

EROSDATA

EROS DATA CENTER, SIOUX FALLS, SD



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U.S. GEOLOGICAL SURVEY, NATIONAL MAPPING DIVISION

Volume II

Number III

Commemorative Issue

Commemorative Issue Past • Present • Future

From the early 1970s to present, the people who have walked the halls of the EDC have given it its motivating force – in customer services, in dissemination, digital data production, archive management, computer services, science and applications, external relations, administration, maintenance and engineering, security, logistics, design and fabrication, and photography. Some of their stories have been remembered in this special commemorative issue; their accomplishments are beyond measure. Many of those names and stories have been assembled for the first time in this special commemorative issue of EROSDATA - in celebration, remembrance, and optimism.



Data Center Breaks Ground for Building Addition

Dignitaries representing the U.S. Department of the Interior, the U.S. Geological Survey, NASA, Congress, and State and Local agencies will serve as "sod busters" today (May 31, 1994) as they help EDC staff break ground for its 65,000 square foot building addition. Participants in the ground breaking ceremony will link the past with the future as they toil - with the help of a local team of horses - with the "original" walking plow used to bust sod in 1972 ceremonies prior to the construction of the existing building. The building addition will house equipment and personnel to support NASA's Earth Observing System (EOS) Program and Landsat data handling.

After a competitive bid process and close Federal scrutiny, Gil Haugen Construction, Sioux Falls, was awarded the contract to build the addition - a 16-20 month project - over three local and five out-of-state construction firms. Gil Haugen came in with a low base bid of \$7.7 million and base bid with all options of \$8.6 million.

A noontime luncheon was hosted by the Sioux Falls Development Foundation for community leaders at the Radisson Encore Inn in recognition of the groundbreaking.

Among the many dignitaries expected to attend today's ceremony at the Data Center are: **Dr. Debra Knopman**, Deputy Assistant Secretary for Water and Science/DoI, **Dr. Gordon Eaton**, Director of the U.S. Geological Survey, **Dr. Al Watkins**, Chief, NMD/USGS, **Dr. Dixon Butler**, Office of Mission to Planet Earth/NASA, **Dr. Charles Kennel**, Associate Administrator of Mission to Planet Earth/NASA, Senators **Larry Pressler** and **Tom Daschle**, Representative **Tim Johnson**, South Dakota Lt. Governor **Steve Kirby**, Sioux Falls Mayor **Jack White**, and other State and Local officials.

Before and after the ground breaking ceremony, EDC will provide dignitaries with the opportunity to view demonstrations featuring some of the Center's most interesting and successful projects and activities. Later this evening, an "Old-timers Dinner" will be hosted by the Sioux Falls Development Foundation where EDC old-timers will witness the burning of the EDC's 20-year mortgage. In addition to present and past EDC staff, USGS Director, Dr. Gordon Eaton, and Chief of the USGS/NMD, Dr. Al Watkins also are scheduled to attend the dinner. ♣



Artist's rendering of the future EDC building and grounds

EDC: History in the Making

The Earth Resources Observation Systems (EROS) Program was announced by Interior Secretary **Stewart Udall** in a news release dated September 21, 1966:

"Project EROS is based upon a series of feasibility experiments carried out by the U.S. Geological Survey with NASA, universities, and other institutions over the past 2 years."

Secretary Udall tapped **Dr. William T. Pecora**, Director of the USGS, to head the program and carry out its mission. The EROS mission included a broad range of activities related to the use of remote sensing technology to inventory, monitor, and manage the Earth's resources.

Five years later (1971) the EROS Data Center was in operation under the auspices of the USGS. Its purpose was to: Use remotely sensed data of the Earth's Surface - collected from satellites and aircraft - to support the Department of the Interior's wide-ranging resource management activities.

Before the completion of the existing 115,000-square-foot building, in September of 1973, the Center began as a 13-employee operation in temporary offices in Sioux Falls. According to **Don Zoller**, one of the original 13 employees at the downtown offices, the leased office space didn't compare with the Annex office space currently being leased for DLG-E activities. "The temporary offices (in what is now the Bergeland Center, 132 South Dakota Avenue) downtown were inadequate. For example, pipes froze one winter and caused serious flood damage. Overcrowding also was a major problem. I remember that some type of photographic equipment was placed in the women's restroom."

Role of the SF Development Foundation

Back in the late 1960s, when the Interior Department was looking for a permanent home for the EDC, Sioux Falls was a growing prairie city that was in the right place at the right time - with the right people at the Sioux Falls Development Foundation. Fortunately for Sioux Falls, the Interior Department was looking for a site that was centrally located so scientists and other technicians could see and communicate with Earth-orbiting satellites - regardless of their positions over the U.S. That narrowed the site selection to a small oval about 60 miles wide centered on Sioux Falls.

According to **Dave Stenseth**, Executive Vice President of the Sioux Falls Development Foundation in the early 1970s, "When **Al Schock** was selling Sioux Falls to the Department of the Interior in Washington, D.C., he was asked what the area would do to show their interest in acquiring the EROS Data Center.

"Whatever is required, we will do it! We will give the land!" said the former Sioux Falls Development Foundation President. As a result, the Sioux Falls Development Foundation coordinated a concerted public relations effort to secure the EDC, which touched almost every South Dakotan. "We conducted a fund drive and raised half-a-million bucks in 3 weeks," said Stenseth. In addition to Stenseth and Schock, another local business leader that helped organize the Sioux Falls bid included **Russ Pohl**, a vice president of Raven Industries who would later become Chief of EDC's Data Services Branch. When Sioux Falls was selected as one of the candidate sites the campaign intensified. The Sioux Falls Development Foundation responded by producing a two-volume report titled, "This is Sioux Falls, South Dakota," and proceeded to host visiting scientists, managers, and politicians. Ultimately, the Foundation gave the Government 318 acres, then arranged financing

and built the existing facility under a 20-year lease-purchase agreement with the Government.

The Work of Sen. Karl Mundt

Most people credit the late **Congressman Ben Reifel** and **Sen. Karl Mundt** and his North Dakota colleague, **Sen. Milton Young**, for politically helping land the EDC near Sioux Falls. "Senator Mundt was the keystone," recalled Stenseth. "Early in 1970, the then senior senator from South Dakota was in **President Nixon's** office asking for the release of the \$300,000 appropriation funding for the site selection team." As a result of local efforts in Sioux Falls and Sen. Mundt's political bargaining power with the Nixon Administration, Sioux Falls had an extremely strong position. Cooperation benefited both Mundt and the DoI: Mundt secured the Data Center for South Dakota bringing economic benefits to his Sioux Falls constituents, and the DoI received funding for the Center - that otherwise would have been denied. After all the talk, trips to Washington, D.C., breakfasts, luncheons, and dinners - on Tuesday, March 31, 1970, Sen. Mundt announced that Sioux Falls had been selected as the site for the EDC.

The EROS Site

When Sioux Falls had been selected as the site for the EDC, the Sioux Falls Development Foundation had to live up to its promise to the Government to provide the land for the facility - at no cost. As a result, 318 acres of land had to be found. The land had to be far enough away from the electronic noise of Sioux Falls, yet ideally would

be located within 5-10 miles from Joe Foss Field. The soil had to be stable with a good supply of quality water.

