FINAL REPORT

of the

NCSL REMOTE SENSING PROJECT

for the period of

July 16, 1978 to September 20, 1979

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For the National Conference of State Legislatures
Under NASA Contract #NASW-3230

September 20, 1979

Denver, Colorado

FOREWORD

This report summarizes work performed by the National Conference of State Legislature's Remote Sensing Project under NASA contract #NASW-3230 during the period of July 16, 1978 to September 20, 1979.

Under this contract, NASA provided support to NCSL to maintain a direct communication link to state legislatures to keep them informed and give them a participatory role in the research and development processes of federal agencies involved in land, resource and environmental management technologies. The effort included:

- informational materials for legislators describing the uses, potential misuses, and limitations of satellite technology in decision-making;
- seminars for interested legislators and their staffs providing more detailed information on this technology, its relative costs and benefits; and
- continual updates for legislators on the rapidly changing nature of satellite technology as an aid to the growing needs of energy, air, water, and land management.

The primary objectives of the Remote Sensing Project are to:

- inform the state legislative community of Landsat's capabilities, applications, limitations and cost.
- provide information and support to the NASA Regional Remote Sensing Applications Program and the three primary RAP field centers.
- provide follow-up assistance, as appropriate, to each particular state in response to interest generated from communications activities.
- serve as a focal point for state feedback to NASA, particularly regarding Landsat systems planning and remote sensing technology transfer efforts.

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I. INTRODUCTION

The NCSL Remote Sensing Project has been working to assist legislatures in their evaluation of Landsat technology for about four years. State legislative awareness and understanding of satellite remote sensing has increased dramatically during this period as a direct result of project activities. These activities are discussed more fully in Chapter II.

Individual state workshops are probably the most visible activities of the project. The Project sponsored or participated in 12 such briefings in 10 different states during the project year.

A number of publications were developed or revised during the project year, including:

"The NRIS Newsletter" (formerly "Remote Sensing")

- State Institutional and Technical Approaches to Landsat Utilization
- A Comparison of State Surface Mining Data Requirements to Public Law 95-87, The Surface Mining Control and Reclamation Act of 1977
- Coastal Zone Management: The States' Response
- Colorado Landsat Conference Proceedings
- Regional Workshop Proceedings
- A Legislator's Guide to Landsat
- Landsat: Down to Earth Views from Space

In addition to these publications and meetings, the project also provided individual technical assistance on Landsat technology to legislators, staff and committees, and served as a user awareness agent. Information on successful Landsat applications was distributed to satisfy information requests, and copies of relevant state legislation and resolutions were provided as appropriate.

The NCSL Remote Sensing Project also fulfilled an important role in representing state interests in Landsat technology to the federal government. Programatic and policy recommendations were formulated by the Landsat

Task Force. Testimony and recommendations on Senator Adlai Stevenson's bill to create an operational Landsat system were provided at the request of the Senate Committee on Commerce, Science and Transportation (Subcommittee on Space, Science and Technology). Project staff furthered state interests through participation in the deliberations of the Landsat-D Technical Users Working Group and the NGA Earth Resources Data Council. Also, informal feedback from the states to NASA regarding the Regional Remote Sensing Applications Program was provided, where appropriate.

Internal project management and development were also addressed. NCSL program reviews were conducted to assure the continued legislative relevance of the project. Project expansion was evaluated, and a Long Range Work Plan developed.

The visibility and understanding of Landsat and natural resource information systems were dramatically increased as a result of project activities. The following section will discuss project tasks in somewhat more detail.

II. ACTIVITIES OF THE CURRENT PROJECT YEAR

A. Task 1 - State Natural Resource Legislation Surveys

NCSL has prepared two natural resource legislation surveys during the project year. The first focused on state surface mining programs, and is included as Attachment A. The second analyzed state coastal zone programs, and is included as Attachment B.

Both publications present summaries of relevant state legislation, rules and regulations and programatic activities in all states participating in the respective programs. Where applicable, data requirements reflected in federal rules and regulations are systematically compared with state requirements to determine areas of compliance or noncompliance with federally mandated data gathering activities.

B. Task 2 - State Legislative Committee Briefings and Workshops

The NCSL Remote Sensing Project has conducted eight state legislative committee briefings or workshops. These are listed in Table 1. In addition, the project contributed to one workshop (Oklahoma) sponsored by a University with significant legislative participation.

TABLE 1.

NCSL LANDSAT BRIEFINGS AND WORKSHOPS

DATE	STATE	COMMITTEE
8/15/78	California	Legislative/executive meeting
8/20/78	Oregon	Water Policy Subcommittee
9/28/78	Illinois/Iowa	Natural Resources
1/15/79	Colorado	Legislative/executive meeting
1/23/79	Mississippi	Ways and Means, entire House
2/16/79	Oregon	Agriculture and Natural Resources, entire House
3/22/79	Missouri	Agency/University briefing
6/05/79	Ohio	Agriculture and Natural Resources

C. Task 3 - Long Range Work Plan

NCSL, in concert with the NASA office of Space and Terrestrial Applications and the National Governor's Association, has prepared a long range work plan designed to develop programatic activities to address various issues requiring attention and resolutions that are critical to increased use of remote sensing. This Long Range Work Plan also addressed representation of state interests and the need for technical assistance across the broad spectrum of NASA - developed technologies. The plan is included as Appendix A.

D. Task 4 - Evaluation of Project Expansion

Early in calendar year 1979, project staff prepared "Recommendations for Expansion of the NCSL Remote Sensing Project". This report, contained in Appendix B, contained three major recommendations:

- Shift project emphasis to natural resource information systems, of which remote sensing is one significant input;
- Develop clearinghouse and technical assistance functions for other NASA technologies; and
- Perform a fessibility study on legislative applications of satellite telecommunications.

In subsequent discussion with the project technical monitor and other NASA officials, it was decided to implement the first two recommendations during the FY 80 project year. The third recommendation was not seen as being appropriate for the current NASA role, and implementation has been deferred for now.

E. Task 5 - Landsat Newsletter and Related Information Flow

Twelve issues of "Remote Sensing" were prepared and distributed during the project period. Over 1200 copies of each issue were circulated. A summary of stories by issue for the project period and stories by state since inception of the newsletter are listed below in tables 2 and 3. Copies of all project year newsletters are contained in Appendix C.

TABLE 2

"REMOTE SENSING" NEWSLETTER STORIES

AUGUST, 1978 Vol. 2, No. 3
- Landsat Task Force Meeting
- New Assistant Director Hired
- Landsat Testimony of Capitol Hill
- Seasat-A
- Maryland Landsat Workshop
- Oklahoma Committee Briefing
- NCSL Annual Meeting Concurrent Session
- NCSL Communication Tools Available

SEPTEMBER, 1978 Vol. 2, No. 4
- Texas/NASA Technology transfer Project
- New Jersey Landsat Information System
- Recent Federal Actions Toward Operationalizing Landsat
- NCSL Activities
- Calendar of Events
- Alaska Legislature Reaches Out

OCTOBER, 1978 Vol. 2, No. 5
- Arizona Resources Information System
- Minnesota Land Management Information Center (LMIC)
- Landsat in Mississippi
- Calendar of Events
- Landsat and Oklahoma Water Quality Planning

NOVEMBER, 1978 Vol. 2, No. 6
- Summary of NCSL Landsat Task Force Recommendations
- Landsat Applications in Oregon

DECEMBER, 1978 Vol. 2, No. 7
- Iowa's Landsat Demonstration and Evaluation Project
- Federal Actions Related to Landsat
- California Satellite Project Inventory Completed
- Satellite Roll Call

JANUARY, 1979 Vol. 2, No. 8
- Landsat and the Kansas Legislature
- Earth Resources Data Project
- Landsat in the State of Hawaii
- Landsat in South Carolina
- Calendar of Events

FEBRUARY, 1979 Vol. 2, No. 9
- Mississippi Legislature Explores Use of Remote Sensing to Assist Statewide Property Appraisal
- Landsat Task Force Meeting
- Listing of State Natural Resource Information Systems

MARCH/APRIL, 1979 Vol. 2, No. 10
- Assistance to the Legislatures: Natural Resources Information Systems Project
- Washington State's Approach to the Landsat Application Program
- Colorado Landsat Conference
- Staff Opening
- Note to our Readers
- Calendar of Events

MAY, 1979 Vol. 2, No. 11
- Representative Flinn Testifies on Senate Landsat Bills
- Florida Landsat Feasibility Study
- Landsat-3 Experiencing Problems
- Calender of Conferences and Training Courses
- Technology Application Center, University of New Mexico

JUNE/JULY, 1979 Vol. 3, No. 1
- Surface Mining Reclamation
- Landsat-3 Update
- Calendar of Conferences and Training Courses
- Natural Resource Assessment Needs in Alaska

AUGUST, 1979 Vol. 3, No. 2
- Landsat and Coastal Zone Management
- The Land Resources Information Service of North Carolina
- Calendar of Conferences and Training Courses
- NCSL Communication Tools Available

SEPTEMBER, 1979 Vol. 3, No. 3
- North Dakota Reap Appropriation Bill Vetoed
- New Special Assistant Hired
- The Idaho Landsat Application Program
- Calendar of Conferences and Training Courses

TABLE 3

STORIES BY STATE - ALL ISSUES OF "REMOTE SENSING"

Alaska	6/79	New Jersey	9/78
Arizona	8/77, 10/78	New Mexico	5/79
California	7/78	North Carolina	8/79
Colorado	6/78, 4/79	North Dakota	6/77, 9/79
Florida	5/79	Ohio	10/79
Georgia	5/77, 7/78	Oklahoma	8/78, 10/78
Hawaii	1/79	Oregon	11/78
Idaho	9/79	South Carolina	1/79
Illinois	6/77, 7/78	South Dakota	8/77
Iowa	12/78	Texas	10/77, 9/78, 10/79
Kansas	1/79	Vermont	6/78
Maryland	8/78	Virginia	1/78, 6/78
Minnesota	10/78	Washington	4/79
Mississippi	10/78, 2/79	Pacific North West	5/78
Montana	6/78		

Several other publications were prepared and distributed during the project period. In addition to the Surface Mining and Coastal Zone reports mentioned earlier, three major publications were developed. State Institutional and Technical Approaches to Landsat Utilization is included as Attachment C. Proceedings of the Colorado Landsat Conference is included as Attachment D. Regional Workshop Proceedings is included as Attachment E.

Circulation and distribution of other communication tools has continued. The slide/tape presentation, Landsat in the States, continues to be a popular item. The project brochure, Landsat: Down to Earth Views from Space and pamphlet, A Legislator's Guide to Landsat were both revised, reprinted and distributed extensively. The revised versions are included as Appendix D.

F. Task 6 - User Awareness Agent and Support of NASA Intergovernmental Activities

One of the principal activities of this task has been the provision of technical assistance to state legislatures, committees and individual

legislators and staff. Most of this assistance is provided in conjunction with more formal activities such as committee briefings or workshops. Project staff have pursued all indications of interest and provided copies of sample state legislation and resolutions, technical assistance on potential Landsat applications and information on institutional approaches and management considerations as appropriate.

Throughout the project period, the NCSL Landsat/Natural Resource Information Systems Task Force has served as a spokesman for state legislatures on Landsat and NRIS Technology. The Task Force met twice during the project period: December 18-19, 1978 in New Orleans and July 25, 1979 in San Fransisco. The agendas, policy positions and recommendations resulting from those meetings are contained in Appendix E. This appendix also contains a policy position in support of the Earth Data and Information Service Act of 1979 endorsed by the NCSL State-Federal Assembly and adopted by the full conference at the 1979 annual meeting in San Fransisco as one of the NCSL Goals for State Federal Action for 1980.

The NCSL Remote Sensing Project also provided some support for Landsat related activities in executive agencies. Presentations by project staff were made at four executive agency Landsat workshops, in South Carolina, New Jersey, Missouri and Ohio. The Project Director also serves as an ex-official member of the National Governor's Association's Earth Resources Data Council (ERDC). This participation serves two major purposes: to provide for interproject and intergovernmental coordination, and to make project expertise available to the ERDC.

Additional support was provided to other NASA intergovernmental activities. Continuing support, feedback and liason was maintained with the White House Office of Science and Technology's (OSTP) Intergovernmental Science, Engineering and Technology Advisory Panel (ISETAP). Principal

interface was through the ISETAP Natural Resource and Environment Task Force, which is chaired by Governor Lamm of Colorado and upon which Representative Thomas Anderson of Michigan, member of the NCSL Landsat Task Force, also serves.

The Remote Sensing Project continued to provide support, assistance and informal feedback from the states to the NASA Regional Applications Program (RAP). The RAP program continues to be widely accepted and utilized by states, and NCSL assistance focused on fine tuning of RAP and input on program priorities and problems.

The Project Director also represents NCSL on NASA's Landsat-D Technical Users Working Group (TUWG). State recommendations on the Landsat-D program have been expressed through this mechanism.

III. Conclusion

The NCSL Remote Sensing Project has been successful at providing technical assistance on Landsat Technology to our nation's state legislatures. Table 4 lists selected project accomplishments.

Project activities are continuing during fiscal year 1980. Table 5 lists activities proposed for the following two fiscal years (1981 and 1982).

NCSL looks forward to continuing its relationship with the NASA Technology Transfer Division. Project activities have helped to meet legitimate needs of state legislators, staff and committees for information and technical assistance in this vital new technology. Project recommendations have also met important NASA needs for feedback from state policymakers, program managers and other Landsat data users. Future project emphasis on natural resource information systems technology will serve to both broaden the legislative relevance of the project and put Landsat into the context of operational natural resource information needs. Landsat is not the answer to state information needs, but it certainly is an extremely important "piece of the puzzle". This realization will lead to increased and more intelligent use of Landsat at the state level.

TABLE 4

ACCOMPLISHMENTS OF THE NCSL REMOTE SENSING PROJECT

- BASIC LANDSAT AWARENESS - 1000 LEGISLATORS AND STAFF (46 of 50 States)
- IN-DEPTH BRIEFINGS AND INFORMATION - 250 LEGISLATORS AND STAFF
- INTER-AND INTRASTATE COORDINATION & COMMUNICATION OF LANDSAT ACTIVITIES
- AWARENESS OF NASA'S INTEREST IN PROVIDING TECHNOLOGY TRANSFER ASSISTANCE TO THE STATES
- LEGISLATIVE SUPPORT AND APPROPRIATIONS FOR 6 STATE LANDSAT SYSTEMS (Approx. $750 K)
- FOCAL POINT FOR STATE FEEDBACK TO NASA ON LANDSAT SYSTEMS PLANNING AND TECHNOLOGY TRANSFER
- INTRODUCTION OF THE PRIVATE SECTOR TO THE DEVELOPING STATE LANDSAT MARKET

TABLE 5

PROPOSED FUTURE NRIS PROJECT ACTIVITIES

FY 81 - 82

I. Representation of State Interests

A. NRIS Task Force

1. Provide state perspectives to federal government

2. Review administrative actions and recommend any needed changes

B. Federal Data Coordination

1. Operational Earth Resources System

2. Five Agency Project - multi-resource inventories

3. National Aerial Photography Program

II. Technical Assistance in NRIS and NASA Technologies

A. Workshops and Committee Briefings - up to 16

1. Flexible, modular format

2. Peer matching and expert witnesses

3. Follow-up technical assistance

B. Information and Advisory Assistance - as requested

1. Comparative state information

2. Policy studies and analyses

3. Clearinghouse role

4. Issue briefs on new technologies

C. Publications

1. Remote Sensing and NRIS newsletter

2. Continue current publications

3. Landsat-D: A New Dimension in Earth Sensing

4. State Applications of NRIS and Landsat Technology

APPENDIX A

Long Range Work Plan for the NCSL

Natural Resource Information Systems Project

October 1, 1980 - September 30, 1982

Prepared under Contract NASW-3230 by

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September 21, 1979

INTRODUCTION

Since 1976, the National Conference of State Legislatures has been involved in a two way communications project under NASA sponsorship. The main emphasis of the first three project years was on satellite remote sensing. By way of one communications link - from the states to the federal government - the project looked at potential state applications of Landsat and made recommendations to NASA on how to improve and transfer the technology, thereby representing legitimate state interests in this valuable new tool. By way of the second link - from NASA to the states - the project provided information and advisory assistance to state legislatures on the capabilities, applications, limitations and costs of Landsat technology.

In the fourth project year, beginning in the fall of 1979, the project emphasis and scope will be significantly expanded. The primary thrust will be on natural resource information systems, of which Landsat is but one - albeit vital - input. A secondary thrust will be on applications of other NASA technologies (non-remote sensing).

This enlarged scope, based on a feasibility study on project expansion (Apendix A), is directed to better meet the needs of NCSL and NASA. NCSL management felt that a focus on NRIS technology would increase the relevance of project activities to state legislatures, while NASA management felt that increased use of NRIS technology was crucial to increased usage of Landsat data. Technical assistance on other NASA technologies was also seen as an important service to be provided to NCSL's constituents on behalf of the NASA technology transfer division.

The project is now at a crucial turning point. The foundation for redirection of project activities will be laid during its fourth year. The fifth and sixth project years will have to consolidate this foundation. The purpose of this long range work plan is to outline the evolution of the project and the implementation of the new directions laid out in the project expansion study.

OVERVIEW

The concept of a two way communications link will remain central to project activities. NCSL will continue to represent state NRIS interests to the federal government and provide technical assistance to state legislatures on NRIS and NASA technologies. Table I contains an outline of a work plan to satisfy these objectives. The remainder of this paper will discuss the proposed tasks in more detail.

TABLE I

Long Range Work Plan Outline

I. Representation of State Interests
   - A. NRIS Task Force
     1. Provide state perspectives to federal government
     2. Review and recommendation of administration actions
   - B. Federal Data Coordination
     1. Operational Earth Resources System
     2. Five Agency Project - multi-resource inventories
     3. National Aerial Photography Program

II. Technical Assistance in NRIS and NASA Technologies
   - A. Workshops and Committee Briefings - up to 16
   - B. Information and Advisory Assistance - as requested
     1. Comparative state information
     2. Policy studies and analyses
     3. Clearinghouse role
     4. Issue briefs on new technologies
   - C. Publications
     1. Remote Sensing and NRIS newsletter
     2. Continue current publications
     3. Landsat-D: A New Dimension in Earth Sensing
     4. State Applications of NRIS and Landsat Technology

REPRESENTATION OF STATE INTERESTS

NRIS Task Force

The NCSL Natural Resource Information Systems Task Force will continue to serve as the project "Board of Directors". State legislative perspectives will be prepared in response to current and proposed actions by the Federal government. The impacts of such federal actions on state government will be evaluated and policy recommendations will be formulated and disseminated. Where appropriate, task force recommendations will be reviewed and processed through the NCSL State-Federal Assembly to become official NCSL positions.

Federal Data Coordination

Coordination of federal data collection and production activities is vital to state interests. Such coordination will lead to increased compatibility and usability of the data available to state users, and might lead to increased data availability and decreased data cost. Project staff, under the guidance of the NRIS Task Force, will represent state interests in federal data coordination efforts such as the Operational Earth Resources System (OERS) and the Five Agency Project on common classification systems and standard inventory procedures.

TECHNICAL ASSISTANCE IN NRIS AND NASA TECHNOLOGIES

Workshops and Committee Briefings

Workshops and committee briefings will continue to be a primary thrust of the technical assistance program. Up to 16 workshops will be conducted during the two year period. Each workshop will be custom tailored to meet constituent needs in both substantive focus and length. Subjects will range from general overviews of NRIS and Landsat technologies to detailed reviews of specific applications. Workshop length will vary from 30 minutes to a full day, depending on time available and the exact subject matter to be covered.

Information and Advisory Assistance

The NRIS project will provide technical assistance to individual legislators, staff, committees or task forces on NRIS and NASA technologies as requested. Comparative state information, documentation of particular applications and policy analyses will be provided or developed as necessary. The project will thereby serve as a national clearinghouse for state legislatures on NRIS technology. In addition, issue briefs on new NASA-developed technologies will be prepared for distribution to legislative science and technology staff. The project will serve as a technology broker, putting potential users in contact with NASA technical experts, and providing assistance along the way.

