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Director's Report

Unidata Policy Committee Meeting

29 October 2007

Boulder, CO

Mohan Ramamurthy
Unidata Program Center
UCAR Office of Programs
Boulder, CO



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New Committee Members

- Policy Committee:
 - Prof. Vanda Grubusic, Division of Atmospheric Sciences, Desert Research Institute
 - Prof. Michael Bevis, School of Earth Sciences, Ohio State University
 - Prof. Paul Ruscher, Department of Meteorology, Florida State University (2nd Term)
- Users Committee:
 - Prof. Bill Gallus, Dept. of Geological and Atmospheric Sciences, Iowa State University



A big thank you to all of the committee members for serving on our governing committees and helping to steer the program!



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A Celebratory Moment!

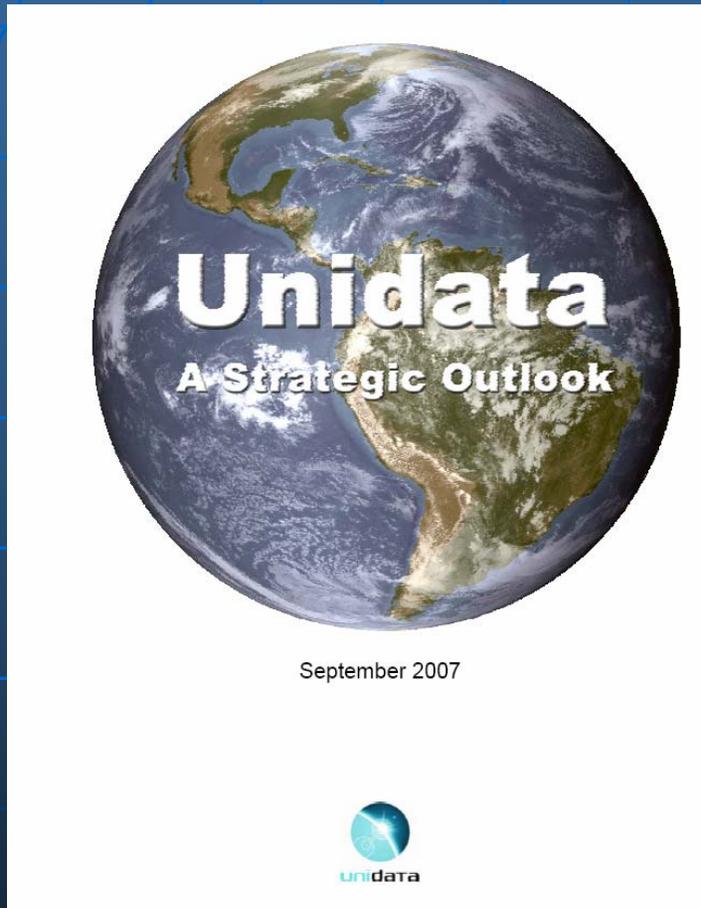
- Dave Fulker, Unidata's founding director, has been awarded the AMS 2008 Cleveland Abbe Award For Distinguished Service to Atmospheric Sciences by an Individual for "his visionary foresight, creative leadership in community building, and pioneering information technology contributions to advance meteorological data use in education and research."
 - Unidata would not be what it is today without his vision, leadership, energy, and his many extraordinary qualities.
- Rich Clark is the winner of the AMS 2008 Teaching Excellence Award for his enthusiasm and dedication to outstanding teaching and mentoring, and exceptional contribution to the professional development of students in the atmospheric sciences."
- Heartiest congratulations to Dave and Rich!



Otis Brown, Dean, RSMAS, University of Miami: "Unidata is one of the most fulfilling projects/programs that I have had the joy to be a part of..."



Strategic Plan Completed!



