



**Second National
Satellite Land
Remote Sensing
Data Archive
Workshop**



October 8-9, 1997

Workshop Purpose

To serve as a transition between the workshop and the advisory committee by producing a charge to the committee. The charge will contain what the workshop participants believe ought to be the committee's focus for its first two years of service

Chair:

Professor Joanne Irene Gabrynowicz
University of North Dakota
Department of Space Studies

Sponsor:

U.S. Department of the Interior
U.S. Geological Survey
EROS Data Center



Second Archive Workshop Agenda

Day 1: Thursday, October 9

USGS Headquarters, Reston, VA, Room BA102A

- 8:00-8:30 Mini-bus to USGS.
- 8:30-9:00 Welcome to USGS and NMD
Introduction of Attendees
- 9:00-9:15 Orientation and Logistics
- 9:15-9:45 Charter Progress Report: FACA Process
- 9:45-10:15 National Data Policy Overview
- 10:15-10:45 Data Policy Overview: The View from EDC
- 10:45-11:00 BREAK
- 11:00-11:30 Data Policy Overview: The View from a Library
- 11:30-12:00 Data Policy Overview: The View from
the National Archive Records Administration
- 12:00-12:45 USGS Tour
- 12:45-13:30 LUNCH
- 13:30-14:00 Workshop Product: A Charge to the Committee
What is the workshop's advice to the Committee regarding
its focus for its first two years of service?
- 14:00-15:30 Discussion break-out groups.
Each group will address what the Committee's focus should be.
Group 1 Facilitator: Adler
Group 2 Facilitator: Thibodeau
Group 3 Facilitator: Thibault
- 15:30-16:30 Group Reports
- 16:30 Adjourn for the day.
- 16:30-17:00 Van returns to hotel.
- 18:30-19:00 Meet in lobby. Mini-bus to restaurant.
- 19:00 Dinner

Second Archive Workshop Agenda

Day 2: Friday, October 10

Hilton Hotel, Dulles Airport, Reston, VA.

8:00-8:30 Continental Breakfast

8:30-10:15 Discussion break-out groups.

Group Facilitators

Each group will continue discussions
and return with three foci in ranked
order of importance.

10:15-10:30 BREAK

10:30-12:00 Return to whole group.

J. Gabrynowicz

Focus Reports.

Draft Workshop's Charge to the Committee.

12:00-13:00 LUNCH

13:00-14:30 Discussion

J. Gabrynowicz

Committee nominations

15:00 Adjourn workshop.

**The Second
National Satellite Land Remote Sensing Data Archive Workshop**

Joanne Irene Gabrynowicz, J.D., Chair

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Data Policy

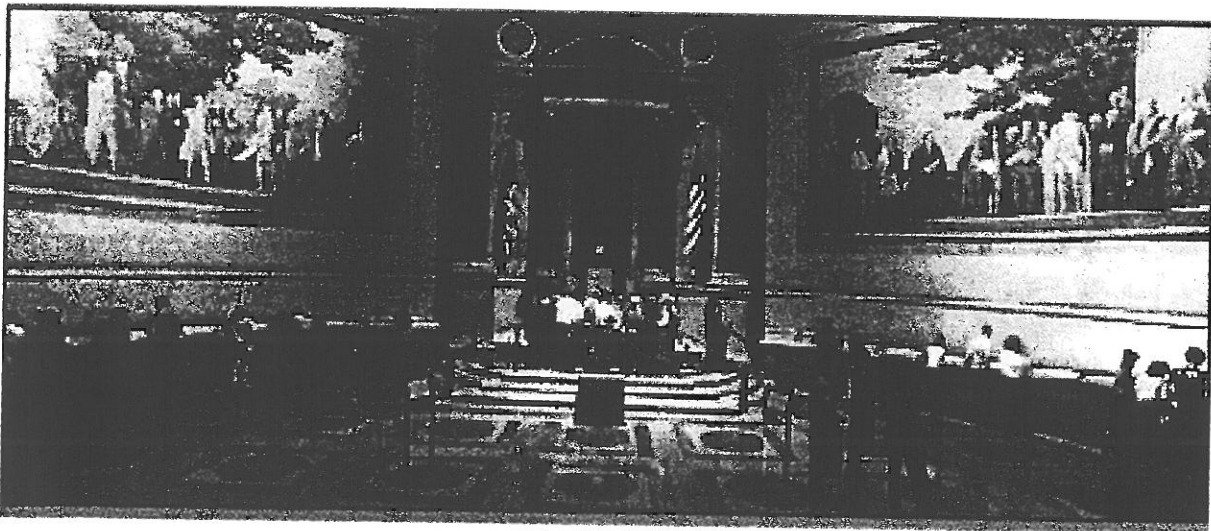
The View from an Archives

October 9, 1997

Kenneth Thibodeau
Director
Center for Electronic Records
National Archives and Records Administration



