

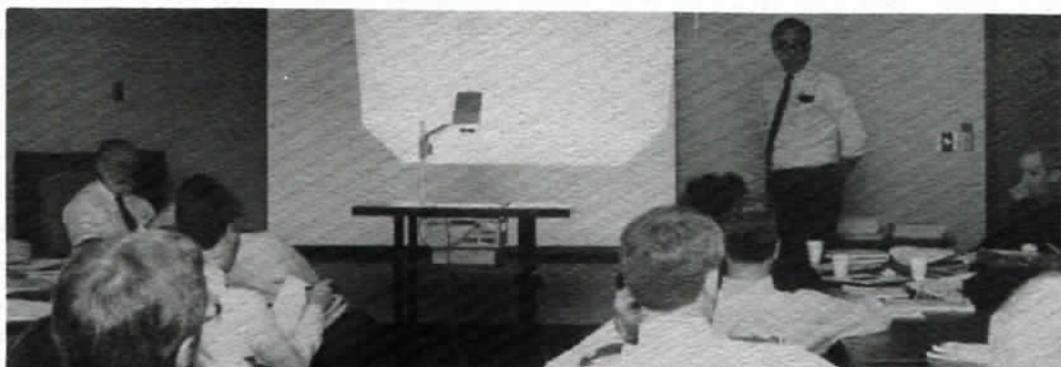
EROS DATA CENTER, SIOUX FALLS, SD

LANDSAT



EROS

U.S. GEOLOGICAL SURVEY



**Tim Horn**, General Electric Aerospace, leads a discussion in the EDC Main Conference Room concerning the concept of operations for Landsat-7 during the 3-day, Landsat-7 Technical Exchange Meeting Dec. 7-9, 1992.

## First Step Back into Landsat Business

**F**orty-five outside participants representing government and private industry met with 20 members of the EROS Data Center Dec. 7-9, 1992 to discuss the Landsat-7 satellite and get acquainted with our facility and its capabilities. According to **John Boyd**, EOS Data Systems Project Office, the "Landsat-7 Technical Exchange Meeting" featured people from the Landsat Project Office/U.S. Air Force, NASA-Goddard, General Electric (GE) Aerospace, the Aerospace Corp, Mitre, Swales, Geodynamics, and the EROS Data Center.

The primary reason the Landsat-7 Technical Exchange Meeting was held at the EDC was to introduce GE management and technical people to EROS management. This "getting to know each other" meeting provided the Data Center with an ideal opportunity to show those attending the meeting its present and past expertise.

"The second goal of the meeting," explains **Boyd**, "was to have a technical exchange by GE with our technical people on the Government staff of the characteristics of the instrument, methods to be used for geo-correction and some of the processing of the data, and also a review of conceptual planning for the operational system."

The Air Force is responsible for the instrument, spacecraft and launch of Landsat-7. NASA will handle the daily operation control of the spacecraft, and also be respon-

sible for ground processing operations. The EDC will assist NASA by operating the ground processing system.

"We also met with NASA-Goddard engineering personnel to talk about our potential role in preparing a request for proposal (RFP) for the ground processing." **Boyd** adds, "The understanding that we have with NASA is that we'll act as a "facilitator", or kind of a combination of a future operator and a current integrator, that would put together what we call

*Continued on page 2*

## Center Scene Changes Look and Name

**W**ith all of the natural and human-induced changes affecting the EDC the last couple of years, we thought it's time the EDC's inhouse publication change along with everything else. Beginning with this issue, the EDC "Center Scene" will sport a new appearance and title. Now called "EROS Data," the publication will be published quarterly and feature news about new and existing EDC activities, employee news, and some brief human interest stories about our staff. If you have any ideas for stories or suggestions on how we might improve future issues, please call **Mark Barber** at ext. 6176. 



## UP FRONT

**T**his is my first column as your official Center Chief. As I told you in the informal briefings recently, I was pleased and honored to be selected for this job, and we can now get on with filling other positions at the Center. As you already know, I asked **Gary Metz** to be the Center Deputy Chief – and he agreed. **Gary** has been in the front office since the day he came to the Center in 1974, thus his experience and knowledge will help me immensely. **Gary** is the Contracting Officer's Technical Representative for the Hughes STX contract, which is only one of many duties of the Center Deputy Chief.

The EROS Data Center has an excellent reputation in the scientific community and in our parent organization. **Dr. Dallas Peck**, Director of the U.S. Geological Survey, continues to ask about the

“world class” research and product development work being done here. Several members of our staff soon will brief **Dr. Peck** and his colleagues on our efforts to develop global topographic data, a 1-kilometer resolution global AVHRR data set, and a comprehensive land characterization data base. It is a tribute to your hard work and imaginative approaches to problem solving that has established us in the forefront of space based data applications studies such as these.

The new year will bring to us some new and interesting challenges. The impact of a new Administration still remains an unknown. All Federal programs will be under very close scrutiny in an era of declining budgets. We must deal with realistic limitations on resources but also aggressively foster and develop our role in the Landsat Program, NASA's Earth Observing System Program, and the U.S. Global Change Research Program. I am confident we can deal with the challenges ahead. As your Chief, I will continue to work with you to do just that.

Donald T. Lauer

ment would be housed in the new part of the building.”

As host for the Landsat-7 meeting, EROS will receive only positive results according to **Boyd**. “We have a fine physical facility. We have an excellent technical staff. Every time we can bring in people from the outside who know very little about us, we gain tremendously in terms of leaving the positive impression on people that we know what we're doing, that we have a mission, and that we're enthusiastic about what we're doing.”

Although the proceedings of the Landsat-7 Technical Exchange Meeting may have been opaque to many EDC staffers, it won't be long before the results become transparent—as the EDC gets back into the Landsat program the way it has always wanted for a long time.

### Landsat-7 Specifics:

- Launch Date: December 1997
- Sensors: \* The Enhanced Thematic Mapper—
  - (TM data augmented with a 15-meter panchromatic band called the ETM-plus. The plus being the thermal band, band-6, with 60-meter resolution vs. 120-meter resolution).
- \* The High-Resolution Multispectral Imager—a pointable device offering finer resolution.

