

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.



# Introduction to the U.S. Geological Survey's EROS Data Center Sioux Falls, South Dakota



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### Products and Services

The EROS Data Center is a part of the Earth Resources Observation Systems (EROS) Office of the Department of the Interior and is managed by the U.S. Geological Survey.

It is the national clearinghouse for the processing and dissemination of spacecraft- and aircraft-acquired images and photographs and electronic data on the Earth's resources. The Center also trains and assists users in the application of such data.

The EROS Data Center provides access to Landsat data, aerial photographs acquired by the U.S. Department of the Interior, and photographs and other remotely sensed data acquired by the National Aeronautics and Space Administration (NASA), from research aircraft, and from Skylab, Apollo, and Gemini spacecraft.

Orders for photographs and images, inquiries on the availability of coverage over specific areas, and requests for price information should be directed to:

EROS Data Center  
U.S. Geological Survey  
Sioux Falls, SD 57198  
Phone: (605) 594-6511, Ext. 151  
FTS: 784-7151

At the heart of the Data Center is a central computer complex that controls a data base of more than 6 million images and photographs of the Earth's surface, performs searches of specific geographic areas of interest, and serves as a management tool for the entire data reproduction process. The computerized data storage and retrieval system is based on a geographic system of latitude and longitude,

**Cover:** An aerial view of the EROS Data Center, the 120,000-square-foot Karl E. Mundt Federal Building

supplemented by information about image quality, cloud cover, and type of data. Guided by customer requirements, the computer will make a geographic search and will print out a listing of available images and photographs from which the requester can make a final selection.

Periodically, training sessions in remote sensing are given at the EROS Data Center. Normally, the sessions are less than 1 week long and stress the use of data for a particular application, such as agricultural inventory or water management. About twice a year, a 4-week course is offered for foreign nationals. This course stresses the fundamentals of remote sensing and introduces the application of remotely sensed data to the solution of various natural resource management problems. Formal training is also supplemented by color slides and recorded tapes that cover the basic methodology of remote sensing and selected applications.

The EROS Data Center has an expanding capability to perform computer-assisted analysis of images. Special devices permit the experimental use of digital analysis techniques to classify phenomena by their reflectance or emittance in different parts of the electromagnetic spectrum.



Application scientists studying Landsat images

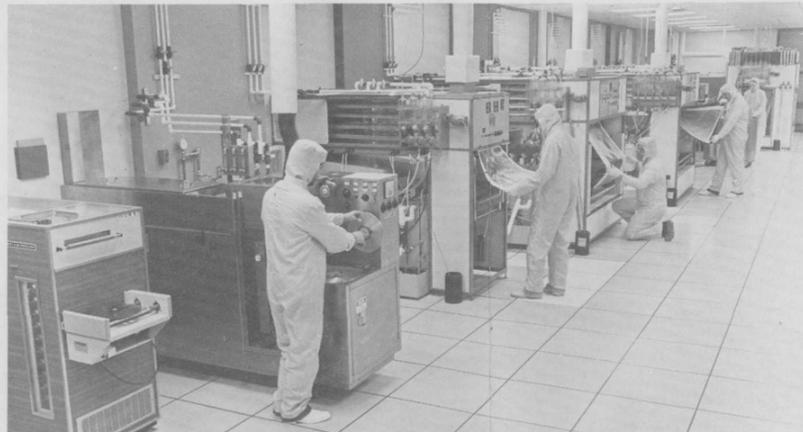
The Center also maintains a technical library on remote sensing of Earth resources for the use of students who are attending training courses, visitors, and Data Center personnel.

### Landsat Data

NASA's Landsat satellites are unmanned space observatories orbiting the Earth at an altitude of approximately 570 miles [920 kilometers (km)]. Each Landsat circles the Earth every 103 minutes and repeats its orbital path every 18 days, thus providing repetitive coverage of almost the entire globe. Data transmitted by the spacecraft to NASA ground stations are subsequently sent to the EROS Data Center through the NASA Goddard Space Flight Center in Greenbelt, Md., via a domestic communications satellite link. The data are converted to photograph-like images and computer compatible tapes at the Data Center. Each scene covers a ground area of 115 by 115 statute miles (185 by 185 km). Copies are stored at the EROS Data Center for reproduction and sale to users throughout the world.

### Skylab Data

The NASA Skylab Program consisted of one unmanned and three manned missions. The



Processor unit of EROS Data Center photographic laboratory

unmanned space vehicle was placed in orbit in May 1973. The manned missions to the space vehicle were launched on May 25, July 28, and November 16, 1973.

The spacecraft traveled in an orbit 270 miles (430 km) above the Earth and acquired photographs, images, and other data of selected areas between latitudes 50° N. and 50° S. The data were collected over test sites selected to support Earth resources experiments.