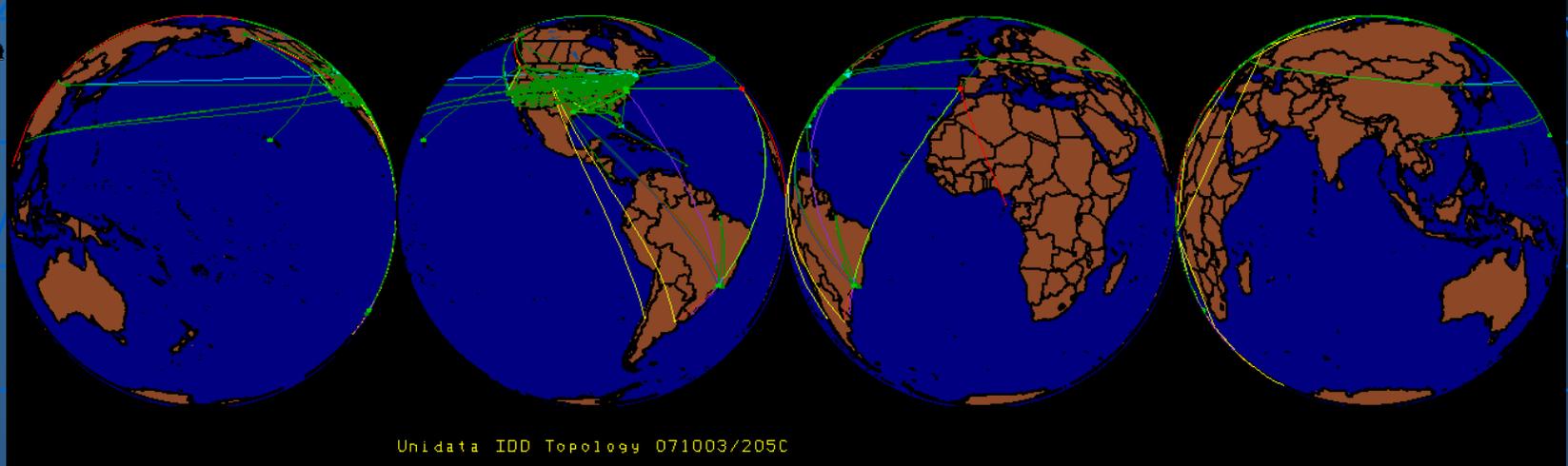
Informal feedback has been highly positive.

Now that the Strategic Plan is completed, we can focus on its implementation through the proposal and work to realize the goals stated therein.



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Data Flows



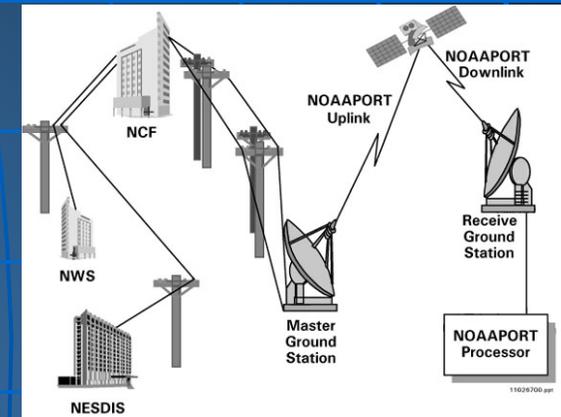
- ❖ The number of sites participating in the IDD continues its steady growth. We now have 487 hosts in 253 unique network domains running LDM-6 and reporting real time statistics.
- ❖ The average volume of data flowing through the IDD has remained steady over the last several months, except for TIGGE and CONDUIT.
- ❖ TIGGE data volume is about 12-13 GB/hour, but in bursts up to 23 GB/hour. Data now flowing to and from CMA, Beijing, and from CPTEC, Brazil.
- ❖ We are in discussions with COSMIC to distribute their GPS data to the community in real-time, via the LDM. There are some data policy issues to work through before that can happen.