*Landsat Business Continued from page 1*  
a data handling facility—with responsibility for incorporating the Landsat-7 systems and interfaces into the Earth Observing System (EOS) programs.”

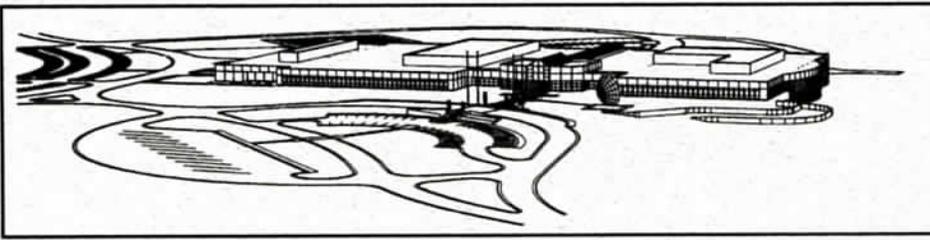
The EOS Data Systems Project Office (EDSPO) hosted the Landsat-7 Exchange Meeting because Landsat-7 is considered a part of the EOS platform. All EOS subjects fall under the direction of **R.J. Thompson**, Chief of the EDSPO, who served as the EDC's official management host. In addition to **Thompson** and **Boyd**, **Bruce Quirk**, EDC's staff liaison located at the Goddard Space Flight Center (GSFC), was heavily in-

involved in organizing and carrying out the meeting.

According to **Boyd**, the Data Center should see immediate repercussions from the December meeting. “It will probably hit us operationally a little sooner than EOS, which is why we're getting prepared now. It's a ‘sleeping giant’ that is going to awaken here soon. About six staff members will have to contribute immediately. That will grow significantly in early 1996 as software is delivered by various Landsat-7 contractors and we begin to put the operation into place. Certainly this impacts the building expansion (see story following) because this equip-

## EDC's New Addition

**C**urrent plans call for the EROS Data Center to break ground this spring on a 65,000 square foot building addition required to house the Land Processes Distributed Active Archive Center (LPDAAC), a part of NASA's Earth Observing System (EOS) Program.



According to contracted architects and engineers, this line-drawing portrays the EDC building and grounds once the LPDAAC addition is completed in late 1994.

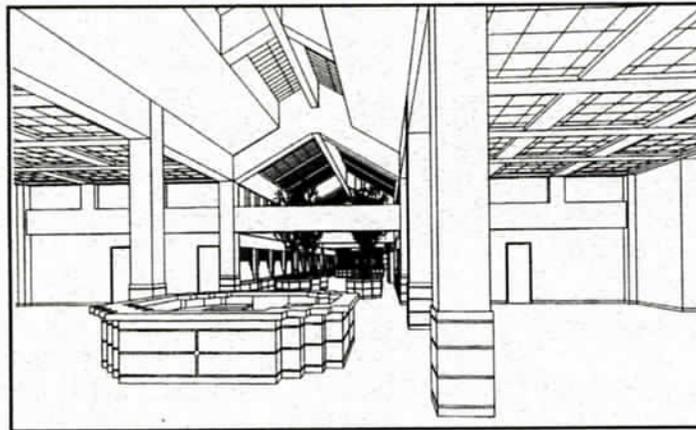
Planning for the expansion began in earnest in the spring of 1991 as a seven member EDC Task Force met for the first time to decide what form the proposed building addition would take.

Task Force members were faced with a challenging job: develop a working environment design flexible enough to meet the inevitable changes required for staff, equipment and space during the evolutionary development of the LPDAAC and its functions. Complicating the task, the group was trying to design the new building based on plans drawn up 3 years ago or earlier.

Following the retirement of **Glenn Landis** in July of 1992, **Dennis Hood** assumed chairmanship of the Task Force. In addition to normal duties associated with committee chairmanship, this also meant serving as political buffer and liaison with architects and engineers. Other members of the Task Force include **Charlie Trautwein**, Science and Applications Branch, (specializing in office space and training areas); **Lyn Oleson**, who replaced **John Boyd** from the EOS Data Systems Project Office (providing EOS program input); **Robin Hermanson**, Viking Engineering Service Company (lending expertise for facility engineering, maintenance and construction techniques); **Tim Smith**, Information Management Section (addressing public spaces such as the lobby and cafeteria); and **Ken Boettcher**, Computer Operations Supervisor,

(designing the DAAC's computer room and related operational support requirements). In addition to these members, **Mary Lou East** and **Arllys Johnson** provided record keeping and secretarial support.

To see the latest in building design and operation effectiveness, Task Force members visited several super-computing facilities nationwide. "We will be trying to bring into the new building a lot of the things we saw at



Conceptual view of what future visitors will see when entering the main entrance of the EDC.

**Cray Research in Minneapolis**," says **Boettcher**. "They had a very nice treatment of separating business and pleasure areas, if you will. The office areas are very professional and high-tech. But, when you want to get away from that, you go out into the public spaces and it's relaxed, laid back, and aesthetically pleasing."

The Task Force believes the architect's use of lots of natural lighting through extensive placing of skylights, and a concourse with many planters that opens into the cafeteria will go a long way toward achieving the environment they envision.

According to **Boettcher**, there will be other innovations as well. "In our present building, if you look at an office space you have an open area where your secretaries are surrounded by offices. In the new building, we'll use a similar concept, but instead of going through a door to get into an office complex, you'll turn down an aisle and you're there. It's much more open and more like an extension of a hallway with a skylight above each intersection."

A focal point of the addition will be the computer room. The Task Force believes a centrally-located computer room will provide for growth as well as access for users.

What can EDC employees expect to see in the next year? A showpiece different than the lobby model, according to **Boettcher**.

"The architect (Spitznagel, Sioux Falls) did an excellent job in tying the existing facility with the new one. When it's done, it will look like one building that was designed from the onset to be that way. Walking into the lobby, you'll be able to tell it's a very professional, businesslike place. In addition to ground level plans, a lower level will be con-

structed, featuring more than a crawl space, as is the case in much of the original facility. This area will have a concrete floor and house equipment and data that don't require constant human supervision. This area will include the archive, storage for dissemination, maintenance and facility support areas and telecommunications capabilities."