The National Archives





National Archives

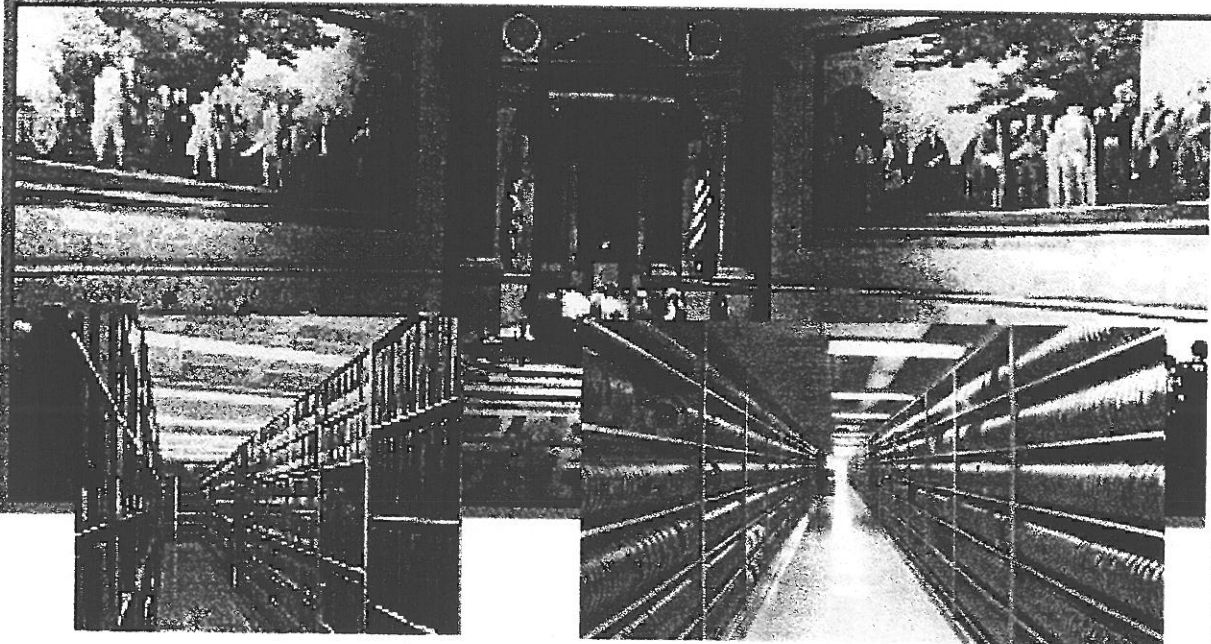


“Those official records which have been determined by the Archivist of the United States to have sufficient historical or other value to warrant their continued preservation by the Federal Government, and which have been accepted by the Archivist for deposit in his custody.”

- 44 U.S.C. 2901(11)



The National Archives





The NATIONAL ARCHIVES and Records Administration

NARA

“An independent agency which establishes policies and procedures for managing U.S. Government records.”



U.S. Government

Federal agency means any executive agency or any establishment in the legislative or judicial branch of the Government (except the Supreme Court, Senate, the House of Representatives, and the Architect of the Capitol and any activities under his direction).

44 U.S.C. 2901(14)



Records

“all books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations or other activities of the Government or because of the informational value of the data in them”

44 U.S.C. 3301.

NARA's Authority & Responsibility

❖ Governmentwide Scope

- ◆ “The Archivist shall prescribe such regulations as... necessary to effectuate the functions of the Archivist, and the head of each executive agency shall cause to be issued such orders and directives as... necessary to carry out such regulations.”**

*** 44 U.S.C. 2104(a)**

NARA's Authority & Responsibility

Life Cycle Management of Records

- ✧ **“The Archivist shall provide guidance and assistance to Federal agencies with respect to ensuring adequate and proper documentation of the policies and transactions of the Federal Government and ensuring records disposition.”**
* 44 U.S.C. 2904(a)
- ✧ **“The Archivist shall establish standards for the selective retention of records of continuing value, and assist Federal agencies in applying the standards....”**
* 44 U.S.C. 2905(a)

NARA's Authority & Responsibility

Life Cycle Management of Records (continued)

- ✧ **“The Archivist shall promulgate regulations... establishing--**
 - ✧ (1) procedures for the compiling and submitting to him of list and schedules of records proposed for disposal;
 - ✧ (2) procedures for the disposal of records authorized for disposal....”
* 44 U.S.C. 3302.
- ✧ **“The procedures prescribed by this chapter are exclusive, and records of the United States Government may not be alienated or destroyed except under this chapter.”**

* 44 U.S.C. 3314

NARA's Authority & Responsibility

Life Cycle Management of Records (continued)

- ✧ **“The head of each Federal agency shall establish safeguards against the removal or loss of records he determines to be necessary and required by regulations of the Archivist.”**

* 44 U.S.C. 3105

- ✧ **“The head of each agency... shall submit to the Archivist...**

- ✧ **“Schedules proposing the disposal after the lapse of specified periods of time or records that... will not... have sufficient Administrative, legal, research, or other value to warrant their further preservation by the Government.”**

* 44 U.S.C. 3303

NARA's Authority & Responsibility

The National Archives

- ✧ **“When it appears to the Archivist to be in the public interest, he may....**
- ✧ **(2) direct and effect the transfer to the National Archives... of records of a Federal agency that have been in existence more than thirty years and determined by the Archivist... to have sufficient historical or other value to warrant their continued preservation by the United States Government, unless the head of the agency... certifies in writing... that they must be retained in his custody for use in the conduct of the regular current business of the agency;”**

44 U.S.C. 2107

NARA's Authority & Responsibility

The National Archives (continued)

- ✧ **“When it appears to the Archivist to be in the public interest, he may....**

- ✧ **“(3) direct and effect... the transfer of records deposited or approved for deposit with the National Archives... to public or educational institutions or associations; title to the records to remain vested in the United States....”**
44 U.S.C. 2107

Scientific Data as Federal Records

- ✧ **Data, created or collected by an agency under Federal law or in the course of its business, that are, or should be, preserved solely because of the informational value of the data they contain come under the Federal Records Act definition of ‘record’**

- ✧ **Records should be preserved if they have “sufficient administrative, legal, research, or other value to warrant their further preservation by the Government”**
* 44 U.S.C. 3303(2), 3303(3), 3303a(a), 3303(a)(d).

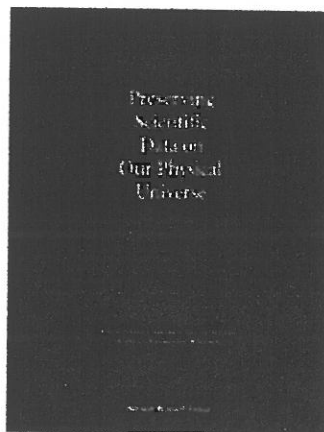
NARA's Role in the Area of Scientific Data

- ✧ **Provide guidance and set standards for management of records.**
- ✧ **Identify scientific records with long term value.**
- ✧ **Acquire, preserve, and provide access to scientific records**

Preserving Scientific Data on Our Physical Universe

National Research Council study, sponsored by NARA,
NOAA, NASA

- ✧ **Life Cycle Management**
- ✧ **Data to be retained by sponsoring agency in discipline data center**
- ✧ **Interagency Collaboration**



