

EROS DATA CENTER

EROS DATA CENTER, SIOUX FALLS, SD

U.S. GEOLOGICAL SURVEY, NATIONAL MAPPING DIVISION

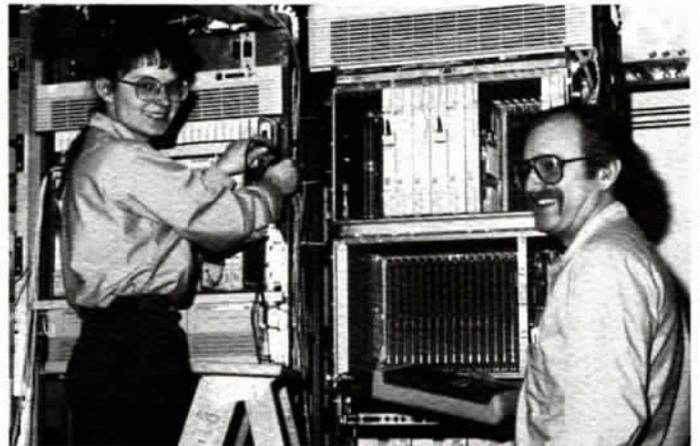
Viking Engineering Services Company: Maintaining the EDC

While the EROS Data Center views itself as a steward of land data, since 1977 Viking Engineering Services Company (VESCO) has been the steward of the EDC building and grounds. According to **Robin Hermanson**, a state licensed mechanical engineer and certified energy manager, VESCO specializes in maintenance operations and engineering, which translates into an infinite variety of services. "That includes maximizing and preserving the investment that the Government has, increasing the longevity of its machines, and providing engineering analysis to give EDC options to the most desirable approach to an engineering need."

Some of EDC's new hires may not realize the true dynamics of the EDC facility. Because of frequent technological changes to keep the Center state-of-the-art, VESCO's primary challenges include: upgrading electrical wiring and communication networks and providing a clean, comfortable, and safe working environment for all EDC employees. "We need to make sure that the lighting is correct, and that indoor air quality standards are kept high," explained Hermanson. "We also must see that the humidity and temperature are correct. That is extremely important in archive environments."

In addition to the innerworkings of the EDC, VESCO is in charge of maintaining the exterior of the building and the grounds. "We also look after the beauty of the Data Center by maintaining the health of the 300-plus acres of trees, grass, waste treatment ponds, and holding lake."

When VESCO acquired the facility engineering and maintenance contract in May of 1977 it had 20 employees. Seventeen years later, that number has grown to 27, with the addition of custodial staff. According to Custodial Supervisor **Dave Qualseth**, keeping the EDC clean is a never ending challenge. "It's really a diffi-



Electricians **Mary Johnson** and **Rod Beck** test telecommunications equipment in the basement.

cult job keeping the building spic-n-span. We do a pretty good job of keeping the daily cleaning up but the extra things (i.e., stripping and waxing floors and shampooing carpet) are tough because our staff is just so small." In addition to this building Qualseth and his crew also clean the warehouse. "I'm proud of my staff. They do a good job given the amount of people we have."

With the exception of custodians VESCO uniforms feature light blue shirts and navy blue pants. The current joke among VESCO workers is that their uniforms resemble Smurfs (the small light and dark blue cartoon characters toddlers can't get enough of.) In keeping with this joke, Robin Hermanson must be the Blue Brigade's Papa Smurf. "We're a service organization that provides for the needs of all aspects of the people who work at the Data Center," said Hermanson. "**Steve Bonte** is particularly exemplary in the

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UP FRONT

"Our long term goal is to change the very culture of the federal government...A

government that puts people first, puts its employees first, too...It delegates authority and responsibility. And it provides for them a clear sense of mission..."

Vice President Al Gore
Speech to the National Performance Review members.

A sense of change is moving through the government these days. And, it is a change we must welcome and embrace. The role of the employee working on federal missions is moving more strongly to one of personal responsibility for the work accomplished. Many times I have stated that the strongest resource this Center has is the quality workforce. An impor-

tant part of my job, as Chief, and an assignment shared by all Center managers and supervisors, is to provide you with the tools and opportunities you need to continue to do your jobs well.

The recent report by the USGS Transition Team highlighted the need to draw on the many talents within the workforce, in effect, freeing them to be creative and successful in solving the many challenges ahead. Again, I strongly support these changes and will continue to search out those mechanisms which will help.

You have seen some of those mechanisms already being established here at the Center. With the implementation of the Concept of Operations (CONOPS), we have established program managers and project leaders who directly coordinate and lead all of the technical activities at the Center, while the Branch and Offices ensure that sufficient resources are available to support these activities. You all had the opportunity to attend the **cmi**

training, where, again, the emphasis is on team building and using your skill and experience from problem solving and for improving the processes by which we carry out our programs and activities. You should, by now, also have seen my notice on the established Human Resource Awareness ad-hoc committee. I encourage you to support the committee and provide ideas on activities you feel are important.

The USGS Transition Team called on managers and supervisors to provide a positive work environment in which tasks are matched with talents and interests, so employees can develop their full potentials. Be assured that I take that charge seriously and will continue to work to create an environment at the Center that you will find productive and, most importantly, enjoyable.

Donald T. Lauer

VESCO

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way he serves people. He really bends over backwards to give people what they need quickly and in a pleasant, cheerful manner." Bonte gets a lot of help from his co-workers. According to Hermanson, **Denny Heidebrink**, **Larry White**, **Brad Maschino**, and **Jeff Martens** are always available to help Bonte in whatever way possible.

While Hermanson is quick to praise the efforts of Bonte and company, he is equally impressed with the work of electricians **Rod Beck** and **Mary Johnson**. They're burdened with the tremendous task of keeping the EDC telephone systems operational. "With all of the new employees and moves, that's been a very large job. They've handled that flawlessly."

"Since this is a new building for me," explained Johnson, "the most

challenging thing is finding my routes. Hooking things up really isn't too difficult. We've got a new testing machine that helps out a lot. If we've made an error, we find out before the person using the equipment finds out."