While the building addition will offer new work environments for an expanded scientific and technical staff (perhaps as many as 150-200), EROS employees who continue to call the original building home will see a

number of improvements also. "Over the next few years," says **Boettcher**, "you're going to see a lot of work going on in this building to update its layout, color schemes and furniture so it closely resembles the addition. Because we will have connections to the LPDAAC, there are going to be some changes in hallways. Customer Services will get a new home. It's still undecided where the Center Chief is going to reside. The present cafeteria probably will be remodelled into office space.

All the office areas along the southeast wall will be disrupted for a period of time. So there are a number of people in the Science and Applications Branch and Customer Services who will be impacted. One of the first things we may do is close the lobby. The lobby will essentially go away with the building addition. We could use that space as a staging area where maybe Customer Services and SAB people could be relocated until their walls are rebuilt. Of course this is only one of many possible scenarios."

While most renovations will expand our building, the parking lots also will be enlarged. "The visitor's parking lot will be expanded in that, where now it's kind of a half-circle, it will be expanded to be a full-circle." **Boettcher** adds, "In the back part of the lot will be an area for RVs and buses. A new back parking lot will add over a hundred new parking spaces."

In addition to cosmetic changes to the present building, **Boettcher** says the Center's operations design most likely will evolve as well. For instance, it hasn't been determined what type of organizational structure an expanded Data Center will feature. Only time will reveal the number and size of new branches we'll see.

While Task Force members have worked hard to come up with a design to expand EROS into an elite

company of world-class centers, the challenge has been worth the effort according to **Boettcher**.

"There's still just a handful of super-computing facilities. To not only be a part of one, but to be part of the design of one is kind of neat. Part of what we (the Task Force) had the opportunity to do was go see what is out there. To find out, What is state-of-the-art in buildings? What will meet our needs? What do we like? What mistakes did we and others make? How do we learn from these mistakes? Not only did we learn a lot about how to build a building, we learned a lot about technology. A lot of the technology that was brought back has led to things that we're doing now. The way we manage our systems, the mass storage devices, supercomputing initiatives, etc."

The only frustration **Boettcher** has experienced during his time on the Task Force has involved conflicts in personal taste.

"Everybody's an expert at interior decorating," laughed **Boettcher**.

As with the original building, the addition supporting the LPDAAC probably will be constructed through a lease arrangement with the Sioux Falls Development Foundation. Construction of the \$11-million project is planned to begin this spring (March-April) with completion during the fall of 1994. **S**

## EDC's First Mass Storage Robotics System

**I**f you had trouble negotiating the hallway in front of the cafeteria and Employees Entrance in early

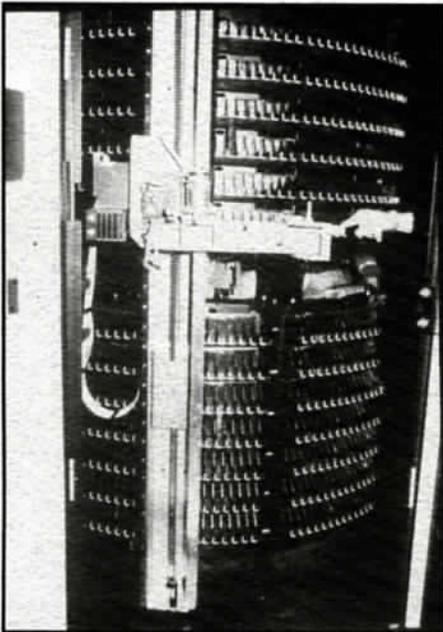
December, the logjam can be blamed on the arrival of the Data Center's new robotic mass storage file system (4400 Automated Cartridge System). While the delivery of this new equipment proved to be an obstacle for some hall users, its installation will provide a clear path to future data storage flexibility and expandability.

According to **Ken Boettcher**, Computer Operations Supervisor, the new system will change the way the EDC manages large computer files of land resources data.

"The networked, user-controlled, robotic mass storage system will provide around-the-clock unattended file availability to research, development, and production staffs. In addition, the new robotic system, called a silo, will help users, computer operators and tape librarians improve efficiency by reducing the number of requests for tape mounting, decreasing the number of tape labels that currently need to be produced, and ease inventory and verification methods."

The acquisition of the silo keeps the Data Center's magnetic storage capacities in step with ever-growing sizes of computer files. This also helps to resolve current size limitations associated with the EDC's current UNIX file system. While the Center's magnetic storage capacity will increase, the silo should allow for more effective use of tape media used to store data. For example, instead of magnetic computer tapes, the new mass storage system will use tape cartridges about the size of old 8-track audio tapes.

What's nice about this type of mass storage module is its flexibility. The physical storage capacity of each silo is approximately 6,000 cartridges. By connecting a series of robotic cartridge storage units, storage may be expanded in increments of 6,000 cartridges to a maximum of roughly 24 million cartridges. The



A closer look at a portion of the internal storage mechanism inside the StorageTek ACS 4400.

tape drives and cartridge media initially were engineered with a data storage capacity of roughly 200 megabytes (one megabyte is slightly more than one million bytes). Because of new data compression techniques, tape cartridges may now store over 400 megabytes. In three or four years, this tape technology is planned to store upwards of 20 gigabytes of data per tape cartridge (one gigabyte is slightly more than one billion bytes). To put all of these "megas" and "gigas" into perspective, consider this: the EDC archive presently holds roughly 39 terabytes of data (one terabyte equals slightly more than one trillion bytes). This one robot will hold 1.2 terabytes of data. Because of the storage capacity of this new robotics system, a significant amount of EDC's archive may be put near-line for users.