Spatial Data: *The Federal Geographic Data Committee*

Historical Data Working Group

- ✧ **The Historical Data Working Group is established to promote an awareness among Federal agencies of the historical dimension to geospatial data; to facilitate the long-term retention, storage, and accessibility of selected historically valuable geospatial data; and to establish a mechanism for the coordinated development, use, sharing, and dissemination of historically valuable geospatial data which have been financed in whole or part by Federal funds.**



<http://www.fgdc.gov/Nara/fgdchdwg.html>

Hdwg5.htm

ISO Archiving Standards - Open Archival Information System

- ✧ **ISO has undertaken a new effort to develop standards in support of the long term preservation of digital information obtained from observations of the terrestrial and space environments. ISO has requested that the Consultative Committee for Space Data Systems Panel 2 coordinate the development of those standards.**

*<http://bolero.gsfc.nasa.gov/nost/isoas/overview.html>

*[ftp://nssdc.gsfc.nasa.gov/pub/sfdu/isoas/us09/CCSDS-650.0-W-1.2.mcw\(draft, MS Word 6\)](ftp://nssdc.gsfc.nasa.gov/pub/sfdu/isoas/us09/CCSDS-650.0-W-1.2.mcw(draft, MS Word 6))

Keeping Federal Scientific Records:

Legal and Physical Custody.

- ◇ **National Archives**
- ◇ **Affiliated Archives**
- ◇ **In the agency's legal custody**
 - ◆ **"Permanent in agency"**
 - ◆ **Unscheduled records**
 - ◆ **Things that are not records: "non-records"**

Managing Digital Scientific Records

38 Code of Federal Regulations 1228 and 1234

- ◇ **Agency responsibilities.**
 - ◆ **Assign responsibility**
 - ◆ **Integrate the management of electronic records with other records and information resources management programs of the agency.**
 - ◆ **Incorporate electronic records management objectives, responsibilities, and authorities in agency directives and disseminate them**
 - ◆ **Establish procedures for addressing records management requirements before approving new electronic information systems or enhancements to existing systems.**
 - ◆ **Ensure adequate training**

Agency Responsibilities

(Continued)

- ✧ **Develop and secure NARA approval of records disposition schedules, and ensure implementation of their provisions.**
- ✧ **Establish procedures for records that are created or maintained by contractors.**
- ✧ **Review systems periodically**

Creation and use of data files.

36 CFR 1234.20

- ✧ **Incorporated disposition instructions for the data shall into the system's design.**
- ✧ **Maintain adequate and up-to-date technical documentation.**
- ✧ **Select appropriate media and systems for storing agency records throughout their life**
- ✧ **Ensure that information is not lost because of changing technology or deterioration by converting storage media to provide compatibility with the agency's current hardware and software.**

▲ **Before conversion, determine that the**

Documentation of Data

- ❖ **Specify all technical characteristics necessary for reading or processing**
- ❖ **Identify all defined inputs and outputs; define the contents of the files and records;**
- ❖ **Determine restrictions on access and use;**
- ❖ **Understand the purpose(s) and function(s) of the system;**
- ❖ **Describe update cycles or conditions and rules for adding information to the system, changing information in it, or deleting information; and**
- ❖ **Ensure the timely, authorized disposition of the records.**

Selection of Storage Media.

36 CFR 1234.30

- ❖ **Permit easy retrieval in a timely fashion;**
- ❖ **Facilitate distinction between record and nonrecord material;**
- ❖ **Retain the records in a usable format until their authorized disposition date; and**
- ❖ **When appropriate, meet requirements for transferring permanent records to NARA**
- ❖ **Consider the portability of the medium (that is, selecting a medium that will run on equipment offered by multiple manufacturers) and the ability to transfer the information from one medium to another (such as from optical disk to magnetic tape)**

**Minutes
of the
National Satellite Land Remote Sensing Data Archive
Advisory Workshop
November 12-13, 1996
EROS Data Center
Sioux Falls, SD**

Participants

Joanne Irene Gabrynowicz, J.D., Chair

Dr. Prudence Adler
Dr. Marion Baumgardner
Dr. Grady Blount
Dr. Darlene M. Carlson
Mr. John Randall Copple
Mr. Thomas J. Feehan
Mr. Wayne Hallada
Dr. Thomas Lillesand
Dr. Gerald Nelson
Mr. Paul Tessar
Mr. David Thibault

John Antenucci
Dr. Frank Beurskens
Mr. John Boyd
Dr. Karen Coker
Dr. Kenneth Davidson
Ms. Kass Green
Mr. Tom Holm
Dr. John S. MacDonald
Dr. George Robinson
Mr. Mike Scott
Dr. Kenneth Thibodeau

Day 1

Introduction

Wayne Rohde, Assistant Center Chief of Programs for EROS Data Center (EDC) welcomed the participants. He said he believed the workshop to be a landmark meeting. It would be the first step in providing the advisory panel which has been needed for some time.

Mr. Rohde pointed out that EDC is interested in the issues of public/private interaction. He said that law and policy stipulate the need for a national archive and the desire to promote the commercialization of space. There are requirements for a global data center. Mr. Rohde said that the question of what that is, is a fair one.

Law and Policy Review

Joanne Gabrynowicz, professor of remote sensing law and policy and workshop chair, began the working portion of the agenda with a review of laws and policies pertinent to the National Satellite Land Remote Sensing Data Archive (NSLRSDA). She reported that the idea of a national archive goes back to 1986 and is mandated in several important documents:

- 1986 NOAA - USGS MOU to establish NSLRSDA
- 1992 The Land Remote Sensing Policy Act
- 1993 NASA - USGS L7 MOU
- 1994 NASA - USGS EOSDIS MOU
- 1994 Presidential Decision Directive/NSTC-3 (Landsat Strategy)
- 1994 Commercial Remote Sensing Policy
- 1995 Executive Order 12951 (Declassification)
- 1996 National Space Policy

The definition of "archive" used by Prof. Gabrynowicz was an institution "where records relating to the activities of a nation are collected, maintained, stored, reproduced, distributed and held in trust."