The site for EDC ended up at the half-section of farmland owned by **Rudy and Olga Froseth** and **Alfred and Annettie Hegge**. Hegge, whose father and two brothers immigrated to America from Norway, had lived on the farm most of his 81 years. The three Hegge brothers all established farmsteads a couple of miles of each other in 1872. The Hegges and the Froseths were traditional Scandinavian rural families. They valued stability and shied away from change. When Sioux Falls realtor **Joe Griffin** finally persuaded Alfred Hegge to sell his farm, Hegge said with a sigh, "You have a lot of memories after 81 years in one home."

While the original site selection team looked for a location that would provide minimal interference for a high-powered antenna system in a centralized spot among the lower 48 states, such selection criteria are no longer valid because of advanced technology and changing program requirements. Because of these factors, even the outstanding promotional and fundraising campaign led by the



(l. to r.) **Dr. William Pecora**, **Merlyn Veren**, South Dakota liaison in Washington, and **Glenn Landis**, former EDC Deputy Chief, take their turn busting sod with the help of Garretson farmer **Gib Kringen** and his mule team during groundbreaking ceremonies April 14, 1972.

Sioux Falls Development Foundation, along with local civic and political leaders in 1970, probably wouldn't be enough to secure the facility for Sioux Falls today - considering the international appeal of the Center's program and the political power of many larger Congressional delegations [proof being the Super Conducting Super Collider in Texas]. Fortunately, in 1970 Sioux Falls was the right place at the right time. Because of its hard work and good fortune, the Sioux Falls area has witnessed a return on its investment far beyond the expectations of the most farsighted leaders over 2 decades ago.

Buffer Zone Controversy

After the 318-acres of land were acquired, a bit of controversy surrounded the Government's proposed 2-mile buffer zone around the perimeter of the site. Over 350 concerned farmers packed the Minnehaha County Courthouse for a public hearing on the matter. The farmers were worried about several issues related to the EDC: radio frequency reduction devices to be installed on their machinery; a concern that the EDC facility might drop the value of their farmland; and, some of the farmers complained of Sioux Falls businessmen acting like "mercenaries" to complete the EROS project. Thanks to former EDC Deputy Chief, **Glenn Landis**, the farmers' reservations and concerns were overcome. "That meeting remains very vivid in my memory," said Landis. "It was a Monday night meeting in August of 1971 with the Minnehaha County Board that handled zoning issues. Up at the front table with the County Commissioners were **Bill Schmidt**, Special Asst. to the Director of the USGS, me, Dave Stenseth, and Al Schock. When I arrived at the Court House for the meeting, I should have known something was up when there were no chairs in the lunch room when I walked by the window. It was a standing room only crowd of about 350 farmers that were there to see that the land adjacent to the EDC was re-zoned to maintain an agricultural setting.

Basically, my job was to explain the intent of the Federal Government and assure people that what we were going to do would be done reasonably."

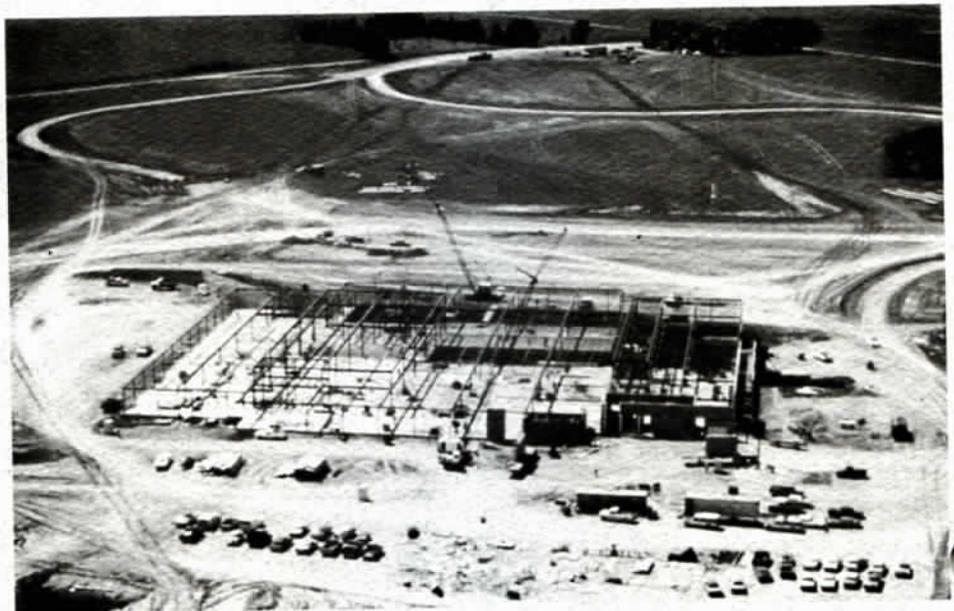
One look at the zoning ordinance at issue that night provides a clue to the wide interest. It was a typical government document that looked very ominous on the surface. "All hell broke loose," Landis recalled. "There were many 2nd and 3rd generation farm family members in the crowd that were back from college stirring up trouble. This large, noisy group of rabble-rousers had placards and the whole 9 yards," Landis said with a chuckle. "It turned out to be a very good forum for EDC to establish the relationship that we now have with the community." According to Landis, while many of the older farmers in attendance may have needed hearing aids, they were the only ones that would listen to reason. "Many of the older farmers came up to me following the meeting to apologize for the conduct of the rabble-rousers," explained Landis.

April 14, 1971

As the gently rolling grasslands of eastern South Dakota struggled to emerge through the thawing soil in the spring of 1971, the Hegge-

Froeth farms were soon to be history. On a prairie farmstead where a Norwegian immigrant tilled the soil with a mule-drawn plow 99 years earlier, Federal, State, and Local dignitaries used a similar mule-drawn plow to break ground for the EDC complex. April 14, 1971 was a cloudy, chilly, spring day in eastern South Dakota. Winter was trying to hang on for all it was worth. It was so damp and chilly that the groundbreaking ceremony had to be moved indoors - a backup fairgrounds tent supplied by Sioux Valley Electric. Federal, State, and Local officials addressed a huddled audience - estimated at 800-1,000 people. After several speeches, Dr. William Pecora and Al Schock were two of the first dignitaries to grasp the handles of the mule-drawn prairie plow. As the mules brayed their objection, the plow lurched forward - furrowing a path for EDC development.

After Lueder Construction of Omaha, NE completed the building on time, the EROS facility was dedicated in ceremonies on August 7, 1973. With national network film cameras clicking, Interior Secretary **Rogers E. Morton** designated the new facility as the "Karl E. Mundt Federal Building."



Aerial view acquired during the summer of 1972 showing the steel support beams used to construct the EDC's skeletal grid.

Presently Speaking: The EROS Data Center Today

As construction of the Data Center's 65,000 square foot building addition picks up steam, it's an opportunity for us to link EDC's past with the present as well as the future. So, just where is the Data Center today? When the EDC was located in temporary offices in downtown Sioux Falls, the operation employed 30 people. Today the Center employs 343 people, more than half of whom are professionals with advanced degrees in science or engineering. In the mid 1970s the total number of employees reached an all-time high of over 400. Thanks to natural attrition and downsizing by the Federal Government, the number of staff has fluctuated from 325 to today's 343. The new building addition could eventually add another 100-to-150 scientists, technicians, and professionals before the decade is over.

