

Dignitaries Cut Ribbon to Dedicate EROS Building Addition

At 10:30 the morning of August 19, the skies of southeast South Dakota were a leaden gray. The prairie grasses and fields of crops were dripping with droplets of rain. Conditions were not conducive to holding an outdoor dedication ceremony and ribbon cutting. However, as the saying goes, if you don't like South Dakota's weather, wait five minutes, and it will change. By noon, rainy skies cleared just in time for Federal, State, and local dignitaries to gather outdoors at EROS to help dedicate the \$9 million, 65,000-square-foot building addition.

The new addition positions EROS to better sustain current programs and activities and pursue new opportunities and partnerships within Government, science, and private industry worldwide.

Among the distinguished guests attending the ceremony to celebrate the opening of the new building addition were: **Gordon Eaton**, Director of the U.S. Geological Survey, who served as Master of Ceremonies, **Doug Pederson**, Spitznagel, Inc., **Leo Reynolds**, Chairman, Sioux Falls Development Foundation, **Michael Mann**, Deputy Associate Administrator of Mission to Planet

Earth/NASA, Senators **Larry Pressler** and **Tom Daschle**, **Bill Janklow**, Governor of South Dakota, **Gary Hanson**, Mayor of Sioux Falls, **Richard Witmer**, Acting Chief, USGS/NMD, **Robert Price**, Director, Mission to Planet Earth Program Office/NASA, **Gil Haugan, Sr.**, Gil Haugan Construction Company.

Following brief comments from several dignitaries seated on the dias, Don Lauer presented Doug Pederson, Spitznagel, Inc. and Gil Haugan, Sr., Gil Haugan Construction Company, with framed aerial photos featuring the Center and grounds. Next, several of the people seated on the dias joined Lauer in cutting a ceremonial ribbon celebrating the opening of the building addition to the EROS Data Center.

With music of the Bill Gibson Dixieland Band filling the air, visitors were offered walk-around tours of the existing building and the new addition. The afternoon dedication and ribbon cutting ended with refreshments served to all people attending the event.

Continued on page 10



Dr. Gordon Eaton, Director, U.S. Geological Survey, cuts the ribbon during dedication ceremonies August 19, 1996. Assisting with the ribbon cutting (pictured l. to r.): **Doug Pederson**, Spitznagel, Inc.; **Dr. Don Lauer**, Chief, EDC; **Leo Reynolds**, Chairman, Sioux Falls Development Foundation; **Larry Pressler**, U.S. Senator, South Dakota; **Gil Haugan**, Gil Haugan Construction; **William Janklow**, Governor of South Dakota; **Dr. Gordon Eaton**, Director, USGS; **Tom Daschle**, U.S. Senator, South Dakota; **Gary Hanson**, Mayor of Sioux Falls; **Richard Witmer**, Acting Chief, NMD/USGS; **Robert Price**, Director, Mission to Planet Earth Program Office/NASA.

*Hidden behind Witmer is **Michael Mann**, Deputy Associate Administrator of Mission to Planet Earth/NASA



UP FRONT

When we opened the new addition last spring, we expected an increase in activities and special events this year. Still, it has been surprising that so many things have happened in such a short time.

The paint was hardly dry on the walls when we hosted a number of technical meetings at the Center, with the United Nations Environment Programme, the World Bank, the Jet Propulsion Laboratory and the Goddard Space Flight Center. All of these meetings helped secure our future as a leading institution for managing land remote sensing data and applying these data to aid in solving Earth resource problems. A personal highlight was a 2-day visit by USGS Director Gordie Eaton, who came here not as Director but as an interested scientist to work on his research project with our staff and use the unique facilities and capabilities at the Center.

Major events came in late summer. First, we had the formal dedication of the new addition. The rain cleared just in time for a beautiful day and an exciting moment in the history of the EROS Data Center. Right on the heels of the dedication came the 13th Pecora Conference. About 280 scientists, managers, and scholars attended the two- and-one-half-day conference. Pecora 13 was a real success, offering a forum for technical exchanges and important professional dialogue. Again, there were special moments. At the evening banquet, Wyn Pecora, widow of the late William Pecora, gave a moving commentary on Bill's life. In fact, many at the session asked that her comments be included in the proceedings of the conference.

The very next week we hosted 180 leading space experts meeting for the LightSAR workshop. This group helped NASA develop a strategy for a future radar satellite system. Finally, in mid-September 80 managers from 10 countries around the world met here for the Committee on Earth Observation Satellites (CEOS) meeting. The CEOS Working Group on Information Systems and Services (and its subgroups on

access, networks and data) addressed a wide variety of data archiving, information access and data distribution issues. We are really making use of the expanded facility!

Meanwhile, the internal work at the Center continues. The declassified imagery project, which has been a major effort for the Center, is now well established. The TMACS project, a 4-year effort, has been successfully completed.

We continue to make major progress in carrying out mission and goals, and, at the same time, we are getting quite a bit of positive attention both nationally and internationally—hard work leads to busy times! I am proud of the work you are doing and we can look forward to the coming months of continuing challenges and opportunities.

Donald T. Lauer

EROS Hosts Pecora 13

August 20-22, 1996, Ramkota Inn, Sioux Falls

Despite nearly 4 weeks of lost planning time because of Federal government shutdowns in November and December 1995, EROS hosted another successful Pecora symposium. Pecora 13 focussed on the theme *Human Interactions with the Environment: Perspectives from Space*.

According to **Ron Beck**, Pecora conference manager, the symposium gave the international remote sensing community an opportunity to exchange information on the ways remote sensing is being used to understand and evaluate the impacts of people on the Earth as well as human adjustments to environmental change. "The principal goals of the symposium," says Beck "were to better identify information requirements, and determine current information deficiencies, for addressing issues related to human interaction with the environment."

Participants

The Thirteenth Pecora Symposium was sponsored by the U.S. Geological Survey, the U.S. Environmental Protection Agency, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, and the U.S. Forest Service. Cooperating sponsors included: the Consortium for International Earth Science Information Network, the American Society for Photogrammetry and Remote Sensing, the University of Nebraska-Lincoln, Conservation and Survey Division, and the United Nations Environment Programme, Global Resource Information Database.