Prof. Gabrynowicz reviewed provisions of the 1992 Policy Act which states that NSLRSDA is to maintain, control, and assure the quality, integrity and continuity of the data. The Act makes archiving practices the duty of the Secretary of the Interior and Landsat Program Management. It refers to a "basic data set" as long-term, global, and generated by remote sensing. The Act also requires there be "timely access" to Archive data. On the issue of content determination, Prof. Gabrynowicz stated that the Act requires anticipating scientific and technical developments, paying particular attention to global change research, and seeking user and producer advice. Referenced criteria include duplicated geographic coverage with different seasonal, spectral and resolution factors; unenhanced data generated by Landsat, private systems, and foreign stations; and, archived data in the public domain, provided by the Secretary of the Interior. Data is to be provided at the cost of fulfilling user requests.

Regarding various policies, Prof. Gabrynowicz noted that the 1994 Presidential Decision Directive (PDD) identified, as a key issue, the maintenance and availability of an archive for existing and future Landsat data. The Commercial Remote Sensing Policy requires private systems, according to the provisions of their licenses, to negotiate with NSLRSDA terms to provide it with any data the private operator intends to purge. The Executive Order declassifying data from early national systems identifies NSLRSDA as the institution to make the declassified data available to the public. The 1996 National Space Policy includes the goals of enhancing knowledge of the Earth and supporting NSLRSDA.

Prof. Gabrynowicz concluded that the NSLRSDA has both legislative and executive mandates. It will be expensive and advice will be needed. In order to solicit multidisciplinary advice there is a need to establish the archive's long-term direction and goals. This can be done, in large part, by forming an archive advisory panel.

Workshop Focus

Prof. Gabrynowicz identified the questions for the workshop participants:

Who must be represented on an advisory panel?

What critical issues are to be addressed by an advisory panel?

Who should be recommended for panel membership?

She suggested representation was needed from, among others, government, industry, academia, natural sciences, informational sciences, policy and law. Some concerns the group might want to address, among others, were standards, product definition, calibration, applications, systems, data preservation and delivery.

A discussion ensued about international representation. It was suggested that the Committee on Earth Observation Satellites (CEOS) might be consulted. It was pointed out that the archive will be paid for by U.S. taxpayer dollars and that the 1992 Act describes the archive as is in the "national interest." However, it was also noted that as a practical matter, the archive would involve international activities, users, and contributors.

A question was raised about the definition of "timely access." Does this mean access by the U.S. population or the international population? Foreign users are identified as a constituency under the 1992 Act. This discussion flowed into the question of data copyright laws. It was noted that the current international trend is to limit data access from national satellite systems under intellectual property concepts and that the U.S. statute is one of the few directives expanding, rather than limiting, access. It was stressed that the U.S. could make some impact on global opinion.

There was a discussion on the issue of defining the terms "raw data," "baseline data," and "unenhanced data." Data definitions was added to the list of advisory panel issues.

The point was raised that aerial data is not legally relevant to NSLRSDA because the statutory mandate is

to archive satellite data. But the importance of aerial data in its ability to complement satellite data was discussed.

The view was expressed that NSLRSDA will be a 21st Century asset, and while embryonic at this time, it should be considered comparable to other national archives.

Archive Contents

By most definitions, the archive would hold records (images, data, metadata, technical processes and procedures), and activities of the nation (land use, water use, natural hazards, population trends, etc.). Archive holdings today include 30+ years of earth observation from Landsat Scanner, Landsat Mapper-AVHRR/LAC/HRPT. In the future it will hold data from SPOT, commercial sources, Landsat 7 and EOS/MODIS and EOS/ASTER. There are also 880,000 frames of declassified intelligence satellite photographs at EROS. Long term preservation includes access and distribution that will maintain data integrity; planned data migration; and, provide information access to all users. It was reported that over 60 data sets are accessible via the Internet and were released in June of 1991.

The Landsat International Data Base includes the following: computer-based catalogue, worldwide arch, metadata exchanged in a common format, GLIS accessibility, 940,000 scenes achieved in the United States, and 2,443,000+ scenes achieved by non-US stations. With Landsat 7, foreign stations will have to provide metadata, but not data, or browse. It was pointed out that non-US populations will have unlimited access to foreign scenes but U.S. users will not have access to foreign scenes.

Definitional Issues

The Tuesday afternoon session began with the task of defining "archive" and "data." A discussion followed as to whether the law's reference to "unenhanced" includes distributing and holding. The opinion was expressed that there is no standard definition of "unenhanced" or "raw" data. The question was asked, "What are the parameters?" Industry will want varying degrees of refinement.

Discussion ensued on the issue of what data is required to be archived. The law says "satellite land data." The opinion was expressed that could be expanded to "Landsat type data." What data is worth keeping and what is not worth keeping? Librarians ask the user community to prioritize saving what can be afforded. Will the archive panel need to do that? Reference was made to section 5652c of the 1992 Act which contain guidelines for archiving. It was pointed out it is almost certain that priorities will change over time, therefore a 5 to 10 year philosophy may need to be the focus. Perhaps the right question is, "What are the objectives of the archive?"

At this point in the discussion the group reached consensus on two points:

1. Issue statements are to be kept simple.
2. The advisory panel will be interdisciplinary.

It was clarified that the panel would report directly to the Secretary of Interior.

Public Good

Discussion then centered on the definition of "public good". Since there will be large archive costs, will a philosophy that equates the maximum spin-off and the maximum public good be appropriate?

The group suggested issues be framed as follows:

- What is the purpose of the NSLRSDA?
- What is being archived?
- What should be the priorities?
- Define how data is to be accessed.
- What constitutes a basic data set?

Panel Membership

Discussion the focused on panel membership. It was agreed that members should be chosen for knowledge, community of representation, and political support of the archive. A view was expressed that a priority for the panel is in influencing and interpreting policy. Technical representation on the panel is fine, but is not the primary function.

Holm was asked how many members the panel should have; he answered he thought no more than 15. Gerald Nelson thought members should be eminent persons rather than representatives of interest groups. Wayne Hallada replied he thought both were important. It was felt the appointment of a futurist would be advisable. Within a couple of years, he said, a new method of allocation of scarce resources will arise. Cost won't drive it; demand will. A collaborative supply chain will be created and the situation will no longer be adversarial. Robinson pointed out that not everyone has the same agenda, and information could cause hostility very quickly. Hallada replied the transparency of information is crucial; the pie could be bigger if we all had better information. Kenneth Thibodeau said he felt the best customers of the archive won't be born for another 100 years. He said the job of an archivist is to carry the message through time without distortion.