By 1974 the EDC produced 300,000 photographs and images per year. Today the EDC produces 350,000 frames of imagery each year. While the Center witnessed sales of \$300,000 in its first year of operation, it provided \$5.5 million in products and services to customers in 1993.

The existing 115,000 square foot building was constructed at a cost of



Bob Hamann, VESCO, re-routes pvc pipe as part of the basement renovation project.

\$6-million dollars in 1973. The 1994 65,000-square foot building addition, when completed, will cost over \$8.6 million. Total investment in the Center, including land, buildings and equipment, now easily surpasses \$60 million. The Center's \$12 million dollar annual budget in the mid-1970s has doubled to \$24-million this fiscal year (not counting the extra funds allocated to begin construction of the building addition). Roughly 50% of EDC's annual budget comes from reimbursable (non-USGS) funds, in contrast to the early years of the facility in which most of the budget was supported by bureau funds.

Customer Services

EDC Customer Services staff receive over 25,000 inquiries each year. From these inquiries, Customer Services staff provided \$5.5 million in products and services to other Federal agencies, private industry, academia and the public during 1993. According to the Data Services Branch, the Data Center currently houses over 3 million satellite images in its archive. In addition to satellite imagery, the EDC now has over 8 million frames of aircraft photography in its archive. The digital satellite data archive of EDC holds over 150,000 tapes.

Science & Applications

EDC's staff of 50 scientists continues to find new ways to use EDC data sets of the Earth's surface to track vegetation maturity, or "green-up" in North America, monitor vegetation changes in Africa, assess the damage of floods in America's northern Great Plains, and study ecosystems such as San Francisco Bay. In addition to its Sioux Falls site, EDC tests systems and performs research at such places as Anchorage, Alaska, Moffett Field, California, Fort Collins, Colorado, and Harare, Zimbabwe.

Digital Data Production

Today's Digital Data Production analysts take traditional map information and combine it with aerial photos or satellite data to produce image maps and other tools for the scientific community. The photo-image products Digital Data Production staff create from data stored on digital tapes have supported a number of world environmental hazards: the Chernobyl Nuclear Reactor accident in the former Soviet Union, the Exxon Valdez oil spill in Alaska's Prince William Sound, the Persian Gulf War, Hurricane Andrew, and the Great Floods of 1993. Whenever there's a major natural or human-induced disaster, you can bet that the Digital Data Production section will be working with map and remotely sensed data to provide the scientific community and decision makers with a sense of where things are and how they relate.

Data Management

Data Services Branch personnel provide online access to EDC data bases and other Centers worldwide through the EDC's Global Land Information System (GLIS). Through GLIS, users worldwide access EDC's 3 million frames of satellite imagery, 8 million frames of aerial photography, or digital data holdings.

Photo Lab

Perhaps no area of the Data Center has changed more dramatically since the early 1970s than the Photo Lab. While the Lab continues to process photos and images 18 hours a day, 5 days each week (producing roughly 1,000 frames each working day), the Lab employs fewer people today than ever before. At peak staffing, 50 people worked three shifts. Today EDC operates 2 shifts employing 30 people. However, with less space and fewer people, the Lab produces more frames of satellite imagery and photography than at any other time in its history! While replacement parts for some of the Lab's equipment became extinct 15 years ago, thanks to the ingenuity

and creativity of the EDC's Design and Fabrication Shop, the antiquated machinery keeps processing. Plans are in the works to procure new processors - a costly endeavor that will provide EDC with modern photo processing technology for the 21st Century.

Computer Services

The EDC continues to house one of the largest, most-sophisticated computer complexes within the Department of the Interior. While the size and number of EDC's mainframe computers shrink, their power continues to escalate. Where EDC once housed a 360-30 computer exsessed from Flagstaff, the computer floor area now features a robotic mass storage file system that holds 6,000 cartridges of data - making much of EDC's satellite data archive immediately available to scientists on demand from desktop workstations. Computer Services Branch continues to convert Landsat multispectral scanner (MSS) and thematic mapper (TM) data from one medium to another - saving thousands of satellite images from their natural nemesis...hydrolysis. Since April 1993, EDC data archivists have successfully recovered over 20,000 Landsat images from over 700 tapes affected by hydrolysis by applying low levels of heat to the tapes.

When all of the MSS and TM data have been converted (using two copy systems), roughly 520,000 Landsat scenes, or 60 terabytes of data on 39,000 tapes will be copied onto 2,000 digital cassette tapes. While the TM archive is three times larger than the MSS archive, conversion of the entire EDC Landsat archive will be completed by the end of 1996.

EOS Project Office

In the next few years the national space program will include a system of satellites and computer processing equipment called the Earth Observing System (EOS). A small group of specialists at the EDC are planning for the enormous amount of data the EDC will receive from this new generation of satellites, tentatively planned to be launched beginning at the end of this decade. This new generation of satellites will provide the Center with data about the Earth's surface many times greater than the amount we receive today.

In addition to the work mentioned previously, many other activities are conducted by departments across the Center. For instance, as the Federal Government's National Satellite Land Remote Sensing Data Archive, the EROS Data Center con-

tinues to maintain and make available land surface data needed for global, continental, and regional studies. Other Federal agencies are providing increasing technical support as they exploit certain capabilities of both the civil satellite program and the EDC. The State Department, through the Agency for International Development (AID), continues to rely on the EDC to support emerging programs in developing nations (i.e., famine and early warning activities in Northwest Africa or ecosystem research in Madagascar).

In summary, more than half of current EDC activities support other federal agencies and programs. The continuing operations and activities of the Center provide the DoI and the USGS with a highly visible presence in remote sensing, geographic information systems, advanced data handling technology, and the emerging global environmental change research community. ♣

SDSU Honors Lauer With Honorary Degree

Dr. Donald T. Lauer received an honorary Doctor of Science degree on behalf of all EDC staff during South Dakota State University's spring Commencement ceremony May 7, 1994 at the Brookings campus. The honorary degree is the highest honor given by the University among the awards presented beyond the degree. The criteria for the degree include significant creativity, resourcefulness, humanitarian concern, personal dedication, and intellectual achievement. Lauer reacted by saying, "I feel like I'm representing a team. There are 350 people who work at EROS and they all contribute to our goal of letting the community take advantage of what we have to offer." ♣



John Faundeen, Information Systems Management Leader, and **Pat Johnson**, Customer Services, show **Terry S. Kees**, Director, Plans, Policy, and Program Directorate, Central Imagery Office, a demo on the Global Land Information system during the Landsat National Security Users' Conference in June 1993.

The 1994 EDC Groundbreaking Ceremony makes us think of the Data Center's past - crowded days in downtown Sioux Falls, early dismissals because of prairie blizzards, the 10th Anniversary Celebration, and the EDC Friendship Tree. Because this commemorative issue of EROSDATA has a look all of its own, Don Lauer's usual brief UPFRONT comments have been expanded to fit the occasion - as EDC lives up to the past and keeps up with the future.



