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OVERVIEW OF THE EARTH RESOURCES PROGRAM OF THE JET PROPULSION LABORATORY

by

Donald P. Burcham
Space Science Program Office
Jet Propulsion Laboratory
California Institute of Technology

INTRODUCTION

The Jet Propulsion Laboratory's applicable experience is that gained under NASA support for the unmanned exploration of the solar system, including remote sensing and the processing and interpretation of the resulting data. At the present time the tasks in Earth Resources consist of two continuing ones under the Manned Spacecraft Center, one just awarded, and two proposals outstanding, as shown on the accompanying figure. The two continuing tasks will have their progress reported by John Blinn, and by David Martin, a co-worker of Walter Brown. My presentation will be very brief in describing what has been proposed on the other three tasks.

FIELD REFLECTANCE SPECTROMETER

The Portable Field Reflectance Spectrometer is a fabrication task for a 20 pound portable instrument including recording to make ground measurements in support of the Geologic Investigation proposal. It will employ a filter wheel to measure terrain spectral reflectivity in the range 0.3 to 2.5 micrometers with 2% or better resolution, and will employ ratio techniques to eliminate sky brightness fluctuations.

THE APPLICATION OF ERTS/EREP IMAGES TO GEOLOGIC INVESTIGATIONS

This proposal includes coinvestigators of Caltech and of USGS and is to exploit orbital multispectral photography plus computer

image processing to test their applicability in geologic mapping and in solving some geologic problems such as the discovery and mapping of geomorphic features of ancient, abandoned drainage systems in northwestern and north-central Arizona.

JPL's Image Processing Laboratory (IPL) is accustomed to applying various computer processes to imaging data, such as: contrast stretching, rubber sheet stretching, band ratios, selective digital Fourier filtering, haze removal, etc. It is sufficiently flexible to apply other processes that may be found desirable, such as those developed by Purdue University.

THE APPLICATION OF ERTS/EREP IMAGES TO A WATER QUALITY MONITORING AND INFORMATION SYSTEM

This proposal includes coinvestigators of the State of California Resources Agency, the Scripps Institution of Oceanography, and Caltech. It proposes an investigation to develop and correlate remote sensing from satellites and aircraft into an effective prototype system for California statewide water quality surveillance. Aircraft overflights, computer enhanced recognition of pollution signatures, ground truth measurements, and data processing will be employed to develop a simplified and automated monitoring system.

The ERTS A data would be used for nine major drainage basins of California having unique water quality influences from waste discharges, thermal contributions, oil spills, turbidity, sea water intrusion, agricultural drainage, toxicity, biostimulation, and eutrophication.

JPL EARTH RESOURCES ACTIVITIES

- CONTINUING TASKS

M W STUDIES	(160-75-03)	JOHN C. BLINN
RADAR RADIOMETER	(160-75-03)	WALTER E. BROWN

- JUST AWARDED TASK

PORTABLE FIELD REFLECTANCE SPECTROMETER (160-75-XX)	ALEXANDER GOETZ

- OUTSTANDING PROPOSALS

APPLICATION OF IMAGES FROM ORBIT TO GEOLOGIC INVESTIGATIONS (ERTS)	ALEXANDER GOETZ
WATER QUALITY MONITORING FROM ORBIT (ERTS)	GUNTHER REDMANN

Figure 1.