Johnson is in the 5th year of her apprenticeship through the Sioux Falls Electrical Apprenticeship Program. She is the only female in a class of twelve. As a female in a male-domi-



Gary Lamb and **Rich Roeman** (an apprentice electrician) wire a junction box for the UPS circuit beneath the Micro Lab as part of the basement renovation project.

nated profession, she says it wasn't easy initially. "When I first started it was really scary and a lot of men didn't accept me. Now they don't judge me for who I am; they judge me for what I can do."

Since 1977 VESCO has experienced some hectic engineering and maintenance challenges. Because of EDC's current reorganization and construction in preparation for the 60,000 square foot building addition, nothing compares with the present. "The balance is trying to prioritize things," says Hermanson, "making your first priority safety. Our second priority is maintenance. The third priority [which people often yell the loudest for] is general work orders, which include the moving, painting, supply, telephone, communications, and remodeling. So, the jobs that are the most urgent to get done are probably not the most important things that we are assigned to do -

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SAST Group Leaves - Product Support Continues

Senior-level scientists and engineers from several Federal agencies convened at the EDC from January 3 to March 11 to gather data and develop a data base of information on watersheds and floodplains to help river basin managers in the Upper Mississippi and Missouri River Basins. While the 18 full-time and many ad-hoc members of the group have returned to their respective Federal agencies, some will return to the EDC periodically to tie up loose ends and help publish its report.

If you recall, the Scientific Assessment and Strategy Team (SAST) wound up at EROS when the White House Interagency Floodplain Management Task Force established the team to support a floodplain management review. In November 1993, SAST was established as a part of the Floodplain Management Review Committee.

The SAST was tasked with providing scientific and technical advice and assistance to officials responsible for making decisions about flood recovery in the Upper Mississippi and Lower Missouri River Basins. The team developed and provided information to support the decision-making process regarding both non-structural (natural floodplains) and structural (levees, dams, dikes) approaches to river basin management.

Key team activities included:

- organizing information in existing and readily available databases,
- producing maps that show base information and vulnerability to flooding,
- preparing a report documenting the products of the SAST and the methods and analysis used to produce them.

The team's report, to be published by early summer, will identify the ongoing monitoring, research, mod-

eling, data management and data distribution requirements necessary to support integrated river basin management.

Members of the SAST came from the Soil Conservation Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Biological Survey, U.S. Geological Survey, U.S. Environmental Protection Agency, and Federal Emergency Management Agency.

"It was exciting to be a part of such an important effort that brings together scientists and engineers who are among the best in their fields to gather information to improve river basin management," said SAST Director **John Kelmelis**. "Our data and report will lay the groundwork for government officials to make sound decisions based on the best scientific information available."



SAST member **Dr. Maurice Mausbach**, soil scientist, USDA/Soil Conservation Service, discusses surface water ponding on the Upper Mississippi and Lower Missouri River Basins with **Connie Hunt** of the World Wildlife Fund, Washington, D.C. Hunt was one of many visitors hosted by the SAST group during its research activities Jan. 3-March 11th at EDC.

The EDC's national archive of satellite imagery, aerial photography, and digital map information as well as its data distribution and research facilities provided an ideal setting for SAST's activities. The SAST group's mapping and geographical analysis activities also benefited from the EDC's extensive computing and analysis capabilities and many of our scientific and technical support staff. While the entire EDC staff was affected by the SAST group, perhaps no one was impacted more than **Charlie Trautwein**. "It's been a real thrill," Trautwein said with a hysterical laugh. "It's been a real eye-opening, ear-opening experience."

While the SAST ended its work at the EDC March 11th, the EDC continues SAST-related work by managing and distributing its unique data base - just in time for Federal, State, and Local officials to address 1994 spring flooding. ♣

Building Addition Update

After 3 years of planning and budgeting that included exhaustive replanning, rebudgeting, and revising, the EDC's 60,000 square foot building addition that will house the Land Processes Distributed Active Archive (LPDAAC) will soon materialize. Planning for the project began in earnest in April of 1991. Because of delays associated with the contract bid process, ground breaking ceremonies have been pushed back from May 2nd to May 31st.

Invitation for bids went out on Valentine's Day and are due back in April. Between February 14 and April, bidders had the opportunity to ask questions, which were funneled through a Contracting Officer in Denver, to assure equal access to all bidders.

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HSTX Second Annual Meeting Warms Cold Day

January 18, 1994 - a day when the mercury would struggle to reach minus 8 degrees Fahrenheit in Sioux Falls, EDC employees gathered for an afternoon of warm praise and recognition. While it seems like a tundra away, that was the day EROS Data Center management, USGS staff, and Hughes STX senior officials joined HSTX contract employees at the Holiday Inn City Centre for the Second Annual Meeting of the EDC Project.

Peer Awards

Once **Ken Klenk**, Hughes STX Project Manager, called the Second Annual Meeting to order, attendees were treated to a 5-minute music video that highlighted the past year's accomplishments and activities of the EDC and HSTX staff. For the second year, perhaps the most exciting part of the meeting revealed the Data Center's Peer Awards. As with last year, these awards were presented to individuals who demonstrated teamwork and unselfish dedication. The honorees were nominated by their peers and selected by a committee of non-supervisory employees.

Despite the bitterly cold weather, HSTX President **Ashok Kaveeshwar** was on hand once again to show his support and provide a few thoughts on the unique aspects of the HSTX organization. "One of the key elements of our success to date has been our ability to create an environment where our employees working as a team across projects can provide value to our customers. I think this is key for our growth, and we want to continue this particular tradition."