It was determined that a charter should be developed defining the relationship among the Secretary of Interior, the EROS Data Center and the panel.

Tom Holm said the largest policy issues for the panel would be:

- Decide the content of the archive (what is a basic set).
- Decide who has "timely access."
- Prioritize the data.

Day 2

Synopsis of the First Day's Results

Wednesday morning's session began with a review and synopsis of Tuesday's activity. Joanne Gabrynowicz reminded the group the task for Wednesday was to:

1. Add substance to the issue list.
2. Provide guidance on the membership of the panel.

Members were given the synopses they had developed:

I) Issues

- What is the Archive
 - Purpose
 - Who uses the Archive/who are the potential users
 - What is being archived
 - What entities
 - Which priorities
 - How is data to be accessed
 - Landsat 7 data access by US and non-US users
- Definitions of data
 - "unenhanced"
 - What constitutes a "basic data set"
- Panel terms of reference
 - Guidelines in 1992 law
 - Scope/relationship of panel to EDC
 - Request from the Secretary of Interior
 - Relationship of the Archive to other similar institutions
 - Applicable advisory panel law

II) Panel

- High-level Community Groups
 - Academia
 - Ad Hoc/At large/general public
 - Government
 - Industry
 - Information science/technology
 - Natural Science
 - Social Science
- Communities
 - Resource managers
 - Policy/Law
 - NGOs
 - K-12
 - Educators
 - Community-based environmental
 - Data providers
 - Value-added
 - International
 - Hardware/system providers
 - Student researchers

The question was raised whether the panel would be advisory to the NSLRSDA or to EDC. It was decided that the panel would be advisory to the archive. The opinion was expressed that because many parts of the EDC activity are archiving activities, any advice taken would be consistent in all areas of EDC, since users do not recognize the lines between archiving activity and other activities.

Joanne Gabrynowicz was asked what the role of the Secretary of Interior would be. She replied that he might ask the panel to address specific areas.

Working Group Reports

The workshop participants organized into three working groups. Each working group each produced a report. The reports are appended to these minutes. (Appendix 1)

Federal Advisory Committee Act

General discussion followed the reports. It was expressed again that panel members would need to be proactive and willing to act as liasons. The standard is the national interest. George Robinson discussed the Federal Advisory Committee Act (FACA). The points he cited were:

The panel must be made public.

Must establish administrative guidelines.

Management controls must be consistent with the GSA.

May not meet without a charter from the Interior.

Supreme Court decisions have indicated broad powers, but the decisions don't include every group.

The GSA has regulations, and the EDC needs to know them well before going further.

The advisory panel ends after two years unless the agency renews and justifies membership.

A plan to attain a balanced membership must be published in the Federal Record.

The panel must be balanced by points of view; a cross-section of qualified/interested people with expertise relating to the task to be achieved.

A 1993 amendment caused each department to slash 1/3 of their advisory committees and they could not create new panels unless the agency head sees a compelling need, the OMB approves, and the panel is seen to be in the national interest.

Recommendation Letter and Future Action

A draft letter was presented and discussion ensued. George Robinson said he felt a letter of support was critical, and suggested appending a list of the signers and a list of the issues and subsets. David Thibodeau added he felt it would be appropriate to provide support for EDC at the meeting on November 22 where the letter would be presented to the USGS director. Further discussion about the letter, which would be addressed to Gordon Eaton, ensued. A copy of the final letter is appended to these minutes. (Appendix 2)

The Workshop participants unanimously accepted the letter and authorized Gabrynowicz to refine it and sign it on their behalf as Chair of the group.

The group asked for an email chat group to be set up so they could be kept apprised of ongoing activity on the issue of the advisory committee. Pru Adler asked if the workshop group would serve until the advisory panel is in place. Tom Holm replied that the workshop group, a subset of this group, or a new group that would consider eventual panel membership. George Robinson said the workshop group could help draft the charter.

Panel Members

Gabrynowicz suggested the group discuss panel membership, urging them to remember that with the letter still having to be accepted, the discussion might be premature. John McDonald agreed the activity would be premature. He said there should be at least one more meeting, since it is too early in his view to be naming names. It was discussed whether to have one more meeting or to use email for the purpose of helping in development of the charter and the suggestion of individuals for the panel. The group then suggested various agencies individuals felt should be represented.

Conclusion

Gabrynowicz asked if there was further business to be discussed. George Robinson thanked her for keeping the group focused, and R. J. Thompson thanked the group for addressing the issues for EDC.

Joanne Gabrynowicz said she felt it had been a good session. The NSLRSDA is an important endeavor, she said, and the integration of disparate viewpoints that occurred at the workshop achieved the goal. She thanked the members for their participation.

APPENDIX 1

National Satellite Land Remote Sensing Data Archive Advisory Workshop

November 12-13, 1996

Joanne Irene Gabrynowicz, Chair

Summary of Workshop Discussions and Key Issues

The National Satellite Land Remote Sensing Archive Advisory Workshop was convened to provide an opportunity for exchange of expert opinions regarding the challenges and issues associated with management of the existing and future archive of satellite land remote sensing data. The two-day workshop included a series of plenary sessions on the first day that described the existing archive of satellite remote sensing data currently managed by the USGS; discussed the conceptual characteristics of that archive; and, developed a common strategy for addressing the requirement for providing advice to the archive management staff. On the second day, three smaller groups addressed these issues in more detail, and a final plenary session consolidated remarks and developed recommendations of the workshop.

The reports of the three groups were discussed in a summary plenary session and are provided in this report. In compiling this report, every effort has been made to faithfully represent only that information developed during the workshop. Therefore, the report is abbreviated in order to avoid adding additional interpretation to the work of the respective groups. Because the goal of the participants were encouraged only to identify issues appropriate for Advisory Panel consideration, not to debate the merits of the issues that were identified.

