectra in aerial photography p0256 A77-50789

DIFFUSE RADIATION

A method to obtain diffuse reflectance measurements from 1.0 to 3.0 microns using a Cary 171 spectrophotometer -- for atmospheric aerosol measurement p0287 A77-49295

DIGITAL COMPUTERS

A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-R-472] p0289 N77-30572

DIGITAL DATA

A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565

Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587

DIGITAL NAVIGATION

Automatic correction of position error by means of a digital correlation of surface structures -- for air navigation p0221 A77-43577

DIGITAL RADAR SYSTEMS

Advances in digital sensor simulation -- radar terrain data bases p0254 A77-47445

Environment and radar operation simulator [AD-A036856] p0288 N77-28378

DIGITAL SIMULATION

Simulation of remote data acquisition systems p0254 A77-47255

Advances in digital sensor simulation --- radar terrain data bases p0254 A77-47445

DIGITAL SYSTEMS

Digital system for the processing of video data for the purpose of studying earth resources p0253 A77-47193

Interactive processing of MSS data A usable system for moderately-sized computer systems p0255 A77-47448

An interactive minicomputer image processing system for remote sensing applications p0254 A77-47449

Digital cartographic study and benchmark [AD-A043156] p0228 N77-32571

DIGITAL TECHNIQUES

Construction and interpretation of a digital inertia image - of Pisgah Crater and Latic Lake in Southern California p0250 A77-44464

Digital image processing for a better recognition of the terrestrial surface in Morocco p0250 A77-45459

Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data p0217 A77-47434

Integration of land-use data and soil survey data p0211 A77-47477

Digital technique for generating synthetic aperture radar images p0256 A77-50447

Contour determination from digital terrain models --- Book p0226 A77-50692

Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77-31575

Digital overlaying of the universal transverse Mercator grid with LANDSAT data derived products [NASA-TM-58200] p0262 N77-31827

Extraction of topological information from digital images [AD-A042125] p0228 N77-32569

DIMENSIONAL MEASUREMENT

Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry p0235 A77-41403

DISPLAY DEVICES

The display of Landsat data at large scales by matrix printer p0267 A77-47480

DISTANCE MEASURING EQUIPMENT

Spaceborne earth applications ranging system /SPEAR/ p0221 A77-40824

Electronic surveying and navigation --- book on instrumentation systems and supporting theory p0267 A77-49775

DISTORTION

Theory and analysis of vegetation pattern [EDFB-IBP-78-3] p0213 N77-31591

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565

DIURNAL VARIATIONS

The determination of the outer boundary of radiation belts from data obtained by the Cosmos 426 satellite p0249 A77-41088

An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420

Fast detection of 10 830-A helium emission p0285 A77-42620

Diurnal oscillation of the area of cloudiness associated with tropical storms p0216 A77-43080

DOPPLER EFFECT

Doppler positioning by the short arc method --- geodetic adjustment from satellite observations p0222 A77-47375

Relating Doppler datum to ordnance survey datum p0224 A77-47392

Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47397

Effect of Geocenter observations upon the classical triangulation network p0225 A77-47399

Updating survey networks - A practical application of satellite Doppler positioning p0225 A77-47400

Adjustment of terrestrial networks using Doppler satellite data p0225 A77-47401

Introduction to the workshop on polar motion --- satellite determination by Doppler effect p0225 A77-47404

Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47406

Doppler data transmission and handling at the Geodetic Institute of Uppsala p0225 A77-47407

Errors of Doppler positions obtained from results of transcontinental traverse surveys p0225 A77-47409

Determination of North American Datum 1983 coordinates of map corners --- Doppler geocentric coordinates p0225 A77-47410

DOPPLER NAVIGATION

Satellite Doppler positioning Proceedings of the International Geodetic Symposium New Mexico State University Las Cruces N Mex October 12-14 1976 Volumes 1 & 2 p0222 A77-47370

DMATC Doppler determination of polar motion p0223 A77-47376

MEDOC experiment of the French Polar Motion Project --- based on Doppler observation of Transit satellite p0223 A77-47377

Satellite technology applied to Antarctic Mapping Program p0223 A77-47378

The Canadian Doppler satellite network p0223 A77-47379

The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380

Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381

Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning p0223 A77-47382

A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383

Standardization of Doppler point positioning results p0224 A77-47384

Development of Doppler activity at IROE --- European tracking station in US Navy Navigation Satellite Tracking Network p0224 A77-47387

Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid p0224 A77-47388

Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389

Methodology and field tests of GDOP - A geodetic computation package for the short arc adjustment of satellite Doppler observations p0224 A77-47390

Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391

DRAINAGE

Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572

DRAINAGE PATTERNS

Application of remote sensing to selected problems within the state of California [E77-10205] p0275 N77 31560

DRILLING

Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391

DROUGHT

Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture p0209 A77-45780

DUST

Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77 30648

DYNAMIC MODELS

Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453

E

EARTH (PLANET)

Skylab explores the earth [NASA-SP-380] p0275 N77-28548

Upper Mesozoal magnetostratigraphy p0230 N77-28656

The application of ERTS imagery to the FAO/Unesco soil map of the world [E77-10236] p0214 N77-33567

EARTH ALBEDO

Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748

Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region p0222 A77-45800

EARTH ATMOSPHERE

Satellite-borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198

EARTH CRUST

On the problem of the nature of the anomalous magnetic field and its interpretation --- in earth crust p0221 A77-43572

Reduction and treatment of magnetic anomalies of crustal origin in satellite data p0222 A77-46270

EARTH ENVIRONMENT

General principles for the design of a space system for sensing earth resources and monitoring the state of the ambient medium p0274 A77-47202

Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77-51438

EARTH MOTION

DMATC Doppler determination of polar motion p0223 A77-47376

MEDOC experiment of the French Polar Motion Project --- based on Doppler observation of Transit satellite p0223 A77-47377

EARTH MOVEMENTS

Recent elevation change in Southern California [PB-265940/7] p0227 N77-28688

EARTH RESOURCES

Some types of preliminary processing of video data --- earth resources remote sensing p0253 A77-47194

Frequency requirements for active earth observation sensors [NASA-CR-153939] p0268 N77-28556

Radar systems for a polar mission volume 2 [NASA-CR-152611] p0258 N77-28561

Remote sensing applications to Missouri environmental resources information system [NASA-CR-150340] p0260 N77-30565

EARTH RESOURCES SURVEY AIRCRAFT

Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources p0253 A77-47198

Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories p0266 A77-47201

EARTH SATELLITES

Magsat A satellite for measuring near earth magnetic fields [NASA-TM-X-71370] p0270 N77-30683

EARTH SURFACE

An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420

Digital image processing for a better recognition of the terrestrial surface in Morocco p0250 A77-45459

Operational means for obtaining spaceborne video data in the optical range p0252 A77-47180

Radio-physical methods of sensing the earth surface and prospects of their development p0274 A77-47183

The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184

Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems p0252 A77-47187

Optimization of identifiable characteristics of objects during multispectral photography p0253 A77-47188

Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195

Satellite-borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198

Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories p0266 A77-47201

Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces p0267 A77-47896

Free-air gravity anomalies in the world's oceans and their relationship to residual elevation p0226 A77-49327

The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

Atlas of probabilities of surface temperature extremes Part 2 Southern Hemisphere [AD-A038237] p0227 N77-29702

EARTHQUAKES

Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas Utah volume 4 [PB-268421/5] p0283 N77-32574

ECLIPTIC

Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42821

ECOLOGY

Remote sensing in ecological botany p0210 A77-46734

Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Praprojekt baseline --- Missouri [E77-10220] p0246 N77-31574

Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77-33575

ECONOMIC FACTORS

Integrated management of water resources --- in France p0243 A77-42874

ECONOMICS

ESCAP inter-governmental meeting on remote sensing and satellite surveying -- Bangladesh [E77-10202] p0260 N77-30582

ECOSYSTEMS

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77 10237] p0277 N77-33568

TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP-78-8] p0247 N77-33592

EGYPT

Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt [IAF PAPER 77-128] p0257 A77-51437

ELECTRIC CORONA

Microwave radiometric detection of corona from chaff within thunderstorms p0288 A77-50274

ELECTRIC DISCHARGES

Microwave radiometric detection of corona from chaff within thunderstorms p0288 A77-50274

ELECTRIC FIELDS

Some results of investigating the electric field with the Interkosmos 10 satellite p0221 A77-40897

ELECTRIC POWER PLANTS

Environmental assessment of geopressed waters and their projected uses [PB-268289/6] p0247 N77-32579

ELECTRICAL PROPERTIES

Effective electrical parameters of incipient forms of sea ice sheet and crust p0237 A77-46185

ELECTRICAL RESISTIVITY

Numerical studies to aid interpretation of an airborne VLF resistivity survey [AD-A039904] p0231 N77-31594

Distribution of electrical resistivity on continental areas p0263 N77-32390

ELECTRO-OPTICAL PHOTOGRAPHY

Electro-optical systems and requirements in cartography p0221 A77-44780

ELECTROMAGNETIC MEASUREMENT

The electromagnetic autonavigation system /the EMAN system/ p0266 A77-43576

ELECTROMAGNETIC SCATTERING

Theory and application of wave propagation and scattering in random media p0256 A77-50966

Microwave backscattering theory and active remote sensing of the ocean surface [NASA-CR-141423] p0240 N77-30442

ELECTROMAGNETIC WAVE TRANSMISSION

Theory and application of wave propagation and scattering in random media p0256 A77-50966

ELECTRON CAPTURE

Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm p0250 A77-46056

ELECTRON DENSITY PROFILES

Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-6 1974 p0215 A77-41110

Model for profile of topside ionosphere p0265 A77-41228

ELECTRON FLUX DENSITY

OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42285

- Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-48386
- ELECTRON GUNS**
Compact high-pressure electron-beam-controlled laser system p0268 A77-50175
- ELECTRONIC EQUIPMENT**
Electronic surveying and navigation --- book on instrumentation systems and supporting theory p0267 A77-49775
- ELEVATION ANGLE**
A theory of sea scatter at large incident angles p0237 A77-45901
- EMISSION SPECTRA**
Fast detection of 10.830-A helium emission p0265 A77-42620
- ENERGY CONSERVATION**
Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0260 N77-30567
- ENERGY SOURCES**
Space technology in the discovery and development of mineral and energy resources p0231 N77-30289
- ENERGY SPECTRA**
Scattering of radio waves by an underlying surface covered with vegetation p0207 A77-41178
- ENTROPY**
Computing residuals in geothermal research by IR scanning p0266 A77-46768
- ENVIRONMENT EFFECTS**
Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77-51438
Environmental assessment of geopressed waters and their projected uses [PB-26289/6] p0247 N77-32579
- ENVIRONMENT MANAGEMENT**
Quo vadis remote sensing -- use of satellite data for resource management [AAS 76-067] p0273 A77-46637
Earth Resources and Environmental Information System Act of 1977 [GPO-83-604] p0276 N77-32562
- ENVIRONMENT POLLUTION**
Significance of environmental research tasks at the German Aviation and Space Research Institute [DLR-IB-553-75/5] p0278 N77-33697
- ENVIRONMENT PROTECTION**
EPA's Catalyst Research Program Environment Impact of sulfuric acid emissions p0215 A77-40639
Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning p0259 N77-30546
- ENVIRONMENT SIMULATORS**
Environment and radar operation simulator [AD-A038656] p0268 N77-28378
- ENVIRONMENTAL CONTROL**
Introduction Man and his total environment p0276 N77-32554
- ENVIRONMENTAL MONITORING**
Air monitoring survey design --- Book p0215 A77-40675
Space methods for investigating the environment --- Russian book p0273 A77-41636
Environmental monitoring --- integrated network design and applications p0215 A77-42255
Investigation of the natural environment using radio-physical methods / Review / p0265 A77-43401
Europe's need for better information on natural resources and environment [AAS 76-065] p0273 A77-46636
Control of spacecraft for sensing earth resources and monitoring the ambient medium p0253 A77-47205
Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
Remote investigations of the environment from space and problems of space data handling p0256 A77-50443
Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633
Environment and radar operation simulator [AD-A038656] p0268 N77-28378
Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir [PB-265204/8] p0244 N77-28463
A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky volume 1 [E77-10189] p0230 N77-28554
A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky Volume 2 Appendices [E77-10190] p0230 N77-28555
Monitoring water quality by remote sensing [E77-10194] p0245 N77-30654
Comparative levels of environmental radioactivity in Utah from industry and fall out. A report of radioecological investigations of airborne radioactivity in the Utah environment [UERL-2] p0219 N77-31297
Application of digital analysis of MSS data to agro-environmental studies --- North Dakota and New Jersey [E77-10204] p0212 N77-31559
EXCEDE 2 [AD-A042491] p0270 N77-32666
- Investigation of environmental change pattern in Japan Classification of shorelines -- Nagoya Yokkaichi and Risu Japan [E77-10224] p0220 N77-33555
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
- ENVIRONMENTAL SURVEYS**
Remote sensing in ecological botany p0210 A77-46734
Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
Alluvial valley floors in east central Montana and their relation to strippable coal reserves A reconnaissance report [PB-267280/8] p0232 N77-31725
- EPHEMERIDES**
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389
- EQUIPMENT SPECIFICATIONS**
Radar system specifications for hydrology and agriculture p0207 A77-43804
- ERROR ANALYSIS**
The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190
Methodology and field tests of G D O P - A geodetic computation package for the short arc adjustment of satellite Doppler observations p0224 A77-47390
- ERROR CORRECTING DEVICES**
Automatic correction of position error by means of a digital correlation of surface structures --- for air navigation p0221 A77-43577
- ESA SATELLITES**
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
- ESTIMATING**
Initial development of a method of significant waveheight estimation for GEOS-III [NASA-CR-141425] p0259 N77-30443
- ESTUARIES**
A study of density fronts and their effects on coastal pollutants p0217 A77-46735
- EUROPE**
Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834
Europe's need for better information on natural resources and environment [AAS 76-065] p0273 A77-46636
Winter snow-cover maps of North America and Eurasia from satellite records 1966 1976 [PB-267393/7] p0245 N77-29722
- EUROPEAN SPACE PROGRAMS**
A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological D C P network --- Data Collection Platform p0208 A77-46758
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
- EVAPOTRANSPIRATION**
The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients p0244 N77-29587
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- EVERGLADES (FL)**
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30657
- F**
- FAR INFRARED RADIATION**
Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0285 A77-41895
- FARM CROPS**
Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture p0209 A77-45780
Implementation of a crop condition monitoring system p0209 A77-45788
Significance of vegetation in interpreting thermal radiation from a terrestrial surface p0211 A77-49511
Determining the usefulness of remote sensing for estimating agricultural water demand in California [E77-10191] p0211 N77-30651
Application of digital analysis of MSS data to agro-environmental studies --- North Dakota and New Jersey [E77-10204] p0212 N77-31559
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine, Illinois and New York [E77-10213] p0213 N77-31567
- FIELD THEORY (PHYSICS)**
Theory and application of wave propagation and scattering in random media p0256 A77-50966
- FINITE ELEMENT METHOD**
Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting p0229 A77-41024
- FIRES**
Monitoring the extent and occurrence of fire in the different wild types of South Africa with particular reference to its ecological role and role in range management [E77-10226] p0283 N77-33557
- FISHERIES**
Remote sensing potential for increasing yields of latent fisheries resources p0236 A77-45771
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827
- FISHES**
Methods for optimizing airborne LLLTV detection of fish induced plankton bioluminescence -- Low Light Level TV p0236 A77-45815
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
- FLAME SPECTROSCOPY**
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- FLIGHT INSTRUMENTS**
The electromagnetic autonavigation system /the EMAN system/ p0266 A77-43576
- FLOOD DAMAGE**
Techniques for estimating flood-produced crop damage using aerial photography p0210 A77-47442
- FLOOD PREDICTIONS**
Investigations using data from LANDSAT-2 [E77-10199] p0280 N77-30559
Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona [E77-10240] p0278 N77-33571
- FLOODS**
Development and testing of operational flood mapping techniques p0243 A77-47455
- FLORIDA**
A Landsat study of water quality in Lake Okeechobee p0243 A77-47453
Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557
Generalized vegetation map of north Merritt Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77-32561
LANDSAT planning applications in east central Florida [E77-10238] p0284 N77-33569
- FLOW DISTRIBUTION**
Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir [PB-265204/8] p0244 N77-28463
- FLUID FLOW**
An experimental investigation of some combined flow sediment transport phenomena [PB-269672/2] p0247 N77-32575
- FLUORESCENCE**
Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
- FOOD**
Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture p0209 A77-45780
- FOREST FIRES**
Forest fire fuel mapping from Landsat p0208 A77-45756
- FOREST MANAGEMENT**
Monitoring crops and forests from space [AAS 76-064] p0210 A77-46638
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439
A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440
Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study p0210 A77-47441
- FORESTS**
Scattering of radio waves by an underlying surface covered with vegetation p0207 A77-41178
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
A comparative analysis of methods for compiling isoline maps of forest cover p0211 A77-50800
Applications of remote sensing volume 3 [E77-10185] p0259 N77-30549
Thailand national programme of the earth resources technology satellite [E77-10207] p0276 N77-31562
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine, Illinois and New York [E77-10213] p0213 N77-31567
Agriculture/forestry hydrology [E77-10219] p0213 N77-31573

- Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology
Preproject baseline --- Missouri
[E77-10220] p0248 N77-31574
Applications of remote sensing --- Texas South Dakota North Dakota and Kansas
[E77-10183] p0214 N77-33553
Application of remote sensing technology to the solution of problems in the management of resources in Indiana
[E77-10223] p0277 N77-33554
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand, mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3
[E77-10236] p0277 N77-33566
Investigation of environmental change pattern in Japan
Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition
[E77-10244] p0214 N77-33575
- FOSSILS**
Identification of 180 million years old probably unchanged melanine
[NASA-TM-75132] p0259 N77-29729
- FOURIER ANALYSIS**
The possibility of using Fourier spectra in aerial photography
p0256 A77-50799
- FOURIER TRANSFORMATION**
The application of Fourier transform spectroscopy to the remote identification of solids in the solar system
p0255 A77-49291
- FRANCE**
Integrated management of water resources --- in France
p0243 A77-42874
The French Atlantic littoral and the Massif Armoncais part 1 --- Island of Jersey Fromentine Loire Estuary and Mont Saint-Michel Bay
[E77-10216] p0281 N77-31570
The French Atlantic littoral and the Massif Armoncais part 3
[E77-10217] p0281 N77-31571
- FRENCH SPACE PROGRAM**
Workshop for a French Program of Spacelab Utilization Avonaz Haute-Savoie France April 13-16 1976
Proceedings
p0274 A77-50689
- FREQUENCY ADJUSTMENT**
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1
[PB-265850/8] p0239 N77-29383
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 --- North Atlantic ocean reliability maps
[PB-265851/8] p0239 N77-29384
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 --- South Pacific ocean reliability maps
[PB-265852/4] p0239 N77-29385
- FREQUENCY DISCRIMINATORS**
Barometric frequency-compensated altimeter-automaton
p0288 A77-50724
- FROST DAMAGE**
The large area crop inventory experiment A major demonstration of space remote sensing
[NASA-TM-74840] p0212 N77-30570

G

- GAMMA RAY ABSORPTOMETRY**
Development of snow water equivalent survey methods using airborne gamma measurements
[EGG-1183-1677] p0248 N77-31592
- GATE ATLANTIC TROPICAL EXPERIMENT**
Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season
p0252 A77-47031
Aerosol in the GATE area and its radiative properties
[PB-265284/2] p0219 N77-30646
- GAS ANALYSIS**
Remote monitoring of nitric oxide by gas-filter correlation techniques
[PB-265455/8] p0218 N77-28574
- GAS CHROMATOGRAPHY**
On-line measurement of the infrared spectra of gas chromatographic eluents
[PB-265570/2] p0269 N77-29258
- GAS DETECTION**
Selective modulation radiometry for remote detection of gaseous pollutants
[ONERA TP NO 1977-111] p0218 A77-50997
On-line measurement of the infrared spectra of gas chromatographic eluents
[PB-265570/2] p0269 N77-29258
- GAS DISCHARGE TUBES**
Compact high-pressure electron-beam controlled laser system
p0268 A77-50175

- GAS LASERS**
Compact high-pressure electron-beam-controlled laser system
p0268 A77-50175
- GAS CHROMATOGRAPHY**
Sulphur dioxide discharge from Mount Etna
p0217 A77-46293
- GEODETIC COORDINATE**
Determination of North American Datum 1983 coordinates of map corners --- Doppler geocentric coordinates
p0225 A77-47410
- GEODESY**
Spaceborne earth applications ranging system /SPEAR/
p0221 A77-40824
Identification of networks in space geodesy by short orbital arcs (short-arc method)
[CNES-NT-61] p0227 N77-29595
Geodetic and astrometric measurements with very long baseline interferometry
[NASA-TM-X-71395] p0227 N77-32566
Gravity modeling for precise terrestrial inertial navigation
[AD-A042418] p0228 N77-33139
- GEODETIC COORDINATION**
Analysis of the accuracy of determining coordinates of points by the orbital method
p0221 A77-41001
- GEODETIC SATELLITES**
Effect of Goceover observations upon the classical triangulation network
p0225 A77-47399
- GEODETIC SURVEY**
Satellite Doppler positioning Proceedings of the International Geodetic Symposium New Mexico State University Las Cruces N Mex October 12-14 1978 Volumes 1 & 2
p0222 A77-47370
Doppler positioning by the short arc method --- geodetic adjustment from satellite observations
p0222 A77-47375
The Canadian Doppler satellite network
p0223 A77-47379
The National Geodetic Survey Doppler satellite positioning program
p0223 A77-47380
Applications of Doppler satellite systems in remote regions in and near Australia
p0223 A77-47381
Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning
p0223 A77-47382
A critical analysis of field operations using portable unattended Doppler satellite instrumentation
p0224 A77-47383
Standardization of Doppler point positioning results
p0224 A77-47384
Development of Doppler activity at I R O E --- European tracking station in U S Navy Navigation Satellite Tracking Network
p0224 A77-47387
Methodology and field tests of GDOP - A geodetic computation package for the short arc adjustment of satellite Doppler observations
p0224 A77-47390
Relating Doppler datum to ordinance survey datum
p0224 A77-47392
Updating survey networks - A practical application of satellite Doppler positioning
p0225 A77-47400
Adjustment of terrestrial networks using Doppler satellite data
p0225 A77-47401
Doppler data transmission and handling at the Geodetic Institute of Uppsala
p0225 A77-47407
Errors of Doppler positions obtained from results of transcontinental traverse surveys
p0225 A77-47409
Determination of North American Datum 1983 coordinates of map corners --- Doppler geocentric coordinates
p0225 A77-47410
Electronic surveying and navigation --- book on instrumentation systems and supporting theory
p0267 A77-49775
Geodetic measurements on the ocean
p0226 A77-51334
The role of geodetic techniques in remote sensing the surface dynamics of the oceans
[IAF PAPER 77-87] p0226 A77-51424
Precision surveying using very long baseline interferometry
[NASA-TM-X-71405] p0228 N77-33588
- GEODAPHY**
Digital geographic data handling activities in the U S geological survey
[PB-266863/4] p0219 N77-30586
- GEOID**
Gravity potential resulting from cylindrical structures of finite length
p0221 A77-43388
Ocean geodesy based on GEOS-3 satellite altimetry
p0222 A77-45787
Gravimetric geoid in the Northwest Pacific Ocean
p0222 A77-46525
Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid
p0224 A77-47388
Geodetic measurements on the ocean
p0226 A77-51334
Mean sea level and the marine geoid - An analysis of concepts
p0226 A77-51335
- GEOL SATELLITES**
Determination of the Geole polyhedron by the short-arc method
[CNES-NT-65] p0227 N77-29596

- GEOLOGICAL FAULTS**
On the problem of the nature of the anomalous magnetic field and its interpretation --- in earth crust
p0221 A77-43572
Structural incoherence and pattern analysis of Missouri using LANDSAT imagery
[E77-10239] p0232 N77-33570
- GEOLOGICAL SURVEY**
Geologic applications of Landsat imagery
p0228 A77-44468
Satellite technology applied to Antarctic Mapping Program
p0223 A77-47378
The progress in microwave radiation investigations of continental covers during 1987 1977
[IAF PAPER 77-118] p0257 A77-51435
Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Gattara depression area Egypt
[IAF PAPER 77-128] p0257 A77-51437
Joint document concerning geological studies from 1971 - 1975
[NASA-TM-78318] p0230 N77-29872
A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer
[NASA-TR-R-472] p0289 N77-30572
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia
[PB-266769/9] p0231 N77-30589
Tectonic sketch map of northern Minas Gerais based on LANDSAT images
[INPE-1078-NTE/104] p0231 N77-31582
Remote identification of geologic materials by multispectral techniques An evaluation of applicability to highway planning in California
[PB-267137/8] p0231 N77-31590
Numerical studies to aid interpretation of an airborne VLF resistivity survey
[AD-A039904] p0231 N77-31594
Geologic investigation of Mercury data and the subsequent mapping and explanation of the quadrangle area H-12
[NASA-CR-155159] p0232 N77-34070
- GEOLGY**
Photo-geology and remote sensing systems for locating ore deposits
p0230 N77-29592
Thailand national programme of the earth resources technology satellite
[E77-10207] p0276 N77-31582
Geologic mapping of the Goiás quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite
[INPE-1071-TP/058] p0231 N77-31579
Application of remote sensing technology to the solution of problems in the management of resources in Indiana
[E77-10223] p0277 N77-33554
Geology orbiter comparison study
[NASA-CR-155058] p0232 N77-34073
- GEOMAGNETIC CALCULATIONS**
Satellite observations of protons involved in the generation of IPDP and Pc 1 --- intervals of pulsations of diminishing periods
p0250 A77-45739
- GEOMAGNETIC PULSATIONS**
Fluctuations of the auroral zone current system and geomagnetic pulsations
p0265 A77-42288
- GEOMAGNETIC TAIL**
Field and particle observations in the magnetotail related to the reconnection process
p0216 A77-44235
- GEOMAGNETICS**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite
p0249 A77-41088
On the problem of the nature of the anomalous magnetic field and its interpretation --- in earth crust
p0221 A77-43572
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction
p0266 A77-45945
Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm
p0250 A77-48056
Reduction and treatment of magnetic anomalies of crustal origin in satellite data
p0222 A77-46270
Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods
p0263 N77-32651
- GEOMORPHOLOGY**
The French Atlantic littoral and the Massif Armoncais part 1 --- Island of Jersey Fromentine Loire Estuary and Mont Saint-Michel Bay
[E77-10216] p0281 N77-31570
Geomorphologic mapping by means of LANDSAT images
[INPE-1078-NTE/102] p0231 N77-31581
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564
Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona
[E77-10240] p0278 N77-33571
- GEOPHYSICAL OBSERVATORIES**
Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories
p0266 A77-47201

GEOPHYSICAL SATELLITES

Monitoring from satellites --- weather earth resources
geophysical applications p0273 A77-46767

GEOPHYSICS

Magnet A satellite for measuring near earth magnetic fields
[NASA-TM-X-71370] p0270 N77-30683

GEOPOTENTIAL

Determination of the Geoid polyhedron by the short-arc method
[CNES-NT-65] p0227 N77-29596

GEORGIA

LANDSAT information for state planning
[NASA-CR-150378] p0276 N77-31577

GEOS 3 SATELLITE

Ocean geodesy based on GEOS-3 satellite altimetry data
p0222 A77-45787

The role of geodetic techniques in remote sensing the surface dynamics of the oceans
[IAF PAPER 77-87] p0226 A77-51424

Initial development of a method of significant waveheight estimation for GEOS-III
[NASA-CR-141425] p0259 N77-30443

Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features
[NASA-CR-141428] p0271 N77-33577

GEOSYNCHRONOUS ORBITS

Physics uses and regulation of the geostationary orbit or ex facto sequitur lex
[IAF PAPER SL-77-44] p0275 A77-51556

GEOTHERMAL ENERGY CONVERSION

Environmental assessment of geopressured waters and their projected uses
[PB-268289/6] p0247 N77-32579

GEOTHERMAL RESOURCES

Computing residuals in geothermal research by IR scanning
p0286 A77-46768

Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas Utah volume 4
[PB-268421/6] p0283 N77-32574

Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6
[PB-268423/1] p0232 N77-32578

GERMANY

Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners
p0215 A77-41255

A multidisciplinary lidar system - Aims technology missions
[IAF PAPER 77-125] p0257 A77-51436

Significance of environmental research tasks at the German Aviation and Space Research Institute
[DLR-IB-553-75/5] p0278 N77-33697

GUIDE PATHS

ILS glide slope performance prediction multipath scattering
[AD-A035288] p0269 N77-29125

GOE SATELLITES

Meso-beta scale features observed in surface network and satellite data
p0252 A77-47039

GRANITE

Rare accessory uraninite in a Sierran granite
p0229 A77-43014

GRAPHITE

Carbon Occurrence of linear forms in natural graphite
[AD-A039520] p0232 N77-31995

GRASSLANDS

Resolution of grass canopy biomass classes
p0208 A77-44471

Application of LANDSAT system for improving methodology for inventory and classification of wetlands
[E77-10188] p0244 N77-28553

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas
[E77-10212] p0213 N77-31566

Monitoring the extent and occurrence of fire in the different yield types of South Africa with particular reference to its ecological role and role in range management
[E77-10226] p0263 N77-33557

GRAVIMETRY

Gravity potential resulting from cylindrical structures of finite length
p0221 A77-43388

Gravimetric geoid in the Northwest Pacific Ocean
p0222 A77-46525

Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid
p0224 A77-47388

GRAVITATIONAL FIELDS

Gravity potential resulting from cylindrical structures of finite length
p0221 A77-43388

Gravity modeling for precise terrestrial inertial navigation
[AD-A042419] p0228 N77-33139

GRAVITY ANOMALIES

Gravimetric geoid in the Northwest Pacific Ocean
p0222 A77-46525

Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid
p0224 A77-47388

Free-air gravity anomalies in the world's oceans and their relationship to residual elevation
p0226 A77-49327

Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6
[PB-268423/1] p0232 N77-32578

GRAVITY WAVES

Interaction between steady non-uniform two-dimensional currents and directional wind-generated gravity waves with applications for current measurements
[AD-A040600] p0282 N77-31702

GREAT LAKES (NORTH AMERICA)

Seasonal variations in Great Lakes design wave heights
Laka Erie
[AD-A039153] p0244 N77-28568

Laka St. Clair hydrologic transfer factors
[PB-268420/9] p0244 N77-28571

GREAT PLAINS CORRIDOR (NORTH AMERICA)

On winter wheat yield from Landsat and Landsat follow-on satellites
p0208 A77-45749

Effective use of Landsat for range monitoring and management - An example on a regional scale
p0208 A77-45765

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas
[E77-10212] p0213 N77-31566

Spectral measurement of watershed coefficients in the southern Great Plains --- Texas Arizona and New Mexico
[E77-10225] p0247 N77-33556

GREEN WAVE EFFECT

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor -- Texas
[E77-10212] p0213 N77-31566

GREENLAND

The icebergs of the North Atlantic
p0236 A77-45612

Sea ice studies in the Spitsbergen-Greenland area
[E77-10208] p0240 N77-31561

GROUND STATIONS

The Canadian Doppler satellite network
p0223 A77-47379

The National Geodetic Survey Doppler satellite positioning program
p0223 A77-47380

Adjustment of terrestrial networks using Doppler satellite data
p0225 A77-47401

Identification of networks in space geodesy by short orbital arcs (short-arc method)
[CNES-NT-61] p0227 N77-29595

GROUND TRUTH

Ground truth measurements for thermal infrared remote sensing --- of soils and vegetation
p0207 A77-44465

Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region
p0222 A77-45800

Satellite observations as ground truth for climate models
p0266 A77-45803

Aerospace polygons problems of investigation and the structure of ground-based observations
p0274 A77-47207

A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery
[E77-10187] p0257 N77-28552

Monitoring water quality by remote sensing
[E77-10194] p0245 N77-30554

LANDSAT/Bangladesh project
[E77-10200] p0260 N77-30560

Remote sensing and satellite surveying in Bangladesh
p0260 N77-30560

A background paper on the latest position of the status of remote sensing and satellite surveying in Bangladesh --- Bay of Bengal
[E77-10201] p0260 N77-30561

Application of digital analysis of MSS data to agro-environmental studies -- North Dakota and New Jersey
[E77-10204] p0212 N77-31559

Thailand national programme of the earth resources technology satellite
[E77-10207] p0276 N77-31562

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas
[E77-10212] p0213 N77-31566

A study of the use of remote sensing data in hydrologic engineering models --- Castro Valley and Trail Creek
[E77-10214] p0246 N77-31568

Agriculture/forestry hydrology
[E77-10219] p0213 N77-31573

Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology
Preproject baseline --- Missouri
[E77-10220] p0246 N77-31574

Application of LANDSAT imagery in land use inventory and classification in Nebraska - Lower and Upper Niobrara area and Sheridan County
[E77-10242] p0214 N77-33573

An analysis on vegetation cover by using LANDSAT MSS data
[E77-10245] p0214 N77-33576

GULF OF MEXICO

A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed
[PB-267392/9] p0219 N77-29723

Atlantic tropical and subtropical cyclone classification for 1976
[PB-269674/8] p0220 N77-33768

GULF STREAM

Tracking a Gulf Stream ring with a free drifting surface buoy
p0235 A77-41918

The annual cycle of the Gulf Loop Current I - Observations during a one-year time series
p0236 A77-43689

H

H ALPHA LINE

Morphology and physical parameters of a solar flare
p0229 A77-45269

HABITATS

Inventory of wetland habitat using remote sensing for the proposed Dahn irrigation unit in eastern South Dakota
[NASA-CR-153412] p0245 N77-30568

HARMONIC ANALYSIS

Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems
p0252 A77-47187

HEAT CAPACITY MAPPING MISSION

Field mapping for heat capacity mapping determinations
Ground support for airborne thermal surveys
[NASA-CR-152587] p0270 N77-32568

HELIUM ATOMS

Fast detection of 10 830-A helium emission
p0265 A77-42620

HEURISTIC METHODS

Methodological aspects of the optimum management of multiple-use reservoirs
p0243 A77-42875

HIGH ENERGY ELECTRONS

Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm
p0250 A77-46056

HIGH PRESSURE

Compact high-pressure electron-beam-controlled laser system
p0268 A77-50175

HIGH RESOLUTION

A high-resolution multispectral scanner for earth observation
[IAF PAPER 77-115] p0257 A77-51433

HIGHWAYS

Remote identification of geologic materials by multispectral techniques An evaluation of applicability to highway planning in California
[PB-267137/8] p0231 N77-31590

HUMAN BEINGS

Introduction Man and his total environment
p0276 N77-32554

HUMIDITY

IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval
[AD-A039861] p0269 N77-28684

HYDROGEOLOGY

Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt
[IAF PAPER 77-128] p0257 A77-51437

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys
[E77-10237] p0277 N77-33568

HYDROGRAPHY

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3
[E77-10235] p0277 N77-33566

HYDROLOGY

Radar system specifications for hydrology and agriculture
p0207 A77-43804

Landscape indication of natural processes from spacecraft photographs
p0243 A77-45200

Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery
p0243 A77-47447

Test of Landsat-based urban hydrologic modeling
p0244 A77-51285

Lake St. Clair hydrologic transfer factors
[PB-266420/9] p0244 N77-28571

Water-management models in Florida from ERTS-1 data
[E77-10197] p0245 N77-30557

Remote sensing applications to hydrologic modeling
[NASA-CR-154842] p0245 N77-30571

Thailand national programme of the earth resources technology satellite
[E77-10207] p0276 N77-31562

A study of the use of remote sensing data in hydrologic engineering models -- Castro Valley and Trail Creek
[E77-10214] p0246 N77-31568

Agriculture/forestry hydrology
[E77-10219] p0213 N77-31573

Stochastic modeling of intermittent daily hydrologic series
p0246 N77-32558

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564

TEHM A Terrestrial Ecosystem Hydrology Model
[EDFB-IBP-76-8] p0247 N77-33592

HYDROXYL EMISSION

Fast detection of 10 830-A helium emission
p0265 A77-42620

ICE ENVIRONMENTS

All-weather ice information system for Alaskan Arctic coastal shipping
p0238 A77-47961

ICE FORMATION

Effective electrical parameters of incipient forms of sea ice sheet and crust
p0237 A77-48185

Remote sensing of accumulated frazil and brash ice in the St Lawrence River
[AD-A039905] p0245 N77-30581

ICE MAPPING

Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry
p0235 A77-41403

Antarctic topography from balloons
p0221 A77-44594

Interpretation key for SAR /L-band/ imagery of sea ice
p0237 A77-47451

Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique
p0255 A77-47690

All-weather ice information system for Alaskan Arctic coastal shipping
p0238 A77-47961

Microwave spectroscopic imagery of the earth
p0287 A77-48269

Subtractive HISS radar --- Holographic Ice Surveying System
p0238 A77-50972

ICE REPORTING

Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment
p0222 A77-45821

ICEBERGS

The icebergs of the North Atlantic
p0238 A77-45612

IDAHO

Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho
p0211 A77-47443

IDENTIFYING

A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme
p0274 A77-48651

Identification of oil slicks by infrared spectroscopy
[AD-A040975] p0220 N77-31587

ILLINOIS

Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States
p0230 N77-28652

An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine Illinois and New York
[E77-10213] p0213 N77-31567

IMAGE CONTRAST

Influence of the atmosphere on the contrast of the Landsat images
p0250 A77-45726

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys
[E77-10237] p0277 N77-33568

IMAGE CORRELATORS

Image analysis library software development
[NASA-CR-151489] p0258 N77-28827

IMAGE ENHANCEMENT

A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image
p0254 A77-47435

ERTS multispectral image transformations for geological lineament enhancement
[E77-10198] p0231 N77-30558

IMAGE FILTERS

Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics
[IAF PAPER 77-113] p0256 A77-51432

IMAGE PROCESSING

Digital technique for generating synthetic aperture radar images
p0258 A77-50447

IMAGE RESOLUTION

Computing residuals in geothermal research by IR scanning
p0266 A77-46788

Optimization of identifiable characteristics of objects during multispectral photography
p0253 A77-47188

Optical power spectrum analysis - Scale and resolution effects --- for land use photomapping classifications
p0255 A77-47476

Simulation of the effects of hard limiting on image quality of synthetic aperture radar --- onboard Landsat satellite
p0256 A77-49905

Experimental study of digital image processing techniques for LANDSAT data
[E77-10221] p0261 N77-31575

IMAGERY

Taxonomic classification of soils using digital information from LANDSAT data Huayllamarca and eucalyptus areas
[NASA-TM-75029] p0211 N77-28557

Land use/land cover mapping (1 25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery
[NASA-TM-X-71382] p0280 N77-30577

Tectonic sketch map of northern Minas Gerais based on LANDSAT images
[INPE-1078-NTE/104] p0231 N77-31582

IMAGES

Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites
[INPE-1072-TP/059] p0282 N77-31580

Geomorphologic mapping by means of LANDSAT images
[INPE-1078-NTE/102] p0231 N77-31581

IMAGING TECHNIQUES

Data management in pattern recognition and image processing systems
p0249 A77-43815

On-line analytics for close-range photogrammetry
p0254 A77-47437

Geometric evaluation of Skylab S-192 conical scanner imagery
p0254 A77-47446

Applications of remote sensing volume 2
[E77-10186] p0280 N77-30550

Experimental study of digital image processing techniques for LANDSAT data
[E77-10221] p0261 N77-31575

Advanced Digital Exploration Techniques (ADET)
[AD A040769] p0282 N77-31588

Comparison of NOAA 3-4 VHRR imagery and LANDSAT multi-spectral scanner images with marine resource measurements
[PB-268674/9] p0240 N77-31597

INDIA

Feasibility study in using multiband photography for studies in geomorphology soils and land use
p0251 A77-46737

ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh
[E77-10202] p0260 N77-30562

INDIAN OCEAN

Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean
p0250 A77-44900

Ocean geodesy based on GEOS-3 satellite altimetry data
p0222 A77-45787

Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope
p0237 A77-46300

INDONESIA

Application of remote sensing technology to the solution of problems in the management of resources in Indonesia
[E77-10223] p0277 N77-33554

INDONESIA

ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh
[E77-10202] p0260 N77-30562

INERTIA

Construction and interpretation of a digital inertia image --- of Pisgah Crater and Lavic Lake in Southern California
p0250 A77-44464

INERTIAL NAVIGATION

Gravity modeling for precise terrestrial inertial navigation
[AD-A042419] p0228 N77-33139

INFECTION

Aerial photographic detection of imported fire ant mounds
p0208 A77-44470

An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine Illinois and New York
[E77-10213] p0213 N77-31567

INFORMATION MANAGEMENT

Data reduction and information extraction for remotely sensed images
p0251 A77-46769

Problems concerning the dissemination of space information for the sensing of earth resources and resources management
p0274 A77-47208

Space studies of earth resources Methods and means of measurements and processing of information
[NASA-TT-F-17544] p0284 N77-33563

INFORMATION RETRIEVAL

Multipurpose Interactive NASA Information Systems (MINIS)
[NASA-TM-78124] p0275 N77-28987

INFORMATION SYSTEMS

Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture
p0209 A77-45780

Satellite climatology and its role in agriculture
p0209 A77-45840

Multipurpose Interactive NASA Information Systems (MINIS)
[NASA-TM-78124] p0275 N77-28987

Remote sensing applications to Missouri environmental resources information system
[NASA-CR-150340] p0260 N77-30565

Digital geographic data handling activities in the U.S. geological survey
[PB-268663/4] p0219 N77-30586

Implementation of a decision support for regional water quality planning
[PB-267342/4] p0246 N77-30593

Earth Resources and Environmental Information System Act of 1977
[GPO-93-604] p0278 N77-32562

Earth resources technology system standalone software package Description and user's guide
[NASA-CR-152598] p0264 N77-33591

INFRARED DETECTORS

Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States
p0266 A77-45224

Effects of cloud particles on remote sensing from space in the 10-micrometer infrared region
[AD-A038502] p0268 N77-28565

Cryogenic spectrometry for the measurement of airglow and aurora
[AD-A036220] p0269 N77-28679

Study of near infrared snow reflectance using Skylab S192 multispectral scanner data
[PB-267504/9] p0269 N77-30591

Evaluation of space application problems of a decimillimeter carcinotron -- far infrared heterodyne detection
[RT-1814] p0270 N77-31593

INFRARED IMAGERY

Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting
p0229 A77-41024

Remote sensing of the oceans from space Achievements problems and prognosis
p0235 A77-42563

Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery
p0243 A77-47447

Huelva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data
p0238 A77-48329

Danube Delta dynamics study by means of remote sensing
[IAF PAPER 77-86] p0244 A77-51423

Visible and infrared imaging radiometers for ocean observations
[NASA-TM-X-71374] p0240 N77-30447

Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning
p0259 N77-30546

Applied Remote Sensing Program (ARSP)
[NASA-CR-153413] p0260 N77-30567

INFRARED LASERS

Compact high-pressure electron-beam-controlled laser system
p0268 A77-50175

INFRARED PHOTOGRAPHY

Resolution of grass canopy biomass classes
p0208 A77-44471

Feasibility study in using multiband photography for studies in geomorphology soils and land use
p0251 A77-46737

Seasonal aerial survey of southern California kelp beds
p0238 A77-47452

Development and testing of operational flood mapping techniques
p0243 A77-47455

Application transfer activity in Missouri
[NASA-CR-150341] p0260 N77-30568

INFRARED RADIATION

Significance of vegetation in interpreting thermal radiation from a terrestrial surface
p0211 A77-49511

The large area crop inventory experiment A major demonstration of space remote sensing
[NASA-TM-74840] p0212 N77-30570

INFRARED RADIOMETERS

Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry
p0235 A77-41403

Ground truth measurements for thermal infrared remote sensing --- of soils and vegetation
p0207 A77-44485

Ozone monitoring with an infrared heterodyne radiometer
p0267 A77-48451

INFRARED REFLECTION

Visible and near-infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship
p0256 A77-49394

Use of near infrared/red radiance ratios for estimating vegetation biomass and physiological status
[NASA-TM-X-71388] p0214 N77-32565

INFRARED SCANNERS

Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting
p0229 A77-41024

Computing residuals in geothermal research by IR scanning
p0266 A77-46768

INFRARED SPECTRA

Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4
p0256 A77-50317

INFRARED SPECTROMETERS

Fast detection of 10 830-A helium emission
p0265 A77-42620

Optical systems unravel smog chemistry
p0216 A77-44814

A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting
p0266 A77-45197

On-line measurement of the infrared spectra of gas chromatographic eluents
[PB-265570/2] p0269 N77-29258

INFRARED SPECTROSCOPY

Problems in infrared spectroscopy of the atmosphere --- Russian book
p0254 A77-47276

A method to obtain diffuse reflectance measurements from 1 0 to 3 0 microns using a Cary 171 spectrophotometer --- for atmospheric aerosol measurement
p0267 A77-49295

Atmospheric transmittance modeling for temperature and water vapor using satellite infrared data
[PB-266414/2] p0269 N77-28690

Identification of 180 million years old probably unchanged melanine
[NASA-TM-75132] p0259 N77-29729

- Identification of crops in Central Arkansas using visual and infrared spectral reflectance signatures [NASA-CR-151495] p0212 N77-30589
- Identification of oil slicks by infrared spectroscopy [AD-A040975] p0220 N77-31587
- Evaluation of space application problems of a decimeter microwave radiometer --- far infrared heterodyne detection [RT-1814] p0270 N77-31593
- INSECTS**
Aerial photographic detection of imported fire ant mounds p0208 A77-44470
- INSTRUMENT ERRORS**
A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383
- INSTRUMENT LANDING SYSTEMS**
ILS glide slope performance prediction multipath scattering [AD-A035288] p0269 N77-29125
- INTERCOSMOS SATELLITES**
Some results of investigating the electric field with the Interkosmos 10 satellite p0221 A77-40897
- INTERFEROMETERS**
Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0265 A77-41895
- INTERFEROMETRY**
Geodetic and astrometric measurements with very long baseline interferometry [NASA-TM-X-71385] p0227 N77-32564
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33588
- INTERNATIONAL COOPERATION**
Information requirements on basic food crops of the FAO global information and early warning system on food and agriculture p0209 A77-45780
Legal questions associated with satellite remote sensing and prospects of international cooperation in this field p0274 A77-47209
Development of Doppler activity at IROE --- European tracking station in U.S. Navy Navigation Satellite Tracking Network p0224 A77-47387
- INTERNATIONAL LAW**
Legal questions associated with satellite remote sensing and prospects of international cooperation in this field p0274 A77-47209
Some legal problems of remote sensing of earth from outer space [IAF PAPER SL 77-20] p0275 A77-51549
- INTERPLANETARY MAGNETIC FIELDS**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-428 satellite p0249 A77-41088
Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42821
- INTERTROPICAL CONVERGENT ZONES**
Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean p0250 A77-44900
- INVENTORIES**
Development of multi-disciplinary ERTS user program in the state of Ohio [E77-10209] p0276 N77-31563
Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10210] p0276 N77-31564
- ION ACCELERATORS**
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0266 A77-45945
- IONOSPHERE**
Some results of investigating the electric field with the Interkosmos 10 satellite p0221 A77-40897
HIRIS experiment - Chatanika radar results [AD-A042183] p0271 N77-32669
- IONOSPHERIC CURRENTS**
Fluctuations of the auroral zone current system and geomagnetic pulsations p0265 A77-42288
- IONOSPHERIC DISTURBANCES**
Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short-wave radio emission p0216 A77-43416
- IONOSPHERIC ELECTRON DENSITY**
Model for profile of topside ionosphere p0265 A77-41228
- IONOSPHERIC ION DENSITY**
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0266 A77-45945
- IOWA**
Implementation of a crop condition monitoring system p0209 A77-45798
Development and testing of operational flood mapping techniques p0243 A77-47455
- IRAQI**
Geologic applications of Landsat imagery p0229 A77-44468
ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh [E77-10202] p0260 N77-30562
- IRELAND**
Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
- IRON**
Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments p0229 N77-28549
- IRRADIANCE**
The remote sensing of chlorophyll --- in upper ocean layer p0236 A77-45852
- IRRIGATION**
Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho p0211 A77-47443
Determining the usefulness of remote sensing for estimating agricultural water demand in California [E77-10191] p0211 N77-30551
LANDSAT/Bangladesh project p0260 N77-30560
Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data [E77-10222] p0213 N77-31576
Application of LANDSAT imagery in land use inventory and classification in Nebraska - Lower and Upper Niobrara area and Sheridan County [E77-10242] p0214 N77-33573
- ISLANDS**
The French Atlantic littoral and the Massif Armoricain part 1 --- Island of Jersey Fromentine Loire Estuary and Mont Saint-Michel Bay [E77-10216] p0261 N77-31570
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
- ISOTROPIC TURBULENCE**
Use of ultrasound for the investigation of small-scale turbulence in the ocean p0235 A77-40815
- ISRAEL**
Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region p0222 A77-45800
- ITALY**
Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834
Development of Doppler activity at IROE --- European tracking station in U.S. Navy Navigation Satellite Tracking Network p0224 A77-47387
- ITERATIVE SOLUTION**
The relative performance of some unsupervised clustering techniques for the per-field classification of Landsat data p0251 A77-46764
- J**
- JAPAN**
Measurement of the temperature distribution on urban surfaces p0215 A77-41749
Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh [E77-10202] p0260 N77-30562
Investigation of environmental change pattern in Japan Classification of shorelines --- Nagoya Yokkachi and Risu Japan [E77-10224] p0220 N77-33555
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
Application of LANDSAT MSS data to the study of oceanographical environment - Seto Inland Sea [E77-10228] p0241 N77-33559
Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560
General pattern of the turbid water in the Seto-inland sea extracted from multispectral images by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561
Environmental change pattern in central Japan as revealed by LANDSAT data p0220 N77-33562
Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563
Investigation of environmental change pattern in Japan Observation of present state of agricultural land-use by analysing LANDSAT data [E77-10243] p0214 N77-33574
Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77-33575
An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576
- K**
- K LINES**
Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547
- KANSAS**
Wheat productivity estimates using LANDSAT data --- Kansas [E77-10181] p0211 N77-28550
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States p0230 N77-28652
Applications of remote sensing volume 3 [E77-10185] p0259 N77-30549
Applications of remote sensing volume 2 [E77-10186] p0260 N77-30550
Applications of remote sensing --- Texas South Dakota North Dakota and Kansas [E77-10183] p0214 N77-33553
- KENTUCKY**
A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky volume 1 [E77-10189] p0230 N77-28554
A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky Volume 2 Appendices [E77-10190] p0230 N77-28555
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States p0230 N77-28652
- L**
- LAKE ERIE**
Seasonal variations in Great Lakes design wave heights Lake Erie [AD-A039153] p0244 N77-28568
- LAKE HURON**
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-48395
Lake St. Clair hydrologic transfer factors [PB-286420/9] p0244 N77-28571
- LAKES**
A Landsat study of water quality in Lake Okeechobee p0243 A77-47453
Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77-10188] p0244 N77-28553
Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0284 N77-33590
- LAND ICE**
Winter snow-cover maps of North America and Eurasia from satellite records 1968 - 1976 [PB-287393/7] p0245 N77-29722
- LAND MANAGEMENT**
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
- LAND USE**
A syntax-directed method for land-use classification of Landsat images p0251 A77-46755
A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435
Optical power spectrum analysis - Scale and resolution effects - for land use photomapping classifications p0255 A77-47476
Integration of land-use data and soil survey data p0211 A77-47477
Testing land-use map accuracy p0255 A77-47478
Urban and regional land use change detected by using Landsat data p0217 A77-48669
Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
DIMECNAV A system for converting scanner-digitized mapping data tapes to polygon format [PB-286438/1] p0258 N77-29599
Land use mapping and modelling for the Phoenix Quadrangle [E77-10196] p0260 N77-30556
LANDSAT/Bangladesh project [E77-10200] p0260 N77-30560
Evaluation of change detection techniques for monitoring coastal zone environments [E77-10203] p0219 N77-30563
Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0260 N77-30567
Land use/land cover mapping (1:25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery [NASA-TM-X-71382] p0260 N77-30577
Resource sensing from space Prospects for developing countries [PB-284171/0] p0275 N77-30590
Thailand national programme of the earth resources technology satellite [E77-10207] p0276 N77-31562
- A-11**

- Development of multi-disciplinary ERTS user program in the state of Ohio
[E77-10209] p0276 N77-31563
- Development of a multi-disciplinary ERTS user program in the state of Ohio
[E77-10210] p0276 N77-31564
- An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine Illinois and New York
[E77-10213] p0213 N77-31567
- A study of the use of remote sensing data in hydrologic engineering models --- Castro Valley and Trail Creek
[E77-10214] p0248 N77-31568
- Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline --- Missouri
[E77-10220] p0248 N77-31574
- An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data
[E77-10222] p0213 N77-31576
- Applications of remote sensing --- Texas South Dakota North Dakota and Kansas
[E77-10183] p0214 N77-33553
- Environmental change pattern in central Japan as revealed by LANDSAT data
[E77-10231] p0220 N77-33562
- Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564
- Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3
[E77-10235] p0277 N77-33566
- LANDSAT planning applications in east central Florida
[E77-10238] p0264 N77-33569
- Application of LANDSAT imagery in land use inventory and classification in Nebraska --- Lower and Upper Niobrara area and Sheridan County
[E77-10242] p0214 N77-33573
- Investigation of environmental change pattern in Japan Observation of present state of agricultural land-use by analyzing LANDSAT data
[E77-10243] p0214 N77-33574
- Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process
[PB-269409/9] p0247 N77-33595
- LANDSAT FOLLOW-ON MISSIONS**
Simulation of remote data acquisition systems
p0254 A77-47255
- A cost benefit evaluation of the LANDSAT follow-on program
[NASA-CR-155156] p0278 N77-33584
- LANDSAT SATELLITES**
LANDSAT non-US standard catalog 1 April 1977 through 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74828] p0258 N77-29591
- LANDSAT non-US standard catalog 1 May 1977 31 May 1977
[NASA-TM-74825] p0258 N77-29593
- LANDSAT US standard catalog 1 April 1977 - 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74776] p0259 N77-28601
- LANDSAT US standard catalog 1-31 May 1977 --- LANDSAT imagery for May 1977
[NASA-TM-74859] p0261 N77-30592
- Geologic mapping of the Goias quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite [INPE-1071-TPT/058] p0231 N77-31579
- LANDSLIDES**
Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado
[E77-10211] p0261 N77-31565
- LAPLACE TRANSFORMATION**
ERTS multispectral image transformations for geological lineament enhancement
[E77-10198] p0231 N77-30558
- LARGE AREA CROP INVENTORY EXPERIMENT**
A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological DCP network --- Data Collection Platform
p0208 A77-45758
- The large area crop inventory experiment - A major demonstration of space remote sensing
p0209 A77-45817
- Monitoring crops and forests from space
[AAS 76-054] p0210 A77-46638
- Applications of remote sensing volume 1
[E77-10182] p0259 N77-30548
- Applications of remote sensing volume 3
[E77-10185] p0259 N77-30549
- Applications of remote sensing volume 2
[E77-10186] p0260 N77-30550
- Determination of aerosol content in the atmosphere from LANDSAT data
[E77-10195] p0219 N77-30555
- The large area crop inventory experiment. An experiment to demonstrate how space-age technology can contribute to solving critical problems here on earth
[NASA-TM-74832] p0212 N77-30564
- LACIE Yield-weather regression models for the Canadian prairies
[NASA-TM-74833] p0212 N77-30576
- LACIE Wheat yield models for the United States revision A
[NASA-TM-74835] p0212 N77-30576
- Application of digital analysis of MSS data to agro-environmental studies --- North Dakota and New Jersey
[E77-10204] p0212 N77-31559
- Large Area Crop Inventory Experiment (LACIE) Phase 2 evaluation report
[NASA-TM-74937] p0213 N77-31564
- Applications of remote sensing --- Texas South Dakota North Dakota and Kansas
[E77-10183] p0214 N77-33553
- LASER APPLICATIONS**
Air monitoring with tunable lasers
p0216 A77-44613
- Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea
p0217 A77-47080
- LASER RANGE FINDERS**
Spaceborne earth applications ranging system /SPEAR/
p0221 A77-40824
- LASERS**
Remote transducer based on coherent mixing of backscattered laser light
[PB-266771/5] p0269 N77-30588
- LEAD SELENIDES**
A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting
p0268 A77-45197
- LEAST SQUARES METHOD**
Initial development of a method of significant waveheight estimation for GEOS-III
[NASA-CR-141425] p0259 N77-30443
- LEBANON**
Discernible lineaments in Landsat images of Lebanon
p0250 A77-44587
- LIBRARIES**
Image analysis library software development
[NASA-CR-151469] p0258 N77-28827
- LIGHT MODULATION**
Selective modulation radiometry for remote detection of gaseous pollutants
[ONERA TP NO 1977-111] p0218 A77-50997
- LIGHT SCATTERING**
A three platform experiment on optical turbulence in the marine boundary layer
[AD-A039789] p0258 N77-28685
- LIGHT TRANSMISSION**
The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration
p0235 A77-40798
- LINES OF FORCE**
Field and particle observations in the magnetotail related to the reconnection process
p0216 A77-44235
- LITHOLOGY**
Structural lineament and pattern analysis of Missouri using LANDSAT imagery
[E77-10239] p0232 N77-33570
- LUMINANCE**
Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges
p0255 A77-47697
- LUNAR ALBEDO**
S-191 sensor performance evaluation
[NASA-CR-151527] p0271 N77-33582
- M**
- MAGNETIC ANOMALIES**
On the problem of the nature of the anomalous magnetic field and its interpretation --- in earth crust
p0221 A77-43572
- Reduction and treatment of magnetic anomalies of crustal origin in satellite data
p0222 A77-46270
- Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States
p0230 N77 28652
- Upper Mesozoic magnetostratigraphy
p0230 N77-28656
- Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6
[PB-268423/1] p0232 N77-32578
- MAGNETIC EFFECTS**
Fluctuations of the auroral zone current system and geomagnetic pulsations
p0265 A77 42288
- Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction
p0266 A77-45945
- MAGNETIC FIELD CONFIGURATIONS**
Interplanetary magnetic field in the ecliptic plane and auroral activity
p0249 A77-42621
- Field and particle observations in the magnetotail related to the reconnection process
p0216 A77-44235
- MAGNETIC FIELDS**
Magsat A satellite for measuring near earth magnetic fields
[NASA-TM-X-71370] p0270 N77-30683
- MAGNETIC MEASUREMENT**
Reduction and treatment of magnetic anomalies of crustal origin in satellite data
p0222 A77-46270
- MAGNETIC STORMS**
Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-8 1974
p0215 A77-41110
- MAGNETIC TAPES**
Simulation of the effects of hard limiting on image quality of synthetic aperture radar --- onboard Landsat satellite
p0256 A77-49905
- MAGNETICALLY TRAPPED PARTICLES**
Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm
p0250 A77-48068
- MAGNETOHYDRODYNAMIC FLOW**
Field and particle observations in the magnetotail related to the reconnection process
p0216 A77-44235
- MAGNETOIONICS**
Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short-wave radio emission
p0216 A77-43416
- MAGNETOMETERS**
Magne geophysical instrumentation
[AD-A040048] p0270 N77-31467
- MAGNETOSPHERE**
Some results of investigating the electric field with the Interkosmos 10 satellite
p0221 A77-40897
- OGO 5 observations of Pc 5 waves - Particle flux modulations
p0249 A77-42295
- The cold plasma throughout the magnetosphere
p0216 A77-44240
- Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm
p0251 A77-46386
- Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods
p0263 N77-32651
- MAINE**
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine Illinois and New York
[E77-10213] p0213 N77-31567
- MALAYA**
ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh
[E77-10202] p0260 N77-30562
- MAN ENVIRONMENT INTERACTIONS**
Remote sensing methods of interpretation of anthropogenic changes of environment
[IAF PAPER 77-130] p0218 A77-51438
- MAN MACHINE SYSTEMS**
Interactive processing of MSS data - A usable system for moderately-sized computer systems
p0255 A77-47448
- An interactive minicomputer image processing system for remote sensing applications
p0254 A77-47449
- MANAGEMENT PLANNING**
Environmental assessment of geopressed waters and their projected uses
[PB-268289/6] p0247 N77-32579
- MANGANESE**
An advection-diffusion model of the DOMES turbidity plumes
[PB-268713/5] p0220 N77-31598
- MAPPING**
Method of compilation of chemical-element maps of insufficiently observed ocean aquifers
p0235 A77-40796
- The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration
p0235 A77-40798
- Satellite technology applied to Antarctic Mapping Program
p0223 A77-47378
- Determination of North American Datum 1983 coordinates of map corners --- Doppler geocentric coordinates
p0225 A77-47410
- Contour determination from digital terrain models -- Book
p0226 A77-50692
- A comparative analysis of methods for compiling isolinear maps of forest cover
p0211 A77-50800
- Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments
p0229 N77-28549
- Taxonomic classification of soils using digital information from LANDSAT data Huayllamarca and eucaliptus areas [NASA-TM 75029] p0211 N77-28557
- Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States
p0230 N77-28652
- The orthophoto and orthophotomap Characteristics development and aspects of cartographic communication
p0227 N77-29585
- DIMECNV** A system for converting scanner-digitized mapping data tapes to polygon format
[PB-266438/1] p0258 N77-29599
- Overall evaluation of LANDSAT (ERTS) follow on imagery for cartographic application
[E77-10193] p0227 N77-30553
- Land use mapping and modeling for the Phoenix Quadrangle
[E77 10196] p0260 N77-30556
- Land use/land cover mapping (1 25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery
[NASA-TM-X-71382] p0260 N77-30577
- Geomorphologic mapping by means of LANDSAT images
[INPE 1076-NTE/102] p0231 N77-31581

- Processing of map information in a minicomputer
p0263 N77-32559
- Generalized vegetation map of north Merrit Island based
on a simplified multispectral analysis
[NASA-CR-155006] p0213 N77-32561
- Digital cartographic study and benchmark
[AD-A043166] p0228 N77-32571
- Snowmapping in southern Norway by use of LANDSAT
imagery
[E77-10241] p0247 N77-33572
- Geologic investigation of Mercury data and the
subsequent mapping and explanation of the quadrangle area
H-12
[NASA-CR-155159] p0232 N77-34070
- MAPS**
- The orthophoto and orthophotomap Characteristics
development and aspects of cartographic communication
p0227 N77-28585
- Atlas of probabilities of surface temperature extremes
Part 2 Southern Hemisphere
[AD-A038237] p0227 N77-29702
- Geologic mapping of the Goias quadrangle based on the
multispectral images transmitted by LANDSAT 1 satellite
[INPE-1071-TPT/068] p0231 N77-31579
- The citizen's guide to North Carolina's shifting inlets
[PB-268738/8] p0262 N77-31782
- Processing of map information in a minicomputer
p0263 N77-32559
- Seismotectonic structural volcanologic and geomorphic
study of New Zealand indigenous forest assessment in
New Zealand mapping land use and environmental studies
in New Zealand volume 2
[E77-10234] p0277 N77-33565
- MARINE ENVIRONMENTS**
- Geodetic measurements on the ocean
p0226 A77-51334
- Mean sea level and the marine geoid - An analysis of
concepts
p0228 A77-51335
- Investigation of environmental change pattern in Japan
Utilization of LANDSAT-2 data for fisheries
[E77-10227] p0241 N77-33558
- Application of LANDSAT MSS data to the study of
oceanographic environment --- Seto Inland Sea
[E77-10228] p0241 N77-33559
- Significant applications of LANDSAT-2 MSS data to
marine environment --- Japanese coastal areas
[E77-10229] p0241 N77-33560
- General pattern of the turbid water in the Seto-inland
sea extracted from multispectral images by the
LANDSAT-1 and 2
[E77-10230] p0241 N77-33561
- MARINE METEOROLOGY**
- Sesat-A and Nimbus-G potential applications to marine
meteorology and oceanography
p0237 A77-46275
- Methods of detecting front regions on oceans from remote
measurements of thermal radio emission
p0238 A77-49459
- Oceanic polar front in the Drake Passage - Satellite
observations during 1976
p0238 A77-51258
- A three platform experiment on optical turbulence in the
marine boundary layer
[AD-A039789] p0258 N77-28685
- MARINE RESOURCES**
- Remote sensing potential for increasing yields of latent
fisheries resources
p0236 A77-45771
- Evaluation of Ocean Color Scanner (OCS) photographic
and digital data Senta Barbara Channel test site 29
October 1975 overflight
[NASA-CR-155171] p0241 N77-33587
- MARINER 10 SPACE PROBE**
- Geologic investigation of Mercury data and the
subsequent mapping and explanation of the quadrangle area
H-12
[NASA-CR-155159] p0232 N77-34070
- MARYLAND**
- Landsat imagery for surface-mine inventory
p0229 A77-44467
- A reduction in ag/residential signature conflict using
principal components analysis of LANDSAT temporal data
[NASA-TM-X-71387] p0220 N77-32566
- MASSACHUSETTS**
- Precision surveying using very long baseline
interferometry
[NASA-TM-X-71405] p0228 N77-33588
- MATHEMATICAL MODELS**
- Air monitoring survey design --- Book
p0215 A77-40675
- Possible improvement of static and dynamic crop-yield
estimation models with the aid of remotely sensed data
p0209 A77-45814
- LAGE Yield-weather regression models for the Canadian
prairies
[NASA-TM-74833] p0212 N77-30575
- LAGE Wheat yield models for the United States revision
A
[NASA-TM-74835] p0212 N77-30576
- The use of array algebra in terrain modeling procedures
[AD-A040619] p0261 N77-30583
- Simulation of ocean currents compared to oceanographic
and remote sensor data in the Cabo Frio area
[INPE 1085-TPT/061] p0240 N77-31757
- MEASURING INSTRUMENTS**
- NASA Workshop on Solar-Terrestrial Studies from a
Manned Space Station
[NASA-CP-2024] p0276 N77-32549
- Space studies of earth resources Methods and means
of measurements and processing of information
[NASA-TT-F-17544] p0264 N77-33583
- Precision surveying using very long baseline
interferometry
[NASA-TM-X-71405] p0228 N77-33588
- MELANIN**
- Identification of 180 million years old probably
unchanged melanin
[NASA-TM-75132] p0259 N77-28729
- MERCATOR PROJECTION**
- Digital overlaying of the universal transverse Mercator
grid with LANDSAT data derived products
[NASA-TM-58200] p0262 N77-31827
- MERCURY (PLANET)**
- Geologic investigation of Mercury data and the
subsequent mapping and explanation of the quadrangle area
H-12
[NASA-CR-155159] p0232 N77-34070
- MERRIT ISLAND**
- Generalized vegetation map of north Merrit Island based
on a simplified multispectral analysis
[NASA-CR-155006] p0213 N77-32561
- MESOMETEOROLOGY**
- Deriving mesoscale temperature and moisture fields from
satellite radiance measurements over the United States
p0268 A77-45224
- Meso-beta scale features observed in surface network
and satellite data
p0252 A77-47039
- Buoy and satellite observations of mesoscale cellular
convection during AMTEX 75 --- Air Mass Transformation
Experiment
p0238 A77-49194
- MESOSPHERE**
- Planetary waves in the winter mesosphere - Preliminary
analysis of Nimbus 6 PMR results --- Pressure Modulator
Radiometer
A study of water vapor measurement in the stratosphere
and mesosphere using microwave techniques
p0270 N77-30676
- METEOROLOGICAL CHARTS**
- Winter snow-cover maps of North America and Eurasia
from satellite records 1966 - 1976
[PB-267393/7] p0248 N77-29722
- METEOROLOGICAL INSTRUMENTS**
- Air monitoring survey design --- Book
p0215 A77-40675
- Microcomputer-controlled acoustic echo sounder
[PB-268033/8] p0271 N77-32679
- METEOROLOGICAL PARAMETERS**
- Retranslation of oceanographic information from an
automatic buoy station via Kosmos-426
p0235 A77-40792
- Satellite observations as ground truth for climate
models
p0268 A77-45803
- Satellite climatology and its role in agriculture
p0209 A77-45840
- Meso-beta scale features observed in surface network
and satellite data
p0252 A77-47039
- Seasonal variations in Great Lakes design wave heights
Lake Erie
[AD-A039153] p0244 N77-28568
- Environmental change pattern in central Japan as
revealed by LANDSAT data
[E77-10231] p0220 N77-33562
- METEOROLOGICAL RESEARCH AIRCRAFT**
- Airborne measurements of air pollution over Denmark
and the adjacent seas
p0217 A77-46298
- METEOROLOGICAL SATELLITES**
- Satellite climatology and its role in agriculture
p0209 A77-45840
- Monitoring from satellites -- weather earth resources
geophysical applications
p0273 A77-46787
- Atmospheric transmittance modeling for temperature and
water vapor using satellite infrared data
[PB-266414/2] p0269 N77-28690
- Satellite temperature sounding of the atmosphere
Ground truth analysis
[AD-A038236] p0259 N77-29679
- Gulfstream Monthly publications January-December
1976 Volume 2 numbers 1 12
[PB-268216/9] p0241 N77-33779
- METEOSAT SATELLITE**
- A European yield forecasting Agromet system - A
proposal to use Meteosat and Landsat 3 data in correlation
with a meteorological D CP network --- Data Collection
Platform
p0208 A77-45758
- Determination of thermal inertia of soil by use of space
data obtained by geosynchronous satellites
[IAF PAPER 77 ST-03] p0211 A77-51568
- METHANE**
- Stratospheric CH4 HCl and ClO and the chlorine-ozone
cycle
p0218 A77-49186
- MEXICO**
- Photo-geology and remote sensing systems for locating
ore deposits
p0230 N77-29592
- Comprehensive study of Leon-Queretaro area -
Mexico
[E77-10208] p0232 N77-32560
- MICA**
- Surface and structural properties of polygorskite
p0230 N77-29586
- MICROFILMS**
- Electro-optical systems and requirements in
cartography
p0221 A77-44780
- MICROPROCESSORS**
- Microcomputer-controlled acoustic echo sounder
[PB-268033/8] p0271 N77-32679
- Feasibility study of microprocessor systems suitable for
use in developing a real-time for the 4.75 GHz
scatterometer
[NASA-CR-151522] p0264 N77-33586
- MICROWAVE FREQUENCIES**
- Anisotropy in the permittivity and absorptivity of Arctic
drift ice in the microwave range
p0237 A77-48186
- MICROWAVE HOLOGRAPHY**
- Subtractive HISS radar --- Holographic Ice Surveying
System
p0238 A77-50972
- MICROWAVE IMAGERY**
- Analysis of some hydrologic variables on the north slope
of Alaska using passive microwave visible and near infrared
imagery
p0243 A77-47447
- MICROWAVE RADIOMETERS**
- Remote sensing of productive moisture stored in the
soil
p0208 A77-44898
- Microwave radiometry of land and water areas on the
earth surface from onboard aircraft laboratories
p0266 A77-47201
- Microwave radiometric detection of corona from chaff
within thunderstorms
p0268 A77-50274
- Active microwave measurement of sea-surface winds
from space
p0239 N77-29333
- MICROWAVE RESONANCE**
- SO2 detection using thermal radiation at 53.53 GHz
rotational resonance
p0268 A77-50976
- MICROWAVE SCATTERING**
- Scattering of radio waves by an underlying surface
covered with vegetation
p0207 A77-41178
- Microwave scattering at the sea surface
[DLR-FB-77-09] p0270 N77-32373
- MICROWAVE SENSORS**
- Theory for passive microwave remote sensing of
near-surface soil moisture
p0207 A77-42015
- Investigation of the natural environment using
radio-physical methods /Review/
Advances in digital sensor simulation --- radar terrain
data bases
p0265 A77-43401
- New developments in microwave remote sensing
[IAF PAPER 77-117] p0257 A77-51434
- MICROWAVE SPECTRA**
- The progress in microwave radiation investigations of
continental covers during 1967-1977
[IAF PAPER 77-118] p0257 A77-51435
- MICROWAVE SPECTROMETERS**
- Microwave spectroscopic imagery of the earth
p0267 A77-48269
- MICROWAVES**
- Microwave backscattering theory and active remote
sensing of the ocean surface
[NASA-CR-141423] p0240 N77-30442
- A study of water vapor measurement in the stratosphere
and mesosphere using microwave techniques
p0270 N77-30676
- Satellite-borne monitoring of atmospheric and surface
characteristics affecting the propagation of microwaves in
the troposphere
p0263 N77-32389
- MIDLATITUDE ATMOSPHERE**
- Infrared spectrum of nitric oxide obtained in the upper
atmosphere at middle latitudes by the orbiting scientific
station Salyut 4
p0256 A77-50317
- MINERAL DEPOSITS**
- Photo-geology and remote sensing systems for locating
ore deposits
p0230 N77-29592
- Space technology in the discovery and development of
mineral and energy resources
p0231 N77-30289
- Structural lineament and pattern analysis of Missouri
using LANDSAT imagery
[E77-10239] p0232 N77-33570
- MINERAL EXPLORATION**
- A PbSe diode laser spectrometer to be used in air pollution
monitoring and mineral prospecting
p0266 A77-45197
- MINERALS**
- An investigation of agricultural and other earth resources
parameters using LANDSAT and other remote sensing data
--- Maine Illinois and New York
[E77-10213] p0213 N77-31567
- The French Atlantic littoral and the Massif Armoncais
part 3
[E77-10217] p0261 N77-31571
- Electron microprobe analyses of minerals in Precambrian
rocks at the Los Alamos Scientific Laboratory Geothermal
Test Site Temez Mountains New Mexico
[LA-6895-MS] p0232 N77-33734
- MINES (EXCAVATIONS)**
- Landsat imagery for surface-mine inventory
p0229 A77-44467
- Methods of determining the orientations of bedrock
fracture systems in southwestern Pennsylvania and northern
West Virginia
[PB-268769/9] p0231 N77-30589
- Alluvial valley floors in east central Montana and their
relation to strappable coal reserves A reconnaissance
report
[PB-287280/8] p0232 N77-31725
- MINICOMPUTERS**
- An interactive minicomputer image processing system
for remote sensing applications
p0254 A77-47449

- Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77 50161
- MISSION PLANNING**
Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning p0259 N77-30546
A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145252] p0278 N77-33585
- MISSISSIPPI RIVER (US)**
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
- MISSOURI**
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States p0230 N77-28652
Remote sensing applications to Missouri environmental resources information system [NASA-CR-150340] p0260 N77 30565
Application transfer activity in Missouri [NASA-CR-150341] p0260 N77 30566
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline --- Missouri [E77-10220] p0246 N77-31574
Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77 33570
- MODELS**
A study of the use of remote sensing data in hydrologic engineering models --- Castro Valley and Trail Creek [E77 10214] p0246 N77 31568
- MOISTURE**
Analysis of observed soil skin moisture effects on reflectance [AD-A041859] p0214 N77-32570
- MOISTURE CONTENT**
Resolution of grass canopy biomass classes p0208 A77-44471
- MOISTURE METERS**
Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77-42015
- MOLECULAR ROTATION**
SO₂ detection using thermal radiation at 53.53 GHz rotational resonance p0268 A77-50976
- MONTANA**
Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
Alluvial valley floors in east-central Montana and their relation to strippable coal reserves A reconnaissance report [PB-267280/6] p0232 N77-31725
- MOROCCO**
Digital image processing for a better recognition of the terrestrial surface in Morocco p0250 A77-45459
- MOUNTAINS**
Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77-33570
Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- MULTIMISSON MODULAR SPACECRAFT**
A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145252] p0278 N77-33585
- MULTISPECTRAL BAND CAMERAS**
A high-resolution multispectral scanner for earth observation [IAF PAPER 77-115] p0257, A77-51433
Study of near-infrared snow reflectance using Skylab S192 multispectral scanner data [PB-267504/9] p0269 N77-30591
Sensor performance report volume 4 (S-190A) [NASA-CR-151528] p0271 N77-33581
- MULTISPECTRAL BAND SCANNERS**
Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255
Geologic applications of Landsat imagery p0229 A77-44468
Discernible lineaments in Landsat images of Lebanon p0250 A77-44587
Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754
Landsat MSS imagery - A thematic mapping base --- multispectral scanner p0254 A77-47436
Geometric evaluation of Skylab S-192 conical scanner imagery p0254 A77-47446
Interactive processing of MSS data - A usable system for moderately-sized computer systems p0255 A77-47448
The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397
Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422
Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
- A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-R-472] p0289 N77-30572
Application of digital analysis of MSS data to agro-environmental studies --- North Dakota and New Jersey [E77-10204] p0212 N77-31559
An interactive color display for multispectral imagery using correlation clustering [NASA-CASE MSC-16253-1] p0262 N77-31583
Generalized vegetation map of north Merrit Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77-32561
Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects [AD-A042999] p0263 N77-32572
Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587
- MULTISPECTRAL PHOTOGRAPHY**
The Skylark sounding rocket programme p0249 A77-41796
The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817
Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-46737
Photographic methods of studying the earth from space p0252 A77-47179
The selection of spectral ranges for sensing earth resources p0252 A77-47186
Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems p0252 A77-47187
Optimization of identifiable characteristics of objects during multispectral photography p0253 A77-47188
The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190
Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197
An interactive minicomputer image processing system for remote sensing applications p0254 A77-47449
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422
Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547
An interactive color display for multispectral imagery using correlation clustering [NASA-CASE-MSC-16253-1] p0262 N77-31583
- N**
- NASA PROGRAMS**
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43899
Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0276 A77-51500
Spinoff 1977 An annual report [NASA-TM-74908] p0278 N77-34049
- NAVIGATION AIDS**
The electromagnetic autonavigation system /the EMAN system/ p0266 A77-43576
- NAVIGATION INSTRUMENTS**
Electronic surveying and navigation --- book on instrumentation systems and supporting theory p0267 A77-49775
- NAVIGATION SATELLITES**
Satellite Doppler positioning Proceedings of the International Geodetic Symposium New Mexico State University Las Cruces N Mex October 12-14 1976 Volumes 1 & 2 p0222 A77-47370
DMATC Doppler determination of polar motion p0223 A77-47376
Satellite technology applied to Antarctic Mapping Program p0223 A77-47378
The Canadian Doppler satellite network p0223 A77-47379
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380
Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381
Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning p0223 A77-47382
A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383
Standardization of Doppler point positioning results p0224 A77-47384
Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid p0224 A77-47388
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389
- Methodology and field tests of GDOP - A geodetic computation package for the short arc adjustment of satellite Doppler observations p0224 A77-47390
Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391
Electronic surveying and navigation --- book on instrumentation systems and supporting theory p0267 A77-49775
- NEAR INFRARED RADIATION**
A method to obtain diffuse reflectance measurements from 1.0 to 3.0 microns using a Cary 171 spectrophotometer --- for atmospheric aerosol measurement p0267 A77 49295
- NEARSHORE WATER**
Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope p0237 A77-46300
- NEBRASKA**
Application of LANDSAT imagery in land use inventory and classification in Nebraska --- Lower and Upper Niobrara area and Shendan County [E77-10242] p0214 N77-33573
- NETWORKS**
Identification of networks in space geodesy by short orbital arcs (short-arc method) [CNES-NT-61] p0227 N77-29595
- NEVADA**
Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments p0229 N77 28549
- NEW JERSEY**
Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
Application of digital analysis of MSS data to agro-environmental studies --- North Dakota and New Jersey [E77-10204] p0212 N77-31559
- NEW MEXICO**
Spectral measurement of watershed coefficients in the southern Great Plains --- Texas Arizona and New Mexico [E77-10225] p0247 N77-33556
Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temex Mountains New Mexico [LA-6895-MS] p0232 N77-33734
- NEW YORK**
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data - Maine Illinois and New York [E77-10213] p0213 N77-31567
- NEW ZEALAND**
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 p0277 N77-33565
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566
Nimbus 6 SATELLITE
Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus 6 PMR results --- Pressure Modulator Radiometer p0265 A77-43483
Seasat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-46275
- NITRIC OXIDE**
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317
Remote monitoring of nitric oxide by gas-filter correlation techniques [PB-265455/6] p0218 N77-28574
- NITROUS OXIDES**
An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420
- NOAA SATELLITES**
Applications of space technology to water resources management p0245 N77-30288
Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites [INPE-1072-TP/059] p0262 N77-31580
Key to meteorological records documentation no 5 4 Environmental satellite imagery February 1977 [KNRD-5 4] p0262 N77-31726
- NORTH AMERICA**
Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
On winter wheat yield from Landsat and Landsat follow-on satellites p0208 A77-45749
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380

- Determination of North American Datum 1983 coordinates of map corners -- Doppler geocentric coordinates p0225 A77-47410
- Seasonal variations in Great Lakes design wave heights Lake Erie [AD-A039153] p0244 N77-28568
- Lake St. Clair hydrologic transfer factors [PB-286420/9] p0244 N77-28571
- Winter snow-cover maps of North America and Eurasia from satellite records 1986 - 1978 [PB-287393/7] p0245 N77-29722
- Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor -- Texas [E77-10212] p0213 N77-31586
- Spectral measurement of watershed coefficients in the southern Great Plains -- Texas Arizona and New Mexico [E77-10225] p0247 N77-33556
- NORTH CAROLINA**
- A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440
- Coastal wave measurements during passage of tropical storm Amy [NASA-TM-74060] p0240 N77-30707
- The citizen's guide to North Carolina's shifting inlets [PB-288736/8] p0262 N77-31762
- Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0264 N77-33590
- NORTH DAKOTA**
- Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
- Application of digital analysis of MSS data to agro-environmental studies -- North Dakota and New Jersey [E77-10204] p0212 N77-31559
- Applications of remote sensing -- Texas South Dakota North Dakota and Kansas [E77-10183] p0214 N77-33553
- NORTH SEA**
- Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77-48298
- Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391
- NORTHERN HEMISPHERE**
- Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus B PNR results --- Pressure Modulator Radiometer p0285 A77-43483
- Satellite observations as ground truth for climate models p0286 A77-45803
- NORWAY**
- Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- NUMERICAL ANALYSIS**
- Numerical studies to aid interpretation of an airborne VLF resistivity survey [AD-A039904] p0231 N77-31594
- NUTRITION**
- Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0264 N77-33590
- O**
- OCEAN BOTTOM**
- A photographic reconnaissance of the microrelief in the Monterey and Carmel submarine canyons, California [AD-A039370] p0239 N77-28567
- OCEAN CURRENTS**
- Expedition of the 12th cruise of the research vessel Akademik Vernadskii --- equatorial Pacific Ocean current investigations p0235 A77-40821
- Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
- Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 --- Air Mass Transformation Experiment p0238 A77-49194
- Visible and infrared imaging radiometers for ocean observations [NASA-TM-X-71374] p0240 N77-30447
- Comparison of NOAA 3-4 VHRM imagery and LANDSAT multi-spectral scanner images with marine resource measurements [PB-288674/9] p0240 N77-31597
- OCEAN MODELS**
- New formulas of the radiation balance of the ocean-atmosphere system p0235 A77-40812
- Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453
- OCEAN SURFACE**
- Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514
- Radar detection of sea surface oil pollution p0215 A77-40758
- Tracking a Gulf Stream ring with a free drifting surface buoy p0235 A77-41918
- Experimental remote sensing of subsurface temperature in natural ocean water p0238 A77-42730
- The depression of remotely-sensed surface temperatures by a dust laden tropical atmosphere p0238 A77-45732
- A theory of sea scatter at large incident angles p0237 A77-45901
- Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
- Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689
- Methods of detecting froth regions on oceans from remote measurements of thermal radio emission p0238 A77-49459
- Advection in the Peru current as observed by satellite p0238 A77-50273
- The role of geodetic techniques in remote sensing the surface dynamics of the oceans [IAF PAPER 77-87] p0228 A77-51424
- Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
- Active microwave measurement of sea-surface winds from space p0239 N77-29333
- Microwave backscattering theory and active remote sensing of the ocean surface [NASA-CR-141423] p0240 N77-30442
- Thermal mapping of the sea surface using VHRM computerized images of the NOAA series of satellites [INPE-1072-TP7/059] p0262 N77-31580
- Microwave scattering at the sea surface [DLR-FB-77-08] p0270 N77-32373
- Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552
- Application of LANDSAT MSS data to the study of oceanographic environment --- Seto Inland Sea [E77-10228] p0241 N77-33559
- Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560
- OCEANOGRAPHIC PARAMETERS**
- Retranslation of oceanographic information from an automatic buoy station via Kosmos-428 p0235 A77-40792
- Method of compilation of chemical-element maps of insufficiently observed ocean aquators p0235 A77-40798
- Use of ultrasound for the investigation of small-scale turbulence in the ocean p0235 A77-40815
- Remote sensing of the oceans from space - Achievements problems and prognosis p0235 A77-42563
- The annual cycle of the Gulf Loop Current 1 - Observations during a one-year time series p0236 A77-43689
- Acoustical oceanography Principles and applications --- Book p0237 A77-45953
- Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope p0237 A77-48300
- ruerva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data p0238 A77-48329
- Oceanic polar front in the Drake Passage - Satellite observations during 1976 p0238 A77-51258
- Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422
- Oceanic tide determination by satellite [IAF PAPER 77-ST-10] p0239 A77-51574
- Initial development of a method of significant waveheight estimation for GEOS-III [NASA-CR-141425] p0259 N77-30443
- Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area [INPE-1065-TP7/061] p0240 N77-31757
- Gulfstream Monthly publications January-December 1976 Volume 2 numbers 1-12 p0241 N77-33779
- OCEAN DATA ACQUISITIONS SYSTEMS**
- Center for collection and processing of data from automatic buoy stations p0249 A77-40818
- OCEANOGRAPHY**
- The icebergs of the North Atlantic p0236 A77-45612
- Seesat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-48275
- Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453
- NOAA program development plan for SEASAT-A research and applications [PB-285414/3] p0239 N77-28566
- Marine geophysical instrumentation [AD-A040048] p0270 N77-31467
- OCEANS**
- Free-air gravity anomalies in the world's oceans and their relationship to residual elevation p0226 A77-49327
- Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA-TN-D-8467] p0239 N77-28564
- OFFSHORE PLATFORMS**
- Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391
- OGO-8**
- OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295
- OHIO**
- Development of multi-disciplinary ERTS user program in the state of Ohio [E77-10209] p0276 N77-31583
- Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10210] p0276 N77-31584
- OIL POLLUTION**
- Summary evaluation of the offshore target detection capabilities of AFS-94D and COR radar systems [AD-A038245] p0218 N77-28379
- Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587
- OIL SLICKS**
- Radar detection of sea surface oil pollution p0215 A77-40758
- Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea p0217 A77-47080
- Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689
- Identification of oil slicks by infrared spectroscopy [AD-A040975] p0220 N77-31587
- OKLAHOMA**
- Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process [PB-289409/9] p0247 N77-33595
- ON-LINE PROGRAMMING**
- On-line analytics for close-range photogrammetry p0254 A77-47437
- OPTICAL CORRECTION PROCEDURE**
- Corrected Landsat images using a small computer p0255 A77-47481
- OPTICAL HETERODYNYING**
- Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
- OPTICAL RADAR**
- Optical detection of atmospheric U-238 decay products --- determination of Pb and Bi scattering cross sections p0250 A77-45305
- DFVLR mobile lidar system --- for air pollution monitoring p0267 A77 50135
- A multidisciplinary lidar system - Aims technology missions [IAF PAPER 77-125] p0257 A77-51436
- OPTICAL SCANNERS**
- Electro-optical systems and requirements in cartography p0221 A77-44780
- Systems analysis and optical scanning methods p0252 A77-47181
- OPTIMIZATION**
- Methodological aspects of the optimum management of multiple-use reservoirs p0243 A77-42875
- Optimization of identifiable characteristics of objects during multispectral photography p0253 A77-47188
- ORBIT DECAY**
- The semi-annual variation in thermospheric air density from January 1972 to April 1975 p0250 A77-45880
- ORBITAL ELEMENTS**
- Doppler positioning by the short arc method --- geodetic adjustment from satellite observations p0222 A77-47375
- ORBITAL MECHANICS**
- Selection of satellite orbits for the sensing of earth resources p0267 A77-47204
- Foundations of space geodesy --- Russian book p0226 A77-50685
- OREGON**
- Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439
- ORGANIC COMPOUNDS**
- On-line measurement of the infrared spectra of gas chromatographic eluents [PB-285570/2] p0269 N77-29258
- ORTHOPHOTOGRAPHY**
- The orthophoto and orthophotomap Characteristics development and aspects of cartographic communication p0227 N77-29585