Employee Recognition

Following Kaveeshwar's remarks, HSTX employees were recognized for many notable accomplishments over the past year. **Randy Sunne**, SE Manager, introduced HSTX staff

members who completed college and university degrees. **Gary Johnson**, HSTX Deputy Project Manager, recognized the publication efforts of EDC staff. **Ken Boettcher**, CCS Manager, recognized EDC personnel who provided exemplary service to others. **Rich McKinney**, PS Manager, introduced the many HSTX staff members who helped prepare the winning proposal to support the EPA's Environmental Photographic Interpretation Center in Warrenton, VA. **Tim Smith**, IS Acting Manager, reviewed Incentive Award Winners. And Ken Klenk substituted for an ailing **Mark Erickson**, CS Acting Manager, by recognizing anniversaries and retirements.

Group Achievement Awards

In addition to these many accomplishments, EDC Chief Don Lauer presented Group Achievement Awards to EDC staff who contributed to the AGRHYMET Project (1988-1993) and the Pecora 12 Symposium. Nominations for these awards were made by USGS or HSTX managers. The nominations were then evaluated by the Chief and Deputy Chief of the EDC as well as the HSTX Project Manager. The first EROS Group Achievement Awards were established to recognize outstanding team efforts in support of the mission of the EDC.

Guest Speaker

Following presentation of the Group Achievement Awards, **Al Watkins**, Chief of the National Mapping Division and former Chief of the EDC, shared with the audience some of the changes, challenges, and opportunities facing the Department of the Interior, the U.S. Geological Survey (NMD), and the EDC. "The future is full of opportuni-



Dr. Al Watkins

ties and challenges I believe," said Watkins. "Hughes STX, with its enthusiastic leadership and the leadership of Ashok Kaveeshwar and Ken Klenk and the rest of the management staff of HSTX are a delight to work with. The whole EDC team is top-notch. Keep up the good work." The Second Annual Meeting adjourned as those in attendance were treated to hot hors d'oeuvres, a cash bar, and conversation with colleagues. ♣

EDC Completes cmi Awareness Training

Nearly the entire Data Center met at the Holiday Inn City Centre from January 10-21 to become more aware of a new philosophy and management system that will enable the EDC to become more efficient. Co-sponsored by EDC Chief **Don Lauer** and Hughes STX Project Manager **Ken Klenk**, the continuous measurable improvement (cmi) training was provided to all Federal and HSTX employees in eight, day-long cmi flow-down sessions. The sessions were taught by Federal and HSTX management personnel who received cmi training in late 1993. The inhouse instruction team was bolstered by HSTX Training and Development expert **Lee Hingle**. All told, the trainers educated up to 36 employees per session - for a total of 335 EDC employees.

According to the emphasis placed on cmi, EROS management believes this new mindset is the vehicle for long-term survival and growth of the EDC. Continuous measurable improvement is the goal, once the process and the key measurable parameters for improvement are defined. These parameters may include cost, time, errors, responsiveness, design simplicity, and many more.

Before the actual training, EDC employees received a prework exercise, which allowed each employee

to focus on their individual customers and suppliers. During the cmi (Because cmi is a process and not a program, its acronym is always presented in lower case letters.) sessions, EDC employees learned the seven cmi principles and how to apply them in their everyday work.

Principles of cmi

1. Ensure that customers drive quality.
2. Treat everything as a process.
3. Improve continuously.
4. Build in quality from the start.
5. Solve problems using facts and data.
6. Involve everyone.
7. Lead through active engagement.

"The principles of cmi are embedded in Vice President Gore's National Performance Review, in the USGS's recently completed Transition Plan, and in EDC's Concept of Operations, which has been approved and we are now implementing," said EDC Chief Don Lauer. "My primary objective with cmi is to empower EDC employees

by shifting decisions to those closer to the customer/client. I expect the processes by which we carry out our responsibilities will improve, and we will do a better job of meeting our mission goals."

Employees also were shown how to use a variety of measurement tools, such as check sheets, charts, and histograms, to measure objectively the impact of their improvements. Finally, the training provided a structured common sense approach to enhancing quality by outlining a quality improvement process:

1. Select area or function to be evaluated.
2. Build the team and identify sponsor.
3. Develop team mission statement and goals.
4. Select process to be evaluated - identify customers, suppliers, and their requirements and priorities.
5. Select proper cmi tool(s) to be used.
6. Evaluate process - capability vs. customer.

7. Recommend/implement improvements.
8. Review.

"Now that we have completed the initial cmi training of all employees," explained HSTX Project Manager Ken Klenk, "we can begin to apply the concepts to our work at the EDC." He added, "We must have patience with the process as developing cmi skills will take 2-to-3 years. We will begin by applying cmi to our individual job functions and to small work units. Then in about a year, we can begin to apply cmi to cross-functional work unit processes. Two years from now we should be able to tackle multi-faceted processes that involve a significant vertical cross-section of the organization."

While cmi principles and guidelines are important, the most valuable lesson learned by EDC staff is that cmi is a way of thinking that all of us must buy into if we want to make quantifiable and significant improvement in the future. ♣

Eric Wood is assisting Gray Tappan on a project to monitor the natural and agricultural resources of the west African nation of Senegal. Wood is enrolled at the University of Wisconsin-Madison, where he is working on his PhD in Environmental Monitoring. Shortly after earning a B.S. in Natural Resource Management from the University of Michigan around 1975, the native of Adrian, MI decided to see if he could tour the world by sea. What follows is a remarkable tale of innocence, trust, and good fortune.

Half-way Around the World in 89 Days!

While most readers are familiar with the book titled Around the World in 80 Days, why did it take 89 days for the EDC's Eric Wood to travel half that distance? Keep reading mate and you'll soon find out.



Eric Wood

In 1975 Wood started out on a quest to fulfill a childhood dream - travel around the world. He anticipated seeing many ports, meeting interesting people, and witnessing the openness and natural beauty of the high seas. What Wood didn't count on was how long it would take.

"I always thought it would be interesting to sail across the ocean," said

Wood. "I grew up reading Kon-Tiki and seeing a handful of pirate movies, so I had this image of a self-contained life boat that heads across the ocean and visits new worlds in the process."