What does the new mass storage robotics system mean for future data storage and retrieval? If we consider the data collected, processed, and stored by the AVHRR Data Acquisition and Processing System (ADAPS), for such projects as "greenness" mapping and the new

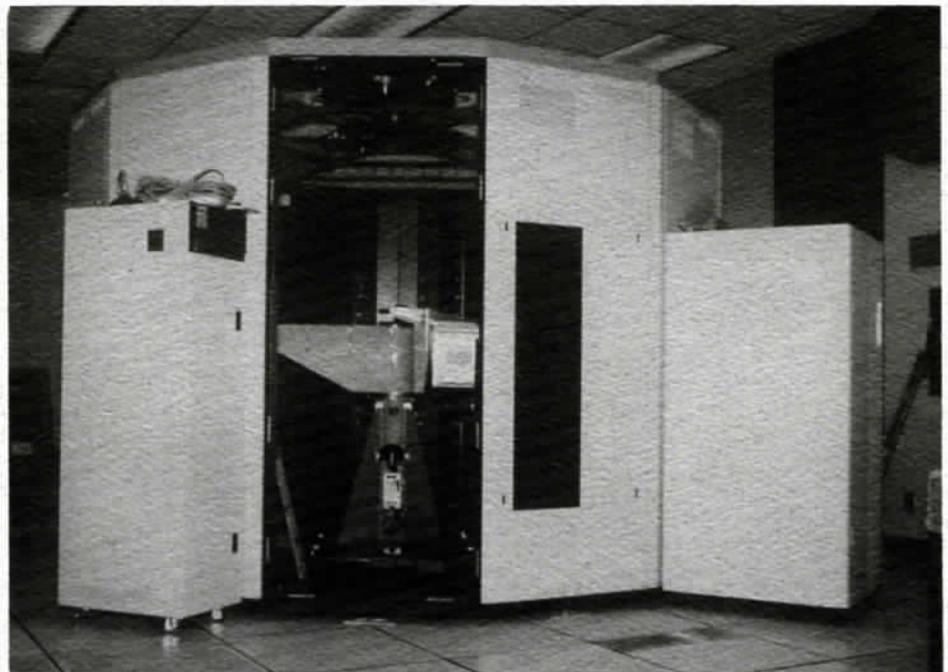
1-Km data (where the EDC is trying to build a global data set of land information daily), the silo will enable the EDC to put all of the most recently acquired data on-line to both researchers and custom image processors of the Digital Data Production Section (DDPS).

"If the silo holds 1.2 terabytes and our data acquisition is 6-to-8 gigabytes of data per day," explains **Boettcher**, "we could use 300-400 gigabytes of data on the robotics system and have a months worth of AVHRR data on-line for users. By using the silo, 90% of our production generation of AVHRR products will be done without anyone having to touch the data. The data won't have to be retrieved downstairs or mounted in a tape drive. It will be there. You just ask for it by file name. This is where we really see a level of automation. The operators don't have to mount and dismount tapes, tapes don't have to be labeled, and the data is available immediately to our DDPS users.

Some of the thinking going into the production of 1-Km AVHRR prod-

ucts concerns taking various orbital swaths and stitching them together to make global products (see AVHRR 1-Km data story on page 6). Since all of these pieces are on many different tapes, you can imagine how many full time employees it would take to do this manually. If the data is in the silo, you let the robot do all of that."

According to **Boettcher**, the robotic storage system will allow EDC employees to work smarter and allow management to re-train people to perform higher-level tasks. This benefit is crucial considering the EDC's monumental challenges in global change research, data set development, agency image mapping and mosaicking, satellite image production, Earth Observation System Data and Information System (EOSDIS) prototype data set manipulation and archive, and other types of Earth science data research and production. 



As the "silo", or StorageTek ACS 4400 Nearline Mass Storage System, nears completion, the system's center-pivoting, robotic arm awaits the final stages of assembly.

## DDPS Takes Up "Stitching"

by Rick Vandersnick

In the fall of 1992 the EROS Data Center was tasked with producing an Advanced Very High Resolution Radiometer (AVHRR) global land 1-kilometer resolution single-day mosaic. Individuals throughout the Data Center worked closely to prepare software procedures to create a product of this magnitude. Normal production of AVHRR data at the EDC consists of 7, 10, 14 and 15-day "greenness" composites over regional and global areas, such as Alaska and the conterminous United States, and most of Europe and Asia. The composite process registers the maximum normalized difference vegetation index (NDVI) values for each orbit. The NDVI is a green index that relates to biomass buildup (green vegetation condition). As a global prototype product requiring

The Digital Data Production Section (DDPS) was assigned the job of implementing these software processes on the Silicon Graphics (SG4) UNIX processor. A function called "stitching," developed by the EDC Software Development Section, was used to join 40 NOAA-11 scenes from June 24, 1992 into 14 orbital paths. Using the mosaic process, the individual tracks of data then were corrected and mosaicked systematically left to right to create the final global image. The map projection used for this project is Goode's Interrupted Homolosine, which at 1-Km pixel resolution created a global image of 17,347 lines by 40,030 samples. The characteristics of the map projection allowed us to divide the world into 12 regions to minimize processing impacts. The 14 orbital tracks were processed through the 12 regions of the world creating regional images which were joined creating the global mosaic.

The mosaic was created as a demonstration to prove that the EDC has

to enhance and correct the data. The NOAA-11, 1-Km, data are acquired generally through deliveries by tape format through joint efforts with numerous satellite ground receiving stations worldwide. The date of June 24, 1992 was selected for its global coverage at summer solstice. In other words, this date offered the best possible coverage of the world for a single day when the Sun was at its greatest distance from the equator. Coverage, however, was not available over Indonesia, Antarctica, or the southern tip of South America at the time of production.

Examples of the completed image mosaic are displayed in some EDC offices. In its current state, this product has gained international exposure from its travel to various sites worldwide. It soon will be available through the Data Center's Public Affairs Office (PAO) file. ☛

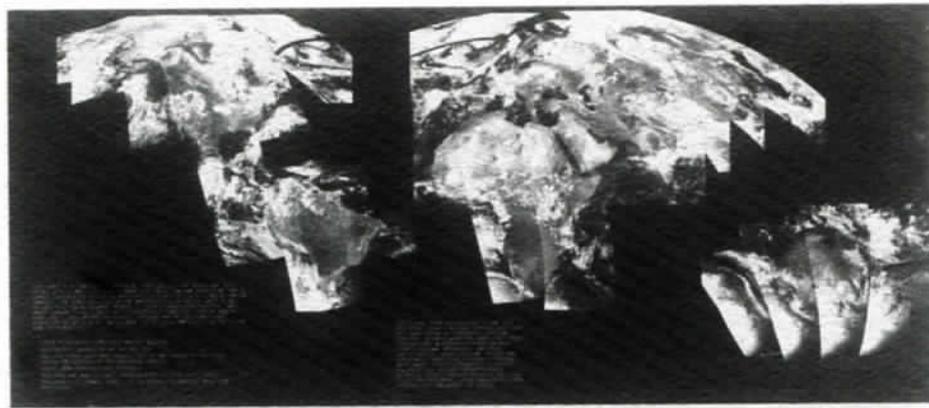
## HELP Desk Receives Busy Signals

by Jim Hovatter

Based on the number of phone calls received by the Computer Services Branch Support HELP Desk since October 1, 1992, the new service is meeting its intended challenge. Since its start date, the HELP Desk has received over 1,200 calls.