Workshop Summary: The workshop concluded with discussion and formulation of a letter from the workshop participants to the Director, U.S. Geological Survey, recommending the establishment of an Advisory Committee to oversee the activities and policies of the National Satellite Land Remote Sensing Data Archive.

Group 1 Report

Group one addressed the conceptual definition of the archive, the scope of the anticipated user community, the content of the archive, and types of representation required on an advisory panel. In addition, a number of questions related to archive management were raised.

Archive- A commitment to collect, maintain, preserve, and provide timely access to important data.

Who Uses- Limitless, given the worldwide reach of networks.

An issue for the panel will be how the archive can be responsive to these different communities, in regard to the level of access to data.

Archive Content:

Metadata

On an orbit-by-orbit basis:

1. Ancillary Data - orbit, date, time, etc.
2. Radiometric Calibration Data - to permit derivation of radiance on a pixel-by-pixel basis.
3. Geometric Correction Model
 - Precision Motion Model
 - Ephemeris
 - Attitude History

- Instrument Geometry

[Generate a product immediately using an approximate model, then update it later to generate a precision model.]

Important Associated Data Sets

1. Digital Elevation Model
2. Ground Control Chip Library

Possible Associated Data Sets

1. Atmospheric Data on an Orbit-by-Orbit basis

Other Related Questions

1. What is the process to determine priorities?
2. How should the archive pursue data from the private sector? How to pursue international data? The latter was seen as a priority.
3. What are the rules and guidance regarding purging of data from the archive?
4. What is the definition of timely access?
5. Duplication of archive -- are there alternatives for redundancy? For example, should the United States and Canada engage in discussions?
6. How will the archive address legal issues? e.g., chain of process concerns.
7. National security issues? Should there be some, any or no restrictions on access to the archive?

Archive Advisory Panel

Assess all available information of the legislation and to best meet the needs of the archive. Consider the enabling laws, directive, policy statements, and memoranda of agreement as a foundation for the charter of the advisory panel.

Draft a charter for advisory panel, the workshop participants would consider reviewing the draft charter before it is finalized.

Panel Membership

Two technologists knowledgeable in networking and computer communications plus expertise in remote sensing.

One library/archivist.

One law, policy, international - possibly a lawyer.

Industry

- value added

- consultants different than value added

Several Data Providers - 1-2 members; diversity of views, thus a need to rotate membership on the panel;

no single community voice or view.

Several End Users - Representative sample from academia - natural and social sciences; industry; NGOs, e.g., community-based groups.

Government - NASA, NOAA, and Interior in some capacity should be represented.

Group 2 Report

Group two focused their discussions on the conceptual definition of the archive; how the archive is to be accessed; and, definition of the levels of data to be archived.

What is the Archive?

The purpose of the archive is to preserve, in trust and over the long term, valuable data which might not be preserved elsewhere.

Because resources are scarce, the panel must focus on priorities between;

* Archiving data that represents coverage of global versus United States areas

* Access versus preservation:

Preservation is less expensive than access, but without preservation there is nothing to access. Yet, if there is no access to the data, there is no reason to preserve.

How is data to be accessed?

The question of access depends on the type of customer to be directly served by the archive. Two types of customers exist:

* Individuals looking for information derived from the processing of the unenhanced data, or

* Organizations that generate information from the unenhanced data

Group two believes that the archive should prioritize its efforts towards organizations that generate information from the data. Emphasizing this type of organization will foster the growth of private and public organizations that will add value to the unenhanced data to serve the individuals.

What is being archived?

Considering that funds are limited and that the Archive has a goal of serving organizations that generate information, leads to archiving only Level 0 data with its associated meta data. This is the Canadian model.

EDC needs to examine the duplication of archives. Duplication is important when it has been established that a data set is valuable enough to be duplicated. Presently, several archives are duplicated (e.g. AVHRR is archived both by EDC and NOAA). However, an explicit decision has not been made that this data set needs duplication. Other cases of duplication also need to be examined.

Panel Members

Panel members should be chosen from those members of the public that have an interest in preserving and accessing unenhanced imagery of the Earth's surface.

Group 3 Report

Group three devoted its time primarily to discussion of potential communities from which a panel membership could be drawn.

Archive Representation Community Groups: Sectors and Disciplines

Sector: Academia (2)

1. Researcher
2. Educator

Sector: Government(4)

3. Federal User
4. State User
5. Local user
6. Science Archivist

Sector: Industry (4)

7. Data Management Technologist
8. Licensed Data Provider
9. Value-Added Service or other data provider
10. End User

Sector: Other (5)

11. Non-affiliated individual at-large
12. NGO
13. International
14. At-large from any sector
15. At-large form any sector

Disciplines: Need to be represented via above sectors:

Information Science

natural Science

Social Science

Policy / Law

Note: Overarching Considerations:

1. Panel members should have a high of interest in spatial information.
2. Members should serve as a communication channel with the interests they represent.
3. Members should focus on the "public interest" in their advice.

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**October 8-9, 1997
Reston, Virginia**