According to Wood, not long after being graduated from college he hitch-hiked up the west coast of Mexico, where he met a guy who explained how easy it was to get on a boat and work your way across the ocean as a crew member. "I didn't find a boat in Acapulco but the virus had set-in," Wood recalled with a smile. "Because I didn't have sailing skills, I returned to the States and contacted an uncle who was living on a sailboat in Boston Harbor." When Wood's uncle agreed to teach him to sail, Eric moved to Boston, got a job, and spent every weekend over the

next 5 months sailing. "I also took the Hurricane Island Outward Bound course, which was sort of 'sailing with a twist!'"

After learning as much as he could about sailing, as quick as he could, Wood ventured to Ft. Lauderdale, FL and began pounding the harbor until he found a boat that was going somewhere...anywhere. [Keep in mind, the dream of sailing the ocean had now mushroomed into a full-blown viral infection.]

Wood fondly recalls the first boat in which he walked the planks. "It was an old schooner that was actually used in the television show, **The Wackiest Ship in the Army** - a 100-foot, double-masted schooner. The hull was full of worms and the new owner had gotten it pretty cheap. He was taking it to Columbia to have it refurbished with good quality hard woods. There were eight of us and we took off through the Caribbean. My goal was to head off into the Pacific and not just hang around the

Caribbean listening to precursors to Jimmy Buffet."

Wood left this boat in the Cayman Islands and made it down to Panama. After spending about a month in the Canal Zone trying to get on another boat, he began to get nervous because the sailing season was coming to an end. "It was getting close to the time of the year when you just don't attempt to leave because of winds and currents. Everything's against you."

Eventually, Wood found a boat called the Klaraborg (Swedish for Clara's girdle), which 10 years earlier had been pulled from the bottom of the bay at Gutenberg, Sweden. This big, bath-tubby, 100-year-old vessel had once been a prized Baltic cargo trader. Including its bow-sprit, it was about 120 feet in length, featured 16 canvas sails, and was labor-intensive. "It took three of us to raise a sail. It had a hand-driven winch that took four people to raise the anchor. When I met **Ove** (Ooo-vah) **Linner**, he had been sailing this boat for 7 years. He was on his second trip around the world." Linner offered Wood the opportunity to come along if he would work and contribute a little towards food. "I got on the boat with two skippers and three other Swedes, a South African woman, four Americans (including myself), one who had been working for the World Bank, another who was a former ski instructor in Breckenridge, CO, and a guy from Scotland who ran away at the age of 16 to become a professional sailor."

Originally, this hodge-podge of personalities were going to sail to the Galapagos Islands, Marquesas Islands, and finally on to Tahiti. As the second to the last ship leaving for the season, the crew quickly found out why most boats didn't sail this time of year. "The currents and winds were wrong. We weren't getting to the Galapagos."

The crew was getting to know their boat though. "I found out at day-10 that the boat's nice looking radio didn't work. At that point I began wondering about the life raft! By day-17, we still were only off the coast of

Ecuador. A few days later it turns out that one of the fuel tanks had leaked into the bilge and most of the fuel had been pumped out. As a result, we had enough fuel for only 50 miles of motoring, which meant we couldn't motor into the Galapagos. We ended up having to go around the north end of the Galapagos and heading-off to pick up the Marquesas." [Keep in mind: a slow boat makes it from Panama to the Marquesas Islands in a maximum 40 days.] Wood recalls, "That part of the world was incredibly rich with sea life so we had plenty to eat." The crew of the boat wasn't exactly sitting fat however. Because of the Peruvian current, it was freezing cold at night despite the fact that they were near the equator.

Proceeding north, the ship hit an area of the open seas known as the doldrums - where there are sporadic winds and perhaps a counter-current.

"At day-60, we were still in the doldrums and started to take on tremendous amounts of water (over 1,000 gallons per hour). Without enough fuel to use the bilge pump, we were forced to pump it out manually using two large deck pumps. Because it was an old, wooden boat, we suspected some screws had popped, but really weren't sure." [It was a double-hulled boat so the crew couldn't see the actual place where water was entering.]

Wood spent most of his early days aboard the Klaraborg reading, taking pictures, standing watch, and sewing



Eric Wood sits on the bow sprit of the Klaraborg off the Marquesas Islands in the mid 1970s.

pants that fell apart after their 10,000th salt-water wash. "Suddenly, it went from sewing your pants and reading to pumping water. If we had hit a big storm we wouldn't have been able to keep up with the water. To complicate matters, the boat was running out of fresh water. Fortunately we got one big rain that enabled us to refill our water tanks."

Day after agonizing day, the boat inched its way toward the Marquesas Islands, where it was able to catch the northern-most island of the chain. This, if you can imagine, was the 89th day! "In this day and age," says Wood, "you pretty much have to be on a submarine to be out at sea that long." Anchored in the bay of a classic Pacific island covered with coconut palms and beautiful lagoons, the crew discovered their water problem stemmed from a 12-inch square gaping hole - the result of a sprung plank.

After spending a while to regroup its mental and physical capacities, the crew did some island hopping, diving and exploring. After using the stars to pass through some dangerous archipelagoes, the ship arrived in Tahiti. In Tahiti, Wood changed boats once again. This time he got on a 35-foot Choi Li ketch and spent the next four months in the Society Islands waiting-out the hurricane season.

After getting a case of island fever, Wood hooked up with a small, German fruit freighter, which gave him a workaway to New Zealand - where he spent several months before ending up in Australia. When Wood left Ft. Lauderdale, he fully intended to sail around the world. After two years, including the 89 days at sea in one stretch, his sailing virus weakened. He didn't have the energy to head-up into Asia so he boarded a freighter for a return trip to Mexico. "The problem is, I still haven't gotten to Asia," said Wood shaking his head with disgust. "Sometimes I think maybe I should have just kept going. I still look at that as my best trip." You know, sometimes there's a fine line between best and worst! ♡

Employee News

U.S. Geological Survey

John Unekis - John entered duty as a computer specialist in the Computer Services Branch in January. His duties include working on specifications for the Landsat-7 ground systems. John earned a B.A. in Mathematics from the University of Steubenville. Ten of John's 15 years in the computer field include image processing applications. In his spare time John enjoys reading, computer hacking, target shooting and working out. He comes to South Dakota from Washington, D.C. and now lives in Dell Rapids.