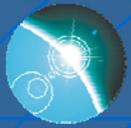


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NOAAPort-related Meeting with NWS

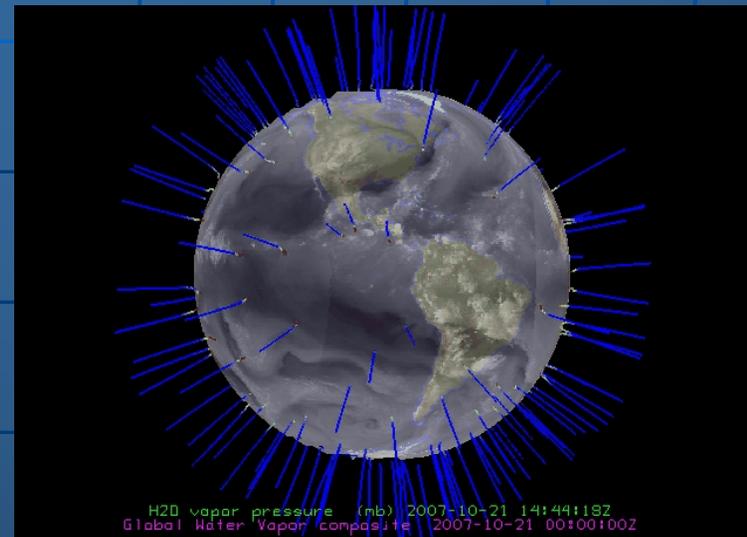
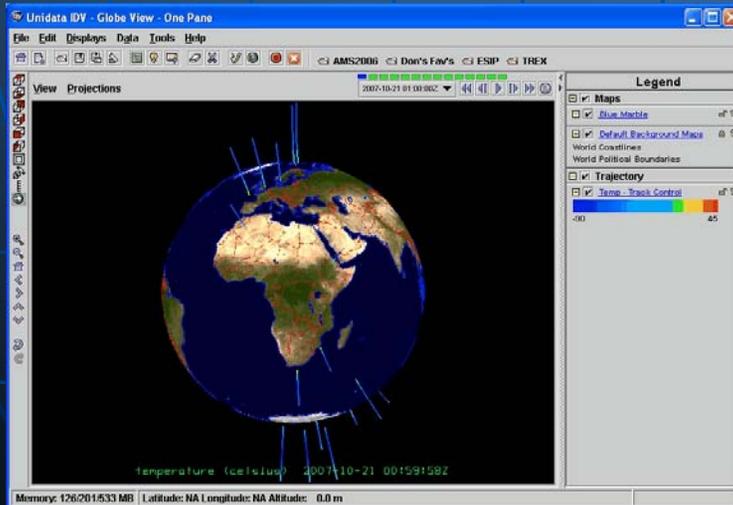
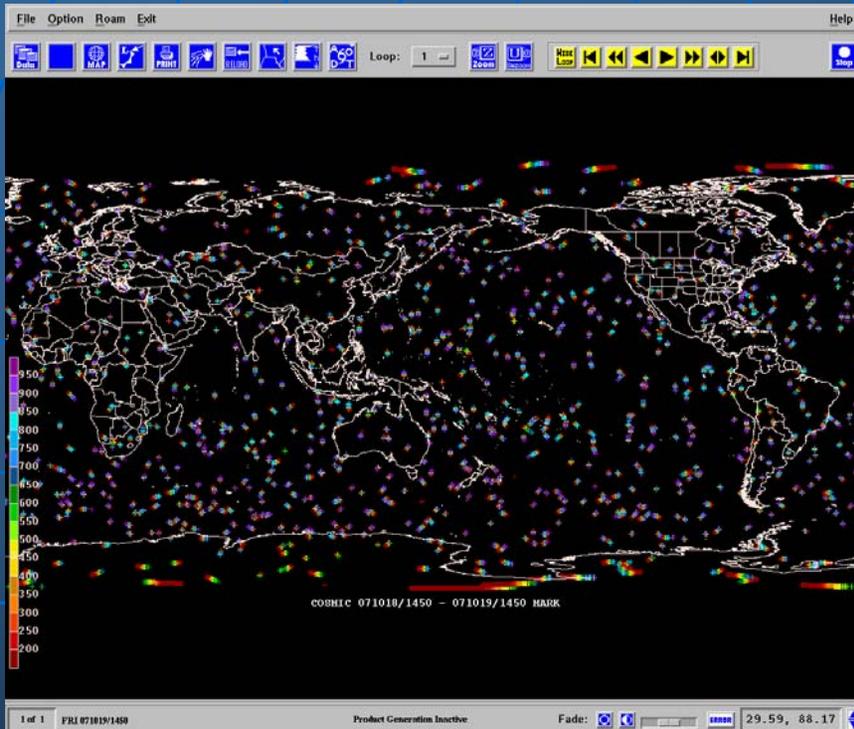
- In June, Linda and I met with a group from NWS to see if NWS will implement an LDM-based terrestrial back up for NOAAPort.
- A draft letter from Unidata and the Users Committee was presented to NWS.
- We generated a draft a white paper that described possible approaches for distributing the data to the community.
- Separately, there is considerable interest in using a CRAFT/Radar Level II type arrangement to distribute other NWS data to all sectors, augmenting the Family of Services. Discussions are underway with NCEP and others in the NWS as well as at the University of Oklahoma.
- A meeting of the principals and CONDUIT users is planned during the next AMS Annual Meeting in New Orleans in January 2008.