Publications

The many project publications will continue to be an important communications tool. The Remote Sensing and NRIS newsletter will continue at a rate of eight issues per year. Other current publications will be distributed throughout the project duration, including:

- Landsat: Down to Earth Views from Space
- A Legislator's Guide to Landsat
- A Legislator's Guide to Natural Resource Information Systems

- State Institutional and Technical Approaches to Landsat Utilization
- State Surface Mining Program Data Requirements
- State Coastal Zone Program Data Requirements
- State Water Quality Program Data Requirements
- Regional Workshop Proceedings

Two major publications will be prepared during the two year period covered by this long range work plan. During the first year, a brochure entitled Landsat-D: A New Dimension in Earth Sensing will be prepared and distributed. The purpose of this brochure will be to describe the technological improvements of the next generation of Landsats and to discuss and illustrate new applications made possible by these advances. This booklet will be completed about six months before the scheduled launch of Landsat-D.

During the second year of this plan, a publication entitled State Applications of NRIS and Landsat Technology will be prepared and distributed. This report will serve two purposes: To update the summary of state Landsat applications prepared by NCSL for the ISETAP Landsat report, and to expand the scope of the summary to include all NRIS applications

CONCLUSION

This long range work plan has charted a course for project activities in 1981 and 1982. The proposed activities, when completed, should further the missions of both NCSL and NASA. The preparation of specific project proposals and statements of work will, most likely, modify portions of this plan to reflect new NCSL or NASA priorities which are not yet apparent. Nonetheless, this document will serve as a basis for future project directions, allowing the mutually beneficial relationship between NCSL and NASA to continue to evolve and grow.

APPENDIX B

NASA CONTRACT NASW-3230

RECOMMENDATIONS FOR EXPANSION

OF THE

NCSL REMOTE SENSING PROJECT

PREPARED BY:

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March 23, 1979

An examination of NASA technologies relevant to state legislatures and a review of potential project directions with NCSL Science and Technology staff and Project TRAIN (Training Resources and Information Network) staff culminated in the following three recommendations relating to the NCSL Remote Sensing Project. These recommendations, if approved by NASA, would result in the future expansion of the current NCSL project directed solely at Landsat technology and its legislative applications. The rationale leading to each recommendation is also included.

1. Expand the focus of the present NCSL Remote Sensing Project to encompass and center on natural resources information systems, of which remote sensing is but one vital element.

A problem prevalent throughout the duration of the Remote Sensing Project has been Landsat's peripheral legislative applicability when compared to the enormity of state legislatures' problems in obtaining independent, timely, accurate and relevant information for making policy relating to natural resources. This is certainly not to say that either the project or Landsat is not worthwhile. On the contrary, the project has generated a great deal of legislative interest in Landsat technology. This interest in Landsat as a valuable informational tool, however, has stimulated legislators in virtually every state the project has worked with to question the absence of any state-wide efforts to integrate and coordinate the myriad of natural resources information scattered throughout numerous executive agencies.

Legislators simultaneously perceive a need for legislative access to this information and a need to coordinate and integrate such information on a state-wide basis. Often, the information required for legislative natural resource policy-making is not readily available. Other times, legislators are inundated with so much information that efforts to dig out the needed information severely hamper and even prevent effective policy. With the preponderance of information which can be generated by Landsat, legislators welcome the technology but express concern that another layer of information, no matter how useful, will add to the existing labyrinth of data from

which accurate, timely and relevant information necessary for effective legislative policy-making must be drawn. In other words, the introduction of Landsat technology to state legislators (not the mention the reverberations of Proposition 13) has focused the attention on the lack of coordination and integration of natural resources information generated by state agencies. None but a handful of states have mechanisms designed to eliminate duplication of effort and create easy access to available information.

The recommendation to expand NCSL's role to encompass natural resources information systems is a logical step and would benefit state legislatures and states directly. It also falls directly in line with NASA's increased emphasis on geo-based information systems. Emphasis on Landsat would decrease slightly, but its utility within a natural resources information system would certainly be stressed and state requested technical assistance on Landsat would be pursued as vigorously as in the previous project.

2. *Authorize the establishment of a clearinghouse within the expanded project directed toward natural resources information systems and other NASA technologies which may be of legislative interest or have legislative application.*

An examination of NASA technologies reveals little of an operational nature to warrant the expansion of the NCSL project at this time. However, there are numerous technological developments within NASA that are of sufficient legislative interest to warrant the establishment of a clearinghouse within the NCSL project for the dissemination of information and issue briefs on these developments. Technologies to be examined can be broken into two groups:

- Mainline, as opposed to spin off, technology.
- New technologies still under development. Some of these include:
  - air and water quality monitoring techniques;
  - satellite tanker tracking;
  - the vascular aquatic plant program;
  - the activated carbon treatment system;

- satellite search and rescue program;
- energy conservation techniques;
- weather forecasting and monitoring programs; and
- telecommunications.

Of these technologies, telecommunications appears to generate the most legislative interest and has definite potential for legislative applications. The others mentioned are of more interest to state executive agencies than to legislative bodies, but legislatures still must have access to information and updates on these programs, particularly when appropriations are requested. The establishment of a clearinghouse within the project would provide a vital vehicle for dissemination of such information.

3. Authorize a feasibility study to be performed on legislative applications of satellite telecommunications.

The status of telecommunications' programs within NASA and other federal agencies, most notably the National Telecommunications and Information Administration, is understandably nebulous at this juncture. However, the legislative interest perceived through NCSL's Project TRAIN is sufficiently strong enough to warrant recommending the NCSL Remote Sensing Project to conduct a feasibility study on legislative application of telecommunications. Potential areas of applications for satellite telecommunications in the legislatures include:

- Simultaneous broadcast of public policy programs by satellite to many state legislatures.
- Routine teleconferencing to enable legislatures to solve problems through economical interstate communications.
- Crisis communication on topics such as energy, drought and flood.
- Special point-to-point broadcasts such as from the states to Washington, D.C..

Given the certainty of what the federal status of telecommunications will be within the next year, or where the main responsibility for such programs will lie (NASA or NTIA) it is felt that only a feasibility study is warranted presently.

APPENDIX C

REMOTE SENSING

AUGUST, 1978 Vol. 2, No. 3

LANDSAT TASK FORCE MEETING

The first meeting of NCSL's Landsat Task Force was held at NCSL headquarters in Denver, Colorado, on Thursday, July 13, 1978. Twelve of the eighteen members of the Task Force were in attendance, along with NCSL Remote Sensing Project staff and a representative of the Intergovernmental Science, Engineering and Technology Advisory Panel (ISETAP).

The Task Force, chaired by Senator Rolland Redlin of North Dakota, focused primarily on developing state legislative recommendations to the Administration, Congress and NASA on how Landsat technology can be made more useful to state and local government. These recommendations, when finalized, will complement similar reports from ISETAP's Natural Resource and Environmental Task Force, chaired by Governor Richard D. Lamm of Colorado, and a subcommittee of the Space Applications Board (SAB) studying regional technology transfer.

In order to coordinate and compare efforts, Leonard Slosky, staff director for this particular ISETAP Task Force, and Representative Tom Anderson of Michigan, member of the ISETAP Task Force, the NCSL Landsat Task Force and the SAB subcommittee, gave a brief overview of the ISETAP report and the recommendations put forth.

Following this discussion, the Task Force members reviewed, modified and expanded the prepared NCSL state legislative recommendations. NCSL staff is currently preparing a final draft which, upon approval by Task Force members, will be sent to the appropriate members of the Carter Administration, Congress and NASA. Copies of the report will be available from NCSL's Remote Sensing Project by late August.

The Task Force also considered and approved the upcoming activities of the Remote Sensing Project. For more information on the Task Force and its activities, please contact Paul Tessar or Mary Arbogast at NCSL headquarters, (303) 623-6600.

NEW ASSISTANT DIRECTOR HIRED

Ronald W. Hogan will be joining the staff of the National Conference of State Legislatures on August 7 as Assistant Director for the Remote Sensing Project. Ron will be coming to NCSL from the Oklahoma State Legislative Council, where he served as Senior Research Assistant with the Research Services Division. In this position, he was instrumental in presenting Landsat technology to members of the Environmental and Natural Resources Committees of the Oklahoma Legislature. His experience with Landsat and the inner workings of state legislatures should prove very valuable to NCSL's Remote Sensing Project.

National Conference of State Legislatures
Earl S. Mackey, Executive Director

Ronald W. Hogan, Assistant Director
Remote Sensing Project

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LANDSAT TESTIMONY ON CAPITOL HILL

"Landsat is an important technology that is presently making and can continue to make significant, often unique contributions to the information base required for state and local government's management of natural resources," said State Representative Tom Anderson of Michigan testifying before the House Subcommittee on Space Science and Applications (Committee on Science and Technology) on June 27, 1978. Anderson went on to say that "Landsat is now cost-effective for a number of applications and will become more cost-effective in an increasing number of applications." Representative Anderson, a member of the NCSL Landsat Task Force and Science and Technology Committee, appeared on behalf of the ISETAP Natural Resource and Environment Task Force.

Representative Anderson's testimony summarized the recent ISETAP report State and Local Government Perspectives on a Landsat Information System. "Thirty-five states have used Landsat in 197 applications in the planning and management of natural resources. Thirty-three states have institutional mechanisms which could facilitate Landsat use. Ten states have purchased, budgeted or ordered analysis equipment. Twelve states have Landsat programs which are legislatively recognized by enabling legislation, specific appropriations or by resolution. Over 17 million dollars of state funds and state controlled Federally provided funds and nearly 380 person-years of staff time have been invested by the states." Anderson identified the main constraints to the states' use of Landsat as lack of Federal commitment to data continuity and compatibility, data timeliness and inadequate Federal technology transfer. He stressed the need for a Federal commitment.

Congressman Don Fuqua (D-Florida) thanked Representative Anderson for appearing and congratulated the Task Force "on a fine job of assessing the value of Landsat to state and local governments, identifying those factors which serve to inhibit the states' use of Landsat, and on making a number of specific recommendations for improving the Federal Landsat system. This report will be useful to the Office of Science and Technology Policy in making Federal Landsat decisions and the Congress in evaluating those decisions."

SEASAT-A

"A new day in man's ability to view and investigate the oceans has dawned," said Walt McCandless, Seasat Program Manager, referring to the recent successful launch of Seasat-A, the first satellite designed to study the oceans. Following that launch, the satellite is undergoing a 30-day period of engineering evaluation, with scientific and applications development to commence immediately following. With all sensors turned on and all systems go, the new ocean survey satellite will circle the earth 14 times a day and sweep across 95 percent of the ocean's surface every 36 hours.

Although it is primarily an experimental satellite, within a few months it will be used in limited commercial applications. According to an AP news release, major areas of early Seasat data use will be in directing fishermen to more productive fishing areas and routing ships to save fuel and time. Petroleum companies will make early use of the information to obtain better weather and sea forecasts for offshore drilling operations.

The satellite's microwave and infrared instruments will collect data day and night in any type of weather. It is anticipated that the radar sensor on board the satellite will also be useful for data-gathering over the earth's land surfaces.

MARYLAND LANDSAT WORKSHOP

A Workshop on the Utilization of Satellite Data was sponsored by the Maryland Department of State Planning during June. The Conference, aided by NCSL and NASA-Goddard, was organized to acquaint various state agencies in Maryland with applications of satellite data in other states. Twenty-five representatives of legislative committees and ten Maryland agencies attended.

The program included presentations by: Paul Tessar, Director of the NCSL Remote Sensing Project; Ken Hansen of the Oregon Land Conservation and Development Commission; Jerry Schlesinger of the South Dakota Land Resources Information System; Peggy Harwood of the Texas General Land Office; and Wayne Chen and Darrell Williams of NASA-Goddard. Topics covered included an overview of NASA's earth resource program, current state Landsat applications, and Landsat applications in wildlife habitat, stripmining, water quality, coastal zone and forestry assessment.

Maryland, with the aid of NASA-Goddard's Regional Applications Center, is currently developing computer software to integrate categorized Landsat data with their Department of State Planning's automated geographic information system (MAGI). The system has been used extensively by State Planning and other state agencies in a wide range of comprehensive planning, natural resources, and facility siting studies. Maryland was an investigator in the ERTS-1 program and is undertaking a series of demonstration projects including temporal land use analysis and an inventory of liquid waste holding ponds. For further information, contact John Antenucci of the Maryland Department of State Planning in Baltimore at (301) 383-2472.

OKLAHOMA COMMITTEE BRIEFING

On July 11, the NCSL Remote Sensing Project, the Oklahoma Conservation Commission and the Oklahoma Foundation for Research and Development Utilization, Inc., presented a one-hour briefing on Landsat and geographic information systems applications to the Oklahoma State Legislative Council's Joint Interim Committee on Environmental and Natural Resources. The 15 legislators and 15 staff present heard Paul Tessar of NCSL describe the Landsat system and its applications in Texas and North Dakota. Keith Vaughn of the Conservation Commission described his agency's "208" water quality planning program's applications of Landsat. Jim Dawson of the Research and Development Foundation discussed the Foundation's data base and Landsat capabilities.

The Commission and Foundation are currently involved in development of a Landsat capability in consultation with NASA's Earth Resources Lab in Slidell, Louisiana. For further information on the project, contact Keith Vaughn at (405) 521-2384.

NCSL ANNUAL MEETING CONCURRENT SESSION

"Reliable data, readily available for proper evaluation, enables the making of intelligent decisions," stated David Ferguson, Secretary of the Texas Natural Resources Information System, at the State Uses of Satellite Remote Sensing Concurrent Session of NCSL's 1978 Annual Meeting. Approximately 20 were in attendance at the meeting, held Friday, July 7, and heard presentations by Ferguson, Paul Tessar of NCSL, Leonard Slosky of ISETAP, Dr. Don Shull, Virginia Legislative Scientific Advisor, Dr. John Reid of the North Dakota Regional Environmental Assessment Program (REAP) and Thomas Loveland of the South Dakota State Planning Bureau. Cassette tapes of the session are available from Eastern Audio Associates, Inc., in Maryland, (301) 596-3900.

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NCSL COMMUNICATION TOOLS AVAILABLE

The NCSL Remote Sensing Project has recently completed or updated the following communications tools:

A Legislator's Guide to Landsat, 30 pages. A non-technical introduction to Landsat technology for legislators, staff and other policy-makers. Major sections of the booklet include:

- The Importance of Landsat to State Government
- Landsat Overview
- Landsat Applications
- Institutional Approaches to Landsat
- Future of the Landsat Program
- Landsat Information Sources
- Summary and Conclusions

Landsat in the States. A 30-minute slide/tape presentation on state uses of satellite remote sensing. Topics covered include:

- Natural Resource Data Needs
- Basics of Landsat
- Case Studies of Landsat Applications in Texas and North Dakota
- Overview of State Approaches to Landsat Utilization
- The NASA Regional Remote Sensing Applications Program

Landsat: Down to Earth Views From Space, 12 pages. A brochure which briefly introduces state applications of Landsat technology and information sources.

Copies of the booklet or brochure may be obtained, free of charge, from:

NCSL REMOTE SENSING PROJECT
1405 Curtis Street, Suite 2300
Denver, Colorado 80202

Those interested in borrowing the slide/tape presentation should contact Paul Tessar or Mary Arbogast at (303) 623-6600.

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A REVIEW OF STATE LANDSAT APPLICATIONS

SEPTEMBER, 1978 Vol. 2, No. 4

TEXAS/NASA TECHNOLOGY TRANSFER PROJECT

The Texas Natural Resources Information System (TNRIS) Task Force and the National Aeronautics and Space Administration (NASA) recently approved a joint project for improvement of existing capabilities, and the development of new capabilities, within TNRIS for the processing and analysis of remote sensing and other natural resources data. This three-year effort is defined in a Memorandum of Understanding and a Project Plan, which include the objectives, organization, schedule, funding and other aspects of the Project. An Implementation Plan, a Data Collection Plan and other mechanisms are currently being developed to provide for Project initiation and monitoring. This type of program in NASA is called an Applications Systems Verification and Transfer (ASVT).

The capabilities to be developed include three major Subsystems: The Remote Sensing Information Subsystem, oriented around the processing and analysis of satellite imagery, aircraft imagery, and related surface-collected data; the Geographic Information Subsystem, Resources Analytical Subsystem, oriented around computer-aided modeling and assessment routines. For purposes of this Project, the overall capabilities, accessible individually or in concert, will be known as the Texas Natural Resources Inventory and Monitoring System.

The Project offers the opportunity to establish a substantial capability for generating various products on a routine basis or on request to support natural resources planning, management and other decision-making and state agency needs. A primary objective of this effort is to develop products and information which directly support the decision-making process in the participating agencies and not just materials which show the "potential" of some data source or analytical approach. To this end, a User Advisory Group was established which provides direct input from the natural resource agencies to the Project Team which will be generating selected products for use in developing, testing and evaluating the system.

The initial focus for test and evaluation of the capabilities will be in a selected test area of the Coastal Zone with test areas in other parts of the state to follow. The User Advisory Group currently consists of representatives from those TNRIS member agencies having responsibilities and interests in the coastal region of the state. For example, support to the General Land Office's Coastal Management Program will be an important part of the initial work on the project.

This joint effort between NASA and the TNRIS participating agencies, supported by the TNRIS staff, offers a unique opportunity to significantly improve the state's ability to utilize remote sensing and natural resources data to support on-going agency needs within the Coastal Zone and elsewhere. For additional information on the project, contact Sam McCulloch of TNRIS in Austin, Texas, at (512) 475-3321.

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NEW JERSEY LANDSAT INFORMATION SYSTEM

The New Jersey Division of State and Regional Planning has integrated Landsat data with computerized maps of the State's political jurisdictions and watersheds. This statewide information system is used to provide land cover information to decision-makers in a context to which they can easily relate. A system of interactive, English-dialogue computer programs permits planners and natural resource managers to analyze Landsat data for any of the state's 567 municipalities, 21 counties and 118 watersheds.

These data are currently being used to provide land cover maps and acreage statistics for water quality planning purposes. Five counties and parts of several others, comprising 2694.45 square miles, have been mapped in eight categories:

- forest
- vacant/pasture
- cropland
- high density urban
- low-density or suburban
- barren/extractive/bare soil
- wetland
- surface water

The mapping pin-pointed severe deficiencies in conventional data sources. Conventional sources report harvested cropland rather than the planted acreage. Conventional data for barren/extractive activities were not available. Other conventional sources were similarly unreliable, and the conventional acreage totals could not be reconciled with the actual land areas of the counties.

The Landsat data suffered from none of these problems, since acreage measurements were ensured for all parts of the counties, and the data were internally consistent. The date of the imagery chosen, however (July 1976), caused some confusion between certain bare soil types and urbanization in the southern portion of the state. Utilizing Landsat's multi-temporal capability should enable the Division of reduce this problem.

The state will be expanding its use of Landsat by obtaining interactive computer graphics equipment and using the categorized data as input to various modeling processes. In addition, merging the remote sensing data with demographic information, which can also be displayed by municipality, will provide a powerful graphic tool for decision-making. For further information, contact Richard Binetsky, Chief of Regional Planning, at (609) 292-8916.

RECENT FEDERAL ACTIONS TOWARD OPERATIONALIZING LANDSAT

State and local government officials are not alone in their efforts to prod the Carter Administration into moving the Landsat program from the experimental to the fully-operational stage. Congressional hearings on the prospects of Landsat were held last year in both houses, and this year U.S. congressional committees, such as the Senate Commerce, Science and Transportation Committee, as well as individual congressmen, such as Rep. Don Fuqua, D-Fla., have recommended that the government consider moving toward an operational system.

According to an article on Landsat in the July 22, 1978 issue of "National Journal", pressure from Congress to obtain an immediate decision from the Administration, however, is somewhat less intense this year since the Administration is in the middle of reviewing U.S. space policy. President Carter has appointed Frank Press, Presidential Science Advisor and Director of the Office of Science and Technology Policy, to chair an interagency policy review committee for space programs.

Press's committee is charged with conducting a wide-ranging review of civilian space programs, which is where Landsat fits in. The committee requested input from the states regarding their experiences with Landsat and their recommendations for change. Via the Intergovernmental Science, Engineering and Technology Advisory Panel (ISETAP),

an advisory group to Press's office, the states responded to the committee's request and presented it with very strong arguments in favor of operationalizing the Landsat program. (See Remote Sensing, Vol. 1, Nos. 6 and 7, and Vol. 2, Nos. 2 and 3)

Additionally, as part of the policy review of the U.S. space program being conducted by the Space Policy Review Council, a subcommittee has been formed to study the civil satellite program which will include the evaluation of converting Landsat to a fully-operational program. While indications within the Carter Administration and the Congress appear to favor a full-scale, operational Landsat program, a move in this direction has not yet been made.