While the HELP Desk is experiencing growing pains much like any completely new operation, it continues to improve in function. Resource Analysts respond to users requests more timely and completely, while HELP Desk staff simultaneously answer more calls.

HELP Desk staff also have been assisting with the installation of PC



Global 1-kilometer AVHRR Coverage, June 24, 1992

single-day coverage, it was necessary to use the mosaic process rather than the greenness composite process. Channel 1 (the visible band) and Channel 2 (the near-infrared band) of the sensor were chosen for this process. AVHRR bands [2,1,1] as red, green, blue (RGB) were used to create the color prints for the global product.

the capabilities and resources available to generate global land 1-Km AVHRR products. The expeditious manner in which this mosaic was created reflects why some enhancements were not applied. Currently we are producing a 10-day composite (June 21-30), including the 40 scenes previously processed, which will reflect techniques applied in a radiometric and geometric method

software as well as other problems associated with these units. As more personnel use the HELP Desk to solve their computer problems, response time continually will improve as the database of trouble-shooting information available to HELP Desk staff increases. Please remember, the HELP Desk has been established to give users one, central point of contact for their computing problems. If you have a computer problem, call the HELP Desk at ext. HELP (4357). 

## Helping Adults Who Can't Read

**T**en percent of all adults in the United States can't read or write. This is a sobering statistic that's especially hard to understand considering some of these people have high school diplomas.

**Paul Severson**, Customer Services Section, had a difficult time understanding this concept also...until he started teaching adults to read two years ago.

For a couple of hours each week **Severson** donates his time to fight illiteracy in South Dakota; a problem perhaps much worse in other parts of the nation, yet a situation knowing no geographic boundaries.

Two years ago, when **Severson** had a little extra time on his hands, he called the Sioux Falls Literacy Council, part of a statewide organization incorporated in 1986 to fight illiteracy among adults. As a former English major in college, with an unending fascination with our language, **Severson** wondered what it would take to become involved.

"The whole process of how someone

(an adult) learns to read intrigued me," confesses **Severson**. "It made me curious. How would you go about teaching another adult how to read?"

After 15 hours of training through the Sioux Falls Literacy Council, **Severson** soon discovered for himself. He currently tutors two young men in their late twenties. One is from the Sioux Falls area and the other is originally from another part of the nation. One dropped out of school after the 7th grade. The other was graduated from a high school curriculum. While their educational histories differ, their literacy rate is similar...NEITHER can read. Despite their inability to read, both men work full time and are not ignorant. There is absolutely nothing functionally wrong with their minds.

"Somewhere along the line they ended up in the back of the classroom," says **Severson**. "They were some of those guys that don't say anything and nobody paid much attention to.

When you get people who were bypassed in their education, it's interesting to figure out at what point their comprehension of what was going on in the classroom ended, what they have picked up since, and what they have done with it. It's fascinating."

**Severson** reaps more than fascination from his tutor sessions. "I get some personal satisfaction from doing this, of course, but also it really intrigues me how people cope with these things. In two years one of my students has gone from not reading at all...to basically being able to handle most of a newspaper story."

While you may be astonished to learn that people actually are able to function and work in today's complex society without being able to read, **Severson** says illiterate people cleverly learn to conceal their plight.

"They usually hide it (their inability to read and write) because it's an embarrassment to them," explains **Severson**. "You know it takes a lot of courage on their part to come into a program and tell strangers that they have been fooling people for a long time and can't read. They have a lot of tricks. They'll have somebody else, like a wife or friend, help them fill-out job applications."

Often when a child is taught to read, she also is taught to write. Writing and reading skills go hand in hand. Where do you start when teaching adults to write as well as read?

"We use a system called Laubach (a structured reading program), which is a phonetic-based system. It starts out with just the letters." **Severson** draws a letter "b" in the air and recites instructions as if from the Laubach manual. "This is the letter 'b' and it's shaped like a bird. This is the letter 'c.' It's shaped like a cup. It starts at that level and then begins to build. I follow this system closely but it's awfully boring and tedious. So, you've got to throw other things in to make it interesting. I just can't sit people down and go through the book with every lesson. I've done things like go to the grocery store and go up and down the aisles reading signs with my people."

One of the biggest challenges **Severson** says he faces with his "students" is finding things for them to read that aren't geared towards children. This requires a great deal of patience and diplomacy. "You've got to be careful," cautions **Severson**, "because if these people feel they're being patronized, they'll leave. You're not dealing with kids here. You must treat them as adults. I try to let them know that, yea, I can read...but I'm still not better than you."

**Severson** estimates that 40 volunteers such as himself serve as tutors for adults who want to learn to read.

Some of the volunteer tutors are retired teachers. Other volunteers are ordinary citizens like **Severson** who love to read and want to contribute to their community. Tutoring usually takes place in rather intense individual one-hour sessions with each student. It's a lot of work for the student but usually not so intense for the teacher. "My work is basically trying to figure out where to go with the student, what kind of questions to ask them. What have we just done that I think they should remember?"

According to **Severson**, **Nancy Hansen**, Program Director of the Sioux Falls Literacy Council, has a tough job. She's responsible for matching students with volunteers. "We look at a number of things," says **Hansen**. "We look at schedules, whether the reader is available evenings or Saturdays. We also consider personality, age, likes and dislikes, and temperament."

**Paul** is in the minority because not many men come forward to volunteer as tutors. We're so tickled to have him on board. I have found that **Paul** is a quiet, unopposing sort that is always there. He's been very influential in exploring the addition of a new computerized program that we'll use to help adults learn to read."

