

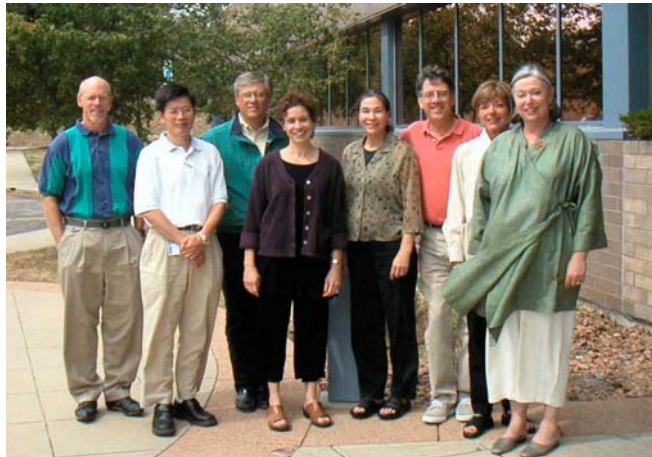
UCAR Office of Programs 2002 Annual Report to the Board, Members, Academic Affiliates, and University Relations Committee

**Jack D. Fellows
UOP Director
October 2002**

The post September 11th year has been a difficult year for most of us. Despite that terrible tragedy and the lingering marks it has left on our nation, UOP and its UCAR community partners have had a very busy and productive year.

Most UOP activities (<http://www.uop.ucar.edu/uop/index.html>) are community defined and led. Our goal is for our community partners to feel that these partnerships and the services UOP provides have allowed them to pursue research, education, technology development, and other related efforts in ways they never dreamed possible. We hope we can be that level of change agent in partnership with the community.

The UOP Directors and I hope you are excited and proud of these joint efforts and would like to thank you for the opportunity to serve you and look forward to many more years working together. The picture to the right shows the UOP senior management: Jack Fellows (UOP Director), Bill Kuo (COSMIC), Tim Spangler (COMET), Mary Marlino (DPC), Meg Austin (VSP), David Fulker (NSDL), Kathy Strand (UOP Budget and Administration Director), Karyn Sawyer (JOSS).



Not pictured is Ben Domenico, Acting Unidata Program Director.

Following is a brief summary of some of these collaborative efforts with the community and a few significant changes I need to bring to your attention. To understand the full extent of the UOP community-based activities, please read the full report.

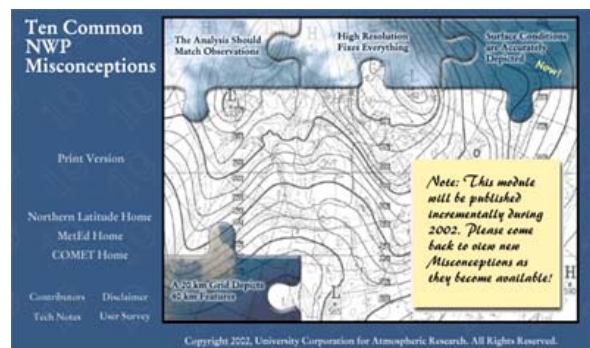
Education and Training

- **Digital Libraries.** UOP has been working closely with the community to develop new tools for teaching, conducting research, and providing educational resources at all levels through digital libraries. UOP is hosting major components of the National Science Digital Library (NSDL) and Digital Library for Earth System Education (DLESE). NSDL (<http://www.nsd.org>) and DLESE (<http://www.dlese.org>) are both

“community governed and operated” digital libraries and it is important that you are familiar with these efforts. Hosted at UCAR, David Fulker is leading the NSDL core integration effort. As many of you know, Dave directed the Unidata program for many years. NSDL has just submitted a multi-year proposal to carry out this core integration effort over the next 5 years that involves a broad range of universities and community members. NSDL is a national library that goes beyond the earth sciences. Both NSDL and DLESE provide tools to search these libraries much more effectively than using more common search engines like Google, etc. DLESE has already become an important component of NSDL and provides earth science collections and innovative earth science-oriented ways to collect, share, use, and navigate through these resources. NSDL will release a modest initial version this December. DLESE released Version 1.0 of the DLESE library in August 2001 (<http://www.dlese.org/>) and Version 2.0 should be released summer 2003. The 2002 DLESE Annual Meeting was an extremely successful event, hosted at Cornell University in Ithaca, NY, June 30-July 2, and attended by 157 educators from 32 states, including eleven UCAR member universities. The DLESE Program Center here in UOP was awarded funding for the next five years to help develop components of the library. NSF has released the DLESE Program Solicitation (NSF 02-158), which will provide community funds to support four other key DLESE components (collections, community services, data services, and evaluation services). These other efforts will be closely coordinated with the DPC activities. Proposals are due to NSF by 30 October 2002.