NCSL ACTIVITIES

The NCSL Remote Sensing Project participated in three state Landsat meetings during the month of August. On the 10th, the project, in cooperation with Oregon Landsat users, presented a 90-minute briefing on state Landsat water resource applications to the Oregon Subcommittee on Water Policy of the Joint Committee on Trade and Economic Development. Paul Tessar of NCSL, Ken Hansen of the Department of Land Conservation and Development, and Steve Brutscher of the Department of Water Resources participated in the briefing.

On August 15-16th, the California Environmental Data Center (CEDC) and the Remote Sensing Project cosponsored the California Conference on Intergovernmental Data Coordination. The sessions featured several panel discussions on federal, state and local data coordination efforts. An introduction to Landsat technology and its applications in the states was presented by Paul Tessar. Tom Loveland of the South Dakota Land Resources Information System and Charles Palmer of the Texas Natural Resources Information System described their states' experiences in applying Landsat derived information. Approximately 100 representatives of the legislature, federal, state and local agencies, the universities and the private sector were in attendance.

On August 22, the University of South Carolina, the Land Resources Conservation Commission, the Division of Research and Statistical Services, and NASA cosponsored a conference on Remote Sensing Applications in South Carolina. Topics covered in the sessions included a general orientation to Landsat, specific areas of use, a discussion of what other states are doing, a review of what South Carolina has done, and a look to the future.

CALENDAR OF EVENTS

September 16-18	International Educators Nimbus-G Conference; Santa Maria, CA. Contact: B. M. Donahoe, NASA Ames Research Center, (415) 965-5544.
September 20-21	Conference on Thermal Infrared Sensing Technology in Energy Conservation Programs; Chattanooga, TN. Contact: William D. French, American Society of Photogrammetry, (703) 534-6617.
October 10-12	Fourth Pecora Symposium - Remote Sensing and Wildlife Management; Sioux Falls, SD. Contact: Dr. Michael E. Berger, National Wildlife Federation, (202) 797-6881.
October 23-26	The Large Area Crop Inventory Experiment (LACIE) Symposium; Houston, TX. Contact: Beverly Cumpton, (713) 845-5711.

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ALASKA LEGISLATURE REACHES OUT

Alaskans who hunt and fish for their meals and for sport were agitated over legislative proposals which would affect their way of life.

Some 100 of them testified, pro and con, on the bills, but they didn't have to travel to the capitol in hard-to-reach Juneau.

Instead, they went to nearer cities with centers for the Legislative Teleconference Network.

There, the witnesses gathered in a hearing room and gave their testimony through an intercom-like device which transmitted to a Juneau legislative hearing room.

The Legislative Teleconference Network connects five cities to Juneau through microwave and satellite communications. The network is a dedicated, closed, circuit system. For covering vast distances in Alaska, it works better than radio or telephone.

Although the network primarily is audio, video transmissions have also been used on several occasions, enabling witnesses at the remote centers and legislators in Juneau to view each other.

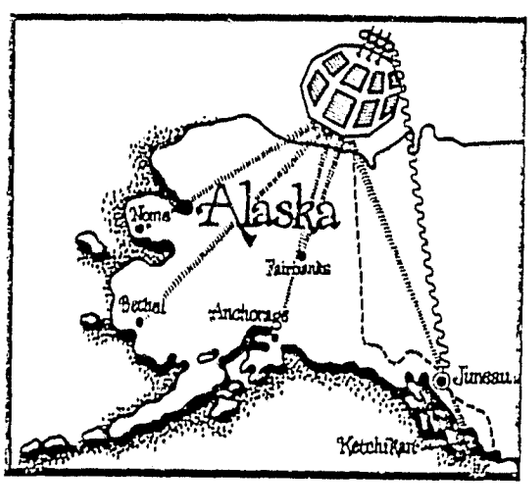
The Legislative Teleconference Network was established on the recommendation of a task force created by the 1977 legislature to improve communications with remote areas.

The effort received a $93,000 appropriation, with the task force using about $13,000.

During the 1978 session, the network has been used for more than 50 teleconferences. Legislative committee chairmen are enthusiastic about the network, reports Peter Fromuth, network coordinator for the Alaska Legislative Affairs Agency.

A bill passed by the house and before the senate would double the network's capacity next year, Fromuth said.

The biggest turnout of witnesses using the network was for the bills affecting subsistence living (those who fish and hunt for daily needs).



Beams to Juneau—*Legislators in Juneau can communicate across vast distances with citizens in five other Alaska cities through the Legislative Teleconference Network's satellite and microwave technology.*

Large numbers of witnesses also used the system for hearings on municipal revenue sharing and state aid to special education, Fromuth added.

Many of those giving testimony via the network wouldn't have testified if they had to travel to Juneau, Fromuth said.

The network has also cut down on the need for some committee travel, Fromuth noted.

In addition to transmitting legislative testimony, the network is also used for conducting daily business between the Legislative Affairs Agency in Juneau and its offices in three other cities.

Executive branch agencies have also used the network for such functions as a meeting of regional public health nurses.

The Legislative Teleconference Network is one of the most successful but not the first legislative effort to reach out to remote areas.

In the 1977 session, the legislature used a radio and toll-free telephone call-in system for receiving testimony. But technical and procedural problems arose with it, Fromuth said. □

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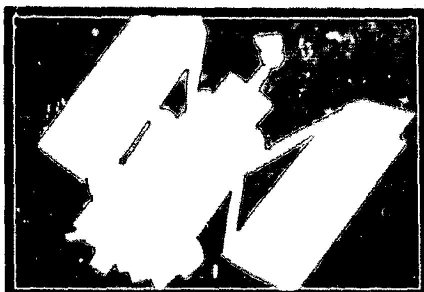

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OCTOBER, 1978 Vol. 2, No. 5

ARIZONA RESOURCES INFORMATION SYSTEM

In 1972, the Arizona legislature established the Arizona Resources Information System (ARIS) in order to improve Arizona's capabilities to support land and natural resource management at all levels of state and local government. The basic goal of the program was to provide organizational and technological capacity and scientific competence for the analysis and evaluation of land alternatives, resource development and environmental protection. ARIS was charged with maintaining and developing methods of providing data for natural resource areas such as soil conservation and classification; food production, forecast, storage and disposal; irrigation management; disease and pest prevention and control; forest protection, logging, regeneration; range inventory and improvement; wildlife control and endangered species protection; mineral and fuel inventory, exploration, forecast and pricing; land use and natural resource inventory; land evaluation; water resources inventory and management; development of regional land use plans, etc.

The first major source of remotely sensed data utilized in the ARIS Program was multispectral photographic images acquired primarily from special aerial cameras. With the advent of the Landsat program, a new and highly prolific source of multispectral image data was suddenly available. The extensive multispectral data collected from Landsat-2 launched in January of 1975, the data collected from Landsat-1, projected data from Landsat-3, -D and -D', and vast amounts of data from airborne multispectral cameras and multispectral scanners are a gigantic data bank available for processing by ARIS personnel. The rapidly increasing number of users throughout state and local government recognize this growing bank of image data as an invaluable tool in the management of Arizona's land and resources. Applications cut across almost every conceivable discipline. The data can be used to classify and measure crops, show urban land usage, measure specific land areas, relate economic activity, locate geological features, evaluate water resources and perform almost any task falling in the province of future potential revenue producing resources. Based on the assumed continued availability of Landsat imagery, Arizona could advance into a more ambitious program of mapping their land and natural resources more effectively.

All sectors in Arizona are utilizing remotely-sensed data, particularly Landsat. The state agencies using Landsat for various planning and management activities are: State Land Department, Arizona Game & Fish Department, Office of Economic Planning and Development; Arizona Water Commission; and Arizona Oil & Gas Conservation Commission. The major use of remotely-sensed information by counties and towns is in the areas of land use and potential use. It is also used by government groups to set up regulations for land use and to enforce its compliance. These tools have been a major help in controlling runaway development of land in the last 10 years.

The major use by federal agencies is in the production of land inventories - inventories

used to determine the impact of various ongoing and proposed projects on the environment. Federal agencies who are active users of ARIS-derived information include: Department of Agriculture, Crop and Livestock Reporting Service and Soil Conservation Service; Department of the Interior, Bureau of Land Management and Geological Survey; National Park Service; and National Forests. The private sector uses the information in the design phase of almost every project involving land use, and to evaluate the impact of the projects upon the environment. The benefit to these users lies in the area of cost and time savings through the elimination of costly ground survey phases of land management projects.

The major benefit to state government is in providing sound information as a base for policy and regulative decisions. It provides the justification for regulative actions, and has been used to provide information and problem definition for legislative actions.

ARIS, using Landsat and the compositing methods now known, can provide the capability of far greater understanding of the tremendous complexities of the future of Arizona and the needs of its governmental agencies. There is no doubt that such data is one of the most critical information keys to understanding Arizona's morphology and changing growth. For further information on the ARIS project, please contact Dr. Michael Castro of ARIS at (602) 271-4061 in Phoenix, Arizona.

MINNESOTA LAND MANAGEMENT INFORMATION CENTER (LMIC)

The 1977 session of the Minnesota State Legislature created a Land Management Information Center within the State Planning Agency. This action brought into the state government system the Minnesota Land Management Information System (MLMIS) which was formerly housed at the University of Minnesota. The new Information Center is composed of three sections - MLMIS, an applications assistance group called PLANS, and a Mapping and Remote Sensing Information Center (MARSIC). The present LMIC staff is composed of seven professional staff members and eight student interns.

The purpose of LMIC is to centralize and analyze data on Minnesota's resources. Three statewide grid data files have been developed - a forty acre file with detailed resource information, a 25 square kilometer system with more generalized resource information and a file based on the 7-and-1/2-minute grid of the U.S.G.S. topographic maps which is used to generate future mapping priorities. More detailed studies are also conducted on a project basis using 2.5 acre grid cells. All of these data files are manipulated by a software system called Environmental Planning and Programming Language (EPPL), developed to retrieve data in tabular, statistical, map or computer file form.

Since LMIC became operational in August of 1977, it has responded to data requests from over 200 agencies including the Legislature, governmental agencies at all levels (state, federal, regional, county, local), private industries, public interest groups and private citizens. Services were provided on an at-cost basis to over 40 agencies, with most of the data base development cost covered by state appropriations. In addition, ten agencies have committed staff to use the State system and/or data in their specific resource management study areas.

On August 21, 1978, Wayne Chen and Jim Weber of NASA's Eastern Regional Applications Center gave a presentation on Landsat applications to approximately 20 interested persons. Because of the interest in applying Landsat to state operational issues, LMIC will continue to explore Landsat technology, work on ways to develop a Landsat service center in Minnesota and ultimately develop a means to merge Landsat data with MLMIS. For further information on LMIC, please contact Al Robinette, Director, LMIC, at (612) 296-1211.

LANDSAT IN MISSISSIPPI

The use of Landsat data in Mississippi has been a cooperative effort of the state universities and federal, state and local agencies. The development of this project as a joint effort has been necessitated by budgetary considerations and the organization of state government. The major utilization of Landsat data will be accomplished through its incorporation into a geographically referenced state data management system.

The Mississippi Landsat program is a portion of the second part of a two-phase land resource inventory and analysis program begun in September of 1973. The Mississippi Research and Development Center, National Aeronautics and Space Administration, and several substate planning districts participated in the project. The first phase of this program was the production of 1,425 township maps covering the entire state, each delineating up to 51 categories of manually interpreted land use and land cover data. These maps were derived from NASA high altitude imagery.

The second phase is the development of a statewide data base and land use analysis system. The U. S. Soil Conservation Service, assisted by the Research and Development Center, is now encoding this land use data and soil survey data to produce the first two levels of information in the state data base. This UTM-referenced system will be incorporated into the Research and Development Center's in-house Landsat processing system (a batch-oriented system). Presently, the Center, with technical assistance from NASA, is in the process of adding an automatic classifier and a geographic reference program to this system.

Presently, the Landsat system is being used primarily in the development of HUD 701 regional planning functions. In addition, it is being used in the classification of land cover in portions of the state's coastal region. This classification, in combination with data modeling systems, will assist in determining the impact of on-shore development caused by outer continental shelf development.

A multi-agency study was conducted in the state's largest wildlife habitat area for the purpose of determining the carrying capacity of the whitetail deer for the area. This project involved the utilization of a data base which included land cover, soils and crown coverage. Landsat has also been utilized in a limited manner in 208 planning in one area of the state.

A Landsat-assisted study of Washington County was undertaken which incorporated soils data in conjunction with Landsat classification of crops to project crop suitability per soil class and estimate yields per acre. This project provided very accurate results.

For further information on Landsat activities in Mississippi, please contact Eddy Downing at (601) 982-6339, or Paul Davis at (601) 982-6354.

CALENDAR OF EVENTS

October 10-12	Fourth Pecora Symposium - Remote Sensing and Wildlife Management; Sioux Falls, SD. Contact: Dr. Michael E. Berger, (202) 797-6881.
October 23-26	The Large Area Crop Inventory Experiment (LACIE) Symposium; Houston, TX. Contact: Beverly Cumpton, (713) 845-5711.
November 7-10	National Symposium on Wetlands; Orlando, FL. Contact Dr. Phillip E. Greeson, U. S. Geological Survey, W.R.D., National Center, Mail Stop 412, Reston, VA, 22092.

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LANDSAT AND OKLAHOMA WATER QUALITY PLANNING

"Our involvement in the development of the statewide water quality management plan for Oklahoma caused us to look for a tool to assess the nonpoint sources of pollution," said Leonard Solomon, Executive Director of the Oklahoma Conservation Commission. He continued, "With the time constraints for completion of the plan, Landsat was the most logical choice we could make."

Nonpoint sources of pollution are diverse in nature and the entire land surface must be considered when assessing the severity of water quality problems related to nonpoint sources. In Oklahoma, this involves approximately 44.5 million acres.

Several other pieces of information in addition to Landsat imagery were needed to completely assess nonpoint sources of water pollution in the state. These included soils data, roadside erosion, sanitary landfill locations, topographic features, watershed boundaries and rainfall information. Literally, mountains of statistics and calculations are involved.

The mass of information necessitated the use of computers to manipulate the various pieces of data. A contract was negotiated with the Oklahoma Foundation for Research and Development Utilization, Inc. for computer services. Also, the foundation acquired an interactive display system to process the Landsat computer compatible tapes. This enables the Conservation Commission to use the soils information furnished by the Soil Conservation Service to complement the Landsat imagery.

At the present time, plans are being developed for the 59 stream segments in the state. Landsat is being used to update vegetative cover changes which helps identify areas that may be contributing to the pollution of streams. Further use of Landsat is anticipated in monitoring water quality after best management practices to control nonpoint sources of pollution are installed.

"We have received assistance from the Earth Resources Lab, Slidell, LA; Johnson Space Flight Center, Houston, TX; Soil Conservation Service, Stillwater, OK, and others in getting this data base established," said Solomon. "Without this help the system would not be in operation today." For further information on the project, contact Keith Vaughn of the Oklahoma Conservation Commission at (405) 521-2384 in Oklahoma City.

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NOVEMBER 1978 Vol. 2, No. 6

SUMMARY OF NCSL LANDSAT TASK FORCE RECOMMENDATIONS

The NCSL Landsat Task Force, chaired by Senator Rolland Redlin of North Dakota, recently compiled and distributed a report detailing the recommendations on Landsat technology which they feel are necessary for the states to fully reap the benefits from satellite remote sensing. These recommendations are divided into two categories and a brief summary of each recommendation follows:

Policy & Institutional Recommendations

1. The Task Force feels the federal government should make a firm commitment to assure the continuity of Landsat data and the federally run Landsat program.

2. The Task Force believes that a configuration of satellites is needed to assure data continuity in the event of satellite failure. At least one, and preferably two backup satellites should be available on the ground to assure operation over a number of years.

3. The Task Force feels the federal government should recognize the importance of involving governors and state legislators in technology transfer efforts.

4. Since state and local agencies having responsibilities in the natural resource and environmental areas represent a large and important segment of the current and potential Landsat user community and their involvement in such is vital, the Task Force strongly recommends that the federal government make a commitment to prior consultation with the state and local governments in all federal Landsat policy and technical decisions.

5. The Task Force believes the federal government should increase funding for Landsat technology transfer activities. A coordinated program of orientation, training, demonstration projects and on-going technical assistance must be complemented by research and development of new, practical applications and technological updates.

6. The Task Force believes that federal agencies, who have generally not been supportive, should be encouraged to use Landsat to meet their own data needs and to work with their state counterparts to collect and utilize Landsat data as appropriate. Federal agency use is likely to stimulate state use.

7. The Task Force strongly recommends that the federal government designate a lead agency to deal with Landsat matters.

8. The Task Force believes the involvement of the private sector is crucial to

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the success of the Landsat program and feels there are several potential areas to which they can contribute.

9. The Task Force feels that universities and other institutions of higher education will continue to be valuable in assisting states in the use of Landsat. State agencies should utilize university expertise to the extent possible in the development of state programs.

10. The Task Force recommends that the federal government recognize Landsat as a 'public good' and encourage its use. It should also recognize the nonquantifiable nature and incremental benefits of better information for natural resource decision-making provided by Landsat.

11. The Task Force recognizes the Landsat-D program, with improved Thematic Mapper capabilities, as a postive step.

12. The Task Force recommends that Landsat data products be in the hands of users within 2 weeks of ordering. Also, an emergency access system of data delivery (24-48 hours) during natural or man-caused disasters should be implemented.

13. The Task Force recommends that Landsat data be considered a public service and all research and development, data acquisition, preprocessing, archiving and cataloging be considered a federal expense, with the price to state and local users limited to the cost of data reproduction and distribution.

Technical Recommendations

1. The Task Force recommends the federal government implement and maintain an all-digital ground data handling system to provide a reasonable capability for rapid, repetitive data acquisition and dissemination capable of supporting a variety of applications.

2. The Task Force believes the current and planned selection of Landsat data products are adequate to states as baseline products.

3. The Task Force feels that future data should be compatible with existing information.

4. The Task Force believes the service-oriented Landsat system should be complemented by a continuing research and development program for remote sensing technology.

5. The Task Force feels that generally applicable software should be developed in a centralized operation and then distributed through a software library to the interested users.

6. The Task Force recommends that rapid, convenient access to suitable browse files be continuously available and that an NCIC state affiliate in each state would be a viable method of improving state and local access to data.

7. The Task Force recommends that the Department of Defense declassify military aircraft and satellite remote sensing data of the U.S. to the fullext extent possible, consistent with natural security concerns.

For more information on the NCSL Landsat Task Force and its report, please contact Paul Tessar of the NCSL Remote Sensing Project in Denver at (303) 623-6600.

LANDSAT APPLICATIONS IN OREGON

Landsat data analysis is a continuing activity in Oregon as work is beginning on the second of two three-year projects to utilize satellite remote sensing technology for natural resource planning and management. The Landsat Applications Program (LAP) is funded by the Pacific Northwest Regional Commission (PNRC), comprised of the Governor's of Idaho, Oregon and Washington.

In the Fall of 1974, PNRC recognized the tremendous potential as well as proven capability of the Landsat system as a tool to be used in resource planning and management. At that time, the Governors funded a program from 1975 to 1978 called the Land Resources Inventory Demonstration Project (LRIPD). Valuable support was also provided to the LRIPD, as well as the LAP, by the USGS EROS and Geography Programs and the NASA Ames Research Center. The overall goal of the LRIPD was to provide accurate & current natural resource and land cover information upon which to base planning activities and management decisions in the Pacific Northwest. A primary objective of this project was to provide an opportunity to a variety of resource planning and management agencies in Idaho, Oregon and Washington to extract, use, and evaluate information derived from satellite multispectral data and other remote sensing sources.

Single and multi-agency demonstration projects were funded in a variety of disciplines and dispersed throughout the three-state region. In Oregon, eight separate projects have been undertaken in such fields as forestry, agriculture, wildlife habitat, water resources, urban and rural land cover, surface mining, and noxious weeds. Because of the success of the three-year LRIPD, the Regional Commission has agreed to support the current Landsat Applications Program.