The Pecora 13 Program included 13 invited speakers who participated in three plenary sessions. According to Beck, these sessions spurred an in-depth exchange of information. Invited and

volunteer papers added to the exchange of information by examining the need for land information, current capabilities for developing land information, and future developments. More than 75 scientists, engineers, technicians, and other professionals submitted titles and abstracts of papers and posters for information on remote sensing and other technologies for monitoring the lands of the Earth. Proposed papers were from agencies and institutions throughout the United States and many foreign countries.

Great Assistance

A core team of people from EROS provided tremendous help in supporting conference activities at the Ramkota Inn. **Chuck Wentler**, Logistics, coordinated equipment and display needs of presenters. **Rhonda Newman**, Center Services, took care of registration and aided with speaker support. **Dawn Buehner**, UNEP/GRID, coordinated transportation needs for special guests. **Arlys Johnson**, PBA, played a major

role in handling registration and keeping track of expenses for the symposium. Work at the Data Center, **Norman Bliss** and **Dave Greenlee**, SAB, led tours with logistical coordination by **Terry Pfannenstien**, PBA.

EROS Research & Work Showcased

In addition to many domestic and international professionals representing a wide range of scientific and technical disciplines, Pecora 13 also gave EROS employees a chance to show off their research and work. EROS employees who developed posters with the help of Media Services designers and production artists included:

Brad Reed & Larry Tieszen

"A Functional Analysis of Ecosystem Performance in Select Kuchler Types of the Northern Great Plains: NDVI & Metrics of Land Cover Classes"

Jenny Schmidtbauer, Kim Kringen, & Bill Kennedy

"Aerial Photography and Satellite Imagery Provided by the EROS Data Center for Environmental Monitoring"

Emily Binnian, Jim Haga, & Mark Shasby

"Alaska Ecoregions Mapping"

Dennis Hetrick, Danielle Ehlen, & Paul SeEVERS

"An Illustration of the Use of Declassified Corona, Lanyard, and Argon Photography in Environmental Studies"

Jeff Danielson

"Delineation of Drainage Basins from 1Km African Digital Elevation Data"

Norman Bliss & Lisa Olsen

"Development of 30-Arc-Second Digital Elevation Model of South America"

Carolyn Gacke, Barb Hubbling, & Paul Severson

"EROS Data Center Supports the GLOBE (Global Learning & Observations to Benefit the Environment) Program"

Rick Vandersnick, Sue Mattson, & Susan Embrock

"Global Compositing of 1Km AVHRR Data at the EROS Data Center"

Gayla Evans, Kelly Feistner, & Chuck Larson

"Landsat Pathfinder Processing Support at the EROS Data Center"

Kristi Saylor, Greg Zylstra, & John Dwyer

"Landscape Change Analysis Using Moderate Resolution Satellite Data"

Gray Tappan, Jean Paulson, & Eric Wood

"Long-term Monitoring of Changes in Senegal's National Resources"

Dana Larsen, Mike Madigan, John Faundeen, & Judy Austad

"National Satellite Land Remote Sensing Data Archive (NSLRSDA) Landsat Multispectral Scanner Data CD-ROM"

Terry Sohl

"North American Landscape Characterization Project: The Production of a Continental Scale Three-Decade Landsat Data Set"

Jim Vogelmann, Terry Sohl, Steve Howard, & Jess Brown

"Regional Land Cover Characterization: A Prototype Case Study in the Eastern United States"

LuAnn Pfeifle, Don Moore, Bob Klaver, John Prouty, Jon Walkes, & Ron Smith

"Somalia Food Security Information System"

Dean Gesch

"Techniques for Development of Global 1Km Digital Elevation Models"

K.C. Wehde, Pat Park, Sheri Fick, & Kathy Goodale

"The EOSDIS Information Management System: Access to Data for Global Change Researchers"

Grant Mah

"The NASA Landsat Pathfinder Global Land Cover Test Sites Project"

Zhi-Liang Zhu

"Translation Strategy to Aid Forest Resource Assessment of FAO Using the Global Seasonal Land Cover Regions Data Base"

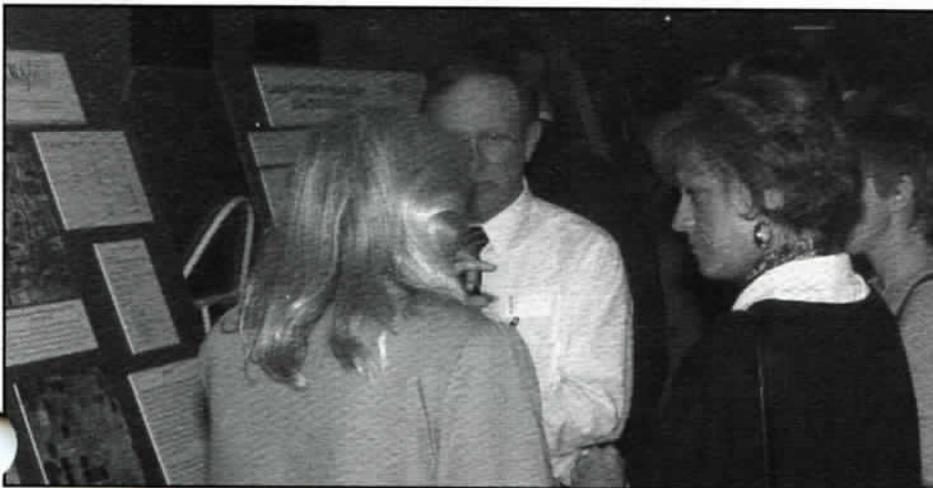
Gene Fosnight & Ashbindu Singh

"United Nations Environment Programme Global Resources Information Database Sioux Falls"

Bruce Wylie, Larry Tieszen, & Dave Meyer

"Using Remote Sensing to Monitor Deviations from Potential Production on Sand Hills Range Sites"

In addition to posters and papers, many other EROS employees contributed to the overall success of the symposium. Not to be forgotten are the countless other employees who played crucial behind-the-scenes roles. **Jan Nelson, Darla Larsen, Darin Krempges, and Sheila Kautz** of Media Services worked many hours of overtime to complete programs, posters, and displays.



Dennis Hetrick, Data Management, talks with some of the people who took in the Pecora 13 poster session.

Continued on page 10

EROS Plays Part in Conceptual Phase of New Imaging Radar

Hosts Workshop August 27-29

EROS hosted 180 potential providers and users of satellite radar data representing Government, scientific, and private organizations from across the Nation August 27-29. The workshop, called LightSAR (an acronym meaning light-weight synthetic aperture radar) and co-hosted by radar experts from NASA and the Jet Propulsion Lab of Pasadena, CA, examined uses of future U.S. imaging radar missions from space.