Evelyn Ringsby - Evelyn joins PB&A in a senior-level financial management capacity. She has over 17 years of financial, procurement, and personnel experience with the National Park Service. Evelyn has served at several parks and historic sites, including Antietam Battlefield and Yellowstone National Park. She comes to EDC from Fort Larned National Historic Site, Larned, Kansas.

Jane Strand - Jane was selected for the Management Information Specialist position in Program, Budget, & Administration. Jane's initial responsibilities include the administration of EDC's Expenditures Reporting System. Her duties will evolve as improvements are made to EDC's resource management systems.

Jean Happel - Jean has been promoted, through merit promotion procedures, from Supply Clerk to Purchasing Agent.

Dennis Hetrick - Dennis was hired as a full-time temporary for 1 year to support programming with the FEWS project within the International Program. Dennis earned a B.S. in Geography from SDSU and is in the process of picking up his M.S. in the same. Dennis lives in Brookings with his wife, Kathy. Their son, Darrin, is a freshman at Bartlesville Wesleyan College in

Oklahoma. Hetrick enjoys photography, camping, and canoeing - time and weather permitting.

Alvinia Quarles - Alvinia has accepted a permanent part-time secretarial position in the EOS Data Systems Project Office. Alvinia has 8 years U.S. Government work experience the most recent at the FmHA office in Sioux Falls. Alvinia lives with her husband, John, and three sons, John, Marcus, and Shaughn, in Brookings. Her husband, John, is an Active Duty Army Chief Warrant Officer assigned to the 139th Readiness Training Detachment. Like most military families, Alvinia and family have had the opportunity to live in various places.

Hughes STX

Sharon Warycka - Sharon joined the Hughes STX Science Department as a Publications Specialist in support of the Scientific Assessment and Strategy Team (SAST). Sharon has a B.A. in English from the University of Pennsylvania, has done graduate work in English at Cornell University, and holds a MFA in Writing from Vermont College.

Patricia Jaggie - Pat also has joined the SAST Team as a secretary in a temporary full-time capacity. She attended high school in Livingston, NJ, Community College in Dallas, TX, and the Academie des Beaux Arts in Brussels, Belgium. She has extensive secretarial experience with companies in California and Washington.

Jacqueline Klaver - Jacie was hired to support the SAST Team as a Database Manager. She holds a M.S. degree in Geography-GIS/Remote Sensing/Cartography from Oregon State University (1991) and a B.A. degree in Communications from Colorado State University (1993). She spent 2 years as a GIS/Remote Sensing Expert for the United Nations Food and Agriculture Organization in Brasilia, Brazil. Jacie also has over 15 years of experience with the U.S. Forest Service, in jobs including Environmental Education Specialist, mountain beaver trapper, and resource data management system design and implementation.

Susan Peterson - Susan joins the Digital Data Production section as an data analyst. Her duties include working with the MRLC project. Susan earned a B.S. in Mathematics at SDSU (1993). Before joining the EDC, Peterson worked with the FEWS project for 2 years. After leaving the FEWS project, Susan worked for GATEWAY 2000's Technical Support Area. The Madison, SD native likes to hike and participate in all types of outdoor sports. Peterson will be married to Mike Embrock, a teacher at Howard High School, in August.

Ron Hayes - Ron also joins the Digital Data Production section. Ron holds B.S. (1990) and M.S. (1992) degrees in Geography from SDSU. The Sioux Falls native likes to work with wood in his leisure time.

David Hopkins - David joins the Computer Services Branch as a programmer. His previous work experience includes programming at Valparaiso University, Valparaiso, IN and system management with Purdue University-CALUMET, Hammond, IN. Hopkins learned his computer skills at Loyola of Chicago, Valparaiso University, DSU, and Augustana. David enjoys the martial arts and lives in Sioux Falls.

Steve Johnson - Steve joined Customer Services as a Customer Services Representative. Johnson isn't new to EDC's Customer Services Section; he worked the last 3 months part-time and was a 1993 summer intern. Steve holds a B.S. in Geography from SDSU (1993). The Apple Valley, MN native enjoys hunting and fishing in his spare time.

John Brock - John has joined the Data Exploitation technical area as a senior scientist in support of the International Program. Initially, Brock will be developing the agro-physical components of the famine vulnerability model for the Famine Early Warning System (FEWS) project. Brock earned B.S. degrees in geology and psychology from the University of Delaware (1979), a M.S. in geological sciences from the University of Georgia (1981), and a Ph.D. in geological sciences from the

University of Colorado (1991). Brock's work experience includes several years as a researcher in the Oceans and Ice Branch at NASA's Goddard Space Flight Center. He joins EDC from the University of South Florida in St. Petersburg, where he was an Assistant Professor in the Marine Science Department. John and his wife, Gay, are looking forward to exploring South Dakota this summer in their VW camper (with their dog Clover).

UNEP/GRID

Gabriela Gomez - Gabby recently completed her stay as a visiting scientist from the Geography Institute at the National Autonomous University of Mexico. During her stay Gabby assisted in the global land characterization project.

Brian Biggs - Brian comes to the UNEP/GRID office as a visiting student from the University of California-Santa Barbara. Brian recently received his B.A. in Geography from the UCSB. He plans to return to the UCSB in September to work on his M.S. Biggs enjoys outdoor sports and travel. ♣

Awards

The following employees were honored with Peer Awards at the Second Annual Meeting of the Hughes STX EROS Data Center Project, Jan. 18, 1994 at the Holiday Inn City Centre, Sioux Falls, SD. Nominated by their peers and selected by a committee of non-supervisory employees, the 20 award winners received plaques and cash stipends.

Brenda Jones - Brenda was recognized for the excellent, efficient, and considerate manner in which she interfaces with project clients and co-workers to achieve positive results while completing difficult tasks.