Oregon LAP activities have been planned largely by state agency representatives who participated in LRIDP in 1975-78. Emphasis in choice of projects is placed on agency participation in developing products that will serve the agencies' operational needs including need for updating the information base in the near future. Three application projects and two training/education activities are the result of first-year planning in Oregon.

The Oregon Water Resources Department will analyze 15 of Oregon's 18 drainage basins for land use activity, compute acreage statistics for each land use and prepare interpretation aids for subsequent updating. The land use categories include irrigated and non-irrigated agricultural land, forest land, range land, urban land, water bodies and special areas (barren land, lava flows and wetlands). The data acquired will be used by the Oregon Water Policy Review Board in maintaining policies on water use. Since irrigation is the greatest single use of water, the location and amount of irrigated and potentially irrigable land is an important data base.

Crook County Planning Department cooperatively with U.S. Forest Service, Ochoco National Forest, Bureau of Land Management, Prineville District and Oregon State University Extension Service have proposed a resource inventory of vegetation/land use for Crook County and the Ochoco-Crooked River Planning Unit of the Ochoco National Forest which lies outside Crook County. Products of the joint analysis endeavor include a mapped and statistical inventory of vegetation/land use which meet the requirements of the Statewide PLanning Goals and Guidelines and can be updated at suitable intervals in the future. Some 21 classes of agriculture, forestry and rangeland resources including water, alkaline soils and exposed rock or barren soils will be sought.

The Oregon Department of Fish and Wildlife is planning to map habitats for the Bridge Creek and South Fork Walla Walla elk herds in the Blue Mountaings of northeastern Oregon. They will analyze digital Landsat data, deriving vegetation composition as well

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as structure in the Winter and Summer ranges and migration routes for an area of about 100,000 acres. Research findings will then be incorporated into elk herd management programs. With accurate knowledge of habitats, ODFW can determine impacts of climatic extremes, forest harvest practices and volume of hunting permits on elk population.

The Environmental Remote Sensing Applications Laboratory of Oregon State University is considered to be the primary provider of Landsat data analysis for Oregon LAP activities. Consequently, a workshop will be conducted at ERSAL/OSU Computer Center aimed at familiarizing Oregon LAP participants with the PIXSYS digital data analysis system. Personnel from state and county agencies dealing with natural resources will be the primary audience for the three-day session. Through lectures, demonstrations, "hands-on" experience, examination of case studies and discussions of recent developments in remote sensing technology, approximately 20 workshop attendees will become acquainted with the potential to incorporate the use of remotely sensed data in their resource management activities. Emphasis will be on integrating the use of Landsat data with other data sources in order to maximize flexibility of extracting information suited to specific information needs.

A course entitled Remote Sensing in Resource Analysis will be offered at Oregon State University three times during LAP. Attendance will be mostly by undergraduate and graduate students form various departments: forestry, rangeland resources, crop and soil science, geology, geography, botany, civil engineering, fish and wildlife. It is probable that such a course will build up the pool of students trained in remote sensing who may eventually accept jobs in the Pacific Northwest.

The above inventory/application and training/education projects have been funded with first-year LAP money. It should be noted that planning is already underway for future LAP activities in Oregon. The second year will bring a continuation of the Water Resources Project, as well as consideration of various potential projects including: elk habitats in the Central Coast Range, fire control planning in northeastern Oregon, surface mine inventory and monitoring in the Willamette Valley, state agency administrator's workshop, and county planner's workshop. For further information contact Ken Hansen at (503) 378-2978 in Salem, Oregon.

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IOWA'S LANDSAT DEMONSTRATION AND EVALUATION PROJECT

The evaluation of potential soil erosion is the principle subject of a project designed by Iowa agencies to investigate the utility of Landsat data for state resource problems. Other subjects include evaluating land use, wildlife habitat and proposed transportation corridors. Personnel from the Iowa Departments of Agriculture, Soil Conservation, and Transportation, the Iowa Conservation Commission, the Iowa Geological Survey, Iowa State University and the U.S. Soil Conservation Service are participating. This Landsat demonstration project is made possible as a result of NASA's Regional Applications Program as administered through the Earth Resources Laboratory (ERL), located in Slidell, Louisiana.

In a state where more than 48% of the land is tilled each year and planted to corn and soybeans, soil is obviously both a valuable resource that needs to be protected and a potential source of water pollution. An intensive analysis of a small watershead will be used to evaluate the applicability of Landsat data and related data handling techniques to soil erosion problems. The erosion potential of the basin will be assessed using the Universal Soil Loss Equation.

Two of the most important variables in the equation are slope and land cover. Slope data will be extracted from the digitized, detailed, modern soil survey of the 70 square mile basin. Land cover will be determined using processed Landsat data. Merging the land cover and slope data, along with the other factors, in a data base will allow the investigators to map areas of high potential soil loss. Also, the total erosion potential of the basin will be computed. Information on land use, extracted by slope classes, will be generated.

The implications for developing this capability in Iowa are significant. Current soil erosion potential could be assessed over either large or small areas as it never could before. This information would be useful to establish specific policies and goals for both existing and new conservation programs. It would also allow an accurate evaluation of the actual effects of these programs.

Three other topics are being investigated in this demonstration project. Land use catagories will be mapped and tabulated for central Iowa using 1973 and 1978 Landsat images. For a small area, the converison of prime agricultural land from agricultural to non-agricultural use will be documented. For other areas, the distribution and types of land cover will be assessed in order to determine wildlife habitat suitability. In addition, land use within a proposed transportation corridor will be extracted and used to assess the data for preliminary planning of arterial highways.

The project will be conducted January 15-19, 1979. About 10 people from the Iowa agencies will travel to ERL and participate in the evaluation. Planning and coordination of this program has been conducted by the Iowa Geological Survey Remote Sensing Laboratory. Inquiries should be addressed to Bernard Hoyer or Patrick McAdams at (319) 338-1173.

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FEDERAL ACTIONS RELATED TO LANDSAT

The President's new space policy and two recent U.S. Senate bills could have far-reaching effects on the future of satellite remote sensing in the United States and throughout the world.

President Carter's Civil Space Policy, announced October 11, continues the present national Landsat policy endorsing an experimental, research and development effort while delaying making the Landsat program operational. Key provisions included:

- The U.S. will continue to provide data from the developmental Landsat program for all classes of users. Operational uses of data from the experimental system will continue to be made by public, private and international users. Specific details of the system and its management will evolve over the next several years.

- A comprehensive plan covering future technical, programmatic, private sector and institutional arrangements will be completed in time for the FY 1981 budget cycle. The administrator of NASA will head a task force to examine the options for developing an integrated national system.

- NASA, the Department of Commerce and other federal agencies will prepare a plan to encourage the private sector to invest and participate in non-military remote sensing systems.

Rather than endorsing the status quo, the NCSL Landsat Task Force had recommended that the federal government take steps to make the remote sensing system operational, increase technology transfer assistance and clearly define federal agency roles and responsibilities.

Immediately after the President's space policy statement, U.S. Sen. Adlai Stevenson (D-Ill) introduced the Earth Data and Information Service Act of 1978 (S. 3589) which is more responsive to the NCSL Task Force's recommendations. Co-sponsors were Howard W. Cannon (D-Nev), Wendell H. Ford (D-Ky), Edward D. Zorinsky (D-Ne) and Donald W. Riegle (D-Mi). "...A useful operational system can only be developed by exposing the existing experimental effort to the demands and pressures of the user community," Stevenson said. "I believe further that the utility of remotely-sensed data has been sufficiently demonstrated to warrant this transitional step from experimental to operational status."

The main purpose of Stevenson's bill is to establish the framework for an operational satellite remote sensing information system within seven years. Under the act, NASA would develop and operate remote sesnsing systems on a global basis to provide rapid and accessible data at a reasonable cost to all users. While all satellites would remain under control of the federal government, the private sector would be encouraged to provide equipment and services to promote maximum use of the system. The information service's general manager is to report to the NASA administrator, and is charged with developing and managing the Earth Data and Information System. The bill provides for participation of user communities in the initial planning and operation of the information system. The communities also would help establish a schedule of user charges which would recover costs of the service within seven years exclusive of research and development expenditures.

Another important bill, the Earth Resources Information Satellite Act (S. 3625) was introduced during the last days of the 95th Congress by U.S. Sen. Harrison Schmitt (R-NM). The legislation provides for establishment, ownership, operation and regulation of a commercial earth resources satellite corporation.

Following the same structure as the Comsat Corporation which provides operational communications satellite services, the earth resources corporation would develop an operational satellite remote sensing service with active participation by private industry. The Federal Communications Commission would be responsible for regulation of the corporation.

CALIFORNIA SATELLITE PROJECT INVENTORY COMPLETED

An overview of the applications of satellite technology, entitled California in Orbit, was recently released by the NASA Remote Sensing and Technology Transfer Project at Humboldt State University. The survey reflects the diversity of programs in the state making use of satellite data, high altitude aircraft photography and other remote sensing tools. Designed as a quick reference, it should be useful to state, federal or local agencies, private industry and educational institutions in California.

The survey was developed to provide a communication link among users of the technology and to create a framework for updating information in California regarding remote sensing activities. To receive a copy of the study, contact: Kamila Plesmid, NASA Remote Sensing Project, Schmidt House 90, Humboldt State University, Arcata, CA 95521. (707) 826-3112.

SATELLITE ROLL CALL

Eight sensitive instruments aboard a new NASA satellite will conduct the most thorough "annual physical" of the Earth's health to date. NIMBUS-7 launched on October 23, 1978, is the first satellite dedicated to daily monitoring of the Earth's atmospheric and oceanic environment. From nearly 600 miles above the planet, NIMBUS-7 will help answer questions such as:

- Is the Earth's cooling off leading to another ice age?
- Is the Earth's warming up leading to world wide floods?
- Is the Earth's protective ozone layer being affected by man-made or natural pollutants?

The continuous environmental data provided by NIMBUS-7 will help scientists determine the physical characterization of the global atmosphere, the oceans, the dynamic atmosphere-ocean interface and the Earth's heat balance - information vital to man's understanding of climate, oceanography, atmospheric pollution and regional and global weather patterns.

Another satellite, TIROS-14, launched on October 13, 1978, is the first in a series of 8 third generation operational weather satellites. The significant technological advances represented in the satellite will allow:

- Improved weather analysis resulting in more accurate weather forecasts;
- More specific location of ocean currrents and upwelling, important to fishing and shipping interests;
- More precise snowcover, snowmelt and rainfall data, essential to water resource management and flood forecasting; and
- The collection and transmission of environmental data from platforms on land, at sea and airborne with precise locational reference for mobile platforms.

After the initial engineering checkouts are completed, the satellite will be turned over to the National Oceanic and Atmospheric Administration's (NOAA) National Environmental Satellite Service (NESS) for operation. The information should prove useful for

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oceanographers, hydrologists and meterologists (including the T.V. variety).

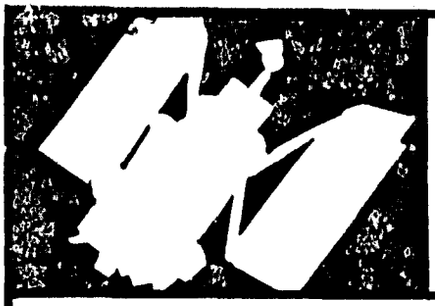
A third satellite, the Heat Capacity Mapping Mission (HCMM), launched on April 25, 1978, is designed to conduct geologic and hydrologic research in areas scattered throughout the United States, Canada, Europe and Australia. Its primary objectives are to:

- Produce maps for thermal inertia measurements for discrimination of rock types and mineral resource location;
- Measure plant canopy temperatures to determine water transpiration and plant stress;
- Measure soil moisture effects on soil temperature;
- Map thermal effluents - both natural and man-made; and
- Observe snow fields to predict water runoff.

Landsat-3, with one exception, is performing as expected. Many images have been acquired and the quality is reported as excellent, particularly from the new, improved, Return Beam Vidicon (RBV) cameras. These data, with a minimum resolution or "spot size" of 40 meters, will be collected on a quarterly basis for the entire U.S. and other worldwide areas within range of a ground receiving station.

The thermal scanner on Landsat-3, however, has developed problems. One of the two detectors in the instrument is not operating. NASA scientists are currently attempting to determine the usefulness of the data from the remaining detector and developing procedures for formating the available information for users.

SEASAT-1 was declared out of commission on November 8, 1978, after 3 months in service. An onboard short circut developed which drained power faster than the solar arrays could recharge the satellite's batteries, necessitating an early retirement for this significant NASA initiative.



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LANDSAT AND THE KANSAS LEGISLATURE

The 1978 Special Committee on Agriculture and Livestock of the Kansas Legislature was charged with the study of assessing corporate farming activities in the state. A study entitled "Agricultural Land In Kansas: The Issue of Corporate Control" was completed by the Kansas Legislative Research Department for use by the committee. The final draft of the study, which will be completed in the Spring of 1979, focuses on three major issues: (1) the examination of corporation farming activity in Kansas during 1976 and a comparison of those results with a similar study done in Kansas in 1973-74, (2) an examination of six counties in Kansas to assess the relationship between corporate farming and the irrigation of agricultural holdings, and (3) a discussion of foreign corporate involvement in Kansas agriculture.

In order to develop reliable information on the issue of corporate involvement in irrigated farming, data was obtained from the Kansas Applied Remote Sensing Laboratory at the University of Kansas to interface with other data on corporate farms. The Remote Sensing Laboratory, under the direction of Ed Martinko and Joe Porascky, was able to identify both gravity flow and center pivot irrigation in each of the six counties. The remote sensing data was plotted on county maps. Irrigated acreage was identified on these maps and a computer then printed out a list containing the legal descriptions for the irrigated acreage in each of the six counties under study. The list of irrigated legal descriptions was cross-referenced with the legal descriptions of land controlled by agricultural corporations in each county. Through a comparison of this information, the study was able to identify what types and how much acreage was irrigated by corporations in those counties for 1976.

This type of information is important to state legislators who are trying to assess the relationship between the growth of corporate farms and the growth in irrigated acreage. The concern expressed stems from an awareness of the rapid depletion of Kansas' invaluable groundwater supply and its impact on the region's future. Responsibility for the depletion of this resource is the crux of the issue.

The information developed using remote sensing technology is useful to the state legislature in a number of ways. Analysis of Landsat data pinpointed all types of irrigated acreage in a county and aided in the obtaining of legal descriptions and owner-operator identification from other state records. The data can be overlayed on a soil conservation map to discern what types of soils are being irrigated. The irrigated acreage maps are also useful to wildlife management personnel who are concerned with wildlife preservation and migration in a changing environment. Most importantly however, the maps developed by remote sensing provide legislators with visual aids in comprehending the issue, its geographic placement and implications to the future of the area under study. For further information on the Kansas study, contact Ron Smith at (303) 623-6600, or Dr. Edward Martinko at (913) 864-4775.

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EARTH RESOURCES DATA PROJECT

On behalf of the National Governors' Association's Committee on Natural Resources and Environmental Management, the Council of State Planning Agencies (CSPA) has initiated a project to advise NASA on the remote sensing applications and technology transfer needs of state and local governments. An issue of concern to CSPA and NASA is that it is often difficult for states to acquire the use of cost-effective remote sensing data and other new technology appropriate to their needs. That is especially important today, as states find their responsibilities to manage natural resources have increased at the same time that budget cut-backs are threatening to reduce their capacity for using earth resources data.

The project includes the following elements:

1. Long Range Work Plan. CSPA will identify issues critical to more effective use of remote sensing data and other new technology by state and local governments, and prepare a detailed three to five year work plan to address these issues. Special attention will be paid to input from state-affiliated groups who are concerned with natural resources programs to identify work plan items. The plan will provide the framework for ongoing communication between state and local governments and NASA.

2. Earth Resources Data Council. In addition to drawing upon the experience and expertise of state-affiliated groups in natural resources, CSPA will look to a special advisory council of state representatives appointed from each of the 10 standard federal regions. Council members include key policy and planning staff with remote sensing technology applications experience and broad knowledge of state needs. The Data Council will have three meetings to review progress, and develop future project activities and recommendations. Because Council members will be responsible for communication within their region, the Council will be closely involved in all project activities, including preparation of the long-range work plan and coordination of the states' input to the Landsat program.

3. State and Local Requirements for the Operational Landsat System. CSPA, in concert with the Earth Resources Data Council will document state and local government requirements for Landsat data in light of studies already conducted by state-affiliated groups and state-composed advisory panels on the operational Landsat system. The scope of the analysis will include performance characteristics for the technical system based on the perspective of state and local governments, as well as the types of data products and supporting services required by states. Policy and institutional issues will include recommendations on data pricing, marketing approaches, and government roles that would result in more effective use of Landsat by state and local governments.

4. User Communications/Information Flow. CSPA will coordinate a two-way exchange of information on state applications with NASA and state and local users. As part of this task CSPA will distribute information on the project through quarterly newsletters published by NGA and CSPA and prepare a Landsat Policy User's Brochure explaining Landsat technology to Governors, executive agency directors and state policy staff. Efforts will also be made to coordinate with state-affiliated groups and professional organizations, particularly the NCSL Remote Sensing Project, and to use existing communications networks where possible.

For further information about this project, please contact Ms. Peggy Harwood, Council of State Planning Agencies, 444 North Capitol Street, Washington, D.C. 20001, or phone (202) 624-5386.

LANDSAT IN THE STATE OF HAWAII

In the State of Hawaii Landsat technology is being reviewed by an Ad Hoc Remote Sensing Committee. This is a multi-disciplinary group comprised of representatives from the Department of Planning and Economic Development (DPED), Department of Agriculture, Department of Land and Natural Resources, Governor's Office of Environmental Quality Control, and the County of Hawaii Planning Department. The Ad Hoc Committee operates under the administrative auspices of the DPED and is studying Landsat data applicability to such areas as coastal zone management, land use, forestry, agriculture, and environmental quality.

Discussions between representatives from NASA's Ames Research Center and DPED and other interested State and County agencies, conducted in the fall of 1977, led to the formation of the Ad Hoc Committee and subsequent development of Hawaii's initial plan for a Landsat demonstration project.

The Ad Hoc Committee, with strong support from NASA, embarked on a Landsat classification of land use/cover and water categories in two test sites. A classification of urban-related use/cover categories was performed for the Honolulu-Pearl City region on the Island of Oahu. A similar classification for non-urban/rural use/cover categories was performed for a portion of the Island of Hawaii.

Ad Hoc Committee members spent two weeks at the Ames Research Center in July, 1978, conducting computer analysis of Hawaii Landsat data. Technical assistance for this phase of the project was provided by the staffs of NASA-Ames and the USGS Geography Program.

The results included line-printer and color-coded hard-copy classifications of the two test sites. Tabular acreage summaries for each land use/cover and water category were also derived from the analysis. The results are being reviewed for their validity and relevance to State and County agency needs.

Landsat technology's ability to provide new data on a repetitive basis also holds much promise for planners and managers in Hawaii. In order to evaluate this aspect of the technology, a change detection demonstration project employing multi-date Landsat coverage of Hawaii is scheduled for early 1979. The project will examine Landsat technology's ability to provide useful information in the monitoring of land use/cover and water conditions.

Further information on Hawaii's demonstration effort can be obtained from Shoji Kato, Head, Planning Division, DPED, at (808) 548-3042, or by writing to him at P.O. Box 2359, Honolulu, Hawaii 96804.

LANDSAT IN SOUTH CAROLINA

Never one to do things in a small way, South Carolina has really latched on to NASA Landsat technology and has already undertaken a number of Landsat related activities. With support from the NASA Earth Resources Laboratory, South Carolina has for the past year been engaged in demonstration projects which include: surface water inventory, forest inventory, vegetation zones in coastal areas, eagle habitat study, environmental effects of river diversion and erosion hazard assessment.

In yet another project, the South Carolina Land Resources Conservation Commission with support from the U.S. Bureau of Mines, is evaluating mining activities in the state via Landsat digital analysis. Study areas ranged from 5 to 200 acres and were

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composed on non-metal and non-coal mine sites. By use of Landsat digital data, mines in selected counties were located, classified and measured in terms of the mining components such as active mine, reclamation, etc. and were monitored for change detection from 1974-76.