SAR Technology

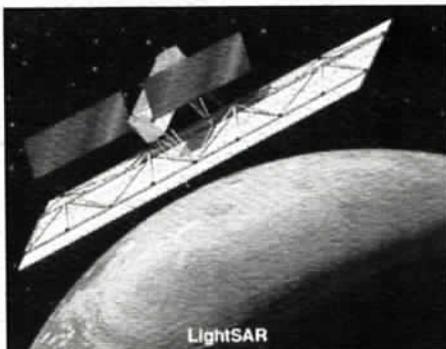
Synthetic Aperture Radar (SAR), also called imaging radar, has a long history in the United States. The first airborne SAR was developed for military reconnaissance and flown in trials in the late 1950s. The first space borne SAR flew on the Seasat satellite in 1978. Since the late 70s, the Jet Propulsion Laboratory has continued to advance SAR technology and its uses.

LightSAR: The Next Generation

The LightSAR Technology Validation Mission, which could be launched before the year 2000, is now being studied. The LightSAR workshop, hosted by EROS last August, provided a conceptual forum for users to provide input on a mission plan that aims to demonstrate that advanced technologies can dramatically reduce the cost of synthetic aperture radar missions while producing data that are vital to commercial remote sensing, Earth science, and emergency management uses. LightSAR could be the first operational satellite of a new era in which small, low-cost satellites with SAR sensors would be available for NASA, commercial, and academic uses.

"Seeing" Many Applications

Before the advent of SAR, scientists were restricted to studying images of the Earth by using visible or infrared light. The primary advantage of radar for the science of remote sensing is its ability to illuminate objects from a distance on its own. Thus, radar can "see" many things



LightSAR Profile:

Sensor: Synthetic Aperture Radar (SAR)

Cost: \$125 million \pm 30%

Planned Launch Date: September 1999

Lifetime: 3-year mission

Applications: soil moisture, topography, seasonal change, forest regeneration, deforestation, topographic change

Repeat Cycle: 10 days

Coverage: Global

Altitude: 600 km

Operational Modes: 6

Available Resolutions: 3m, 6-10m, 25m, 100m

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

an ordinary camera or sensor cannot. For instance, radar's self-illuminating capability enables it to see through clouds, acquire images at night, look through the dense tree canopy of a forest, and see through desert sands. These capabilities allow earth scientists to see the Earth and other objects in new ways. As a result, imaging radar technology enabled scientists to uncover Venus by "seeing" through its perpetual shroud of clouds. Closer to home, it also has been useful in many types of Earth observations. For example, geologists have used SAR data to map flooding along the Missouri River, to detect flood-related sand deposits along the river banks, and predict the impact of future floods in nearby areas. Seismologists now study radar images that show

surface displacements of the ground at earthquake sites. These displacements can be measured within a fraction of a centimeter.

Businesses that depend on geographic information systems to manage large tracts of land now use radar images to give them added information. Radar has demonstrated its ability to distinguish forest types, monitor soil moisture, and map changing land uses. Oil, gas, mineral exploration, and other companies are interested in using radar to create topographic maps for remote areas that, until now, have never been successfully mapped.

Satellite Radar Systems Today

Technological developments in imaging radar over the past 30 years have demonstrated promise for many uses in business, science, and Government. As a result, the Europeans, Japanese, and Canadians now fly radar satellites. At this time, the United States does not. The LightSAR mission is designed to launch the U.S. into a new era of imaging radar to compete in an expanding global market.

LightSAR: Ground Zero

According to EROS Chief Don Lauer, LightSAR is a great opportunity for the Center to be involved with new technology from day one. "The LightSAR Workshop is like the beginning of a concept, and it's fun to be involved in some of the very beginnings of these kinds of programs."

Participants

R.J. Thompson, Chief of the Satellite Systems Branch, and **Grant Mah**, Satellite Systems Branch, represented the Data Center during the JPL-sponsored workshop. **Ron Beck**, Program, Budget, & Administration, represented EROS on the workshop's Organizing Committee. Other prominent attendees included **Louis Whitsett**, Majority Staff Counsel, U.S. Senate Commerce Committee, **Warren Ferster**, Space News, and **Fred Doyle**, McLean, VA. ☺

CEOS Working Groups Meet at EROS

Several task teams affiliated with the Committee on Earth Observation Satellites (CEOS) met at the Sioux Falls Holiday Inn September 15 and at EROS September 16-20 to discuss a wide array of topics related to access to remote sensing data collected by 12 international agencies.

The CEOS

The CEOS Working Groups represented space agencies from around the world. People in these groups are their agencies' technical representatives working together on technical issues on satellite data archiving, product formats, network accessibility, and data calibration.

The USGS Role in the CEOS

According to Donna Scholz, EROS has been the USGS representative to the CEOS since the first CEOS meeting in September 1984. "The Center's participation primarily has been with the Working Group on Data (renamed last year to Working Group on Information Systems and Services - WGISS [wig-iss]). Our interests relate to data archiving, information access, and data distribution. Because the USGS EDC mission is international in scope, we feel that participation in CEOS gives us an opportunity to cooperate in developing data standards and task teams like the highly successful AVHRR 1-Km Project."

EROS Participants

According to Donna Scholz, Data Services Branch, and meeting coordinator, 80 international remote sensing scientists from 12 nations met at EROS in 14 sessions. While the largest number of international attendees came from Japan and Germany, 10 EROS employees participated in the week-long event. People from EROS who have been involved over the years with WGISS have included Gary Metz, Donna Scholz, Stu Doescher, Jeff Eidenshink, and Sue Jenson. "These sessions are subgroups and task teams affiliated with the CEOS Working Group on Information Systems and Services (WGISS). I represent the USGS on the WGISS Access Subgroup. John Dwyer, Satellite Systems Branch, represents the

USGS on the WGISS Data Subgroup. Stu Doescher, Computer Services Branch, represents the USGS on the WGISS Networks Subgroup. Kent Lethcoe, Data Services Branch, represents the USGS on the Global Mapping Task Team. And Sue Jenson, Science and Applications Branch, represents the USGS on the GLOBE Task Team."

The Agenda

The meeting schedule featured 14 sessions throughout the week on variety of issues associated with earth observation satellites. The issues included:

- Global Mapping,
- Data Access,
- Browse,
- The World Wide Web,
- Data Formats and Standards,
- Networks.