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COSMIC Data Visualizations

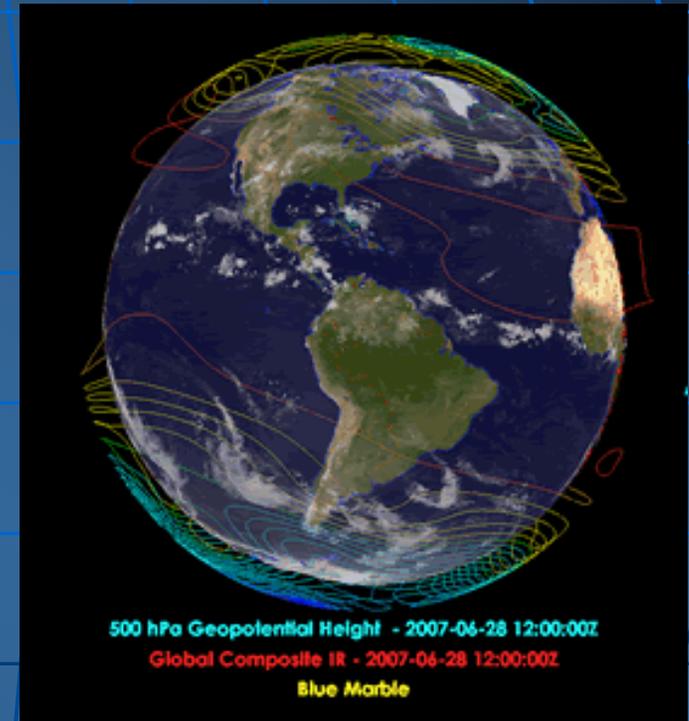




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Integrated Data Viewer

- ❖ IDV use continues to increase steadily.
- ❖ IDV Version 2.4.b2 was released last Friday (10/26).
 - ❖ New Grid Diagnostic functions added to the Jython library.
 - ❖ The formulas provide a powerful capability and are based on the GEMPAK syntax
 - ❖ Use of the familiar GEMPAK syntax for diagnostic analysis should enable users to add many new formulas.
- ❖ An Advanced IDV (for Developers) training workshop was conducted in August. There were 14 participants
- ❖ The IDV developers, Don Murray and Jeff McWhirter, have been nominated for the 2007 UCAR Outstanding Scientific and Technical Advancement Award



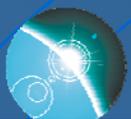


GEMPAK & McIDAS

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- ❖ GEMPAK continues to be Unidata's most popular analysis and visualization tool.
- ❖ Between October 2005 and Sept. 2007, 1871 unique users downloaded GEMPAK from the UPC.
- ❖ NWS/NCEP is migrating GEMPAK, a.k.a. N-AWIPS, toward a service-oriented architecture and integrating it into AWIPS-II. In the short term, this will not impact the Unidata community, but in the long term the migration to AWIPS-II has implications for Unidata.
- ❖ McIDAS-X/XCD v2007 was released on 16 August.
 - ❖ McIDAS-X use is decreasing, but ADDE (provides remote data access) continues to be a mainstay
 - For longitudinal comparison, 102 sites downloaded version 2004, approx. 60 downloaded v2005, and 50 downloaded v2006.
 - The majority of new interest in Unidata McIDAS is coming from sites outside of the US.