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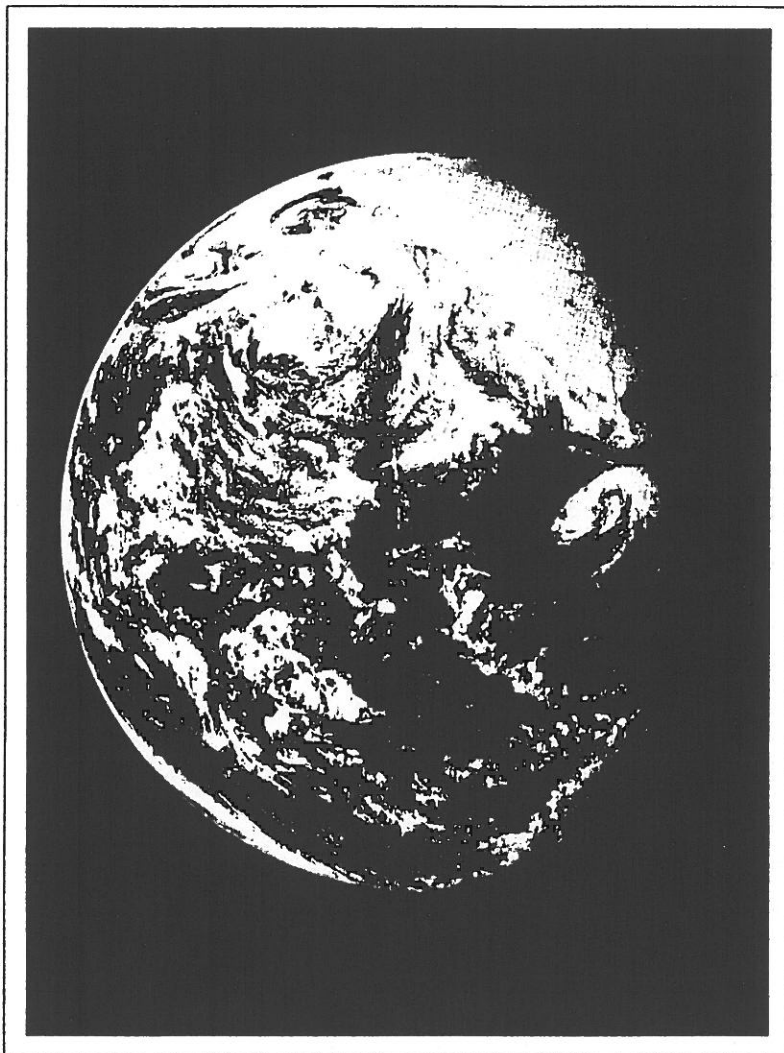
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Policy Statements on Data Management for Global Change Research

U.S. Global Change Research Program



**EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20508**

July 2, 1991

Dear Dr. Peck:

Enclosed please find a copy of the final version of the "Data Management for Global Change Research Policy Statements." This, along with its descriptive Annex, has been reviewed in depth and agreed to by each of the Federal Coordinating Council for Science, Engineering and Technology agencies through the Office of Management and Budget Legislative Referral process. Suggested changes and comments that were submitted were considered and incorporated as appropriate.

These may now be considered as U.S. policy statements and can be distributed accordingly. I would like to thank both you and your committee for the active role you played in the initial development and review of these policy statements.

Sincerely,



Dr. Allan Bromley
Director

Enclosure

The Honorable Dallas Peck
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**DATA MANAGEMENT FOR
GLOBAL CHANGE RESEARCH
POLICY STATEMENTS**

July 1991

The overall purpose of these policy statements is to facilitate full and open access to quality data for global change research. They were prepared in consonance with the goal of the U.S. Global Change Research Program and represent the U.S. Government's position on the access to global change research data.

- The Global Change Research Program requires an early and continuing commitment to the establishment, maintenance, validation, description, accessibility, and distribution of high-quality, long-term data sets.
- Full and open sharing of the full suite of global data sets for all global change researchers is a fundamental objective.
- Preservation of all data needed for long-term global change research is required. For each and every global change data parameter, there should be at least one explicitly designated archive. Procedures and criteria for setting priorities for data acquisition, retention, and purging should be developed by participating agencies, both nationally and internationally. A clearinghouse process should be established to prevent the purging and loss of important data sets.
- Data archives must include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance and aids for locating and obtaining the data.
- National and international standards should be used to the greatest extent possible for media and for processing and communication of global data sets.
- Data should be provided at the lowest possible cost to global change researchers in the interest of full and open access to data. This cost should, as a first principle, be no more than the marginal cost of filling a specific user request. Agencies should act to streamline administrative arrangements for exchanging data among researchers.
- For those programs in which selected principal investigators have initial periods of exclusive data use, data should be made openly available as soon as they become widely useful. In each case, the funding agency should explicitly define the duration of any exclusive use period.

ANNEX

**DATA MANAGEMENT FOR
GLOBAL CHANGE RESEARCH
POLICY STATEMENTS**

July 1991

The Global Change Research Program requires an early and continuing commitment to the establishment, maintenance, validation, description, accessibility, and distribution of high-quality, long-term data sets.

Agencies involved in global change research noted that inadequate attention has often been given in the past to the creation and maintenance of quality long-term data sets. Often this neglect was attributed to relatively lower priority given to long-term data management compared with initial data collection and analysis, with a concomitant lack of resources for the longer term effort. The Interagency Working Group on Data Management for Global Change (IWGDMGC), which assisted in development of these policy statements, pointed out that the long-term cost of maintaining large volumes of data can be significant and suggested that the required resources for this purpose must be committed at the start of data collection projects.

Furthermore, the proper preparation, validation, description, and care of data sets is critical to their use by the widest possible scientific community. Those not involved in the initial data collection and processing must be able to easily determine how data have been collected, calibrated, validated, and otherwise transformed. This may include the development of community-consensus algorithms and instructional efforts to ensure that potential users are aware of data availability.

In some cases the responsibility for establishing and maintaining global change research data sets may be shared by agencies other than the originators of the data collection efforts. Plans must be developed as part of the overall project to ensure that the investment in data collection is enhanced and expanded by adequate long-term data management practices.

Full and open sharing of the full suite of global data sets for all global change researchers is a fundamental objective.

Federal agencies have different data distribution practices affecting global change research data. The IWGDMGC proposes establishing a fundamental objective of full and open sharing of the full suite of global data sets for all global change researchers. Data sets should be made available in a timely manner, but the definition of timeliness is left as a responsibility of the funding agencies involved. As data are made available, global change researchers should have full and open access to them without restrictions on research use.

Global change researchers include those in academic, industry, government, and non-government sectors conducting both basic and applied research.

The global change research data sets contain data of potential usefulness to a competitive U.S. economy for industrial applications and improved environmental management. As required by appropriate public law, global change research agencies will develop plans for commercial access to the global change databases.

To accomplish this objective, data must be submitted to archives, and information about data sets must be created and made available as well. The access policies for these archives should encourage the widest possible use of global change research data in meeting the objectives of the Global Change Research Program.

Preservation of all data needed for long-term global change research is required. For each and every global change data parameter, there should be at least one explicitly designated archive. Procedures and criteria for setting priorities for data acquisition, retention, and purging should be developed by participating agencies, both nationally and internationally. A clearinghouse process should be established to prevent the purging and loss of important data sets.