- Summer Faculty Course.** The Cooperative Program for Operational Meteorology, Education, and Training program (COMET) held a summer faculty course in August 2002 to help faculty in undergraduate meteorology programs create more effective learning environments through the use of innovative technology and instructional strategies. This course was an overwhelming success and involved many community members.
- Training.** COMET and Unidata are involved in technology transfer to the WMO Region III Regional Meteorological Training Centers. These centers are in less developed countries where enhancement of training and skills is being sought from our programs. The Visiting Science Program (VSP) is collaborating with



the Chinese Meteorological Administration to manage a program to train the next generation of atmospheric scientists in China during their graduate studies and made 30 new postdoctoral and visitor appointments over the past year. COMET continues to operate a national meteorology education and training website for the National Weather Service (<http://meted.ucar.edu/>), which contains COMET web-based modules and much more. This site averages about 1,581,000 hits and 74,000 user sessions per month, a significant increase from the previous year. COMET also released quite a few new modules over the past year, including ones on convection, mesoscale models, numerical weather prediction, and satellite meteorology. The COMET **Hurricane Strike!** module was introduced to the public at the National Hurricane Conference during the first week of April 2002 (<http://www.comet.ucar.edu/modules/fema3.htm>). This computer-based learning module on hurricanes is geared toward students in grades 6-8 and has been enthusiastically received by the Federal Emergency Management Agency (FEMA) and middle school teachers. Currently, FEMA is seeking funding to support a large distribution of this module. COMET also launched a Northern Latitude Meteorology website (<http://meted.ucar.edu/norlat/index.htm>) in the beginning of May that provides access to education and training materials on meteorological topics of interest to those in the northern latitudes.

Research Services and Technology Development

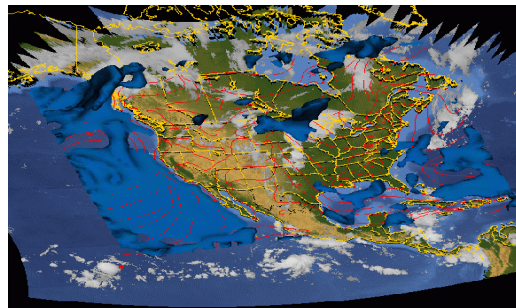
- **Satellite Constellation.**

The Constellation Observing System for Meteorology, Ionosphere, and Climate program (COSMIC) just held a science workshop 21-23 August with 100 scientists from 12 countries. All



contracts necessary for the development of this six satellite constellation and associated operations and data systems have been signed. The launch of the COSMIC system is scheduled for September 2005 (<http://www.cosmic.ucar.edu/>).

- **Real-Time Data Distribution.** The Unidata user community has played a significant role in the development of a strategic plan and a new 5-year funding proposal for the Unidata Program Center. Unidata has launched **my.unidata** (<http://my.unidata.ucar.edu/>) an interactive portal that serves as Unidata's electronic community center and the



Integrated Data Viewer to provide the community with a free, cross-platform 3D visualization tool (<http://www.unidata.ucar.edu/projects/metapps/webstart/IDV/>).

- **Community Field Campaigns.** JOSS has provided primary support for several large international field projects over the past year, including IHOP and EPIC. IHOP reports, mission summaries, and data products (operational and preliminary research) are available in the JOSS's IHOP on-line Field Catalog (<http://www.joss.ucar.edu/ihop/catalog/>) and the JOSS IHOP Data Management webpage (<http://www.joss.ucar.edu/ihop/dm/>). A data workshop is scheduled for Spring 2003.



- **Community Water Vapor Network.** SuomiNet now has 60 universities operating real-time GPS stations, and the expectation that all 73 proposed sites will be established by the end of the year (<http://suominet.ucar.edu>).

Management Changes

- **UNAVCO, Inc.** For over ten years, UCAR has helped UNAVCO (an informal solid earth university consortium) advance high-precision geodetic and strain techniques using the Global Positioning System (GPS). We have done this by hosting the UCAR UNAVCO Facility and because we thought there were significant collaborative possibilities between the solid earth community (UNAVCO) and UCAR in developing these GPS-related tools (e.g., SuomiNet). Over the past year, UNAVCO incorporated, and has approached UCAR to take over operation of the UNAVCO Facility. UCAR and UNAVCO, Inc staff are working closely to make sure this transition is completed effective October 2003. Despite this management change, we hope the UCAR and UNAVCO scientific collaboration will continue.
- **New Unidata Director.** After a national search, Mohan Ramamurthy was selected to be the next Unidata Director. Mohan will arrive in January 2003. Mohan, who is presently at the University of Illinois, Urbana-Champaign, has a long involvement with Unidata, including chairing its Users Committee and sitting on the Policy Committee. We expect Mohan to bring a strong university and educational connection to Unidata. Mohan's website can be found at: <http://www.atmos.uiuc.edu/dept/personnel.php?id=8>



- **New Campus.** Like the rest of UCAR, UOP has been actively involved in space planning efforts over the past several months, which has required considerable time and effort. The acquisition of the Center Green campus brings the promise of adequate space for our growing partnerships with the community.



It has been a busy year for UOP as it continues to focus on developing and maintaining the partnerships mentioned in this report. This is my fifth year anniversary as the UOP Director and I feel honored to be part of this effort. This brief introduction just skims the surface of what we have been doing across UOP. I encourage you to read on to learn about the full scope of UOP activities and how we might serve you.