NetCDF-4

NetCDF-4, the next major upgrade to the netCDF standard, was released in beta in April 2007.

While supporting full backward compatibility, it allows users to read and write HDF-5 files with the netCDF API, including support for groups, user-defined types, per-variable compression, and parallel I/O.

NetCDF-4 depends on HDF-5 version 1.8.0, which is currently in beta release.

The NetCDF for Developers and Data Providers training workshop had 38 participants, the largest number of attendees of all sessions.

Over the summer, a new C++ API was developed by Shanna Shaye Forbes, a returning SOARS protégé.

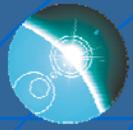


This spring Shanna received her B.S.E.E. degree from the University of Texas at Austin.

She is now attending grad school at UC-Berkeley.

A joint NSF proposal from Unidata and OPeNDAP.org was recently funded. The work seeks to improve OPeNDAP and netCDF Integration by

- enhancing Unidata's netCDF C library to support the OPeNDAP protocol as the remote access protocol for netCDF data, and
- extending the OPeNDAP protocol to support the Unidata Common Data Model on the server side as well as the client side.



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2007 Training Workshops

- ❖ The 2007 Training workshops were held 20 July – 10 August.
- ❖ 75 participants registered, 41 from academic and research communities, 28 from government organizations.
- ❖ There were several international participants. They came from Germany (2), Panama (2) and Portugal (1). All five Chinese registrants didn't get visas in time.
- ❖ For the first time, a session on Advanced IDV was offered. NetCDF for Developers attracted 38 participants.



Register
Online

netCDF for developers	July 20
GEMPAK	July 23-25
LDM	July 26-27
THREDDS Data Server Administration	July 30-31
Introductory IDV	August 1-2
Advanced IDV	August 3-4
netCDF JAVA	August 6
McIDAS	August 7-10

[Event Details](#)



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Unidata Regional Workshop

- The University of Oklahoma hosted a Unidata Regional Workshop during 10-12 September at their new National Weather Center.
- The main purpose of the workshop was to provide training in the use of Unidata's Integrated Data Viewer (IDV).
- Sessions on THREDDS and LEAD were included.
- There were about 25 participants. A few participants presented posters on the use of Unidata applications at their institution.
- Next Regional Workshop will be held at Plymouth State University in May 2008.



Unidata Regional Workshop
Hosted by the
University of Oklahoma
School of Meteorology
September 10-12, 2007





2007 Community Equipment Awards

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1. **Central Michigan University, Dr. Martin Baxter** - "Enhancing the Use of IDV and GEMPAK in Undergraduate Research and Education at Central Michigan University"
2. **Florida Institute of Technology, Dr. Steven M. Lazarus** – "A Multidisciplinary Computer Lab for Meteorological and Oceanographic Applications at the Florida Institute of Technology"
3. **University of Missouri-Columbia, Patrick S. Market, Anthony R. Lupo and Neil I. Fox** – "Increasing Use of the Integrated Data Viewer (IDV) in the Atmospheric Science Curriculum at the University of Missouri-Columbia"
4. **Plymouth State University, Brendon Hoch** – "Enhancement of Meteorology Technology at PSU"
5. **San Francisco State University, Dr. Dave Dempsey** – "Upgrading SFSU's Weather Graphics and Simulation Laboratory"
6. **University of Utah, Dr. John Horel** – "Enhancing Use of Surface Observations in IDV"

Users Committee Action Item: Unidata should explore seeking additional equipment awards funding from other NSF GEO divisions, due to the broadening efforts and collaborations

We discussed this idea with Cliff Jacobs and Bernard Grant in June. They advised us to work initially with ATM in seeding such community broadening grants with ATM funds. Once those efforts are successful, we will be in a stronger position to approach other GEO divisions.