Planned Ice-breaking Activities

In addition to the week of discussion sessions, several special events and tours were held during the week for the international remote sensing scientists attending the meetings. For example, several EROS and local area families hosted dinners on Monday, September 16 to give the international visitors a flavor of American life in the Midwest. On Tuesday, September 17, the USGS hosted a reception at the Old Minnehaha County Courthouse Museum to welcome all meeting participants. A "pay-as-you-go" Western Chuckwagon Barbecue on Wednesday allowed the scientists to get a taste of the food and hospitality of South Dakota's old west heritage. In addition to these special social events, tours of the Center's computer facilities and film and digital archives were scheduled as well as a seminar on Japan's recent ADEOS launch presented by Mr. Shinichi Sobue. During his seminar, Sobue presented a video of the August 18, 1996 launch of Japan's ADEOS satellite and showed the first image collected from this new platform. ☺



Shinichi Sobue

Employee News

A Job Well Done! Congratulations to the Declassified Intelligence Satellite Photography Data Management Team, especially Joan Amundson and Karen Voelker. Joan and Karen entered thousands of rolls of film to the archive featuring declassified satellite photos collected by the U.S. intelligence community during the 1960's and early 1970's. The Team entered 17,448 rolls of film to the data base, which includes 947,564 frames. This monumental task completes the original USGS obligation to the Central Intelligence Agency for archiving this historical photo collection.

Congratulations to the UNEP/GRID office for its site being recognized as a superior Internet resource by eNetDigest -- a weekly critique of Internet resources dealing with the environment, natural resources, and agriculture. The GRID Web page is maintained by Linda Black with contributions from all members of the GRID office. Ratings are based on site content, design and ease of use.

Milestones:

Computer Services Branch staff completed TMACS transcription!

The Data Services Branch production staff celebrated a \$4 million production year September 25, 1996!

Data Services Branch staff also completed 54 global 10-day composites in October.

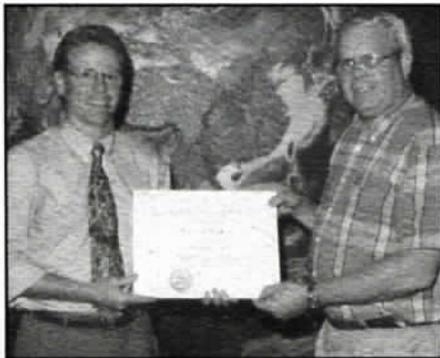
USGS

Len Gaydos - received a STAR Award for his continued excellence of communicating and coordinating within the USGS and across other Federal agencies to promote research, product development, and product delivery for several initiatives.

Lou Steyaert - received an On-the-Spot Award for his application and validation of the global 1 km land cover characterization data base.

Continued on page 6

Jim Sturdevant - received the USGS Meritorious Service Award for outstanding contributions as a physical scientist and administrator for the National Mapping Program of the USGS. This award recognizes Jim's technical and administrative leadership in developing and implementing satellite remote sensing programs of national and international significance.



Jim Sturdevant (l.) receives a USGS Meritorious Service Award from **Dr. Richard Witmer**, Acting Chief, NMD/USGS.

Ron Beck - received a STAR Award for his work on the Data Center's Open House, Building Dedication, Pecora Symposium, LightSAR Applications Workshop and other efforts.

Dennis Hood - received a STAR Award for his work on the building addition project - completed on time and within budget.

Gary Dinkel - received an On-the-SPOT Award for his outstanding performance in planning, developing, processing, and managing procurement and installation of key, critical components of the new computer room facility.

Bill Draeger, Ron Parsons, R.J. Thompson, June Thormodsgard, and **Gene Napier** received a STAR Team Award for being part of a strong TEAM throughout one of the most challenging years in the history of the EROS Data Center.

Char Johnson - received an On-the-Spot Award for her work in support of the EROS Data Center Building Addition Dedication Ceremony, Ribbon Cutting and Banquet Dinner.

Jeff Eidenshink received a STAR Award for his contributions on the success of the Global Land 1 km AVHRR Data Set Project and contributions as Acting Deputy Branch Chief in the Data Services Branch.

Doug Binnie received a STAR Award for his leadership in ensuring that the Data Center met its production commitments, kept quality high, and operate within budget through a particularly busy and challenging period.

Donna Scholz received a STAR Award for her active and effective support of National Mapping Division programmatic planning and policy-making as the Division Program Manager for Data Management and her direction of two major EDC projects.

Doug Spelhaug - received a STAR Award in part for his exemplary contributions for financial activities at the Data Center and for effectiveness in working with numerous federal customers.

Nick Van Driel - received a STAR Award for his efforts to establish a Federally coordinated land cover program that provides the impetus for a FGDC Earth Cover Working Group and a subcommittee, which he co-chairs.

Darin Kremppes - received an On-the-Spot Award for quality work under tight deadlines in support of the Pecora Symposium and other projects requiring imagination, creativity, and talent.

Lisa Kurtz - received an On-the-Spot Award for her support of two major meetings last summer and effective presentations given to general public tour groups the summer of 1996.

Rebecca Engebretson - also received an On-the-Spot Award for her support of two major meetings this past summer and effective presentations given to general public tour groups.

Jean Paulson - received an On-the-Spot Award for her initiative, creativity, and commitment in redeveloping the information system for the USAID mission in Harare, Zimbabwe.

Shar Van Beek - received an On-the-Spot Award for her "can do" approach, excellent communications, and outstand-

ing customer service to the Computer Services Branch and the EROS Data Center.

Dan Wray - received an On-the-Spot Award for his ability to analyze and properly develop and process inter-agency agreements.

Carolyn Hieb - received an On-the-Spot Award for her great initiative and exemplary service in her Purchasing Agent duties.

Jane Strand - received a STAR Award for her excellent job with ERMS and added duties as the Team Leader for the Data Center's Procurement Office.

Geny Kasten - received a STAR Award for her effectiveness in resolving EROS financial problems and taking on the added responsibility of acting as the Financial Team Leader.

Wayne Miller - received a STAR Award for his leadership in working with all Branches at the EROS Data Center by providing authoritative solutions to difficult programmatic problems.

John DiRito - received an On-the-Spot Award for his uncanny knack to uncover existing vehicles to purchase large computer systems and associated support and supplies after USGS contracts offices stopped procurement functions during a fiscal year.