GPS SCIENCE & TECHNOLOGY (GST)

Program Director: Randolph Ware <http://www.gst.ucar.edu>

Mission. Equip, support, and develop Global Positioning Satellite related research tools for the geosciences.

GST is the UCAR focal point for the advancement of GPS applications in Earth sciences. Some of the recent GST key activities include:

- **SuomiNet** now includes 60 university operated real-time GPS stations. We expect that all 73 sites proposed for SuomiNet will be established by the end of the year. Hourly water vapor maps for the Kansas-Oklahoma region based on PW measurements from 22 GPS sites are available via http://www.gst.ucar.edu/gpsrg/realtime/center_large.html. Videos of the previous day's water vapor maps are available on the same page. Daily slant delay residuals showing three dimensional variations in water vapor are also available.
- **UNAVCO** is playing a major role in the Plate Boundary Observatory (PBO), part of a major solid Earth science initiative called Earthscope. PBO includes a high-resolution national seismic network, 1,000 continuously recording GPS receivers and 200 strain meters. With 200 real time GPS sites planned, the PBO has considerable potential for meteorological and climate research applications. UNAVCO has re-organized under its own corporate structure in preparation for its PBO support role, and will operate independently of UCAR.
- **GPS Research Group** is proceeding with slant delay GPS assimilation and validation research. Plans are in progress to augment SuomiNet data and products to include real-time GPS slant delays. Assimilation of these data should allow improvements in high resolution mesoscale modeling.

- **Convective Storm Analysis.** Simulated slant delay observations from 1,300 GPS sites and water vapor soundings from 16 microwave profiler sites were used with 3DVAR to recover details of major convective storms in the central US (MacDonald, Xie, and Ware, *Monthly Weather Review*, 130, 386-397, 2002). Based on these encouraging results NOAA is planning a National MesoNet including 3,000 GPS and 200 wind and thermodynamic profiler stations.

CONSTELLATION OBSERVING SYSTEM FOR METEOROLOGY, IONOSPHERE, AND CLIMATE (COSMIC)

Program Director: Bill Kuo <http://www.cosmic.ucar.edu/>

Mission. Ensure a successful collaborative science project between UCAR, several US federal agencies, and Taiwan for the launch of a constellation of six micro-satellites to collect atmospheric remote sensing data for weather prediction, climate, and ionospheric research.

Program Status. This past year has been a very good year for COSMIC. All the contracts necessary for the development of the COSMIC system have been signed. These include: (1) the Mission Science Support Service contract between UCAR and NSPO, (2) the Spacecraft Development contract between NSPO and Orbital Sciences Corporation (OSC), (3) the AIT-TECRO Agreement on Launch Support Services between UCAR and NSPO, (4) the Payload Development contract between UCAR and OSC, and (5) the Ground System Development contract between UCAR and the Universal Space Network. UCAR began its execution of the Mission Science Support service contract on 19 November 2001, and OSC began the execution of the Spacecraft Development contract on 19 February 2002.

The COSMIC project has officially moved into the implementation phase, and the launch of the COSMIC system is scheduled for September 2005.

Major Milestones. COSMIC has passed two important milestones over the past few months. On June 17-20, 2002, the COSMIC System Requirements Review and Spacecraft Design Review were held at NSPO in Hsin-Chu City, Taiwan. All the major design issues for the COSMIC system and the COSMIC spacecraft have been resolved. On August 19-20, 2002, UCAR held a COSMIC Payload Preliminary Design review in Boulder, Colorado. This allowed the development of the COSMIC science payload, including the advanced GPS receiver, the Tiny Ionospheric Photometer, and the Tri-band Beacon Transmitter, to move forward.

Science Workshop. On 21-23 August 2002, UCAR held a COSMIC Radio Occultation Science Workshop. Approximately 100 scientists from 12 different countries attended the workshop. Results from the recent GPS radio occultation missions (e.g., CHAMP and SAC-C) were presented, and key scientific issues related to GPS radio occultation were discussed. An important outcome of the workshop is the formation of four science teams, which will address critical science issues in different areas. These include: (1)

radio occultation data retrieval, (2) weather prediction, data assimilation, and climate analysis, (3) ionospheric research and space weather monitoring, and (4) geodetic science applications.

A significant conclusion from the workshop is that the GPS radio occultation technology is becoming a major tool for global observations and is here to stay. Strong international collaboration is needed to expedite the development of the technique, and to fully realize the scientific potential of this important global observing system.

COOPERATIVE PROGRAM FOR OPERATIONAL METEOROLOGY, EDUCATION AND TRAINING (COMET)

Program Director: Tim Spangler www.comet.ucar.edu

Mission. Serve as a premier resource to support, enhance, convey, and stimulate scientific knowledge about the weather for the benefit of providers, educators, and users of weather information.