Up Front – Back to the Future

Since the early 1970s, a long-standing part of the EDC mission has been to receive, process, store, distribute, and analyze millions of images of the Earth acquired by both satellites and high-flying aircraft. This will not change in the years ahead. But, what else will EROS be doing in the future? A good indicator is the vision statement EDC employees helped form through the efforts of EDC Chief **Don Lauer**.

"The key elements are data products and services and building and implementing information systems that can support those products and services, as well as conducting research and developing applications on the cutting edge of user's needs."

According to Lauer, with a well-defined and understood vision and mission statement, he's very optimistic about the Center's future. "I probably couldn't say that 10 years ago. Then, we were under scrutiny because our mission was so

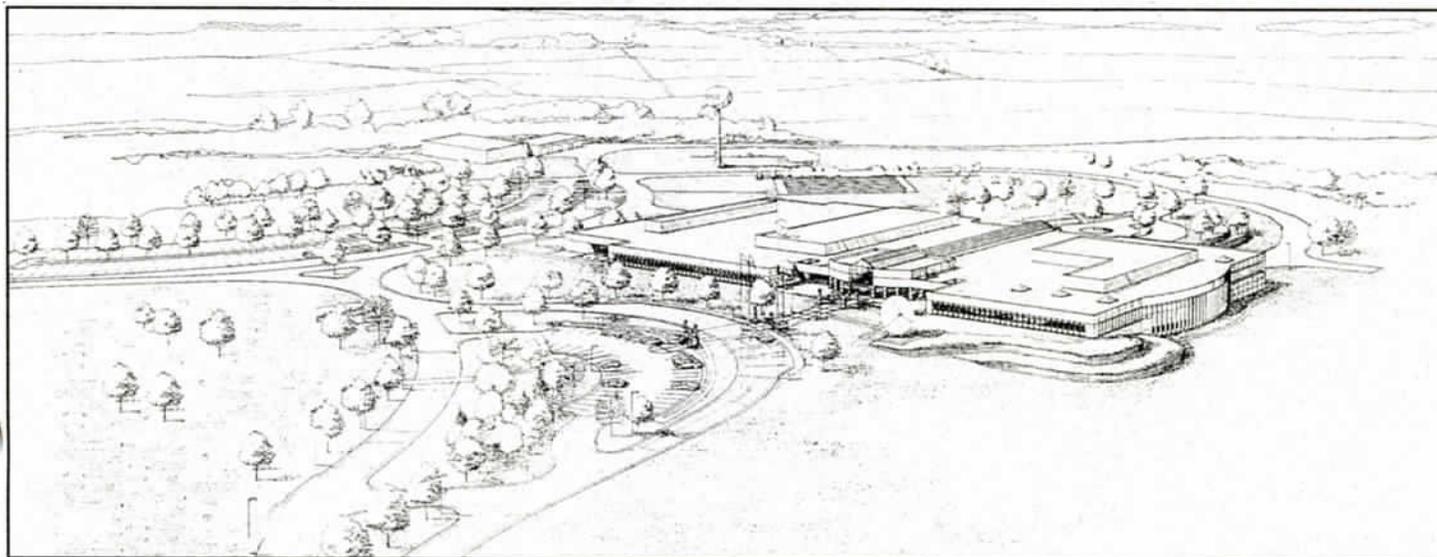
vague and we couldn't get support when we tried to define it." It appears Lauer's optimism is based on the public's growing awareness of Earth's diminishing resources. "As time goes on there seems to be increasing public awareness - not a fad or just an advocacy group (i.e., Sierra Club or National Wildlife Federation) - that the human species is pressing the resource base on our planet."

While Lauer doesn't see much immediate opportunity for optimism in the way we humans continue to push the Earth's resource base, his optimism comes from the sense that there is a continuing and growing need for what we do at EDC - using pictures of the Earth to better understand how we are impacting our planet.

EDC in the Short-term

There are many challenges in the next 3-5 years which will provide brilliant opportunities, which adds to Lauer's overall optimism. The following four opportunities paint an optimistic short-term portrait for the Center. "Part of it is how we enhance our data access, archive, and distribution responsibility," explained Lauer. "We're making enormous strides in populating our archive with many new types of data (i.e., 1-kilometer data, global land data, the Upper Mississippi Flood study, and derivative information from these and other data sets). These different types of data all lead to an enhancement of the access, archive, and distribution capabilities of the Center. I look at that as an opportunity and I see growth in that area because of the demand. If it's not hurricanes, fires, or floods, there will be other similar events in the future and there will be a need for these data nationally as well as internationally."

Another tough challenge facing the Center in the next few years is reestablishing its role in the Landsat program. The EDC's role in the Landsat program diminished in the mid-1980s because of controversial changes in national policies. Just as the prairie winds change direction, so do policies. "There is a role for EROS in processing and distributing Landsat data 4 or 5 years from now



and we're working really hard to recapture that," said Lauer.

Coincident with the Landsat program, the EDC also is aggressively pursuing the role of accessing, processing, and distributing data that has previously been classified by the Department of Defense (DoD) and Intelligence community. "We're right on the threshold of large segments of information," explained Lauer, "that is currently classified but becoming de-classified. Classified systems won't go away. Therefore, there will be a role for us for many years to come with the newer systems that

are flying in space that may be de-classified - providing access to these data to either the public or those given permission to have access."

