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JUL 25 1997

Fax Cover Sheet

U.S. Department of the Interior
U.S. Geological Survey

Thanks
Total number of pages including cover sheet: 6
Don 7/25/97

Date: 7/24/97

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Message: Final copy - going to Department today.

Department of the Interior
U.S. Geological Survey

Hail Damage to EROS Data Center Facilities
Sioux Falls, South Dakota

Storm on July 13, 1997

EROS Data Center Function

The U.S. Geological Survey's (USGS) Earth Resources Observation Systems (EROS) Data Center, or the EDC is located near Sioux Falls, SD and carries out data collection and distribution activities. Besides handling data from several series of satellites, the EDC archives more than 8 million photographs taken from airplanes. The EDC's huge and growing base of earth science information – the world's largest – is used by scientists at the EDC itself, within the private sector, and at government institutions and universities around the globe.

By law, the EDC is home to the National Satellite Land Remote Sensing Data Archive, an immense storehouse of information on land-surface phenomena, now dating back three decades. In recent years the EDC also has become the distributed active archive center, or DAAC, for land processes on behalf of NASA's Mission to Planet Earth.

With elaborate computer systems, the EDC has developed the means to deliver massive amounts of data over the Internet. This effort has led to the EDC's becoming host to the National Mapping Division's Digital Cartographic Sales Data Base. The institution now is a world leader in information management as well as in earth science.

1. What happened?

A severe thunderstorm moved through Minnehaha County in Southeastern South Dakota during the late afternoon hours on July 13, 1997. The storm caused extensive damage to the U.S. Geological Survey (USGS) EROS Data Center. Baseball to softball size hail, pushed by 55-knot winds, struck at 4:18 pm causing extensive roof and atrium damage, smashing skylights and windows, and destroying government and privately-owned vehicles. The hail also severely cracked and dented satellite data receiving antennas and completely demolished a 1-acre, 504 panel solar array. Nearby agricultural fields were stripped of vegetation and farmers' fields were cratered by the falling chunks of ice. For more information on the storm, see the National Weather Service website at "www.crh.noaa.gov/fsd/eros.htm".

2. What are the damage cost estimates?

Total damage to the EROS Data Center facilities is estimated at \$1.29 million. (In addition, the recently installed Landsat 7 data reception antenna, owned by NASA and its contractors, sustained damage estimated at \$1 million.

3. What was affected?

Although significant facility damage occurred, there were no injuries to people, and Data Center operations continue. However, the next inclement weather could take a much more serious and costly toll on the facility, its contents, and USGS mapping programs.

- Numerous cracks and tears in the roof's surface membrane are being spot patched. Water leaks from recent rains (on July 16 and July 20) occurred over many areas of the facility, including the computer center with equipment valued at over \$60 million. Permanent and comprehensive roof repair is required.
- Temporary plastic has been draped over the broken and cracked atrium and skylights. Total replacement of the atrium and skylights is required. This work should be done as soon as possible, and certainly before the onset of winter.
- USGS and NASA satellite data reception antennas were severely damaged. Key antenna components were damaged beyond repair, exposing the signal amplifiers to the storm and allowing water penetration. Reflectors were dented, and replacement is required. At no cost to the USGS, NASA's Landsat 7 antenna will be disassembled, returned to the manufacturer, reconstructed and delivered to the Center by Spring, prior to the launch of Landsat 7 scheduled for July, 1998. Data are being received by the USGS antennas, however signal strengths are at all-time lows, and loss of incoming data is highly probable. Engineers are concerned about winter's ice forming on dented reflectors, further reducing signals.
- Seven government vehicles (three passenger and four maintenance vehicles) were totally destroyed and replacement is required. The Center is highly dependent on these vehicles because of its responsibility for all ground maintenance, coupled with its remote location.
- Other items damaged or destroyed were air conditioning units, security cameras, signs, the water tower, and light fixtures.

4. What replacements and repairs are needed?

An itemized list is attached.

5. What are the immediate, short-term, and long-term repairs?

See attached list.

6. What are the threats to the Data Center if funds are not provided?

If funds are not provided the USGS will redirect funds to make the necessary repairs to ensure that the Federal Government's investment in valuable equipment and satellite data and aerial photography are protected. The damage unrepaired at the Data Center's facility would threaten the ability of the USGS to ensure the availability of the nation's federally owned digital cartographic and remotely sensed data which contributes to the U.S. Global Change Research Program, NASA's Mission to Planet Earth Program, and other science programs of the administration. The Center is also the steward for more than 10 million frames of aerial photography and the home for the National Satellite Land Remote Sensing Data Archive, a one-of-a-kind repository for over 3 million frames of land satellite data acquired globally since 1960. It is also the single distribution center for the National Mapping Division's digital cartographic data.