Education and Training. All COMET education and training activities fall under one core program, ensuring an integrated suite of education products that focus on topic areas rather than method of delivery. The program uses the Web for conceptual understanding and application, teletraining for seminar-like discussions of application and forecasting issues, and CD-ROM for practice cases and archival storage of Web and teletraining content. In-residence activities take place in the COMET classroom and include case studies to illustrate and clarify lecture sessions. This has been a productive year for the COMET Program, as some outstanding projects have been delivered to our end users and other exciting projects started.

Computer-based training products produced by the COMET Program include:

- **MetEd Website.** The COMET Program operates a national meteorology education and training website. The site, <http://meted.ucar.edu/>, contains web-based modules on several weather forecasting subjects. The COMET website averages about 1,581,000 hits and 74,000 user sessions per month, a significant increase from the previous year.
- **Hurricane Strike!** This module was introduced to the public at the National Hurricane Conference during the first week of April 2002. This computer-based learning module on hurricanes is geared toward students in grades 6-8. *Hurricane Strike!* Has been very enthusiastically received by FEMA and middle school teachers. Currently, FEMA is seeking funding to support a large distribution of this module.
- **Northern Latitude Meteorology.** This website, launched in the beginning of May, provides access to education and training materials on meteorological topics of interest to those in the northern latitudes, particularly those in Canada, Alaska, and

northern-tier states in the U.S. The site also provides a forum for sharing experience and expertise within the community. The site is developed and maintained by a cooperative team from the Meteorological Service of Canada, the Alaska Region of the U.S National Weather Service, and the COMET Program. Materials developed specifically for this effort include:

- *Ten Common Misconceptions About NWP*, Web Module
 - *Slantwise Convection: An Operational Approach*, Webcast
 - *Diagnosing and Forecasting Extratropical Transition: A Case Exercise on Hurricane Michael*, Case Study
 - *Hurricanes Canadian Style: Extratropical Transition*, Webcast
- **Mesoscale Meteorology Primer.** This has been a very productive year for this multi-year effort. The modules created for this project include audio narration, rich graphics and companion print versions. The following Web-based modules have been completed:
 - *Forecasting Radiation Fog*
 - *Definition of the Mesoscale*
 - *How Mesoscale Models Work*
 - *Coastally-Trapped Wind Reversals*
 - *Mountain Valley Breezes*
 - *Sea Breezes*
 - *Cape and Buoyancy*
 - **Satellite Meteorology.** There are several projects underway in this area. The most significant is the development and implementation of the NPOESS UserPort for the NPOESS Integrated Project Office (IPO). The UserPort website is in the final review process and should go live during October. The development of training modules on new NPOESS technologies will be ongoing. Additionally, the COMET Program is collaborating with the Meteorological Service of Canada's Arctic Weather Center to develop a computer-based module on mid- and high-latitude forecasting with low-Earth orbiting satellites. Also, a webcast, Feature Identification from Environmental Satellites featuring Tom Lee from the Naval Research Laboratory is nearing completion. Work in this area also includes on-going updates on new GOES features and products.

Completed works for this effort include:

- *Remote Sensing of Land, Oceans and Atmosphere with MODIS*, a Webcast featuring Dr. Paul Menzel
 - *Satellite Meteorology: GOES Channel Selection*
- **Case Studies and Weather Event Simulator.** In cooperation with Unidata and JOSS, the COMET Program continued to develop its case study library that provides data sets for research and education programs throughout the nation. By October of 2002, forty-two case studies will be available. Most cases have been used in the COMET classroom or have been suggested by NWS Science and Operations Officers. Each case presents a unique forecasting challenge that was faced by on-

duty forecasters. Additional information about the library may be obtained online at <http://www.comet.ucar.edu/resources/cases>.

During 2002, the COMET Program began distributing cases in support of the National Weather Service Weather Event Simulator (WES). WES provides displaced real-time (DRT) playback of case study data using the NWS operational display software. With WES case studies, NWS forecasters can simulate the warning decision environment in a setting similar to daily operations. These WES cases are not yet in a format useable by the university community but there are future plans to provide AWIPS capabilities under the Linux operating system. This development would then make WES cases available to the university community.

- **Multimedia Database (MMDB).** The multimedia database was announced to the public in January at the AMS conference in Orlando, FL. Its goal is to provide access to individual media elements used in COMET distance learning materials for reuse by sponsor training focal points, university faculty, and other government agency personnel developing new training and educational materials that will benefit the meteorological and university communities. Media objects from the COMET Web-based modules are already in the database and currently media objects from COMET CD-ROM modules are being cataloged and entered. Access to the MMDB can be found at <http://archive.comet.ucar.edu/moria/index.jsp>.
- **Fire Weather.** The Introduction to Fire Behavior: Influences of Topography, Fuels, and Weather on Fire Ignition and Spread website provides an overview of factors that affect the ignition and spread of wildfire. Information is presented with 3-dimensional graphics and animations as well as audio descriptions and commentary provided by a fire behavior expert. The content for the website was adapted from the COMET produced CD-ROM training module Fire Weather. Direct access to this module is at <http://www.meted.ucar.edu/fire/fwx/index.htm>.