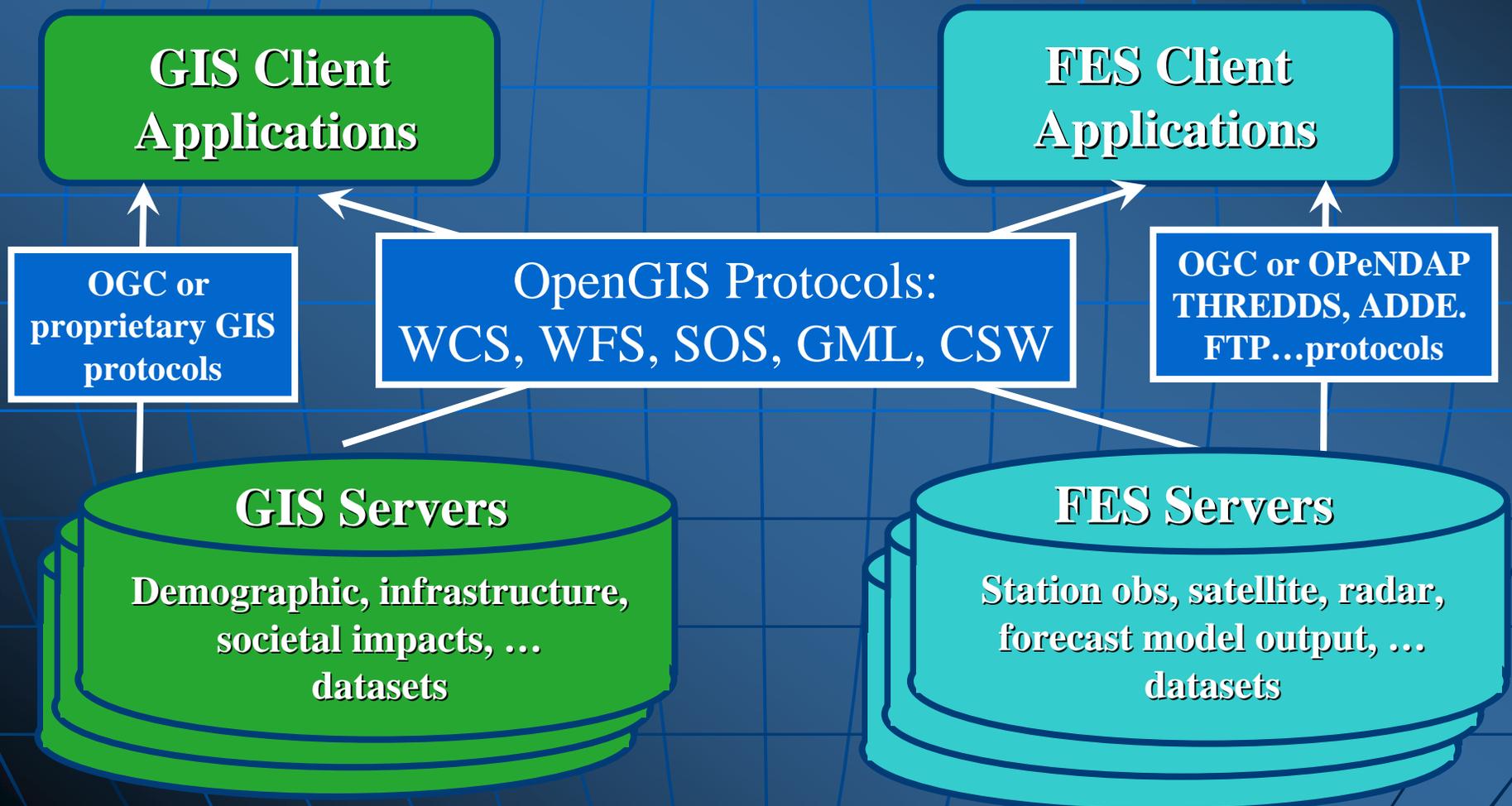
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Unidata-OGC Interoperability Workshop