OXIDIZERS

- Air quality data for the Northeast oxidant transport study 1976
[PB-267545/2] p0219 N77-30683
- Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0286 A77-48945
- Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451

P

PACIFIC ISLANDS

- Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555

PACIFIC OCEAN

- Expedition of the 12th cruise of the research vessel Akademik Vernadskii --- equatorial Pacific Ocean current investigations p0235 A77-40821
- Gravimetric geoid in the Northwest Pacific Ocean p0222 A77-48525
- Long waves in the eastern equatorial Pacific Ocean A view from a geostationary satellite p0237 A77-47175
- Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 --- Air Mass Transformation Experiment p0238 A77-49194
- Advection in the Peru current as observed by satellite p0238 A77-50273
- An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/8] p0239 N77-29383
- An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 --- North Atlantic ocean reliability maps p0239 N77-29384
- An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 --- South Pacific ocean reliability maps p0239 N77-29385
- Investigation of environmental change pattern in Japan Classification of shorelines --- Nagoya Yokkaichi and Ria Japan [E77-10224] p0220 N77-33555
- PARIGUARI
ESCAP inter-governmental meeting on remote sensing and satellite surveying -- Bangladesh [E77-10202] p0280 N77-30562
- PALCOZANACHTIC
Upper Mesozoic magnetostratigraphy p0230 N77-28656

PARIS

- Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554

PARTICLE INTERACTIONS

- Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods p0283 N77-32651

PATTERN RECOGNITION

- Data management in pattern recognition and image processing systems p0249 A77-43815
- A syntax-directed method for land-use classification of Landsat images p0251 A77-48755
- Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547
- Advanced Digital Exploration Techniques (ADET) [AD-A040769] p0282 N77-31588
- Theory and analysis of vegetation pattern [EDFB-18P-76-3] p0213 N77-31591
- Digital overlaying of the universal transverse Mercator grid with LANDSAT data derived products [NASA-TM-58200] p0282 N77-31827
- Extraction of topological information from digital images [AD-A042125] p0228 N77-32569

PAYLOADS

- Sarlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-46790

PENNSYLVANIA

- Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77-28551
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] p0231 N77-30589

PERIODIC VARIATIONS

- OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295

PERMITTIVITY

- Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0237 A77-48186

PERTURBATION THEORY

- A theory of sea scatter at large incident angles p0237 A77-45901

PERU

- Advection in the Peru current as observed by satellite p0238 A77-50273

PETROGRAPHY

- Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temoz Mountains New Mexico [LA-8695-MS] p0232 N77-33734

PETROLOGY

- Rare accessory uraninite in a Sierran granite p0229 A77-43014

PH

- Comprehensive study of Leon-Queretero area --- Mexico [E77-10208] p0232 N77-32560

PHILIPPINES

- ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh [E77-10202] p0260 N77-30562

PHOENIX QUADRANGLE (AZ)

- Land use mapping and modeling for the Phoenix Quadrangle [E77-10196] p0260 N77-30556

PHOSPHATICS

- The flat of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798

PHOTOCHEMICAL REACTIONS

- Optical systems unravel smog chemistry p0216 A77-44614

PHOTOGRAMMETRY

- Skylab photography for geological mapping p0229 A77-47176

PHOTOGRAMMETRY

- Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195
- American Society of Photogrammetry and American Congress on Surveying and Mapping Fall Convention Seattle Wash September 28-October 1 1976 Proceedings p0274 A77-47432
- On-line analytics for close-range photogrammetry p0254 A77-47437
- Techniques for estimating flood-produced crop damage using aerial photography p0210 A77-47442
- Accuracy models for bundle block triangulation p0255 A77-47874
- Contour determination from digital terrain models --- Book p0226 A77-50892
- The possibility of using Fourier spectra in aerial photography p0258 A77-50789
- Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552

PHOTOGRAMMIC PROCESSING

- Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195

PHOTOGRAMMIC RECORDING

- The use of photographic imagery in earth resources studies p0251 A77-48763

PHOTOINTERPRETATION

- Construction and interpretation of a digital inertia image --- of Pisgah Crater and Levic Lake in Southern California p0250 A77-44464
- Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469
- Digital image processing for a better recognition of the terrestrial surface in Morocco p0250 A77-45459
- Toward fully automated agricultural inventory from satellites p0209 A77-45844
- A comparative study of cloud classification techniques p0251 A77-48733
- Data reduction and information extraction for remotely sensed images p0251 A77-48789
- Technology of the thematic automated processing of video data p0253 A77-47191
- Interpretation key for SAR /L-band/ imagery of sea ice p0237 A77-47451
- Optical power spectrum analysis - Scale and resolution effects --- for land use photomapping classifications p0255 A77-47476
- The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

- Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77-51438

PHOTOGRAMMETRY

- Skylab explores the earth [NASA-SP-380] p0275 N77-28548
- Photo-geology and remote sensing systems for locating ore deposits p0230 N77-29592
- Determination of true elevations from aerial photographs [AD-A039356] p0281 N77-30579
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] p0231 N77-30589

PHOTOGRAMMETRY

- Discernible lineaments in Landsat images of Lebanon p0250 A77-44587
- Electro-optical systems and requirements in cartography p0221 A77-44780
- Forest fire fuel mapping from Landsat p0208 A77-45756

- Remote sensing in ecological botany p0210 A77-48734
- Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-48737
- Applications of Suits spectral model to wheat p0210 A77-48738
- The use of photographic imagery in earth resources studies p0251 A77-48763
- Skylab photography for geological mapping p0229 A77-47176
- American Society of Photogrammetry and American Congress on Surveying and Mapping Fall Convention Seattle Wash September 28-October 1 1976 Proceedings p0274 A77-47432
- The use of Landsat imagery in urbanized area studies p0217 A77-47433
- Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data p0217 A77-47434
- Landsat MSS imagery - A thematic mapping base --- multispectral scanner p0254 A77-47436
- Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439
- Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho p0211 A77-47443
- A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
- Development and testing of operational field mapping techniques p0243 A77-47455
- Integration of land-use data and soil survey data p0211 A77-47477
- Testing land-use map accuracy p0255 A77-47478
- Proposed parameters for an operational Landsat p0255 A77-47479
- The display of Landsat data at large scales by matrix printer p0287 A77-47480
- Corrected Landsat images using a small computer p0255 A77-47481
- Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77-47697
- Accuracy models for bundle block triangulation p0255 A77-47974
- Digital overlaying of the universal transverse Mercator grid with LANDSAT data derived products [NASA-TM-58200] p0282 N77-31827
- Extraction of topological information from digital images [AD-A042125] p0228 N77-32569
- Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 p0277 N77-33586
- LANDSAT planning applications in east central Florida [E77-10238] p0264 N77-33589
- PHOTOMETRY
- The principles of photometry theory in relation to spaceborne photography of the earth p0253 A77-47189
- The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190
- PHYSICAL PROPERTIES
- Use of near infrared/red radiance ratios for estimating vegetation biomass and physiological status [NASA-TM-X-71388] p0214 N77-32565
- PLASMA SURFACES
- The application of Fourier transform spectroscopy to the remote identification of solids in the solar system p0255 A77-49291
- PLANKTON
- Methods for optimizing airborne LLLTV detection of fish induced plankton bioluminescence --- Low Light Level TV p0236 A77-45815
- Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
- Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33568
- PLASMA DIASPECTICS
- The cold plasma throughout the magnetosphere p0218 A77-44240
- PLASMA-ELECTROMAGNETIC INTERACTION
- Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short wave radio emission p0216 A77-43416
- PLASMA SURFACES
- The cold plasma throughout the magnetosphere p0216 A77-44240
- Satellite observations of protons involved in the generation of IPDP and Pc 1 - - intervals of pulsations of diminishing periods p0250 A77-45739
- PLUMES
- Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- POLAR CAPS
- Observations of high-latitude protons p0249 A77-42312
- POLAR REGIONS
- Observations of high-latitude protons p0249 A77-42312
- Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42621

- The icebergs of the North Atlantic p0236 A77-45612
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0286 A77-46345
DMATC Doppler determination of polar motion p0223 A77-47378
MEDOC experiment of the French polar Motion Project --- based on Doppler observation of Transit satellites p0223 A77-47377
The progress in microwave radiation investigations of continental covers during 1967-1977 [IAF PAPER 77-118] p0257 A77-51435
- POLAR SUBSTANCES**
Fluctuations of the auroral zone current system and geomagnetic pulsations p0285 A77-42288
Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm p0250 A77-46056
Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-46386
- POLAR WANDERINGS (GEOLOGY)**
Introduction to the workshop on polar motion --- satellite determination by Doppler effect p0225 A77-47404
Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47406
- POLARIZATION CHARACTERISTICS**
Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water marsh and wetlands p0243 A77-47458
Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689
- POLLUTION CONTROL**
Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633
Experimental and theoretical studies of solid solution formation in lime and limestone SO₂ scrubbers volume 1 [PB-264963/1] p0219 N77-28625
- POLLUTION MONITORING**
EPA's Catalyst Research Program Environment impact of sulfuric acid emissions p0215 A77-40639
Air monitoring survey design --- Book p0215 A77-40675
Radar detection of sea surface oil pollution p0215 A77-40758
Air monitoring with tunable lasers p0216 A77-44613
Optical systems unravel smog chemistry p0216 A77-44614
A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting p0266 A77-45197
Sulphur dioxide discharge from Mount Etna p0217 A77-46293
Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77-46298
Satellite monitoring of atmospheric gases p0217 A77-46766
Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea p0217 A77-47080
Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689
DFVLR mobile lidar system --- for air pollution monitoring p0267 A77-50135
Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50161
Selective modulation radiometry for remote detection of gaseous pollutants [ONERA TP NO 1977-111] p0218 A77-50997
A multidisciplinary lidar system - Aims technology missions [IAF PAPER 77-125] p0257 A77-51438
Remote monitoring of nitric oxide by gas-filter correlation techniques [PB-26545/6] p0218 N77-28574
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976 [NASA-TM-74066] p0220 N77-33579
- PONDS**
Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77-10188] p0244 N77-28553
- PORTABLE EQUIPMENT**
A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383
Standardization of Doppler point positioning results p0224 A77-47384
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389
DFVLR mobile lidar system --- for air pollution monitoring p0267 A77-50135
- POSITION (LOCATION)**
Geodetic measurements on the ocean p0226 A77-51334
- POSITION ERRORS**
Automatic correction of position error by means of a digital correlation of surface structures --- for air navigation p0221 A77-43577
Doppler positioning by the short arc method --- geodetic adjustment from satellite observations p0222 A77-47375
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380
- Methodology and field tests of GDOP A geodetic computation package for the short arc adjustment of satellite Doppler observations p0224 A77-47390
Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47397
Errors of Doppler positions obtained from results of transcontinental traverse surveys p0225 A77-47409
- POSITIONING**
Satellite Doppler positioning Proceedings of the International Geodetic Symposium New Mexico State University Las Cruces N Mex. October 12-14 1976 Volumes 1 & 2 p0222 A77-47370
Doppler positioning by the short arc method --- geodetic adjustment from satellite observations p0222 A77-47375
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380
Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381
Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning p0223 A77-47382
Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77-47391
Updating survey networks - A practical application of satellite Doppler positioning p0225 A77-47400
- POWER SPECTRA**
Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
Optical power spectrum analysis: Scale and resolution effects --- for land use photomapping classifications p0255 A77-47476
- PRECAMBRIAN PERIOD**
Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Tamez Mountains New Mexico [LA-6686-MS] p0232 N77-33734
- PRECIPITATION (METEOROLOGY)**
Stochastic modeling of intermittent daily hydrologic series p0246 N77-32558
- PREDICTION ANALYSIS TECHNIQUES**
Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data p0209 A77-45814
- PRESIDENTIAL REPORTS**
Aeronautics and space report of the President 1976 activities --- technology development and utilization p0275 N77-31048
- PRESSURE SENSORS**
Barometric frequency-compensated altimeter-automaton p0268 A77-50724
The display of Landsat data at large scales by matrix printer p0267 A77-47480
- PROTON ENERGY**
Observations of high-latitude protons p0249 A77-42312
- PROTON FLUX DENSITY**
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295
Observations of high-latitude protons p0249 A77-42312
Satellite observations of protons involved in the generation of IPDP and Pc 1 -- intervals of pulsations of diminishing periods p0250 A77-45739
- PUBLIC HEALTH**
Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500
- QUALITY CONTROL**
Environmental monitoring --- integrated network design and applications p0215 A77-42255
- R**
- RADAR DETECTION**
Radar detection of sea surface oil pollution p0215 A77-40758
- RADAR ECHOES**
Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031
- RADAR EQUIPMENT**
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561
- RADAR IMAGERY**
Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514
Radar system specifications for hydrology and agriculture p0207 A77-43804
Sarlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-46790
Advances in digital sensor simulation --- radar terrain data bases p0254 A77-47445
- Interpretation key for SAR /L-band/ imagery of sea ice p0237 A77-47451
Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water marsh and wetlands p0243 A77-47458
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
Simulation of the effects of hard limiting on image quality of synthetic aperture radar --- onboard Landsat satellite p0256 A77-49905
Digital technique for generating synthetic aperture radar images p0256 A77-50447
Subtractive HISS radar --- Holographic Ice Surveying System p0238 A77-50972
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561
- RADAR RECEIVERS**
Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems [AD-A036245] p0218 N77-28379
- RADAR SCATTERING**
A theory of sea scatter at large incident angles p0237 A77-45901
ILS glide slope performance prediction multipath scattering [AD-A036298] p0269 N77-29125
- RADAR SIGNATURES**
HIRIS experiment - Chateaux radar results [AD-A042183] p0271 N77-32669
- RADAR TARGETS**
Environment and radar operation simulator [AD-A036656] p0268 N77-28378
- RADIANCE**
A Landsat study of water quality in Lake Okechobee p0243 A77-47453
- RADIATION BELTS**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-428 satellite p0249 A77-41088
Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-8 1974 p0215 A77-41110
Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-46386
- RADIATION DETECTORS**
Microwave radiometric detection of corona from chaff within thunderstorms p0268 A77-50724
SO₂ detection using thermal radiation at 53.5 GHz rotational resonance p0268 A77-50976
- RADIATION EFFECTS**
NASA Workshop on Solar-Terrestrial Studies from a Manned Space Station [NASA-CP-2024] p0278 N77-32549
- RADIATION MEASUREMENT**
Radiation studies in the atmosphere --- Russian book p0267 A77-47687
- RADIATIVE TRANSFER**
New formulas of the radiation balance of the ocean-atmosphere system p0235 A77-40812
Effects of cloud particles on remote sensing from space in the 10-micrometer infrared region [AD-A038502] p0268 N77-28565
Radiative transfer model for remote sensing of suspended sediments in water [NASA-CR-145145] p0248 N77-32567
- RADIO ALTIMETERS**
Ocean geodesy based on GEOS-3 satellite altimetry data p0222 A77-45787
Barometric frequency-compensated altimeter-automaton p0268 A77-50724
Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features [NASA-CR-141428] p0271 N77-33577
- RADIO ASTRONOMY**
Geodetic and astrometric measurements with very long baseline interferometry [NASA-TM-X-71395] p0227 N77-32564
- RADIO COMMUNICATION**
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/6] p0239 N77-29383
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 --- North Atlantic ocean reliability maps p0239 N77-29384
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 --- South Pacific ocean reliability maps [PB-265852/4] p0239 N77-29385
- RADIO EMISSION**
Satellite-borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198
Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690
- RADIO METEOROLOGY**
Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0231 A77-46186

Methods of detecting froth regions on oceans from remote measurements of thermal radio emission p0238 A77-49459

RADIO OBSERVATION
The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184

RADIO PHYSICS
Investigation of the natural environment using radio-physical methods / Review/ p0265 A77-43401

RADIO PROBING
Radio-physical methods of sensing the earth surface and prospects of their development p0274 A77-47183

RADIO RECEIVERS
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389

RADIO SCATTERING
Scattering of radio waves by an underlying surface covered with vegetation p0207 A77-41178

RADIO SPECTROSCOPY
The progress in microwave radiation investigations of continental covers during 1967-1977 [IAF PAPER 77-118] p0257 A77-51435

RADIOACTIVE CONTAMINANTS
Comparative levels of environmental radioactivity in Utah from industry and fall out A report of radioecological investigations of airborne radioactivity in the Utah environment [UERL-2] p0219 N77-31297

RADIOACTIVE DECAY
Optical detection of atmospheric U-238 decay products --- determination of Pb and Bi scattering cross sections p0250 A77-45305

RADIOMETERS
Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces p0267 A77-47696
Selective modulation radiometry for remote detection of gaseous pollutants [ONERA TP NO 1977-111] p0218 A77-50997
Three field tests of a gas filter correlation radiometer [NASA-CR-153931] p0268 N77-28467
Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments p0229 N77-28549
IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval [AD-A039861] p0289 N77-28684
Visible and infrared imaging radiometers for ocean observations [NASA-TM-X-71374] p0240 N77-30447
Sensor performance report volume 4 (S-190A) [NASA-CR-151528] p0271 N77-33581

RADIOSONDES
Satellite temperature sounding of the atmosphere Ground truth analysis [AD-A038236] p0259 N77-29679

RAIN
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557
Rainfall infiltration characteristics for a semi-and watershed soil [PB-267723/5] p0246 N77-30587

RANGEFINDING
Electronic surveying and navigation --- book on instrumentation systems and supporting theory p0267 A77-49775

RANGELANDS
Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region p0222 A77-45800
Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region [INPE-1044-TPT/058] p0212 N77-30578
Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region [INPE-1075-NTE/101] p0213 N77-31578
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

RECEIVERS
Effect of Geocover observations upon the classical triangulation network p0225 A77-47399

RECLAMATION
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77-28551

RED TIDE
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
Application of LANDSAT MSS data to the study of oceanographical environment --- Seto Inland Sea [E77-10228] p0241 N77-33559

Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560

REFLECTANCE
Identification of crops in Central Arkansas using visual and infrared spectral reflectance signatures [NASA-CR-151495] p0212 N77-30569
Study of near-infrared snow reflectance using Skylab S192 multispectral scanner data [PB-267504/9] p0269 N77-30591
Analysis of observed soil skin moisture effects on reflectance [AD-A041859] p0214 N77-32570
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

REGIONAL PLANNING
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43689
LANDSAT planning applications in east central Florida [E77-10238] p0284 N77-33569
Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process [PB-269409/9] p0247 N77-33595

RELIEF MAPS
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566

REMOTE REGIONS
Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381

REMOTE SENSORS
Optimal calibration of remote sensors using time averaging p0285 A77-40813
The use of remote sensing to study earth resources p0285 A77-40999
Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77-42015
Remote sensing of the oceans from space - Achievements problems and prognosis p0235 A77-42563
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77-42730
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43689
Remote sensing of productive moisture stored in the soil p0208 A77-44898
Remote sensing potential for increasing yields of latent fisheries resources p0236 A77-45771
Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data p0209 A77-45814
The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817
The remote sensing of chlorophyll --- in upper ocean layer p0236 A77-45852
Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
Quo vadis remote sensing --- use of satellite data for resource management [AAS 76-057] p0273 A77-46837
Remote sensing in ecological botany p0210 A77-46734
Remote sensing - Satellite analyses of earth resources p0273 A77-46748
Inflight performance evaluation of satellite remote sensor data by ground-based measurements p0251 A77-46765
The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184
Technology of the thematic automated processing of video data p0253 A77-47191
Some types of preliminary processing of video data --- earth resources remote sensing p0253 A77-47194
Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources p0253 A77-47199
Legal questions associated with satellite remote sensing and prospects of international cooperation in this field p0274 A77-47209
An interactive minicomputer image processing system for remote sensing applications p0254 A77-47449
Integration of land-use data and soil survey data p0211 A77-47477
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50161
Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-88] p0244 A77-51423
The role of geodetic techniques in remote sensing the surface dynamics of the oceans [IAF PAPER 77-87] p0226 A77-51424
New developments in microwave remote sensing [IAF PAPER 77-117] p0257 A77-51434
Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77-51438

Some legal problems of remote sensing of earth from outer space [IAF PAPER SL-77-20] p0275 A77-51549
Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633
Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste p0239 N77-28564
[NASA-TN-D-8467] p0239 N77-28564
IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval [AD-A039861] p0289 N77-28684
Photo-geology and remote sensing systems for locating ore deposits p0230 N77-29592
Joint document concerning geological studies from 1971 - 1975 [NASA-TM-78318] p0230 N77-29672
Microwave backscattering theory and active remote sensing of the ocean surface [NASA-CR-141423] p0240 N77-30442
Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning p0259 N77-30548
Remote sensing applications to Missouri environmental resources information system [NASA-CR-150340] p0280 N77-30585
Application transfer activity in Missouri [NASA-CR-150341] p0280 N77-30586
Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0280 N77-30587
Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
The large area crop inventory experiment A major demonstration of space remote sensing [NASA-TM-74840] p0212 N77-30570
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-R-472] p0289 N77-30572
Remote sensing of accumulated frazil and brash ice in the St Lawrence River [AD-A039905] p0245 N77-30581
Resource sensing from space Prospects for developing countries [PB-264171/0] p0275 N77-30590
Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area [INPE-1085-TPT/061] p0240 N77-31757
Radiative transfer model for remote sensing of suspended sediments in water [NASA-CR-145145] p0246 N77-32567
Literature review of the remote sensing of natural resources --- bibliography [NASA-CR-155190] p0277 N77-33551
Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features [NASA-CR-141428] p0271 N77-33577
A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145262] p0278 N77-33585
Application of remote sensing for planning purposes [NASA-CR-150418] p0272 N77-33589
Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0284 N77-33590

RESEARCH
Significance of environmental research tasks at the German Aviation and Space Research Institute [DLR-IB-553-75/5] p0278 N77-33697

RESEARCH PROJECTS
EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77-40639

RESERVOIRS
Methodological aspects of the optimum management of multiple-use reservoirs p0243 A77-42875
Application of a transient flow model to coordinate urban storm runoff data with flow in a reservoir [PB-265204/8] p0244 N77-28463
Land use mapping and modelling for the Phoenix Quadrangle [E77-10198] p0280 N77-30556
LANDSAT/Bangladesh project [E77-10200] p0280 N77-30560
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline --- Missouri [E77-10220] p0246 N77-31574
Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops, enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

RESIDENTIAL AREAS
A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X-71387] p0220 N77-32566

RESOURCES MANAGEMENT

Applications of space observations to the management and utilization of coastal fishery resources

Quo vadis remote sensing --- use of satellite data for resource management [AAS 78-057] p0238 A77-45827 p0273 A77-46637

Problems concerning the determination of space information for the sensing of earth resources and resources management p0274 A77-47208

Value of Landsat in urban water resources planning p0243 A77-51280

Applications of space technology to water resources management p0245 N77-30288

Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554

RICE

Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77-45795

RIVERS

Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-86] p0244 A77-51423

Lake St. Clair hydrologic transfer factors [PB-288420/9] p0244 N77-28571

Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560

Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563

Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona [E77-10240] p0278 N77-33571

ROCKET LAUNCHING

The Skylark sounding rocket programme p0249 A77-41798

ROCKS

Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temez Mountains New Mexico [LA-8895-MS] p0232 N77-33734

ROCKY MOUNTAINS (NORTH AMERICA)

Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853

ROOT-MEAN-SQUARE ERRORS

Most favorable time for determining azimuth from solar observations p0221 A77-41002

RUMANIA

Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-86] p0244 A77-51423

RURAL AREAS

Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-258] p0275 A77-51500

RURAL LAND USE

A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery [E77-10187] p0257 N77-28552

A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X-71387] p0220 N77-32568

Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma counties Arizona [E77-10240] p0278 N77-33571

S**SACRAMENTO VALLEY (CA)**

Determining the usefulness of remote sensing for estimating agricultural water demand in California [E77-10191] p0211 N77-30551

SALINITY

Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469

Comprehensive study of Leon-Querretaro area --- Mexico [E77-10206] p0232 N77-32560

SALTON SEA (CA)

Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555

SAMPLING

Remote water monitoring system [NASA-CASE-LAR-11973-1] p0244 N77-28563

SAN FRANCISCO BAY (CA)

Monitoring water quality by remote sensing [E77-10194] p0245 N77-30654

SAN JUAN MOUNTAINS (CO)

Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado [E77-10211] p0261 N77-31565

SANDS

Visible and near-infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship p0256 A77-49394

Investigation of environmental change pattern in Japan Classification of shorelines --- Nagoya Yokkaichi and Iria Japan [E77-10224] p0220 N77-33555

SATELLITE CONTROL

Control of spacecraft for sensing earth resources and monitoring the ambient medium p0253 A77-47205

SATELLITE DESIGN

Serlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-46790

Proposed parameters for an operational Landsat p0255 A77-47479

SATELLITE NETWORKS

The Canadian Doppler satellite network p0223 A77-47379

Quick-look capability in a European earth resources satellite data network [FU15-4] p0258 N77-28562

SATELLITE OBSERVATION

The use of remote sensing to study earth resources p0265 A77-40999

Space methods for investigating the environment --- Russian book p0273 A77-41635

Earth studies from satellite-borne sensors p0265 A77-41795

OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295

Observations of high-latitude protons p0249 A77-42312

Remote sensing of the oceans from space - Achievements problems and prognosis p0235 A77-42563

Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus 6 PMR results --- Pressure Modulator Radiometer p0265 A77-43483

Aerosat program - System and status p0273 A77-43806

Field and particle observations in the magnetotail related to the reconnection process p0218 A77-44235

Landsat imagery for surface-mine inventory p0228 A77-44467

The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731

Satellite observations of protons involved in the generation of IPDP and Pc 1 --- intervals of pulsations of diminishing periods p0250 A77-45739

On winter wheat yield from Landsat and Landsat follow-on satellites p0208 A77-45749

Remote sensing potential for increasing yields of latent fisheries resources p0236 A77-45771

Ocean geodesy based on GEOS-3 satellite altimetry data p0222 A77-45787

Implementation of a crop condition monitoring system p0209 A77-45798

Rangeland recovery in an enclosure - Satellite and ground observations --- in Sinai and region p0222 A77-45800

Satellite observations as ground truth for climate models p0266 A77-45803

Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data p0209 A77-45814

The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817

Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827

Satellite climatology and its role in agriculture p0209 A77-45840

The remote sensing of chlorophyll --- in upper ocean p0236 A77-45852

Observation of an ionospheric acceleration mechanism producing energetic /keV ions primarily normal to the geomagnetic field direction p0266 A77-45945

Reduction and treatment of magnetic anomalies of crustal origin in satellite data p0222 A77-48270

Sesat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-48275

Gravimetric geoid in the Northwest Pacific Ocean p0222 A77-48525

Europe's need for better information on natural resources and environment [AAS 78-055] p0273 A77-48638

Quo vadis remote sensing --- use of satellite data for resource management [AAS 78-057] p0273 A77-48637

Remote sensing - Satellite analyses of earth resources p0273 A77-48748

The use of photographic imagery in earth resources studies p0251 A77-48783

Inflight performance evaluation of satellite remote sensor data by ground-based measurements p0251 A77-48785

Satellite monitoring of atmospheric gases p0217 A77-48786

Monitoring from satellites --- weather earth resources geophysical applications p0273 A77-48787

Serlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-48790

Long waves in the eastern equatorial Pacific Ocean - A view from a geostationary satellite p0237 A77-47175

Space studies of earth resources Methods and means of measurement and data processing --- Russian book p0273 A77-47177

Space studies and the sensing of earth resources p0273 A77-47178

Radio-physical methods of sensing the earth surface and prospects of their development p0274 A77-47183

The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184

Consideration of the atmosphere in problems of the satellite sensing of earth resources p0252 A77-47185

The selection of spectral ranges for sensing earth resources p0252 A77-47186

Technology of the thematic automated processing of video data p0253 A77-47191

Requirements for space techniques of the sensing of earth resources and possible types of satellites p0274 A77-47203

Selection of satellite orbits for the sensing of earth resources p0287 A77-47204

Control of spacecraft for sensing earth resources and monitoring the ambient medium p0253 A77-47205

Aerospace polygons problems of investigation and the structure of ground-based observations p0274 A77-47207

Legal questions associated with satellite remote sensing and prospects of international cooperation in this field p0274 A77-47209

Doppler positioning by the short arc method --- geodetic adjustment from satellite observations p0222 A77-47375

DMATC Doppler determination of polar motion p0223 A77-47376

MEDOC experiment or the French Polar Motion Project --- based on Doppler observation of Transit satellite p0223 A77-47377

Satellite technology applied to Antarctic Mapping Program p0223 A77-47378

The Canadian Doppler satellite network p0223 A77-47379

Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381

Methodology and field tests of GDOP - A geodetic computation package for the short arc adjustment of satellite Doppler observations p0224 A77-47390

Relating Doppler datum to ordnance survey datum p0224 A77-47392

Effect of Geocenter observations upon the classical triangulation network p0225 A77-47399

A Landsat study of water quality in Lake Okeechobee p0243 A77-47453

Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces p0267 A77-47696

Microwave spectroscopic imagery of the earth p0267 A77-48269

Huelva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data p0238 A77-48329

Urban and regional land use change detected by using Landsat data p0217 A77-48669

Buoy and satellite observations of mesoscale cellular convection during AMTEX 75 --- Air Mass Transformation Experiment p0238 A77-48194

Free-air gravity anomalies in the world's oceans and their relationship to residual elevation p0226 A77-48327

The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-48397

Advection in the Peru current as observed by satellite p0238 A77-50273

Remote investigations of the environment from space and problems of space data handling p0256 A77-50443

Foundations of space geodesy --- Russian book p0226 A77-50685

Geodetic measurements on the ocean p0228 A77-51334

Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-86] p0244 A77-51423

The role of geodetic techniques in remote sensing the surface dynamics of the oceans [IAF PAPER 77-87] p0226 A77-51424

A high-resolution multispectral scanner for earth observation [IAF PAPER 77-116] p0257 A77-51433

The progress in microwave radiation investigations of continental covers during 1967-1977 [IAF PAPER 77-118] p0257 A77-51435

Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt [IAF PAPER 77-128] p0257 A77-51437

Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568

Frequency requirements for active earth observation sensors [NASA-CR-153939] p0268 N77-28566

Key to meteorological records documentation no 5 4 Environmental satellite imagery February 1977 [KMRD-5.4] p0262 N77-31726

Satellite-borne monitoring of atmospheric and surface characteristics affecting the propagation of microwaves in the troposphere p0263 N77-32389

Literature review of the remote sensing of natural resources --- bibliography [NASA-CR-155180] p0277 N77-33551

- Space studies of earth resources Methods and means of measurements and processing of information
[NASA-TT-F-17544] p0284 N77-33583
- SATELLITE ORBITS**
Analysis of the accuracy of determining coordinates of points by the orbital method p0221 A77-41001
Ocean geodesy based on GEOS-3 satellite altimetry data p0222 A77-45787
Selection of satellite orbits for the sensing of earth resources p0287 A77-47204
Physics uses and regulation of the geostationary orbit or ex facto sequitur lex
[IAF PAPER SL-77-44] p0275 A77-51558
LANDSAT non-US standard catalog 1 April 1977 through 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74828] p0258 N77-29591
LANDSAT non-US standard catalog 1 May 1977 - 31 May 1977
[NASA-TM-74825] p0258 N77-29593
LANDSAT US standard catalog 1 April 1977 - 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74778] p0259 N77-29801
LANDSAT US standard catalog 1-31 May 1977 --- LANDSAT imagery for May 1977
[NASA-TM-74859] p0261 N77-30592
- SATELLITE PERTURBATION**
Oceanic tide determination by satellite
[IAF PAPER 77-ST-10] p0239 A77-51574
- SATELLITE TELEVISION**
Remote-area health care delivery through space technology - STARPAHC
[IAF PAPER 77-255] p0275 A77-51500
- SATELLITE TRACKING**
Analysis of the accuracy of determining coordinates of points by the orbital method p0221 A77-41001
Tracking a Gulf Stream ring with a free drifting surface buoy p0235 A77-41918
Satellite Doppler positioning Proceedings of the International Geodesic Symposium New Mexico State University Las Cruces N Mex October 12-14 1976 Volumes 1 & 2 p0222 A77-47370
Development of Doppler activity at IROE --- European tracking station in U S Navy Navigation Satellite Tracking Network p0224 A77-47387
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77-47389
Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47397
Updating survey networks - A practical application of satellite Doppler positioning p0225 A77-47400
Adjustment of terrestrial networks using Doppler satellite data p0225 A77-47401
Introduction to the workshop on polar motion --- satellite determination by Doppler effect p0225 A77-47404
Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47408
Errors of Doppler positions obtained from results of transcontinental traverse surveys p0225 A77-47409
Foundations of space geodesy --- Russian book p0228 A77-50685
- SATELLITE TRANSMISSION**
Simulation of remote data acquisition systems p0254 A77-47255
- SATELLITE-BORNE INSTRUMENTS**
Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77-40792
Spaceborne earth applications ranging system /SPEAR/ p0221 A77-40824
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite p0249 A77-41088
Earth studies from satellite-borne sensors p0265 A77-41795
Gravity potential resulting from cylindrical structures of finite length p0221 A77-43388
Space studies of earth resources Methods and means of measurement and data processing --- Russian book p0273 A77-47177
Space studies and the sensing of earth resources p0273 A77-47178
Operational means for obtaining spaceborne video data in the optical range p0252 A77-47180
Satellite-borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198
Space experiment simulation using an aircraft laboratory p0266 A77-47200
Requirements for space techniques of the sensing of earth resources and possible types of satellites p0274 A77-47203
Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning p0223 A77-47382
A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317
A high-resolution multispectral scanner for earth observation
[IAF PAPER 77-115] p0257 A77-51433
- Some scientific applications of the low-g accelerometer Cactus --- neutral density wave detection in upper earth atmosphere
[IAF PAPER 77-ST-06] p0288 A77-51569
Evaluation of space application problems of a decimilimeter carcinotron --- far infrared heterodyne detection
[RT-1814] p0270 N77-31593
- SATELLITE-BORNE PHOTOGRAPHY**
Data management in pattern recognition and image processing systems p0249 A77-43815
Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469
Discernible lineaments in Landsat images of Lebanon p0250 A77-44587
Landscape indication of natural processes from spacecraft photographs p0243 A77-45200
Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754
Forest fire fuel mapping from Landsat p0208 A77-45756
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77-45795
Toward fully automated agricultural inventory from satellites p0209 A77-45844
A comparative study of cloud classification techniques p0251 A77-46733
A syntax-directed method for land-use classification of Landsat images p0251 A77-46755
Meso-beta scale features observed in surface network and satellite data p0252 A77-47039
Photographic methods of studying the earth from space p0252 A77-47179
The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190
Analytical methods of the coordinate connection of video data obtained for purposes of sensing earth resources p0253 A77-47196
The use of Landsat imagery in urbanized area studies p0217 A77-47433
Landsat MSS imagery - A thematic mapping base --- multispectral scanner p0254 A77-47438
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
The display of Landsat data at large scales by matrix printer p0267 A77-47480
Corrected Landsat images using a small computer p0255 A77-47481
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
Simulation of the effects of hard limiting on image quality of synthetic aperture radar --- onboard Landsat satellite p0256 A77-49905
Oceanic polar front in the Drake Passage - Satellite observations during 1976 p0238 A77-51258
Value of Landsat in urban water resources planning p0243 A77-51280
Remote sensing methods of interpretation of anthropogenic changes of environment
[IAF PAPER 77-130] p0218 A77-51438
Environmental pattern change as revealed by Landsat MSS data
[IAF PAPER 77-131] p0218 A77-51439
LANDSAT non-US standard catalog 1 April 1977 through 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74828] p0258 N77-29591
LANDSAT non-US standard catalog 1 May 1977 - 31 May 1977
[NASA-TM-74825] p0258 N77-29593
LANDSAT US standard catalog 1 April 1977 - 30 April 1977 --- LANDSAT imagery for April 1977
[NASA-TM-74778] p0259 N77-29601
The large area crop inventory experiment An experiment to demonstrate how space-age technology can contribute to solving critical problems here on earth
[NASA-TM-74832] p0212 N77-30564
LANDSAT US standard catalog 1-31 May 1977 --- LANDSAT imagery for May 1977
[NASA-TM-74859] p0261 N77-30592
- SCALE (RATIO)**
Optical power spectrum analysis - Scale and resolution effects --- for land use photomapping classifications p0255 A77-47478
- SCATTEROMETERS**
Feasibility study of microprocessor systems suitable for use in developing a real-time for the 4.75 GHz scatterometer
[NASA-CR-151522] p0264 N77-33586
- SCIENTIFIC SATELLITES**
Analysis of observed soil skin moisture effects on reflectance
[AD-A041859] p0214 N77-32570
- SEA ICE**
Effective electrical parameters of incipient forms of sea ice sheet and crust p0237 A77-46185
- Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0237 A77-46186
Interpretation key for SAR /L-band/ imagery of sea ice p0237 A77-47451
Sea ice studies in the Svalbard-Greenland area
[E77-10206] p0240 N77-31561
Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33652
- SEA STATES**
Methods of detecting froth regions on oceans from remote measurements of thermal radio emission p0238 A77-49459
General pattern of the turbid water in the Seto-inland sea extracted from multispectral imagenes by the LANDSAT-1 and 2
[E77-10230] p0241 N77-33561
- SEA TRUTH**
Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas
[E77-10229] p0241 N77-33560
- SEA WATER**
Radar detection of sea surface oil pollution p0215 A77-40758
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77-42730
The remote sensing of chlorophyll --- in upper ocean layer p0236 A77-45852
Investigation of environmental change pattern in Japan Classification of shorelines --- Nagoya Yokkaichi and Riu Japan
[E77-10224] p0220 N77-33555
Application of LANDSAT MSS data to the study of oceanographical environment --- Seto Inland Sea
[E77-10228] p0241 N77-33559
- SEAS**
Overall evaluation of LANDSAT (ERTS) follow on imagery for cartographic application
[E77-10193] p0227 N77-30553
Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features
[NASA-CR-141428] p0271 N77-33577
- SEASAT-A SATELLITE**
Seasat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-46275
NOAA program development plan for SEASAT-A research and applications
[PB-285414/3] p0239 N77-28566
- SEASONS**
Land use mapping and modelling for the Phoenix Quadrangle
[E77-10196] p0260 N77-30556
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline --- Missouri
[E77-10220] p0246 N77-31574
Experimental study of digital image processing techniques for LANDSAT data
[E77-10221] p0261 N77-31575
- SEAWEEDES**
Seasonal aerial survey of southern California kelp beds p0238 A77-47452
- SEDIMENT TRANSPORT**
Multiband survey as a method to study suspension distribution in the sea
[IAF PAPER 77-84] p0238 A77-51422
An experimental investigation of some combined flow sediment transport phenomena
[PB-269872/2] p0247 N77-32575
- SEDIMENTS**
The French Atlantic littoral and the Massif Armoncais part 1 --- Island of Jersey Fromentine Loire Estuary and Mont Saint-Michel Bay
[E77-10216] p0261 N77-31570
Radiative transfer model for remote sensing of suspended sediments in water
[NASA-CR-145145] p0246 N77-32567
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2
[E77-10234] p0277 N77-33565
- SEISMOGRAPHS**
Marine geophysical instrumentation
[AD-A040048] p0270 N77-31467
- SELECTIVE DISSEMINATION OF INFORMATION**
Problems concerning the dissemination of space information for the sensing of earth resources and resources management p0274 A77-47208
Some legal problems of remote sensing of earth from outer space
[IAF PAPER SL-77-20] p0275 A77-51549
- SELENOGRAPHY**
S-191 sensor performance evaluation
[NASA-CR-151527] p0271 N77-33582
- SEWAGE**
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976
[NASA-TM-74068] p0220 N77-33579