Stu Doescher - received a STAR Award for his efforts to develop a program designed to encompass and manage the development and integration of software systems at EROS.

Dave Greenlee - received a STAR Award for his leadership for the Mojave Desert Clearinghouse and support of the Center and the NMD in the area of standards.

Dave Hair - received a STAR Award in recognition of his efforts to develop the Digital Line Graph Framework (DLG-F) project and his ability to adapt the project staff to quickly changing technologies and requirements.

Glenn Kelly - received an On-the-Spot Award for his enthusiasm and support of WRD collaborative work with EROS in North Dakota.

Bruce Quirk - received a STAR Award for his continued leadership with the science and Applications Branch. This award also recognized Bruce's positive attitude and the time and energy he devotes to the Center's operations and programs.

New Faces & New Places

HSTX

Melissa Johnson - The Information Services Department and Customer Services welcomes Melissa to EROS. Melissa is a full-time Customer Services Technician working in accounting. Melissa's educational background includes a Bachelor's degree in secondary education from Northwest Missouri State University (1994). Following graduation, she taught business and physical education courses and coached volleyball and basketball at Polo Missouri. Originally from Brandon, Melissa now lives in Sioux Falls.

Jason Kaufman - Jason also joins the Information Services Department and Customer Services as a full-time Customer Services Technician. Jason is a recent graduate of the geography program at South Dakota State University, where he received his B.S. degree in 1996. When he's not working in DAAC User Services, Jason enjoys outdoor activities such as hunting and fishing. He lives in Sioux Falls.

Catherine Baxter - Cathy joins the Alaska Field Office (AFO) working in the Mineral Resources Survey Program. Cathy comes to the AFO from Dames & Moore, where she served as a consulting geologist the past years. Cathy is now working on her Ph.D. in geophysics through the University of Wyoming. Her educational background includes bachelor and master degrees in geology from the University of Montana. Cathy's work experience includes 8 years of computer programming and work with systems. Cathy, her husband Michael, and their two dogs live in Anchorage, where they enjoy Alaska's many outdoor activities.

Paparao Kodali - The Data Center welcomes Paparao to the Software Engineering Department. Paparao's educational background includes a M.S. in computer science from North Dakota State University (1992). After graduating from NDSU, Paparao worked as a consultant/programmer for the Compuware Corporation in Rochester, MN. Paparao and his wife, Rama, have one son, Milan (12 months). Rama is a medical internist with the USD School of Medicine. When not working or spending time with his family, Paparao enjoys playing tennis, volleyball, and soccer.

Robert Thomas - joins EROS as a Logistics Technician. You can see him delivering your mail as well as a number of other inventory and supply tasks. Originally from Chicago, IL, Robert loves to camp and exercise (running and weight lifting).

Sharon Ivens - joins Data Management to work with the ASAS and AVRIS data bases. She came to EROS in 1993 as Government Step Student in the Science and Applications Branch. Since then, she was hired full-time and has worked in Information Systems and Customer Services. Sharon's outside interests include remodeling her house as well as golfing, skiing, camping, gardening, landscaping and molding her Himalayan kittens.

Steve Peterson - Steve comes to EROS to work as a computer operator in the Computer and Communications Department. The Canton High School graduate attended SDSU for 2 years before enlisting in the U.S. Air Force. During his 10 years in the Air Force, Steve served 4 years as an Avionics and Technician on B52 aircraft and 6 years as a computer operator. As an avid golfer, Steve enjoys spending his off-duty hours on the links.

Terry Tronson - Terry joins the Computer and Communications Systems Department in the Digital Archive. Terry started work at EROS in 1983. He formerly performed many tasks in Logistics including work as the EROS courier. Terry is a native of Garretson, where he graduated from high school. He holds a 2-year Associate Arts degree from the University of South Dakota Springfield (now closed). Terry's hobbies include golf, walking his dogs, Sasha and Belush,

and working on his PC. He's a member of the exclusive "Hole-in-One" Club at the River Ridge Golf Course in Garretson.

Jim Hall - Jim comes to the EROS Alaska Field Office to work in the USGS Geologic Division's Mineral Resource Survey Program. Jim is a recent graduate of Alaska Pacific University where he earned a B.A. in Environmental Science. He spent the last 2 years working for the Water Resources Division performing a variety of temporary student tasks. Jim, his wife Jennifer, and their two dogs live in Anchorage.

Dawn Junker - Dawn joins the Data Services Branch in the Photo Lab. Dawn graduated from SDSU with a B.S. in biology (1993). Before becoming a victim of downsizing, Dawn worked as a chemist for the State of South Dakota's Dairy Lab and as a virology lab technician at Grand Laboratories. In addition to her degree in biology, Dawn also has a degree in Studio Art from Southwest State University, Marshall, MN. Outside the Photo Lab, Dawn enjoys hanging out with friends, reading sci-fi books, playing games of all types, and baking. She lives in Sioux Falls with two feline friends, Pepper and Spicer.

Dennis Bell - Dennis joins the Systems Engineering and Management technical area as an electronic engineer. He comes to EROS from Best Business Products, where he worked for 8 years as a service manager for its computer department. In addition to Best Business Products, Dennis worked 14 years as a service manager for Business Resources. Dennis is a 1968 graduate of Sioux Falls Washington High School and a 1972 graduate of Southeast Area Technical School. He also attended Novell CNE training. Dennis enjoys boating, fishing, and playing the guitar. The Bell family includes his wife, Lori, son, Logan (11), and daughter, Taylor (9).

Darrin Foell - The Computer and Communication Systems Department welcomes Darrin to its Systems Engineering and Management technical area as a systems administrator. Darrin is a 1991 graduate of South Dakota State University. He spent 4 years in the U.S. Air Force and comes to EROS from MidAmerican Energy Company, Des

Continued on page 11

EROS Hosts NBS Mississippi River Basin Initiative Meeting

The Mississippi River System drains 41% of the United States, including 33 States and is home to more than 110 million people. According to resource planners and managers up and down the Mississippi River Basin, there are many concerns about the future quality of the River System's natural and diverse resources. Because of these growing concerns, river managers are beginning to recognize that they must take a more holistic view of the entire river system to address its problems.

The EROS Data Center hosted the first meeting to evaluate USGS capabilities and goals in developing a long-term science strategy for the entire Mississippi River System. The meeting, held July 24-25, 1996, focused on what the USGS and its new Biological Resources Division can and should do to support integrated management of the Mississippi River System into the next century.