### NASA Aerial Photographs

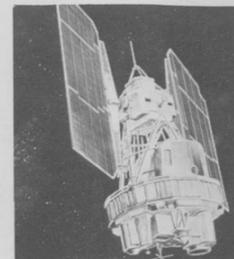
NASA aerial photographs are the product of surveys carried out by the NASA Earth Resources Aircraft Program. The program primarily tests remote-sensing instruments and techniques in aerial flights, generally over preselected test sites within the continental United States.

Photographs available in a wide variety of formats were obtained from standard aircraft at altitudes of a few thousand feet up and from U-2 and RB-57F aircraft at altitudes above 60,000 feet [18,000 meters (m)].

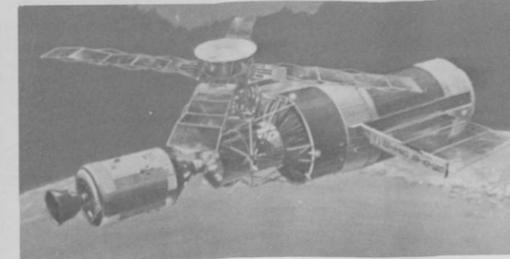
Aerial photographs are available in black and white, color, or false-color infrared. Because these data are acquired at relatively low altitudes, ground features such as roads,



Overview of Data Analysis Laboratory at the EROS Data Center



Landsat



Skylab Spacecraft



NASA U-2 airplane

farms, and cities are easily identifiable. Electronic data from the more sophisticated research sensors on the aircraft may also be obtained through the Data Center.

### Aerial Mapping Photographs

For the past 25 years, aerial photographs have been acquired by the U.S. Geological Survey and other Federal agencies for mapping the United States. The photographs are black and white and the aerial-survey altitude ranges from 2,000 to 40,000 feet (600 to 12,000 m), depending on the planned use of the photographs.

### Visits, Tours, and News Media Inquiries

The visitors' lobby of the EROS Data Center is open to the public from 8 a.m. to 4:15 p.m. on weekdays and from 10 a.m. to 4:15 p.m. on Saturdays. Pictorial exhibits and photographic displays are in the lobby area. Guided tours and film presentations for individuals and small groups are offered on weekdays at 10:30 a.m. and 2 p.m. Guided tours and educational slide and film presentations may be arranged for upper elementary school, high school, and college groups, and for service clubs and professional organizations, as well as for the news media.



User Services Area of the EROS Data Center

## EROS Office

Within the technology of the space age lies a key to increased knowledge about the resources and environment of the Earth. This key is remote sensing—detecting the nature of an object without actually touching it. Although the photographic camera is the most familiar remote-sensing device, other instrument systems, such as scanning radiometers and radar, can produce photographs and images.

On the basis of the potential of this technology, and in response to the critical need for greater knowledge of the Earth and its resources, the Department of the Interior established the EROS Office to gather and use remotely sensed data collected by satellite and aircraft of natural and man-made features on the Earth's surface.

The potential application of remote-sensing techniques for inventory and management of the Nation's Earth resources and monitoring of the environment has been demonstrated in many ways. Landsat images, because of their synoptic coverage, have been used to identify previously unmapped geologic structures as targets for exploration for oil, gas, copper, and other minerals and are being used to inventory water impoundment areas. The repetitive coverage of satellite data provides information for land-use planning with a timeliness not previously possible. The capability of detecting changes in land use has proven effective in monitoring strip mining and reclamation of strip mines and is useful for gaging the environmental impact of the Alaskan pipeline. Satellite data are also used for evaluating range conditions over vast areas of the Western United States and for updating small-scale maps.

In addition to meeting the needs of the Department of the Interior, the EROS Office has the responsibility for providing copies of remotely sensed data in response to public demand and for providing user training and assistance to further the understanding and use of remotely sensed data.

## National Cartographic Information Center

The National Cartographic Information Center (NCIC) is headquartered in the Geological Survey's National Center in Reston, Va. It provides a unique service to those customers requiring information on the availability of cartographic data, including multiuse maps, geodetic control, aerial photographs, and space images. Qualified personnel in the fields of geodesy, photogrammetry, photography, and cartography are ready to help those with specialized needs.

The EROS Data Center functions as an integral part of the NCIC system for those requesting information about available aircraft or space imagery and for those wanting to place orders for these data. This service is readily available by a direct terminal link to the Data Center's computerized data base. Inquiries and orders for data are transmitted daily from NCIC to the EROS Data Center to provide a timely response to customer needs.

This publication is one of a series of general interest publications prepared by the U.S. Geological Survey to provide information about the earth sciences, natural resources, and the environment. To obtain a catalog of additional titles in the series "Popular Publications of the U.S. Geological Survey," write:

Branch of Distribution  
U.S. Geological Survey  
604 South Pickett Street  
Alexandria, VA 22304

or

Branch of Distribution  
U.S. Geological Survey  
Box 25286, Federal Center  
Denver, CO 80225

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The EROS Data Center is located on a 318-acre tract approximately 16 miles northeast of Sioux Falls, South Dakota. Privately owned or rental cars are needed for travel to and from the center. There is no scheduled transportation from Sioux Falls.