On August 22, 1978, over 130 interested participants gathered at the University of South Carolina for an introduction to Landsat and its future direction. The South Carolina Land Resources Conservation Commission, Research and Statistical Service, the University of South Carolina's Computer Services Division and NASA joined forces to support a successful conference. Guest speakers from across the nation detailed their uses and experiences with Landsat. Their presentations enabled participants to view both pros and cons of Landsat digital analysis. South Carolina's conference enabled potential users in the state to evaluate Landsat in terms of other states' "operational" experiences rather than from a pure research standpoint.

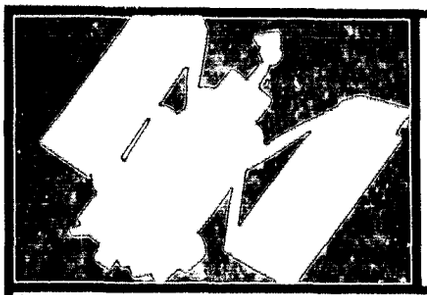
As a result of these activities with NASA as well as the Bureau of Mines, the state is proceeding to institutionalize its Landsat capability within the Computer Services Division of the University of South Carolina. The necessary software packages have been obtained and hardware is currently being procured.

In addition, to assist South Carolina in developing its own capability to utilize Landsat technology, NASA's Earth Resources Laboratory in Slidell, Louisiana, has provided a variety of orientation and training programs to South Carolina personnel.

For further information on Landsat activities in South Carolina, contact Nick Bayne at (803) 758-7197 in Columbia.

CALENDAR OF EVENTS

January 8 - 12	Coal Surface Mining Remote Sensing Workshop, Sioux Falls, SD. Contact: David M. Carneggie, (605) 594-6511.
March 5 - 9	Introduction to Renewable Resource Inventory Methods, Berkeley, CA. Contact: UC at Berkeley, Div. of Letters & Sciences (415) 642-1061



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MISSISSIPPI LEGISLATURE EXPLORES USE OF REMOTE SENSING TO ASSIST STATEWIDE PROPERTY APPRAISAL

Mississippi legislative reappraisal specialists are focusing on a statewide mapping program as the first step toward court-ordered equalization of property taxes by 1983. A House Ways and Means Subcommittee, chaired by Representative H.L. "Sonny" Merideth, is now drafting a reappraisal bill which includes a provision requiring the state to provide accurate maps to county assessors. To see if satellite photography could be used in this effort, the NCSL Remote Sensing Project, NASA officials from the Earth Resources Laboratory (ERL) in Slidell, Louisiana, and Mississippi university remote sensing specialists were requested by Representative Bill Wilkerson to brief the subcommittee at its meeting on January 23, 1979. Representative Wilkerson is a member not only of the House subcommittee but also of the the NCSL Landsat Task Force.

Paul Tessar, NCSL Project Director, presented the subcommittee with an introductory review of Landsat and reviewed state applications of Landsat in North Dakota, Texas, Kansas and Montana, the last two of which are utilizing satellite-derived information in projects closely related to the Mississippi problem.

Roy Estess, ERL's Regional Application Program Manager, discussed the results of integrating satellite data with other natural resource information, such as soil survey data, in recent Mississippi projects undertaken with NASA assistance.

Henry Byers and Paul Davis, both from the Mississippi Research and Development Center, and Frank Miller, Mississippi State University, briefed the subcommittee on their respective remote sensing programs and capabilities.

The subcommittee expressed appreciation for the various briefings and technical assistance. The members, however, felt the immediate need was to map each separately-owned parcel of land in the state and they voiced a desire to explore the costs of obtaining large scale aerial photography for use as a map base in the plotting of individual tracts. Nevertheless, the subcommittee did feel that Landsat-derived information might very well be brought into play during actual reassessment after property lines have been mapped. As a result, follow-up discussions will soon be taking place between pertinent officials of the Mississippi State Tax Commission, the Mississippi Research and Development Center, Mississippi State University and NASA Earth Resources Laboratory to explore development of a pilot project designed to integrate satellite derived data and low-altitude photography into a land appraisal system.

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LANDSAT TASK FORCE MEETING

On December 18 and 19, 1978, the NCSL Remote Sensing Task Force convened to develop recommendations and a resolution on the Earth Data and Information Service Act of 1978 (S.3589) and recommendations on the Space Policy Act of 1979 (S.3530). Additionally, the Task Force made several recommendations regarding 1979 state legislative activities, one of which portends a significant change in focus for the NCSL Remote Sensing Project. These and other events are discussed more fully below.

Resolutions and Recommendations

On behalf of the Task Force, the resolution and recommendations on the two Congressional bills were submitted for consideration by Chairman Rolland Redlin to the bills' sponsor, Senator Adlai E. Stevenson. The resolution endorsed the enactment of the Earth Data and Information Service Act. The accompanying recommendations reflect minor substantive changes in both bills to better address the needs of state and local government. The Task Force urged the following on:

S.3589 - The Earth Data and Information Service Act

1. Reflect a public service concept in the Earth Data and Information Service charter.

2. Establish procedures to incorporate existing mechanisms to obtain input from representatives of various user sections regarding civil remote sensing policy.

3. Clarify the technology transfer role of the service, particularly to state and local governments.

4. Require federal natural resource agencies to use and encourage the use of Landsat type data, wherever practical and cost-effective, to meet data requirements of themselves and their state counterparts.

5. Provide for the widest practical satellite remote sensing data continuity and compatibility, development and distribution of computer software and development of regional and state browse files to assist users in data screening and selection.

6. Develop a continuous, reliable and compatible civil remote sensing system at the earliest practical date, phased over an interim period of seven to ten years.

S.3530 - The Space Policy Act

1. Enactment of the U.S. Congress of the Space Policy Act after due consideration of its financial implications.

2. Maintenance of an adequate NASA budget level, adjusted for inflation, and reprogramming of space shuttle funds in support of the goals of the Space Policy Act.

Full texts of the resolution and recommendations are available upon request to Paul Tessar, Remote Sensing Project Director. (Story continued on page 4)

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IMPORTANT NOTICE

Beginning in early 1979, three NCSL Newsletters (Remote Sensing, Science and Technology for the Legislatures and Energy Report to the States) will be combined into a single monthly publication entitled The Legislative Resource. Extensive attention will continue to be paid to remote sensing issues in the new combined newsletter.

If you wish to continue on our mailing list, you must fill out the subscription renewal form above and should return it to NCSL as soon as possible. We look forward to continuing our communications with you.

LISTING OF STATE NATURAL RESOURCE INFORMATION SYSTEMS

During the course of responding to an information request, the Remote Sensing Project compiled a listing of state geographic or natural resource information systems. We felt this would be of interest to our readers and have reproduced it below. If you have any questions, additions, or corrections, please let us know.

SYSTEM NAME	CONTACT	PHONE
Alabama Resource Information System (ARIS)	Walter Stevenson	(205) 832-6400
Arizona Resource Information System (ARIS)	Mike Castro	(602) 271-4061
Georgia Resource Assessment Program	Bruce Rado	(404) 656-3164
Iowa Water Resources Data System (IWARDS)	Bernie Hoyer	(319) 338-1173
Louisiana Areal Resource Information System (LARIS)	Glenn Daigre	(504) 923-4580
Maryland Automated Geographic Information System (MAGI)	John Antenucci	(301) 383-2472
Minnesota Land Management Information System (MLMIS)	Alan Robinette	(612) 296-1211
Mississippi Data Management System	Eddy Downing	(601) 982-6339
Montana Geo-Data System	Tom Dundas	(406) 449-2890
New Jersey Geographic Base File	Bob Mills	(609) 292-2857
New York Land Use and Natural Resources Inventory (LUNR)	Chuck Guinn	(518) 474-7690
North Carolina Land Resource Information System (LRIS)	Jim Haddox	(919) 733-3833
North Dakota Regional Environmental Assessment Program (REAP)	Rich Giddings	(701) 224-3700
Ohio Capability Analysis Project (OCAP)	Garry Schaal	(614) 466-6557
South Carolina (Not yet named)	Nick Bayne	(803) 777-7237
South Dakota Land Resource Information System (LRIS)	Jerry Schlesinger	(605) 715-3628
Texas Natural Resources Information System (TNRIS)	John Wilson	(512) 475-3321
Virginia Resource Information System (VARIS)	Bill Breen	(804) 786-7831

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LANDSAT TASK FORCE MEETING - CONTINUED

Briefings

The Task Force was briefed on NASA Technology Transfer Activities by Mr. Floyd Roberson, Director of the NASA Technology Transfer Division. Mr. Alex Tuyahov, Manager of NASA's User Requirements Section, presented NASA's response to the Task Force Recommendations made in July 1978 concerning federal policy on Landsat technology.

In addition, an overview of the recently intitiated NGA/Council of State Planning Agencies' Earth Resources Data Project was given by Ms. Peggy Harwood, Project Director. The Staff Director of the ISETAP Natural Resource and Environment Task Force, Mr. Leonard Slosky, reviewed for the NCSL Task Force (1) that portion of the Presidential Space Policy regarding Landsat and (2) the Congressional responses thereto.

The second day's agenda consisted of an on-site tour and a number of briefings by NASA officials at the Earth Resources Laboratory in nearby Slidell, Louisiana. The tour was highlighted by an on-line computer presentation which graphically demonstrated various ways in which Landsat and the other remote sensing information have been put to use in state/NASA cooperative demonstration programs.

Recommendations on 1979 Legislative Activities

In an attempt to provide future direction both for the project staff and the Task Force itself, a number of recommendations were presented, considered and adopted by the Task Force. All but one of the recommendations call for continued involvement in state and federal remote sensing activities by the Task Force and/or the project staff.

The recommendation departing from this theme calls for a broadening of the focus of the NCSL Remote Sensing Project. The recommendation calls for "increasing involvement by the NCSL Remote Sensing Project in natural resource information system activities, particularly regarding policy applications." Efforts are currently underway to broaden the focus of the future project activities.

REMOTE SENSING

A REVIEW OF STATE LANDSAT APPLICATIONS

MARCH/APRIL 1979 VOL. 2, NO. 10

ASSISTANCE TO THE LEGISLATURES: NATURAL RESOURCES INFORMATION SYSTEMS PROJECT

The Natural Resources Information Systems (NRIS) Project (formerly the Remote Sensing Project) provides individual technical assistance to state legislators, staff and legislative committees. To trigger any or all of these assistance mechanisms, a legislator or staff member merely needs to request it.

The primary mechanism for individualized technical assistance has been committee briefings and follow-up staff support. The NRIS Project has also developed a slide/tape show, approximately 28 minutes in length, which provides an introduction to satellite remote sensing and its applications in the natural resources areas. The project has prepared "A Legislator's Guide to Landsat", and will soon publish a companion guide on natural resources information systems. Regular news articles and informational notes are published in the newsletter, Remote Sensing.

Additional technical assistance to legislators and staff is provided in the form of comparative state information to specific legislatures, analyses of various policy alternatives available to states, issue briefs on new technologies, and identification of major informational sources, expert witnesses, state and federal contacts, research reports, studies, legislation, and so forth.

State legislative workshops, seminars and committee briefings are the main thrust of the technical assistance program. An important part of this on-site assistance is bringing together key in-state elected officials and administrators with their appropriate out-of-state counterparts who have extensive experience in satellite remote sensing and natural resources information systems. The NCSL Project has worked with seven states during the past seven months, the most recent being Oregon where an official from the Washington State Department of Forestry was brought in to testify before a joint meeting of the House and Senate Agriculture and Natural Resources Committees and the House and Senate Environmental and Energy Committees.

Other states where the project has provided briefings and workshops are: Mississippi, Colorado, Oklahoma, Iowa/Illinois (joint briefing), California and Missouri. To reiterate, this type of assistance as well as any other assistance the project can provide to State Legislatures in the areas of remote sensing and natural resources information systems is available to states upon their request. Please contact Paul Tessar, Project Director in Denver at (303) 623-6600 for further information.

National Conference of State Legislatures
Earl S. Mackey, Executive Director

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WASHINGTON STATE'S APPROACH TO THE LANDSAT APPLICATION PROGRAM

In September 1978, Pacific Northwest Regional Commission (PNRC) grants were made to seven Washington state agencies and universities under the new PNRC Landsat Application Program (LAP). These grants support both the continuing development of state agency capability to use Landsat derived data for natural resource management and the implementation of analysis software to support state and local agencies at Washington State University.

Each Washington grant participant was required under the guidelines to match the funds received from the PNRC. The following agencies received grants in support of the briefly described activities:

- The City of Tacoma - received a grant to complete the installation of data management software on the City's computer.

- The Department of Natural Resources - was funded to undertake the continuing development of Landsat for potential inventory applications within the Department. The Department is involved in four projects, including analysis of timber harvesting activities in conjunction with the Department of Revenue.

- The Department of Game's Mount Vernon Office - will be undertaking a Ruffed Grouse Habitat Inventory in Western Washington.

- Spokane County Planning Department - received a grant to support continuing development of a countywide land cover analysis and to establish a countywide data management system based upon the new software capability at Washington State University.

The Washington Computer Center was funded to participate in one or more demonstration projects. This demonstration activity would also provide staff at the Center with practical experience applicable throughout the state. A state-wide workshop will be held late next spring. The following projects were assisted:

- The University of Washington - received a grant to support a workshop to provide hands-on experience in Landsat digital analysis.

- The Washington State University's Computer Center - will pass-through a grant as a share of the costs of installation of, and training in the use of Landsat analysis software.

- The Planning and Community Affairs Agency - will be conducting a series of workshops for local governmental officials.

These activities combine the continuing momentum from the Land Resources Inventory Demonstration Project with the complementary installation of in-state analysis capability. As LAP moves into planning for the second year the approach will continue to be one of direct involvement by the user community. This approach allows agencies to pursue their own objectives while investing in the State's long-term capability - an approach which will leave the State and the agencies with a valuable new tool to assist them in meeting their responsibilities long after the end of the Pacific Northwest Regional Commission funding. For further information, contact Mike McCormick at (206) 753-1928.

COLORADO LANDSAT CONFERENCE

On January 15 and 16, 1979, the NCSL Remote Sensing Project and the Colorado Mapping Advisory Committee co-sponsored a conference in Denver on potential remote sensing applications in Colorado. The January 15th morning sessions were specifically geared for state legislators and other state policy-makers. That afternoon's presentations were more technical and discipline specific with concurrent sessions being offered. Additionally, a legislative luncheon was held to deal with individual questions and concerns of attending legislators. Fifteen representatives of legislative committees and over 100 representatives of federal, state and local agencies, state universities and private organizations attended.

The morning program included presentations by: Senator Fred Anderson, President of the Colorado State Senate; Leonard Slosky, representative from Colorado Governor Lamm's office; Paul Tessar, Director of the NCSL Remote Sensing Project; David Ferguson, Secretary of the Texas Natural Resources Information System Task Force; Bruce Rado, Georgia Department of Natural Resources; and Mike McCormick, Washington State Planning Community Affairs Agency.

Topics covered during the January 15th sessions were both numerous and varied in nature including: an overview of NASA's earth resources program, current state Landsat programs and Landsat applications in agriculture, urban and regional land use, forestry, water resources, geology and wildlife and parks.

On January 16th, experts from out-of-state and NASA/Ames conducted several "consultations" with Colorado state agencies. The purpose of these sessions was to provide a "one-on-one" opportunity for agency personnel to question workshop speakers in detail and draw upon their experiences in developing Landsat capabilities and making practical applications of the technology.

STAFF OPENING

The National Conference of State Legislatures' Natural Resources Information Systems Project (formerly Remote Sensing) currently has a staff position for a Masters degree+ professional with experience in natural resource information systems, remote sensing and state resource management policy and programs. At least two years legislative or state government experience is required. Salary is negotiable up to $20,000 per year, depending on background and qualifications. Duties will include:

- Assistance in the preparation of "A Legislator's Guide to Natural Resources Information Systems"
- Provision of technical assistance to state legislators, staff and committees on NRIS and Remote Sensing.
- Assistance in the conduct of NRIS Committee briefings, seminars and workshops.
- Preparation of text and graphics for NRIS presentations.
- Preparation of NRIS newsletter stories.
- Coordination with the NASA Regional Remote Sensing Applications Program.
- Staff support to the Project Director.

Required qualifications:

- Masters degree in a natural resource related field.
- Two years state legislative or government experience.
- One years experience in NRIS.
- Familiarity with technical aspects of remote sensing.
- Good verbal and written communications skills.
- A clear understanding of NRIS and remote sensing technology transfer needs at the state level.

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NOTE TO OUR READERS

Due to administrative changes within NCSL, Remote Sensing will continue to appear monthly until further notice.

If you did not send in your subscription renewal form from the last issue, please do so if you wish to continue receiving the newsletter. New subscription requests should be sent to:

Becca Smith
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CALENDAR OF EVENTS

May 14 - 18	Advanced Topics in the Analysis of Remote Sensing Data, LARS, West Lafayette, IN. Contact: Dr. Phillip Swain, (317) 749-2052.
June 4 - 8	Basic Geology Workshop, Sioux Falls, SD, Contact: Branch of Applications, EROS Data Center, Sioux Falls, SD 57198.
June 11 - 15	William T. Pecora Memorial Symposium, "Satellite Hydrology", Sioux Falls, SD. Contact: Branch of Applications, EROS, as above.
June 18 - 22	Vegetation Remote Sensing Workshop, Ann Arbor, MI. Contact: Dr. Charles Olson, (313) 764-1413.
June 27 - 29	LARS Machine Processing Symposium, West Lafayette, IN. Contact: Doug Morrison, (317) 749-2052.
July 15 - 20	Users Conference on Computer Mapping, Harvard Computer Graphics Week, Cambridge, MA. Contact: Allan Schmidt, (617) 495-2526.
July 23 - 27	NCSL Annual Meeting, San Francisco Hilton Contact: Teresa Fraley, (303) 623-6600.

REMOTE SENSING

A REVIEW OF STATE LANDSAT APPLICATIONS

MAY 1979 VOL. 2, NO. 11

REPRESENTATIVE FLINN TESTIFIES ON SENATE LANDSAT BILLS

"The time to formalize the institutional responsibilities and relationships for an Earth Data and Information Service has come, and the NCSL Landsat Task Force strongly supports the development of an ongoing service to provide continuous, reliable and compatible data to public and private users," said Rep. Monroe Flinn, Majority Whip of the Illinois House. Rep. Flinn, appearing at the request of the U.S. Senate Subcommittee on Science, Technology and Space, represented NCSL and its Landsat Task Force at hearings held on S.663 and S.875. Both of the bills would create an operational Landsat system, with S.663, sponsored principally by Sen. Adlai Stevenson of Illinois, initially favoring a government owned and operated service, and S.875, sponsored by Sen. Harrison Schmitt of New Mexico, favoring a privately held corporation similar to Comsat.

Testifying on behalf of the Administration were Dr. Frank Press, Science Advisor to the President, Dr. Robert A. Frosch, Administrator of NASA, and James P. Walsh, Deputy Administrator of NOAA. The administration witnesses expressed support for the ideas behind the bill. They did not feel ready to develop a national service until current studies underway were completed and, in any case, felt the administration had sufficient authority at present to proceed should they decide to move ahead.

A panel composed of Rep. Flinn, Bob Wise of the Council of State Planning Agencies, Jim Monaghan, Gov. Lamm's Executive Assistant, Bruce Q. Rado of the Georgia Department of Natural Resources, and Erling O. Mork, City Manager for Tacoma, Washington presented views of State and local governments on the legislation. All were supportive of Sen. Stevenson's Bill (S.663), and suggested several revisions to make it more responsive to the needs of State and local government. Rep. Flinn suggested four specific amendments:

- Use of a public service concept, rather than "pay-as-you-go", to finance the system;
- Provide explicitly for State and local government participation in policy making on systems development and operation;
- Provide an explicit technology transfer mandate to the service to assist State and local government; and
- Include an exemption to the ban on data reproduction for all non-commercial State and local government users.

Sen. Stevenson stated that the technology transfer recommendation would be reflected in the revised bill, and promised to consider the other recommendations suggested by Rep. Flinn and the rest of the panel.

Following the hearings, Senators Stevenson and Schmitt agreed to seek a compromise between S.663 and S.875. They hope to bring this compromise version before the full committee early this summer so that legislation can be reported to the Senate calendar prior to the August recess.

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FLORIDA LANDSAT FEASIBILITY STUDY

Early in 1977, NASA Earth Resources Laboratory (ERL) officials approached the Governor of Florida's Office to discuss opportunities for the state to participate in a Landsat Feasibility Study. The approach ERL officials presented was to demonstrate the application of Landsat digital data to natural resource management problems in the State of Florida.