Because of **Severson's** dedication, **Hansen** selected him to attend a three-day national literacy convention last June in Raleigh, North Carolina. "Myself and two other people from this area went down with four students," explains **Severson**. "There were a variety of activities for the students as well as a variety of seminars for the tutors and administrators."

According to **Severson**, he acquired a different perspective about this nation's literacy problem because of the convention. "There are a couple of levels you can look at. There's the personal level where you think gee, it's really kind of rough for somebody

not being able to read. They're missing a heck of a lot—the richness of the culture we live in. At a personal level, it (illiteracy) affects their entire life—from entertainment to work.

From a social level, we're wasting humanity. The more I'm involved in this, the more I see the indicators that there are an awful lot more people around that are bluffing their capabilities of reading, more than we may think."

Whether you look at the problem of illiteracy from an individual or a societal perspective, the waste of human potential becomes glaring. By donating hardly more than a couple of hours each week with the Sioux Falls Literacy Council, **Paul Severson** is addressing both sides of the problem by helping adults who are trying to help themselves. ♣

## The Growth of the EDC Friendship Tree: 1983-1993

From a seedling transplanted from the minds of former EDC Chief **Al Watkins**, former Technical Information Office Chief, **Ray Byrnes** and 1983 EDCEA President, **Tom Holm** (currently Deputy Chief, Data Services Branch), the EDC Friendship Tree has grown into a popular holiday tradition. According to **Holm**, the holiday fundraiser got its start during the 1983 EDC Christmas Party.

"**Watkins** and **Byrnes** and I got talking about what EDC employees could do for the surrounding communities—something that we could rally around and feel good about at Christmas. We started talking about this concept of a Christmas tree

where we would sell bows, each one representing a \$10 donation.

We all agreed. And as **Al** does most of the time, he wanted to take action and said, "Introduce me **Tom**. I'm going to start selling bows right here and now and I'll buy the first five bows."

Thanks to **Al Watkins'** generous start, the 1983 Friendship Tree enjoyed overwhelming success. After **Watkins** had suggested a goal of \$1,000, a total of \$1,400 was contributed to the Sioux Falls Food Pantry. In addition, a large quantity of food, clothing, and toys were presented to the Salvation Army for distribution.

Also making the inaugural Friendship Tree campaign distinctive was the participation of U.S. Senator **Larry Pressler**. Senator **Pressler** purchased a bow immediately after **Watkins** announced in a special ceremony that more than a \$1,000 had been contributed.

"And that's how it all got started," explained **Holm**. "EDCEA had the charter to decide what charitable organizations we would target and we've been doing that every year."

Since 1983 the Sioux Falls Friendship Tree has donated thousands of dollars of non-perishable food items, clothing and toys as well as over \$11,000 dollars to many community charities:

- The Food Service Center (including The Food Pantry and the Food Bank)
- The Children's Home Society
- The Senior Companion Program
- The Banquet
- The Children's Inn
- The Salvation Army
- Threshold Youth Services
- The Union Gospel Mission
- Make A Wish Foundation
- Family Violence Project
- St. Francis House
- Turn About

## Habitat for Humanity Ronald McDonald House

The toughest test for the Friendship Tree occurred early in its existence. After collecting \$1,400 through the 1983 Friendship Tree, a late December fire gutted the farm home of **Bob** and **Phyllis Ollerich**. The **Ollerich** home is located at the intersection of Minnehaha County Road-121 and the EROS access road. According to **Holm**, another \$500 was raised by EDC employees the first couple of weeks of the new year through a special Friendship Tree collection.

Roughly 2 months after a fire destroyed the **Ollerich** home, another blaze burned a mobile home located a half-mile south of the **Ollerich** farm on the west side of County Road-121. Even after two Friendship Tree collections, EDC employees responded once more by providing a substantial cash donation to help this family as well.

The idea of the Friendship Tree is to provide a gesture showing that the employees of the EROS Data Center care about its surrounding communities. No time during the 10-year history of the Friendship Tree has this goal been more apparent and successful than late 1983 and early 1984. While there have been many successful Friendship Tree campaigns, the Center's generosity perhaps shined the brightest its inaugural year. 

## NEWHIRES

### Hughes STX

**Dr. Gary E. Johnson** has rejoined the EDC as the Deputy Project Manager for Hughes STX Corp. **Johnson** returns to EROS where he previously served in supervisory capacities for four years in the late

1970s and early 1980s. **Gary** returns from the United Nations Environment Programme, Global Resource Information Database (GRID), Bangkok, Thailand where he served as director. **Johnson** received an A.A. from Bismarck Junior College, Bismarck, ND in 1963. He earned a Bachelor's in Geography and a M.S. in Geography and Political Science from the University of North Dakota, Grand Forks, ND in 1965 and 1966. He completed his Ph.D. in Geography, Regional Economics and Remote Sensing in 1971 at Indiana State University, Terre Haute, IN. **Gary** and his wife, **Diana**, live in Sioux Falls. They have two children - a daughter, **Tracy**, of Aberdeen, SD and a son, **Rob**, of Columbia, MO. **Gary** enjoys traveling, pheasant hunting, and photography while **Diana** is "an avid quilter" who previously taught quilting classes in Bangkok.

**Kevin J. Lowell** joins the Software Development Section from Purdue University, West Lafayette, IN where he earned a B.S. in Applied Physics with a M.S. in Remote Sensing and Photogrammetry. Prior to graduating from Purdue, **Kevin** served 4 years in the U.S. Navy. Originally from Brandon, SD, **Kevin** enjoys scuba diving (hasn't checked out Lake EROS yet), reading, collecting stamps, and riding mountain bikes in his spare time.

**David A. Tarrell** also joins the Software Development Section from the Naval Surface Warfare Center, Dahlgren, VA. **David** received a B.S. in Electrical Engineering from the South Dakota School of Mines and Technology, Rapid City, SD and is currently working toward a M.S. in Systems Engineering from Virginia Polytechnic Institute, Blacksburg, VA. **David** and his wife, **Kathy**, have an 18-month son, **Alex**, and one cat. The **Tarrells** live in Sioux Falls. **David** claims his only hobby at the moment is home building because in his words, "we just moved

into a new house and we've got a lot of work to do." **David** originally is from Aberdeen, SD.