Repairs and replacements of roof structures would be needed to avoid further water and structural damage which could have devastating effects on tens of millions of dollars of data processing computer equipment. If funds are not provided, repairs are not made, and inclement weather occurs, computer room equipment will need to be shut down and covered. This would essentially shut down the Data Center, and render the USGS incapable of providing land remote sensing, digital cartographic and associated spatial data to any users.

Any loss in the use of the satellite data reception antennas would mean interruptions in the acquisition of 1-km Advanced Very High Resolution Radiometer data collected by NOAA's polar orbiting meteorological satellites. These global data, acquired daily at multiple times, are used by:

- U.S. Forest Service, Bureau of Land Management, and others for continuous production of fire danger rating indexes in the Lower 48 States and Alaska;
- U.S. Department of Agriculture, other Federal agencies, and private grain commodity brokers for agricultural forecasting;
- Global change scientists for vegetation monitoring and land cover mapping worldwide;
- Researchers for modeling, validation and testing for future Mission to Planet Earth data processing algorithms; and
- International users for a variety of applications worldwide.

7. How would the USGS address the damage requirements if new appropriated funds are not provided?

The USGS would propose to redirect available funds from map data contracts, within the Map Data Collection and Integration budget subactivity, to fund emergency repairs to the EROS Data Center facility. Due to the late date in the fiscal year, flexibility to redirect funds is limited. Funds that would be redirected to this emergency are planned for contracts with private sector companies to fulfill mission requirements established during FY 1997. These funds are currently committed through procurement vehicles, and are intended to meet needs for data identified by Interior Department bureaus such as the U.S. Fish and Wildlife Service, the

National Park Service, the Bureau of Land Management, the Bureau of Indian Affairs, and other Federal agencies including: The Department of Agriculture's National Resources Conservation Service, Farm Services Administration, and U.S. Forest Service; the Environmental Protection Agency; the Federal Emergency Management Agency, and numerous State government agencies .

There are several impacts that could result from this redirection of funds from mapping contracts. First, the data needs of several Federal programs may not be met, resulting in incomplete information that is needed for law enforcement, emergency response planning, transportation and community development issues, and land and resource analyses. A second impact would be on private sector partners in map data production. Participating companies have planned on the work related to these contracts, and withdrawal of the work may have repercussions for these companies. Third, the progress made toward increasing the percentage of USGS appropriations that are provided to private sector partners to help achieve the USGS mission would also be reduced, thereby preventing USGS from meeting the contracting goal established by the Congress in the report accompanying the FY 1997 appropriations for the Department of the Interior and Related Agencies.

8. What source of funds does the USGS usually turn to for its facility requirements, and why can't that source be used to address these needs?

The USGS has traditionally relied on the General Services Administration to support emergency repairs for most (well over 90 percent) of its building space nationwide. However, the EROS Data Center is wholly owned by USGS and is therefore, not supported by GSA. Emergency repairs of a limited nature would normally be supported by redirecting operational funds appropriated by the Congress to the National Mapping Program. However, the cost for repairs of the magnitude that resulted from the recent hail storm far exceeds amounts that could be made available from normal operational resources. This is particularly true now, due to the damage occurring so late in the fiscal year, after commitments to priority programs and partners (such as NASA and USAID) have already been made. The EROS Data Center has no flexibility to divert other agency funds that were provided to EDC to support agreed upon reimbursable work.

Hail Damage to EROS Data Center Facilities

Sioux Falls, South Dakota

Storm on July 13, 1997

		(\$000)
Roof		190
Surface repair	50	
Fan replace	50	
Flashing replace	90	
Atrium/Skylights replace		450
Antennas		170
Direct AVHRR	50	
DOMSAT AVHRR	100	
C-Band/FM/TV	20	
Government Vehicles (7)		90
Solar Panel Field		150
Demolition	80	
Natural Gas Feed	70	
AC Units		70
Other		170
Light Fixtures	50	
Security Cameras	50	
Painting and stucco repair	50	
Exterior Cleanup	10	
West Windows	10	
TOTAL		1,290

Immediate (\$860K):

- Roof surface repair
- Roof flashing replace
- Roof fan replace
- Atrium/skylight replace
- 2 satellite antenna repair
- Security camera replace
- Cleanup
- Window replace

Short-Term (by December, 1997) (\$280K):

- C-Band/FM/TV antenna replace
- Government vehicles
- Light fixtures
- Painting and stucco repair

Long-Term (by March, 1998) (\$150K):

- Solar Panel Field EROS Data Center Function

July 24, 1997