The Governor's Office directed the Division of State Planning to contact the various state agencies who would have interest in this particular project. A committee was established for the purpose of participating in the feasibility study. Representatives from the Departments of Administration, Agriculture, Natural Resources, Environmental Regulation and Transportation were established as members. The committee has considered two major topics:

- Evaluation of the utility of the potential Landsat applications as they related to assisting in resource management decisions in Florida; and

- Determination of the potential usefulness of an in-state capacity to process and utilize Landsat data.

In developing the feasibility study, each of the Department's representatives queried their various agencies for topics which had direct application to specific problems. Water turbidity, flood plain delineation, wetland inventory, agricultural land classification, and shore line measurements were a few of the topics submitted to the committee. Each of the topics were reviewed and forwarded to NASA/ERL for an evaluation of their technical feasibility. ERL staff selected test sites which they felt would be compatible with the problems to be addressed in the demonstration.

Two Landsat frame areas were selected as test sites. In phase I of the program, ERL, in cooperation with state participants, was to process and classify the first frame, with topics ranging from a detailed land cover classification to a surface water inventory at 1:250,000 scale (8 miles/inch). Large scale 1:24,000 maps (2.5 inches/mile) are to be developed on selected areas within the frame. These detailed maps also will include additional data such as erosion hazard and crop yield assessments.

In the early stages of the project, it was determined that it would be necessary to appoint a technical coordinator with extensive background in remote sensing and computer processing methodology. Henceforth all elements of the program went through the technical coordinator to and from ERL and the committee members.

The first phase of the program is in the final stages of production. The strongest interests to date have been wetlands oriented, with interest from the five major Water Management Districts, Department of Environmental Regulation and Department of Transportation. Initial demonstration project products are to delivered in the middle of April, 1979. Interested state agencies will evaluate the quality and potential applications of the products. State staff feel confident that the results of the first phase will be accepted and look for continuation of the program.

The Chairman of the Feasibility Study is Jon S. Beazley, State Topographic Engineer, and the Technical Coordinator is William H. Kuyper, Remote Sensing Engineer. For further information on the project, contact: State Topograhic Office, Florida Department of Transportation, 605 Suwannee Street, Haydon Burns Building, Tallahassee, FL 32301. Phone: Jon S. Beazley (904) 488-8911; William H. Kuyper (904) 488-2168.

LANDSAT-3 EXPERIENCING PROBLEMS

A potentially serious problem has developed in the scanner (MSS) on Landsat-3. The intermittent bug appears to effect about a quarter of the scanner scenes acquired. An engineering evaluation is currently being conducted to diagnose the problem, with an analysis of the situation expected by late May. Operation of the Return Beam Vidicon (RBV) television cameras on Landsat-3 is unaffected by the current problems.

Landsat-2 appears to be doing well. The MSS is operating satisfactorily, and there are enough consumables on board to last for several years. Should Landsat-2 fail and the problems with Landsat-3 worsen, however, users could face a gap in scanner data coverage until the launch of Landsat-D in late 1981.

CALENDAR OF CONFERENCES AND TRAINING COURSES

May 25 June 22	Two Sessions - Remote Sensing Orientation Workshop (Greenbelt, MD) Contact: Dr. Nick Short, Goddard Space Flight Center, (301) 344-5515.
June 4 - 8	Basic Geology Workshop (Sioux Falls, SD) Contact: Branch of Applications, EROS Data Center, Sioux Falls, SD 57198.
June 11 - 15	William T. Pecora Memorial Symposium, "Satellite Hydrology" (Sioux Falls, SD) Contact: Branch of Applications, EROS Data Center, Sioux Falls, SD 57198.
June 18 - 22	Terrain Analysis: Interpretation of Aerial Photography and Images (Sioux Falls, SD) Contact: Lisa Underkoffler, Harvard Graduate School of Design, (617) 495-2578.
June 18 - 22	Vegetation Remote Sensing Workshop (Ann Arbor, MI) Contact: Dr. Charles Olson, (313) 764-1413.
June 18 - 21 June 19 - 22	Two Sessions - A Short Course on Remote Sensing and Image Interpretation (University of Minnesota, St. Paul) Contact: Eugene Anderson, (612) 373-0725.
June 25 - 29	Coal Surface Mining Remote Sensing Workshop - Abandoned Mines (Sioux Falls, SD) Contact: Gary E. Johnson, Branch of Applications, EROS Data Center, Sioux Falls, SD, (605) 594-6511 (#114).
June 27 - 29	LARS Machine Processing Symposium (West Lafayette, IN) Contact: Doug Morrison, (317) 749-2052.
July 15 - 20	Users Conference on Computer Mapping, Harvard Computer Graphics Week (Cambridge, MA) Contact: Allan Schmidt, (617) 495-2526.
July 23 - 27	NCSL Annual Meeting (San Francisco Hilton) Contact: Teresa Fraley, (303) 623-6600.
Aug. 19 - 24	Air and Space Technology in the Forest Environment (Arcata, CA) Contact: Donna Hankins, Humbolt State University, (707) 826-3731.
Sept 10 - 14	"Remote Sensing for Natural Resources -- An International View of Problems, Promises and Accomplishments." (Moscow, ID) Contact: Robert C. Heller, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, ID 83843.
Oct. 15 - 19	Advanced Geology Workshop (Sioux Falls, SD) Contact: Applications Branch, EROS, Sioux Falls, SD 57198.

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TECHNOLOGY APPLICATION CENTER, UNIVERSITY OF NEW MEXICO

The Technology Application Center (TAC) is a nonprofit research and service organization established to operate under the administration of the University of New Mexico and is partially funded by NASA. TAC is one of seven Industrial Applications Centers sponsored by NASA to enhance the diffussion of aerospace technology. The primary goal of TAC's Remote Sensing - Natural Resources Division is to lend assistance to industry and government in a variety of ways through the skilled application of remote sensing technology. The remote sensing services provided by the division range from image analysis of aerial photography, airborne scanner data, satellite photography, and radar data, as they apply to natural resource evaluation.

During the last year and one half, TAC has been working directly with state agencies of New Mexico and with NASA's Earth Resources Laboratory (ERL) in Slidell, Louisiana in the performance of a demonstration project designed to aid in the transfer of remote sensing technology to the state. The project was conducted as part of NASA's Regional Applications Program and involved the automatic classification of timber lands and range lands assessment. State agencies involved were Game and Fish; Forestry; State Engineers Office; Natural Resources Conservation Commission; and the Environmental Improvement Agency.

This demonstration is one of many projects in which TAC cooperated with state agencies. These projects have resulted in the state, through the Department of Natural Resources, deciding to participate in the establishemant of an image processing capability within the state. This capability will be housed at and operated by TAC.

TAC is presently acquiring an image processing system which can accomodate Landsat as well as airborne multispectral scanner data. Current plans also call for the creation of a computerized data bank of digitized map data to allow state resource agencies to place many of their resource maps in our computer bank for reproduction and synthesis. The system is expected to be fully operational in the latter part of 1979.

For further information on Landsat and other remote sensing related activities in New Mexico, please contact Mike Inglis or Tom Budge, Remote Sensing - Natural Resources Division, Technology Applications Center, University of New Mexico, Albuquerque, NM, 87131, (505) 277-3622.

REMOTE SENSING

A REVIEW OF STATE LANDSAT APPLICATIONS

JUNE/JULY 1979 VOL. 3, NO. 1

SURFACE MINING RECLAMATION

Coal producing states are currently under pressure to meet the requirements of the the Surface Mining Control and Reclamation Act of 1977 (PL 95-87, 30 U.S.C. 1201). The Natural Resources Information Systems Project at the National Conference of State Legislatures will soon be releasing a study of state responses to the Act, particularly in the area of compliance with natural resource data requirements. For several years prior to its enactment, many state legislatures treated mining as an interim land use and enforced reclamation and environmental standards on strip mining operations. PL 95-87 was enacted to provide uniformity in reclamation laws and, of course, to ensure reclamation of strip-mined lands to a condition equal to or better than its pre-mined status.

States wishing to assume primary control of their coal mining activities have been charged with developing complex reclamation programs which must meet federal standards. Any state with an unapproved reclamation program, or with no program at all, forfeits all authority and jurisdiction over coal mining activities to the federal government.

Since May 3, 1978, the states have been operating under interim federal regulations of minimal standards. State programs meeting the standards of permanent regulations (adopted March 15, 1979) must be submitted by August 3, 1979. Regional branches of the Office of Surface Mining will work with state legislatures to modify and resubmit disapproved programs in the succeeding eight months. Final program approval will be determined by the Secretary of the Interior June 3, 1980. At that time, conditional approval may be extended to a state if their program contains only narrow deficiencies. Briefly, the components of a state program package should include legislation (one or a combination or measures providing the authority to run a state program), implementing regulations, the administrative plans, and a budget. Once a state's program is approved, the federal government assumes an oversight role, monitoring for compliance, conducting occasional inspections and reviewing reports.

Many states have justifiably expressed the sentiment that ample time has not been alloted to prepare a state reclamation program. Kansas, a state that will adhere to the federal requirements, was forced to develop and enact a massive reclamation bill in only a few weeks time. The state was under pressure from the coal companies who preferred state regulation over federal and the Mined Land Reclamation Board which wished to continue managing the state's coal reclamation program. There was also concern that time be provided to draft rules and regulations within the submission schedule. The pressures for quick action may not be as prevalent in other states.

By the time permanent federal regulations were adopted, a handful of states appeared to be in complete compliance with the new reclamation standards. Of the remaining states, helf needed minor work on their plans, and half needed to undertake major efforts to meet federal standards. (Continued on page 2)

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SURFACE MINING RECLAMATION - CONTINUED

Much of the work to be completed involves the collection and analysis of natural resource data, required of operators and states in setting enviornmental performance standards. It is here that Landsat can and is being utilized. For example, Iowa plans on using remote sensing to undertake a geologic survey. To minimize adverse changes in a coal mined area's hydrological balance, information is needed regarding water location, quality, drainage features, diversion, etc. Land use maps and plans, topography characteristics, geologic conditions, vegetative cover and type, air quality and soil data, identification of fish and wildlife hatitats, and climatology data are vital components of effective reclamation plans. The state regulatory authority is also expected to establish a data base and inventory system to enable designation of areas unsuitable for coal mining. So that a state may designate such areas, the system would contain the aforementioned and other pertinent natural resource data.

Currently, most states lack provisions for coal exploration permits, another requirement of the reclamation program. As in the inventory system, the exploration permitting process requires detailed collection of natural resource data.

Persons interested in obtaining copies of "A Comparison of State Surface Mining Data Requirements to Public Law 95-87, The Surface Mining Control and Reclamation Act of 1977" should contact Holly Higgins at NCSL, (303) 623-6600.

LANDSAT-3 UPDATE

Landsat-3 returned to full operational mode on 4/28/79. The problem of missing portions of scan lines has not been corrected as yet, but Goddard staff are still working on a solution.

In the first two weeks of operation, however, the problem has only affected a few orbital passes. At present, there is a randomly occuring displacement of individual scan lines due to a malfunction in the "start of line" signal. When a fix is implemented in September, full scenes will be available with only 25% of the few affected lines missing.

CALENDAR OF CONFERENCES AND TRAINING COURSES

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NATURAL RESOURCE ASSESSMENT NEEDS IN ALASKA

Federal, state and local officials in Alaska are faced with complex and overlapping land management problems - probably more complex than in any other part of the nation. The Alaska State Legislature will, of necessity, be a key force in the resolution of these problems. The Legislature is currently addressing a number of crucial policy and intergovernmental relations questions, and has taken several important steps to assure that the state has the capabilities to access or develop the information required for the decision-making, planning and management of the state's resource base.

"We have such a potential of rapidly changing land ownership and stewardship," emphasized Dr. Paula Krebs, assistant professor at the University of Alaska's Geophysical Institute. "No other state has had to address the magnitude of problems we face in this century. Yet, right now we don't have the interaction we need, of federal agencies with federal agencies, much less federal agencies with state agencies with local agencies."

Officials face a myriad of pressing land use mandates. With the Alaska Statehood Act (1958-1959), Congress allocated 103 million acres of land to the state, but only a small portion of that had been selected and processed when the Alaska Native Claims Settlement Act was passed in 1971.

That Act directed natives to choose 40 million acres of land as their own before state selection could proceed. Section 17(d)(2) permitted the Secretary of the Interior to add up to 80 million acres to the already large federal holdings for national forests, parks, wildlife reserves, and wild and scenic rivers.

Add to these President Carter's designation last December of 56 million acres as national monumemts, under the 1906 Antiquities Act, and Representative Morris Udall's bill, recently passed by the U.S. House, to set aside 125 million acres for national parks and wildlife refuges.

And completing the list was the Alaska Homestead Act, adopted last November, which orders the state to give away 30 million acres in 40- to 160-acre parcels to residents. The Alaska Supreme Court is expected to rule on the Act's constitutionality, but until then, only one million of the state's 365 million acres remains in private ownership.

Getting up-to-date, relevant information is the biggest roadblock in the large-scale planning Alaska desperately needs. Due to size and remoteness, most of the state remains unstudied; resource maps either don't exist or are of limited use. Statewide aerial phtotgraphy of World War II vintage forms the common data base.

No wonder, then, that decision-makers at all levels are concerned that resource management will stumble over the lack of adequate base maps. And that without them, the hope of information exchange is narrowed.

Many state officials feel remote sensing technology may be able to provide a significant part of the information base to assist natural resource policy making and program implementation. "Remote sensing - especially Landsat - is one of the biggest driving concerns in Alaska," Krebs said. "It's an effective tool, used appropriately."

"But," she cautioned, "mission-oriented agencies must select the technology that gives them the best information. Their resources and funding have to be placed in the right spot the first go-around."

Before the state can proceed in an organized fashion, however, a technology transfer program must be developed. The NASA Regional Applications Program at Ames Research Center near San Francisco is ready and willing to provide assistance to the State. But to develop a really effective technology transfer program, a significant state committment

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is required. Recognizing this need, the Alaska State Legislature recently took several key steps to help make improved natural resources information for decision-making a reality. Under the state legislature's H.B. 750, about $56,000 went to the University's Geophysical Institute to run a remote sensing workshop for state agency people this Spring.

The same bill gave the Institute $158,000 to research setting up a "quick look" service - receiving the real-time satellite imagery from the Prince Albert, Sask. ground station to study natural catastrophes like fire or flood while they're occurring.

And the legislature took a third step that should affect remote sensing in the state by authorizing a Science and Technology Council to get started in late '78. Attached to the governor's office and composed mainly of university, legislative and state agency representatives, the council is to zero in on Alaska's research needs. Observers feel remote sensing will get a lot of attention and even more support.

In cooperation with NASA/Ames and the Alaska Geophysical Institute, the State is developing a Landsat demonstration project which will focus on the Southcentral region. This area contains about two thirds of the state's population, and is where the majority of the growth and problems are. The proposed project includes six state and local agencies, and will focus on the following applications:

Municipality of Anchorage
- General land cover
- Detailed Land and Water Use
- Land-use Change Detection
- 208 Water Quality Analysis

Matansuka-Susitna Borough
- General Land Cover
- Land and Water Use Classification
- Land-use Change Detection
- Land-use Suitability Mapping

Kodiak Island Borough
- General Land Cover
- Forest Inventory
- OCS-related Coastal Inventory

Kenai Peninsula Borough
- General Land Cover
- Road and Construction Site Identification and Change Detection

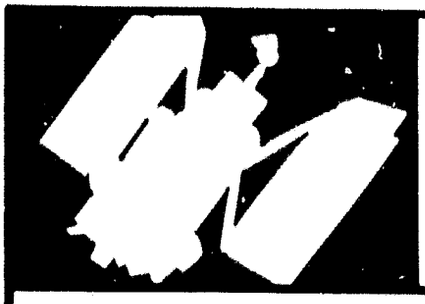
Department of Natural Resources/Planning and Classification Section
- General Land Cover of Lower Susitna Basin
- Land Capability Analysis in Susitna Basin

Department of Natural Resources/Forestry Section
- General Land Cover of Mat-Su Intensive Study Areas
- Forest Inventory for a Selected Township

Department of Fish and Game
- Cook Inlet Intertidal Zone Measurement and Change Detection
- Habitat Classification in Lower Susitna Basin
- Wetlands Inventory in Lower Susitna Basin

For further information on Alaska Landsat activities, contact Jim Anderson, Chairman of the Federal-State Land Use Planning Commission for Alaska, in Anchorage (907) 279-9565.

This article was excerpted from Vol. 1, No. 5 of the Plain Brown Wrapper, published by the Western Regional Applications Program of Ames Research Center. The editor of Remote Sensing would like to express his appreciation for permission to use the material.



REMOTE SENSING

A REVIEW OF STATE LANDSAT APPLICATIONS

AUGUST 1979 VOL. 3, NO. 2

LANDSAT AND COASTAL ZONE MANAGEMENT

In the past five years, improved management of our nation's coasts has been expedited by a federal grant-in-aid program established by Congress in 1972. The Coastal Zone Management Act of 1972, as amended in 1976, provides the 35 coastal states and territories the opportunity to voluntarily participate in the federal coastal planning and implementation process. The first planning grants were awarded in 1974. To a few states this meant refined integration of already existing coastal management efforts. Elsewhere, the Act brought heightened awareness of the need to protect and manage the fragile resources and development needs of the coasts. At least 20 states are expected to have federally approved management programs by September, 1979. Those states encompass 75 percent of America's shoreline.

Much of the coastal planning process has involved legislative authorization, policy development and organizational coordination. Twelve states have enacted comprehensive coastal management legislation. Another ten have special purpose coastal management laws in effect. All coastal states have statutes that in some way regulate shoreline resources.

Application of Landsat in the coastal zone management planning process has occurred in at least 14 coastal states. Data collected from remote sensing techniques, such as Landsat, has been utilized to improve natural resource decision making. For instance, the Georgia legislature has enacted a significant set of resource laws that will be incorporated into their coastal management program. Collection of data through Landsat facilitated both development and implementation of Georgia's legislation. Soil erosion source inventories, shoreline delineations, and wetlands assessment, all necessary to the development of a strong coastal management program, have been attained by various coastal states through the application of Landsat.

As states enter the implementation phase of coastal zone management, the lead agencies, legislators, and their research staff, can practically use remote sensing techniques in developing alternative policies to coastal resource development and conservation practices. For instance, this technology can be used to monitor estuarine sanctuaries, shoreline erosion and natural hazard areas, so that planning programs may be updated. Remote sensing application has proven to be a viable technique for managing our nation's coasts. The Natural Resources Information Systems Project is currently preparing a report describing each coastal state's coastal zone management program. State programs are compared to the federal rules and regulations for management organization, authorities, and implied natural resource data requirements. Information contained in this report can be used to determine where remote sensing may be applied in a coastal state to further expedite effective management. Those interested in obtaining a copy of "CZM - The States' Response" (available Oct. 1) should contact Holly Higgins at the NCSL Denver office.

National Conference of State Legislatures
Earl S. Mackey/Executive Director

Paul A. Tessar, Director
Remote Sensing Project

1405 Curtis Street, 23rd Floor
Denver, Colorado 80202
Phone 303/623-6600

THE LAND RESOURCES INFORMATION SERVICE OF NORTH CAROLINA

Under the program directives given to the North Carolina Land Policy Council in the Land Policy Act of 1974, a "system of information and data concerning the land resources of the entire state" was to be developed. A mechanism for providing systematic exchange of land use, environmental, economic and social information among all levels of government was desired. It was from this mandate that the Land Resources Information Service (LRIS) was formed.

Since its commencement in the Fall of 1977, LRIS's top priorities have been establishing a structure for housing the state's land resource data and facilitating the access to and use of that data by those involved in land resource planning and management activities. A key component was the acquisition of a sophisticated configuration of computer hardware and software. The LRIS system consists of a Data General minicomputer and various peripheral devices for the automated capture, display, manipulation, and summation of graphic, geographically referenced data. Using this hardware and a package of user oriented software, LRIS has the necessary components for constructing a statewide land resource data base and providing assistance to a variety of ongoing state programs.

While designed to service state and local agencies on a cost recovery basis after its first year of operation, initial LRIS activities were directed towards supporting programs within three state agencies which had provided initial funding for LRIS-Natural Resources and Community Development, Administration, and Cultural Resources. Projects supported included the State planning programs for Water Quality (208), Archaeology and Historic Site Preservation, State Property, Parks and Recreation, Land Quality, Geologic Survey, Geodetic Survey, Natural Heritage, and Land Records.