Carolyn Van Beek - Carolyn received her award for possessing those "special qualities" that promote a sense of pride and team spirit

with peers in her own department as well as around the Center.

Jim Haga - Jim received his award for the resourceful and timely methods of maintaining the Alaska Field Office computer system through a myriad of adverse situations.

Lou Ogren - Lou was awarded for her expeditious and excellent manner in which she devised a method for handling the large volume of TM data tapes.

Dick Heinemann - Dick was cited for developing, mostly on his own time, a satellite tracking program that provides the capability to locate a satellite's path and predict the time it will pass over a specific global location.

Pat Schrader - Pat was recognized by her peers for accepting the additional responsibility of providing critical and efficient secretarial support for the reception and tracking of papers and abstracts, in addition to managing the correspondence with presenters for Pecora 12.

Mary Chmela - Mary received an award for her commitment to excellence in supporting the challenging and demanding tasks of micro-com-

puter user support and the Vines Network System.

Don Wagner - Don was cited for his exceptional leadership of the diapositive team while learning photographic printing techniques and still meeting stringent product requirements.

Mike Wehde - Mike was honored by his peers for his ability to integrate his unique combination of technical and people skills with the DLG-E team in a positive, unselfish manner.

Kim Rinehart - Kim received her award for her dedication to accuracy, high standards, and the ability to promote teamwork while assuming the increased responsibilities for the DLG-E "Standards Database".

Michelle Anthony - Michelle was recognized by her peers for the excellent manner in which she individually accomplished the training and distribution of the Agriculture Statistics Data Manager (AGMAN) to the Famine Early Warning System (FEWS) field representatives in Africa.

Cheryl Greenhagen - Cheryl picked up an award for always being helpful, thorough, professional,



Peer Award winners: (front l. to r.) Linda Block, Lou Ogren, Kim Rinehart, Mary Chmela, Brenda Jones, Cheryl Greenhagen, Jan Matthiesen. (middle l. to r.) Carolyn Van Beek, Michelle Anthony, Pat Schrader, Darla Larsen, Jan Nelson, Max Borchardt, Mike Wehde. (back l. to r.) Gary Nelson, Don Wagner, Ken Gacke, Mike Neiers, and Dick Heinemann. (Not pictured: Jim Haga).

pleasant, and readily accepting additional tasks including her critical role in the implementation of the Thematic Mapper Archive Conversion System (TMACS).

Ken Gacke - Ken was acknowledged for demonstrating an exceptional and genuine commitment to computer system software tasks, in particular his work with the implementation of the STK Tape Storage SILO, the administration and maintenance of the Silicon Graphics systems, and the user directed backup (UDB) program.

Linda Block - Linda was rewarded for her resourceful testing and analysis techniques that expedited the certification of a new online contact printer for diapositive use in the Photo Lab.

Jan Matthiesen - Jan was honored for her friendly attitude and the cooperative way in which she performs her tasks regardless of how complicated they may be, while promoting a team spirit that is recognized and appreciated.

Max Borchardt - Max was cited by his peers for his ability to remain calm and assured in performing complicated and voluminous printing tasks while maintaining a cooperative attitude that promotes a team spirit.

Gary Nelson - Gary received his award for taking the initiative to investigate, evaluate, and implement software program packages for personal computer systems - a task above and beyond his required responsibilities.

Mike Neiers - Mike was rewarded for providing a high level of technical competence with a consistent, helpful attitude even with an extraordinarily heavy workload.

Jan Nelson - Jan received a Peer Award for her ability to accomplish complicated tasks in a timely manner while keeping a positive, professional attitude that helped portray the EROS Data Center as a world class facility and contributed to the overall success of Pecora 12.

Darla Larsen - Darla also was honored for her ability to accomplish complicated tasks in a timely manner while keeping a positive, professional attitude helped portray the EROS Data Center as a world class facility and made Pecora 12 a great success. ♣

TMACS Activity and Tape Baking

Since July of 1992 a dedicated, unheralded group of EDC employees has been quietly and methodically converting Landsat multispectral scanner (MSS) data from old high-density [instrumentation] tapes (HDT) to smaller digital cassette tapes. The new tape format is called DCRSi media, which are more durable and hold more information. While this may not sound too exciting, the significance of this activity is paramount. Because of their efforts, these individuals have saved thousands of satellite images on the verge of permanent degradation.

Known as the Thematic Mapper (TM) and Multispectral Scanner (MSS) Archive Conversion System (TMACS), its primary functions are to copy MSS and TM data from one medium to another, while simultaneously assessing the data for quality and cloud-cover. The TMACS was developed by Hughes STX scientists and engineers in Lanham, MD. Although the TM archive is three times larger than the MSS archive, conversion of both archives as well as the entire EDC Landsat archive will be completed by the end of

1996. "What's unique about the TM copy system," says **Darla Werner**, Technical Area Lead of Integration and Technology Assessment, "is that all of the tapes have been stored at a storage facility in Alexandria, VA. So we have the additional process of periodically shipping a load of tapes to a second storage facility in Sioux Falls before the tapes are delivered to EDC as needed."

Some of the primary people responsible for the day-to-day operation of

the TMACS project include **Larry Murtha, Lou Ogren, Ron Mofle, Chuck Greco, Danielle Ehlen, Judy Austad, and Ollie Miller**. Murtha delivers tapes as needed from the Sioux Falls storage location. Ogren is the primary person responsible for receiving and staging tapes for conversion and then returning them once the process is completed. Mofle is the technical area leader overseeing the TMACS operation. Greco has been the primary individual staging the MSS data between the digital archive in the

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Individuals responsible for day-to-day TMACS activities line up in front of the system's hardware in the computer room. Pictured (front l. to r.) **Jeff Burkman, Lou Ogren, Chuck Greco, Steve Marthaler**. (middle l. to r.) **Judy Austad, Danielle Ehlen, Diane Aspaas**. (back l. to r.) **Al Engelbrecht, Ollie Miller**.