Meeting Objectives

According to the coordinators of the meeting, **Robert Delaney**, National Biological Service, and **George Garklavs**, USGS Water Resources Division, there were three primary goals for the meeting:

- Identify the major natural resource issues of the Mississippi River System,
- Assess available information and USGS capabilities,
- List recommendations for near-term action.

Critical Issues

According to **June Thormodsgard**, Chief, Science & Application Branch, two key natural resource issues for the Mississippi River Basin were raised during the meeting: nutrient loading/Gulf Hypoxia, and habitat degradation.

Nutrient Loading/Gulf Hypoxia

A zone of hypoxia spanning 7,000 square miles occurs at the point where the mouth of the Mississippi River flows into the Gulf of Mexico. Hypoxia is water where

oxygen depletion occurs. The hypoxic zone threatens multimillion dollar fish and shellfish industries. One educated guess suggests that excessive nutrients entering the River, primarily from the Upper Midwest, cause the hypoxic zone. Hypotheses implicating other factors have been proposed. Whatever the cause, the major concern is that the hypoxic area, which may have always existed to some extent, has been slowly increasing since the 1960s because of the activities of people in the watershed. In addition to threatening commercial and recreational fishing, hypoxia expansion in the Gulf of Mexico causes changes in coastal phytoplankton food webs, noxious algae blooms, and ecosystem changes.

Habitat Degradation

Land use changes throughout the basin, tributaries, and floodplain of the Mississippi River have altered habitats for many native animals and plants. Agencies that manage wildlife and plant habitat critically need spatial information about habitats that have been lost and those most threatened to establish cost-effective plans to conserve and restore them.

Federal natural resource science and management agencies are not organized at the appropriate spatial scales to address these issues. Also, no well-understood and accepted operational measuring stick exists to gage the ecological health of the broad, natural resource management units within the Mississippi River system.

Information Needs

The most relevant information needs associated with the natural resource issues discussed during the meeting are:

1. The status, trends, and predictions of land use and cover,
2. The mass balance of water, nutrients, sediments, and pesticides,
3. The contributions of sub-basins,
4. The role of the floodplain in processing nutrients,
5. Evaluations of ecological responses to nutrient loading and habitat degradation,
6. Evaluations of alternatives (i.e., reduced loadings, riparian restoration) to shrink or eliminate the hypoxic zone and restore habitat,
7. Science-based yardsticks to measure ecosystem health.

Participants

Forty-two people attended the two-day strategic planning session representing a wide array of Federal, Regional, and State land and resource management agencies. Attendees included people from several agencies within the Department of the Interior, the Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Department of Agriculture, and organizations representing States located in the Mississippi River Basin. In addition to Thormodsgard, other EROS staff who participated in the meeting were **Don Lauer**, EROS Chief, **Wayne Rohde**, Assistant Center Chief for Programs, **Dave Greenlee**, Science and

Continued on page 12



Group shot of participants who attended the NBS Mississippi River Basin Initiative Meeting hosted by EROS last July.

EROS Data Center Finishes Second in Corporate Cup

Receives Spirit of 96 Award

The day after the competition, the competitors bubbled with pride and excitement. No matter where you went at EROS the day after the Sioux Falls Corporate Cup conversations centered on the previous night's competition. That's because many EROS employees walked, ran, spiked, splashed, tugged, and pedaled their way to an impressive 2nd Place overall finish during the 1996 Sioux Falls Corporate Cup competition.

About the Corporate Cup

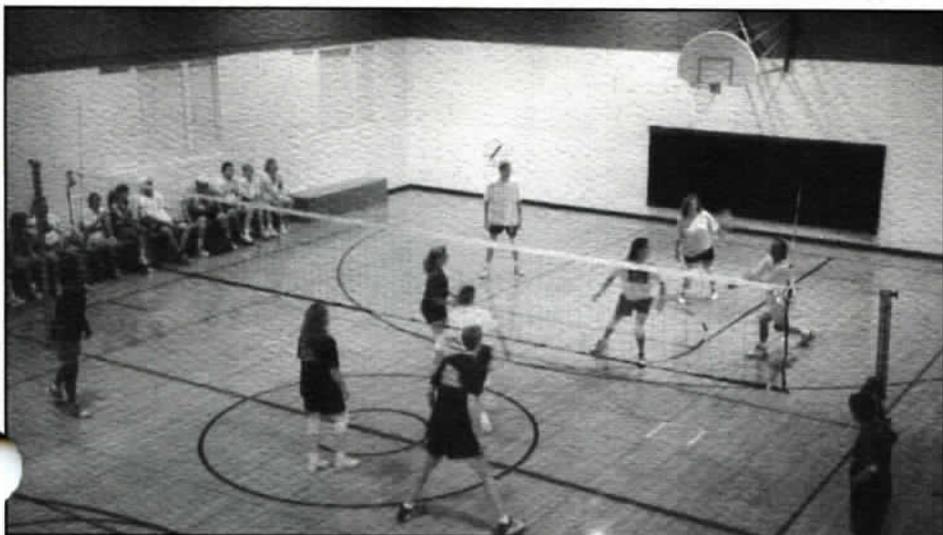
Sponsored by McKennan Hospital and the YMCA, the Sioux Falls Corporate Cup competition, held September 10, 1996 at various sites around Sioux Falls, featured a variety of sporting events among 49 Sioux Falls businesses in four divisions. Headquartered at the downtown YMCA, the Corporate Cup competition included opportunities for EROS employees to compete in events such as volleyball, swimming, tug-of-war, basketball shooting, and running for the cost of a dollar. The dollar fee helped cover the Corporate Cup entry fee of \$295, which was paid in part by donations from the EDCAA and Hughes STX. In addition to standard events, employees also could try their luck at tossing a roll of toilet tissue (wrapped in

duct tape to prevent unraveling) into the lid of a toilet.

According to **Carla Lynn**, EROS Health Activities Specialist and coordinator for the EROS participation in the event, **Char Johnson, Mike Madigan** as well as all team leaders made valuable contributions to the event. But the aspect of the event Lynn remembers most is the pride of EROS participants. "The comradery was unbelievable. Our volleyball match with the cheering and people doing the wave gave me goose bumps everywhere. It was just neat to see everyone come together like they did."