COMET Classroom Activities. The COMET Program offered a total of 30 weeks of classes and over 20,000 student hours of instruction this year. Approximately, 540 students from the National Weather Service, the Meteorological Service of Canada, the Air Force Weather Agency, the Naval Meteorology and Oceanography Professional Development Center, and the university community attended classes offered by the COMET Program this year.

During May and June, the six week COMET Mesoscale Analysis and Prediction Course (COMAP) was held. This course, which is only offered every two years, is designed to increase participants' knowledge of mesoscale meteorology and new observing systems, and enhance their capabilities in forecasting, leading training programs, and participating in research activities. Dr. James T. Moore from Saint Louis University and Matt Kelsch of COMET served as co-lead instructors.

In addition, the COMET Summer Faculty Course highlighting new approaches to meteorology instruction was held during August. The goal for the course was to help

faculty in undergraduate meteorology programs create more effective learning environments through the innovative use of technology and instructional strategies. This course was an overwhelming success. Drs. Doug Yarger of Iowa State University and Brent Wilson of the University of Colorado at Denver were the lead instructors for this course. Assisting them were Drs. Greg Byrd and Joe Lamos of the COMET Program.

Outreach Program. The Outreach Program funds applied research conducted by university faculty in collaboration with operational forecasters from NWS offices. This past year, the Outreach Program also expanded its efforts to include projects that partnered Department of Transportation offices with university faculty and NWS offices to research local modeling of precipitation amounts and pavement heat balance, and to improve quality control of highway sensor data.

The Outreach Program's primary activities during the past year include:

- Administering: 50 projects
- Reviewing proposals and awarding: 6 NWS Cooperative Projects, and 14 Partners Projects

UNIDATA

Program Director: Ben Domenico, Acting <http://www.unidata.ucar.edu/>

Mission. Empower universities to acquire and analyze atmospheric and related data.

Unidata undertook a broad range of community interactions and data activities (new tools, access, and sources) over the past year, including:

New Leadership: Mohan Ramamurthy will take up Unidata's leadership reins in January 2003. After a wide-ranging search process, Dr. Ramamurthy, presently at the University of Illinois at Urbana-Champaign, was selected from a comprehensive set of applicants. In addition to interviews by committee members, Unidata staff interviewed the three finalists following presentations by each one of them. Mohan's involvement with the Unidata program and UCAR spans 16 years. He served as Chair of the Unidata Users Committee for six years and was a committee member for several years prior to being appointed its Chair. He presently sits on the UPC's Policy Committee. A focus of Mohan's research has been the application of information technologies in the geosciences, and in that capacity he has been involved in the DLESE project and its community since the program's inception.

my.unidata inauguration: A project which has been on Unidata's drawing board for several months came to fruition the first week of September. That project dubbed my.unidata, is a dynamic, interactive portal that will serve as Unidata's electronic community center. Included in planned enhancements are on-line support forums, account personalization, and tools for collaborating with others in the Unidata community.

The Integrated Data Viewer Release: The Integrated Data Viewer (IDV) was released to the community for download at the same time as my.unidata's release. Developed as

part of Unidata's MetApps project, this freely available, cross-platform 3D visualization tool allows users to interactively explore the Earth System by creating cross-sections, profiles, animations and value readouts of multi-dimensional geoscience data sets.

The IDV and *my.unidata* initiative are both products of Unidata's strength: the Program Center serving as the hub for staff and community members working together to produce software and services that enhance the teaching and research activity of all present and future community members.

The Users Workshop: Planning for the joint Unidata/COMET triennial workshop is underway. The workshop, to be held in Boulder from June 22 to June 27 2003, will have a theme of model use in the research and teaching communities. Entitled, "Expanding Horizons Using Environmental Data and Model Output for Education, Prediction, and Decision Making," the workshop is co-chaired by Mark Laufersweiler (University of Oklahoma) and Michael Morgan (University of Wisconsin). Unidata will celebrate its 20th anniversary in 2003, and we will honor that occasion during the workshop.

Users Phone Survey: To augment the Users Survey conducted on-line by the Users Committee in 2001, Unidata is now conducting a phone survey. The goal is to contact all of Unidata's 150+ sites. In mid-September 90 sites had been asked for input on the broader community impact of Unidata software and tools. We also are learning more about how and how much Unidata impacts and involves under-represented populations. This information will be used to inform the funding proposal.

International Connections: Unidata and COMET are involved in technology transfer to WMO Region III Regional Meteorological Training Centers (RMTCs). Unidata's task is to deliver real-time data and tools to analyze the data. Internet Data Distribution-Brazil (a system of cooperating Unidata Local Data Managers) is being developed.

Training Workshops: Unidata held its annual training workshops in July and August in UCAR's state-of-the-art training facility. GEMPAK, McIDAS, and LDM workshops drew users from sites throughout the community.

Thematic Servers: In May, 25 THREDDS partners participated in a technical workshop that resulted in input for THREDDS plans to integrate scientific data centers, and analysis tools into digital libraries. Dr. Stefano Nativi, University of Florence (Italy), collaborated with THREDDS developers during a three-month visit this past summer. It was Stefano's second extended stay with Unidata. His expertise in the GIS arena facilitates the THREDDS project's long-term goal of integrating GIS formats and data into the THREDDS suite of tools and sites.