VESCO

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maintenance, operations, and engineering."

VESCO perhaps is most proud of its accomplishments in the area of energy conservation. Electrical Supervisor **Bill Nelson** is responsible for one award from the Department of Energy (DoE) and two awards from Honeywell. Technically, Nelson is a State-certified electrician. However, given his responsibilities and innovations, Nelson's value rivals the experience of an electrical engineer. According to Nelson, the award VESCO and the EDC earned for its peak energy shaving measures is the most meaningful. "This is where we reduce our (energy) peak on demand by using the computer system to transfer loads to the generator or alternate energy sources (i.e. fuel oil or cycling off heat banks)."

A recent award from Honeywell cited Nelson's work in the area of indoor air quality. Nelson instituted indoor air sensors to run variable frequency drives in the fan systems of the Photo Lab. According to Nelson, if the quality of the air degrades, additional outside air is added. "We do a lot of things with the air quality in the building. We monitor the quality of it through remote sensor feedback to our Honeywell system. The result of those readings will increase or decrease our fan speeds, outside air, and things like that."

While the awards are nice, Nelson quickly points to the primary reason VESCO earns them. "I feel fortunate in having such a good group of people. They make our jobs a lot easier. They're all craftsmen and women in their own field. We totally depend on their skill."

Recent Energy Conservation Awards Presented to the EDC and VESCO:

- * Solar-Heated Building - a regional award from the American Society of Heating and Air Conditioning Engineers (ASHACE) and a DoE award.

- * The Heat Recovery System - an international ASHACE award and a DoE award.
- * The Free Cooling Systems - a DoE award and a special award from the South Dakota Governor's Office.

According to Hermanson, these awards wouldn't be possible without the pioneering spirit of EDC Federal staffers. "We're particularly grateful for the building construction and conservation experience and awareness of **Dennis Hood** and **Dan Wray**. They always want to help us accomplish something, while working to stay within the regulations."

"We are so fortunate to have a contract with a company - both on a corporate and individual level - that have energy conservation, service to the Data Center, and innovation in their respective fields in the forefront, all the time," said Dennis Hood. "Everybody across the group tries to think of new and better ways to do the job. Historically, they have done a terrific job managing a building with an obsolete heating system in a way that has maximized energy efficiency. Similarly, with projects like the crawl space renovation and before that the conversion of the Custom Lab to DDPS and Photo Lab, they have saved taxpayers hundreds of thousands of dollars over the last 10 years or so and are a joy and delight to work with."

While VESCO depends on its own professionals to look after the building and grounds during regular business hours, Hermanson says he and his staff rely on Professional Services Unlimited after they go home. "We're extremely dependent on the security guards when we're not here. There have been so many times when they have found a roof leak or something and saved thousands of dollars by catching it before it did major damage. Bill and I must get 30 phone calls a year from the security people. They do a good job of protecting the building from things that can go wrong."

Each year VESCO performs many "behind-the-scenes" tasks that are

out of sight and out of mind to most EDC employees. One of the most unusual behind-the-scenes jobs VESCO has completed over the years involved plugging a hole in the dam at the south end of Lake EROS...while the lake was full. "This involved using a contractor with a drilling machine," recalled Hermanson. "We used this equipment to place grout completely across the dam. Once we located the hole from above, we devised apparatuses to fill the pipe left in the dam with grout...while the lake was full of water." If VESCO had not been able to plug the hole in the dam, eventually the \$500,000 water reclamation system wouldn't have had water to recycle.

Longest Maternity Leave Ever

Mary Thompson first worked for VESCO when it wasn't VESCO. In 1972 Thompson worked with many of the same people she does today - only under a different contractor. She left VESCO in 1978 on maternity leave; 13 years later she's back on the job. "Robin calls my 13 years off the longest maternity leave ever," Thompson says with a laugh. When Thompson rejoined the company, she and **Mark Petersen** began to use computer aided design (CAD) systems to ease design modifications to the facility. "Basically the CAD is much quicker and more precise than using a straight-edge and pencil. You can pop in the new furniture, plot that, and print it. Then you can do another one - perhaps moving walls. We've got the whole building on it and it's accurate to the thousandth of an inch. Mark Petersen works on this too and he is a whiz. He helps me a lot when I run into problems or just have questions." While Thompson enjoyed her maternity leave, there's no question she enjoys her work and her co-workers. "It's great working with all of the people in VESCO. I'm really proud of the fact that I get to work with them. I have a lot of respect for them."

"VESCO, This is Connie..."

When Data Center employees have engineering or service problems, they call VESCO - and get **Connie**

Haugen. According to Hermanson, Haugen is the "glue that holds us together." "My secret is having great co-workers," claims Haugen. "When I get a phone call, 90% of the time it's a rush - things need to be done immediately. When I get a hold of whoever has to take care of the problem, my co-workers are really good about getting things done quick."

In a nutshell, VESCO is much like the State of South Dakota - an entity noted for infinite variety. This EDC contractor is an extended family of talented craftspeople and professionals that works together to attack problems and solve them. In the words of Hermanson, "We're not offended by problems; we're challenged by them." ♣

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basement and the conversion system on the main floor computer room. Finally, Ehlen, Austad, and Miller are Data Management staff responsible for assessing and adding information to the data base.

When the MSS and TM data have been converted using two copy systems, roughly 520,000 Landsat scenes, or 60 terabytes of data (one terabyte equals about one trillion bytes), that now exist on over 39,000 HDTs will be copied on about 2,000 digital cassette tapes. In addition to preserving the data, the conversion process has reduced the amount of storage space required for the Landsat archive by a factor of 40.