The data bases to support these projects have been entered into LRIS on an incremental basis. Information for detailed soils, land use, topography, roads, streams, etc., is being captured for specific geographic areas of the state where planning projects are currently active. On a more general level, statewide information has been developed for generalized soils, topography, population, political boundaries, drainage basin boundaries, and 1970 census enumeration district boundaries. Once in the LRIS system, this information can be accessed singularly, or in combination with any other data sets, where scale, analysis, criteria, geographic area, and form of output are defined interactively by the user.

Most of the LRIS data base construction activity involves manual conversion of graphic data to a computerized format. However, present demand for information far outstrips LRIS in-house capabilities to perform the data capture. Thus LRIS is actively seeking existing sources of digital information. One such source is the Landsat satellite imagery that could provide current land use/land cover information for large geographic areas of the state. Interest in the utilization of Landsat is not new in North Carolina. In fact, from the outset of the planning and development of LRIS, a basic requirement of the system configuration acquired was that it serve as a basis for the eventual handling of the Landsat data. While LRIS has not yet applied Landsat data to a production effort, compatibility of a classified Landsat scene with LRIS data sets has been successfully demonstrated in a test area and its use for future projects is anticipated.

Typical LRIS applications to date have relied heavily on the data compositing or overlay capability of the system. Identification is made of those geographic areas having the specific combination of physical characteristics of relevance to a particular study. For example, a recent project with the Soil Conservation Service (SCS) involved identifying areas which because of land use, soil type, and nearness to streams, had a high probability of contributing to non-point source water pollution. Specifically, as

part of the North Carolina program to control non-point source water pollution from various land uses, the objective of this study was to utilize LRIS data handling capabilities to:

- Isolate areas with high potential for having agricultural-related water problems resulting from erosion and sedimentation;
- Calculate soil loss for these areas in terms of tons/acre/year by applying the Universal Soil Loss Equation;
- Identify the best management and treatment practices and associated costs of application; and
- Graphically and tabularly summarize the results.

Along with the actual outputs of the study an additional result of the project was the demonstration that through use of the LRIS geographic information system, land resource decision-making cannot only be facilitated by the ready access to pertinent information, but can incorporate creative techniques for analysis and display of alternatives.

The results from the SCS project highlight another aspect of the first year efforts of LRIS - its success at establishing a mechanism for facilitating communication among the collectors and users of land resource information at all levels, federal, state and local. LRIS provides the structure for bringing together the numerous data sets on the State's resources. This allows the program to provide more data at a lower cost to individual users. Through the combined efforts of the North Carolina planning programs, the Land Resources Information Service is well on its way to fulfilling its legislative mandate - to build a statewide data base of land resource information.

For more information on the North Carolina LRIS, contact Carol Simmermacher in Raleigh at 919/773-2090.

CALENDAR OF CONFERENCES AND TRAINING COURSES

July 23 - 27	NCSL Annual Meeting (San Francisco Hilton) Teresa Fraley, 303/623-6600.
Aug. 19 - 24	Air and Space Technology in the Forest Environment (Arcata, CA) Contact: Donna Hankins, Humboldt State University, 707/826-3731.
Sep. 10 - 14	"Remote Sensing for Natural Resources - An International View of Problems, Promises and Accomplishments." (Moscow, ID) Contact: Robert C. Heller, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, ID, 63843.
Sep. 24 - 29	Vegetation/Terrain Analysis Remote Sensing Workshop (Coeur d'Alene, ID) Contact: Joseph J. Ulliman, College of Forestry, Wildlife and Range Science, University of Idaho, Moscow, ID, 63843.
Oct. 15 - 19	Advanced Geology Workshop (Sioux Falls, SD) Contact: Applications Branch, EROS Data Center, Sioux Falls, SD, 57198.
Nov. 5 - 9	Applied Remote Sensing for Soil Inventory and Assessment (Pleasant Hill, CA) Contact: Sharon Arce', UCB Extension, 415/642-1061.

National Conference of
State Legislatures
1405 Curtis Street/23rd Floor
Denver, Co. 80202

NCSL COMMUNICATION TOOLS AVAILABLE

The NCSL Natural Resources Information Systems Project has recently completed or updated the following communication tools:

- A Legislator's Guide to Landsat, 30 pages. A non-technical introduction to Landsat technology for legislators, staff and other policy-makers. Major sections of the booklet include:
  - The Importance of Landsat to State Government
  - Landsat Overview
  - Landsat Applications
  - Institutional Approaches to Landsat
  - Future of the Landsat Program
  - Landsat Information Sources

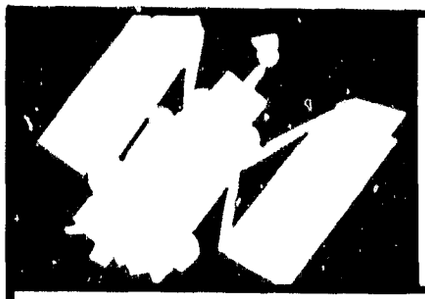
- Landsat in the States. A 30-minute slide/tape presentation on state uses of satellite remote sensing. Topics covered include:
  - Natural Resource Data Needs
  - Basics of Landsat
  - Case Studies of Landsat Applications in Texas and North Dakota
  - Overview of State Approaches to Landsat Utilization
  - The NASA Regional Remote Sensing Applications Program

- Landsat: Down to Earth Views from Space, 12 pages. A brochure which briefly introduces state applications of Landsat technology and information sources.

- Regional Workshop Proceedings, 139 pages. A selection of presentations from various Remote Sensing workshops. State applications discussed include Illinois, Idaho, Oregon, Maryland, Florida, Missouri and New Jersey.

- Colorado Conference Proceedings, 136 pages. Proceedings from a conference held in Denver on January 15-16, 1979. The Conference was co-sponsored by NCSL and the Colorado Mapping Advisory Committee.

Copies of the above publications may be obtained, free of charge, from: Becca Smith, NCSL, 1405 Curtis, Suite 2300, Denver, CO, 80202. Those interested in borrowing the slide/tape presentation should contact Paul Tessar or Becca Smith at 303/623-6600.



REMOTE SENSING

A REVIEW OF STATE LANDSAT APPLICATIONS

SEPTEMBER 1979 VOL. 3, NO. 3

NORTH DAKOTA REAP APPROPRIATION BILL VETOED

On Friday, April 13, 1979, Governor Arthur Link vetoed the appropriation bill for the North Dakota Regional Environmental Assessment Program (REAP). The bill had passed both houses of the 46th Legislative Session only after a long and difficult struggle, and the veto, coming after adjournment, was a surprise to some members of the Legislative Assembly. After four years of effort, REAP ceased to exist on July 1, 1979.

REAP, the scientific and technological arm of the North Dakota Legislature, was established in 1975 in response to impending large-scale coal development. REAP's mandate was to establish and carry on research in regard to North Dakota's resources and areas of governmental activity or responsibility. With respect to coal development, priority was to be given to the collection of necessary data and the development of information systems necessary to determine the existence of and potential use of North Dakota's natural resources.

When the 44th Legislative Assembly created REAP in 1975, it took a novel and radical step. REAP was unique among state efforts to bring science and technology into the decision-making process in that it was made part of the legislative branch of government, and was responsible to a committee of the Legislative Council, the Resources Research Committee (RRC). The RRC was comprised of legislators, state agency personnel, university faculty, an industry representative, and a citizen at large. The effort was radical when one considers that the initial funding of $2 million for a two-year period (appropriated from a special coal development fund) was part of the total state government budget of only $442 million -- a substantial portion of the state's budget devoted to what amounted to an experiment that would require a substantial development period (originally estimated to be four to six years).

Early in REAP's development, four major tasks were defined:

- To develop an adequate data base on the environmental, economic, and sociologic characteristics of North Dakota;
- To design and implement a computer-based information system capable of meeting the needs of, and being used by, decision makers;
- To design and implement assessment/modeling systems capable of forecasting the implications of alternative development activities on the environmental and social characteristics of North Dakota; and,
- To design and implement a mechanism for monitoring changes in the characteristics of North Dakota.

National Conference of State Legislatures
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According to Rich Giddings, REAP's last Director, the goal was to "create an information system that, to a decision maker, appeared to have all the data about North Dakota and be capable of performing any needed analysis, while the in-house portion consisted only of those capabilities that cost and response time considerations justified". To supplement its in-house capabilities, REAP obtained many services and research elsewhere.

How REAP lost its funding is the subject of much speculation and considerable opinion. Several contributory factors leading to REAP's demise have been cited. They include a lack of realization as to the breadth of REAP's mandate; the lack of visibility of tangible results of the program activities (despite the fact that a four-to-six year development period was anticipated prior to the provision of any significant services); ongoing disagreement about which branch of government should "control" REAP; limited visibility of much of the information provided to decision-makers by REAP because of REAP's mode of operation; and the unique 50-50 split of Republicans and Democrats in the House in the 1977 Legislative Session. This split resulted in REAP being thrust into political controversy when it was held hostage by the Democrats in order to obtain a percentage coal severence tax. Republican support for REAP during that session was, and is still, equated with Republican control of REAP.

More important, however, was REAP's inability to make a positive contribution to legislative information needs. While REAP was very successful in meeting the needs of the executive agencies, local governments, business and industry, and private citizens, attempts to provide information to legislators were always controversial.

As the REAP bill progressed through the legislature, it was amended so that the original appropriation was cut by $900,000, the program's name was changed to "Scientific and Technological Research and Development Program," and no participation from the executive branch was provided for on the governing committee. This latter amendment was the reason Governor Link gave for vetoing the final bill.

Major REAP capabilities such as the system software and data base, Economic-Demographic Model, REAP Resources Reference System, and baseline data studies, have been disseminated to appropriate state agencies and institutions in North Dakota, and are, to a surprising extent, being carried on. Correspondence regarding REAP or the disposition of its capabilities should be sent to Mr. John Graham, Director, Legislative Council, State Capitol, Bismarck, ND 58505 (phone - 701/224-2916).

NEW SPECIAL ASSISTANT HIRED

Loyola M. Caron joined the staff of NCSL on August 16 as Special Assistant for the Natural Resources Information Systems Project. Loyola was formerly with the North Dakota Regional Environmental Assessment Program (REAP), where she served as its Earth Sciences Research Coordinator. In that position, she was responsible for developing a variety of natural science projects; coordinating the collection of existing earth resource data for the REAP automated data base; developing cooperative efforts with state agencies, the universities and local governments; and, supporting legislative committees and studies. Her experience in providing information for legislative policy making and program development should prove valuable to the NCSL NRIS Project.

Ron Hogan, who formerly held this position, has become Director of the NCSL Science and Technology Project.

THE IDAHO LANDSAT APPLICATIONS PROGRAM

The State of Idaho, over the last several years, has been an active participant in an innovative, two-stage technology transfer program. The program is being conducted under the auspices of the Pacific Northwest Regional Commission (PNRC) with the assistance of the NASA Ames Research Center and the U.S. Geological Survey. The first stage, lasting three and one half years, was the PNRC Land Resource Inventory Demonstration Project. This stage afforded the opportunity to 45 state and local agencies in Idaho, Oregon and Washington to conduct test projects incorporating satellite data into surveys and inventories of various land cover types. The second stage (FY 79 - 81) is the Landsat Applications Program, which will build the region's operational capability to extract and use information gathered by Landsat.

As part of the effort to build this capacity in Idaho, a number of state agencies are involved in projects. Specific ongoing application projects to improve data for natural resource planning and management include:

- The Idaho Department of Fish and Game is inventorying and mapping the major vegetative ecosystems and physiographic features of an important big game management unit in south central Idaho. The improved information base will be used in analyzing impacts caused by potential large-scale logging operations to wildlife habitat in the area.

- The Idaho Bureau of Mines and Geology is identifying, interpreting and assessing natural geologic hazards from Landsat imagery for use in natural resource and land use planning. Much of the active faulting in Idaho has yet to be mapped and it is anticipated that this project will help to fill this existing information void.

- The Idaho Department of Water Resources (IDWR), in addition to developing the state's digital Landsat analysis, is conducting a classification of irrigated agriculture on a test site in eastern Idaho. A primary objective of the task is the development of an operational methodology of data classification that produces consistent results.

- Two training activities are being planned by the University of Idaho's College of Forestry, Wildlife and Range Sciences. An intensive five-day workshop may be conducted in and around Coeur d'Alene on vegetation/terrain analysis remote sensing during the last week of September. An advanced remote sensing course will take place during the fall semester with special emphasis given to establishing student familiarity with computer-aided classification systems, such as VICAR/IBIS.

Development of a Landsat image analysis capability in state government is a key element in Idaho's Landsat program. The Idaho Department of Water Resources, which is taking a lead role in this development, is currently conducting a project to establish and utilize the Jet Propulsion Laboratory's VICAR/IBIS image analysis software on the State's IBM 370-158 computer. A significant improvement of this basic Landsat data analysis and application capability is being planned. A color image display system will soon be installed to perform interactive image display and analysis tasks. The basic components of the system are a high resolution color video monitor, a minicomputer, and software that supports interactive image analysis.

The addition of this subsystem will significantly improve the productivity and effectiveness of Landsat digital analysis activities. Also, such a system can produce more useable and understandable output products for state data users and decision-makers. An interactive display system is also an effective training tool upon which the user can develop more confidence in the data because of individual involvement and comparison with known ground data.

The current activities in Idaho to develop a capability and refine applications will lead to an operational capability to utilize Landsat data on an ongoing basis. For further information, contact Alan Porter in Boise at 208/384-3900.

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CALENDAR OF CONFERENCES AND TRAINING COURSES

9/24 - 9/28	Water Resources Management in a Changing Society (Las Vegas, NV) Contact: American Water Resources Association, 612/376-5050.
9/24 - 9/28	Vegetation and Landform Remote Sensing Workshop Contact: Joseph Ullman, University of Idaho, 208/885-7016.
10/2 - 10/5	Regional Applications Conference of the Eastern Regional Remote Sensing Applications Center (Tidewater Inn, Easton, MD) Contact: Dr. Robert Regan, University of Maryland, 301/454-6617.
10/9 - 10/13	Terrain Analysis Interpretation of Aerial Photographs and Images (Sioux Falls, SD) Contact: Lisa Underkoffler, Harvard University, 617/495-2578.
10/15 - 10/19	Advanced Geology Workshop (Sioux Falls, SD) Contact: Branch of Applications, EROS Data Center, 605/594-6511, ext 114.
10/15 - 10/19	Digital Image Processing of Earth Observation Sensor Data (Washington, D.C.) Contact: Continuing Engineering Education, George Washington University, 202/676-6106.
10/17 - 10/19	WRAP Western Regional Remote Sensing Conference (Monterey, CA) Contact: Fred Mascy, NASA/Ames Research Center, 415/965-5897.
10/22 - 10/26	Applications of Geological Remote Sensing to Mineral Exploration (Rapid City, SD) Contact: Director of Continuing Education, South Dakota School of Mines and Technology, 605/394-2480.
10/22 - 10/26	Remote Sensing and Digital Information Extraction (Washington, D.C.) Contact: Continuing Engineering Education, George Washington University, 202/676-6106.
10/22 - 10/26	Five Day Advanced Landsat Course, University of New Mexico (Albuquerque, NM) Contact: Dr. Stan Morain, 505/277-3622.
10/23 - 10/26	Water Resources Remote Sensing Workshop (Sioux Falls, SD) Contact: Branch of Applications, EROS Data Center, 605/594-6511.
10/24 - 10/26	Remote Sensing and Photo-Interpretation Workshop for Environmental Studies (Orono, ME) Contact: Marshall D. Ashley, University of Maine at Orono, 207/581-7313.
10/29 - 11/1	Space Shuttle: Dawn of an Era (Los Angeles, CA) Contact: Ms. Janet Dean, 213/922-3289.
11/5 - 11/9	Applied Remote Sensing for Soil Inventory and Assessment (Pleasant Hill, CA) Contact: Sharon Arce', U.C. Berkeley Extension, 415/642-1061.
11/14 - 11/15	Landsat/Geobased Information Systems Symposium (Biloxi, MS) Contact: Bob Barlow, Earth Resources Laboratory, 601/688-2042.

APPENDIX E

NATIONAL CONFERENCE OF STATE LEGISLATURES
LANDSAT TASK FORCE MEETING

December 18 - 19, 1978
Le Pavillion Hotel, New Orleans, Louisiana

Monday, December 18, 1978

9:00 - 12:00 CALL TO ORDER; OPENING REMARKS
Senator Rolland Redlin, Chairman
Dr. Donald Shull, Vice-Chairman

OVERVIEW OF NASA TECHNOLOGY TRANSFER ACTIVITIES WITH STATE AND LOCAL GOVERNMENT
Floyd Roberson, Director, NASA Technology Transfer Division

NASA RESPONSE TO LANDSAT TASK FORCE RECOMMENDATIONS
Alex Tuyahov, Manager, User Requirements and Assistance

* * COFFEE BREAK * *

THE NGA/COUNCIL OF STATE PLANNING AGENCIES REMOTE SENSING PROJECT
Peggy Harwood, Project Director

REVIEW OF NCSL REMOTE SENSING PROJECT AND PRESENTATION OF SLIDE/TAPE SHOW, LANDSAT IN THE STATES
Paul A. Tessar, NCSL Remote Sensing Project Director

12:00 * * LUNCH * *

1:30 - 4:30 REVIEW OF PRESIDENTIAL LANDSAT POLICY AND CONGRESSIONAL RESPONSES
Paul A. Tessar, NCSL
Leonard Slosky, Staff Director of Natural Resource and Environment Task Force, ISETAP

TASK FORCE RECOMMENDATIONS TO THE ADMINISTRATION AND CONGRESS

* * COFFEE BREAK * *

INTRODUCTION, DISCUSSION AND POTENTIAL ACTION ON MODEL LANDSAT RESOLUTION

DISCUSSION OF POTENTIAL LEGISLATIVE ACTIVITIES TO BE UNDERTAKEN DURING THE 1979 SESSIONS

OTHER BUSINESS: - NEXT MEETING

Tuesday, December 19, 1978

8:00	DEPART FROM HOTEL LOBBY (BAGGAGE ALONG)
9:15	ARRIVAL AT THE NASA EARTH RESOURCES LAB
9:30	WELCOME AND INTRODUCTION Lee Tilton III, Deputy Director, ERL
10:00	PRESENTATIONS ON NASA ERL REMOTE SENSING PROGRAMS ERL Staff
11:00	TOUR/DEMONSTRATIONS
12:30	ADJOURN FOR LUNCH (DIRTY HARRY'S)
2:00	DEPART FOR NEW ORLEAN'S AIRPORT
3:15	ARRIVAL AT AIRPORT

RECOMMENDATIONS OF

THE NATIONAL CONFERENCE OF STATE LEGISLATURES'

LANDSAT TASK FORCE ON

THE EARTH DATA AND INFORMATION SERVICE ACT OF 1978 (S.3589)

AND THE SPACE POLICY ACT OF 1978 (S.3530)

NCSL LANDSAT TASK FORCE

Senator Rolland Redlin, North Dakota, Chairman

Dr. Don Shull, Virginia, Vice-Chairman

Representative Tom Anderson, Michigan
Representative Bernard Byers, Oregon
Senator Earl Christensen, Wyoming
Representative Monroe Flinn, Illinois
Representative Dale Locker, Ohio
Senator John McCune, Oklahoma
Dr. John Reid, North Dakota
Senator A.R. "Babe" Schwartz, Texas
Representative A.J. Spano, Colorado
Senator Jerome Van Sistine, Wisconsin
Assemblyman Frank Vicencia, California
Representative Bill Wilkerson, Mississippi

I. Financing of the Earth Data and Information Service

The major area of difference between the NCSL Landsat Task Force Recommendations of August 1978 and the Earth Data and Information Service Act (S.3589) relates to the philosphy behind the financing of the service. In Recommendation J (Justification of the Landsat Program), the Task Force recommended "that the federal government recognize Landsat as a "public good" and encourage use of this valuable national service". In Recommendation M (Data Pricing), the Task Force urged that "all research and development, data acquisition, preprocessing, archiving and cataloging be considered as a cost of establishing the system and, therefore, a federal expense [and] that the price of Landsat data be limited at most, to the cost of data reproduction and distribution".