ATD/Unidata Collaboration: Unidata-IDV developers and their counterparts at ATD worked together to create a customized IDV product. The customization provided IHOP scientists in the field with a tool for visually tracking mesoscale weather events as they developed.

Funding Proposal: Unidata's staff are preparing the program's 5-year funding proposal. The summer months were filled with meetings of groups representing the proposal's focus areas: Support; Real-time self managing data flows; Software to

visualize/analyze geoscience and geographic data; Distributed, organized collections of digital material; Improved data representation and access; and new data types and sources. Also involved with the proposal's development are members of the Program's governance committees.

THE DIGITAL LIBRARY FOR EARTH SYSTEM EDUCATION (DLESE) PROGRAM CENTER

Director: Mary Marlino www.dlese.org

Mission. Enhance geoscience education through new educational technologies. The Digital Library for Earth System Education (DLESE) is an NSF-funded project offering easy access to high quality electronic resources about the Earth system at all educational levels. The DLESE Program Center (DPC) of UOP is charged with developing the operational and technical infrastructure of the library, facilitating the distributed library-building process, and supporting the community governance structure.

DLESE does not “hold” resources; it holds metadata records that describe and point to locally held educational resources at universities, schools, government agencies, and informal science facilities across the country and the world. The library is designed to evolve into a distributed and reviewed “collection of collections,” a virtual community center that supports community goals and growth, and an Earth system science node of the National Science Digital Library (NSDL). “Community-owned” and “community-governed” embody the singularity of DLESE through its unique participatory approach to both library building and governance.

Currently entering its fourth year of development and operation, the DPC was recently awarded core funding for a five-year performance period (October 2002 – September 2007) by the NSF Geosciences and Education and Human Resources Directorates. Version 1.0 of the library was released in August of 2001 with approximately 1000 resources. The library featured a basic discovery system permitting keyword and controlled-vocabulary searching, based on a geoscience education-specific metadata framework enabling searching by educational level, topic and resource type.

The current library consists of approximately 3000 resources, along with a prototype review system developed by Dr. Kim Kastens at Columbia University (an NSDL-funded project), a cataloging tool that allows community cataloging of resources and supports keyword and controlled-vocabulary-based searches, and a portal website supporting library use, community action, and DLESE partnerships.

DPC support for library building processes is one of continual development and refinement of a wide variety of functionalities, including: user interfaces, metadata framework, cataloging and catalog management services, collections development, search capability, and the provision of community services. In accordance with the DLESE Strategic Plan (available at www.dlese.org), and the recent award, the DPC is

now working on development of Version 2.0 of the library, anticipated for release in Summer 2003. Features for Version 2.0-2.x include:

- A metadata framework enhanced by collection-level description, National Science Education Standards (NSES) information; and by Earth system science vocabularies (currently under community development)
- Tools and services to support multiple collections for K-16
- Integrated community review mechanisms
- Specifications for data access and delivery developed in collaboration with specific community projects (e.g. Unidata's THREDDS project)

Active community participation is a cornerstone of DLESE, and is embodied in an annual meeting of the DLESE community. The 2002 DLESE Annual Meeting was an extremely successful event, hosted at Cornell University in Ithaca, NY, June 30-July 2, and attended by 157 educators from 32 states, including curriculum/instructional designers, library infrastructure builders, and governance body members. Eleven UCAR member universities and one UCAR affiliate university were represented by 24 attendees (16% of the total participants). The theme for the meeting was Using DLESE. A day of Skills Workshops preceding the meeting was designed to acquaint participants with a variety of software tools and services developed within the larger DLESE community.

The distributed nature of DLESE will be very evident in the coming year. NSF has released the DLESE Program Solicitation (NSF 02-158), which will provide community funds to support four key DLESE services. Together with the DLESE Program Center (a fifth core service), these core services will constitute the comprehensive operational facility needed to support the building of the library. The four services addressed in the solicitation are:

1. *Collections Services*: Support for robust collections development and peer review systems
2. *Community Services*: Outreach to the community and nurturing the use of best practices to enable learning about the Earth system
3. *Data Services*: Development and use of tools in order to facilitate access via DLESE to Earth system data sets
4. *Evaluation Services*: Ongoing monitoring of efficacy of use of DLESE collections and its value in substantively improving learning.

Proposals are due to NSF by October 30, 2002. It is anticipated that PIs from these projects will participate in the DLESE Management Council and work to integrate their efforts with those of the DPC, under letters of agreement to be approved by the DLESE Executive Director and DLESE Steering Committee.

NSDL

Program Director: David Fulker <http://www.nsd.org/>

Mission: Creating a dynamic network of environments and resources, structured for science learning.