- REMOTE SENSING**
 Overview of evolution of LANDSAT (ERTS) follow on imagery for cartographic application [E77-10103] p0227 N77-30563
- RESEARCH VESSEL**
 Expedition of the 12th cruise of the research vessel Albatross Vornedaki --- equatorial Pacific Ocean current investigations p0235 A77-40321
- SEISMOLOGICAL**
 Seismotectonic, structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping, land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565
- SNOWMAPPING**
 Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- THICKNESS**
 Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry p0235 A77-41403
- THICKNESS**
 Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690
- MICROWAVE SPECTROSCOPY**
 Microwave spectroscopic imagery of the earth p0267 A77-48269
- WINTER SNOW-COVER**
 Winter snow-cover maps of North America and Eurasia from satellite records 1966 1976 [PB-287393/7] p0246 N77-29722
- SKYLAB S192**
 Study of near-infrared snow reflectance using Skylab S192 multispectral scanner data [PB-287504/8] p0269 N77-30591
- ESCAP MEETING**
 ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh [E77-10202] p0260 N77-30562
- GROUND TRUTH**
 Ground truth measurements for thermal infrared remote sensing --- of soils and vegetation p0207 A77-44465
- INTEGRATION**
 Integration of land-use data and soil survey data p0211 A77-47477
- PLANT GROWTH**
 Plant growth and soil humidity above wall remnants - Preliminary results of a soil test as a contribution to aerial-photography archaeology p0207 A77-41256
- THEORY**
 Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77-42015
- RADAR SYSTEM**
 Radar system specifications for hydrology and agriculture p0207 A77-43804
- REMOTE SENSING**
 Remote sensing of productive moisture stored in the soil p0208 A77-44698
- SURFACE TEMPERATURE**
 Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748
- DETERMINATION**
 Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568
- RAINFALL INFILTRATION**
 Rainfall infiltration characteristics for a semi-and watershed soil [PB-267723/5] p0246 N77-30567
- APPLICATIONS**
 Applications of remote sensing volume 3 [E77-10185] p0259 N77-30549
- COMPREHENSIVE STUDY**
 Comprehensive study of Leon-Queretaro area --- Mexico [E77-10208] p0232 N77-32560
- ANALYSIS**
 Analysis of observed soil skin moisture effects on reflectance [AD-A041859] p0214 N77-32570
- APPLICATIONS**
 Applications of remote sensing --- Texas South Dakota North Dakota, and Kansas [E77-10183] p0214 N77-33553
- APPLICATION**
 Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554
- APPLICATION**
 The application of ERTS imagery to the FAO/Unesco soil map of the world [E77-10236] p0214 N77-33567
- APPLICATION**
 Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- INVESTIGATION**
 Investigation of environmental change pattern in Japan Observation of present state of agricultural land-use by analysing LANDSAT data [E77-10243] p0214 N77-33574
- MORPHOLOGY**
 Morphology and physical parameters of a solar flare p0229 A77-45269
- MORPHOLOGY**
 Morphology and physical parameters of a solar flare p0229 A77-45269
- NEW FORMULAS**
 New formulas of the radiation balance of the ocean-atmosphere system p0235 A77-40812
- THE SENSITIVITY**
 The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731
- MOST FAVORABLE**
 Most favorable time for determining azimuth from solar observations p0221 A77-41002
- REMOTE SENSING**
 Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- NASA WORKSHOP**
 NASA Workshop on Solar-Terrestrial Studies from a Manned Space Station [NASA-CP-2024] p0278 N77-32549
- FOURIER TRANSFORM**
 The application of Fourier transform spectroscopy to the remote identification of solids in the solar system p0255 A77-49291
- Introduction**
 Man and his total environment p0276 N77-32564
- MORPHOLOGY**
 Morphology and physical parameters of a solar flare p0229 A77-45269
- AN ADVECTION-DIFFUSION**
 An advection-diffusion model of the DOMES turbidity plume [PB-268713/5] p0220 N77-31598
- ESTIMATION**
 Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- HYGROMETRIC SODAR**
 Hygrometric sodar --- for remote sensing of water vapor p0271 N77-32684
- THE SKYLARK**
 The Skylark sounding rocket programme p0249 A77-41796
- TIME VARIATIONS**
 Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope p0237 A77-46300
- MONITORING**
 Monitoring the extent and occurrence of fire in the different veld types of South Africa with particular reference to an ecological role and role in range management [E77-10226] p0263 N77-33557
- USEFULNESS**
 Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region [INPE-1044-TPT/056] p0212 N77-30578
- UTILIZATION**
 Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region [INPE-1075-NTE/101] p0213 N77-31578
- INTEGRATION**
 Integration of land-use data and soil survey data p0211 A77-47477
- INVENTORY**
 Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
- APPLICATIONS**
 Applications of remote sensing --- Texas South Dakota North Dakota and Kansas [E77-10183] p0214 N77-33553
- APPLICATION**
 Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- RECENT ELEVATION**
 Recent elevation change in Southern California [PB-265940/7] p0227 N77-28688
- DETERMINATION**
 Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
- AN INTEGRATED**
 An integrated study of earth resources in the state of California using remote sensing techniques [E77-10215] p0246 N77-31569
- ATLAS**
 Atlas of probabilities of surface temperature extremes Part 2 Southern Hemisphere [AD-A038237] p0227 N77-29702
- METHODOLOGICAL**
 Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197
- SOME LEGAL**
 Some legal problems of remote sensing of earth from outer space [IAF PAPER SL-77-20] p0275 A77-51549
- PHYSICS**
 Physics uses and regulation of the geostationary orbit or ex facto sequitur lex [IAF PAPER SL-77-44] p0275 A77 51568
- MONITORING**
 Monitoring from satellites --- weather earth resources geophysical applications p0273 A77-46767
- AERONAUTICS**
 Aeronautics and space report of the President 1976 activities --- technology development and utilization p0275 N77-31048
- A STUDY**
 A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145252] p0278 N77 33585
- THE USE**
 The use of photographic imagery in earth resources studies p0251 A77-46783
- SKYLARK PHOTOGRAPHY**
 Skylark photography for geological mapping p0229 A77-47176
- THE PRINCIPLES**
 The principles of photometry theory in relation to spaceborne photography of the earth p0253 A77-47189
- PHOTOMETRIC**
 Photometric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195
- GEOMETRIC**
 Geometric evaluation of Skylab S-192 conical scanner imagery p0254 A77-47446
- SOIUS-22**
 Soius-22 A new contribution to space geography p0275 N77-28559
- RETRANSLATION**
 Retranslation of oceanographic information from an automatic buoy station via Kosmos-428 p0235 A77 40792
- METHODOLOGICAL**
 Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197

- Digital technique for generating synthetic aperture radar images p0258 A77-50447
 Geology orbiter comparison study [NASA-CR-156056] p0232 N77-34073
- SPACECRAFT PERFORMANCE**
 Landsat-1 and Landsat-2 flight evaluation report 23 October 1976 to 23 January 1977 [NASA-CR-152577] p0258 N77-29594
- SPACELAB**
 Sarlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-48790
 Workshop for a French Program of Spacelab Utilization Avonaz Haute-Savoie France April 13-16 1978 Proceedings p0274 A77-50689
- SPAIN**
 Huelva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data p0238 A77-48329
- SPECTRAL BANDS**
 The selection of spectral ranges for sensing earth resources p0252 A77-47186
- SPECTRAL RECONNAISSANCE**
 On winter wheat yield from Landsat and Landsat follow-on satellites p0208 A77-45749
- SPECTRAL REFLECTANCE**
 Resolution of grass canopy biomass classes p0208 A77-44471
 Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754
 Utilization of the spatial variability of reflectance for rice phenological stages determination p0209 A77-45795
 The remote sensing of chlorophyll --- in upper ocean layer p0236 A77-45852
 Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
 Applications of Suits spectral model to wheat p0210 A77-46738
 Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems p0252 A77-47187
 Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77-47697
 A method to obtain diffuse reflectance measurements from 1.0 to 3.0 microns using a Cary 171 spectrophotometer --- for atmospheric aerosol measurement p0267 A77-49295
 Visible and near-infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship p0256 A77-49394
 Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395
 Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics [IAF PAPER 77-113] p0256 A77-51432
- SPECTRAL SIGNATURES**
 Scattering of radio waves by an underlying surface covered with vegetation p0207 A77-41178
 Visible and near-infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship p0256 A77-49394
 Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA-TN-D-8467] p0239 N77-28564
 A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X-71387] p0220 N77-32566
- SPECTROMETERS**
 Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50161
- SPECTROPHOTOMETERS**
 A method to obtain diffuse reflectance measurements from 1.0 to 3.0 microns using a Cary 171 spectrophotometer --- for atmospheric aerosol measurement p0267 A77-49295
- SPECTROPHOTOMETRY**
 Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395
- SPECTRORADIOMETERS**
 S-181 sensor performance evaluation [NASA-CR-151527] p0271 N77-33582
- SPECTRUM ANALYSIS**
 Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77-42730
 Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547
 Identification of oil slicks by infrared spectroscopy [AD-A040976] p0220 N77-31587
- STANDARDIZATION**
 Standardization of Doppler point positioning results p0224 A77-47384
- STATISTICAL DISTRIBUTIONS**
 Theory and application of wave propagation and scattering in random media p0256 A77-50966
- STATISTICAL TESTS**
 Testing land-use map accuracy p0256 A77-47478
- STEREOPHOTOGRAPHY**
 Skylab photography for geological mapping p0229 A77-47176
 Digital cartographic study and benchmark [AD-A043156] p0228 N77-32571
 Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552
- STOCHASTIC PROCESSES**
 Stochastic modeling of intermittent daily hydrologic series p0246 N77-32558
- STORMS (METEOROLOGY)**
 Methods of detecting front regions on oceans from remote measurements of thermal radio emission p0238 A77-49459
 Characteristics of meso-beta-scale deep convection over the eastern tropical Atlantic [PB-266955/4] p0258 N77-28709
- STRATIFICATION**
 Applications of remote sensing volume 2 [E77-10186] p0260 N77-30550
 Carbon Occurrence of linear forms in natural graphite [AD-A039520] p0232 N77-31995
- STRATIGRAPHY**
 Upper Mesozoic magnetostratigraphy p0230 N77-28656
- STRATOSPHERE**
 Stratospheric CH4 HCl and ClO and the chlorine-ozone cycle p0218 A77-49186
 A study of water vapor measurement in the stratosphere and mesosphere using microwave techniques p0270 N77-30676
- STREAMS**
 Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- STRIP MINING**
 Landsat imagery for surface-mine inventory p0229 A77-44467
 Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77-28551
 A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky volume 1 [E77-10189] p0230 N77-28554
 A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky Volume 2 Appendices [E77-10190] p0230 N77-28555
- STRUCTURAL BASINS**
 Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- STRUCTURAL PROPERTIES (GEOLOGY)**
 Discernible lineaments in Landsat images of Lebanon p0250 A77-44587
 Skylab photography for geological mapping p0229 A77-47178
 Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt [IAF PAPER 77-128] p0257 A77-51437
 ERTS multispectral image transformations for geological lineament enhancement [E77-10198] p0231 N77-30558
 The French Atlantic littoral and the Massif Armoricain part 3 [E77-10217] p0261 N77-31571
 Structural lineament and pattern analysis of Misourin using LANDSAT imagery [E77-10239] p0232 N77-33570
- SULFATES**
 Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625
- SULFIDES**
 Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625
- SULFUR DIOXIDES**
 Sulphur dioxide discharge from Mount Etna p0217 A77-46293
 SO2 detection using thermal radiation at 53.53 GHz rotational resonance p0268 A77-50976
 Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625
- SULFUR OXIDES**
 Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- SULFURIC ACID**
 EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77-40639
- SUMMER**
 Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031
- SURFACE PROPERTIES**
 Surface and structural properties of polygonalrite p0230 N77-29586
- SURFACE ROUGHNESS EFFECTS**
 A theory of sea scatter at large incident angles p0237 A77-45801
- SURFACE TEMPERATURE**
 Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255
 Measurement of the temperature distribution on urban surfaces p0215 A77-41748
- Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45749
 Some results of radiometric measurements onboard Cosmos 243 --- brightness temperature of underlying surfaces p0267 A77-47696
 Advection in the Peru current as observed by satellite p0238 A77-50273
 Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568
 Atlas of probabilities of surface temperature extremes Part 2 Southern Hemisphere [AD-A038237] p0227 N77-29702
 Gulfstream Monthly publications January-December 1976 Volume 2 numbers 1-12 [PB-268216/9] p0241 N77-33779
- SURFACE WAVES**
 Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
- SURVEYS**
 Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites [INPE-1072-TPT/059] p0262 N77-31580
- SUSPENDING (MIXING)**
 Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422
- SWEDEN**
 Quick-look capability in a European earth resources satellite data network [FU15-4] p0258 N77-28562
- SYNCHRONOUS SATELLITES**
 Physics uses and regulation of the geostationary orbit or ex facto sequitur lex [IAF PAPER SL-77-44] p0275 A77-51566
 Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568
- SYNOPTIC MEASUREMENT**
 Antarctic topography from balloons p0221 A77-44594
- SYNOPTIC METEOROLOGY**
 Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean p0250 A77-44900
- SYNTAX**
 A syntax-directed method for land-use classification of Landsat images p0261 A77-46755
- SYNTHETIC ARRAYS**
 Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems [AD-A036245] p0218 N77-28379
- SYSTEMS ANALYSIS**
 Systems analysis and optical scanning methods p0252 A77-47181
 Landsat-1 and Landsat-2 flight evaluation report 23 October 1976 to 23 January 1977 [NASA-CR-152577] p0258 N77-29594
- SYSTEMS ENGINEERING**
 Environmental monitoring --- integrated network design and applications p0215 A77-42255
 Aerosat program - System and status p0273 A77-43806
 General principles for the design of a space system for sensing earth resources and monitoring the state of the ambient medium p0274 A77-47202

T

TARGET RECOGNITION

- Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems [AD-A036245] p0218 N77-28379
 Advanced Digital Exploration Techniques (ADET) [AD-A040769] p0262 N77-31588

TECHNOLOGY ASSESSMENT

- Aerosat program - System and status p0273 A77-43806
 Landsat - Current and future capabilities for agriculture p0209 A77-45647
 Inflight performance evaluation of satellite remote sensor data by ground-based measurements p0251 A77-46765
 Doppler survey equipment - Background requirements and trends --- for satellite geodetic positioning p0223 A77-47382
 New developments in microwave remote sensing [IAF PAPER 77-117] p0267 A77-51434
 Space technology in the discovery and development of mineral and energy resources p0231 N77-30289
 Application of remote sensing for planning purposes [NASA-CR-150418] p0272 N77-33589
- TECHNOLOGY TRANSFER**
 Resource sensing from space Prospects for developing countries [PB-264171/0] p0275 N77-30590
 Landsat information for state planning [NASA-CR-150376] p0276 N77-31577
 Earth resources-regional transfer activity contracts review [NASA-TM-78130] p0278 N77-33578
 Spinoff 1977 An annual report [NASA-TM-74906] p0278 N77-34049

TECHNOLOGY UTILIZATION

Environmental monitoring --- integrated network design and applications p0215 A77-42255
 Satellite technology applied to Antarctic Mapping Program p0223 A77-47378
 Workshop for a French Program of Spacelab Utilization Avonaz Hauts-Savoies France April 13-16 1976 Proceedings p0274 A77-50689
 Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500
 Aeronautics and space report of the President. 1976 activities --- technology development and utilization p0275 N77-31048

TECTONICS

Souiz 22 A new contribution to space geography p0275 N77-28559
 The French Atlantic littoral and the Massif Armoncais part 3 [E77-10217] p0281 N77-31571
 Tectonic sketch map of northern Minas Gerais based on LANDSAT images [INPE-1078-NTE/104] p0231 N77-31582

TELEVISION CAMERAS

Methods for optimizing airborne LLLTV detection of fish induced plankton bioluminescence --- Low Light Level TV p0238 A77-45815

TEMPERATURE DISTRIBUTION

Measurement of the temperature distribution on urban surfaces p0215 A77-41749

TEMPERATURE GRADIENTS

Computing residuals in geothermal research by IR scanning p0288 A77-46768

TEMPERATURE MEASUREMENT

Measurement of the temperature distribution on urban surfaces p0215 A77-41749

TEMPERATURE PROFILES

Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States p0288 A77-45224

TENNESSEE

Theory and analysis of vegetation pattern [EDFB-IBP-76-3] p0213 N77-31591

TENNESSEE VALLEY (AL-KV-TN)

Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir [PB-285204/8] p0244 N77-28463

TERRAIN ANALYSIS

Landscape indication of natural processes from spacecraft photographs p0243 A77-45200
 Advances in digital sensor simulation --- radar terrain data bases p0254 A77-47445
 Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water marsh, and wetlands p0243 A77-47458
 Significance of vegetation in interpreting thermal radiation from a terrestrial surface p0211 A77-49511
 Contour determination from digital terrain models --- Book p0226 A77-50692

Application of Landsat satellite imagery in assessing the regional geological structural, environmental and groundwater conditions in the Qattara depression area Egypt [IAF PAPER 77-128] p0257 A77-51437

A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-R-472] p0269 N77-30672

The use of array algebra in terrain modeling procedures [AD-A040619] p0281 N77-30583

A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X-71387] p0220 N77-32566

Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects [AD-A042999] p0263 N77-32572

TERRRESTRIAL RADIATION

Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories p0288 A77-47201

TEXAS

Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469
 Aerial photographic detection of imported fire ant mounds p0208 A77-44470

Applications of remote sensing, volume 3 [E77-10185] p0259 N77-30649

Evaluation of change detection techniques for monitoring coastal zone environments [E77-10203] p0219 N77-30663

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas [E77-10212] p0213 N77-31566

Applications of remote sensing --- Texas, South Dakota, North Dakota, and Kansas [E77-10183] p0214 N77-33553

Spectral measurement of watershed coefficients in the southern Great Plains --- Texas, Arizona, and New Mexico [E77-10225] p0247 N77-33556

THAILAND

ESCAP inter-governmental meeting on remote sensing and satellite surveying --- Bangladesh [E77 10202] p0260 N77-30662
 Thailand national programme of the earth resources technology satellite [E77-10207] p0276 N77-31582
 Agniculture/forestry hydrology [E77-10219] p0213 N77-31573

THEMATIC MAPPING

A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435
 Landsat MSS imagery - A thematic mapping base --- multispectral scanner p0254 A77-47438
 Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study p0210 A77-47441

Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77-47697

Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics [IAF PAPER 77-113] p0258 A77-51432

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping, land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566

THERMAL EMISSION

Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690

Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568

THERMAL MAPPING

Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255

Measurement of the temperature distribution on urban surfaces p0215 A77-41749
 Construction and interpretation of a digital inertia image -- of Pisgah Crater and Lava Lake in Southern California p0250 A77-44484

Ground truth measurements for thermal infrared remote sensing --- of soils and vegetation p0207 A77-44485

Computing residuals in geothermal research by IR scanning p0288 A77-46768

Field mapping for heat capacity mapping determinations Ground support for airborne thermal surveys [NASA-CR-152587] p0270 N77-32568

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

THERMAL RADIATION

Radiation studies in the atmosphere --- Russian book p0287 A77-47687

SO2 detection using thermal radiation at 53.53 GHz rotational resonance p0268 A77-50976

Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites [INPE-1072-TPT/058] p0262 N77-31580

THERMOSPHERE

The semi-annual variation in thermospheric air density from January 1972 to April 1975 p0250 A77-45860

THUNDERSTORMS

Microwave radiometric detection of corona from chaff within thunderstorms p0268 A77-50274

TIDES

Mean sea level and the marine geoid - An analysis of concepts p0226 A77-51335
 Oceanic tide determination by satellite [IAF PAPER 77-ST-10] p0239 A77-51674

TIMBER IDENTIFICATION

Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834

A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450

TIMBER INVENTORY

Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
 Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439

A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440

Computer-assisted forest land classification in British Columbia and the Yukon territory - A case study p0210 A77-47441

A comparative analysis of methods for compiling isolinear maps of forest cover p0211 A77-50800

An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine, Illinois, and New York [E77-10213] p0213 N77-31567

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops, enhance contrast in photographic products monitor rangeland habitat loss map Aspen, and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

TOPOGRAPHY

Antarctic topography from balloons p0221 A77-44594
 Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77-45821
 Mean sea level and the marine geoid - An analysis of concepts p0226 A77-51335

A photographic reconnaissance of the microrrelief in the Monterey and Carmel submarine canyons California [AD-A039370] p0239 N77-28567

Extraction of topological information from digital images [AD-A042125] p0228 N77-32569

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566

LANDSAT planning applications in east central Florida [E77-10238] p0264 N77-33569

Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77-33570

Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features [NASA-CR-141428] p0271 N77-33577

TRACKING STATIONS

Standardization of Doppler point positioning results p0224 A77-47384

Development of Doppler activity at IROE --- European tracking station in U.S. Navy Navigation Satellite Tracking Network p0224 A77-47387

Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid p0224 A77-47388

TRAJECTORY MEASUREMENT

Tracking a Gulf Stream ring with a free drifting surface buoy p0235 A77-41918

TRANSUDERS

Remote transducer based on coherent mixing of backscattered laser light [PB-286771/5] p0269 N77-30588

TRANSFER FUNCTIONS

The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients p0244 N77-29587

TRANSFORMATIONS (MATHEMATICS)

Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics [IAF PAPER 77-113] p0258 A77-51432

TRANSIT SATELLITES

MEDOC experiment or the French Polar Motion Project --- based on Doppler observation of Transit satellite p0223 A77-47377

Development of Doppler activity at IROE --- European tracking station in U.S. Navy Navigation Satellite Tracking Network p0224 A77-47387

TRANSPARENCY

The field of transparency at 30 m depth in the tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798

TRIANGULATION

Effect of Geocover observations upon the classical triangulation network p0225 A77-47399

Accuracy models for bundle block triangulation p0255 A77-47974

TROPICAL METEOROLOGY

Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean p0250 A77-44900

The depression of remotely-sensed surface temperatures by a dust-laden tropical atmosphere p0238 A77-45732

A comparative study of cloud classification techniques p0251 A77-46733

Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031

TROPICAL REGIONS

Method of compilation of chemical-element maps of insufficiently observed ocean equators p0235 A77-40796

The field of transparency at 30 m depth in the tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798

Expedition of the 12th cruise of the research vessel Akademik Vernadskii --- equatorial Pacific Ocean current investigations p0235 A77-40621

Long waves in the eastern equatorial Pacific Ocean - A view from a geostationary satellite p0237 A77-47175

TROPICAL STORMS

Diurnal oscillation of the area of cloudiness associated with tropical storms p0216 A77-43080

A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/8] p0219 N77-29723

Coastal wave measurements during passage of tropical storm Amy [NASA-TM-74060] p0240 N77-30707

Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768

TROPOSPHERE

Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47387

Satellite-borne monitoring of atmospheric and surface characteristics affecting the propagation of microwaves in the troposphere p0263 N77-32389

TUNING
Air monitoring with tunable lasers p0216 A77-44613

TURBIDITY
The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

TURBULENCE
A three platform experiment on optical turbulence in the marine boundary layer [AD-A039789] p0258 N77-28685

TWO-DIRECTIONAL FLOW
Interaction between steady non-uniform two-dimensional currents and directional wind generated gravity waves with applications for current measurements [AD-A040800] p0282 N77-31702

U

U.S.S.R.
Space methods for investigating the environment --- Russian book p0273 A77-41635
Remote sensing of productive moisture stored in the soil p0208 A77-44898
Problems in infrared spectroscopy of the atmosphere --- Russian book p0254 A77-47276
Radiation studies in the atmosphere --- Russian book p0287 A77-47687
Souz-22 A new contribution to space geography p0275 N77-28559

LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77-30574
Large Area Crop Inventory Experiment (LACIE) Phase 2 evaluation report [NASA-TM-74837] p0213 N77-31584

ULTRASONIC RADIATION
Use of ultrasound for the investigation of small-scale turbulence in the ocean p0235 A77-40815

ULTRAVIOLET LACIE
Optical systems unravel smog chemistry p0216 A77-44614

UNDERWATER ACOUSTICS
Acoustical oceanography Principles and applications --- Book p0237 A77-45953

UNDERWATER OPTICS
The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798

UNDERWATER PHOTOGRAPHY
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
A photographic reconnaissance of the microrelief in the Monterey and Carmel submarine canyons California [AD-A039370] p0239 N77-28567

UNITED STATES OF AMERICA
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43699
Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States p0268 A77-45224
A study of density fronts and their effects on coastal pollutants p0217 A77-48735
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States p0230 N77-28652
The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients p0244 N77-29587
LANDSAT US standard catalog 1 April 1977 - 30 April 1977 --- LANDSAT imagery for April 1977 [NASA-TM-74778] p0259 N77-29601
LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77-30576
Study of near-infrared snow reflectance using Skylab S192 multispectral scanner data [PB-287504/9] p0269 N77-30591
LANDSAT US standard catalog 1-31 May 1977 --- LANDSAT imagery for May 1977 [NASA-TM-74859] p0261 N77-30592
Air quality data for the Northeast oxidant transport study 1975 [PB-287545/2] p0219 N77-30663
Aeronautics and space report of the President 1976 activities --- technology development and utilization p0275 N77-31048
Large Area Crop Inventory Experiment (LACIE) Phase 2 evaluation report [NASA-TM-74937] p0213 N77-31584

UPPER ATMOSPHERE
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77 50317

UPPER IONOSPHERE
Model for profile of topside ionosphere p0265 A77 41228

URANIUM OXIDE
Rare accessory uraninite in a Sierran granite p0229 A77-43014

URANIUM ZEO
Optical detection of atmospheric U-238 decay products --- determination of Pb and Bi scattering cross sections p0250 A77-45305

URBAN DEVELOPMENT
Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data p0217 A77-47434
Urban and regional land use change detected by using Landsat data p0217 A77-48689

URBAN PLANNING
Value of Landsat in urban water resources planning p0243 A77-51280
Test of Landsat-based urban hydrologic modeling p0244 A77-51285
The value of Landsat data in urban water resources planning p0245 N77-30545

URBAN RESEARCH
Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255
Measurement of the temperature distribution on urban surfaces p0215 A77-41749

URBAN REQUIREMENTS
Problems concerning the dissemination of space information for the sensing of earth resources and resources management p0274 A77-47208
Earth resources technology system standalone software package Description and user's guide [NASA-CR-152598] p0264 N77-33591

UTAH
Comparative levels of environmental radioactivity in Utah from industry and fall out A report of radioecological investigations of airborne radioactivity in the Utah environment p0219 N77-31297
Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas Utah volume 4 [PB-268421/5] p0263 N77-32574
Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6 [PB-268423/1] p0232 N77-32578

VALUE ENGINEERING
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651

VEGETATION
Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data --- multispectral scanners p0215 A77-41255
Ground truth measurements for thermal infrared remote sensing --- of soils and vegetation p0207 A77-44465
Remote sensing in ecological botany p0210 A77-48734
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
Significance of vegetation in interpreting thermal radiation from a terrestrial surface p0211 A77-49511
Land use mapping and modelling for the Phoenix Quadrangle [E77-10196] p0260 N77-30556
Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor --- Texas [E77-10212] p0213 N77 31566
Theory and analysis of vegetation pattern [EDFB-IBP-76-3] p0213 N77-31591
Generalized vegetation map of north Merrit Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77-32561
Use of near infrared/red radiance ratios for estimating vegetation biomass and physiological status [NASA-TM-X-71388] p0214 N77-32565
Applied Remote Sensing Program (ARSP) --- Apache Yavapai Graham and Yuma countries Arizona [E77-10240] p0278 N77-33571
Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77-33575
An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576

VEGETATION GROWTH
Plant growth and soil humidity above wall remnants - Preliminary results of a soil test as a contribution to aerial-picture archeology p0207 A77-41256

VEG LOW REQUIREMENTS
Numerical studies to aid interpretation of an airborne VLF resistivity survey [AD-A039904] p0231 N77-31594

VIDEO DATA
Data management in pattern recognition and image processing systems p0249 A77-43815

V

Operational means for obtaining spaceborne video data in the optical range p0262 A77-47180
Technology of the thematic automated processing of video data p0263 A77-47191
Digital system for the processing of video data for the purpose of studying earth resources p0263 A77-47193
Some types of preliminary processing of video data --- earth resources remote sensing p0263 A77-47194
Analytical methods of the coordinate connection of video data obtained for purposes of sensing earth resources p0263 A77-47196
Space experiment simulation using an aircraft laboratory p0268 A77-47200

VIETNAM
Value of Landsat in urban water resources planning p0243 A77-51280
Test of Landsat-based urban hydrologic modeling p0244 A77-51285

VISUAL OCCUPATION
Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery p0243 A77-47447

VOICE COMMUNICATION
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/8] p0239 N77-29383
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 --- North Atlantic ocean reliability maps [PB-265851/8] p0239 N77-29384
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 --- South Pacific ocean reliability maps [PB-265852/4] p0239 N77 29385

VOLCANIC
Sulphur dioxide discharge from Mount Etna p0217 A77-46293

VOLCANOLOGY
Sismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10229] p0241 N77-33560

W

WASHINGTON
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438

WASTE DISPOSAL
Monitoring coastal development pressure - Examples of the application of remote sensing technique II p0257 A77-51633
Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA-TN-D-8467] p0239 N77 28564
An advection-diffusion model of the DOMES turbidity plumes [PB-268713/5] p0220 N77-31598
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976 [NASA-TM-74086] p0220 N77 33579

WATER
Remote water monitoring system [NASA-CASE-LAR-11973 1] p0244 N77-28563
Development of snow water equivalent survey methods using airborne gamma measurements [EGG-1183-1677] p0246 N77-31592

WATER COLOR
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49385

WATER CURRENTS
General pattern of the turbid water in the Seto-inland sea extracted from multispectral imagenes by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561

WATER FLOW
Lake St. Clair hydrologic transfer factors [PB-266420/9] p0244 N77-28571
Rainfall infiltration characteristics for a semi-and watershed soil [PB-267723/5] p0246 N77-30567
General pattern of the turbid water in the Seto-inland sea extracted from multispectral imagenes by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561

WATER MANAGEMENT
Integrated management of water resources --- in France p0243 A77-42874
Methodological aspects of the optimum management of multiple-use reservoirs p0243 A77-42875
Value of Landsat in urban water resources planning p0243 A77-51280
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557

WATER POLLUTION

- Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- A study of density fronts and their effects on coastal pollutants p0217 A77-46735
- A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky, volume 1 p0230 N77-28554 [E77-10189]
- An advection-diffusion model of the DOMES turbidity plumes [PB-268713/5] p0220 N77-31598
- Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
- Application of LANDSAT MSS data to the study of oceanographical environment --- Seto Inland Sea [E77-10228] p0241 N77-33559
- Significant applications of LANDSAT-2 MSS data to marine environment --- Japanese coastal areas [E77-10228] p0241 N77-33560
- General pattern of the turbid water in the Seto-inland sea extracted from multispectral images by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561

WATER QUALITY

- Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- A Landsat study of water quality in Lake Okaechobee p0243 A77-47453
- Monitoring water quality by remote sensing [E77-10194] p0246 N77-30554
- Implementation of a decision support for regional water quality planning [PB-267342/4] p0248 N77-30593
- An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data --- Maine Illinois and New York [E77-10213] p0213 N77-31567

WATER RESOURCES

- Integrated management of water resources --- in France p0243 A77-42874
- Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho p0211 A77-47443
- Value of Landsat in urban water resources planning p0243 A77-51280
- Test of Landsat-based urban hydrologic modeling p0244 A77-51285
- Applications of space technology to water resources management p0245 N77-30288
- The value of Landsat data in urban water resources planning p0245 N77-30545
- Determining the usefulness of remote sensing for estimating agricultural water demand in California [E77-10191] p0211 N77-30551
- Investigations using data from LANDSAT-2 [E77-10199] p0260 N77-30559
- An integrated study of earth resources in the state of California using remote sensing techniques [E77-10215] p0246 N77-31569
- An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data [E77-10222] p0213 N77-31576
- Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process [PB-269409/9] p0247 N77-33595

WATER RUNOFF

- Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir [PB-265204/8] p0244 N77-28463

WATER TEMPERATURE

- Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77-42730
- The depression of remotely-sensed surface temperatures by a dust-laden tropical atmosphere p0236 A77-45732

WATER VAPOR

- Microwave spectroscopic imagery of the earth p0267 A77-48269
- A study of water vapor measurement in the stratosphere and mesosphere using microwave techniques p0270 N77-30676
- Hygrometric sodar --- for remote sensing of water vapor p0271 N77-32684

WATER WAVES

- Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514
- Long waves in the eastern equatorial Pacific Ocean - A view from a geostationary satellite p0237 A77-47175
- Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
- Seasonal variations in Great Lakes design wave heights Lake Erie [AD-A039153] p0244 N77-28568
- Initial development of a method of significant waveheight estimation for GEOS-III [NASA-CR-141425] p0259 N77-30443
- Coastal wave measurements during passage of tropical storm Amy [NASA-TM-74060] p0240 N77-30707
- Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552

WATERSHEDS

- Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- LANDSAT/Bangladesh project p0260 N77-30560
- [E77-10200]
- Rainfall infiltration characteristics for a semi-end watershed soil [PB-267723/5] p0246 N77-30567
- Application of remote sensing to selected problems within the state of California [E77-10205] p0275 N77-31560
- A study of the use of remote sensing data in hydrologic engineering models --- Castro Valley and Trail Creek [E77-10214] p0248 N77-31568
- Spectral measurement of watershed coefficients in the southern Great Plains --- Texas Arizona and New Mexico [E77-10225] p0247 N77-33556

WATERWAY ENERGY

- Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272

WAVE INTERACTION

- Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods p0263 N77-32651

WAVE PROPAGATION

- Satellite-borne monitoring of atmospheric and surface characteristics affecting the propagation of microwaves in the troposphere p0263 N77-32389

WAVE SCATTERING

- Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552

WEATHER

- LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77-30574
- LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77-30576

WEATHER STATIONS

- Meso-beta scale features observed in surface network and satellite data p0252 A77-47039

WEST VIRGINIA

- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] p0231 N77-30589

WETLANDS

- Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77-10188] p0244 N77-28553
- Inventory of wetland habitat using remote sensing for the proposed Oshe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
- Application of LANDSAT imagery in land use inventory and classification in Nebraska - Lower and Upper Niobrara area and Shendan County [E77-10242] p0214 N77-33573

WHEAT

- On winter wheat yield from Landsat and Landsat follow-on satellites p0208 A77-45749
- Applications of Suts spectral model to wheat p0210 A77-46738
- Wheat productivity estimates using LANDSAT data --- Kansas [E77-10181] p0211 N77-28550
- LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77-30574
- Applications of remote sensing --- Texas South Dakota North Dakota and Kansas [E77-10183] p0214 N77-33553

WILDLIFE

- Inventory of wetland habitat using remote sensing for the proposed Oshe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
- Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554

WIND (METEOROLOGY)

- Active microwave measurement of sea-surface winds from space p0239 N77-29333
- Sea ice studies in the Sprintsbergen Greenland area [E77-10206] p0240 N77-31561

WIND EFFECTS

- Scattering of radio waves by an underlying surface covered with vegetation p0207 A77-41178
- Tracking a Gulf Stream ring with a free drifting surface buoy A theory of sea scatter at large incident angles p0237 A77-45901
- Interaction between steady non-uniform two-dimensional currents and directional wind-generated gravity waves with applications for current measurements [AD-A040600] p0262 N77-31702

WINTER

- Planetary waves in the winter mesosphere - Preliminary analysis of Nimbus 6 PMR results - Pressure Modulator Radiometer p0265 A77-43483
- Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754

WYOMING

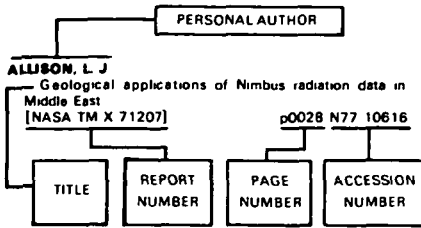
- Integration of land-use data and soil survey data p0211 A77-47477

- Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

Y**YIELD**

- Wheat productivity estimates using LANDSAT data --- Kansas [E77-10181] p0211 N77-28550
- LACIE Yield-weather regression models for the Canadian prairies [NASA-TM-74833] p0212 N77-30575
- LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77-30576

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g. NASA report translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title (e.g. p0028 N77-10616). Under any one author's name the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

A

AARONSON A C
Implementation of a crop condition monitoring system
p0209 A77-45798

ABDEL HADY, M A
Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt
[IAF PAPER 77 128] p0257 A77-51437

ABROSIMOV I K
Landscape indication of natural processes from spacecraft photographs
p0243 A77 45200

ACHTERMANN, E F
A multidisciplinary lidar system - Aims technology missions
[IAF PAPER 77-125] p0257 A77-51436

ACKERMAN, M
Stratospheric CH₄, HCl and ClO and the chlorine-ozone cycle
p0218 A77-49186

ADAMS F
Landsat MSS imagery - A thematic mapping base
p0254 A77-47436

ADAMS J E
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1
[PB-265850/8] p0239 N77-29383
An analysis of the maritime high-frequency single sideband voice communication system for the North Atlantic and the South Pacific volume 2
[PB-265851/8] p0239 N77-29384
An analysis of the maritime high-frequency single sideband voice communication system for the North Atlantic and the South Pacific volume 3
[PB-265852/4] p0239 N77-29385

ADAMS, L
Inflight performance evaluation of satellite remote sensor data by ground based measurements
p0251 A77-46765

ADLER, S
Satellite observations as ground truth for climate models
p0266 A77-45803

AGAZZI A.
Utilization of the spatial variability of reflectance for rice phenologic stages determination
p0209 A77-45795

AGEE, E M
Buoy and satellite observations of mesoscale cellular convection during AMTEX 75
p0238 A77-49194

AGENBAQ, J J
Methods for optimizing airborne LLLTV detection of fish induced plankton bioluminescence
p0236 A77 45815

AGGERS L W
Douglas County forest cover condition mapping and forest volume inventory
p0210 A77-47439

AHMADJIAN, M
Identification of oil slicks by infrared spectroscopy
[AD-A040975] p0220 N77-31587

AL-ABBAS A H
The effect of the atmosphere on the classification of satellite observations to identify surface features
p0218 A77 49397

ALGAZI V R
A study of the use of remote sensing data in hydrologic engineering models
[E77-10214] p0246 N77 31568

ALLENDOERFER W B
Experimental study of digital image processing techniques for LANDSAT data
[E77 10221] p0261 N77-31575

AMSTUTZ, D E
Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction
p0240 N77 33552

ANDERLE R J
Ocean geodesy based on GEOS-3 satellite altimetry data
p0222 A77-45787

ANDERSON A T
Landsat imagery for surface-mine inventory
p0229 A77-44467

ANDERSON J A
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes
p0218 A77-43376

ANDERSON J R
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology
Preproject baseline
[E77-10220] p0246 N77-31574

ANDERSON, R
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act
[E77-10184] p0229 N77 28551

ANDERSON R R
Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods
p0263 N77 32651

ANDRAWIS A S
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys
[E77-10237] p0277 N77 33568

ANDRIANOV V A
Scattering of radio waves by an underlying surface covered with vegetation
p0207 A77-41178

ANURKIN, A A
Digital system for the processing of video data for the purpose of studying earth resources
p0253 A77-47193

ANUTA P E
ERTS multispectral image transformations for geological lineament enhancement
[E77-10198] p0231 N77-30558
Evaluation of change detection techniques for monitoring coastal zone environments
[E77 10203] p0219 N77-30563

ARCONI, S A
Numerical studies to aid interpretation of an airborne VLF resistivity survey
[AD A039904] p0231 N77-31594

ARGENTIERO, P D
Spaceborne earth applications ranging system /SPEAR/
p0221 A77-40824

ARMAND, N A
Scattering of radio waves by an underlying surface covered with vegetation
p0207 A77 41178
Investigation of the natural environment using radio-physical methods /Review/
p0265 A77-43401
Radio-physical methods of sensing the earth surface and prospects of their development
p0274 A77 47183
The progress in microwave radiation investigations of continental covers during 1967-1977
[IAF PAPER 77-118] p0257 A77-51435

ARMSTRONG, A. C
The relative performance of some unsupervised clustering techniques for the per-field classification of Landsat data
p0251 A77 46764

ARTEMEV, V IU
Systems analysis and optical scanning methods
p0252 A77-47181

AVANESOV, G A
Operational means for obtaining spaceborne video data in the optical range
p0252 A77-47180
Systems analysis and optical scanning methods
p0252 A77-47181

Technology of the thematic automated processing of video data
p0253 A77-47191
Space experiment simulation using an aircraft laboratory
p0266 A77 47200
Space studies of earth resources Methods and means of measurements and processing of information
[NASA-TT F-17544] p0264 N77-33583

BAKERINTSEV M B
The selection of spectral ranges for sensing earth resources
p0252 A77 47186

B

BAHETHI, O P
The effect of the atmosphere on the classification of satellite observations to identify surface features
p0218 A77-49397

BAKER, K S
The remote sensing of chlorophyll
p0236 A77-45852

BAKER, N K
An interactive minicomputer image processing system for remote sensing applications
p0254 A77 47449

BAKER S
The citizen's guide to North Carolina's shifting inlets
[PB-268736/6] p0262 N77 31762

BALDRIDGE, P E
Development of multi-disciplinary ERTS user program in the state of Ohio
[E77-10209] p0276 N77 31563
Development of a multi-disciplinary ERTS user program in the state of Ohio
[E77 10210] p0276 N77-31564

BALLEW, G I
The display of Landsat data at large scales by matrix printer
p0267 A77-47480

BARATH, F T
Microwave spectroscopic imagery of the earth
p0274 A77-48269

BARFIELD, J N
Satellite observations of protons involved in the generation of IPPD and Pc 1
p0250 A77-45739

BARINOV I V
Space experiment simulation using an aircraft laboratory
p0266 A77-47200

BARNES, J C
Study of near infrared snow reflectance using Skylab S192 multispectral scanner data
[PB 267504/8] p0269 N77-30591

BARNES, W L
Visible and infrared imaging radiometers for ocean observations
[NASA TM-X-71374] p0240 N77-30447

BARNETT, J J
Planetary waves in the winter mesosphere Preliminary analysis of Nimbus 6 PMR results
p0265 A77-43483

BARR D J
Application transfer activity in Missouri
[NASA CR-150341] p0280 N77 30566

BARRINGER, A R
Satellite monitoring of atmospheric gases
p0217 A77 46766

BARTENEVA, O D
Aerosol in the GATE area and its radiative properties
[PB-265264/2] p0219 N77-30646

BARTH D S
Environmental monitoring
p0215 A77 42255

BARTHOLIC, J F
Significance of vegetation in interpreting thermal radiation from a terrestrial surface
p0211 A77-48511

BASHARINOV, A E
Investigation of the natural environment using radio-physical methods /Review/
p0265 A77 43401
Radio-physical methods of sensing the earth surface and prospects of their development
p0274 A77-47183
Satellite-borne radio-physical studies of the earth atmosphere and surface
p0253 A77-47198
The progress in microwave radiation investigations of continental covers during 1967-1977
[IAF PAPER 77-118] p0257 A77-51435

BATLIVALA, P P
Radar system specifications for hydrology and agriculture
p0207 A77-43804

BEBLO, M.
Distribution of electrical resistivity on continental areas
p0283 N77-32390

BEGOVICH, C L
 TEHM A Terrestrial Ecosystem Hydrology Model
 [EDFB-IBP-76-8] p0247 N77-33592

BELASCIO, N
 Remote-area health care delivery through space
 technology - STARPAHC
 [IAF PAPER 77 256] p0275 A77-51500