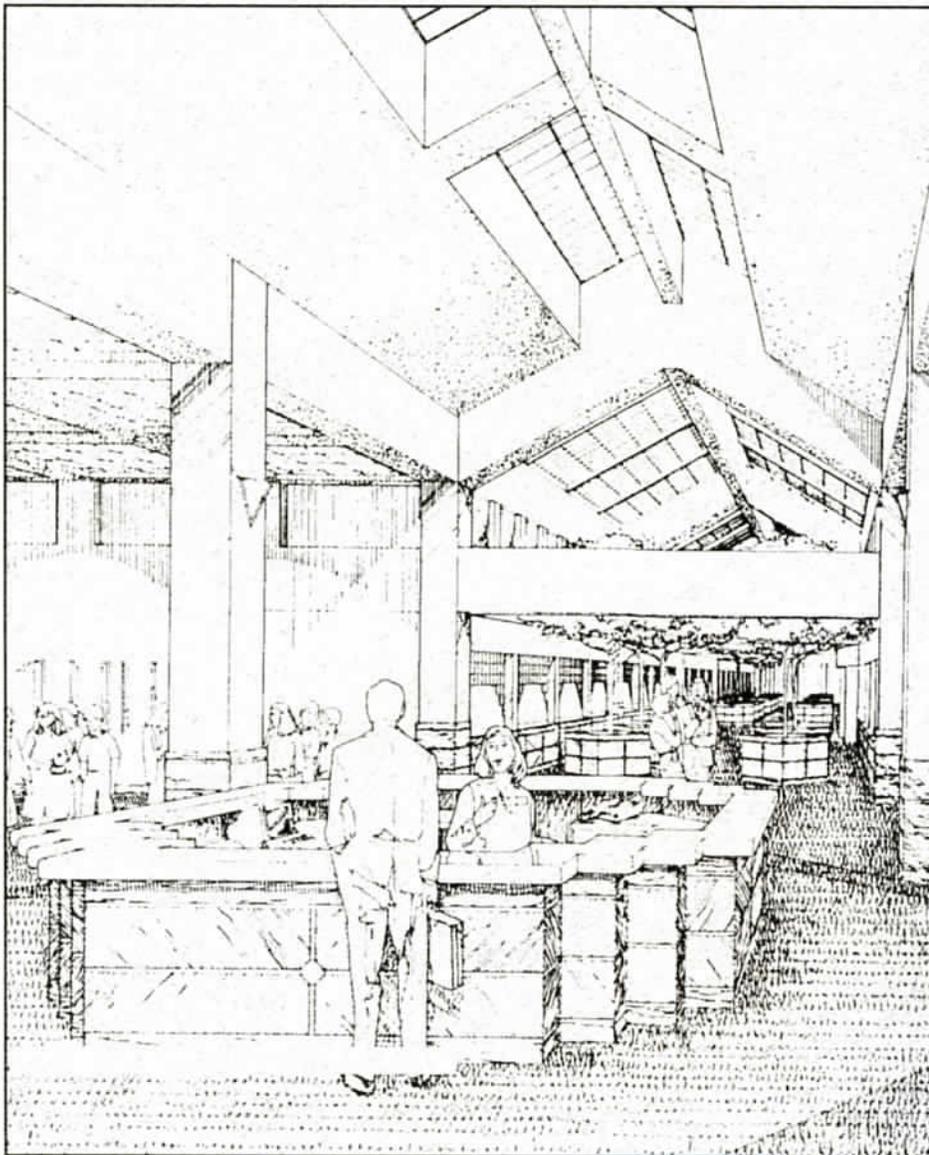
While these opportunities will provide tremendous challenges for the entire Data Center, nothing may equal the task of becoming a processing center for NASA's EOS program. "We are well-entrenched in that program and have to meet the challenge to carry out our responsibilities - which provided the opportunity for us to build a new building addition. There will be data processing and distribution systems put in that building that will

enhance enormously our capabilities."

EDC in the Long-term

If we look beyond 3-5 years and think about 10-15 years down the road, the luminance of EDC's future doesn't lose any intensity. "Ten or 15 years down the line," says Lauer as he gazes out his window, "the Center could be a key institution that builds comprehensive data bases for the Nation that are composed of a variety of data sources (i.e., Landsat, AVHRR, de-classified military intelligence data, as well as cartographic and geographic data of elevation, soils, and climate) at varying scales and in differing resolutions. Each scale and resolution would be nested in a common data base so that they are geographically relatable. It's a tremendous challenge to be able to do that - building comprehensive data bases such as these, and providing access and readily distributing these data. That is a vision I think will come true eventually after the turn of the Century. If we're successful with that, I'm convinced it will grow to global proportions because population pressures won't go away in the next couple of generations. So, the pressure on planet Earth to provide renewable and non-renewable resources is only going to increase."

If Lauer's vision of EDC's future is 20/20, that explains his contagious optimism. The Center's future looks blindingly bright because it holds a treasure of data that can help provide the type of scientific information needed to help manage future renewable and non-renewable resources effectively. If the record of achievement over the past two decades indicates what is in store for the "little Data Center on the prairie", EROS is indeed on the brink of reaching achievements Karl Mundt never dreamed could be true. ♣



Conceptual view of EDC main entrance after construction is completed.

Printed on recycled paper
using Envirotech inks
containing soy oil.



EDC Timeline

1966 - EROS program announced by Interior Secretary Stewart Udall September 21st

- Dr. William T. Pecora named Director of the U.S. Geological Survey and head of the EROS program

- October 21st, Under Secretary of the Interior, Charles Luce sends NASA "operational requirements for global resource surveys by Earth-orbital satellites"



1967 - EROS created by an Under Secretary Luce memo to Assistant Secretaries and Bureau Heads

1969 - South Dakota Sen. Karl Mundt announces that Sioux Falls is among the cities to be visited and evaluated by the site selection panel for the EROS Data Center

1970 - Sen. Karl Mundt visits President Nixon's office asking for the release of \$300,000 to fund the EROS site selection team

- Sioux Falls leaders mount massive sales campaign to lure the EDC to South Dakota



- Sen. Karl Mundt announces on March 31st that Sioux Falls will be the site for the Dept. of the Interior's EROS Data Center

- June 18th, Al Shock, Sioux Falls Development Foundation, reports the \$390,000 goal tagged EROS "OPERATION GROUNDSHOT" is surpassed by \$72,000 - with a total of \$462,000 [for purchase of land for EROS]

1971 - August 25th, zoning approved by Minnehaha County for a 2-mile buffer zone around the perimeter of farmland that would serve as site for EDC

- EROS Data Center sets up shop out of interim office facilities in downtown Sioux Falls

1972 - Groundbreaking ceremony of April 14th attended by Sioux Falls Development Foundation officials, mayors, dignitaries, Federal officials and an audience of 800-1,000 local people

- Earth Resources Technology Satellite-1 (ERTS—now called Landsat) launched in July

1973 - The \$6 million EROS Data Center is dedicated August 7th by Secretary of the Interior Rogers C. Morton, 16 miles northeast of Sioux Falls, SD



- EDC facilities completed in September

1975 - Landsat 2 launched in January

- Office of Land Information and Analysis (LIA) formed at the USGS, which incorporated the EROS Program

- First Annual William T. Pecora Memorial Symposium held in October in Sioux Falls



1976 - 2nd Annual Pecora Symposium held in Sioux Falls



1977 - Landsat 3 launched in December

- Pecora 3 Symposium

1978 - Pecora 4 Symposium held in Sioux Falls

1979 - EROS Vanpool begins operation in November

- Pecora 5 held in Sioux Falls

1980 - Name changed from EROS Program to EROS Office and Land Information Office changed name to Office of Earth Sciences Applications

- EROS Alaska Field Office opens in Anchorage

- Pecora 6 Symposium held in Sioux Falls

1981 - EROS image products support Great Britain's involvement in the Falkland Islands War

- Pecora 7 Symposium held in Sioux Falls

1982 - Launch of Landsat 4

1983 - Office of Earth Sciences Applications disbanded - EDC becomes one of five field centers of the National Mapping Division of the U.S. Geological Survey



- Pecora 8 held in Sioux Falls

- EDC 10th Anniversary Celebration

1984 - Landsat 5 is launched

- Pecora 9 held in Sioux Falls

1985 - The EOSAT Company was selected by the Commerce Dept. as the Landsat owner/operator to proceed towards a commercialized, privately owned and operated system

- Pecora 10 held at Colorado State University, Fort Collins, CO

1986 - In early May EDC Chief Al Watkins is interviewed by CBS Evening News anchor Dan Rather (in a live afternoon news break) about how EROS scientists were using Landsat imagery to assess damage from an explosion at the Chernobyl Nuclear Power Plant much to the chagrin of a tight-lipped former Soviet Union regime