- *Theme: Standards-based Web Services Interfaces to Existing Atmospheric/Oceanographic Data Systems*
- *Organized by Unidata on 19 September 2007*
- Related to the GALEON (Geo-interface for Air, Land, Earth, Oceans NetCDF) effort
 - Foster interoperability between data systems of FES and GIS communities
 - Provide standard interfaces to existing netCDF/THREDDS services, e.g.,
 - Web Coverage Service (WCS)
 - Web Feature Service (WFS)
 - Sensor Web Enablement (SWE)
 - Catalog Services for the Web (CSW)
- The workshop had a large turn out: 63 people attended!
- The workshop resulted in a productive discussion and a few specific steps to enhance interoperability across scientific and GIS data services



GALEON (Geo-interface for Air, Land, Earth, Oceans NetCDF)





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EGU ESSI Division

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European Geosciences Union
General Assembly 2007
Vienna, Austria, 15 – 20 April 2007



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News

The 2007 General Assembly drew 8037 participants from 90 countries

- ❖ A proposal to start a new ESSI program within EGU was approved. A standalone program for the EGU 2008 meeting has been approved.
- ❖ Proposers: Stefano Nativi, Peter Fox, Mike Jackson, Mohan Ramamurthy, Bernard Ritschel, and Charles Barton
- ❖ Twelve sessions have been approved on a range of cyberinfrastructure topics for the 2008 meeting. We will be announcing it to the community this week and drum up interest and abstracts. Please try to participate and spread the word.



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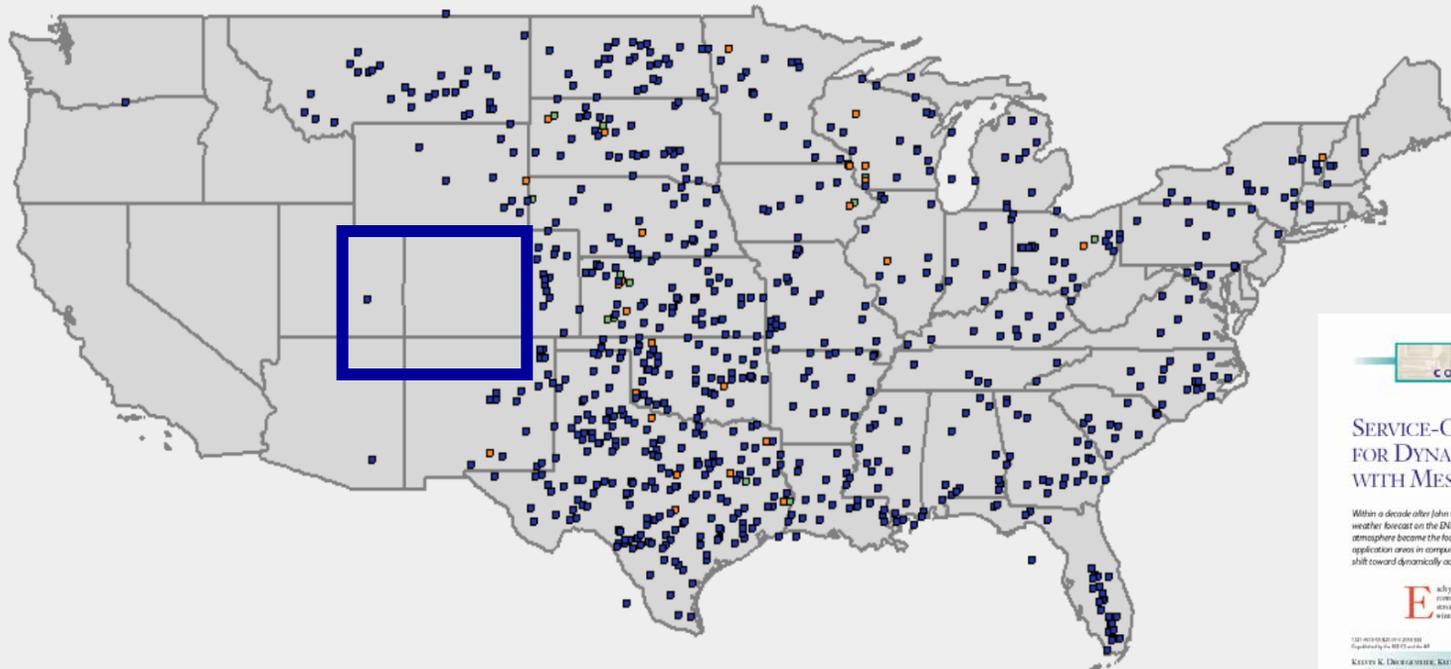
LEAD Deployment: Weather Challenge and NOAA Hazardous Weather Test Bed