BELUGINA, V N
 On the problem of the nature of the anomalous magnetic
 field and its interpretation p0221 A77-43572

BENCH, B M
 Methods of determining the orientations of bedrock
 fracture systems in southwestern Pennsylvania and northern
 West Virginia
 [PB-266769/9] p0231 N77-30589

BENILOV, Y M
 Space studies of earth resources Methods and means
 of measurements and processing of information
 [NASA-TT F-17544] p0264 N77-33583

BENSKO, J, JR
 Earth resources-regional transfer activity contracts
 review
 [NASA-TM-78130] p0278 N77-33578

BEREGOV, G T
 The use of remote sensing to study earth resources
 p0265 A77-40999

BERKTOLD A
 Distribution of electrical resistivity on continental areas
 p0263 N77-32390

BERNIER J
 Methodological aspects of the optimum management of
 multiple-use reservoirs p0243 A77-42875

BEST, R G
 Inventory of wetland habitat using remote sensing for
 the proposed Oahe irrigation unit in eastern South
 Dakota
 [NASA-CR-153412] p0245 N77-30568
 Application of remote sensing in South Dakota to provide
 accurate inventories of agricultural crops enhance contrast
 in photographic products monitor rangeland habitat loss
 map Aspen and prepare hydrogeologic surveys
 [E77-10237] p0277 N77-33568

BEY, P
 Interaction between steady non-uniform
 two-dimensional currents and directional wind-generated
 gravity waves with applications for current measurements
 [AD-A040600] p0262 N77-31702

BEYERMANN, K
 Identification of 180 million years old probably
 unchanged melanine
 [NASA-TM-75122] p0259 N77-29729

BHATTACHARYYA, B K
 Reduction and treatment of magnetic anomalies of crustal
 origin in satellite data p0222 A77 46270

BILLINGSLEY, F C
 Quo vadis remote sensing
 [AAS 78-057] p0273 A77-46637

BINDER, A K
 Information requirements on basic food crops of the FAO
 global information and early warning system on food and
 agriculture p0209 A77-45780

BIRIUKOV I U L
 The selection of spectral ranges for sensing earth
 resources p0252 A77 47186

BIRNIE, R W
 An investigation of agricultural and other earth resources
 parameters using LANDSAT and other remote sensing
 data
 [E77-10213] p0213 N77-31567

BLANCHARD, B J
 Spectral measurement of watershed coefficients in the
 southern Great Plains
 [E77-10225] p0247 N77-33556

BLASIUS, K R
 Geologic investigation of Mercury data and the
 subsequent mapping and explanation of the quadrangle area
 H-12
 [NASA-CR-155159] p0232 N77 34070
 Geology orbiter comparison study
 [NASA-CR-155056] p0232 N77-34073

BLIVEN, L
 An experimental investigation of some combined flow
 sediment transport phenomena
 [PB-289872/2] p0247 N77-32575

BOAL, J D
 The Canadian Doppler satellite network
 p0223 A77-47379

BODECHTEL J
 Europe's need for better information on natural resources
 and environment
 [AAS 78-055] p0273 A77-46636

BOGORODSKII, V V
 Evaluation of the possibility of indicating the thickness
 of snow-covered ice sheets of the Arctic using IR
 radiometry
 p0235 A77-41403
 Effective electrical parameters of incipient forms of sea
 ice sheet and crust
 p0237 A77-46185
 Anisotropy in the permittivity and absorptivity of Arctic
 drift ice in the microwave range p0237 A77-46186

BOIKOV, V V
 Analysis of the accuracy of determining coordinates of
 points by the orbital method p0221 A77-41001

BOLLE, H J
 Radiation in the atmosphere p0216 A77-44997

BOLSHOI A A
 Control of spacecraft for sensing earth resources and
 monitoring the ambient medium p0253 A77-47205

BOLSHOV, A A
 Space studies of earth resources Methods and means
 of measurements and processing of information
 [NASA-TT F-17544] p0264 N77-33583

BONCZEK R C
 Implementation of a decision support for regional water
 quality planning
 [PB-267342/4] p0246 N77-30593

BONN, F J
 Ground truth measurements for thermal infrared remote
 sensing p0207 A77-44465

BORDEN, F Y
 A reduction in ag/residential signature conflict using
 principal components analysis of LANDSAT temporal
 data
 [NASA-TM-X-71387] p0220 N77-32566

BORDUNOV, V D
 Some legal problems of remote sensing of earth from
 outer space
 [IAF PAPER SL-77-20] p0275 A77 51549

BORISENKO V I
 Some types of preliminary processing of video data
 p0253 A77 47194

BORODIN, L F
 Radio-physical methods of sensing the earth surface and
 prospects of their development p0274 A77-47183
 Microwave radiometry of land and water areas on the
 earth surface from onboard aircraft laboratories
 p0268 A77 47201*

BOUCHER, C
 Methodology and field tests of GDOP - A geodetic
 computation package for the short arc adjustment of satellite
 Doppler observations p0224 A77 47390

BOWDEN, L W
 Application of remote sensing to selected problems within
 the state of California
 [E77-10205] p0275 N77 31560

BOWLEY C J
 Study of near-infrared snow reflectance using Skylab
 S192 multispectral scanner data
 [PB-267504/9] p0269 N77-30591

BOWMAN, B R
 DMATC Doppler determination of polar motion
 p0223 A77-47376

BRICE, K A
 An important ground surface sink for atmospheric nitrous
 oxide p0215 A77-41420

BROOKS, R M
 Seasonal variations in Great Lakes design wave heights
 Lake Erie
 [AD-A039153] p0244 N77-28568

BROUNSHTEIN, A M
 Problems in infrared spectroscopy of the atmosphere
 p0254 A77-47276

BROWN, C W
 Identification of oil slicks by infrared spectroscopy
 [AD-A040975] p0220 N77-31587

BROWN, D C
 Doppler positioning by the short arc method
 p0222 A77-47375

BROWN, G S
 Microwave backscattering theory and active remote
 sensing of the ocean surface
 [NASA-CR-141423] p0240 N77-30442

BROWN, R L
 Monitoring water quality by remote sensing
 [E77-10194] p0245 N77-30554

BROWNER, S P
 Diurnal oscillation of the area of cloudiness associated
 with tropical storms p0216 A77 43080

BRUCE, R A
 Remote transducer based on coherent mixing of
 backscattered laser light
 [PB-266771/5] p0269 N77-30588

BRUNT, P
 A methodology applicable to the identification and
 quantification of the benefits of a European Remote-Sensing
 Satellite Programme p0274 A77-48851

BRYAN, M L
 Interpretation key for SAR /L-band/ imagery of sea ice
 p0237 A77-47451

BRYANT, J
 Image analysis library software development
 [NASA-CR-151469] p0258 N77-28827

BRYANT, N A
 Data management in pattern recognition and image
 processing systems p0249 A77-43815

BUCHMAN, N
 Landsat imagery for surface-mine inventory
 p0229 A77-44467

BUCHMAN, P E
 Implementation of a crop condition monitoring system
 p0209 A77-45798

BULATOV, R P
 Diagnostic calculation of the world ocean horizontal
 circulation p0238 A77-49453

BURCH, D E
 Remote monitoring of nitric oxide by gas-filter correlation
 techniques
 [PB-265455/6] p0218 N77-28574

BUROV, V P
 Remote sensing methods of interpretation of
 anthropogenic changes of environment
 [IAF PAPER 77 130] p0218 A77 51438

BURT, W V
 Buoy and satellite observations of mesoscale cellular
 convection during AMTEX 75 p0238 A77 49194

BUSH, T F
 Radar system specifications for hydrology and
 agriculture p0207 A77-43804

BUTMAN, S A
 Simulation of the effects of hard limiting on image quality
 of synthetic aperture radar p0256 A77-49905

BUZNIKOV, A A
 Application of the polarization effect to the remote
 detection of oil slicks on the sea surface
 p0217 A77 47689

BYKOV, A V
 Some types of preliminary processing of video data
 p0253 A77-47194

C

CAMPBELL, S A
 Three field tests of a gas filter correlation radiometer
 [NASA CR-153931] p0268 N77-28467

CAMPBELL, W F
 Simulation of remote data acquisition systems
 p0254 A77-47255

CAPUTO, B
 Experimental remote sensing of subsurface temperature
 in natural ocean water p0236 A77-42730

CARLI, B
 Very-high-resolution far-infrared measurements of
 atmospheric emission from aircraft p0265 A77-41895

CARLSON, M P
 Application of LANDSAT imagery in land use inventory
 and classification in Nebraska
 [E77-10242] p0214 N77-33573

CARON, L M
 Upper Mississippi River underwater feature detection
 capabilities of water-penetrating aerial photography
 p0243 A77-47454

CARON, R H
 Experimental study of digital image processing techniques
 for LANDSAT data
 [E77 10221] p0261 N77-31575

CARR, H
 Electro-optical systems and requirements in
 cartography p0221 A77-44780

CARROU, J P
 Identification of networks in space geodesy by short
 orbital arcs (short-arc method)
 [CNES-NT-81] p0227 N77-29595
 Determination of the Geole polyhedron by the short arc
 method
 [CNES-NT-85] p0227 N77-29596

CASAB, J C
 Three field tests of a gas filter correlation radiometer
 [NASA-CR-153931] p0268 N77 28467

CHAN, H L
 A theory of sea scatter at large incident angles
 p0237 A77 45901

CHANCE, J E
 Applications of Suits spectral model to wheat
 p0210 A77-46738

CHANDLER, B J
 The use of photographic imagery in earth resources
 studies p0251 A77 46763

CHAPURSKY, L I
 Aerosol in the GATE area and its radiative properties
 [PB-265264/2] p0219 N77-30646

CHASE, T L
 All-weather ice information system for Alaskan Arctic
 coastal shipping p0238 A77-47981

CHEKALINA, T I
 Danube Delta dynamics study by means of remote
 sensing
 [IAF PAPER 77-86] p0244 A77-51423

CHENEY, R E
 Tracking a Gulf Stream ring with a free drifting surface
 buoy p0235 A77-41918

CHENG, C-P
 Radar characteristics of tropical convection observed
 during GATE - Mean properties and trends over the summer
 season p0252 A77-47031

CHERNENKO, A P
 Aerosol in the GATE area and its radiative properties
 [PB-265264/2] p0219 N77-30646

CHEVIAKOV, V A
 A comparative analysis of methods for compiling isolinear
 maps of forest cover p0211 A77-50800

CHEBALIN, L S.
 Some types of preliminary processing of video data
 p0253 A77-47194

CHESNOKOV, I U M
 Photographic methods of studying the earth from
 space p0252 A77-47179

CHESNOKOV, Y M
 Space studies of earth resources Methods and means
 of measurements and processing of information
 [NASA-TT-F-17544] p0264 N77-33583

- CHEW, D T**
Interaction between steady non-uniform two-dimensional currents and directional wind-generated gravity waves with applications for current measurements [AD-A040600] p0262 N77 31702
- CHRISTENSON, J W**
Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data p0217 A77-47434
- CHU, W W**
Earth resources technology system standalone software package Description and user's guide [NASA-CR-152598] p0264 N77-33591
- CHUNG, S J**
Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547
- CIRAOLO, L**
Development of Doppler activity at IROE p0224 A77-47387
- CLAASSEN, J P**
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561
- CLARK, T A**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33588
- CLAY, C S**
Acoustical oceanography Principles and applications p0237 A77-45953
- CLAYTON, A R**
Environment and radar operation simulator [AD-A036656] p0268 N77 28378
- COATES, R**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33588
- COCHRAN, J R**
Free air gravity anomalies in the world's oceans and their relationship to residual elevation p0226 A77 49327
- COINER, J C**
Application of digital analysis of MSS data to agro-environmental studies [E77 10204] p0212 N77 31559
- COKER, A E**
Water management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557
- COLE, S M**
Environment and radar operation simulator [AD-A036656] p0268 N77 28378
- COLEMAN, R**
The role of geodetic techniques in remote sensing the surface dynamics of the oceans [IAF PAPER 77-87] p0226 A77 51424
- COLLINS, V G**
Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA TN-D-8467] p0239 N77-28564
- COLLINS, W**
Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments p0229 N77-28549
- COLNER, B J**
The use of Landsat imagery in urbanized area studies p0217 A77-47433
- COLVOCORESSES, A P**
Proposed parameters for an operational Landsat Overall evaluation of LANDSAT (ERTS) follow on imagery for cartographic application [E77-10193] p0227 N77-30553
- COLWELL, J**
Wheat productivity estimates using LANDSAT data [E77 10181] p0211 N77-28550
Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77 10188] p0244 N77 28553
- COLWELL, R N**
Determining the usefulness of remote sensing for estimating agricultural water demand in California [E77 10191] p0211 N77 30551
Application of remote sensing to selected problems within the state of California [E77 10205] p0275 N77 31560
An integrated study of earth resources in the state of California using remote sensing techniques [E77 10215] p0246 N77 31559
An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data [E77-10222] p0213 N77 31576
- CONDON, E P**
Three field tests of a gas filter correlation radiometer [NASA-CR-153931] p0268 N77-28467
- COOK, K**
Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6 [PB-268423/1] p0232 N77-32578
- CORDESE, E H**
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557
- COREY, B E**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77 33588
- COSENTINO, M**
Application of remote sensing to selected problems within the state of California [E77-10205] p0275 N77 31560
- COUNSELMAN, C C**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77 33588
- COX, T L**
Integration of land-use data and soil survey data p0211 A77 47477
- CRAM, D L**
Remote sensing potential for increasing yields of latent fisheries resources p0236 A77 45771
Methods for optimizing airborne LLLTV detection of fish induced plankton bioluminescence p0236 A77 45815
- CREBS, T J**
Gravity and ground magnetic surveys of the central mineral mountains Utah volume 6 [PB-268423/1] p0232 N77 32578
- CREPANI, E**
Geologic mapping of the Goias quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite [INPE-1071 TPT/058] p0231 N77-31579
- CUELLAR, J A**
Distinguishing saline from non saline rangelands with Skylab imagery p0208 A77-44469
- CUTTS, J A J**
Geology orbiter comparison study [NASA-CR 155056] p0232 N77-34073

D

- DACUNHA, R P**
Tectonic sketch map of northern Minas Gerais based on LANDSAT images [INPE-1078-NTE/104] p0231 N77-31582
- DAILLET, S**
Oceanic tide determination by satellite [IAF PAPER 77-ST 10] p0239 A77 51574
- DALSTED, K J**
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77 10237] p0277 N77-33568
- DANIELS, J L**
Earth resources-regional transfer activity contracts review [NASA-TM-78130] p0278 N77 33578
- DARCHEN, J**
The icebergs of the North Atlantic p0236 A77 45612
- DAVIE, M F**
Discernible lineaments in Landsat images of Lebanon p0250 A77 44587
- DAVIES, J H**
Satellite monitoring of atmospheric gases p0217 A77-46766
- DAVIS, D R**
Geology orbiter comparison study [NASA-CR-155056] p0232 N77 34073
- DAVIS, J M**
Analysis of observed soil skin moisture effects on reflectance [AD-A041859] p0214 N77-32570
- DAVIS, M R**
Aerial photographic detection of imported fire ant mounds p0208 A77-44470
- DAVIS, R**
Remote sensing applications to hydrologic modeling [NASA-CR 154842] p0245 N77-30571
- DAVIS, R E**
Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272
- DEAN, A M, JR**
Remote sensing of accumulated frazil and brash ice in the St Lawrence River [AD-A039905] p0245 N77-30581
- DEERING, D W**
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
- DEJACE, J**
Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834
- DEMATOS, J T**
Tectonic sketch map of northern Minas Gerais based on LANDSAT images [INPE 1078-NTE/104] p0231 N77 31582
- DEMIN, I U L**
Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453
- DEMORAES NOVO, E M L**
Geomorphologic mapping by means of LANDSAT images [INPE 1076-NTE/102] p0231 N77 31581
- DENNIS, A R**
Geometric positioning via satellite of a drilling platform in the North Sea p0224 A77 47391
- DESNE, J P**
Evaluation of space application problems of a decimillimeter carcinotron [RT-1814] p0270 N77 31593
- DESIGNES, G**
Gravity potential resulting from cylindrical structures of finite length p0221 A77-43388
- DIAMOND, W P**
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-286769/9] p0231 N77-30589
- DONASCIMENTO, M A L S**
Geomorphologic mapping by means of LANDSAT images [INPE-1078-NTE/102] p0231 N77-31581
- DOSSANTOS, A P**
Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region [INPE 1044-TPT/056] p0212 N77-30578
Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region [INPE-1075-NTE/101] p0213 N77-31578
- DOTSENKO, S V**
Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77-40792
Optimal calibration of remote sensors using time averaging p0265 A77-40813
- DOWNS, S W, JR**
Earth resources regional transfer activity contracts review [NASA-TM-78130] p0278 N77-33578
- DOZIER, J**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- DRACUP, J F**
Updating survey networks - A practical application of satellite Doppler positioning p0225 A77 47400
- DRAKE, C L**
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data [E77 10213] p0213 N77 31567
- DROZDOV, V N**
Diagnostic calculation of the world ocean horizontal circulation p0238 A77-40833
- DRUMMOND, H E**
Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process [PB-269409/9] p0247 N77 33595
- DUVAL, R J**
The application of ERTS imagery to the FAO/Unesco soil map of the world [E77 10236] p0214 N77 33567
- DUFFIELD, F V**
EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77-40839
- DUNAIEV, B S**
Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197
- DURHAM, J L**
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77 43376

E

- EBNER, H**
Accuracy models for bundle block triangulation p0255 A77 47974
- ECKL, MR**
Automatic correction of position error by means of a digital correlation of surface structures p0221 A77 43577
- EDWARDS, D**
Monitoring the extent and occurrence of fire in the different veld types of South Africa with particular reference to its ecological role and role in range management [E77 10226] p0263 N77-33557
- EDWARDS, J R**
Forest inventory of western Washington by satellite multi stage sampling p0210 A77-47438
- EDWARDS, R M**
Gravity modeling for precise terrestrial inertial navigation [AD-A042419] p0228 N77-33139
- EGGLETON, A E J**
An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420
- EHRENBERG, S. N**
Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temez Mountains New Mexico [LA-6695-MS] p0232 N77-33734
- EIDENSHINK, J C**
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77 10237] p0277 N77 33568

EL GHAWABY, M. A.

- Application of Landsat satellite imagery in assessing the regional geological, structural, environmental and groundwater conditions in the Qattara depression area Egypt
[IAF PAPER 77-128] p0257 A77-51437
- Application of Landsat satellite imagery in assessing the regional geological, structural, environmental and groundwater conditions in the Qattara depression area Egypt
[IAF PAPER 77-128] p0257 A77-51437
- Application of Landsat satellite imagery in assessing the regional geological, structural, environmental and groundwater conditions in the Qattara depression area Egypt
[IAF PAPER 77-128] p0257 A77-51437
- Integrated management of water resources p0243 A77-42874

ENG, S. T.

A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting p0286 A77-45197

EREMEEV, V. V.

Digital system for the processing of video data for the purpose of studying earth resources p0253 A77-47193

ERICKSON, R. L.

Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561

ERMAKOV, I. G.

Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77 51438

ERMOLENKO, A. I.

Method of compilation of chemical-element maps of insufficiently observed ocean aquifers p0235 A77-40796

EROSHKO, A. A.

Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77 40792

Center for collection and processing of data from automatic buoy stations p0249 A77 40818

ESPARZA, F.

LANDSAT planning applications in east central Florida [E77-10238] p0264 A77-33569

ESTES, J. E.

Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems [AD-A036245] p0218 N77-28379

Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571

Application of remote sensing to selected problems within the state of California [E77-10205] p0275 N77-31580

Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587

ETKIN, V. S.

The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184
Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690

EVERITT, J. H.

Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469

F

FAINTICH, M. B.

Advances in digital sensor simulation p0254 A77-47445

FALLER, K. H.

Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827

A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-R-472] p0269 N77-30572

FAUST, N. L.

LANDSAT information for state planning [NASA-CR-150378] p0276 N77-31577

FEARS, C. B.

Literature review of the remote sensing of natural resources [NASA-CR-155190] p0277 N77-33551

FEDOROVA, N. I.

Fast detection of 10 830-A helium emission p0265 A77-42620

FELDSHTEIN, I. A.

Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42621

FENG, F. H.

Advanced Digital Exploitation Techniques (ADET) [AD-A040769] p0262 N77-31588

FIELD, D.

Theory and analysis of vegetation pattern [EDFB-IBP 76-3] p0213 N77-31591

FINK, U.

The application of Fourier transform spectroscopy to the remote identification of solids in the solar system p0255 A77-49291

FINLAYSON-PITTS, B. J.

Optical systems unravel smog chemistry p0216 A77-44614

FISCHER, I.

Mean sea level and the marine geoid - An analysis of concepts p0226 A77-51335

FISH, B. R.

A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky volume 1 [E77-10189] p0230 N77-28554

A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky Volume 2 Appendices [E77-10190] p0230 N77-28555

FITCH, W. W.

Test of Landsat-based urban hydrologic modeling p0244 A77 51285

FITZSIMMONS, C. K.

Air quality data for the Northeast oxidant transport study 1975 [PB-287545/2] p0219 N77-30663

FIVENSKII, I. U. I.

Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems p0252 A77-47187

The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190

Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197

FLOYD, W. J.

Generalized vegetation map of north Merritt Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77-32561

FLYNT, E. R.

Environment and radar operation simulator [AD-A036656] p0268 N77-28378

FONG, R. K. T.

Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560

Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561

FORSEN, G. E.

Advanced Digital Exploitation Techniques (ADET) [AD-A040769] p0262 N77-31588

FOSTER, K. E.

Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0260 N77-30567

FRANCOIS, C.

Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST-03] p0211 A77-51568

FRASER, R. S.

The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397

FRAYSSE, G.

A European yield forecasting Agromet system - A proposal to use Meteosat and Landsat-3 data in correlation with a meteorological D C P network p0208 A77-45758

FREW, J.

Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571

FRIES, R. E.

Implementation of a crop condition monitoring system p0209 A77-45798

FRIMOUT, D.

Stratospheric CH₄, HCl and ClO and the chlorine-ozone cycle p0218 A77 49186

FRITZACHE, A.

Development of snow water equivalent survey methods using airborne gamma measurements [EGG-1183 1677] p0246 N77-31592

FU, K. S.

A syntax-directed method for land-use classification of Landsat images p0251 A77-46755

FULLER, D. B.

Managerial applications of a 4 year regional program in remote sensing p0273 A77-43699

FULLER, K. B.

Managerial applications of a 4-year regional program in remote sensing p0273 A77-43699

FUNG, A. K.

A theory of sea scatter at large incident angles p0237 A77-45901

G

GABY, D. C.

Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768

GALAEV, I. U. M.

Radar detection of sea surface oil pollution p0215 A77-40758

GALERKIN, L. I.

Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453

GALLI DE PARATESI, S.

Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834

GAMBLE, J.

Remote identification of geologic materials by multispectral techniques. An evaluation of applicability to highway planning in California [PB-287137/8] p0231 N77-31590

GANKEVICH, A. V.

General principles for the design of a space system for sensing earth resources and monitoring the state of the ambient medium p0274 A77-47202

GANSHIN, V. N.

Most favorable time for determining azimuth from solar observations p0221 A77-41002

GARCIAVIDAL, O. P.

Processing of map information in a minicomputer p0263 N77-32559

GARELIK, I. S.

Aerospace polygons problems of investigation and the structure of ground-based observations p0274 A77-47207

GAROFALO, D.

Monitoring coastal development pressure. Examples of the application of remote sensing technique II p0257 A77-51633

GEDNEY, R. T.

All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47981

GERASIMOVA, O. A.

The possibility of using Fourier spectra in aerial photography p0256 A77-50799

GERBERMANN, A. H.

Distinguishing saline from non-saline rangelands with Skylab imagery p0208 A77-44469

GERVIN, J. C.

A Landsat study of water quality in Lake Okeechobee p0243 A77-47453

GHOVANLOU, A.

Radiative transfer model for remote sensing of suspended sediments in water [NASA-CR-145145] p0246 N77-32567

GILLESPIE, A. R.

Construction and interpretation of a digital inertia image p0250 A77-44464

GILLESPIE, J. B.

A method to obtain diffuse reflectance measurements from 10 to 30 microns using a Cary 171 spectrophotometer p0267 A77-49295

GILLOTTE, M. J.

Advanced Digital Exploitation Techniques (ADET) [AD-A040769] p0262 N77-31588

GILMER, D. S.

Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77-10188] p0244 N77-28553

GINZBURG, E. A.

Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-46386

GLAZKOV, V. D.

Space experiment simulation using an aircraft laboratory p0266 A77-47200

GLUSHKO, E. V.

Remote sensing methods of interpretation of anthropogenic changes of environment [IAF PAPER 77-130] p0218 A77-51438

GOFF, F. G.

Theory and analysis of vegetation pattern [EDFB-IBP-76-3] p0213 N77-31591

GOLDBERG, M.

Forest fire fuel mapping from Landsat p0208 A77-45756

GOLDSTEIN, H. W.

A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145252] p0278 N77-33585

GONIN, G. B.

Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77 47195

GOSSMANN, H.

Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data p0215 A77 41255

GOWER, J. F. R.

Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907

GRABAU, W. E.

Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects [AD A042999] p0263 N77-32572

GRAHAM, M. H.

Digital overlaying of the universal transverse Mercator grid with LANDSAT data derived products [NASA-TM-58200] p0262 N77-31827

GRANA, D. C.

Remote water monitoring system [NASA-CASE-LAR-11973 1] p0244 N77-28563

GRAULEAU, D.

Evaluation of space application problems of a decimimillimeter carcinotron [RT-1814] p0270 N77 31593

- GRAY, J. B.**
120 MB/S and 240 MB/S bit synchronizer-signal conditioners for NASA high data rate applications p0256 A77-50317
- GRECHKO, G. M.**
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317
- GREEN, L. R.**
Aerial photographic detection of imported fire ant mounds p0208 A77-44470
- GREYDA, R. N.**
A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle [NASA-CR-145252] p0278 N77-33585
- GRIFFITH, C. G.**
Diurnal oscillation of the area of cloudiness associated with tropical storms p0218 A77-43080
- GRIFFITHS, P. R.**
On-line measurement of the infrared spectra of gas chromatographic eluents [PB-265570/2] p0269 N77-29258
- GRIGGS, M.**
Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555
- GRIN, A. M.**
Aerospace polygons problems of investigation and the structure of ground-based observations p0274 A77-47207
- GRINGAUZ, K. I.**
The cold plasma throughout the magnetosphere p0216 A77-44240
- GRISHECHKIN, V. S.**
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77-30648
- GRISHIN, S. D.**
Selection of satellite orbits for the sensing of earth resources p0287 A77-47204
- GRYVNAK, D. A.**
Remote monitoring of nitric oxide by gas-filter correlation techniques [PB-265455/6] p0218 N77-28574
- GUBAREV, A. A.**
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317
- GUERIN, O.**
The French Atlantic littoral and the Massif Armoncaïn part 1 [E77-10216] p0261 N77-31570
- GUETTER, P. J.**
The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731
- GUIGNARD, J. P.**
Sarlab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-46790
- GUINOT, B.**
MEDOC experiment or the French Polar Motion Project p0223 A77-47377
- GURGANUS, E. A.**
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976 [NASA-TM-74066] p0220 N77-33579
- GURVICH, A. S.**
Some results of radiometric measurements onboard Cosmos 243 p0267 A77-47696
- GUSEMAN, L. F., JR.**
Image analysis library software development [NASA-CR 151469] p0258 N77 528827
- GUYOT, G.**
Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754
- H**
- HAAK, V.**
Distribution of electrical resistivity on continental areas p0283 N77 32390
- HAAS, R. H.**
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
- HAGGERTY, J. J.**
Spinoff 1977 An annual report [NASA-TM 74908] p0278 N77-34049
- HAJIC, E. J.**
Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587
- HALL, D. K.**
Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery p0243 A77-47447
- HALL, F. G.**
The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817
The large area crop inventory experiment A major demonstration of space remote sensing [NASA-TM-74840] p0212 N77-30570
- HALLBERG, G. R.**
Development and testing of operational flood mapping techniques p0243 A77 47455
- HALSEY, G.**
Contour determination from digital terrain models p0226 A77-50692
- HAMILTON, J. R.**
Environmental assessment of geopressed waters and their projected uses [PB-268289/6] p0247 N77 32579
- HANLON, R. A.**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77 47961
- HANNAH, J. W.**
LANDSAT planning applications in east central Florida [E77-10238] p0264 N77-33569
- HANSON, B. C.**
Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water marsh and wetlands p0243 A77 47456
Radar systems for a polar mission volume 2 [NASA-CR 152511] p0258 N77 28561
- HARDING, R. A.**
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
- HARLAN, J. C.**
Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765
- HARLAN, J. C., JR.**
On winter wheat yield from Landsat and Landsat follow on satellites p0208 A77 45749
- HARMAN, D. M.**
Managerial applications of a 4-year regional program in remote sensing p0273 A77-43699
- HARRIES, J. E.**
Very-high-resolution far infrared measurements of atmospheric emission from aircraft p0265 A77-41895
- HARRIS, N. W.**
Compact high pressure electron-beam-controlled laser system p0268 A77-50175
- HART, G. F.**
Monitoring crops and forests from space [AAS 76-054] p0210 A77-48638
- HART, W. G.**
Aerial photographic detection of imported fire ant mounds p0208 A77-44470
- HASENMAIER, D.**
Identification of 180 million years old probably unchanged melanine [NASA-TM-75132] p0259 N77-29729
- HASKELL, R. E.**
An interactive color display for multispectral imagery using correlation clustering [NASA-CASE-MSC-16253-1] p0262 N77-31583
- HATFIELD, J. L.**
Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748
- HAULEY, R.**
Sulphur dioxide discharge from Mount Etna p0217 A77-46293
- HAYASHI, S.**
Investigation of environmental change pattern in Japan. Observation of present state of agricultural land use by analysing LANDSAT data [E77-10243] p0214 N77-33574
- HAYNE, G. B.**
Initial development of a method of significant waveheight estimation for GEOS-III [NASA-CR-141425] p0259 N77-30443
- HAYNES, D. P.**
Remote water monitoring system [NASA CASE-LAR-11973-1] p0244 N77 28563
- HEACOCK, R. R.**
Satellite observations of protons involved in the generation of IPDP and Pc 1 p0250 A77 45739
- HEIDAM, N. Z.**
Airborne measurements of air pollution over Denmark and the adjacent seas p0217 A77 46298
- HEINRICH, M. L.**
A comparison of two Landsat image products for land use discrimination A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435
- HENRIKSEN, S. W.**
Effect of Geocover observations upon the classical triangulation network p0225 A77 47399
- HENRIKSON, P. J.**
An interactive minicomputer image processing system for remote sensing applications p0254 A77-47449
- HENZE, W., JR.**
Morphology and physical parameters of a solar flare p0229 A77-45269
- HERRMANN, H.**
DFVLR mobile lidar system p0287 A77-50135
- HESB, W. C.**
An advection-diffusion model of the DOMES turbidity plu [PB-268713/5] p0220 N77-31598
- HESB, W. N.**
An advection-diffusion model of the DOMES turbidity plumes [PB-268713/5] p0220 N77 31598
- HESSEL, MR.**
Automatic correction of position error by means of a digital correlation of surface structures p0221 A77-43577
- HIDAKA, T.**
SO2 detection using thermal radiation at 53.53 GHz rotational resonance p0268 A77-50976
- HIGER, A. L.**
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557
- HIGH, C. J.**
Application of digital analysis of MSS data to agro-environmental studies [E77-10204] p0212 N77 31559
- HILL, H. L.**
Monitoring crops and forests from space [AAS 76-054] p0210 A77-46638
- HILLGER, D. W.**
Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States p0266 A77 45224
- HINKLEY, E. D.**
Air monitoring with tunable lasers p0216 A77 44613
- HINTEGGER, H. F.**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77 33588
- HIREKERUR, L. R.**
Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-46737
- HIROTA, I.**
Planetary waves in the winter mesosphere Preliminary analysis of Nimbus 6 PMR results p0265 A77-43483
- HOARE, D. N.**
The Skyark sounding rocket programme p0249 A77-41796
- HOGG, F. E.**
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77 42730
- HOLDAHL, S. R.**
Recent elevation change in Southern California [PB-265940/7] p0227 N77-28688
- HOLMAN, R. E.**
Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR 150419] p0264 N77-33590
- HOLSAPPLE, C. W.**
Implementation of a decision support for regional water quality planning [PB-267342/4] p0246 N77-30593
- HONEY, F.**
Earth studies from satellite-borne sensors p0265 A77-41795
- HOPPE, P.**
Digital image processing for a better recognition of the terrestrial surface in Morocco p0250 A77-45459
- HORITA, R. E.**
Satellite observations of protons involved in the generation of IPDP and Pc 1 p0250 A77-45739
- HOSSAIN, A.**
Investigations using data from LANDSAT-2 [E77-10199] p0260 N77-30559
LANDSAT/Bangladesh project [E77-10200] p0260 N77-30560
Remote sensing and satellite surveying in Bangladesh A background paper on the latest position of the status of remote sensing and satellite surveying in Bangladesh [E77-10201] p0260 N77-30561
ESCAP inter-governmental meeting on remote sensing and satellite surveying [E77-10202] p0260 N77-30562
- HOTHEN, L. D.**
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380
- HOUEZ, R. A., JR.**
Radar characteristics of tropical convection observed during GATE - Mean properties and trends over the summer season p0252 A77-47031
- HOXIT, L. R.**
Characteristics of meso-beta-scale deep convection over the eastern tropical Atlantic [PB-266955/4] p0268 N77-28709
- HOYER, B. E.**
Development and testing of operational flood mapping techniques p0243 A77-47455
- HUANG, M. E.**
An experimental investigation of some combined flow sediment transport phenomena [PB 269672/2] p0247 N77-32575
- HUFF, D. D.**
TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP-76-8] p0247 N77-33592
- HUGHES, C. L.**
S-191 sensor performance evaluation [NASA-CR-151527] p0271 N77-33582
- HUGHES, T. H.**
Application of remote sensing for planning purposes [NASA-CR-150418] p0272 N77-33589
- HUM, O. K.**
Remote sensing of the oceans from space - Achievements problems and prognosis p0235 A77-42563

HUKE R E
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data [E77-10213] p0213 N77-31567

HULSTROM, R
Inflight performance evaluation of satellite remote sensor data by ground-based measurements p0251 A77 46765

HUSAR, J D
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376

HUSAR, R B
Particulate sulfur analysis Application to high time resolution aircraft sampling in plumes p0216 A77-43376

HYPES, W D
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976 [NASA-TM-74066] p0220 N77-33579

I

IANEV T K
Comparison of the discriminant possibilities of some transformations of the spectral reflective characteristics [IAF PAPER 77-113] p0256 A77 51432

IDSO, S B
Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77 45748

IIZUKA K
Subtractive HISS radar p0238 A77 50972

IMBER A
Rangeland recovery in an enclosure Satellite and ground observations p0222 A77 45800

INGLIS, M H
Literature review of the remote sensing of natural resources [NASA CR-155190] p0277 N77 33551

IRANPANAH A
Geologic applications of Landsat imagery p0229 A77-44468

ISHIDA, E
Measurement of the temperature distribution on urban surfaces p0215 A77-41749

ISHIMARU, A
Theory and application of wave propagation and scattering in random media p0256 A77-50966

IVANIAN G A
Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689

Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77-47697

IVANOV I U S
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317

IVANOV, V A
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77-30646

IVANOV, V V
Souz-22 A new contribution to space geography p0275 N77 28559

IVLEV L S
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77 30646

J

JACKSON, R D
Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748

JACKSON, T J
Value of Landsat in urban water resources planning p0243 A77-51280
Test of Landsat-based urban hydrologic modeling p0244 A77-51285
The value of Landsat data in urban water resources planning p0245 N77-30545

JAIN, A
Determination of ocean wave heights from synthetic aperture radar imagery p0249 A77-40514

JAIN, S C
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395

JANDOWITZ, G S
An experimental investigation of some combined flow sediment transport phenomena [PB 269672/2] p0247 N77-32575

JENSEN, J A
A photographic reconnaissance of the microrrelief in the Monterey and Carmel submarine canyons California [AD-A039370] p0239 N77-28567

JENSEN, J R
The orthophoto and orthophotomap Characteristics development and aspects of cartographic communication p0227 N77-29585

JIRBERG, R J
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77 47961

JOELS K
Remote sensing Satellite analyses of earth resources p0273 A77 46748

JOHNSON G E
A comparison of two Landsat image products for land use discrimination A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435

JOHNSON J D
Applied Remote Sensing Program (ARSP) [NASA CR-153413] p0260 N77-30567

JOHNSON, R G
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0266 A77 45945

JOHNSON R L
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77 42730

JOHNSTON E J
Microwave spectroscopic imagery of the earth p0267 A77 48269

JOHNSTON R S
Remote area health care delivery through space technology STARPAHC [IAF PAPER 77-255] p0275 A77-51500

JONES, B F
Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625

JONES N L
Earth resources-regional transfer activity contracts review [NASA-TM 78130] p0278 N77-33578

JOSEPH, J H
The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731
The depression of remotely sensed surface temperatures by a dust-laden tropical atmosphere p0236 A77-45732

JULIAN, P R
Antarctic topography from balloons p0221 A77-44594
Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77 45821

JUPITER C
Development of snow water equivalent survey methods using airborne gamma measurements [EGG-1183-1677] p0246 N77-31592

K

KAHLE, A B
Construction and interpretation of a digital inertia image p0250 A77 44464

KAHN W D
Spaceborne earth applications ranging system /SPEAR/ p0221 A77-40824

KALMYKOV, A I
Radar detection of sea surface oil pollution p0215 A77-40758

KALRA, Y P
Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77 42853

KAN, E P
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450

KANGAS, J
Satellite observations of protons involved in the generation of IPDP and Pc 1 p0250 A77-45739

KANTOR, A J
Atlas of probabilities of surface temperature extremes Part 2 Southern Hemisphere [AD-A038237] p0227 N77-29702

KANTOROWICZ, G
Evaluation of space application problems of a decimeter laser radar [RT-1814] p0270 N77-31593

KARPEEV I P
On the problem of the nature of the anomalous magnetic field and its interpretation p0221 A77-43572

KAUFMAN, Y J
Influence of the atmosphere on the contrast of the Landsat images p0250 A77-45726

KELLEY, E B
Douglas County forest cover condition mapping and forest volume inventory p0210 A77-47439

KELLEY P S
Interactive processing of MSS data A usable system for moderately-sized computer systems p0255 A77-47448

KELMAN, J
Stochastic modeling of intermittent daily hydrologic series p0246 N77-32558

KELSEY, C T
Theory and analysis of vegetation pattern [EDFB-IBP-76-3] p0213 N77-31591

KEMMERER, A J
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827

KENG, J
A syntax-directed method for land-use classification of Landsat images p0251 A77-46755

KERR Y
Determination of thermal inertia of soil by use of space data obtained by geosynchronous satellites [IAF PAPER 77-ST 03] p0211 A77 51568

KHAWABIK, S M
Application of Landsat satellite imagery in assessing the regional geological structural environmental and groundwater conditions in the Qattara depression area Egypt [IAF PAPER 77-128] p0257 A77 51437

KHODAREV, I U K
Space studies of earth resources Methods and means of measurement and data processing p0273 A77 47177
Systems analysis and optical scanning methods p0252 A77 47181
Technology of the thematic automated processing of video data p0253 A77 47191

KHODAREV, Y K
Space studies of earth resources Methods and means of measurements and processing of information [NASA-TT-F-17544] p0264 N77-33583

KHOKHLOV, G P
Effective electrical parameters of incipient forms of sea ice sheet and crust p0237 A77 46185
Anisotropy in the permittivity and absorptivity of Arctic drift ice in the microwave range p0237 A77 46186

KIBARDINA, I N
Scattering of radio waves by an underlying surface covered with vegetation p0207 A77 41178

KIENKO, I U P
The use of remote sensing to study earth resources p0265 A77 40999

KIRKHAM, R G
Comparison of NOAA 3-4 VHRH imagery and LANDSAT multi spectral scanner images with marine resource measurements [PB-268674/9] p0240 N77 31597

KISSICK, W A
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/8] p0239 N77 29383
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 [PB-265851/6] p0239 N77 29384
An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 [PB-265852/4] p0239 N77 29385

KISVARSANYI G
Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77 33570

KIVEL B
Atmospheric transmittance modeling for temperature and water vapor using satellite infrared data [PB-266414/2] p0269 N77 28690

KIVELSON, M G
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77 42295

KLEMAS, V
A study of density fronts and their effects on coastal pollutants p0217 A77 46735

KLIMOV, S I
Some results of investigating the electric field with the Interkosmos 10 satellite p0221 A77-40897

KNEPPER, D. H. JR
Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado [E77-10211] p0261 N77 31565

KOCH D W
Spaceborne earth applications ranging system /SPEAR/ p0221 A77-40824

KOKUBUN, S
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77 42295

KOLESNIKOV, A G
Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77 40792
Method of compilation of chemical-element maps of insufficiently observed ocean aquators p0235 A77-40796

KOMEN, M J
Radar systems for a polar mission volume 1 [NASA CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77 28561

KONDRATEV, K IA
Remote sensing of productive moisture stored in the soil p0208 A77-44898
Radiation studies in the atmosphere p0267 A77-47687
Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689
Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77-47697