1987 - April 3rd, EDC installs AVHRR antenna on roof

- Pecora 11 hosted by EDC in Sioux Falls

- Field Office established through USAID at Regional AGRHYMET Center in Niamey, Niger



1988 - TDRSS satellite launch permits the Goddard Space Flight Center to relay Landsat data to EDC more rapidly

1989 - EDC Alaska Field Office supports cleanup efforts of Exxon Valdez oil spill in Prince William Sound

- South Dakota Centennial Wagon Train stops at EDC



1990 - Soviet Union delegation visits

- August 28th, NASA flag raised at Center to symbolize future EOS partnership

1991 - EDC mandated by Congress to be the National Satellite and Land Remote Sensing Data Archive

- After 18 years as Chief of the EDC, Dr. Al Watkins leaves the Center to become Chief of the USGS National Mapping Division

- Dr. Donald T. Lauer named Chief of the EDC



- EROS image products support Allied Forces in Persian Gulf War

- DLG-E activity begins at Sioux Falls Annex

1992 - After 21 years at the EDC, mostly as Deputy Chief, Glenn Landis retires

- UNEP/GRID Ribbon Cutting Ceremony

- Hughes STX takes over principal support services contract at EDC from long-time EDC contractor TGS Technology, Inc.



- TERRA Lab established at Colorado State University, Fort Collins, CO

- EDC designated as one of 13 "World Data Center-A's" worldwide

- Gary Metz named Deputy Chief of EDC

1993 - Pecora 12 hosted by EDC in Sioux Falls



- Unsuccessful launch of Landsat 6
- EROS installs first mass storage robotics system
- EDC wins Federal Leadership Award for Global Land 1-km AVHRR Data Set project



- Ames Research Group joins EDC

1994 - EDC hosts Scientific Assessment & Strategy Team (SAST) - 18 scientists and engineers representing Federal agencies who dealt with 1993 flooding on the Upper Mississippi and Lower Missouri River Basins



- May 31st Groundbreaking for 65,000 square-foot building addition to support LPDAAC
- Tom Loveland, Remote Sensing Scientist, becomes first EDC staff member to be selected as the USGS Mendenhall Seminar Lecturer

EDC VISION STATEMENT

We are stewards of land remote sensing and associated spatial data, advancing the availability and applicability of these data for scientific and land management users worldwide.

MISSION

The fundamental mission of the EROS Data Center is to contribute to meeting the Nation's needs for basic geographic, cartographic, and other types of Earth science information by acquiring, managing, and distributing land remote sensing and associated spatial data. In support of this mission we:

- Provide data products and services to scientific and land management users worldwide.
- Develop, implement, and operate advanced data storage, information management, data processing, product generation, and product delivery systems.
- Define and document user requirements, conduct research, and develop data and related technology applications.

SD Job Service Helps Provide Early EDC Staff

When the EDC facility was formally dedicated in ceremonies August 7, 1973, 36 employees served as the Center staff. Thirteen of these individuals worked at the temporary offices leased in downtown Sioux Falls before construction was completed on the existing facility. According to Pamela Mack's book titled, Viewing the Earth: The Social Construction of the Landsat Satellite System, Data Center managers became experts at creative financing when the Nixon Administration's political promises were stronger than its willingness to provide funding. For example, EROS management in the early 1970s used a subsidy from the Work Incentive Program to hire production workers off the local welfare rolls. Department of the Interior and USGS officials were amazed by the tremendous success of the training program that hinged on managerial ingenuity and the dedication and work ethic of unemployed South Dakotans. Creative management tactics such as these helped mold or add to the Center's "go-it-alone" reputation among other Federal facilities. Of the 36 employees who served on the Center Staff since August 7, 1973, the dedication day for our facility, 20 remain on duty (in bold). Among the following list of early EDC employees are some of the people who were located through the South Dakota Job Service for the Work Incentive Program*

Geny Austin
Sue Battista
Dwaine Bogenhagen
 Leo Braconnier
 Ed Constant
 Irene DeNeui
Becky Deno
JoAnn Engelbrecht
Tom Earley
Donna Haacke
Gail Hanson
Robin Hermanson
Aljean Klaassen

Geneva Kluck*
Diane Krell*
 Glenn Landis
 Tom Lee
 Betty Machmiller
Diane Matzke
 Jim McCord
Dick Nelson
 Don Orr
Ben Raiche
 Juanita Roland
 Dorothy Sandstrom
Ron Schultz
 Bill Seward
 Freddie Simon
Karla Sprenger
Glenda Theel*
R.J. Thompson
Rita Tornow
Mary Weinheimer
 Phyllis Wiekping
Dwayne Wipf*
 Woody Yaroeh

Comment Corner: An EDC Oldtimer Retrospective

The following paragraphs answer the question: "What are your early recollections or fond memories concerning the EDC in the early 1970s?"

Diane Krell

I have very fond memories of the "Downtown" days of EDC. I was a single mother of two small children - having the opportunity to attend the Employment Training Program being conducted was a dream come true. Although I was committed to long hours attending classes and on-the-job training, I could see the potential of the Data Center and felt it was worth it. I re-

member filling out sheets and sheets of data entry forms (back in the key punch card days!) to build the data base for film arriving by the truck-load. There was also a feeling of camaraderie and caring among the group. [We didn't get paid much - like \$30 a week!]

Ben Raiche

I can recall some of the first times I opened the door to the downtown office, in the building where the senior citizen center is presently located. I entered to be greeted by three young women, **Geny Severs, Gail Schaunaman and Rhonda Pugh** - who have all changed names since that time. I met a man who became a cherished friend. His name was **Bill Seward**, now deceased. I met with **Glenn Landis, Tom Lee, Don Carney** and **Jim McCord, Bill and Donna Sowers and Diane Krell**. I was introduced to **Bill Campbell, Norm Doolittle, Hans Jorgenson, Glenn Wachob, Bill Nelson, Scott Frazeur, Don Zoller, and Diane Matzke**. Soon thereafter more of the family were familiar. **Gloria Rapp and Freddie Simon, Mary Weinheimer**, along with **Phyllis Wiekping and Rebecca Faircloth, Gary Selner, young Ralph Thompson, and Ed Green**. I suppose I could name most of the rest, but that is no story.

In those days it was necessary to build equipment we didn't have. Long before any satellite ever flew, we were deciding what constituted a sophisticated photo lab. We found problems like film scratching caused by commercial grade processing machines. Newton rings were caused by cheap lenses and old fashioned film handling methods in printers. Scratching could not be tolerated, so I devised a means to coat the rollers of a processor with surgical rubber, making them much softer. I baked the rollers in a small oven and they all melted into a rather non-descript shape. **Jim McCord** mounted the plastic glob on an old toilet seat and presented it to me as a trophy. This was done in the presence of the entire EDC staff. We all accepted

this kind of fun in the manner in which it was presented and the EROS Data Center family was off and running.

Geny Austin

My first day at EDC was January 17, 1972, at the temporary site in downtown Sioux Falls. I believe it was that day, or sometime within the first week at EROS, that the water lines broke from the extreme cold, and the windows were heavily coated with ice when I arrived at work. The building suffered a lot of damage, but somehow the computer room was pretty much unscathed. We served coffee and rolls to the firemen as they cleaned up all the water that had "flooded" the building.