The National Science Foundation formally launched the NSDL funding program in 2000 to advance the quality of science, technology, engineering, and mathematics education. The program goal is to construct the premier portal for high-quality educational and research content, offering seamless access to a rich array of interactive materials and resources, "distinguished by the depth and breadth of the subject matter addressed, and valued for its authority and reliability," as stated by the program officer, Lee Zia.

Following a competitive proposal process, the NSDL headquarters are now established in UCAR/UOP. NSDL will be constructed by many organizations, all linked through these Core Integration efforts, led by Dave Fulker in collaboration with Bill Arms at Cornell University and Kate Wittenberg at Columbia. Subcontracts have been established with several other universities where highly reputed advances in digital-library technologies and in technology-enhanced education already are underway:

- James Allen, University of Massachusetts in Amherst
- Terry Smith, University of California in Santa Barbara
- Dave Lankes, Syracuse University
- Reagan Moore, San Diego Supercomputer Center
- Tamara Sumner, University of Colorado, Center for LifeLong Learning and Design
- Ellen Hoffman, Eastern Michigan University and MERIT

The NSDL is proceeding toward a modest initial release this December, with cataloging for about 250,000 individual items, held in several dozen collections. As with DLESE, the system is built with very few centralized holdings of content. Instead, a central repository of metadata (i.e., information about data) provides the foundation for constructing "portals," which offer special-purpose or general-purpose views of the library. Such portals will offer capabilities for searching and browsing content, even though the content resides at many different locations.

The strategy for achieving educational impact via NSDL has many facets, most of which are beyond the scope of this report. Of particular note are the strong ties being forged with DLESE and similar endeavors; with publishers and other non-NSF-funded partners; and with a highly diverse cadre of innovators. Some of these innovators are direct recipients of NSDL funds (awards in the "Services" track, e.g.), while others are participating in the NSF's 10-year-old digital-library research effort (run in the computer science directorate).



The image shows the logo for the Gender & Diversities Institute (GDI) and a navigation menu. The logo features a stylized globe with three human figures in profile, and the text "gender & diversities institute" in a mix of orange and blue. To the right of the logo is contact information for EDC: 52 Chapel Street, Newton, MA 02458, phone: 617.269.7100, fax: 617.332.4318, and email: genderdiversities@edc.org. Below the logo is a navigation menu with links: About Us, Our Work, Impact Stories, News, Links, Contact Us, Professional Development, and Publications. To the right of the menu is a graphic of a globe with the text "AREAS OF WORK" and a list: Education Reform, Technology, Work and Economy, Violence, and Gender. The EDC logo is in the bottom right corner.

EDC
52 Chapel Street
Newton, MA 02458
phone: 617.269.7100
fax: 617.332.4318
e-mail: genderdiversities@edc.org
Education projects that empower individuals
and communities globally, linking gender with
race, ethnicity, economic status, disability and
other diversities.

About Us
Our Work
Impact Stories
News
Links
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Professional Development
Publications

AREAS OF WORK
Education Reform
Technology
Work and Economy
Violence
Gender

EDC

One of many NSDL participants, the Gender and Diversities Institute, is building a *Gender and Science Digital Library* that represents the type of focused component that the NSDL will organize into the most comprehensive digital library of its kind.

Dave recently submitted a proposal to NSF for continuation of the Core Integration effort until 2006, and he has received notification that full funding will be recommended.

JOINT OFFICE FOR SCIENCE SUPPORT (JOSS)

Program Director: Karyn Sawyer www.joss.ucar.edu

Mission. Assist the national and international research community in the organization and implementation of research programs in the atmospheric and related sciences.

The 2002 International H2O Project (IHOP_2002) field operations were successfully conducted from 13 May to 26 June 2002. JOSS staff provided primary support for the set-up and execution of field operations and data management at the Operations Center (Norman, Oklahoma). Operations involved 6 aircraft and a wide variety of fixed and mobile surface facilities across the southern great plains. Reports, mission summaries, and data products (operational and preliminary research) were compiled and are available in the JOSS developed IHOP on-line Field Catalog (<http://www.joss.ucar.edu/ihop/catalog/>). An IHOP Data Management WWW page (<http://www.joss.ucar.edu/ihop/dm/>) has been established and contains relevant links to the IHOP_2002 data policy, data access and information/documentation, data submission guidelines/instructions, the on-line field catalog, and collaborating projects. A data workshop is scheduled for Spring 2003.

JOSS has been named as the VAMOS Project Office by CLIVAR. C.B. Emmanuel will serve as the Director and Jose Meitin (JOSS and NOAA/NSSL) will be the Deputy Director. VAMOS includes the EPIC program that was carried out in the fall of 2001, and the South American Low Level Jet Experiment which will be carried out from 15 November until 15 February 2003 in Bolivia. Starting in about 2004, additional VAMOS projects will be the North American Monsoon Experiment (NAME), VAMOS Eastern Pacific Investigations of Climate (VEPIC), and Climatology and Hydrology of the Plata Basin (PLATIN). JOSS will be involved in all these projects from the earliest planning stages, site surveys, project coordination among the participating countries, operations direction and data management.