**James D. Rowland** of the International Projects Section comes to EROS from Montreal, Canada where he earned a M.S. in Geography, specializing in climate at McGill University. While registered in the Department of Renewable Resources at McGill, **Jim** also studied at the University of Quebec-Montreal in the Atmospheric Sciences Department. While **Jim** resides in Sioux Falls when he's not overseas for the International Program, he hails from Philadelphia, PA. His interests include riding 10-speed bikes, cross-country skiing, reading, and listening to alternative music programming (i.e. African rhythms).

**Andrew R. Jacobson** joins the Niamey Field Office with a B.S. in Engineering Physics as well as a B.S. in Psychology from the University of Illinois, Champaign-Urbana. After being graduated from Illinois, **Andrew** worked as a hydrologist with the U.S. Geological Survey Water Resources Division District Office in Champaign, IL. Before joining the Niamey Field Office, the Byron, IL native also served in the Peace Corps in the northwest African nation of Benin, where he taught advanced high school chemistry and physics. In addition to English, **Andrew** speaks fluent French, which comes in handy working and living in Niamey, Niger.

**Dean B. Gesch** has accepted a position with the Land Sciences Section of the Science and Applications Branch. **Dean** comes to the EDC from the Hughes STX home office in Lanham, MD. Originally from Milwaukee, WI, **Dean** earned a B.S. in Geography from Carroll College, Waukesha, WI in 1982. He added a M.S. in Geosciences from Murray State University, Murray, KY in 1984. **Dean** and his wife, **Amy**, live

in Sioux Falls with their two boys, **Karl** and **Brian**, ages 3 and 1. According to **Dean**, he likes to fish, hunt and golf in his spare time.

**Kimberly Kringen**, a 1990 Business Administration graduate from Sioux Falls College, joins the Data Center's Customer Services Section. Since receiving her degree, **Kim** has held management positions with Michael's & Burke's of Sioux Falls. Before coming to EROS, **Kim** worked for **Dr. Marvin Wingert** at the Garretson Clinic. Born in Belle Fourche but raised in Garretson, **Kim** and her husband, **Todd**, live in Garretson with their daughter, **Alaina**, 14-months. Other than keeping tabs on her daughter, **Kim** likes to attend area craft shows.

**David Sutton** joins the International Projects Section in the Science and Applications Branch. **David** attends South Dakota State University, Brookings, SD where his major fields of study are computer science and math. His interests include golf, alpine skiing, and watching college and professional football on TV. Home for **David** is Flandreau, SD.

**Dr. Fred Westin** recently joined the International Projects Section as a consultant. **Dr. Westin**, who lives in Brookings, is a retired South Dakota State University professor of Soil Science who was associated with the SDSU Remote Sensing Institute for over 10 years. **Dr. Westin** helps the International Program by interpreting soils maps and making agricultural assessments. He has been a key participant in assessing agricultural crop-use intensity for the EDC's South African Drought Project. **Fred** and his wife, **Wilma**, have four daughters, three who live in St. Paul, MN and one who resides in Seattle, WA. Originally from Florence, WI, **Westin** lives in Brookings, SD where he hones his fine woodworking skills by making

violins, guitars, and cellos. **Fred** earned his B.S. in Agriculture (1941), a M.S. in Soils (1947) and a Ph.D. (1952) in Earth Sciences all from the University of Wisconsin, Madison, WI. Throughout his career, **Fred's** research has taken him to such overseas destinations as Botswana, Kenya, The Gambia, Syria, China and Bangladesh.

**Kevin Dalsted**, of SDSU, also is serving as a consultant for the Science and Applications Branch, International Projects Section. **Kevin**, like **Fred Westin**, also has been heavily involved with providing assessments of agricultural crop-use intensity for the EDC's South African Drought Project. Because **Kevin** spent nearly a year in the African nation of Mauritania, he is providing valuable agricultural and soil assessments in sub-Saharan Africa. The International Program also is relying on **Dalsted** for interpretation of soils and land-use from Landsat images. **Kevin** holds a B.S. and a M.S. in Soils from North Dakota State University, Fargo, ND. He has been associated with SDSU's Office of Remote Sensing for nearly 15 years. Originally from a North Dakota farm near the Canadian border, **Kevin** makes his home in Brookings, SD with his wife, **Kay**, and their three children: **Alisha**-9, **Evan**-6 and **Kyle**-3. **Kevin** enjoys woodworking as a hobby.

**Barbara Cayabyab** has been hired to provide secretarial support for the UNEP GRID office. **Barbara** and her husband, **Bobby**, live in Sioux Falls, with their 3-year-old daughter, **Chloe**. Originally from Anchorage, AK, **Barbara** brings 14 years of secretarial experience to the GRID-Sioux Falls office. In addition to spending time with her daughter, **Barbara** enjoys reading and all types of cooking.

## U.S. Geological Survey

**James Verdin** joins the International Projects Section of the Science and Applications Branch to serve as **Don Moore's** deputy. **Jim** joins the EDC after spending three years in Brasilia, Brazil with the U.S. Department of the Interior, Bureau of Reclamation, Technical Assistance Team. As a member of this team, **Jim** helped to establish a laboratory for remote sensing and geographic information systems research to support Brazil's National Irrigation Program. **Verdin** earned a B.S. in Civil Engineering (specializing in remote sensing and mapping) from the University of Wisconsin, Madison, WI and added a M.S. in Civil Engineering (specializing in hydrology) from Colorado State University, Ft. Collins, CO. Born in Maryland, **Jim** was raised in LaCrosse, WI. He and his wife, **Kristine**, have three boys; **Peter**, 9; **Andrew**, 7; and **Mark**, 4. The **Verdins** live in Sioux Falls where **Jim** enjoys tennis (he plays in a tennis league at Wood Lake Athletic Club), alpine and nordic skiing.