The agency representatives noted that data sets representing some of the measurement parameters important to global change research do not presently have an archive "home". Many of the biological parameters were cited as an example.

This policy statement is meant to emphasize the responsibility of data collecting and producing agencies to identify suitably supported, long-term archives for all data sets important to global change research, make arrangements for those archives to acquire the data sets and related information, and make them available for open research use. This principle is not meant to exclude distributed or multiple archives where appropriate for particular data sets, but to establish, at a minimum, one explicitly designated archive for each global change research parameter.

In light of the high cost of long-term data maintenance, the IWGDMGC recommends the establishment of specific criteria and procedures for setting priorities for data acquisition, retention, and purging. Some data may not be worth retaining on a long-term basis due to poor quality or other considerations such as cloud cover. However, a mechanism should be developed to ensure that the research community is consulted prior to decisions that result in data loss. This includes the opportunity for a new organization to assume responsibility for maintaining data sets no longer given a high priority by the original archival agency.

This consultative and clearinghouse process should include international as well as national organizations. This might provide a reciprocal opportunity for US agencies to participate in decision making by non-US agencies that hold data of interest to the US.

Data archives must include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance and aids for locating and obtaining the data.

Archive data should include supporting information sufficient to permit its effective use by researchers not familiar with the original data collection project or the particular instrument making the measurements. One limitation on using existing data sets by scientists involved in global change research is the difficulty encoun-

tered in identifying what data exist, how to access them, and what the real meaning is of the information contained in such data sets. In the absence of supporting documentation on instrument calibration, validation campaigns, and other ancillary information, full evaluation and application of existing data can be limited. The repositories for global change research data sets must recognize their obligation to obtain or develop full accompanying information for all global change research data holdings and make the data and the supporting information easily available. This requires a well-conceived directory, catalog, and inquiry system.

Peer review is one important mechanism for establishing and documenting data quality. The IWGDMGC, however, notes that peer review may not always be necessary before data release. What is essential is that data be well enough documented to ensure that users can understand what they are getting.

Work under way through the IWGDMGC to establish an interagency Global Change Master Directory (GCMD), and eventually a more comprehensive Global Change Data and Information System (GCDIS), should contribute to accomplishing this objective. Through linking individual agency directories, users will be able to obtain information about existing data holdings anywhere in the interagency complex without having to separately contact each individual agency. Once data of interest are located, the user can then proceed to obtain the data of interest from the archive where the data reside.

National and International standards should be used to the greatest extent possible for media and for processing and communication of global data sets.

Use of standard media, and processing and communications protocols and procedures, aims at making data accessible in a "vendor-independent" environment. The diverse user community has investigated in many different types of data analysis systems. To the extent possible, through standards and protocols, users should be able to obtain, read, and process data without needing to design or purchase data-specific hardware, software, and systems.

Much progress has been made through national and international standards organizations, some of which address very broad areas of application and others which are more discipline or application specific. For example, the International Standards Organization has an Open Systems Interface protocol with seven different layers of interconnection for communications systems. This work is stimulated by many industries and potential users far beyond the global change research community. The Committee on Earth Observations Satellites is an international organization comprising satellite operators and is developing standard formats for user products from specific types of sensors on remote sensing satellites. These efforts and others should be encouraged and supported by IWGDMGC agencies, and the resulting standards and protocols should be used in global change research projects.

The critical objective of standards use is to ensure the widespread availability and use of data. The emphasis is on ensuring that data sets are available to users in standard formats and through agreed communications protocols where

applicable, not necessarily that the internal details of individual agency data handling and data archiving systems be common.

Data should be provided at the lowest possible cost to global change researchers in the interest of full and open access to data. This cost should, as a first principle, be no more than the marginal cost of filling a specific user request. Agencies should act to streamline administrative arrangements for exchanging data among researchers.

Agencies are governed by a wide variety of policies and practices in data charging and pricing. For researchers (defined differently at different agencies) data are usually, but not always, provided either free of cost or at the marginal cost of reproduction and distribution.

There was recognition by the IWGDMGC that charging the marginal cost of reproduction and distribution can be an effective tool for managing requests for large data sets without restricting access. It also permits data distribution agencies to support widespread data use without adverse budget impacts. For small data sets and those accessed infrequently, the administrative burden of marginal cost recovery may outweigh the benefits of charging such costs, and data may be more efficiently provided at no cost. The essential principle is that research users should not be subject to commercial, profit-based pricing for data sets to be used in support of publicly-sponsored global change research.

In addition to the charging practices, administrative arrangements should be streamlined to facilitate data access and exchange. The Global Change Data and Information System development effort is beginning to address these issues.

For those programs in which selected principal investigators have initial periods of exclusive data use, data should be made openly available as soon as they become widely useful. In each case the funding agency should explicitly define the duration of any exclusive use period.

The agreed objective of this data policy statement is to facilitate full and open access to quality data on a timely basis. Although some data are made available as soon as the data are collected, some agencies provide initial periods of exclusive data use for selected investigators so that data evaluation and validation can be accomplished before general release. Data are not always fully documented and useful during the initial data collection and analysis period, and the need for flexibility in data release was recognized by the IWGDMGC.

Deciding when data become widely useful is the responsibility of the funding agency, which should explicitly define the periods of restricted access, if any. In the past, some Principal Investigators have retained data for indefinite periods, and this has inhibited their widespread use. This practice should be eliminated through active consideration of the tradeoffs between widespread distribution of data sets and the need to assure data quality and validity. The guiding principle is that as soon as data might be useful to other researchers the data should be released, along with documentation which can be used by the other researchers to judge data quality and potential usefulness. In this way users can determine for themselves if they want to proceed with data of questionable quality or wait for additional developments.

The U.S. Global Change Research Program (USGCRP) was conceived and developed to be policy-relevant, and hence, to support the needs of the United States and other nations to address significant uncertainties in knowledge concerning the natural and human-induced changes now occurring in the Earth's life-sustaining environmental envelope.

Prepared for the U.S. Global Change Research Program

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