The Surface Heat Budget of the Arctic (SHEBA) Project is now in its final analysis activities. JOSS is assisting with bringing the final versions of datasets into the archive as well as building the so-called SHEBA integrated dataset. The Arctic Transitions in the Land-Atmosphere System (ATLAS) Projects continues analysis after five years of data collection. JOSS has just recently completed the preparation of a CD that documents all activities at one of the main observatory sites of ATLAS near Ivotuk, Alaska. This CD presents the legacy of data collection as well as general site information. Data are accessible using spreadsheet software, and summary plots are provided for easy display. It is important to note that this CD will also be distributed to schools and local residents as part of important ARCSS outreach activities.

The Western Arctic Shelf Basin Interactions (SBI) Project has just entered its crucial first data collection phase. JOSS has deployed the SBI In-Field Data and Documentation Catalog aboard the first two cruises of the USCGS Healy this past spring and summer.

The catalog was used to document all shipboard activities and provide added access to the NSF Teacher Experience in the Arctic (TEA) reports and pictures. JOSS has responsibility for interim archival of all SBI datasets for the next 4 years of data collection. JOSS acts as the interim archive for datasets from the ongoing Arctic Regional Climate Model Intercomparison Project (ARCMIP).

During FY 2000 the JOSS Program Support Group continued to provide administrative support to four off-site offices. Over 36 individuals have been employed as off-site staff to provide scientific, technical, and programmatic expertise to national and international programs.

PSG also provided logistics support to approximately 1400 travelers attending over 400 planning, organizing, and oversight meetings, workshops, conferences, and field research experiments. On-site PSG staff support was provided to 23 scientific meetings, including:

The Global Learning and Observations to Benefit the Environment Program (GLOBE) Seventh Annual Conference, Chicago, where leaders from GLOBE countries around the world gathered to discuss their experiences and strategies for advancing the program.

Land-Atmosphere Ice Interaction All Hands Meeting which included ATLAS (Arctic Transitions in the Land-Atmosphere), ITEX (International Tundra Experiment), RAISE (Russian American Initiative on Shelf-Land Environments in the Arctic) and several related independent projects (November, Salt Lake City). It was held to discuss the future of arctic research, data archiving, and results of a number of completed research projects in the arctic.

Ace-Asia Workshop (Cal-Tech, Pasadena), held to compare and discuss related data from different groups and locations, gathered during 2001 ACE-Asia Field Experiment in the oceans near Japan and Korea.

VISITING SCIENTIST PROGRAMS (VSP)

Program Director: Meg Austin www.vsp.ucar.edu

Mission. Provide postdoctoral and visitor opportunities at federal research labs and universities. Organize and support advisory panels and scientific workshops.

VSP has made 30 new appointments in the past year. There are currently about 80 postdoctoral fellows, visiting scientists, and term employees being supported through VSP-managed programs.

The NOAA Postdoctoral Program in Climate and Global Change continues to be a highly regarded fellowship program. About 80% of the alumni have attained leadership positions in the community. The biennial NOAA Summer Institute, held in June in Steamboat Springs, CO, drew 18 postdoctoral fellows and an equal number of experienced scientists for a week of lively discussion. There is a push in the community

to expand the number of fellowships offered each year, because over the 12 years of the program's existence the investment value has proven to be very high.

VSP postdoctoral fellows and visiting scientists work on a broad spectrum of research including, for example:

- snow accumulation and ablation model
- forecasting urban and regional meteorology, ground level ozone and particulate matter
- instrument development to study the role of water vapor in climate and global change
- mesoscale modeling, data assimilation, model verification and validation
- regional hydrology
- sea-ice modeling
- paleo ice core
- human dimensions and impacts
- carbon cycle

VSP is currently managing collaborative research appointments involving more than 20 different universities and 18 federal laboratories.

Current Recruitments

NOAA Postdoctoral Program in Climate and Global Change

Application deadline: January 15, 2003

UCAR Postdoctoral Fellowship Program at the Naval Research Laboratory

Quarterly Application deadlines: January 15, April 15, July 15 and October 15

UCAR Visiting Scientist Program at the Air Force Weather Agency

Application review for two positions began Sept. 15. Positions are still open.

New Initiative

PhD training program for Chinese graduate students at U.S. universities.

The Chinese Meteorological Administration (CMA) approached UCAR to support this program during a visit to Boulder last fall. The CMA is anticipating a shortfall of experienced atmospheric scientists in the next decade to lead CMA, and has asked for VSP's help in managing a program to train the next generation of atmospheric scientists during their graduate studies. The program is being designed to match Chinese students with host scientists in the U.S. for one or two years. U.S. hosts will act as co-advisors to the students and will be in frequent communication with the Chinese university advisor during the student's U.S. visit.

A joint U.S./Chinese steering committee has been formed to advise CMA and VSP on the program operation. A preliminary meeting of this committee was held on July 26 in

Beijing at the CMA offices. A Memorandum of Understanding is in the final stages and a formal announcement of the program is being planned for late fall 2002. The program will start out at a modest level with 4 to 5 students during the first few years.

| [Back to the UCAR October 2002 Meetings site](#) |