A Spirited Bunch

The EROS Data Center competed with 16 other businesses in Sioux Falls in Division III — businesses with 151-500 employees. EROS not only finished in 2nd Place in the overall point standings, it received the first ever Spirit of 96 Award for competitors in its Division. "If someone wasn't participating in an event," says Lynn, "they went to other events to watch and cheer on others. We really had great team spirit." ☺



EROS volleyballers (far court) net another win on their way to 1st Place during the Corporate Cup competition in September.

Corporate Cup Events and Results

Tug of War

- 2 teams, one team placed 3rd

Shuttle Relay

- 2 teams, one team placed 2nd

5K Run

- Jenny Schmidtbauer placed 1st over all

Basketball Shootout

- 3 teams competed, 2nd place overall

Volleyball

- 3 teams, one team placed 1st

Toilet Paper Toss

- 25 total participants, EROS placed 4th overall

Bicycle Ride Participation

- EROS received minimum # of points allowed

Participation Walk

- EROS received maximum # of points allowed

CEO Dunk Tank

- 21 dunks in 15-min. time period, 4th overall

Obstacle Course

- 2 teams, one team placed 1st

Putt for Points

- 25 total participants, 1st place

Aerobics

- 3rd place overall

500 Yd. Swim Relay

- 2 teams, one team placed 2nd

T-Shirt Relay Swimming Event

- 2 teams competed, EROS awarded minimum # of points

Participation Swim

- EROS awarded minimum # of points

Volunteer Program

- 9 of 10 volunteers allowed

**Points amassed by EROS during
1996 Corporate Cup
Competition: 7,195**

Dedication
Continued from page 1

What They Had to Say...

"This building addition embodies the continued commitment by our Nation to the long-term stewardship of earth science information and illuminates the strong partnership between NASA and the USGS." **Gordon Eaton, Director of the U.S. Geological Survey**

"There's no amount of political or government support that can make something a success. You men and women, who do the work at the EROS Data Center, make it successful." **Bill Janklow, Governor of South Dakota**

"I'd like to thank the 375 private and public employees who live and work in the city of Sioux Falls and all of the surrounding communities. Thank you very much for your hard work, perseverance, integrity, and your quality of craftsmanship." **Gary Hanson, Mayor of Sioux Falls**

"It has been my dream that one day our farmers will be able to predict crop yields, soil moisture, detect insect infestations, and make season-to-season weather predictions using their personal laptop computers to assess NASA satellite data stored at EROS." **Senator Larry Pressler**

"The spirit, determination, and adventurousness of John Wesley Powell is alive and well at the USGS and EROS today. Just as he provided invaluable information to all who desired land and water information, so does EROS. This building is a commitment by the people of the United States of America to continue that work. The legacy of John Wesley Powell will continue within these new walls for many years to come. For that we can all be grateful. And as South Dakotans, we can all be proud." **Senator Tom Daschle**

"When we fill this building addition (with data from Mission to Planet Earth), and I believe we will fill it, will the USGS, Sioux Falls, and the State of South Dakota be prepared to build another addition? Given our long, successful, and fruitful cooperation, I think I already know the answer." **Robert Price, Director, Mission to Planet Earth Program Office/NASA**

"We have incredible opportunities ahead of us as a workforce, but an enormous challenge to be able to do this work that the U.S. taxpayer has vested in us. Our charge according to USGS Director Gordon Eaton is to provide 'Earth Science in the Public Service.' I will borrow a motto from the Sioux Falls Development Foundation used 25 years ago. 'Whatever is required, we'll do it.' That's been our motto, and that's going to be our motto for the next 25 years." **Don Lauer, Chief, EROS Data Center**

The Dinner Program

Many Federal, State, and local dignitaries at the afternoon dedication and ribbon-cutting ceremonies attended a dinner later that evening hosted by the Sioux Falls Development Foundation at the Westward Ho Country Club in Sioux Falls. The dinner, held to commemorate the day's event, featured brief remarks by **Leo Reynolds**, Chairman of the Sioux Falls Development Foundation, **Gordon Eaton**, Director, U.S. Geological Survey, **Al Schock**, Chairman of the Board, Nordica Enterprises, Inc., and **Michael Mann**, Deputy Associate Administrator of NASA's Mission to Planet Earth Program.

Mann spoke about NASA's Mission to Planet Earth and EROS' role in supporting this major NASA program. "In the last 30 years since we went into Space," said Mann, "we've learned more about this planet than in the two thousand years people just walked around on it. The EROS Data Center has a unique ability to handle large sets of data, tie it together, and provide meaningful products. But, that's not the issue. The issue is, how do we deal with the environment, and how do we understand the world that we live in? I just wanted to communicate NASA's view so that when you do your job, you can understand where we're trying to go in the longer term. And then, you can make the right kind of decisions and contributions." ☺

Pecora 13
Continued from page 3

Pecora Award Honors Two

Following an hour mixer Wednesday evening, Aug. 21, Dr. Dallas Peck, USGS Emeritus Scientist and former USGS Director, Reston, VA, served as Master of Ceremonies for the Pecora 13 Banquet and Pecora Award Presentation. **Dr. Crofton B. Farmer** and **Dr. M. Patrick McCormick** received the 1996 William T. Pecora Award. Dr. Farmer, an atmospheric physicist at the Jet Propulsion Laboratory, Pasadena, CA, received the award for his achievements in the use of remote sensing to investigate chemical processes leading to the depletion of stratospheric ozone. Dr. McCormick, from Hampton University, Hampton, VA, was honored for his contributions to the pioneering advancements of both active and passive remote sensing of the Earth's atmosphere from space. Dr. Peck, along with Dr. Nancy Maynard, Deputy Director of the Science Division of NASA's Office of Mission to Planet Earth, presented the awards. The William T. Pecora Award, sponsored jointly by the Department of the Interior and NASA, has honored people since 1974 for outstanding achievements and leadership in the advancement of remote sensing. The Pecora Symposia began in 1974 to honor the memory of Dr. William T. Pecora, former Director of the U.S. Geological Survey, Under Secretary of the Department of the Interior, and a pioneer in remote sensing from space.

Welcome

Several special guests attended Pecora 13, including **Mrs. Ethelwyn "Wyn" Pecora**, widow of Dr. Pecora, his daughter, **Ann**, and granddaughter, **Maggie Pecora-Jewett**. Wyn Pecora delivered a touching commentary at the Pecora Banquet on Dr. Pecora and his pioneering work in satellite remote sensing.



Wyn Pecora

In addition to Mrs. Pecora, another speaker who delighted the banquet audience was long-time Sioux Falls business leader, **Al Schock**. Schock

recanted stories about the city of Sioux Falls and the negotiations which led to the Data Center being located in southeast South Dakota.