KONDRATYEV, K. Y
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77-30646

- KONG J-A**
Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77-42015
- KOREPANOV, V E**
Some results of investigating the electric field with the Interkosmos 10 satellite p0221 A77-40897
- KOROLEV, E P**
Digital system for the processing of video data for the purpose of studying earth resources p0253 A77-47193
- KORZHAN, G A**
Center for collection and processing of data from automatic buoy stations p0249 A77-40818
- KORZOV, V I**
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77-30648
- KOTTBOV, V A**
Harmonic analysis of the spectral brightness of natural objects for selecting multispectral photography systems p0252 A77-47187
Optimization of identifiable characteristics of objects during multispectral photography p0253 A77-47188
- KOUBA, J**
The Canadian Doppler satellite network p0223 A77-47379
- KOURTZ, P**
Forest fire fuel mapping from Landsat p0208 A77-45758
- KOVRYGINA, L M**
Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-6 1974 p0215 A77-41110
- KOVTURNENKO, V M**
Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77-40792
- KOZLOV, V N**
Some results of radiometric measurements onboard Cosmos 243 p0267 A77-47696
- KRACK, K**
Accuracy models for bundle block triangulation p0255 A77-47974
- KRAMARCHUK, I**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
- KRASKOV, V A**
Analytical methods of the coordinate connection of video data obtained for purposes of sensing earth resources p0253 A77-47196
- KRASNORYLOV, I I**
Foundations of space geodesy p0226 A77-50685
- KRATKY V**
On-line analytics for close-range photogrammetry p0254 A77-47437
- KRAUS, S P**
Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems [AD-A036245] p0218 N77-28379
Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR-155171] p0241 N77-33587
- KRAVTSOVA, V I**
Danube Delta dynamics study by means of remote sensing [IAF PAPER 77-86] p0244 A77 51423
- KREMBEL, P R**
Microwave radiometric detection of corona from chaff within thunderstorms p0288 A77 50274
- KREMBERG, G**
Fluctuations of the auroral zone current system and geomagnetic pulsations p0265 A77-42288
- KRISTOF, S J**
Evaluation of change detection techniques for monitoring coastal zone environments [E77-10203] p0219 N77-30563
- KRONENBERG M R**
Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight [NASA-CR 155171] p0241 N77 33587
- KROPOTKIN, M A**
Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea p0217 A77 47080
- KUREKIN, A S**
Radar detection of sea surface oil pollution p0215 A77-40758
- KURSKAIA, A A**
Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories p0266 A77-47201
- KUTUZA, B G**
Satellite borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198
- KUZNETSOV I U N**
The problem of the accuracy of photometric measurements of a spectrally differentiated image p0253 A77-47190
- KUZNETSOV, S N**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite p0249 A77-41088
- L**
- LABUTINA, I A.**
Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422
- LANGREBE, D A.**
Applications of remote sensing volume 1 [E77 10182] p0259 N77-30548
Applications of remote sensing volume 3 [E77 10185] p0259 N77-30549
Applications of remote sensing volume 2 [E77 10186] p0260 N77-30550
Applications of remote sensing [E77 10183] p0214 N77-33553
- LANGEL, R A.**
Magsat A satellite for measuring near earth magnetic fields [NASA-TM X-71370] p0270 N77-30683
- LARSON, H P**
The application of Fourier transform spectroscopy to the remote identification of solids in the solar system p0255 A77-49291
- LAURENT, J**
Selective modulation radiometry for remote detection of gaseous pollutants [ONERA TP NO 1977-111] p0218 A77-50997
- LAURILA, S. H**
Electronic surveying and navigation p0267 A77-49775
- LEACHTENAUER, J C**
Optical power spectrum analysis - Scale and resolution effects p0255 A77-47476
- LEDUC, S K**
LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77 30574
- LEE, E T P**
EXCEDE 2 [AD A042491] p0270 N77 32666
- LEE, R E, JR**
EPA's Catalyst Research Program - Environment impact of sulfuric acid emissions p0215 A77 40639
- LEE, Y J**
Computer assisted forest land classification in British Columbia and the Yukon territory - A case study p0210 A77-47441
- LEEDS, A R**
Gravimetric geoid in the Northwest Pacific Ocean p0222 A77-46525
- LEGECKIS, R**
Long waves in the eastern equatorial Pacific Ocean - A view from a geostationary satellite p0237 A77 47175
Oceanic polar front in the Drake Passage Satellite observations during 1976 p0238 A77 51258
- LEMENTA, I U A**
Radar detection of sea surface oil pollution p0215 A77-40758
- LEONARD, D A**
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77 42730
- LEROY C F**
DMATC Doppler determination of polar motion p0223 A77-47376
Results from portable Doppler receivers using broadcast and precise ephemerides p0224 A77 47389
- LEU, D J**
Visible and near-infrared reflectance of beach sands - A study on the spectral reflectance/grain size relationship p0256 A77-49394
- LEVANON, N**
Antarctic topography from balloons p0221 A77 44594
Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77-45821
- LEWIS, B W**
Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA-TN-D-8467] p0239 N77-28564
- LIETZ, J C**
Advanced Digital Exploitation Techniques (ADET) [AD-A040769] p0262 N77-31588
- LIN H-E**
Observations of high-latitude protons p0249 A77-42312
- LIN, W-C**
Observations of high-latitude protons p0249 A77-42312
- LINDBERG, J D**
A method to obtain diffuse reflectance measurements from 10 to 30 microns using a Cary 171 spectrophotometer p0267 A77-49295
- LINDSAY E W JR**
Hygrometric sodar p0271 N77-32684
- UNK L E JR**
Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning p0259 N77-30546
- LIPATOV, V B**
Aerosol in the GATE area and its radiative properties [PB 265264/2] p0219 N77-30646
- LIPEB, R G**
Simulation of the effects of hard limiting on image quality of synthetic aperture radar p0256 A77-49905
- LISOVOI, V T**
Selection of satellite orbits for the sensing of earth resources p0267 A77-47204
- LITOM, R**
An interactive minicomputer image processing system for remote sensing applications p0254 A77-47449
- LLOYD, P D**
Sensor performance report volume 4 (S-190A) [NASA-CR-151528] p0271 N77-33581
- LOCK, B F**
Testing land-use map accuracy p0255 A77-47478
A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery [E77-10187] p0257 N77-28552
- LONGBOTHUM, R L**
A study of water vapor measurement in the stratosphere and mesosphere using microwave techniques p0270 N77-30676
- LOOMIS, A. A.**
Sasat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-46275
- LOPATINA, G B**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite p0249 A77-41088
- LORENZ, D**
Plant growth and soil humidity above wall remnants Preliminary results of a soil test as a contribution to aerial-picture archeology p0207 A77-41256
- LOVE, J D**
Standardization of Doppler point positioning results p0224 A77-47384
- LOW, R D H**
Effects of cloud particles on remote sensing from space in the 10-micrometer infrared region [AD-A038502] p0268 N77-28565
- LOWELL, P S**
Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625
- LOWMAN, P D**
Space technology in the discovery and development of mineral and energy resources p0231 N77-30289
- LOZOVSKII A A.**
The possibility of using Fourier spectra in aerial photography p0268 A77-50799
- LUCEY, D J**
Advanced Digital Exploitation Techniques (ADET) [AD A040769] p0262 N77-31588
- LUGOVENKO, V N**
On the problem of the nature of the anomalous magnetic field and its interpretation p0221 A77 43572
- LUSHINE, J B**
A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/8] p0219 N77-29723
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768
- LUTJENHARMS, J R E**
Time variations in the spatial scales and intensities of ocean circulation in the vicinity of the Cape of Good Hope p0237 A77-46300
- LUXMOORE, R J**
TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP-76-8] p0247 N77-33592
- LYNCH, P F**
Identification of oil slicks by infrared spectroscopy [AD-A040975] p0220 N77-31587
- LYON, R J P**
The display of Landsat data at large scales by matrix printer p0267 A77-47480
Field mapping for heat capacity mapping determinations Ground support for airborne thermal surveys [NASA-CR 152587] p0270 N77 32568
- M**
- MA, C**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77 33588
- MACDONALD, R B**
The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817
The large area crop inventory experiment A major demonstration of space remote sensing [NASA-TM 74840] p0212 N77-30570
- MACDONALD, W R**
Satellite technology applied to Antarctic Mapping Program p0223 A77-47378
- MACIAS, E S.**
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- MADDOX, R A**
Meso-beta scale features observed in surface network and satellite data p0252 A77-47039
- MAFFI, C**
Skylab photography for geological mapping p0229 A77-47176
- MAGEE, R L**
The use of array algebra in terrain modeling procedures [AD A040619] p0261 N77-30583

- MALAN, O. G.**
Methods for optimising airborne LLLTV detection of fish induced plankton bioluminescence p0236 A77-45815
- MALET, P.**
Study of the evolution of the reflectance of winter wheat in the 4 MSS channels of Landsat p0208 A77-45754
Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77-45795
Possible improvement of static and dynamic crop-yield estimation models with the aid of remotely sensed data p0209 A77-45814
- MALHOTRA, R. C.**
Geometric evaluation of Skylab S-192 conical scanner imagery p0254 A77-47446
- MALISHEVSKII, V. N.**
Most favorable time for determining azimuth from solar observations p0221 A77-41002
- MALKEVICH, M. S.**
Consideration of the atmosphere in problems of the satellite sensing of earth resources p0252 A77-47185
- MALMSTROM, V. M.**
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data [E77-10213] p0213 N77-31587
- MALTSEVA, N. F.**
Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-46386
- MALYSHEVA, A. B.**
Variations of electron fluxes with energies greater than 0.7 MeV near the radiation belt boundary during a magnetospheric substorm p0251 A77-46386
- MANKIN, J. B.**
TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP-76-8] p0247 N77-33592
- MANNING, J. A.**
Environmental assessment of geopressed waters and their projected uses [PB-268289/6] p0247 N77-32579
- MANTINI, L. A.**
Tracking a Gulf Stream ring with a free drifting surface buoy p0235 A77-41918
- MARK, H.**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
- MARKOV, M. N.**
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317
- MARKE, D.**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- MARSHALL, M. L.**
A Landsat study of water quality in Lake Okechobee p0243 A77-47453
- MARTIN, D. H.**
Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0265 A77 41895
- MARTIN, J. A.**
Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77-33570
- MARTINI, P. R.**
Geologic mapping of the Goiás quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite [INPE-1071-TPT/058] p0231 N77-31579
- MARTYNOVA, E. A.**
Evaluation of the possibility of indicating the thickness of snow-covered ice sheets of the Arctic using IR radiometry p0235 A77-41403
- MARUYABU, T.**
Investigation of environmental change pattern in Japan Classification of shorelines [E77-10224] p0220 N77 33555
Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558
Application of LANDSAT MSS data to the study of oceanographical environment [E77-10228] p0241 N77-33559
Significant applications of LANDSAT-2 MSS data to marine environment [E77-10229] p0241 N77-33560
General pattern of the turbid water in the Seto-inland sea extracted from multispectral images by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563
Investigation of environmental change pattern in Japan Observation of present state of agricultural land-use by analysing LANDSAT data [E77-10243] p0214 N77-33574
Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77 33575
- An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576
- MASON, J. B.**
Analysis of observed soil skin moisture effects on reflectance [AD A041859] p0214 N77-32570
- MATEEV, D. T.**
Some results of radiometric measurements onboard Cosmos 243 p0267 A77-47696
- MATHER, R. S.**
The role of geodetic techniques in remote sensing the surface dynamics of the oceans [IAF PAPER 77-87] p0226 A77-51424
- MATIASEVICH, L. M.**
The principles of photometry theory in relation to spaceborne photography of the earth p0253 A77-47189
- MATSON, M.**
Winter snow-cover maps of North America and Eurasia from satellite records 1986 - 1976 [PB-267393/7] p0245 N77-29722
- MAUL, G. A.**
The annual cycle of the Gulf Loop Current I - Observations during a one-year time series p0236 A77-43689
- MAWDSLEY, J. A.**
The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients p0244 N77-29567
- MAX, E.**
A PbSe diode laser spectrometer to be used in air pollution monitoring and mineral prospecting p0266 A77-45197
- MAYFIELD, B. M.**
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768
- MCADAMS, M. P.**
Techniques for estimating flood-produced crop damage using aerial photography p0210 A77-47442
Development and testing of operational flood mapping techniques p0243 A77-47455
- MCCAULEY, J.**
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
- MCCLATCHEY, R. A.**
Satellite temperature sounding of the atmosphere Ground truth analysis [AD-A038236] p0259 N77-29679
- MCCULLOCH, C. M.**
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] p0231 N77-30589
- MCDONOUGH, G. F.**
Data management for earth observations p0259 N77-30290
- MCGREEVY, M. G.**
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566
- MCKINNON, D. M.**
Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77-31575
- MCLUSKEY, D.**
Applications of Doppler satellite systems in remote regions in and near Australia p0223 A77-47381
- MCMILLAN, S. B.**
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561
- MCNEIL, W. R.**
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395
- MCPHERRON, R. L.**
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295
- MEADE, B. K.**
Errors of Doppler positions obtained from results of transcontinental traverse surveys p0225 A77-47409
- MEDWIN, H.**
Acoustical oceanography Principles and applications p0237 A77-45953
- MEGIER, J.**
Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834
- MEHL, W.**
Contribution of the Agreste investigation to the identification and inventory of agricultural resources in Europe p0209 A77-45834
- MEL, M. R.**
Seasonal aerial survey of southern California kelp beds p0236 A77-47482
- MELCHIOR, P.**
Introduction to the workshop on polar motion p0225 A77-47404
- MELENTEV, V. V.**
Remote sensing of productive moisture stored in the soil p0208 A77-44898
- MENDLOWITZ, R. A., SR.**
Sensor performance report volume 4 (S-180A) [NASA-CR-151528] p0271 N77-33581
- MENZIES, R. T.**
Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
- MESEROLE, F. B.**
Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28625
- MEYER, M. P.**
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
- MEZZANI, L.**
Development of Doppler activity at IROE p0224 A77-47387
- MIASNIKOV, E. N.**
Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short-wave radio emission p0216 A77-43418
- MICHELSON, R. C.**
Environment and radar operation simulator [AD-A036656] p0268 N77-28378
- MILLARD, J. J.**
LANDSAT planning applications in east central Florida [E77-10238] p0264 N77-33569
- MILLER, F. R.**
Comparison of NOAA 3-4 VHRR imagery and LANDSAT multi-spectral scanner images with marine resource measurements [PB-268674/9] p0240 N77-31597
- MILLER, J. R.**
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77 49395
- MILLER, L. D.**
Land use/land cover mapping (1:25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery [NASA-TM-X-71382] p0260 N77-30577
- MILLER, L. S.**
Microwave backscattering theory and active remote sensing of the ocean surface [NASA-CR-141423] p0240 N77-30442
Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features [NASA-CR-141428] p0271 N77-33577
- MILLER, T. L.**
Air monitoring survey design p0215 A77-40675
- MINOR, J. M.**
Upper Mississippi River underwater feature detection capabilities of water-penetrating aerial photography p0243 A77-47454
- MISHEV, D. N.**
Comparison of the discriminant possibilities of some transformations of the spectral reflectance characteristics [IAF PAPER 77-113] p0256 A77-51432
- MITAKOVA, E. E.**
Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high-power short-wave radio emission p0216 A77-43416
- MITNIK, L. M.**
Remote investigations of the environment from space and problems of space data handling p0256 A77-50443
- MOBASSERI, B.**
ERTS multispectral image transformations for geological lineament enhancement [E77 10198] p0231 N77-30558
- MOMIN, S. M.**
Evaluation of change detection techniques for monitoring coastal zone environments [E77-10203] p0219 N77-30563
- MONGET, J. M.**
The French Atlantic littoral and the Massif Armoricain part 1 [E77-10216] p0261 N77-31570
The French Atlantic littoral and the Massif Armoricain part 3 [E77-10217] p0261 N77 31571
- MOONEY, H.**
Sariab project - Preliminary ideas on side looking radar systems for Spacelab earth observation payloads p0251 A77-46790
- MOORE, D. G.**
Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
- MOORE, R. K.**
Polarization and depression angle constraints in the utilization of SLAR for identifying and mapping surface water marsh and wetlands p0243 A77-47456
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77 28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77 28561

- MOOSE, R E**
Effect of Geocover observations upon the classical triangulation network p0225 A77 47399
- MORAVEK, D**
Gulfstream Monthly publications January-December 1976 Volume 2 numbers 1-12 [PB-268216/9] p0241 N77 33779
- MORENO, H R**
Comprehensive study of Leon-Queretaro area [E77-10208] p0232 N77 32560
- MORGAN, G B**
Environmental monitoring p0215 A77 42255
- MORGAN, G E**
Data reduction and information extraction for remotely sensed images p0251 A77 46769
- MORIN, S.**
ILS glide slope performance prediction multipath scattering [AD-A035298] p0269 N77-29125
- MORRIS, W D**
Coastal wave measurements during passage of tropical storm Amy [NASA-TM-74060] p0240 N77-30707
- MORSE, J G**
Rainfall infiltration characteristics for a semi-arid watershed soil [PB-267723/5] p0246 N77-30587
- MORTON, R R**
Earth resources-regional transfer activity contracts review [NASA-TM-78130] p0278 N77-33578
- MOUAT, D A.**
Applied Remote Sensing Program (ARSP) [NASA-CR-153413] p0260 N77-30567
- MOURAD, A G**
Geodetic measurements on the ocean p0226 A77-51334
- MOWER, R D**
A comparison of two Landsat image products for land use discrimination - A Mead enhanced DGG image and an EROS color composite image p0254 A77-47435
- MROZCZYNSKI, R P**
Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554
- MUENLBERG, P E**
Environmental assessment of geopressed waters and their projected uses [PB-268289/6] p0247 N77-32579
- MUELLEN, R A.**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
- MUENCH, J W**
Fluctuations of the auroral zone current system and geomagnetic pulsations p0265 A77-42288
- MULLER, C**
Stratospheric CH₄ HCl and ClO and the chlorine-ozone cycle p0218 A77-49186
- MURAI, S.**
An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576
- MURPHY, J P**
Magsat A satellite for measuring near earth magnetic fields [NASA-TM-X-71370] p0270 N77-30683
- MURTHY, R S.**
Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-46737
- MYERS, R E**
Remote sensing applications to Missouri environmental resources information system [NASA-CR-150340] p0260 N77-30565
- MYERS, V I**
Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- N**
- NAGY, L A.**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
- NAKAJIMA, I**
Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77-33575
- NALEPKA, R F**
Wheat productivity estimates using LANDSAT data [E77-10181] p0211 N77 28550
- NELEPO, B. A.**
Radar detection of sea surface oil pollution p0215 A77-40758
- Retranslation of oceanographic information from an automatic buoy station via Kosmos-426 p0235 A77-40792
- Methods of detecting froth regions on oceans from remote measurements of thermal radio emission p0238 A77-49459
- NEUMIMIN, G G**
The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798
Expedition of the 12th cruise of the research vessel Akademik Vernadskii p0235 A77-40821
- NEVILLE, R A.**
Passive remote sensing of phytoplankton via chlorophyll alpha fluorescence p0237 A77-45907
- NEWSOM, D**
ILS glide slope performance prediction multipath scattering [AD-A035298] p0269 N77-29125
- NICHOLS, D. A.**
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77-28551
- NICHOLS, J D**
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
- NISHIDA, A.**
Field and particle observations in the magnetotail related to the reconnection process p0216 A77 44235
- NJOKU, E G**
Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77 42015
- NOCK, H M**
Landsat imagery for surface mine inventory p0229 A77 44467
- NOLL, K E**
Air monitoring survey design p0215 A77 40675
- NOUËL, F**
MEDOC experiment or the French Polar Motion Project p0223 A77 47377
- NOVO, E M L D**
Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region [INPE-1044-TPT/056] p0212 N77-30578
Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region [INPE-1075-NTE/101] p0213 N77 31578
- NOVOSELOV, A. A.**
Method of compilation of chemical-element maps of insufficiently observed ocean aquators p0235 A77-40796
- NUEBLER, W**
Surface temperature and vegetation distribution in Freiburg im Breisgau Two-component pictures as an aid in the evaluation of MSS data p0215 A77-41255
- O**
- OCHIAI, H**
Environmental pattern change as revealed by Landsat MSS data [IAF PAPER 77-131] p0218 A77-51439
Application of LANDSAT MSS data to the study of oceanographic environment [E77-10228] p0241 N77 33559
Significant applications of LANDSAT-2 MSS data to marine environment [E77-10229] p0241 N77-33560
Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562
- ODEGAARD, H**
Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- OHNING, G**
Satellite observations as ground truth for climate models p0266 A77-45803
- OLD, R J**
Manne geophysical instrumentation [AD-A040048] p0270 N77-31467
- OLDHAM, L**
Inflight performance evaluation of satellite remote sensor data by ground-based measurements p0251 A77-46765
- OLSON, J K**
Aerial photographic detection of imported fire ant mounds p0268 A77-44470
- OLSON, T L**
Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas Utah volume 4 [PB-268421/5] p0263 N77-32574
- ONDERDELINDEN, D**
Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50161
- ONEIL, R R.**
EXCEDE 2 [AD-A042491] p0270 N77-32666
- ONEILL, F**
Compact high-pressure electron-beam-controlled laser system p0268 A77-50176
- ONEILL, N T**
Interpretation of airborne spectral reflectance measurements over Georgian Bay p0256 A77-49395
- OROSZ, J A.**
Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47406
- OSHAUGHNESSY, M**
Doppler data transmission and handling at the Geodetic Institute of Uppsala p0225 A77-47407
- OSTROVSKII, I E**
Radar detection of sea surface oil pollution p0215 A77-40758
- OTRIO, G**
A high-resolution multispectral scanner for earth observation [IAF PAPER 77-115] p0257 A77-51433
- OTTERMAN, J**
Rangeland recovery in an enclosure - Satellite and ground observations p0222 A77-45800
- OWEN-JONES, E S.**
The use of photographic imagery in earth resources studies p0251 A77-46763
- OWENS, E J**
Microcomputer-controlled acoustic echo sounder [PB 268033/8] p0271 N77-32679
- P**
- PACKER, M R**
Developing operational techniques for the use of Landsat data in identifying irrigated agriculture in Idaho p0211 A77-47443
- PAFFRATH, D**
Significance of environmental research tasks at the German Aviation and Space Research Institute [DLR-IB-553-75/5] p0278 N77-33697
- PAINE, R H**
A three platform experiment on optical turbulence in the marine boundary layer [AD-A039789] p0258 N77-28685
- PALLUEL, P**
Evaluation of space application problems of a decimillimeter carcinotron [RT-1814] p0270 N77-31593
- PALUDAN, C. T**
Earth resources-regional transfer activity contracts review [NASA-TM-78130] p0278 N77-33578
- PANDEY, S.**
Feasibility study in using multiband photography for studies in geomorphology soils and land use p0251 A77-46737
- PANG, K D**
Geology orbiter comparison study [NASA-CR-155056] p0232 N77-34073
- PANIN, B D**
Some results of radiometric measurements onboard Cosmos 243 p0267 A77-47696
- PANTON, D J**
Digital cartographic study and benchmark [AD-A043156] p0228 N77-32571
- PARASHAR, S. K.**
Radar systems for a polar mission volume 1 [NASA-CR-152510] p0257 N77-28560
Radar systems for a polar mission volume 2 [NASA-CR-152511] p0258 N77-28561
- PARIKH, J. A.**
A comparative study of cloud classification techniques p0251 A77-46733
- PARK, A. B**
Implementation of a crop condition monitoring system p0209 A77-45798
- PAVLOVSKII, I B**
Center for collection and processing of data from automatic buoy stations p0249 A77-40818
- PCHELKIN, A. V**
On the problem of the nature of the anomalous magnetic field and its interpretation p0221 A77-43572
- PEARCE, S. C.**
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269874/8] p0220 N77-33788
- PECROT, A. J**
The application of ERTS imagery to the FAO/Unesco soil map of the world [E77-10238] p0214 N77-33567
- PEMBERTON, L J**
Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77-31575
- PENKETT, S. A.**
An important ground surface sink for atmospheric nitrous oxide p0215 A77-41420
- PEREK, L**
Physics uses and regulation of the geostationary orbit, or ex facto sequitur lex [IAF PAPER SL-77-44] p0275 A77-51556
- PERKINS, P. C.**
Electron microprobe analyses of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temaz Mountains, New Mexico [LA-6695-MS] p0232 N77-33734

PETROV, V S
Infrared spectrum of nitric oxide obtained in the upper atmosphere at middle latitudes by the orbiting scientific station Salyut 4 p0256 A77-50317

PICHUGIN, A P
Radar detection of sea surface oil pollution p0215 A77 40758

PITTS, J N, JR
Optical systems unravel smog chemistry p0216 A77 44614

PLACE, J L
Land use mapping and modeling for the Phoenix Quadrangle [E77-10196] p0260 N77 30556

PLAKHOV, IU V
Foundations of space geodesy p0226 A77 50685

PLEVIN, J
Europe's need for better information on natural resources and environment [AAS 78-055] p0273 A77-46636

POISSON, R M
The French Atlantic littoral and the Massif Armoncaïn part 1 [E77-10216] p0261 N77 31570

PORROVSKII, O M
Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges p0255 A77 47697

POLANSKI, G
Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77 31575

POLEVOI, V A
Barometric altimeter-automaton frequency-compensated p0268 A77-50724

POLIS, D F
A study of density fronts and their effects on coastal pollutants p0217 A77 46735

POLKOVSKI, G
Rare accessory uraninite in a Sierran granite p0229 A77 43014

PONTIVIANNE, M
Evaluation of space application problems of a decimillimeter carcinotron [RT-1814] p0270 N77-31593

POOL, S L
Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500

POONAI, P
Generalized vegetation map of north Merrit Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77 32581

POPELAR, J
Application of Doppler satellite tracking system for polar motion studies in Canada p0225 A77-47406

PORTNOVA, V P
On the problem of the nature of the anomalous magnetic field and its interpretation p0221 A77-43572

POTEAT, K O
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77 33768

POZDNIAROV, D V
Application of the polarization effect to the remote detection of oil slicks on the sea surface p0217 A77-47689

PRIBEKIN, V A
Center for collection and processing of data from automatic buoy stations p0249 A77-40818

PROBINE, M C
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565

Seismotectonic structural volcanologic and geomorphic study of New Zealand, indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33566

PROKOPYEV, M A
Aerosol in the GATE area and its radiative properties [PB-265264/2] p0219 N77-30646

PROTZ, R
LANDSAT/Bangladesh project [E77-10200] p0260 N77 30560

PUPLETT, E F
Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0285 A77-41895

PUSTOVOTENKO, V V
Radar detection of sea surface oil pollution p0215 A77 40758

Q

QUINN, F H
Lake St Clair hydrologic transfer factors [PB-266420/9] p0244 N77 28571

QUIROGA, S O
Taxonomic classification of soils using digital information from LANDSAT data Huayllamarca and eucalyptus areas [NASA-TM-75029] p0211 N77-28557

R

RABINOVICH IU I
Remote sensing of productive moisture stored in the soil p0208 A77-44898

RAEV, M D
Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690

RAGAN, R M
Value of Landsat in urban water resources planning p0243 A77-51280
Test of Landsat-based urban hydrologic modeling p0244 A77-51285

RAHMANI, M A
Generalized vegetation map of north Merrit Island based on a simplified multispectral analysis [NASA-CR-155006] p0213 N77-32561

RAHN, P H
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237(8)] p0277 N77-33568

RAKHUN, A V
Preliminary results of height-distribution measurements for ionospheric inhomogeneities excited by high power short-wave radio emission p0216 A77 43416

RAMM N S
Photogrammetric processing of space photographs using computers and other devices in the context of studying earth resources p0253 A77-47195

RAO, P K
Satellite climatology and its role in agriculture p0209 A77-45840

RAPP, R H
Comparison of Doppler derived undulations with gravimetric undulations considering the zero-order undulations of the geoid p0224 A77-47388

RASCHKE, E
Satellite-borne monitoring of atmospheric and surface characteristics affecting the propagation of microwaves in the troposphere p0263 N77-32389

REGAN, R D
Magsat A satellite for measuring near earth magnetic fields [NASA-TM-X-71370] p0270 N77 30683

REGIER, L A
Observations of the power and directional spectrum of ocean surface waves p0237 A77-47272

REGINATO, R J
Surface temperature and albedo observations as tools for soil moisture and crop yield estimation p0208 A77-45748

RENGERT, W
A multidisciplinary lidar system - Aims technology missions [IAF PAPER 77-125] p0257 A77-51436

REHO, D T
Seasonal variations in Great Lakes design wave heights Lake Erie [AD-A039153] p0244 N77-28568

REYNOLDS, R C
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data [E77-10213] p0213 N77-31567

REZHENOV, B V
Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm p0250 A77-46056

RICE, S S
Environment and radar operation simulator [AD-A038658] p0268 N77-28378

RICE, D P
Wheat productivity estimates using LANDSAT data [E77-10181] p0211 N77-28550

RICHARDS, M R
Relating Doppler datum to ordnance survey datum p0224 A77-47392

RICHARDSON, P L
Tracking a Gulf Stream ring with a free drifting surface buoy p0235 A77-41918

RIFMAN, S S
Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77-31575

RIGGINS, R E
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology Preproject baseline [E77-10220] p0246 N77-31574

ROBERTSON, D S
Geodetic and astrometric measurements with very long baseline interferometry [NASA-TM-X-71395] p0227 N77-32564
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33568

RODGERS, P D
A critical analysis of field operations using portable unattended Doppler satellite instrumentation p0224 A77-47383

ROGERS, R H
Water-management models in Florida from ERTS-1 data [E77-10197] p0245 N77-30557

ROSENFELD, A
Extraction of topological information from digital images [AD-A042125] p0228 N77-32569

ROSENKRANZ, P W
Microwave spectroscopic imagery of the earth p0267 A77 48269

ROUSE, J W, JR
Effective use of Landsat for range monitoring and management An example on a regional scale p0208 A77-45765
New developments in microwave remote sensing [IAF PAPER 77-117] p0257 A77-51434
Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor [E77 10212] p0213 N77-31566

RUBINSTEIN, I
IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval [AD-A039861] p0269 N77-28684

RUMMEL, R
Comparison of Doppler derived undulations with gravimetric undulations considering the zero order undulations of the geoid p0224 A77-47388

RUSSELL, C T
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295

RUSSELL, O R
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10184] p0229 N77 28551

RUSBO, S
Utilization of the spatial variability of reflectance for rice phenologic stages determination p0209 A77 45795

RUST, W D
Microwave radiometric detection of corona from chaff within thunderstorms p0268 A77-50274

RYAN, J W
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33568

S

SABHASRI, S
Thailand national programme of the earth resources technology satellite [E77-10207] p0276 N77-31562

SABROUX, J C
Sulphur dioxide discharge from Mount Etna p0217 A77 46293

SAFIANOV, G A
Multiband survey as a method to study suspension distribution in the sea [IAF PAPER 77-84] p0238 A77-51422

SAGDEEV, R Z
Space studies and the sensing of earth resources p0273 A77-47178

SAITO, T
Measurement of the temperature distribution on urban surfaces p0215 A77-41749

SAKAMOTO, C M
LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77-30574

SALUOV, L G
Optimal calibration of remote sensors using time averaging p0265 A77-40813

SALOMONSON, V V
Applications of space technology to water resources management p0245 N77-30288

SARKISIAN, A S
Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453

SAUER, H H
Observations of high-latitude protons p0249 A77-42312

SAULSKII, V K
Selection of satellite orbits for the sensing of earth resources p0287 A77-47204

SAVASTANO, K J
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827

SAVOSTIANOV, V S
Methodological problems of multispectral photography from Soyuz-12 p0253 A77-47197

SAZHKO, M IU
Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources p0253 A77-47189

SCANVIC, J Y
The French Atlantic littoral and the Massif Armoncaïn part 3 [E77-10217] p0261 N77-31571

- SCARDINA, J. A.**
Aerosol program - System and status p0273 A77-43806
- SCHERTLER, R. J.**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47981
- SCHIFFMAN, K.**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- SCHMER, F. A.**
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- SCHMIDT, J.**
Alluvial valley floors in east-central Montana and their relation to stripable coal reserves A reconnaissance report [PB-287280/B] p0232 N77-31725
- SCHMITT, T. J.**
Upper Mesozoic magnetostratigraphy p0230 N77-28856
- SCHOLZ, D. K.**
Evaluation of change detection techniques for monitoring coastal zone environments [E77-10203] p0219 N77-30563
- SCHUBERT, E.**
Accuracy models for bundle block triangulation p0255 A77-47974
- SCHUCK, E. A.**
Environmental monitoring p0215 A77-42255
- SCHULTZ, D.**
Landsat imagery for surface-mine inventory p0229 A77-44487
- SCOTT, R. B.**
Forest inventory of western Washington by satellite multi-stage sampling p0210 A77-47438
- SCOTTO, M.**
ILS glide slope performance prediction multipath scattering [AD-A035298] p0269 N77-29125
- SEALS, R. K., JR.**
Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
- SEGER, A.**
The electromagnetic autonavigation system /the EMAN system/ p0286 A77-43576
- SEEVERS, P. M.**
Application of LANDSAT imagery in land use inventory and classification in Nebraska [E77-10242] p0214 N77-33573
- SEMENOV, E. K.**
Characteristics of cloud clusters in the intertropical convergence zone of the Indian Ocean p0250 A77-44900
- SERAFIMOV, K. B.**
Model for profile of topside ionosphere p0265 A77-41228
- SHAPIRO, I. I.**
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33588
- SHARKOV, E. A.**
The possibility of remote sensing of the earth surface using radio-physical systems p0252 A77-47184
Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690
- SHARP, R. D.**
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0266 A77-45945
- SHCHERBININ, A. D.**
Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453
- SHCHETININ, I. U. T.**
Center for collection and processing of data from automatic buoy stations p0249 A77-40818
- SHELLEY, E. G.**
Observation of an ionospheric acceleration mechanism producing energetic /keV/ ions primarily normal to the geomagnetic field direction p0266 A77-45945
- SHEPHERD, W. K.**
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- SHERMAN, J. W.**
Seasat-A and Nimbus-G potential applications to marine meteorology and oceanography p0237 A77-46275
- SHEVELEVA, T. I. U.**
Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea p0217 A77-47080
- SHEVNINA, N. F.**
Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42621
- SHIPLEY, S. T.**
The sensitivity requirements for the determination of desert aerosols from space p0217 A77-45731
- SHIRIAEVA, T. A.**
Some aspects of the calculation of the thermal radio emission from ice and snow-type stratified structures by a computer-aided flow graph technique p0255 A77-47690
- SHNEIDER, I. I. U.**
On the problem of the nature of the anomalous magnetic field and its interpretation p0221 A77-43572
- SHOJI, D.**
Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563
- SHREVE, D. C.**
Geology orbiter comparison study [NASA-CR-155056] p0232 N77-34073
- SHROFF, A. M.**
Evaluation of space application problems of a decimillimeter carcinotron [RT-1814] p0270 N77-31593
- SHYRKOV, Y. M.**
Space studies of earth resources Methods and means of measurements and processing of information [NASA-TT-F-17544] p0264 N77-33583
- SHULGINA, E. M.**
Remote sensing of productive moisture stored in the soil p0208 A77-44898
- SHUTKO, A. M.**
Investigation of the natural environment using radio-physical methods /Review/ p0265 A77-43401
Radio-physical methods of sensing the earth surface and prospects of their development p0274 A77-47183
Satellite-borne radio-physical studies of the earth atmosphere and surface p0253 A77-47198
Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories p0266 A77-47201
The progress in microwave radiation investigations of continental covers during 1967-1977 [IAF PAPER 77-118] p0257 A77-51435
- SIDOROV, I. U. E.**
Remote investigations of the environment from space and problems of space data handling p0256 A77-50443
- SIMON, K. W.**
Experimental study of digital image processing techniques for LANDSAT data [E77-10221] p0261 N77-31575
- SIMONETT, D. S.**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- SIMPSON, C. J.**
Skylab photography for geological mapping p0229 A77-47176
- SINGH, T.**
Estimation of natural pollution loads from streamflow measurements in remote catchments p0215 A77-42853
- SIPLE, G. W.**
Air quality data for the Northeast oxidant transport study 1975 [PB-267545/2] p0219 N77-30663
- SJOBERG, E. S.**
Environment and radar operation simulator [AD-A036858] p0268 N77-28378
- SKORVE, J.**
Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572
- SMITH, C. L.**
Determination of true elevations from aerial photographs [AD-A039358] p0261 N77-30579
- SMITH, J. B., JR.**
Morphology and physical parameters of a solar flare p0229 A77-45269
- SMITH, J. R.**
Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568
- SMITH, R. B.**
Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas Utah volume 4 [PB-268421/5] p0263 N77-32574
- SMITH, R. C.**
The remote sensing of chlorophyll p0236 A77-45852
Rare accessory uraninite in a Sierran granite p0229 A77-43014
- SNETSINGER, K. G.**
Analytical methods of the coordinate connection of video data obtained for purposes of sensing earth resources p0253 A77-47196
- SOBCHUK, V. G.**
Plant growth and soil humidity above wall remnants - Preliminary results of a soil test as a contribution to aerial-picture archeology p0207 A77-41256
- SOLODOVA, S. M.**
The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798
- SOLOMON, J. E.**
Optical detection of atmospheric U 238 decay products p0250 A77-45305
- SOLONIN, S. V.**
Remote investigations of the environment from space and problems of space data handling p0256 A77-50443
- SONODA, T.**
Measurement of the temperature distribution on urban surfaces p0215 A77-41749
- SOROKINA, N. A.**
The field of transparency at 30 m depth in this tropical Atlantic and its adjustment to that of phosphate concentration p0235 A77-40798
- SOBNOVETS, E. N.**
Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-6 1974 p0215 A77-41110
- SOUZA, M.**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- SPANN, G. W.**
LANDSAT information for state planning [NASA-CR-150378] p0276 N77-31577
- STAELIN, D. H.**
Microwave spectroscopic imagery of the earth p0267 A77-48269
- STAIR, A. T., JR.**
Cryogenic spectrometry for the measurement of airglow and aurora [AD-A036220] p0269 N77-28679
EXCEDE 2 [AD-A042491] p0270 N77-32666
- STANSELL, T. A., JR.**
Doppler survey equipment - Background requirements and trends p0223 A77-47382
- STARKOV, G. V.**
Interplanetary magnetic field in the ecliptic plane and auroral activity p0249 A77-42621
- STEIN, V.**
Microwave scattering at the sea surface [DLR-FB-77-09] p0270 N77-32373
- STEINES, L. W.**
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
- STEPANENKO, V. D.**
Some results of radiometric measurements onboard Cosmos 243 p0267 A77-47696
- STEPANOV, V. N.**
Diagnostic calculation of the world ocean horizontal circulation p0238 A77-49453
- STEVENSON, M. R.**
Comparison of NOAA 3-4 VHRM imagery and LANDSAT multi-spectral scanner images with marine resource measurements [PB-268874/9] p0240 N77-31597
- STEVENSON, R. E.**
Huelva Front and Malaga Spain eddy chain as defined by satellite and oceanographic data p0238 A77-48329
- STIRLING, I. F.**
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3 [E77-10235] p0277 N77-33568
- STOIBER, R. E.**
An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data [E77-10213] p0213 N77-31567
- STOLPOVSKII, V. G.**
The determination of the outer boundary of radiation belts from data obtained by the Cosmos-426 satellite p0249 A77-41088
- STONESIFER, J. C.**
Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500
- STRACKEE, L.**
Computer assisted correlation spectrometer for the remote sensing of air pollution p0218 A77-50161
- STRANGE, W. E.**
The National Geodetic Survey Doppler satellite positioning program p0223 A77-47380
- STRUVE, H.**
Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects [AD-A042999] p0263 N77-32572
- SUETIN, V. S.**
Methods of detecting froth regions on oceans from remote measurements of thermal radio emission p0238 A77-49459
- SUGGATE, R. P.**
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1 [E77-10233] p0277 N77-33564
Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2 [E77-10234] p0277 N77-33565

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3
[E77-10236] p0277 N77-33568

SUK, M.
A study of the use of remote sensing data in hydrologic engineering models
[E77-10214] p0246 N77-31568

SUKHOVYANENKO, P. IA.
Fast detection of 10 830-A helium emission
p0265 A77-42620

SULIDI-KONDRATEV, E. D.
Sovuz-22 A new contribution to space geography
p0275 N77-28559

SUMARUK, P. V.
Interplanetary magnetic field in the ecliptic plane and auroral activity
p0249 A77-42821

SUMMERS, D. A.
Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir
[PB-265204/8] p0244 N77-28463

SUNG, G. C.
Land use/land cover mapping (1 25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery
[NASA-TM-X-71382] p0260 N77-30577

SUOMI, V. E.
Antarctic topography from balloons p0221 A77-44594
Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77-45821

SURIKOV, V. M.
Selection of satellite orbits for the sensing of earth resources
p0267 A77-47204

SUTHERLAND, R. A.
Significance of vegetation in interpreting thermal radiation from a terrestrial surface
p0211 A77-49511

SYCHEV, A. G.
Systems analysis and optical scanning methods
p0252 A77-47181

T

TABBAGH, A.
Determination of favorable times of measurement and the interpretation of results in thermal archaeological prospecting
p0229 A77-41024

TAKAKI, L. T.
Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites
[INPE-1072-TPT/059] p0262 N77-31580

TAKEDA, K.
Application of LANDSAT MSS data to the study of oceanographical environment
[E77-10228] p0241 N77-33559

TALWANI, M.
Free-air gravity anomalies in the world's oceans and their relationship to residual elevation
p0228 A77-49327

TANAKA, K.
Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area
[INPE-1085-TPT/061] p0240 N77-31757

TANENBAUM, M. G.
Adjustment of terrestrial networks using Doppler satellite data
p0225 A77-47401

TANIGUCHI, H.
Measurement of the temperature distribution on urban surfaces
p0215 A77-41749

TARNOPOLSKII, V. I.
Systems analysis and optical scanning methods
p0252 A77-47181

Space experiment simulation using an aircraft laboratory
p0268 A77-47200

TASHIRO, Y.
Measurement of the temperature distribution on urban surfaces
p0215 A77-41749

TATTELMAN, P.
Atlas of probabilities of surface temperature extremes Part 2 Southern Hemisphere
[AD-A038237] p0227 N77-29702

TAYLOR, S. E.
Analysis of observed soil skin moisture effects on reflectance
[AD-A041859] p0214 N77-32570

TER-MARKARIANTS, N. E.
Radiation studies in the atmosphere
p0267 A77-47687

TEREKHIN, IU. V.
Radar detection of sea surface oil pollution
p0215 A77-40758

THOMAS, G. L.
LANDSAT planning applications in east central Florida
[E77-10238] p0264 N77 33569

THOMAS, Y.
The French Atlantic littoral and the Massif Armoricain part 1
[E77-10216] p0261 N77-31570

THOMSON, K. P. B.
Interpretation of airborne spectral reflectance measurements over Georgian Bay
p0256 A77-49395

TIMCHENKO, I. F.
Method of compilation of chemical-element maps of insufficiently observed ocean aquators
p0235 A77-40796

TIMOFEEV, N. A.
New formulas of the radiation balance of the ocean-atmosphere system
p0235 A77-40812

TOOD, W. J.
Urban and regional land use change detected by using Landsat data
p0217 A77-48669

TONELLI, A. M.
Computing residuals in geothermal research by IR scanning
p0268 A77-46768

TORRES, F. E.
Atlantic tropical and subtropical cyclone classification for 1976
[PB-269674/8] p0220 N77-33768

TSTOVICH, V. S.
Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources
p0253 A77-47199

TSUCHIYA, K.
Environmental pattern change as revealed by Landsat MSS data
[IAF PAPER 77-131] p0218 A77-51439

Application of LANDSAT MSS data to the study of oceanographical environment
[E77-10228] p0241 N77-33559

Environmental change pattern in central Japan as revealed by LANDSAT data
[E77-10231] p0220 N77-33562

TSVETKOV, D. G.
Aerospace polygons problems of investigation and the structure of ground-based observations
p0274 A77-47207

TUCKER, C. J.
Resolution of grass canopy biomass classes
p0208 A77-44471

Use of near infrared/red radiance ratios for estimating vegetation biomass and physiological status
[NASA-TM-X-71388] p0214 N77-32565

TVERSKAIYA, L. V.
Formation and decay of an energetic-electron belt consisting of particles injected during the storm of July 4-8 1974
p0215 A77-41110