It has been interesting during my 22-plus years at EROS as we went through stages of being "experimental," and close to being closed down different times, to where we are now. It has been a good feeling being part of an organization that is the only kind like it in the world!

Al Watkins

I vividly recall the day in 1971 when I first heard about the plan to establish a Sioux Falls EROS Data Center and my reaction was, "What kind of @%*&#@ political pork boondoggle is this?" A year or so later I was literally talked into accepting the job as the Director of the new Center and as I left a perfectly good job with NASA in Houston, my colleagues, family, and friends seriously questioned my sanity. I answered by saying that my "contract" was for only 3 years and I would be back when those 3 years were up. Well, as they say, the rest is history! I ended up falling in love with Sioux Falls, with that "piece of political pork" called the EROS Data Center, and with all of the staff of the Center who have made it a truly world-class operation. The "3-year contract" turned into 18 wonderful years, which I would not trade for anything. Those 18 years shaped my career, my family, and my life.

I thank all of you at the Center for your help, and I congratulate you on the visible progress exemplified by the new building addition. My support and a very large part of my "heart" remain with you at the "little Data Center on the prairie."

W. Scott Frazier

Arriving in the winter of 1971 and being greeted by the snow and cold of South Dakota, I was very grateful for working indoors. My wife and I were used to the weather of California and did not take well at first to this climate. An old...old building which used to be the main office for the local telephone company was to be our temporary home. Memories bring back many long hours - and regardless of your GS level, hours spent working without benefit of a clock as we as Government workers were used to. This was a different environment when the original eleven found ourselves and we actually liked it. There was a job to be done and we did it.

Memories also bring back the parties which were always thrown on the spur of the few moments of free time which we found. Our fearless leader, Glenn Landis, was aggressive and cared for our needs above his own and for this we worked even harder. I had not worked this hard since being in the military and loved every minute of it as we could see what we were accomplishing as we built your Data Center. We were on the leading edge of the technologies we were using and one may only get this chance once in a life time. But, we should remember that without the leadership we had we would possibly still be in that old telephone building and the Data Center would not be what it has become.

Juanita Roland

It was a thrill to move to the new EROS facility after working in the drab, cramped offices downtown. The new building was bright, spacious and colorfully decorated. That very day (April 14, 1973) an article about EROS and the new satel-

lite came out in a national magazine. User Services was deluged with phone calls from people who were fascinated with the idea of having pictures of their home towns from high in the sky. For me, the fascination continued for many years.

Rhonda Watkins

Over 20 years ago, fresh out of college, I started my Federal career at the downtown EROS Data Center facility. My first position was secretary for the Photo Lab. I remember that even though my desk was located near the entrance to the building, my boss' (**Jim McCord's**) office was at the opposite end of the Photo Lab. So, every time I needed to see him or he needed to see me, I would faithfully don my "clean garb" - consisting of white booties, robe, and hat (which, incidentally did wonders for the hairdo)- and make the trek back to his office through the Photo Lab. Needless to say, I could hardly wait for the move to the new building where my desk was conveniently located next to my boss' office, both of which were located outside the Photo Lab. During my 11 years at the Center, I watched it grow from a virtually unknown organization, with just a handful of people, to the world-renowned, highly successful scientific and technical organization it is today. This happened because of a lot of hard-working, dedicated employees, whom I still miss. (P.S. Who knows, if I hadn't gotten a "better offer," I might still be working there today.)

Karla Sprenger

Many of my most cherished EDC memories occurred prior to the new building in 1973. I can remember working for **Bill Campbell** in January 1972, and being deluged with customer orders. We worked many hours of overtime trying to respond as quickly as possible to the volumes of customer requests. One ad in a magazine and the incoming mail just stacked up; we would work on it for weeks. During those times, overtime was a given; but you enjoyed doing it because you be-

lieved in the concept of the EROS Data Center and the managers made you feel you were contributing to the future of something important. We also had a camaraderie among us that I still cherish to this day. We have come a long way from the good old days, and the activities at EROS Data Center are still bustling.

Glenn H. Landis

When I reflect on the earliest days of the Data Center, the thing that stands out in my mind is the quality and dedication of the people who created the Data Center. A small cadre of Survey people from across the country came to Sioux Falls in 1971. I think there were about 13 in all, from Menlo Park, Denver, Flagstaff and Washington, D.C. plus a young lady from NASA, Houston.

None of us knew for sure what an Earth Resources Observation Systems Data Center should look like, let alone how to put one together. A few of us had done some planning for the last year back in Washington, but all of the details had to be identified and addressed on site in Sioux Falls while we were getting the operation off the ground. What data products will the customers want and in what quantities? How do you communicate with the customer to tell him what data you have and what it looks like? Do you need a "computerized" data base, and if so, what information should it contain? What training and technical assistance should be provided? And on and on! The "paper was (truly) blank!"

Undaunted, everyone rolled up their sleeves and got to work, gathering and training an operating staff and modifying several buildings to house the downtown, temporary facility. Hiring our local staff was a very satisfying experience; Lots of applicants who wanted to work, were intelligent and anxious to learn. Our first hires were some great secretaries and clerk typists. With the help of the State, we organized training classes in photo laboratory and data base creation techniques and re-

cruited 15-20 trainees into each. They were among the most dedicated folks I have ever been privileged to work with. Many of the graduates of these courses are still with the Data Center, where they have become some of the most knowledgeable people in the world about data center operations.

The entire staff, some 70 strong, worked together, viewing every customer inquiry handled and every product shipped as an opportunity to develop procedures, learn techniques or increase skills. Together, they took the "blank paper" and drew the foundation of the EROS Data Center.

Gail Hanson

I'll never forget the first day I walked into the EROS Data Center at our temporary location in downtown Sioux Falls. It was November 1971, I was 20 years old, and I had moved here to accept my first job right after college. Imagine my surprise when **Glenn Landis** and **Don Carney** showed me where I'd be working - a table just big enough for the typewriter to sit on but not quite large enough for the telephone - so it was sitting on the floor! I was the first person hired since the original crew of men had come out a month or so before to start getting set up. And they did get right to it! So much so that they were using all the available space for photo processing equipment - including the women's rest room! So several times a day I got to visit the ladies' room at the Rite Spot Cafe just next door!! Any illusions of glamour I may have had quickly disappeared! And we rolled up our sleeves and pitched in to work many long hours. We worked hard, played hard, and accomplished much as a "family." It was fun being part of the development and growth of the Data Center, and I am looking forward to the excitement and challenges that the new building addition will also bring.

Phyllis G. Wiepking

Memories from an EDC Old Timer? My very first memory is of boxes and boxes piled upon boxes and boxes, filled with letters from people who had read articles in magazines or items picked up by AP or UPI about a new space age facility to be located in an incredibly unbelievable place—rural South Dakota. I was hired to try to get those letters answered. (It had become impossible for the scientific and administrative staff to squeeze routine letter answering into their extremely busy schedules. It certainly didn't make efficient use of their time either.)