Recovering Data by Baking

A "sticky" problem challenging those involved in the archive conversion project is recovering data from tapes affected by "hydrolysis." Hydrolysis is a process where the magnetic coating on the computer tape absorbs water vapor causing the tape binder to degrade. While this process cannot be stopped, it can be reversed long enough to re-

trieve the data at risk and copy it to a newer tape format. According to the National Media Lab in St. Paul, MN, hydrolysis occurs in humid conditions, while tapes are in storage, or during transportation. It's also thought that hydrolysis may be part of the natural aging process of older magnetic tapes. According to Werner, to get a high quality conversion, you need to have your tapes in the best possible condition. "One way to do that is clean your tapes - making sure that there is no debris - because some of these tapes are from 1978 and 1979. If we weren't baking these tapes, we would stand the risk of losing some of our Landsat data - not being able to recover it and the conversion process wouldn't be as successful." According to Werner, this problem occurred before EDC understood what the problem was. "We would put the tapes up on a tape drive or a tape cleaner and the drive or cleaner would get so sticky it would actually stop. Because of the torque, tapes would either stretch or break. As a result, we would lose data and put a great deal of wear and tear on the heads of the tape drives."

English Recipe

Since April 1993, EDC data archivists have successfully recovered over 10,000 Landsat images from nearly 400 tapes affected by hydrolysis by applying low levels of heat to the



Design and "Fab-bulous Baker Boys" Dave Eitreim (l) and Kelvin Tellinghuisen pose with "Head Chef" Kris Machmiller next to the tape baking oven that has helped EDC archivists recover over 10,000 Landsat images from nearly 400 tapes affected by hydrolysis.

tapes. While not a permanent fix, this technique temporarily reverses the degrading. This procedure, called "baking," allows data archivists to playback the tapes without physically damaging them.

Tape baking is a data recovery technique invented in 1983 by Justin Underwood. He perfected the procedure while working on a similar hydrolysis problem affecting the duplication of broadcast audio tapes for the Ampex tape company in Crowthorne Berkshire, England. While Ampex patented Underwood's procedure, EDC's tape baking process is a little different. "We've customized the procedure so its more fitting for our tapes and our environment," explains Werner. In addition to Ampex, Werner also likes to give credit to the Australian Centre for Remote Sensing (ACRES). "It (ACRES) had been baking tapes 2 years prior to us and we pretty much took their lead on it because of their success."

Fab Four Build EDC Oven

The EDC tape oven is a convection oven featuring double-walled construction with a fan-forced heating element located remotely from the oven cavity. A remotely located source of heat insures even heat distribution plus prevents damage to the tapes in the unlikely event redundant safety systems should all fail at once. According to Werner, Design and Fabrication staffers **Mark Erickson, Russ Hanken, Kelvin Tellinghuisen, and Dave Eitreim** all contributed to building EDC's tape baking oven. "Dave Eitreim was instrumental in building the oven. We gave him and the rest of the Design and Fab crew the requirements and they designed the oven, sketched it out, and did a great job."

Once the oven was built to the needed specifications, **Kris Machmiller** conducted important preliminary tests and analysis before the baking could begin. While Machmiller is the head "chef" in EDC's tape baking process, **Barb Larson and Cindy Paggett** con-

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*Building Addition Update
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The EDC hosted a Site Visit and Pre-bid Conference, March 1, 1994, that attracted 25 prospective bidders. According to EDC Building Task Force Chairperson Dennis Hood, Contracting Officers from Denver (**Teresa Henninger** and **Debe Boles**) chaired the conference-like meeting. "They reviewed the government phraseology at the front of the bid package. The architect was represented by a half-dozen or so folks with various specialties who reviewed the building specifications." Following a tour of the facility and lunch, bidders returned for a 2-hour question-and-answer session. "It was a crucial meeting in that we had to be absolutely certain that all vendors heard the questions and answers, so we had a court reporter on site to copy down everything that was said. We then made copies that were sent to all prospective bidders."

Hood says he's very encouraged by the number of bidders that responded and confident about a competitive bid atmosphere. "If we held a pre-bid conference and three bidders showed up, they'd smile at each other. Because over 20 showed up, they were serious."

Once the bid packages were received, the complexity of a project of this scope requires a technical review and evaluation and a pre-award survey to identify serious contenders. "Once we knew who the low bidder was," explained Hood, "we notified the Department of Labor's regional EEO office. After the required EEO compliance review, the contract was awarded."

This very structured and time-consuming procedure continues with a final pre-construction conference and a notice to proceed. "As soon as this is issued, the contractor has 10 days to mobilize their forces and get on the job," added Hood.

Meanwhile, the EDC continues to negotiate with NASA about the contribution it will make towards vari-

ous systems within the building addition. In addition to NASA negotiations, there are some remaining contracts involving telephone and communication systems that are being ironed out. Despite these additional details to be worked out, Hood is confident the building addition will be done as scheduled. "We are still looking at a 16-month construction time." ♣

*TMACS
Continued from page 3*

tribute by cleaning tapes before they hit the oven and identifying tapes to be baked. According to Werner, in addition to the efforts of the employees mentioned above, EDC's tape baking success relies on the following "recipe":

- * Clean tapes in preparation for baking.
- * Place ten tapes in a vertical position in the oven and bake at 130 degrees F for 24 hours.
- * Acclimate the tapes for 24 hours in the environment where they will be "cleaned" to avoid physical damage to the tapes.
- * After cleaning once again, transcribe and file the tapes in the digital archive.

Because the EDC continues to archive data to support several global environmental change activities, it must be able to preserve and manage Landsat and other forms of remotely sensed data for current and future studies. The efforts of EDC staff who designed, implemented, and currently operate the TMACS and tape baking projects are ensuring that one-of-a-kind Earth science information are available and accessible for scientists today as well as tomorrow. ♣

Software Engineering Holds XID Training



Sheri Fick and **Kevin Lowell** (foreground) listen as **Laurie Huewe**, Scientific Systems Development, demonstrates one of the functions in the X-window Image Display (XID) program to **Tom Milton** during one of six 2-hour training sessions February 16-18 in the Science and Applications Branch Conference Room. The XID program, which allows users to view and analyze many types of images, has been in use throughout the EDC for some time. This training session provided users with an opportunity to learn about additional capabilities recently added to the XID program.

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