U

ULABY, F. T.
Radar system specifications for hydrology and agriculture
p0207 A77-43804

ULBRICHT, K. A.
Digital image processing for a better recognition of the terrestrial surface in Morocco
p0250 A77-45459

ULWICK, J. C.
EXCEDE 2
[AD-A042491] p0270 N77-32666

UNGAR, S. G.
Toward fully automated agricultural inventory from satellites
p0209 A77-45844

UNNI, N. V. M.
Feasibility study in using multiband photography for studies in geomorphology soils and land use
p0251 A77-46737

URDENKO, V. A.
Expedition of the 12th cruise of the research vessel Akademik Vernadski
p0235 A77-40821

USHAKOVA, L. A.
Danube Delta dynamics study by means of remote sensing
[IAF PAPER 77-86] p0244 A77-51423

USPENSKII, G. R.
Requirements for space techniques of the sensing of earth resources and possible types of satellites
p0274 A77-47203

V

VAN DE LINDT, W. J.
Digital technique for generating synthetic aperture radar images
p0256 A77-50447

VAN GENDEREN, J. L.
Testing land-use map accuracy
p0255 A77-47478

VANDERHOOD, W. J.
Agriculture/forestry hydrology
[E77-10219] p0213 N77-31573

VANEE, J. J.
Air quality data for the Northeast oxidant transport study 1975
[PB-267545/2] p0219 N77-30663

VANGENDEREN, J. L.
A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery
[E77-10187] p0257 N77-28552

VANSCOYOC, G. E.
Surface and structural properties of polygorskite
p0230 N77-29586

VASILEV, O. B.
Remote investigation of natural formations from measurements of luminance coefficients in narrow spectral ranges
p0255 A77-47697

VERESHCHETIN, V. S.
Legal questions associated with satellite remote sensing and prospects of international cooperation in this field
p0274 A77-47209

VERGER, F.
The French Atlantic littoral and the Massif Armoricain part 1
[E77-10218] p0261 N77 31570

The French Atlantic littoral and the Massif Armoricain part 3
[E77-10217] p0261 N77-31571

VILLAIN, J.-P.
Some scientific applications of the low-g accelerometer
[IAF PAPER 77-ST-05] p0268 A77-51569

VINCENT, C. L.
Seasonal variations in Great Lakes design wave heights
Lake Erie
[AD-A039153] p0244 N77 28568

VINCENTY, T.
Determination of North American Datum 1983 coordinates of map corners
p0225 A77 47410

VINJE, T. E.
Sea ice studies in the Sprintsbergen-Greenland area
[E77-10206] p0240 N77 31561

VINOGRADOV, B. V.
Space methods for investigating the environment
Remote sensing in ecological botany
p0273 A77-41635
p0210 A77-46734

VOLKOVA, A. V.
Use of ultrasound for the investigation of small-scale turbulence in the ocean
p0235 A77-40815

VONBUN, F. O.
Spaceborne earth applications ranging system
[SPEAR/]
VONDER HAAR, T. H

Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States
p0286 A77-45224

VOROBEV, V. G.
Dynamics of the high-latitude trapping boundary of energetic electrons during a substorm
p0250 A77-46056

VOSTOKOVA, E. A.
Landscape indication of natural processes from spacecraft photographs
p0243 A77-45200

W

WAGEL, Y.
Rangeland recovery in an enclosure
Satellite and ground observations
p0222 A77-45800

WALKER, D. M. C.
The semi annual variation in thermospheric air density from January 1972 to April 1975
p0250 A77-45860

WALLACE, J. W.
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976
[NASA-TM 74066] p0220 N77-33579

WALTER, L. S.
Landsat - Current and future capabilities for agriculture
p0209 A77-45847

WASILEWSKY, J.
Toward fully automated agricultural inventory from satellites
p0209 A77-45844

WATANABE, K.
General pattern of the turbid water in the Seto-inland sea extracted from multispectral images by the LANDSAT-1 and 2
[E77-10230] p0241 N77-33561

WATANABE, T.
Investigation of environmental change pattern in Japan
Classification of shorelines
[E77-10224] p0220 N77-33555

Investigation of environmental change pattern in Japan
Utilization of LANDSAT-2 data for fisheries
[E77-10227] p0241 N77-33558

WATERS, J. W.
Microwave spectroscopic imagery of the earth
p0267 A77-48269

WATT, T. M.
HIRIS experiment - Chatanika radar results
[AD-A042183] p0271 N77-32669

WATTS, A. B.
Gravimetric geoid in the Northwest Pacific Ocean
p0222 A77-46525

WEBB, K. E.
Application of digital analysis of MSS data to agro-environmental studies
[E77-10204] p0212 N77-31559

WEBER, E.
A multidisciplinary lidar system - Aims technology missions
[IAF PAPER 77-125] p0257 A77-51436

WEBER, F. P.
Monitoring crops and forests from space
[AAS 78-054] p0210 A77-46638

An interactive minicomputer image processing system for remote sensing applications
p0254 A77-47449

WEINMAN, J. A.
The sensitivity requirements for the determination of desert aerosols from space
p0217 A77-45731

WEISSMILLER, R. A.
Evaluation of change detection techniques for monitoring coastal zone environments
[E77-10203] p0219 N77-30563

- Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554
- WELBY, C W**
Application of satellite remote sensing to North Carolina
Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0264 N77 33590
- WERNER C**
DFVLR mobile lidar system p0267 A77-50135
- WEST, H I JR**
OGO 5 observations of Pc 5 waves - Particle flux modulations p0249 A77-42295
- WEST H W**
Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects [AG-A042999] p0263 N77-32572
- WHINSTON, A. B**
Implementation of a decision support for regional water quality planning [PB-267342/4] p0246 N77-30593
- WHITE, H L**
Variations in Doppler positions resulting from differences in computer programs and tropospheric refraction computations p0224 A77-47397
- WHITE, L P**
Monitoring from satellites p0273 A77-48767
A methodology applicable to the identification and quantification of the benefits of a European Remote-Sensing Satellite Programme p0274 A77-48651
- WHITNEY, W T**
Compact high-pressure electron-beam-controlled laser system p0268 A77-50175
- WHITTAKER, A. G**
Carbon Occurrence of linear forms in natural graphite [AD-A039520] p0232 N77-31995
- WIESEMANN, W**
A multidisciplinary lidar system - Aims technology missions [IAF PAPER 77-125] p0257 A77-51436
- WILHELM, K**
Fluctuations of the auroral zone current system and geomagnetic pulsations p0265 A77 42288
- WILLIAMS, D L**
A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440
A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X 71387] p0220 N77-32566
- WILLIAMSON, A. N**
Corrected Landsat images using a small computer p0255 A77-47481
- WILSON J S**
Environmental assessment of geopressed waters and their projected uses [PB-268289/6] p0247 N77-32579
- WILSON, R M**
Morphology and physical parameters of a solar flare p0229 A77-45269
- WILSON, W E**
Particulate sulfur analysis - Application to high time resolution aircraft sampling in plumes p0216 A77-43376
- WINER, A. M**
Optical systems unravel smog chemistry p0216 A77-44614
- WITEBSKY, E**
Remote sensing applications to hydrologic modeling [NASA-CR-154842] p0245 N77-30571
- WITTELS, J J**
Precision surveying using very long baseline interferometry [NASA-TM-X 71405] p0228 N77-33588
- WOBBER F J**
Monitoring coastal development pressure Examples of the application of remote sensing technique II p0257 A77-51633
- WOODLEY, W L**
Diurnal oscillation of the area of cloudiness associated with tropical storms p0218 A77 43080
- WYRTKI, K**
Advection in the Peru current as observed by satellite p0238 A77-50273
- ZEITZ, P**
Toward fully automated agricultural inventory from satellites p0209 A77-45844
- ZELLER, K F**
Air quality data for the Northeast oxidant transport study 1975 [PB-267545/2] p0219 N77-30663
- ZETTWOOG, P**
Sulphur dioxide discharge from Mount Etna p0217 A77-46293
- ZHURAVLEV, I F**
Selection of satellite orbits for the sensing of earth resources p0267 A77-47204
- ZIETZ, I**
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States p0230 N77-28652
- ZIMAN, IA L**
Technology of the thematic automated processing of video data p0253 A77-47191
Analytical methods of the coordinate connection of video data obtained for purposes of sensing earth resources p0253 A77-47196
Aircraft laboratories and experience in using them for the development of methods and means of remote sensing of earth resources p0253 A77-47199
Space experiment simulation using an aircraft laboratory p0266 A77-47200
- ZIMAN, Y L**
Space studies of earth resources Methods and means of measurements and processing of information [NASA-TT F-17544] p0264 N77-33583
- ZLOBIN, V K**
Digital system for the processing of video data for the purpose of studying earth resources p0253 A77-47193
- ZOBRIST A L**
Data management in pattern recognition and image processing systems p0249 A77-43815
- ZONOV, IU V**
Problems concerning the dissemination of space information for the sensing of earth resources and resources management p0274 A77-47208

Y

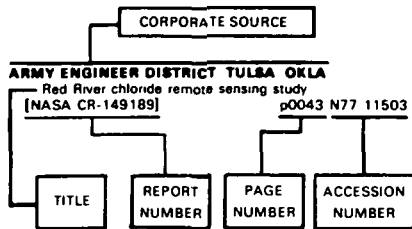
- YEGOROV, V V**
Space studies of earth resources Methods and means of measurements and processing of information [NASA-TT-F-17544] p0264 N77-33583
- YOUNG, J D**
Active microwave measurement of sea-surface winds from space p0239 N77-29333

Z

- ZALL, L S**
Photo-geology and remote sensing systems for locating ore deposits p0230 N77-28592

CORPORATE SOURCE INDEX

Typical Corporate Source Index Listing



The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable a report number is also included as an aid in identifying the document.

A

ACADEMY OF SCIENCES (USSR), MOSCOW
Joint document concerning geological studies from 1971-1975
[NASA-TM-78318] p0230 N77-29672

AERONUTRONIC FORD CORP., NEWPORT BEACH, CALIF.
Remote monitoring of nitric oxide by gas-filter correlation techniques
[PB-265455/8] p0218 N77-28574

AEROSPACE CORP., EL SEGUNDO CALIF.
Carbon Occurrence of linear forms in natural graphite
[AD-A039520] p0232 N77-31995

AIR FORCE ACADEMY, COLO.
Determination of true elevations from aerial photographs
[AD-A039356] p0261 N77-30579

AIR FORCE GEOPHYSICS LAB., HANSCOM AFB, MASS.
Cryogenic spectrometry for the measurement of airglow and aurora
[AD-A036220] p0269 N77-28679

Satellite temperature sounding of the atmosphere
Ground truth analysis
[AD-A038236] p0259 N77-29679

Atlas of probabilities of surface temperature extremes
Part 2. Southern Hemisphere
[AD-A038237] p0227 N77-29702

EXCEDE 2
[AD-A042491] p0270 N77-32666

AIR FORCE INST OF TECH., WRIGHT-PATTERSON AFB, OHIO
Gravity modeling for precise terrestrial inertial navigation
[AD-A042419] p0228 N77-33139

AIRBORNE INSTRUMENTS LAB., DEER PARK, N. Y.
IHR (Infrared Heterodyne Radiometer) for low altitude temperature retrieval
[AD-A039861] p0269 N77-28684

ALABAMA UNIV., UNIVERSITY
Application of remote sensing for planning purposes
[NASA-CR-150418] p0272 N77-33589

APPLIED SCIENCE ASSOCIATES, INC., APEX, N. C.
Microwave backscattering theory and active remote sensing of the ocean surface
[NASA-CR-141423] p0240 N77-30442

Initial development of a method of significant waveheight estimation for GEOS-III
[NASA-CR-141425] p0259 N77-30443

Investigation of the applications of GEOS-3 radar altimeter data in remote sensing of land and sea features
[NASA-CR-141428] p0271 N77-33577

ARIZONA UNIV., TUCSON.
The application of Fourier transform spectroscopy to the remote identification of solids in the solar system
Applied Remote Sensing Program (ARSP)
[NASA-CR-153413] p0260 N77-30567

Applied Remote Sensing Program (ARSP)
[E77-10240] p0278 N77-33571

ARIZONA WATER RESOURCES RESEARCH CENTER, TUCSON
Rainfall infiltration characteristics for a semi-arid watershed soil
[PB-267723/5] p0246 N77-30587

ARKANSAS UNIV., PINE BLUFF
Identification of crops in Central Arkansas using visual and infrared spectral reflectance signatures
[NASA-CR-151495] p0212 N77-30569

ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB., MANOVER, N. H.
Remote sensing of accumulated frazil and brash ice in the St. Lawrence River
[AD-A039905] p0245 N77-30581

Numerical studies to aid interpretation of an airborne VLF resistivity survey
[AD-A039904] p0231 N77-31594

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.
Investigation of the effects of construction and stage filling of reservoirs on the environment and ecology
Preproject baseline
[E77-10220] p0246 N77-31574

ARMY ELECTRONICS COMMAND FORT MONMOUTH, N. J.
Effects of cloud particles on remote sensing from space in the 10-micrometer infrared region
[AD-A038502] p0268 N77-28565

Analysis of observed soil skin moisture effects on reflectance
[AD-A041859] p0214 N77-32570

ARMY ENGINEER TOPOGRAPHIC LABS., FORT BELVOIR, VA.
The use of array algebra in terrain modeling procedures
[AD-A040619] p0261 N77-30583

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.
Seasonal variations in Great Lakes design wave heights
Lake Erie
[AD-A039153] p0244 N77-28568

Acquisition of terrain information using LANDSAT multispectral data Report 1 Correction of LANDSAT multispectral data for extrinsic effects
[AD-A042998] p0263 N77-32572

ATOMIC ENERGY COMMISSION, DACCA (BANGLADESH)
Investigators using data from LANDSAT-2
[E77 10199] p0260 N77-30559

Remote sensing and satellite surveying in Bangladesh
A background paper on the latest position of the status of remote sensing and satellite surveying in Bangladesh
[E77 10201] p0260 N77-30561

ESCAP inter-governmental meeting on remote sensing and satellite surveying
[E77-10202] p0260 N77-30562

AVCO-EVERETT RESEARCH LAB., EVERETT, MASS.
Atmospheric transmittance modeling for temperature and water vapor using satellite infrared data
[PB-266414/2] p0269 N77-28690

B

BATTELLE COLUMBUS LABS., OHIO
Geodetic measurements on the ocean
p0226 A77-51334

BETHUNE-COOKMAN COLL., DAYTONA BEACH, FLA.
Generalized vegetation map of north Merritt Island based on a simplified multispectral analysis
[NASA-CR-155006] p0213 N77-32561

BREYARD COUNTY PLANNING DEPT., MERRITT ISLAND, FLA.
LANDSAT planning applications in east central Florida
[E77-10238] p0264 N77-33569

BUREAU OF MINES, DENVER, COLO.
Remote transducer based on coherent mixing of backscattered laser light
[PB 268771/5] p0269 N77-30588

BUREAU OF MINES, PITTSBURGH, PA.
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia
[PB-268769/9] p0231 N77-30589

C

CALIFORNIA STATE DEPT OF TRANSPORTATION, SACRAMENTO
Remote identification of geologic materials by multispectral techniques. An evaluation of applicability to highway planning in California
[PB-267137/8] p0231 N77-31590

CALIFORNIA STATE DEPT OF WATER RESOURCES, SACRAMENTO
Monitoring water quality by remote sensing
[E77-10194] p0245 N77-30554

CALIFORNIA UNIV., BERKELEY
Determining the usefulness of remote sensing for estimating agricultural water demand in California
[E77-10191] p0211 N77-30551

Application of remote sensing to selected problems within the state of California
[E77-10205] p0275 N77-31560

An integrated study of earth resources in the state of California using remote sensing techniques
[E77-10215] p0246 N77-31569

An inventory of irrigated lands for selected counties within the state of California based on LANDSAT and supporting aircraft data
[E77-10222] p0213 N77-31576

CALIFORNIA UNIV., DAVIS.
A study of the use of remote sensing data in hydrologic engineering models
[E77-10214] p0246 N77-31568

CALIFORNIA UNIV., LIVERMORE LAWRENCE LIVERMORE LAB.
OGO 5 observations of Pc 5 waves. Particle flux modulations
p0249 A77-42295

CALIFORNIA UNIV., LOS ANGELES
OGO 5 observations of Pc 5 waves - Particle flux modulations
p0249 A77-42295

The orthophoto and orthophotomap Characteristics development and aspects of cartographic communication
p0227 N77-29585

CALIFORNIA UNIV. SANTA BARBARA.
Summary evaluation of the offshore target detection capabilities of APS-94D and COR radar systems
[AD-A038245] p0218 N77-28379

Remote sensing applications to hydrologic modeling
[NASA-CR-154842] p0245 N77-30571

Evaluation of Ocean Color Scanner (OCS) photographic and digital data Santa Barbara Channel test site 29 October 1975 overflight
[NASA-CR-155171] p0241 N77-33587

CATHOLIC UNIV OF AMERICA, WASHINGTON, D. C.
Interpretation of aeromagnetic anomalies between latitudes 37 deg N and 38 deg N in the Eastern and Central United States
p0230 N77-28652

CENTRE NATIONAL D'ETUDES SPATIALES, TOULOUSE (FRANCE)
Identification of networks in space geodesy by short orbital arcs (short arc method)
[CNES-NT 81] p0227 N77-29595

Determination of the Geole polyhedron by the short-arc method
[CNES-NT 85] p0227 N77-29596

COLOGNE UNIV (WEST GERMANY)
Satellite borne monitoring of atmospheric and surface characteristics affecting the propagation of microwaves in the troposphere
p0263 N77-32389

COLORADO STATE UNIV., FORT COLLINS.
Deriving mesoscale temperature and moisture fields from satellite radiance measurements over the United States
p0268 A77-45224

Aerosol in the GATE area and its radiative properties
[PB-265264/2] p0219 N77-30646

Stochastic modeling of intermittent daily hydrologic series
p0246 N77-32558

COLORADO UNIV., BOULDER
Application of LANDSAT data to delimitation of avalanche hazards in Montane Colorado
[E77-10211] p0261 N77-31565

COLUMBIA UNIV., NEW YORK
Spectroradiometric detection and mapping of areas enriched in ferric iron minerals using airborne and orbiting instruments
p0229 N77-28549

Application of digital analysis of MSS data to agro-environmental studies
[E77-10204] p0212 N77-31559

COMISION NACIONAL DEL ESPACIO EXTERIOR, MEXICO CITY (MEXICO)

Comprehensive study of Leon-Queretaro area
[E77-10208] p0232 N77-32560

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION (U. S. SENATE).

Earth Resources and Environmental Information System Act of 1977
[GPO-93-804] p0278 N77-32562

COMPUTER GENETICS CORP., WAKEFIELD, MASS.

Experimental remote sensing of subsurface temperature in natural ocean water
p0238 A77-42730

COMPUTER SCIENCES CORP., LOS ANGELES, CALIF.

Earth resources technology system standalone software package Description and user's guide
[NASA-CR-152598] p0284 N77-33591

COMPUTER SCIENCES CORP., SILVER SPRING, MD.

The effect of the atmosphere on the classification of satellite observations to identify surface features
p0218 A77-49397

CONTROL DATA CORP., MINNEAPOLIS, MINN.

Digital cartographic study and benchmark
[AD-A043156] p0228 N77-32571

CORNELL UNIV., ITHACA, N. Y.

The determination of regional evapotranspiration using regularly recorded data and the boundary layer transfer coefficients
p0244 N77-28587

Photo-geology and remote sensing systems for locating ore deposits
p0230 N77-29592

D**DARTMOUTH COLL., HANOVER, N. H.**

An investigation of agricultural and other earth resources parameters using LANDSAT and other remote sensing data
[E77-10213] p0213 N77-31567

DELAWARE UNIV., NEWARK

A study of density fronts and their effects on coastal pollutants
p0217 A77-48735

DEPARTMENT OF AGRICULTURAL TECHNICAL SERVICES, PRETORIA (SOUTH AFRICA)

Monitoring the extent and occurrence of fire in the different veld types of South Africa with particular reference to its ecological role and role in range management
[E77-10226] p0283 N77-33557

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH, WELLINGTON (NEW ZEALAND)

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 1
[E77-10233] p0277 N77-33564

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 2
[E77-10234] p0277 N77-33565

Seismotectonic structural volcanologic and geomorphic study of New Zealand indigenous forest assessment in New Zealand mapping land use and environmental studies in New Zealand volume 3
[E77-10235] p0277 N77-33566

DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, OBERSPANNENHOFEN (WEST GERMANY)

Microwave scattering at the sea surface
[DLR-FB-77-09] p0270 N77-32373

Significance of environmental research tasks at the German Aviation and Space Research Institute
[DLR-IB-553-75/5] p0278 N77-33697

DOW CHEMICAL CO., FREEPORT, TEX.

Environmental assessment of geopressured waters and their projected uses
[PB-268289/6] p0247 N77-32579

E**EARTH SATELLITE CORP., WASHINGTON, D. C.**

Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act
[E77-10184] p0229 N77-28551

ECOLE PRACTIQUE DES HAUTES ETUDES, PARIS (FRANCE)

The French Atlantic littoral and the Massif Armoncais part 1
[E77-10216] p0281 N77-31570

The French Atlantic littoral and the Massif Armoncais part 3
[E77-10217] p0281 N77-31571

ECON, INC., PRINCETON, N. J.

A cost benefit evaluation of the LANDSAT follow-on program
[NASA-CR-155156] p0278 N77-33584

EDGERTON, GERMESHAUSEN AND GRIER, INC LAS VEGAS, NEV.

Development of snow water equivalent survey methods using airborne gamma measurements
[EGG-1183-1677] p0246 N77-31592

ENVIRONMENTAL MONITORING AND SUPPORT LAB., LAS VEGAS, NEV.

Air quality data for the Northeast oxidant transport study 1975
[PB-267545/2] p0219 N77-30663

ENVIRONMENTAL RESEARCH AND TECHNOLOGY, INC., CONCORD, MASS.

Study of near-infrared snow reflectance using Skylab S182 multispectral scanner data
[PB-267504/9] p0269 N77-30591

ENVIRONMENTAL RESEARCH INST OF MICHIGAN, ANN ARBOR.

Wheat productivity estimates using LANDSAT data
[E77-10181] p0211 N77-28550

ENVIRONMENTAL SYSTEMS RESEARCH INST., REDLANDS, CALIF.

DIMECNV A system for converting scanner-digitized mapping data tapes to polygon format
[PB-268438/1] p0258 N77-29599

EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, D. C.

Aeronautics and space report of the President 1976 activities
p0275 N77-31048

F**FLORIDA UNIV., GAINESVILLE**

Significance of vegetation in interpreting thermal radiation from a terrestrial surface
p0211 A77-49511

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME (ITALY)

The application of ERTS imagery to the FAO/Unesco soil map of the world
[E77-10236] p0214 N77-33567

G**GENERAL ELECTRIC CO., BELTSVILLE, MD.**

Landsat imagery for surface-mine inventory
p0229 A77-44467

LANDSAT-1 and Landsat-2 flight evaluation report 23 October 1976 to 23 January 1977
[NASA-CR-152577] p0258 N77-29594

GENERAL ELECTRIC CO., PHILADELPHIA, PA.

A study of selected environmental quality remote sensors for free flyer missions launched from the space shuttle
[NASA-CR-145252] p0278 N77-33585

GEOLOGICAL SURVEY, DENVER, COLO.

Reduction and treatment of magnetic anomalies of crustal origin in satellite data
p0222 A77-48270

GEOLOGICAL SURVEY, MIAMI, FLA.

Water-management models in Florida from ERTS-1 data
[E77-10197] p0245 N77-30657

GEOLOGICAL SURVEY, RESTON, VA.

Overall evaluation of LANDSAT (ERTS) follow on imagery for cartographic application
[E77-10193] p0227 N77-30653

Land use mapping and modelling for the Phoenix Quadrangle
[E77-10198] p0260 N77-30556

GEOLOGICAL SURVEY, UNIVERSITY, ALA.

Application of remote sensing for planning purposes
[NASA-CR-150418] p0272 N77-33589

GEORGIA INST OF TECH., ATLANTA.

Environment and radar operation simulator
[AD-A038656] p0268 N77-28378

LANDSAT information for state planning
[NASA-CR-150378] p0276 N77-31577

GEORGIA UNIV., ATHENS.

Processing of map information in a minicomputer
p0263 N77-32559

QUELPH UNIV (ONTARIO)

LANDSAT/Bangladesh project
[E77-10200] p0260 N77-30560

H**HARRIS CORP., MELBOURNE, FLA.**

120 MB/S and 240 MB/S bit synchronizer-signal conditioners for NASA high data rate applications
p0267 A77-49886

I**IBM FEDERAL SYSTEMS DIV., HOUSTON, TEXAS.**

Digital technique for generating synthetic aperture radar images
p0256 A77-50447

INSTITUTO DE PESQUISAS ESPACIAIS, SAO JOSE DOS CAMPOS (BRAZIL)

Usefulness of the LANDSAT 1 data in the implementation control and monitoring of the cattle farm projects in the southeastern Amazon region
[INPE-1044-TP/058] p0212 N77-30578

Utilization of LANDSAT images in the monitoring and control of the cattle farm projects established in the Amazon region
[INPE-1075-NTE/101] p0213 N77-31578

Geologic mapping of the Goias quadrangle based on the multispectral images transmitted by LANDSAT 1 satellite
[INPE-1071-TP/058] p0231 N77-31578

Thermal mapping of the sea surface using VHRR computerized images of the NOAA series of satellites
[INPE-1072-TP/059] p0282 N77-31580

Tectonic sketch map of northern Minas Geras based on LANDSAT images
[INPE-1078-NTE/104] p0231 N77-31582

Simulation of ocean currents compared to oceanographic and remote sensor data in the Cabo Frio area
[INPE-1085-TP/061] p0240 N77-31757

INSTITUTO DE PESQUISAS ESPACIAIS, SAO PAULO (BRAZIL).

Geomorphologic mapping by means of LANDSAT images
[INPE-1078-NTE/102] p0231 N77-31581

INTER-AMERICAN TROPICAL TUNA COMMISSION, LA JOLLA, CALIF.

Comparison of NOAA 3-4 VHRR imagery and LANDSAT multi-spectral scanner images with marine resource measurements
[PB-268674/9] p0240 N77-31597

INTERNATIONAL GEOGRAPHICAL UNION COMMISSION ON GEOGRAPHICAL DATA SENSING AND PROCESSING

Digital geographic data handling activities in the U.S. geological survey
[PB-268683/4] p0219 N77-30586

IOWA UNIV., IOWA CITY

Wave-particle interactions in the evening magnetosphere during geomagnetically disturbed periods
p0263 N77-32651

J**JET PROPULSION LAB., CALIF INST OF TECH., PASADENA.**

Determination of ocean wave heights from synthetic aperture radar imagery
p0249 A77-40514

Theory for passive microwave remote sensing of near-surface soil moisture
p0207 A77-42015

Data management in pattern recognition and image processing systems
p0249 A77-43815

Construction and interpretation of a digital inertia image
p0250 A77-44464

Quo vadis remote sensing
[AAS 78-057] p0273 A77-46637

Interpretation key for SAR /L-band/ imagery of sea ice of the earth
p0237 A77-47451

Microwave spectroscopic imagery of the earth
p0267 A77-48289

Ozone monitoring with an infrared heterodyne radiometer
p0267 A77-48451

Simulation of the effects of hard limiting on image quality of synthetic aperture radar
p0256 A77-49905

Frequency requirements for active earth observation sensors
[NASA-CR-153939] p0268 N77-28556

K**KANNER (LEO) ASSOCIATES, REDWOOD CITY, CALIF.**

Taxonomic classification of soils using digital information from LANDSAT data Huayllamarca and eucaliptus areas
[NASA-TM-75029] p0211 N77-28557

Identification of 180 million years old probably unchanged melanite
[NASA-TM-75132] p0259 N77-29729

Space studies of earth resources Methods and means of measurements and processing of information
[NASA-TT-F-17544] p0264 N77-33583

KANSAS UNIV., LAWRENCE

Active microwave measurement of sea-surface winds from space
p0239 N77-29333

KANSAS UNIV CENTER FOR RESEARCH, INC., LAWRENCE

Radar system specifications for hydrology and agriculture
p0207 A77-43804

A theory of sea scatter at large incident angles
p0237 A77-45901

Radar systems for a polar mission volume 1
[NASA-CR-152510] p0257 N77-28560

Radar systems for a polar mission volume 2
[NASA-CR-152511] p0258 N77-28561

KENTUCKY DEPT OF NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION, FRANKFORT

A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky volume 1
[E77-10189] p0230 N77-28554

A feasibility analysis of the employment of satellite imagery to monitor and inspect surface mining operations in western Kentucky Volume 2 Appendices
[E77-10190] p0230 N77-28555

KENTUCKY UNIV., LEXINGTON

Value of Landsat in urban water resources planning
p0243 A77-51280

Test of Landsat-based urban hydrologic modeling
p0244 A77-51285

L

- LAMONT-DAVIES GEOLOGICAL OBSERVATORY, PALISADES, N. Y.**
Growth rate of coral in the Northwest Pacific Ocean p0222 A77-46526
- LANCASHIRE (A. A. BRADLEY) STATE UNIV. (UNCL.)**
Aerial in the GATE area and its radiative properties [PB-285284/2] p0219 N77-30846
- LANCASTER ELECTRONICS CO., HANOVER, N.H.**
A new computer approach to map mixed forest features and postprocess multispectral data p0211 A77-47450
Sensor performance report, volume 4 (S-180A) [NASA-CR-161526] p0271 N77-33581
S-181 sensor performance evaluation [NASA-CR-161527] p0271 N77-33582
- LANCASTER ELECTRONICS AND SPACE CO., PALO ALTO, CALIF.**
SOLAR-22 A new contribution to space geography p0275 N77-28559
- LOS ALAMOS SCIENTIFIC LAB., N. MEX.**
Electron microprobe analysis of minerals in Precambrian rocks at the Los Alamos Scientific Laboratory Geothermal Test Site Temez Mountains New Mexico [LA-6895-MS] p0232 N77-33734
- LUDWIG-MAXIMILIANS-UNIVERSITÄT, MÜNCHEN (WEST GERMANY)**
Distribution of electrical resistivity on continental areas p0263 N77-32390

M

- MARYLAND UNIV., COLLEGE PARK**
Value of Landsat in urban water resources planning p0243 A77-51280
Test of Landsat-based urban hydrologic modeling p0244 A77-51285
The value of Landsat data in urban water resources planning p0245 N77-30545
Extraction of topological information from digital images [AD-A042125] p0228 N77-32569
- MASSACHUSETTS INST. OF TECH., CAMBRIDGE**
Theory for passive microwave remote sensing of near-surface soil moisture p0207 A77-42015
Microwave spectroscopic imagery of the earth p0267 A77-48269
- MERIONS COMMITTEE SECRETARIAT, DANBROOK (MAILING)**
Agriculture/forestry hydrology [E77-10218] p0213 N77-31573
- MISSOURI DEPT. OF NATURAL RESOURCES, ROLLA**
Remote sensing applications to Missouri environmental resources information system [NASA-CR-150340] p0260 N77-30565
Structural lineament and pattern analysis of Missouri using LANDSAT imagery [E77-10239] p0232 N77-33570
- MISSOURI UNIV., ROLLA**
Application transfer activity in Missouri [NASA-CR-150341] p0260 N77-30566
- MITRE CORP., BEDFORD, MASS.**
Radiative transfer model for remote sensing of suspended sediments in water [NASA-CR-145145] p0246 N77-32567
- MONTANA DEPT. OF HEALTH AND ENVIRONMENTAL SERVICES, HELENA**
Alluvial valley floors in east-central Montana and their relation to stripable coal reserves A reconnaissance report [PB-267280/6] p0232 N77-31725

N

- NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.**
Resource sensing from space Prospects for developing countries [PB-264171/0] p0275 N77-30590
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.**
Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
Joint document concerning geological studies from 1971 - 1975 [NASA-TM-78318] p0230 N77-29672
Spinoff 1977 An annual report [NASA-TM-74908] p0278 N77-34049
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, AEROSPACE RESEARCH CENTER, WRIGHT PATER, OHIO**
Rare accessory uraninite in a Sierran granite p0229 A77-43014
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, EARTH RESOURCES LAB., DAYTON, OHIO**
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.

- Toward fully automated agricultural inventory from satellites p0209 A77-45844
Applications of space technology to water resources management p0245 N77-30288
Space technology in the discovery and development of mineral and energy resources p0231 N77-30289
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.**
Spectroscopic earth applications ranging system /SPEAR/ p0221 A77-40824
Landsat imagery for surface-mine inventory p0229 A77-44467
Resolution of grass canopy biomass classes p0208 A77-44471
Landsat - Current and future capabilities for agriculture p0209 A77-45847
Urban area delineation and detection of change along the urban-rural boundary as derived from Landsat digital data p0217 A77-47434
A canopy-related stratification of a Southern pine forest using Landsat digital data p0210 A77-47440
Analysis of some hydrologic variables on the north slope of Alaska using passive microwave visible and near infrared imagery p0243 A77-47447
The effect of the atmosphere on the classification of satellite observations to identify surface features p0218 A77-49397
- LANDSAT non-US standard catalog 1 April 1977 through 30 April 1977 [NASA-TM-74828] p0258 N77 29591**
LANDSAT non-US standard catalog 1 May 1977 - 31 May 1977 [NASA-TM-74825] p0258 N77 29593
LANDSAT US standard catalog 1 April 1977 - 30 April 1977 [NASA-TM-74776] p0259 N77-29601
Visible and infrared imaging radiometers for ocean observations [NASA-TM-X-71374] p0240 N77-30447
Land use/land cover mapping (1 25000) of Taiwan Republic of China by automated multispectral interpretation of LANDSAT imagery [NASA-TM-X-71382] p0260 N77-30577
LANDSAT US standard catalog 1-31 May 1977 [NASA-TM-74859] p0261 N77-30692
Magsat A satellite for measuring near earth magnetic fields [NASA-TM-X-71370] p0270 N77-30683
Geodetic and astrometric measurements with very long baseline interferometry [NASA-TM-X-71395] p0227 N77-32564
Use of near infrared/red radiance ratios for estimating vegetation biomass and physiological status [NASA-TM-X-71388] p0214 N77-32565
A reduction in ag/residential signature conflict using principal components analysis of LANDSAT temporal data [NASA-TM-X-71387] p0220 N77-32566
Precision surveying using very long baseline interferometry [NASA-TM-X-71405] p0228 N77-33588
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LYNNEDON JOHNSON SPACE CENTER, HANOVER, N.H.**
The large area crop inventory experiment - A major demonstration of space remote sensing p0209 A77-45817
Remote-area health care delivery through space technology - STARPAHC [IAF PAPER 77-255] p0275 A77-51500
Skylab explores the earth p0275 N77-28548
The large area crop inventory experiment An experiment to demonstrate how space-age technology can contribute to solving critical problems here on earth [NASA-TM-74832] p0212 N77 30564
The large area crop inventory experiment A major demonstration of space remote sensing [NASA-TM-74840] p0212 N77 30570
A procedure for detection and measurement of interfaces in remotely acquired data using a digital computer [NASA-TR-472] p0269 N77-30572
LACIE Wheat yield models for the USSR [NASA-TM-74834] p0212 N77 30574
LACIE Yield-weather regression models for the Canadian prairies [NASA-TM-74833] p0212 N77-30575
LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77-30576
An interactive color display for multispectral imagery using correlation clustering [NASA-CASE-MSC-16253-1] p0262 N77-31583
Large Area Crop Inventory Experiment (LACIE) Phase 2 evaluation report [NASA-TM-74937] p0213 N77-31584
Digital overlaying of the universal transverse Mercator grid with LANDSAT data derived products [NASA-TM-58200] p0262 N77-31827

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, JOHN F. BISHOP, SPACE CENTER, GAITHERSBURG, MD.

- A Landsat study of water quality in Lake Okechobee p0243 A77-47453
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.**
Ozone monitoring with an infrared heterodyne radiometer p0267 A77-48451
Remote water monitoring system [NASA-CASE-LAR-11873-1] p0244 N77-28563
Remotely sensed and laboratory spectral signatures of an ocean-dumped acid waste [NASA-TM-D-8467] p0239 N77-28564
Coastal wave measurements during passage of tropical storm Amy [NASA-TM-74080] p0240 N77-30707
A summary of the test procedures and operational details of an ocean dumping pollution monitoring experiment conducted 7 October 1976 [NASA-TM-74036] p0220 N77-33579
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, MICRO RESEARCH CENTER, CLEVELAND, OHIO**
All-weather ice information system for Alaskan Arctic coastal shipping p0238 A77-47961
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.**
Morphology and physical parameters of a solar flare p0229 A77-45269
Multipurpose Interactive NASA Information Systems (MINIS) [NASA-TM-78124] p0275 N77-28987
Data management for earth observations p0259 N77-30290
NASA Workshop on Solar-Terrestrial Studies from a Manned Space Station [NASA-CP-2024] p0276 N77 32549
Introduction Man and his total environment p0276 N77 32554
Earth resources-regional transfer activity contracts review [NASA-TM-78130] p0278 N77 33578
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, Wallops Station, Wallops Island, VA.**
Experimental remote sensing of subsurface temperature in natural ocean water p0236 A77-42730
- NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLO.**
Antarctic topography from balloons p0221 A77-44594
Antarctic ice topography and 150 mb circulation from the Nimbus-B TWERL Experiment p0222 A77-45821
- NATIONAL ENVIRONMENTAL SATELLITE SERVICE, WASHINGTON, D. C.**
NOAA program development plan for SEASAT-A research and applications [PB-265414/3] p0239 N77-28566
Winter snow-cover maps of North America and Eurasia from satellite records 1966 - 1976 [PB-267393/7] p0245 N77-29722
A relationship between weakening of tropical cyclone cloud patterns and lessening of wind speed [PB-267392/9] p0219 N77-29723
Key to meteorological records documentation no 5 4 Environmental satellite imagery February 1977 [KMRD-5-4] p0262 N77-31726
Atlantic tropical and subtropical cyclone classification for 1976 [PB-269674/8] p0220 N77-33768
- NATIONAL GEODETIC SURVEY, ROCKVILLE, MD**
Recent elevation change in Southern California [PB-265940/7] p0227 N77-28688
- NATIONAL MARINE FISHERIES SERVICE, DAYTON, OHIO, OHIO**
Applications of space observations to the management and utilization of coastal fishery resources p0236 A77-45827
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ANN ARBOR, MICH.**
Late St. Clair hydrologic transfer factors [PB-266420/8] p0244 N77-28571
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.**
Morphology and physical parameters of a solar flare p0229 A77 45269
Characteristics of meso-beta-scale deep convection over the eastern tropical Atlantic [PB-266955/4] p0258 N77-28709
An advection-diffusion model of the DOMES turbidity plumes [PB-266713/5] p0220 N77-31598
Microcomputer-controlled acoustic echo sounder [PB-268033/8] p0271 N77 32679
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, COLUMBIA, MO**
LACIE Yield-weather regression models for the Canadian prairies [NASA-TM-74833] p0212 N77-30575
LACIE Wheat yield models for the United States revision A [NASA-TM-74835] p0212 N77 30576

NATIONAL PHYSICAL LAB., TEDDINGTON (ENGLAND)

Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0265 A77-41895
NATIONAL RESEARCH COUNCIL BANGKOK (THAILAND)

Thailand national programme of the earth resources technology satellite [E77-10207] p0276 N77-31562

NATIONAL SCIENTIFIC LABS., INC FALLS CHURCH VA.

Frequency requirements for active earth observation sensors [NASA-CR-153939] p0268 N77-28556

NATIONAL WEATHER SERVICE SILVER SPRING MD

Gulfstream Monthly publications January-December 1976 Volume 2 numbers 1-12 [PB-268216/9] p0241 N77-33779

NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF

A photographic reconnaissance of the microrelief in the Monterey and Carmel submarine canyons California [AD-A039370] p0239 N77-28567

A three platform experiment on optical turbulence in the marine boundary layer [AD-A039789] p0258 N77-28685

NAVAL RESEARCH LAB., WASHINGTON, D C.

Interaction between steady non-uniform two-dimensional currents and directional wind-generated gravity waves with applications for current measurements [AD-A040800] p0262 N77-31702

NAVAL WEAPONS CENTER, CHINA LAKE, CALIF

A theory of sea scatter at large incident angles p0237 A77-45901

NEBRASKA UNIV., LINCOLN

Application of LANDSAT imagery in land use inventory and classification in Nebraska [E77-10242] p0214 N77-33573

NEW MEXICO UNIV ALBUQUERQUE

Literature review of the remote sensing of natural resources [NASA-CR-155190] p0277 N77 33551

NORSK POLARINSTITUTT, OSLO

Sea ice studies in the Spitsbergen-Greenland area [E77-10206] p0240 N77 31561

NORTH CAROLINA STATE UNIV., RALEIGH

The citizen's guide to North Carolina's shifting inlets [PB-288736/6] p0262 N77-31762

An experimental investigation of some combined flow sediment transport phenomena [PB-269672/2] p0247 N77-32575

Application of satellite remote sensing to North Carolina Development of a monitoring methodology for trophic states of lakes in North Carolina [NASA-CR-150419] p0264 N77-33590

NORTHERN PRAIRIE WILDLIFE RESEARCH CENTER, JAMESTOWN, N DAK

Application of LANDSAT system for improving methodology for inventory and classification of wetlands [E77-10188] p0244 N77 28553

NORWEGIAN WATER RESOURCES AND ELECTRICITY BOARD, OSLO

Snowmapping in southern Norway by use of LANDSAT imagery [E77-10241] p0247 N77-33572

O

OAK RIDGE NATIONAL LAB., TENN

Theory and analysis of vegetation pattern [EDFB-IBP-76-3] p0213 N77-31591

TEHM A Terrestrial Ecosystem Hydrology Model [EDFB-IBP 76-8] p0247 N77-33592

OAKLAND UNIV., ROCHESTER, MICH

An interactive color display for multispectral imagery using correlation clustering [NASA-CASE-MS-C-16253-1] p0262 N77-31583

OFFICE OF TELECOMMUNICATIONS, BOULDER, COLO

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 1 [PB-265850/8] p0239 N77-29383

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 2 [PB-265851/6] p0239 N77-29384

An analysis of the maritime high-frequency single-sideband voice communication system for the North Atlantic and the South Pacific volume 3 [PB-265852/4] p0239 N77-29385

OHIO DEPT OF ECONOMIC AND COMMUNITY DEVELOPMENT, COLUMBUS.

Development of multi-disciplinary ERTS user program in the state of Ohio [E77-10209] p0276 N77-31563

Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10210] p0276 N77-31564

OHIO UNIV., ATHENS.