**Tom Kalvelage** joins the Computer Services Branch with a B.S. in Electrical Engineering from the University of Illinois, Champaign-Urbana in 1986. After graduation, the Sandwich, IL native went to work for the Rockwell Space Operations, Corp. located at the Johnson Space Center (JSC), Houston, TX. Over the next 5 years **Tom** worked for Rockwell and NASA as a Space Shuttle Flight Controller. Before leaving the JSC, **Tom** worked with the Real-time Data Systems Project and ultimately helped transmit real-time shuttle flight data throughout the nation under the Gateway Project. **Tom** and his wife, **Carol**, have one child, a 3-year-old boy, **Mark**. The **Kalvelages** live in Sioux Falls where **Tom** enjoys writing fiction and spending time with his family.

**Raymond Watts**, a Theoretical and Solid Earth Geophysicist, has been named to head the Terrestrial Ecosystems Regional Research and Analysis (TERRA) Laboratory located in Ft. Collins, CO. The TERRA Lab falls under the direction of the EDC's Science and Applications Branch. In addition to the U.S. Geological Survey, the TERRA Lab is affiliated with the U.S. Forest Service, the Soil Conservation Service and the Agricultural Research Service. **Ray** earned a B.S. in Physics from Pomona College, Pomona, CA (1966) and a M.S. and Ph.D. in Geophysics from the University of Toronto, Toronto, Canada (1972). **Ray** joins the EDC's TERRA Lab after 11 years of service with the USGS Geologic Division where he spent several years measuring the thickness of glacial ice and permafrost in such places as Alaska and Antarctica. Eventually **Ray** served in Reston as Deputy/Assistant Director for Research for the entire Survey. In 1988 **Watts** became the Executive Secretary of the Committee on Earth and Environmental Sciences which developed the interagency budget for the Global Change Program. **Ray** and his wife, **Beth**, have a daughter, **Kelli**, 3 years of age. Originally "a beach bum" from Santa Monica, CA, **Ray** now lives in Fort Collins, CO where he enjoys mountain trail running, mountain biking and rock climbing. **Ray** also is a pilot-certified to fly single-engine aircraft.

**Timothy Ruggles** is a USGS coop student from South Dakota State University, Brookings, SD. He joins the Information Sciences Section of the Science and Applications Branch. Originally from Watertown, SD, **Tim** earned a B.S. in Physics and Electrical Engineering from SDSU and currently is working on his M.S. in Electrical Engineering at the Brookings campus. With little time to spare between his studies at

SDSU and his work at the EDC, **Tim** enjoys reading and computer programming time permitting.

**Ina Zastrow** is a temporary student employee for the Software Development Section from Dakota State University, Madison, SD. **Ina**, a native of Henning, MN, is a varsity volleyball player for DSU and somehow finds time to serve as the editor of "The Trojan," the school yearbook. The senior, majoring in English for Information Systems, will be graduated May 1993. Following graduation next spring, **Ina** plans to attend graduate school at either Purdue University, West Lafayette, IN or the University of Minnesota.

**Robert Van Roekel** also is a temporary student with the Computer Services Branch from Augustana College. Robert will be graduated December 1993 with a degree in Computer Science. **Robert** and his wife, **Merry**, live in Sioux Falls with their two children, **Josh** and **Ann**, ages 7 and 5. In his spare time the Sioux Falls native enjoys riding bikes, playing softball and camping.

## Plans Underway for Pecora 12

The Pecora 12 Symposium Committee continues to prepare for Pecora 12 to be held August 24-26, 1993 at the Holiday Inn City Centre, Sioux Falls. According to **Dr. Robert Haas**, Pecora 12 Planning Committee chairperson with the Science and Applications Branch, the theme for this year's symposium will be "Land Information from Space-based Systems." In keeping with this theme, **Haas** says the symposium will "evaluate the adequacy of

space-based systems to meet information needs in an era of global change."

Pecora 12 is being co-sponsored by the U.S. Geological Survey, the National Aeronautics and Space Administration, the Environmental Protection Agency, and, possibly, other Federal agencies. The Pecora 12 Symposium Committee also has secured the cooperation of the University of Nebraska-Lincoln, the American Society for Photogrammetry & Remote Sensing (ASP&RS), the Institute for Electrical & Electronic Engineers (IEEE) and other professional organizations.

"A Call-for-Papers is being distributed through the ASP&RS as well as several other mailing lists," says **Haas**. "Titles and abstracts are due by February 15, 1993. Paper abstracts and posters will be preprinted and proceedings for the symposium will be published soon after the conference (requiring camera-ready copy by August 15, 1993)."

The Pecora Symposia were started back in 1975 to honor the late **Dr. William T. Pecora** for his leadership and foresight in developing a national program promoting satellite-based studies of the land resources of the Earth. As in the past, the Pecora 12 Symposium committee asks all EDC employees to do their best to guarantee the continued success of the symposium.

If you have any suggestions for making Pecora 12 the best one yet, please call Pecora 12 Symposium Chairperson, **Bob Haas** (ext. 6007) or Arrangements Committee Chairperson **Ron Beck** (ext. 6551).

# CALENDAR

## January:

4th - Feb. 26 – Bench  
Aerobics/Circuit Training Session

18th – Birthday of Dr. Martin  
Luther King, Jr. (Holiday)

19th – Hughes STX Annual  
Meeting, Holiday Inn City Centre,  
Sioux Falls, SD

Weight Watchers - 10 week session

## February:

15th – Presidents Day (Holiday)

Prostate Cancer Seminar

SDSU Health Fair (tentative)

## March:

18th - April 30 – New session  
Bench Aerobics/Circuit Training

Employee Fitness Evaluations

Walk, run, row or bike your way  
to fitness in the "Trek to Your  
Favorite Place in South Dakota"  
(watch for additional info)

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The Director of the USGS has determined the  
publication of this periodical is necessary in  
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This publication is printed with soy ink on  
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## EDC Christmas Party

December 12, 1992



Escapeses from the South Dakota Mental Institute take part in the "Twelve Days of Christmas" skit performed as a part of the EDC Christmas Party Talent Show.



◀ Rick Wiese, Logistics (left), and Ken Klenk, Hughes STX Project Manager, harmonize Roger Miller's "King of the Road" during the talent show portion of the 1992 EDC Christmas Party.



▶ These three individuals could not be identified. EROS Data assumes they are the "Three Wise Men."



◀ Max Borchart tells his wife, Marlene (center), "It's easy to dance to and it's got a good beat. I'd give it an 87!"