S. 3589 directs the service to establish a schedule of user charges, which, within seven years, will recover the costs of the service exclusive of research, development and testing.

A. RECOMMENDATION:

The Task Force urges the Senate Subcommittee on Science, Technology and Space to amend Section 9(a) of S.3589 to reflect a public service concept in the Earth Data and Information Service charter. The Task Force feels that Landsat type data should be considered in the same context as census, cartographic and meterological data which are provided at cost of reproduction and distribution as a public service of the federal government.

B. RECOMMENDATION:

The Task Force recommends that Section 9(c) of S.3589, which exempts the service from U.S. Code provisions limiting user charges to reproduction and handling, be deleted.

II. Role of State and Local Governments

S.3589 would benefit from clarification of the role of and assistance to state and local governments in relation to the Earth Data and Information Service. In Recommendation D (Involvement of State and Local Governments), the "Task Force strongly recommend(ed) that the federal government make a commitment to prior consultation with state and local governments in all federal Landsat policy and technical decisions...(and that) a structured consultation process for their continued involvement...be developed". In Recommendation E (Technology Transfer to State and Local Governments), the Task Force urged the federal government to expand Landsat technology transfer activities to state and local government under the NASA Regional Remote Sensing Applications Program. While S.3589 appears to be in harmony with these recommendations, a more explicit statement to that effect would be desirable.

C. RECOMMENDATION:

The Task Force recommends that Section 7(d)(2) of S.3589 be amended to direct the general manager of the service to establish procedures to incorporate existing mechanisms to obtain input from representatives of state legislatures, federal, state and local agencies, private sector users and vendors, and the universities regarding federal civil remote sensing policy, mission planning, systems development, systems operation and research and development activities.

D. RECOMMENDATION:

The Task Force recommends that Section 7(d) of S.3589 be amended to clarify the technology transfer role of the service, particularly to state and local governments. The Task Force urges that present activities of orientation, training, demonstration projects and technical assistance, which facilitate technology transfer to state and local governments, be explicitly addressed in the legislation.

III. Role of Federal Agencies

S.3589 clearly recognizes the need for a single federal lead agency to administer the system. The role of federal user agencies, however, is not discussed. In Recommendation F (Role of Federal Mission Agencies), the Task Force urged federal natural resource agencies "to use Landsat to meet their own data needs and to work with their state counterparts [to stimulate them] to collect and utilize Landsat data as appropriate".

E. RECOMMENDATION:

The Task Force feels that Section 5(b) of S.3589 be amended to include:

(4) federal natural resource agencies shall use and encourage the use of Landsat type data, wherever practical and cost-effective, to meet data requirements of themselves and their state counterparts.

IV. Functions of the Service

Three additional Task Force Recommendations are not addressed in S.3589. In Recommendation P (Data Compatibility), "the Task Force recogniz(ed) that (data) compatibility...must be assured so that states can both maintain current operational capabilities and take full advantage of the change detection capability". In Recommendation R (Development of Software), the Task Force urged that "generally applicable software...be developed in a centralized operation and then distributed through a software library to interested users...at the cost of reproduction and distribution". In Recommendation S (More Browse Files), the Task Force recommended "that rapid, convenient access to suitable browse files be continually available... in each state capitol".

F. RECOMMENDATION:

The Task Force feels Section 7(d) of S.3589 should be amended to include:

The administrator (of NASA) shall:

(4) provide for the widest practical satellite remote sensing data continuity and compatibility.

(5) provide for the development and distribution, at reasonable cost, of generally applicable computer data analysis and display software to interested users.

(6) provide for the availability of regional and state browse files to assist users in data screening and selection.

V. General Approach of the Earth Data and Information Service Act

G. RECOMMENDATION:

The Task Force recommends that the development of a continuous, reliable and compatible civil remote sensing system take place over an interim period of seven to ten years. Furthermore, the Task Force believes that NASA, particularly in light of its responsiveness to the needs of state and local governments, is most qualified to administer the Earth Data and Information Service.

H. RECOMMENDATION:

The Task Force urges the federal government to develop a continuous, reliable and compatible remote sensing system at the earliest practical date, so that the public and private sectors may fully reap the benefits of improved and more cost effective resource information as soon as possible. Furthermore, the Task Force feels that such a system is required before the technology can gain widespread acceptance and regular, ongoing usage by state and local governments.

VI. Overall Space Policy (S.3530)

I. RECOMMENDATION:

The Task Force recommends that the U.S. Congress enact the Space Policy Act after due consideration of its financial implications.

J. RECOMMENDATION:

The Task Force urges the U.S. Congress to maintain an adequate NASA budget level, adjusted for inflation, and to reprogram space shuttle funds in support of the goals of the Space Policy Act.

STATEMENT OF

THE HONORABLE MONROE L. FLINN
Majority Whip, Illinois House of Representatives

THE NATIONAL CONFERENCE OF STATE LEGISLATURES
LANDSAT TASK FORCE

before the

SUBCOMMITTEE ON SCIENCE, TECHNOLOGY AND SPACE
COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION

UNITED STATES SENATE

Mr. Chairman and members of the Committee:

My name is Monroe Flinn. I am the Majority Whip of the Illinois House of Representatives. I am here representing the National Conference of State Legislatures, which serves all of our nation's State Legislatures, and the NCSL Landsat Task Force, which is responsible for formulating policy recommendations on satellite remote sensing.

I am honored to have the opportunity to present NCSL's views on the Earth Data and Information Service Act of 1979 (S.663). Overall, we feel this legislation is an important, constructive step forward in the development of a capability to inventory monitor and evaluate our nation's and the world's resources and environment on a continuous, ongoing basis. We applaud the efforts of Senator Stevenson, other sponsors of S.663, and Senators Ford and Moss before them, to provide an institutional framework to reap the benefits of satellite remote sensing.

Landsat data has been increasingly accepted and used within state and local governments over the past seven years. My purpose here, however, is not to detail these past and other potential future Landsat applications, but rather to provide a state and local perspective on the future institutionalization of the technology as reflected in the Earth Data and Information Service Act of 1979.

The time to formalize the institutional responsibilities and relationships for an Earth Data and Information Service has come, and the NCSL Landsat Task Force strongly supports the development of an ongoing service to provide continuous, reliable and compatible data to public and private users. Over the last several years, many studies

have been conducted and their consistently stated conclusions are generally compatible with S.663. Indeed, the Administration is currently conducting yet another study. While the states (through NCSL, the Intergovernmental Science, Engineering and Technology Advisory Panel, and the National Governor's Association), the federal user agencies (through the FCCSET Landsat Study), and the private sector (through the Space Applications Board), and others, have clearly expressed their needs over the last several years, the federal government seems to be caught in a cycle of continuous committees, studies and task forces that never seem to get anything done. We need an established, reliable service, and, hopefully, S.663 will break the bureaucratic paper cycle that seems to be forestalling action rather than charting a course for the future of satellite remote sensing.

We are particularly supportive of the idea of developing the service within the federal government and the National Aeronautics and Space Administration. Over the last several years, NASA has clearly demonstrated its sensitivity and responsiveness through activities such as the Regional Remote Sensing Applications Program and Applications Systems Verification and Transfer Projects. Furthermore, our Task Force feels the technology is still not accepted widely enough to be taken over entirely by the private sector, and that the needs of public sector users would not necessarily be adequately met in an environment where profit and loss are the major considerations. In the longer run, once adequate markets have been aggregated and public and private sector users have developed the capacity to fully utilize Landsat type data, the private sector might well be best qualified to manage and operate the system. Such a turnover, however, would clearly be premature at this time.

The major area of difference between NCSL Landsat Task Force policy positions and S.663 relates to the philosophy behind the financing of the service. While a "pay-as-you-go" system may be desirable from a federal perspective and justifiable for certain classes of users, such as those deriving a profit through use of products of the system, from a state perspective, other arrangements would be more desirable. Specifically, we

feel that the service's charter should reflect a public service concept, and that Landsat type data should be considered in the same context as census, cartographic and meterological data which are provided at cost of reproduction and distribution by the federal government.

Timely and accurate information on our resources and environment cannot help but improve the quality of our resource decision-making, which will lead, in turn, to improving the common good. An ongoing natural resource census provided through Landsat type data can make a positive contribution to the information base available to our natural resource decision-makers, both legislative and executive, and its use should be encouraged whenever possible. Because of increasing demands for resource planning, spurred in large part by federal programs, and since the advent of Proposition 13 and related actions, state and local data budgets have been stretched to the limit. The costs of a "pay-as-you-go" system would effectively discourage use at a time when the user base needs to be expanded so that it can eventually become self supporting.

I submit that no one fully understands the user costs associated with a self supporting Earth Data and Information System. A data cost increase of 10 - 100 times - an estimate currently being used in some circles - would have a devastating effect on public sector users. Let us take care not to throw the baby out with the bath water. We must recognize the public good aspects of the service.

The role of state and local governments in providing input and advice on systems development and operation could be strengthened in S.663. The bill currently gives the Administrator of NASA the responsibility to arrange for participation of user communities in such activities. An explicit statement defining "user communities" to include state and local governments and others would remove any potential ambiguities and assure adequate participation by the non-federal public sector.

Another area the NCSL Landsat Task Force feels should be explicitly addressed in S.663 concerns the technology transfer function of the service. As partners in the federal system, the federal government has an obligation to assist the states in

developing the capacity to manage their resources. Landsat type data can make a strong contribution to the data base for natural resource decision-making - but only if the decision makers and other users have the capability to interpret and apply the vast stores of information space remote sensing can provide. The Landsat Task Force, therefore, urges that the committee explicitly address technology transfer to state and local government - including orientation, training, demonstration projects and technical assistance - in their revision and amendment of S.663.

A final suggestion regarding the Earth Data and Information Service Act of 1979 concerns the ban on data reproduction of service products by users. While we are cognizant of the need to provide an adequate market to allow economies of scale to be realized within the service, we must also consider the fiscal implications of such a ban on our state and local governments. Many states have or are setting up centralized information services and clearinghouses to reduce the costs of data to state, regional and local agencies, eliminate duplication of data gathering expenditures, promote multiple use of data resources, pool existing hardware resources to limit capital outlays, and provide specialized staff capabilities. A total ban on reproduction of service products will unnecessarily undermine such efforts. In modifying S.3589, an exemption to the ban for educational purposes was recognized as being needed, and is reflected in S.663. I would suggest that this exemption be extended to state and local governments for all non-commercial uses.

On behalf of the National Conference of State Legislatures and the NCSL Landsat Task Force, I would like to thank the committee for this opportunity to express our views on this important piece of legislation. I have taken the liberty of suggesting specific language to reflect NCSL's recommended changes, which you will find attached to my written statement. I trust you will find our suggestions to be both constructive and reasonable. If we can be of further assistance, please feel free to call upon us.

SUGGESTED AMENDMENTS

ATTACHMENT TO THE STATEMENT OF

THE HONORABLE MONROE L. FLINN

ON S.663 - THE EARTH DATA AND INFORMATION SERVICE ACT OF 1979

Sec. 7(d)(7) - to conduct a technology transfer program directed at federal, state and local government users and consisting of training, demonstration projects and technical assistance activities.

Sec. 7(f)(2) - arrange for the participation of the scientific, technical and user communities, including federal, state and local governments and the private sector, in planning the system, and in acquiring, processing, analyzing, and distributing data and basic information products to users; and

Sec. 9(a) - the Administrator shall establish a schedule of charges for products and services provided to users as required to carry out the provisions of this Act. The Administrator shall design such charges to be consistent with the provisions of Section 552 of Title 5, United States Code, and is restricted and limited to charges for reporduction and handling set forth in that section.

Sec. 9(e) - delete.

Sec. 10 (insert after subsection (a) or (b)) - Notwithstanding the provisions of subsection (a), the fair use of any data or basic information product, including such use by reproduction in copies or by any other means specified by the Administrator, for purposes in support of the missions of state and local government agencies, is not a violation of subsection (a) of this section.

BIOGRAPHICAL SKETCH

Monroe L. Flinn
Majority Whip
Illinois House of Representatives
Member, Landsat Task Force

Representative Monroe L. Flinn, Majority Whip of the Illinois House of Representatives, is currently serving his fifth term in the Illinois House. In previous sessions, he served as Chairman of the House Environment, Energy and Natural Resources Committee. Before his election to the Illinois General Assembly, Representative Flinn served ten years as a member of the St. Clair County Board of Commissioners. Representative Flinn has been a member of the NCSL Landsat Task Force for two years.

Representative Flinn, who resides in Cahokia, Illinois, is married and has three grown children. He is presently employed as Director of Community Affairs at the Granite City Steel Company of Granite City, Illinois.

RECOMMENDATIONS OF THE NATIONAL CONFERENCE OF STATE LEGISLATURE'S

LANDSAT TASK FORCE ON ADMINISTRATION LANDSAT POLICY

I. Overall Policy

The NCSL Landsat Task Force is concerned with both the tenor and specifics of President Carter's recent policy decisions on the Landsat program, developed as a part of an overall national space policy.

A. RECOMMENDATION:

The Task Force is encouraged by the administration's current reconsideration of the satellite remote sensing components of the national space policy and strongly urges the administration to develop and implement a policy consistent with the recommendations of the NCSL Landsat Task Force (State Legislative Recommendations on Landsat Technology), the Natural Resources and Environment Task Force of the Intergovernmental Science, Engineering and Technology Advisory Panel (State and Local Government Perspectives on a Landsat Information System), the Space Applications Board (Practical Applications of Space Systems), and its own consultants (Earth Information From Space by Remote Sensing).

B. RECOMMENDATION:

The Task Force strongly urges the administration to make an explicit commitment and undertake the necessary actions to provide for continuity and compatibility of Landsat type data in future years.

C. RECOMMENDATION:

The Task Force applauds recent steps taken by the administration to involve state legislatures and state and local governments in certain areas of Landsat policy development. The Task Force recommends that representatives of these groups be afforded a significant opportunity to participate in the development of the comprehensive plan covering technical, programmatic, private sector and institutional issues of the integrated national remote sensing system.

II. Landsat-D Plans

The Task Force feels that the Landsat-D program has been underfunded in at least two areas. First, the data distribution system planned for thematic mapper data is a step backwards from the all-digital capabilities currently being developed for Landsat-2 and Landsat-3. Considering the overall Landsat-D price tag in the neighborhood of $350 million, it seems rather shortsighted to not spend an additional 2-3% to assure timely data distribution. Secondly, the backup satellite, Landsat-D', has not been fully funded or scheduled for launch.

D. RECOMMENDATION:

The Task Force urges the administration to take the necessary steps to implement an all digital data processing and distribution system for all Landsat-D data so that data can be delivered to users within two weeks of ordering.

E. RECOMMENDATION:

The Task Force recommends that Landsat-D' be fully funded and scheduled for launch as soon as practicable, following the launch of Landsat-D. The presence of two satellites in orbit will allow for eight or nine day repetitive coverage, rather than sixteen to eighteen days as with one satellite.

AGENDA

LANDSAT TASK FORCE MEETING

JULY 23-24, 1979 - SAN FRANCISCO HILTON

MONDAY, JULY 23

2:00 - 5:00 Tour of the Space Sciences Laboratory at the University of California at Berkeley (Optional Activity)

6:30 - 9:30 Dinner (Meet in lobby of San Francisco Hilton at 6:15)

TUESDAY, JULY 24

8:30 - 12:30 Business Session

I. Welcome and Introduction of New Members
Senator Rolland Redlin, Chairman

II. Review of NASA Technology Transfer Activities In Remote Sensing
Alex Tuyahov, Chief, Space Applications Branch, NASA Technology Transfer Division

III. Review of Landsat Activities at the Federal Level

A. Congress - Paul A. Tessar, Natural Resources Information Systems Project Director
1. Report on April 9th U.S. Senate Hearings
2. Status of Stevenson and Schmitt Bills
3. U.S. House Activities

B. Administration - Leonard Slosky, White House Office of Science and Technology Policy
1. Integrated Remote Sensing System Study
2. Private Sector Integration Study
3. Future Studies and Administration Actions

IV. Consideration of Task Force Policy Positions and Recommendations to the Federal Government

A. Policy position passed by NCSL State-Federal Assembly and to be considered at Annual Meeting
B. NASA response to Task Force recommendations on administration Landsat policy
C. New policy positions and recommendations

V. Presentation on Five Agency Project on Classifications and Inventories of Natural Resources
Paul A. Tessar, NCSL

VI. Working Lunch - Catered

A. Presentation on Virginia Strip Mining Demonstration Project
   Don Shull, Virginia Legislative Scientific Advisor
B. Reveiw of NCSL Natural Resources Information Systems Project Activities
   Paul A. Tessar, Project Director
C. Future Project Activities
   Paul A. Tessar, Project Director

VII. Tour of the NASA Ames Research Center

12:30 - 1:30	Drive to Ames Research Center
1:30	Overview of Western Regional Applications Program Dale Lumb, WRAP Director
1:50	Brief Review of Montana Projects Bob Wrigley, WRAP Project Coordinator
2:30	Demonstration of IDIMS Interactive Display Willie Todd
3:00	Tour of U-2 Photo Facilities Bob Elkstrand
3:30	Demonstration of SEL Interactive Display Harry Jones
4:00	Tour of U-2 Aircraft Jim Cherbonneaux
4:30	Adjourn and return to San Francisco
6:00 - 7:30	Early Bird Reception (Annual Meeting Activity in City Hall Rotunda)
7:30 - 10:00	Dinner (Meet in front of City Hall after reception)

EARTH DATA AND INFORMATION SERVICE ACT

The demand for, and utilization of, land, water, forest products, minerals, energy and other finite resources is constantly increasing as a result of increased population and an increased rate of consumption per individual. To effectively manage these resources, our state and local governments require accurate and timely data on the quality and quantity of the Earth's resources and environment. Because of the development of the Landsat Earth Resources Survey Program, new technologies have become available which can provide states the opportunity to generate new types of information on their resource bases.

NCSL believes, on the basis of demonstrated experience, that the types of information obtained from Earth remote sensing satellites and other remote sensing technologies is extremely useful and cost effective in providing additional information that is necessary for inventorying, monitoring and evaluating each state's resources and environment. Until these new technologies are institutionalized at the national level and a continuous, reliable flow of basic information is assured, the states will not be able to fully reap the benefits of satellite remote sensing. State resource planning and management programs need an ongoing, compatible source of information. Without assurances of continuity, Landsat-type data will be seen and treated as an interesting experiment by many decision-makers at the state and local levels.

In order to overcome the current system's shortcomings and provide an institutional framework to allow states and others to take full advantage of Earth remote sensing data, NCSL urges the passage by Congress and the signing by the President of an Earth Data and Information Service Act in 1979. This legislation should establish the institutional framework for an Earth remote sensing satellite system so as to contribute to the attainment of national objectives, to serve the needs of the federal, state and local governments and the private sector, and to ensure consolidation of continuing research and development of remote sensing.

Policy Position passed by the NCSL membership at the Annual Meeting in San Fransisco, July 24-27, 1979.

TECHNICAL ASSISTANCE IN NRIS AND NASA TECHNOLOGIES

Workshops and Committee Briefings

Workshops and committee briefings will continue to be a primary thrust of the technical assistance program. Up to 16 workshops will be conducted during the two year period. Each workshop will be custom tailored to meet constituent needs in both substantive focus and length. Subjects will range from general overviews of NRIS and Landsat technologies to detailed reviews of specific applications. Workshop length will vary from 30 minutes to a full day, depending on time available and the exact subject matter to be covered.

Information and Advisory Assistance

The NRIS project will provide technical assistance to individual legislators, staff, committees or task forces on NRIS and NASA technologies as requested. Comparative state information, documentation of particular applications and policy analyses will be provided or developed as necessary. The project will thereby serve as a national clearinghouse for state legislatures on NRIS technology. In addition, issue briefs on new NASA-developed technologies will be prepared for distribution to legislative science and technology staff. The project will serve as a technology broker, putting potential users in contact with NASA technical experts, and providing assistance along the way.

Publications

The many project publications will continue to be an important communications tool. The Remote Sensing and NRIS newsletter will continue at a rate of eight issues per year. Other current publications will be distributed throughout the project duration, including:

- Landsat: Down to Earth Views from Space
- A Legislator's Guide to Landsat
- A Legislator's Guide to Natural Resource Information Systems