On-line measurement of the infrared spectra of gas chromatographic eluents [PB-265570/2] p0269 N77-29258

OKLAHOMA STATE UNIV., STILLWATER
 Predicting changes in land-use patterns resulting from water resource investment using a nonstationary Markov process [PB-269409/9] p0247 N77-33595

OKLANOMA UNIV., NORMAN
 Hygrometric sodar p0271 N77-32684

OLD DOMINION UNIV., NORFOLK, VA.
 The Role of Aerospace Technology in Agriculture The 1977 Summer Faculty Fellowship Program in Engineering Systems Design [NASA-CR-145218] p0278 N77-33580

OLD DOMINION UNIV RESEARCH FOUNDATION, NORFOLK, VA.
 Three field tests of a gas filter correlation radiometer [NASA-CR-153931] p0268 N77-28467

OREGON STATE UNIV., CORVALLIS.

Stereophotogrammetric reconnaissance of ocean wave/sea ice interaction p0240 N77-33552

P

PAN AMERICAN UNIV., EDINBURG, TEX.

Applications of Surtis spectral model to wheat p0210 A77-46738

PATTERN ANALYSIS AND RECOGNITION CORP., ROME, N Y

Advanced Digital Exploitation Techniques (ADET) [AD-A040769] p0262 N77-31588

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK

Procedures for the systematic evaluation of remote sensor performance and quantitative mission planning p0259 N77-30546

Bhattacharyya distance as a feature selection method for multispectral data p0259 N77-30547

A study of water vapor measurement in the stratosphere and mesosphere using microwave techniques p0270 N77-30876

PURDUE UNIV., LAFAYETTE, IND

Surface and structural properties of polygorskite p0230 N77-28586

Applications of remote sensing volume 1 [E77-10182] p0259 N77-30548

Applications of remote sensing volume 3 [E77-10185] p0259 N77-30549

Applications of remote sensing volume 2 [E77-10186] p0260 N77-30550

ERTS multispectral image transformations for geological lineament enhancement p0231 N77-30558

Evaluation of change detection techniques for monitoring coastal zone environments p0219 N77-30563

Implementation of a decision support for regional water quality planning [PB-267342/4] p0246 N77-30593

Applications of remote sensing [E77-10183] p0214 N77-33553

Application of remote sensing technology to the solution of problems in the management of resources in Indiana [E77-10223] p0277 N77-33554

Q

QUEEN MARY COLL., LONDON (ENGLAND)

Very-high-resolution far-infrared measurements of atmospheric emission from aircraft p0265 A77-41895

R

RADIAN CORP., AUSTIN, TEX.

Experimental and theoretical studies of solid solution formation in lime and limestone SO2 scrubbers volume 1 [PB-264953/1] p0219 N77-28825

RHODE ISLAND UNIV., KINGSTON

Identification of oil slicks by infrared spectroscopy [AD-A040975] p0220 N77-31587

S

SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF

Determination of aerosol content in the atmosphere from LANDSAT data [E77-10195] p0219 N77-30555

SCIENCE APPLICATIONS, INC., PASADENA, CALIF

Geologic investigation of Mercury data and the subsequent mapping and explanation of the quadrangle area H-12 [NASA-CR-155159] p0232 N77-34070

Geology orbiter comparison study [NASA-CR-155056] p0232 N77-34073

SHEFFIELD UNIV (ENGLAND)

A methodology for producing small scale rural land use maps in semi-arid developing countries using orbital imagery [E77-10187] p0257 N77-28552

SOUTH CAROLINA UNIV., COLUMBIA.

Upper Mesozoic magnetostratigraphy p0230 N77-28656

SOUTH DAKOTA STATE UNIV. BROOKINGS.

Integration of land-use data and soil survey data p0211 A77-47477

Inventory of wetland habitat using remote sensing for the proposed Oahe irrigation unit in eastern South Dakota [NASA-CR-153412] p0245 N77-30568

Application of remote sensing in South Dakota to provide accurate inventories of agricultural crops enhance contrast in photographic products monitor rangeland habitat loss map Aspen and prepare hydrogeologic surveys [E77-10237] p0277 N77-33568

STANFORD RESEARCH INST., MENLO PARK, CALIF

HIRIS experiment - Chatanika radar results [AO-A042183] p0271 N77-32669

STANFORD UNIV., CALIF

The display of Landsat data at large scales by matrix printer p0267 A77-47480

Field mapping for heat capacity mapping determinations Ground support for airborne thermal surveys [NASA-CR-152587] p0270 N77-32568

SWEDISH SPACE CORP SOLNA.

Quick-look capability in a European earth resources satellite data network [FU15-4] p0258 N77-28562

T

TEL-AVIV UNIV (ISRAEL)

Antarctic topography from balloons p0221 A77-44594
 Antarctic ice topography and 150 mb circulation from the Nimbus-6 TWERL Experiment p0222 A77-45821

TELEDYNE BROWN ENGINEERING, HUNTSVILLE, ALA

Morphology and physical parameters of a solar flare p0229 A77 45269

TENNESSEE UNIV., KNOXVILLE

Application of a transient flow model to coordinate urban storm runoff data with flow in a receiving reservoir [PB-265204/8] p0244 N77 28483

TEXAS A&M RESEARCH FOUNDATION, COLLEGE STATION

Image analysis library software development [NASA-CR-151489] p0258 N77 28827

TEXAS A&M UNIV., COLLEGE STATION

Effective use of Landsat for range monitoring and management - An example on a regional scale p0208 A77-45765

Applied regional monitoring of the vernal advancement and retrogradation (Green wave effect) of natural vegetation in the Great Plains corridor [E77-10212] p0213 N77-31566

Spectral measurement of watershed coefficients in the southern Great Plains [E77-10225] p0247 N77-33556

Feasibility study of microprocessor systems suitable for use in developing a real-time for the 4.75 GHz scatterometer [NASA-CR-151522] p0264 N77-33568

THOMSON-CBF, VELIZY (FRANCE)

Evaluation of space application problems of a decimillimeter carcinotron [RT-1814] p0270 N77-31593

TOKYO UNIV (JAPAN)

Investigation of environmental change pattern in Japan Classification of shorelines [E77-10224] p0220 N77-33555

Investigation of environmental change pattern in Japan Utilization of LANDSAT-2 data for fisheries [E77-10227] p0241 N77-33558

Application of LANDSAT MSS data to the study of oceanographical environment [E77-10228] p0241 N77-33559

Significant applications of LANDSAT-2 MSS data to marine environment [E77-10229] p0241 N77-33560

General pattern of the turbid water in the Seto-inland sea extracted from multispectral imagenes by the LANDSAT-1 and 2 [E77-10230] p0241 N77-33561

Environmental change pattern in central Japan as revealed by LANDSAT data [E77-10231] p0220 N77-33562

Investigation of environmental change pattern in Japan Investigation of variations in the prominent oceanic current Kuroshio [E77-10232] p0241 N77-33563

Investigation of environmental change pattern in Japan Observation of present state of agricultural land-use by analysing LANDSAT data [E77-10243] p0214 N77-33574

Investigation of environmental change pattern in Japan Investigation of the ecological environment index from observation of the regional vegetation cover and their growing condition [E77-10244] p0214 N77-33575

An analysis on vegetation cover by using LANDSAT MSS data [E77-10245] p0214 N77-33576

TRANSPORTATION SYSTEMS CENTER, CAMBRIDGE, MASS.

ILS glide slope performance prediction multipath scattering [AD-A035298] p0269 N77-29125

TRW SYSTEMS GROUP, REDONDO BEACH, CALIF
Experimental study of digital image processing techniques
for LANDSAT data p0261 N77-31575
[E77-10221]

U

UTAH UNIV , SALT LAKE CITY
Comparative levels of environmental radioactivity in Utah
from industry and fall out A report of radioecological
investigations of airborne radioactivity in the Utah
environment p0219 N77-31297
[UERL-2]
Earthquake surveys of the Roosevelt Hot Springs and
the Cove Fort areas Utah volume 4 p0263 N77-32574
[PB-268421/5]
Gravity and ground magnetic surveys of the central
mineral mountains Utah volume 6 p0232 N77-32578
[PB-268423/1]

W

**WATER RESOURCES ENGINEERS, INC.,
SPRINGFIELD, VA.**
Test of Landsat-based urban hydrologic modeling
p0244 A77-51285

WISCONSIN UNIV , MADISON
Antarctic topography from balloons p0221 A77-44594
Antarctic ice topography and 150 mb circulation from
the Nimbus-6 TWERL Experiment p0222 A77-45821

WISCONSIN UNIV , MILWAUKEE
Manne geophysical instrumentation
[AD-A040048] p0270 N77 31487

CONTRACT NUMBER INDEX

Earth Resources/A Continuing Bibliography (Issue 16)

JANUARY 1978

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the AIAA accession numbers appearing first. The accession number denotes the number by which the citation is identified in the abstract section. Preceding the accession number is the page number on which the citation may be found.

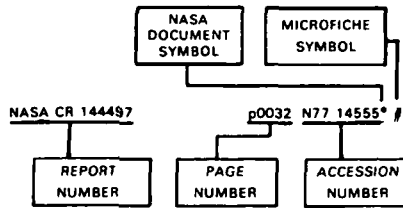
AF PRQJ 2310	p0270 N77 32868	NAS5-20889	p0219 N77-30555	NSF ENG-74-23540	p0258 A77 50986
AF PRQJ 7670	p0259 N77 29679	NAS5-20907	p0284 N77-33569	NSF GA-312	p0226 A77-49327
AF PRQJ 8195	p0246 N77-32567	NAS5-20914	p0281 N77-31565	NSF GA-668	p0226 A77-49327
AF PRQJ 8624	p0227 N77-29702	NAS5-20937	p0232 N77-33570	NSF GA-894	p0226 A77-49327
AF-AFOSR-3271-77	p0228 N77-32569	NAS5-20945	p0245 N77-30554	NSF GA-1434	p0226 A77-49327
AID/CSD-2584	p0275 N77-30590	NAS5-20969	p0213 N77-31576	NSF GA-1523	p0226 A77-49327
CEC-CEE-132/75-1 ENVF	p0218 A77-50997	NAS5-20983	p0217 A77-48735	NSF GA-12825	p0226 A77-49327
CNRS-RCP-215	p0217 A77-48293	NAS5-20988	p0287 A77-48886	NSF GA-17761	p0226 A77-49327
DA PRQJ 1S7-82703-DH 83	p0268 N77-28378	NAS5-21808	p0258 N77-29594	NSF GA-27281	p0226 A77-49327
DA PRQJ 4A0-61101-A-81D	p0263 N77-32572	NAS5-21857	p0208 A77-45765	NSF GA-34148	p0249 A77-42295
DAAB07-74 C-0272	p0268 N77-28378	NAS5-21937	p0217 A77-48735	NSF GB-31882X2	p0208 A77-44471
DAAG53-75 C-0195	p0228 N77-32571	NAS5-21980	p0287 A77-48269	NSF GB-41233X	p0208 A77-44471
DI-6-07 DR-20020	p0266 A77-45224	NAS5-21998	p0229 N77-28551	NSF GI-41896	p0217 A77-46735
DI-14-08-0001 G-215	p0219 N77-30586	NAS5-22325	p0257 N77-28560	NSF GP-5392	p0226 A77-49327
DI-14-31-0001-3503	p0246 N77-30587	NAS5-22384	p0258 N77-28561	NSF GV-23334	p0226 A77-49327
DI-14 31 0001-5105	p0247 N77-33595	NAS5-22389	p0211 N77 28550	NSF GV-27472	p0226 A77-49327
DI-14-34-0001-8044	p0244 N77-28483	NAS5-22389	p0276 N77-31563	NSF INA-AG-199	p0247 N77-33592
DI-14-34-0001-8078	p0246 N77-30593	NAS6-2519	p0276 N77-31564	NSF OGD-71-00271	p0238 A77-49194
DNA001-77-C-0042	p0271 N77-32689	NAS6-2520	p0247 N77-33558	NSF OGD-75-00220-A05	p0238 A77-49194
DOT-CG-81-74-1099	p0220 N77-31587	NAS7-100	p0222 A77-46525	NSF OCE 75-08765	p0235 A77-41918
DOT-CG-63698-A	p0218 N77-28379	NAS7-100	p0240 N77 30442	NSF OPP-74-02238	p0226 A77-49327
DSS-0554-0078	p0256 A77-49395	NAS7-100	p0259 N77-30443	NSF 76-01854	p0207 A77-42015
E(26-1)-0482	p0219 N77 31297	NAS7-100	p0271 N77-33577	NSG-1057	p0236 A77-45732
EPA R 802815	p0216 A77-43376	NAS7-100	p0249 A77-40514	NSG-1127	p0268 N77-28467
EPA R 803517	p0269 N77 28258	NAS8-30653	p0207 A77 42015	NSG-2207	p0211 N77-30551
EPA-R-803896	p0216 A77-43376	NAS8-31768	p0250 A77 44464	NSG-5017	p0243 A77-51280
EPA-68-02-0786	p0218 N77 28574	NAS8-31767	p0237 A77-47451	NSG-5050	p0244 A77-51285
EPA-68-02 1329	p0247 N77-32579	NAS8-31908	p0267 A77-48451	NSG-5080	p0267 A77-47480
EPA-68-02-1883	p0219 N77-28625	NAS8-31979	p0256 A77-49905	NSG-5082	p0270 N77-32568
ESA SC/128-HQ	p0258 N77 28562	NAS8-31984	p0276 N77-31577	NSG-5106	p0212 N77-31559
ESTEC-2925/78-NL-AK	p0270 N77-31593	NAS8-31979	p0260 N77-30565	NSG-5155	p0246 N77-31568
EY-78 C-08 1183	p0246 N77-31592	NAS8-31984	p0229 A77-45269	NSG-7070	p0241 N77-33587
F04701-76 C-0077	p0232 N77-31995	NAS9-14350	p0272 N77-33589	NSG-7220	p0245 N77-30571
F19828-74-C-005	p0256 A77-50966	NAS9-14350	p0264 N77-33590	NSG-8002	p0255 A77-48291
F19828-76 C-0010	p0224 A77-47388	NAS9-14350	p0256 A77-50447	NSG-9033	p0275 N77-31560
F19828-77-C 0001	p0246 N77-32567	NAS9-14350	p0207 A77-43804	NSG-9033	p0212 N77-30569
F30602-75-C-0141	p0262 N77-31588	NAS9-14350	p0211 A77-47450	N0014-74-C-0273	p0210 A77-48738
F30602 75-C-0150	p0251 A77-48755	NAS9-14904	p0271 N77-33582	N00014-87-A-0128-0016	p0256 A77-49394
F44820-72-C-0062	p0251 A77-48733	NAS9-14970	p0237 A77-45901	N00014-87-A0108-0004	p0270 N77-31467
JPL-95324	p0207 A77-42015	NAS9-14970	p0231 N77-30558	N00014-89-A-200-4016	p0228 A77-49327
JPL-954669	p0288 N77-28556	NAS9-15311	p0219 N77-30563	N00014-72-C-0234	p0249 A77-42295
MQV-75-02123	p0218 A77-50997	NAS10-8774	p0207 A77 43804	N00014-75-C-210	p0266 A77-45945
NASA ORDER H-12261-B	p0229 A77-45289	NAS10-8774	p0262 N77 31583	N00014-75-C-0210	p0222 A77-46525
NASA ORDER L-88328	p0246 N77-32567	NGL-03-002-313	p0259 N77 28827	N00014-76-C-0721	p0226 A77-49327
NASA ORDER S-543-47A	p0227 N77 30553	NGL-05-003-404	p0284 N77-33553	N00014-76-C-0721	p0269 N77-28684
NASA ORDER S-53875	p0246 N77 31574	NGL-14-007-041	p0284 N77-33558	W-7405-ENG-28	p0213 N77 31691
NASA ORDER S-54049-A	p0244 N77-28553	NGL-15-005 112	p0211 A77-49611	W-7405-ENG-36	p0247 N77-33592
NASA ORDER S-70243 AG	p0260 N77-30556	NGL-15-005-188	p0245 N77-30568	161-07-02-03	p0232 N77 33734
NASW-2558	p0245 N77 30557	NGL-42-003-007	p0277 N77-33554	176-30-31-11	p0240 N77-30707
NASW-2613	p0278 N77-33584	NGR-03-002-332	p0211 A77-47477	176-30-31-11	p0239 N77-28564
NASW-2790	p0232 N77-34073	NGR-05-007 004	p0245 N77-30568	177 55-89-00 72	p0220 N77-33579
	p0211 N77 28557	NGR-06-002-102	p0245 N77-30568		p0269 N77 30572
	p0259 N77-29729	NGR-10-200-001	p0278 N77 33580		
	p0264 N77-33583	NGT-47-003-028	p0256 A77 50986		
	p0232 N77-34070	NIH-GM-18438	p0238 A77-45852		
	p0278 N77-33585	NQAA-UCSD-5 35406	p0269 N77 28890		
	p0264 N77-33591	NQAA-6-35161	p0269 N77 30591		
	p0261 N77-31575	NQAA-6-35201	p0262 N77 31782		
	p0208 A77-45765	NQAA-04-6-058-44054	p0238 A77-45852		
	p0213 N77-31566	NQAA-04-6-158-44033	p0219 N77 30846		
	p0214 N77-33573	NQAA-04-6-158-44038	p0240 N77-31597		
		NQAA-04-6-158-44043	p0247 N77 32575		
		NQAA-04-6-158-44054	p0226 A77 49327		
		NONR-288(49)	p0228 A77-49327		
		NONR-266(79)	p0249 A77-42312		
		NRC A-2425	p0249 A77-42312		
		NRC A-4480	p0263 N77-32574		
		NSF AER-74-01043	p0232 N77-32578		
		NSF ATM 71-00617	p0250 A77-45739		
		NSF ATM 74 14830-A01	p0252 A77-47031		
		NSF BMS 73 02027-A02	p0208 A77-44471		
		NSF DES-71-00214	p0226 A77-49327		
		NSF DES-72-01371	p0268 A77 50274		
		NSF DES-74-23464	p0249 A77-42295		
		NSF EAR-74-22712	p0227 N77-32564		

REPORT/ACCESSION NUMBER INDEX

Earth Resources/A Continuing Bibliography (Issue 16)

JANUARY 1978

Typical Report/Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The page number indicates the page on which the citation is located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche. A plus sign (+) indicates a document that cannot be microfiched but for which one-to-one facsimile is available.

NASA CR 144497		COSPAR-D 2 3	p0212 N77-30570* #	E77-10228	p0241 N77 33559* #
		CRREL-77-5	p0231 N77-31594 #	E77-10229	p0241 N77 33560* #
		CRREL-77-8	p0245 N77-30581 #	E77-10230	p0241 N77 33561* #
		CSC/TM 75/8145	p0264 N77-33591* #	E77-10231	p0220 N77 33562* #
		DLR-FB-77-09	p0270 N77-32373 #	E77-10232	p0241 N77 33563* #
		DLR-IB-553-75/5	p0278 N77-33697 #	E77-10233	p0277 N77 33564* #
		ONA-4229T	p0271 N77 32669 #	E77-10234	p0277 N77 33565* #
		DOC-77SDS4246	p0278 N77-33585* #	E77-10235	p0277 N77-33566* #
		DOT TSC-FAA-76-18	p0269 N77 29125 #	E77-10236	p0214 N77-33567* #
		ECOM-74-0272-9	p0268 N77 28378 #	E77-10237	p0277 N77-33568* #
		ECOM-5811	p0268 N77 28565 #	E77-10238	p0264 N77-33569* #
		ECOM-5822	p0214 N77 32570 #	E77-10239	p0232 N77-33570* #
		EDFB IBP-76-3	p0213 N77-31591 #	E77-10240	p0278 N77-33571* #
		EDFB-IBP-76-8	p0247 N77-33592 #	E77-10241	p0247 N77-33572* #
		EGG 1183-1877	p0246 N77-31592 #	E77-10242	p0214 N77-33573* #
		EPA-600/2-76 273-A-VOL-1	p0219 N77-28625 #	E77-10243	p0214 N77-33574* #
	p0210 A77-46638	EPA-600/2-76-277	p0218 N77-28574 #	E77-10244	p0214 N77-33575* #
AAS 76-055	p0273 A77-46636	EPA-600/4-76-061	p0269 N77-29258 #	E77-10245	p0214 N77-33576* #
AAS 76-057	p0273 A77-46637*	EPA-600/4-77-020	p0219 N77-30663 #	FAA-RD-76-216	p0269 N77-29125 #
		EPA-600/7-77-039	p0247 N77-32579 #	FHWA-CA-TL-2117 76 57	p0231 N77-31590 #
		EPA-908/4-77-001	p0232 N77-31725 #	FR-76-102-3	p0278 N77-33584* #
		ERIM-114800-35-L	p0211 N77-28550* #	FU15-4	p0258 N77-28562 #
		ERT-1474-F	p0269 N77-30691 #	GPO-93-604	p0276 N77-32562 #
		ESA-CR(P)-963	p0270 N77-31593 #	GSFC/LN-C/004	p0258 N77-29591* #
		ETL-0093	p0228 N77-32571 #	GSFC/LN-C/005	p0258 N77-29593* #
		ETL-0094	p0261 N77-30583 #	GSFC/LU-C/004	p0259 N77-29601* #
		E77 10181	p0211 N77-28550* #	GSFC/LU-C/005	p0261 N77-30592* #
		E77 10182	p0259 N77-30548* #	IAF PAPER SL 77-20	p0275 A77 51549
		E77 10183	p0214 N77-33553* #	IAF PAPER SL 77-44	p0275 A77-51556
		E77 10184	p0229 N77-28551* #	IAF PAPER 77-ST-03	p0211 A77 51568
		E77 10185	p0259 N77-30549* #	IAF PAPER 77 ST 05	p0268 A77 51569
		E77 10186	p0260 N77-30550* #	IAF PAPER 77 84	p0239 A77-51574
		E77 10187	p0257 N77-28552* #	IAF PAPER 77 86	p0238 A77-51422
		E77 10188	p0244 N77-28553* #	IAF PAPER 77 87	p0226 A77-51424
		E77 10189	p0230 N77-28554* #	IAF PAPER 77 113	p0256 A77-51432
		E77 10190	p0230 N77-28555* #	IAF PAPER 77 115	p0257 A77-51433
		E77 10191	p0211 N77-30551* #	IAF PAPER 77 117	p0257 A77-51434
		E77 10193	p0227 N77-30553* #	IAF PAPER 77 118	p0257 A77-51435
		E77-10194	p0245 N77-30554* #	IAF PAPER 77 125	p0257 A77-51436
		E77-10195	p0219 N77-30555* #	IAF PAPER 77 128	p0257 A77-51437
		E77-10196	p0260 N77-30556* #	IAF PAPER 77 130	p0218 A77-51438
		E77 10197	p0245 N77-30557* #	IAF PAPER 77 131	p0218 A77-51439
		E77-10198	p0231 N77-30558* #	IAF PAPER 77 255	p0275 A77-51500*
		E77-10199	p0260 N77-30559* #	INFORMATION-2	p0262 N77-31762 #
		E77-10200	p0260 N77-30560* #	INPE-1044-TPT/056	p0212 N77-30578 #
		E77 10201	p0260 N77-30561* #	INPE-1071-TPT/058	p0231 N77-31579 #
		E77-10202	p0260 N77-30562* #	INPE-1072-TPT/059	p0262 N77-31580 #
		E77-10203	p0219 N77-30563* #	INPE-1075-NTE/101	p0213 N77-31578 #
		E77-10204	p0212 N77-31559* #	INPE-1076-NTE/102	p0231 N77-31581 #
		E77-10205	p0275 N77-31560* #	INPE-1078-NTE/104	p0231 N77-31582 #
		E77-10206	p0240 N77-31561* #	INPE-1085-TPT/061	p0240 N77-31757 #
		E77-10207	p0276 N77-31562* #	IR-4	p0228 N77-32571 #
		E77-10208	p0232 N77-32560* #	IR/BOSTID-77/23	p0275 N77-30590 #
		E77-10209	p0276 N77-31563* #	ISSN-0067-0340	p0219 N77-30646 #
		E77-10210	p0281 N77-31564* #	JSC-S-467	p0269 N77-30572* #
		E77-10211	p0213 N77-31565* #	JSC-11343	p0212 N77-30574* #
		E77-10212	p0213 N77-31566* #	JSC-11656	p0212 N77-30576* #
		E77-10213	p0213 N77-31567* #	JSC-11658	p0212 N77-30575* #
		E77-10214	p0246 N77-31568* #	JSC-11694	p0213 N77-31584* #
		E77-10215	p0246 N77-31569* #	JSC-11854	p0212 N77-30564* #
		E77-10216	p0261 N77-31570* #	KMRD-5 4	p0262 N77-31726 +
		E77-10217	p0281 N77-31571* #	L-11373	p0239 N77-28564* #
		E77-10219	p0213 N77-31573* #	LA 6695-MS	p0232 N77-33734 #
		E77-10220	p0246 N77-31574* #	LACIE 00430-REV-A	p0212 N77-30574* #
		E77-10221	p0261 N77-31575* #	LACIE-00431-REV-A	p0212 N77-30576* #
		E77-10222	p0213 N77-31576* #	LACIE-00433	p0212 N77-30575* #
		E77-10223	p0277 N77-33554* #		
		E77-10224	p0220 N77-33555* #		
		E77-10225	p0247 N77-33556* #		
		E77-10226	p0263 N77-33557* #		
		E77-10227	p0241 N77-33558* #		

REPORT/ACCESSION NUMBER INDEX

LACIE-00453	p0213 N77-31584*	NASA-CR-155033	p0214 N77-33574*	PAPER-570	p0246 N77-30593 #
LARS-INFORM-NOTE-022575	p0231 N77-30558*	NASA-CR-155034	p0214 N77-33575*	PAR-77-3	p0262 N77-31588 #
LARS-INFORM-NOTE-062277	p0219 N77-30563*	NASA-CR-155035	p0214 N77-33576*		
		NASA-CR-155056	p0232 N77-34073*	PB-264171/0	p0275 N77-30590 #
LEC-5778	p0271 N77-33582*	NASA-CR-155156	p0278 N77-33584*	PB-264953/1	p0219 N77-28625 #
LEC-5789	p0271 N77-33581*	NASA-CR-155159	p0232 N77-34070*	PB-265204/8	p0244 N77-28463 #
		NASA-CR-155171	p0241 N77-33587*	PB-265264/2	p0219 N77-30646 #
MA-657T	p0214 N77-33553*	NASA-CR-155190	p0277 N77-33551* +	PB-265414/3	p0239 N77-28566 #
				PB-265455/6	p0218 N77-28574 #
MTR-7433	p0246 N77-32567*	NASA-SP-380	p0275 N77-28548*	PB-265570/2	p0269 N77-29258 #
				PB-265850/8	p0239 N77-29383 #
NASA-CASE-LAR-11973-1	p0244 N77-28563*	NASA-TM-X-71370	p0270 N77-30683*	PB-265851/6	p0239 N77-29384 #
		NASA-TM-X-71374	p0240 N77-30447*	PB-265852/4	p0239 N77-29385 #
NASA-CASE-MS-16253-1	p0262 N77-31583*	NASA-TM-X-71382	p0260 N77-30577*	PB-265940/7	p0227 N77-28688 #
		NASA-TM-X-71387	p0220 N77-32566*	PB-266414/2	p0269 N77-28690 #
NASA-CP-2024	p0276 N77-32549*	NASA-TM-X-71388	p0214 N77-32565*	PB-266420/9	p0244 N77-28571 #
		NASA-TM-X-71395	p0227 N77-32564*	PB-266438/1	p0258 N77-29599 #
		NASA-TM-X-71405	p0228 N77-33588*	PB-266663/4	p0219 N77-30586 #
NASA-CR-141423	p0240 N77-30442*	NASA-TM-58200	p0262 N77-31827*	PB-266771/5	p0269 N77-30588 #
NASA-CR-141425	p0259 N77-30443*	NASA-TM-74060	p0240 N77-30707*	PB-266955/4	p0258 N77-28709 #
NASA-CR-141428	p0271 N77-33577*	NASA-TM-74068	p0220 N77-33579*	PB-267137/8	p0231 N77-31590 #
NASA-CR-145145	p0246 N77-32567*	NASA-TM-74776	p0259 N77-29601*	PB-267280/6	p0232 N77-31725 #
NASA-CR-145218	p0278 N77-33585*	NASA-TM-74825	p0258 N77-29593*	PB-267342/4	p0246 N77-30593 #
NASA-CR-145252	p0260 N77-30565*	NASA-TM-74828	p0258 N77-29591* +	PB-267392/9	p0219 N77-28723 #
NASA-CR-150340	p0260 N77-30568*	NASA-TM-74832	p0212 N77-30564*	PB-267393/7	p0245 N77-29722 #
NASA-CR-150341	p0276 N77-31577*	NASA-TM-74833	p0212 N77-30575*	PB-267504/9	p0269 N77-30591 #
NASA-CR-150378	p0272 N77-33589*	NASA-TM-74834	p0212 N77-30574*	PB-267545/2	p0269 N77-30587 #
NASA-CR-150418	p0264 N77-33590*	NASA-TM-74835	p0212 N77-30578*	PB-267723/5	p0219 N77-30663 #
NASA-CR-150419	p0257 N77-28552*	NASA-TM-74840	p0212 N77-30570*	PB-268003/8	p0246 N77-30587 #
NASA-CR-150419	p0257 N77-28552*	NASA-TM-74859	p0261 N77-30592*	PB-268218/9	p0271 N77-32679 #
NASA-CR-151173	p0214 N77-33553*	NASA-TM-74908	p0278 N77-34049*	PB-268289/6	p0241 N77-33779 #
NASA-CR-151451	p0259 N77-30549*	NASA-TM-74937	p0213 N77-31584*	PB-268421/5	p0247 N77-32579 #
NASA-CR-151452	p0260 N77-30550*	NASA-TM-75029	p0211 N77-28557*	PB-268423/1	p0232 N77-32578 #
NASA-CR-151453	p0259 N77-30548*	NASA-TM-75132	p0275 N77-29729*	PB-268674/9	p0240 N77-31597 #
NASA-CR-151454	p0231 N77-30558*	NASA-TM-78124	p0259 N77-29897*	PB-268713/5	p0220 N77-31598 #
NASA-CR-151468	p0258 N77-28827*	NASA-TM-78130	p0278 N77-33578*	PB-268738/6	p0262 N77-31762 #
NASA-CR-151469	p0219 N77-30563*	NASA-TM-78318	p0230 N77-29672*	PB-268940/9	p0247 N77-33595 #
NASA-CR-151482	p0212 N77-30569*			PB-268967/2	p0277 N77-32575 #
NASA-CR-151495	p0264 N77-33586*	NASA-TN-D-8467	p0239 N77-28564*	PB-269674/8	p0220 N77-33768 #
NASA-CR-151522	p0271 N77-33582*				
NASA-CR-151527	p0271 N77-33581*	NASA-TR-R-472	p0269 N77-30572*	PR-9	p0219 N77-30555* #
NASA-CR-151528	p0257 N77-28560*			PR-10	p0219 N77-30555* #
NASA-CR-152510	p0258 N77-28561*	NASA-TR-F-17544	p0264 N77-33583*	QPR-7	p0276 N77-31563* #
NASA-CR-152511	p0261 N77-31575*			QPR-8	p0276 N77-31564* #
NASA-CR-152552	p0246 N77-31568*	NOAA S/T-77-2953	p0262 N77-31726 +	QR-3	p0277 N77-33551* +
NASA-CR-152574	p0258 N77-29594*			QR-9	p0268 N77-28378 #
NASA-CR-152577	p0270 N77-32568*	NOAA TM-ERL-GLERL-10	p0244 N77-28571 #	RADC-TR-77-145	p0262 N77-31588 #
NASA-CR-152587	p0264 N77-33591*			REPT-3	
NASA-CR-152598	p0245 N77-30568*	NOAA TM-ERL-WPL-21	p0271 N77-32679 #	REPT-3	p0261 N77-31570* #
NASA-CR-153412	p0260 N77-30567*			REPT-6	p0261 N77-31571* #
NASA-CR-153413	p0211 N77-28550*	NOAA TM-NESS-84	p0245 N77-29722 #	REPT-6	p0213 N77-31573* #
NASA-CR-153915	p0229 N77-28551*	NOAA TM-NESS-85	p0219 N77-29723 #	REPT-6	p0258 N77-28594* #
NASA-CR-153916	p0244 N77-28553*	NOAA TM-NESS-87	p0220 N77-33768 #	REPT-6	p0277 N77-33564* #
NASA-CR-153918	p0230 N77-28554*	NOAA TM-NOS-NGS-7	p0227 N77-28688 #	REPT-77SDS4204	p0277 N77-33564* #
NASA-CR-153919	p0230 N77-28555*			REPT-587-VOL-1	p0277 N77-33565* #
NASA-CR-153931	p0268 N77-28467*	NOAA TR-ERL-366	p0258 N77-28709 #	REPT-587-VOL-2	p0277 N77-33565* #
NASA-CR-153939	p0268 N77-28558*	NOAA TR-ERL-382	p0220 N77-31598 #	REPT-587-VOL-3	
NASA-CR-153969	p0212 N77-31559*			RSC-3273-7	p0247 N77-33556* #
NASA-CR-153970	p0275 N77-31560*	NOAA-76071404	p0241 N77-33779 #	RSC-3556-1	p0264 N77-33586* #
NASA-CR-153971	p0276 N77-31562*	NOAA-77020207	p0219 N77-30646 #		
NASA-CR-153972	p0232 N77-32560*	NOAA-77030210	p0239 N77-28566 #	RSL-TR-291-2-VOL-1	p0257 N77-28560* #
NASA-CR-153973	p0276 N77-31563*	NOAA-77031802	p0227 N77-28688 #	RSL-TR-291-2-VOL-2	p0258 N77-28561* #
NASA-CR-153975	p0246 N77-31565*	NOAA-77032904	p0244 N77-28571 #		
NASA-CR-153976	p0211 N77-30551*	NOAA-77032919	p0269 N77-28690 #	RT-1814	p0270 N77-31593 #
NASA-CR-153976	p0245 N77-30554*	NOAA-77041314	p0258 N77-28709 #	SAI-1120-399-S1	
NASA-CR-154258	p0229 N77-30555*	NOAA-77041804	p0245 N77-29722 #	SAI-77-793-LJ	p0232 N77-34073* #
NASA-CR-154259	p0245 N77-30554*	NOAA-77041805	p0219 N77-29723 #		p0219 N77-30555* #
NASA-CR-154260	p0245 N77-30554*	NOAA-77050104	p0271 N77-32679 #	SAMSO TR-77-94	p0232 N77-31895 #
NASA-CR-154261	p0280 N77-30559*	NOAA-77051101	p0262 N77-31762 #	SDSU-RSI-77-08	p0277 N77-33568* #
NASA-CR-154262	p0280 N77-30560*	NOAA-77051117	p0240 N77-31597 #		
NASA-CR-154265	p0280 N77-30561*	NOAA-77051813	p0220 N77-31598 #	SRI-TR-9	p0271 N77-32669 #
NASA-CR-154266	p0280 N77-30562*	NOAA-77052401	p0220 N77-33768 #	SSL-SER-18-ISSUE-44	p0246 N77-31569* #
NASA-CR-154267	p0213 N77-31566*	NOAA-77060203	p0247 N77-32575 #	SSL-SER-18-ISSUE-50	p0213 N77-31576* #
NASA-CR-154796	p0213 N77-31567*			SSL-SER-18-ISSUE-52	p0275 N77-31560* #
NASA-CR-154797	p0246 N77-31569*	NRL-MR-3508	p0262 N77-31702 #	SSL-SER-18-ISSUE-59	p0211 N77-30551* #
NASA-CR-154798	p0261 N77-31570*			SU-TR-76-3	p0270 N77-32568* #
NASA-CR-154799	p0261 N77-31571*	NSF/RA-780752	p0263 N77-32574 #	T-1314/5	p0214 N77-33553* #
NASA-CR-154800	p0213 N77-31573*	NSF/RA-780753-VOL-6	p0232 N77-32578 #	TN-77-2	p0212 N77-30574* #
NASA-CR-154802	p0246 N77-31574*			TR-PGSTR-AP77-57	p0268 N77-28467* #
NASA-CR-154803	p0213 N77-31576*	NTISUB/C/138-004	p0259 N77-29601*	TR-547	p0228 N77-32589 #
NASA-CR-154842	p0245 N77-30571*	NTISUB/C/138-005	p0261 N77-30592*	TR-0077(2250-10)-2	p0232 N77-31895 #
NASA-CR-154843	p0277 N77-33554*	NTISUB/C/139-004	p0258 N77-29591* +	TRW-26232-6004-TU-01	p0281 N77-31575* #
NASA-CR-154983	p0213 N77-32561*	NTISUB/C/139-005	p0258 N77-29593*	U-8252	p0218 N77-28574 #
NASA-CR-155006	p0220 N77-33555*			UERL-2	p0219 N77-31297 #
NASA-CR-155014	p0247 N77-33556*	OALS-BULL-15	p0260 N77-30567* #	UNC-SG-77-04	p0247 N77-32575 #
NASA-CR-155015	p0263 N77-33557*			UNC-SG-77-08	p0262 N77-31762 #
NASA-CR-155016	p0241 N77-33558*	OD-13	p0220 N77-31598 #	US-PATENT-APPL-SN-821881	p0244 N77-28563* #
NASA-CR-155018	p0241 N77-33559*			US-PATENT-APPL-SN-831631	p0262 N77-31583* #
NASA-CR-155018	p0241 N77-33560*	ONERA TP NO 1977-111	p0218 A77-50997 #		
NASA-CR-155020	p0241 N77-33561*				
NASA-CR-155021	p0220 N77-33562*	ORNL-NSF-EATC-27	p0247 N77-33592 #		
NASA-CR-155022	p0241 N77-33563*				
NASA-CR-155023	p0277 N77-33564*	OTR-77-113-VOL-1	p0239 N77-29383 #		
NASA-CR-155024	p0277 N77-33565*	OTR-77-113-VOL-2	p0239 N77-29384 #		
NASA-CR-155025	p0277 N77-33566*	OTR-77-113-VOL-3	p0239 N77-29385 #		
NASA-CR-155026	p0214 N77-33567*				
NASA-CR-155027	p0277 N77-33568*	OWRT-A-027-ARIZ(1)	p0246 N77-30587 #		
NASA-CR-155028	p0264 N77-33569*	OWRT-A-043-TENN(1)	p0244 N77-28463 #		
NASA-CR-155029	p0232 N77-33570*				
NASA-CR-155030	p0278 N77-33571*	OWRT-B-030-OKLA(1)	p0247 N77-33595 #		
NASA-CR-155031	p0247 N77-33572*	OWRT-B-080-IND(4)	p0246 N77-30593 #		
NASA-CR-155032	p0214 N77-33573*				
		PAPER-247	p0219 N77-30646 #		

REPORT/ACCESSION NUMBER INDEX

USAFA-TR 77-3	p0281 N77 30579 #
USCG-D-19-77	p0220 N77 31587 #
USCG-D-125-76	p0218 N77 28379 #
WES-MP H-76-21	p0244 N77-28568 #
WES-TR-M-77-2-1	p0283 N77-32572 #
W77-05931	p0244 N77 28463 #
W77-07812	p0248 N77-30593 #
W77-08206	p0248 N77-30587 #
W77-09268	p0247 N77-33595 #
X-922-77-228	p0227 N77-32564* #
X-922-77-242	p0228 N77-33588* #
X-922-97-199	p0270 N77-30683* #
X 923-77-182	p0220 N77-32566* #
X 923-77-183	p0214 N77-32565* #
X 923-77-210	p0280 N77-30577* #
X-941-77-168	p0240 N77-30447* #

1 Report No NASA SP-7041 (16)	2 Government Accession No	3 Recipient's Catalog No	
4 Title and Subtitle EARTH RESOURCES A Continuing Bibliography (Issue 16)		5 Report Date January 1978	
		6 Performing Organization Code	
7 Author(s)		8 Performing Organization Report No.	
		10 Work Unit No	
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546		11 Contract or Grant No	
		13 Type of Report and Period Covered	
12 Sponsoring Agency Name and Address		14 Sponsoring Agency Code	
		15 Supplementary Notes	
16 Abstract This bibliography lists 543 reports, articles, and other documents introduced onto the NASA scientific and technical information system between October 1 and December 31, 1977. Emphasis is placed on the use of remote sensing and geophysical instrumentation in spacecraft and aircraft to survey and inventory natural resources and urban areas. Subject matter is grouped according to agriculture and forestry, environmental changes and cultural resources, geodesy and cartography, geology and mineral resources, hydrology and water management, data processing and distribution systems, instrumentation and sensors, and economic analysis.			
17 Key Words (Suggested by Author(s)) Bibliographies Earth Resources Program Remote Sensors		18 Distribution Statement Unclassified - Unlimited	
19 Security Classif (of this report) Unclassified	20 Security Classif (of this page) Unclassified	21 No of Pages 134	22 Price* \$9.00 HC

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to ten special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA

University of California, Berkeley

COLORADO

University of Colorado, Boulder

DISTRICT OF COLUMBIA

Library of Congress

GEORGIA

Georgia Institute of Technology, Atlanta

ILLINOIS

The John Crerar Library, Chicago

MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

MISSOURI

Linda Hall Library, Kansas City

NEW YORK

Columbia University, New York

PENNSYLVANIA

Carnegie Library of Pittsburgh

WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA

Los Angeles Public Library

San Diego Public Library

COLORADO

Denver Public Library

CONNECTICUT

Hartford Public Library

MARYLAND

Enoch Pratt Free Library, Baltimore

MASSACHUSETTS

Boston Public Library

MICHIGAN

Detroit Public Library

MINNESOTA

Minneapolis Public Library

MISSOURI

Kansas City Public Library

St. Louis Public Library

NEW JERSEY

Trenton Public Library

NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

OHIO

Akron Public Library

Cincinnati Public Library

Cleveland Public Library

Dayton Public Library

Toledo Public Library

OKLAHOMA

Oklahoma County Libraries, Oklahoma City

TENNESSEE

Memphis Public Library

TEXAS

Dallas Public Library

Fort Worth Public Library

WASHINGTON

Seattle Public Library

WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "*" and "#", from ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av. Charles de Gaulle, 92-Neuilly-sur-Seine, France.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D C 20546
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

SPECIAL FOURTH CLASS MAIL
Book

POSTAGE AND FEES PAID
NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
NASA-451



POSTMASTER

If Undeliverable (Section 158
Postal Manual) Do Not Return

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY <i>Aviation medicine, space medicine, and space biology</i>	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING <i>Engineering, design, and operation of aircraft and aircraft components</i>	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY <i>NASA patents and applications for patent</i>	Semiannually
NASA SP-7041	EARTH RESOURCES <i>Remote sensing of earth resources by aircraft and spacecraft</i>	Quarterly
NASA SP-7043	ENERGY <i>Energy sources, solar energy, energy conversion, transport, and storage</i>	Quarterly
NASA SP-7500	MANAGEMENT <i>Program, contract, and personnel management, and management techniques</i>	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C. 20546