Rita Tornow, who was the IBM Typewriter expert, and I soon discovered that if we were ever going to make a dent in those mountains of letters, we would have to write up dozens of "generic" paragraphs, which we did with the assistance of the scientific staff. I'd compose a few original sentences, then "insert para. 7", a few more sentences, then "insert para. 4", etc." EDC was operating in makeshift facilities in downtown Sioux Falls where space was not ample. We often returned to our little corner of the building after hours and worked late into the night. At the same time, I was learning everything I could find about remote sensing, aerial photography, computers, geology, geography, etc., taking formal courses and through "osmosis" from my associates who were the first wonderfully helpful cadre of scientists at EDC.

By the time we had moved out to the beautiful, spacious new facility twenty miles northeast of Sioux Falls, interest in EROS was not only national but global in scope. I was then in the business of community affairs public relations, information dissemination—I became kind of a liaison between the scientists and the general public and the media.

Sum up those early years in a couple paragraphs? Impossible! But I'll give it a try.

- Tours, tours, tours—Junior High Earth science classes, Senior Citizens, (one elderly woman, at

the end of a tour, said, "I don't know where we are and I don't know what we saw, but it was fabulous." Canadian college students brought every year by their instructor, a European bus tour group whose curiosity was piqued by the EROS sign on the highway. (They learned that it wasn't what they'd expected.) more tours, tours, tours...

- Showing slides and giving talks to Rotarians, Elks, Lions, women's clubs, school classes, convention attendees and spouses,...

- Scheduling agendas for national and international scientists from every continent and many, many countries, and learning that even when their countries were unfriendly, the scientists who came to EDC to learn how to help their people protect and manage their resources were very special people who shared common goals.

Working with USGS staff from Reston, Washington, Menlo Park, Rolla, etc., setting up and monitoring beautiful huge displays at scientific symposia or conventions in New York City, Boston, San Francisco, Los Angeles, Houston, and being in the midst of unbelievable enthusiasm and excitement about the work that was going on at EDC.

- Working by telephone and correspondence with editors and feature writers from Newsweek, National Geographic, Scientific American, etc., and with staff at the Smithsonian and other museums and media—sending them images and photographs with information when events of global interest occurred.

- Working with so many wonderfully talented, dedicated, motivated persons from all over the country (and a few who weren't so wonderful) who put EROS and EDC together made us Old Timers know that we were a part of history in the making. We reached peaks that we had never dreamed of. As with all new endeavors, as time

passes, some of the excitement becomes mundane, some of the passions ebb, reality replaces idealism. I'm glad that I had the early mountain top experience of being in on the morning.

Ken Merrill

Certainly I don't consider myself a "pioneer" in the development of the Data Center however, many of the people I worked for were pioneers in that sense.

In recalling fond memories of the EROS Data Center's beginnings, I always seem to think of the wonderful people I have worked with. I won't name anyone, because each person brings to mind special projects or relationships that are stories in themselves. I can only express love and respect to each person that I was able to work with (and you know who you are!). I remember how we all pulled together with limited resources and modified equipment in order to anticipate what might be expected of us when the satellite imagery reached the center. We were all teaching each other and learning from each other. I very fondly remember working thirty-six hours straight during the Rapid City flood. We processed original aircraft images on a very pieced-together Pako RD — no mistakes allowed!

When we think of the past and the future, they can only be justified by our present accomplishments. I congratulate you all on the current expansion of the center and wish you well!

Elizabeth L. Deno

In August, 1973, I was hired by the government on a 700 hour work contract. On September 17, 1973, I was hired by Technicolor full time. So began my career at the EROS Data Center. I've always been in Customer Services, which for years was called User Services. It's a great office to work in.

In the early years in User Services, we had upward of 40 people in the department. There were literally filing cabinet drawers of work to be

done. There were people working 15:15 to 24:00. We had to share desks because there weren't enough desks to go around.

My best memory of the early years in User Services is that we were like one, big, happy family. We were all very close and helped each other to produce the best results for everyone.

I'm very glad that I've been a member of the EDC family for 20 years!

Rita Flanery

I started at the downtown office in Oct. 1972 and moved to the new center the summer of 1973, as secretary to the chief, Applications Assistance (Training) Branch in time to help prepare for the first of many International Remote Sensing Training Courses. I remained at EROS until Nov. 1977.

My supervisors were **Don Kulow**, who died following a heart attack in 1973, **Bob Reeves**, **Gene Thorley**, and **Don Lauer**.

My days at EROS were filled with many challenging and educational experiences, and I have fond memories of the many fine coworkers and visiting scientists from all over the world with whom I worked.

My best wishes for the successful completion of the new addition and for the future of EDC. ♡

EROS: Turning Point for Sioux Falls

by **David Stenseth**, Sioux Falls Development Foundation

When the Sioux Falls Argus Leader headlined in August of 1992, "We're No. 1," it quoted Money Magazine as saying they had picked Sioux Falls as their No. 1 city in the Nation. It also quoted Money as saying, "This former cow town nestled in the southeastern corner of South Dakota has one of the most diverse and robust economies anywhere in the U.S."

One must reflect as to why and how this happened. Many factors played into this achievement. However, I am positive that the turning point in this journey was coveting and eventually receiving the EROS facility. From the first mumblings that such a facility was being considered by the Government in 1969, to the corner stone laying in 1973, the political and financial energies of Sioux

Falls were marshaled to make EROS a reality.

The total cooperation of City, County, and State Government, our Congressional Delegation and the business community was a wonderful example of what could happen when we had a common goal. The immediate and rapid over-subsidized fund drive allowed the purchase of the site for EROS and some additional funds to make the down payment on what is today the Sioux Empire Development Park, home of Citibank, StarMark, and countless other employers. All because **Al Schock**, in one of his sales pitches, said, "We'll give you land," thinking it was a 10-acre site, not 360 acres.

No one except the Argus-Leader ever believed that it would employ 2,000 and be the Center of the space age. What I did believe was, regardless of size or employment, it would play a major role in helping

Sioux Falls refute its image of a cow town depending on one major industry. We made more scientific journals and publications in one year than we had in the previous 100 years. Air traffic increased dramatically helping us in our ability to be a vital transportation center. Foreign visitors with motor needs to the Center and training changed the complexion of our community. Under **Al Watkins'** guidance, the Center prospered to the point of your present expansion. The Sioux Falls Development Foundation built the facility and owned it for 20 years on a lease-back to the Government. The Foundation worked closely, and I believe well, with EROS over those years assisting where it could with its expansions.

Congratulations to EROS on its continued service to humanity and Sioux Falls. There is no question that **Schock's** statement of "Whatever is required, we will do it!" made EROS happen in Sioux Falls. That was the turning point for the City in its quest for diversification which ultimately ended in the Argus headline "We're No. 1". Thanks EROS and all the community leaders past and present who made it happen. ♡



The Sioux Falls Development Foundation worked closely – and well – with the EDC for 20 years assisting where it could with expansions. Key community and Government participants in the early 1970s included: Standing (l. to r.) **Russ Pohl**, SF Development Foundation, **Russ Greenfield**, SF Attorney, **Duane Paulson**, Architect, and **Al Watkins**, Chief, EDC. Seated (l. to r.) **Dave Stenseth**, SF Development Foundation, and **Bill Schmidt**, Special Asst. to the Director of the USGS.

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