Pecora Memorial & Concluding Addresses

Francis Bretherton, University of Wisconsin-Madison, presented the Pecora Memorial Address titled, "Earth System Science - Where Are We?"

Before the thirteenth Pecora Symposium drew to a close on Thursday, August 22, **Roberta Balstad Miller**, Consortium for International Earth Science Information Network (CIESIN), University Center, MI, gave a concluding address that centered on the future directions and needs for human interactions in the environment.

The proceedings from Pecora 13 will be published by the American Society for Photogrammetry and Remote Sensing in late 1996. ☺

EROSDATA is published quarterly for EDC employees. The success of this publication depends on your input. EROSDATA coordinators welcome your comments and ideas for future issues.

Opinions expressed in EROSDATA represent those of its contributors and editors. Unless specifically noted to the contrary, these opinions do not represent official policies of the EDC or the USGS. Any use of trade names or trademarks in this publication is for descriptive purposes only and does not constitute endorsement by the U.S. Government.

**EROS Data Center
U.S. Geological Survey
Sioux Falls, South Dakota 57198
(605) 594-6176**

Employee News Continued from page 7

Moines, Iowa, where he was a network analyst. Darrin's outside interests include hunting, fishing, camping, classic cars, and motorcycles. His family includes wife, Tina, and daughter, Stacie (6).

Lisa Olsen - Lisa joins the Science Department to work on the Soil Carbon project with Norman Bliss. Before accepting her full-time position, Lisa worked as a government student since March 1996 with Norman Bliss on the Global 1 km Topographic Data project. Lisa's academic background includes a B.A. in geography with a minor in Latin American studies from the University of Tennessee-Knoxville (1993) and a M.S. in geography from the University of Wisconsin-Madison (1995). Lisa married Paul Olsen (SAB) in November 1995. The Olsens make their home in Dell Rapids.

Pat Schmidt - After working as a temporary Customer Services Representative since February 1996, Pat joins Donna Haacke's team in a full-time capacity. Pat earned a B.S. in geography (1995) from South Dakota State University. While at the Brookings campus, Pat played short-stop on the Jackrabbit baseball team. In 1995, Pat was named team captain and earned All-North Central Conference honors. Pat continues his baseball passion by playing for the Dell Rapids Blue Ribbon team in the Corn Belt League. The Schmidt family includes wife, Angie, and son, Michael. Pat and Angie are expecting their second child in December.

David Strande - David joins Kim Kringen's team as full-time Customer Services Representative after being a temporary employee since April 1996. David's educational background includes a B.S. in geography from South Dakota State University (1994). A U.S. Army veteran, David served as a reconnaissance scout in Germany. He served in a similar capacity for his Army Reserve unit in Saudi Arabia in support of Operations Desert Shield and Storm. David and his wife, Dixie, were married in August and live in Dell Rapids. ☺

Chills in the Air



A crane unloads two, 15,000-pound chillers August 26 for installation at the EROS Data Center. Installed in December, the new chillers replace two existing units located in the mechanical room of the original building. Due to the weight of the new chillers, the mechanical room floor was reinforced to prevent structural damage when they were moved over the floor. According to Gary Dinkel, PBA, the new chillers cost roughly \$65,000 each and have a 300-ton cooling capacity. ☺

Editor: **Mark Barber**

Content Editors: **Gene Napier**

Graphic Artist: **Jan Nelson**

Creative Director: **Lee McManus**

Contributors: **Don Lauer, R.J. Thompson, Ron Beck, Gary Dinkel, Gail Hanson, Donna Scholz, June Thormodsgard**

Photographers: **Max Borchardt, Mike Austad, Wendell DeGeus, Denny Pearson**

*Mississippi River Basin Meeting
Continued from page 8*

Applications Branch, and **Donna Scholz**, Data Services Branch.

Recommended Actions

The first integration meeting in July made it clear that a wide variety of USGS/NBS monitoring, analytical, experimental, remote sensing, mapping, data management, and modeling capabilities can be focussed on the information needs previously mentioned. Each division of the USGS, including the new Biological Resources Division, has extensive available data for use as a framework for filling data gaps. All of the offices that attended the meeting expressed an interest in being involved and coordinating ongoing programs. In addition, the EPA, the NRCS, and the USACOE have essential data and capabilities to add to the Mississippi River Basin Initiative.

Attendees at the July meeting also identified a team of scientists who will write proposals that address the two major natural resources issues previously mentioned. This group will get together soon to develop a formal list of information needs, work schedule, products, and costs associated with the NBS meeting held at EROS.

USGS Role and Relevance for America

The USGS continues to provide massive amounts of timely, unbiased earth science information to meet the changing needs of America. This information provides a historic record of the geology, topography, and water resources shaping our Nation. As the National Biological Service merges with the USGS (becoming the new Biological Resources Division) this fall, the Survey plans to stress long-term studies of the quality and accessibility of natural resources at regional and national levels. In particular, the USGS sees an opportunity to link

work involving tributaries, mainstream floodplain, and Gulf of Mexico activities into a systematic data collection and analysis framework. Another reason the Center hosted the meeting is because of its support of the Scientific Assessment and Strategy Team (SAST) activities of 1994 and its continued role as a clearing house for SAST data.

The significance of this meeting and future planning sessions go well beyond the health and well-being of the 110 million people who live and work in the 33 States drained by the Mississippi River System. This and future meetings are important to all Americans because systematic data collection and analysis work used for the Mississippi River System may be applied to concerns about the quality of other river systems nationwide. ☺

Satellite Image Mosaic of South Dakota



Digital Data Production staff recently completed work on a satellite image mosaic featuring the State of South Dakota. DDP staff, lead by **Rich McKinney**, **Chuck Larson**, **Gayla Evans**, and **Brian Granneman**, formed the color-infrared mosaic by combining 18, cloud-free, Landsat images acquired

by the thematic mapper sensor from the months of September and October, 1986-1993. Center Chief **Don Lauer** presented complimentary 27 x 42-inch framed prints of this mosaic to several dignitaries who attended the formal dedication ceremony of the EROS addition, August 19, 1996. Data forming this mosaic also will

be used in a large wall-sized mural similar to the AVHRR Greenness data now displayed in the EROS lobby. The mosaic also will be used as an information handout for EDC visitors and presentations outside the Center. ☺