- In a pilot effort, a limited number of students at 10 universities used the LEAD system during the Spring Weather Challenge. The goal of this pilot project was to make available LEAD technology to users and enable them to use a high resolution WRF model as a tool in preparing forecast for WxChallenge.
 - We learned a great deal from this experience and the LEAD Gateway team has already begun to incorporate user suggestions (and bug discoveries) into the next release of the Gateway.
- LEAD was also used by NOAA/Storm Prediction Center to create...
 - 10-member ensemble CONUS forecast at 4 km grid spacing
 - 2 km CONUS forecast at 2 km grid spacing
 - 2 km forecasts launched automatically over tornado watches
 - 2 km regional forecasts launched by forecasters on demand





Centers of On-Demand Forecast Grids Launched at NCSA During 2007 Spring Experiment



- Launched automatically in response to hazardous weather messages (tornado watches, mesoscale discussions)
- Launched based on forecaster guidance

GRID COMPUTING

SERVICE-ORIENTED ENVIRONMENTS FOR DYNAMICALLY INTERACTING WITH MESOSCALE WEATHER

Within a decade after John von Neumann and colleagues conducted the first experimental weather forecast on the ENIAC computer in the late 1940s, numerical models of the atmosphere became the foundation of modern-day weather forecasting and one of the driving application areas in computer science. This article describes research that is enabling a major shift toward dynamically adaptive responses to rapidly changing environmental conditions.

Every year across the US, mesoscale weather events—flash floods, tornadoes, hail, strong winds, lightning, ice—cause winter storms—cause hundreds of deaths, seriously damage transportation and commerce, and lead to economic losses exceeding more than \$200 billion. Although mitigating the impacts of such events would yield enormous economic and societal benefits, research leading to that goal is hindered by rigid IT frameworks that can't accommodate the real-time, on-demand, financially-algebraic needs of mesoscale weather research, its disparate, high-volume data sets and systems, or the research team composition. Attempts at its remediation through ad hoc integration systems.

In response to the increasing research need for a comprehensive, national cyberinfrastructure in atmospheric research, particularly one that can integrate work that has been developed in other relevant disciplines, the US National Science Foundation (NSF) funded a large, multi-institution research (ITR) grant in 2001, known as Leaded Atmospheres for Atmospheric Discovery (LEAD). A multi-disciplinary effort involving state universities and more than 100 scientists, students, and technical staff in meteorology, computer science, social sciences, and education, LEAD addresses the fundamental research challenges needed to create an integrated, scalable framework for advanced modeling and forecasting the atmosphere. LEAD's foundation in dynamic workflow orchestration and data management in a Web services framework. These capabilities provide for the use of analysis tools, forecast models, and data repositories.

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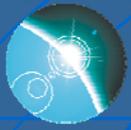
LEAD: A Way Forward

LEAD PIs visited NSF on 30 August to discuss the future of the project. The PIs met with officials in ATM, OCI and CISE. An invited seminar on LEAD was given to NSF staff. A possible approach to LEAD-2 was presented.

- Community Deployment of LEAD as a facility (through Unidata, but in partnership with a couple of other LEAD institutions)
- Advanced Meteorology Research
- Computer Science Research
- Integrated Educational Activities

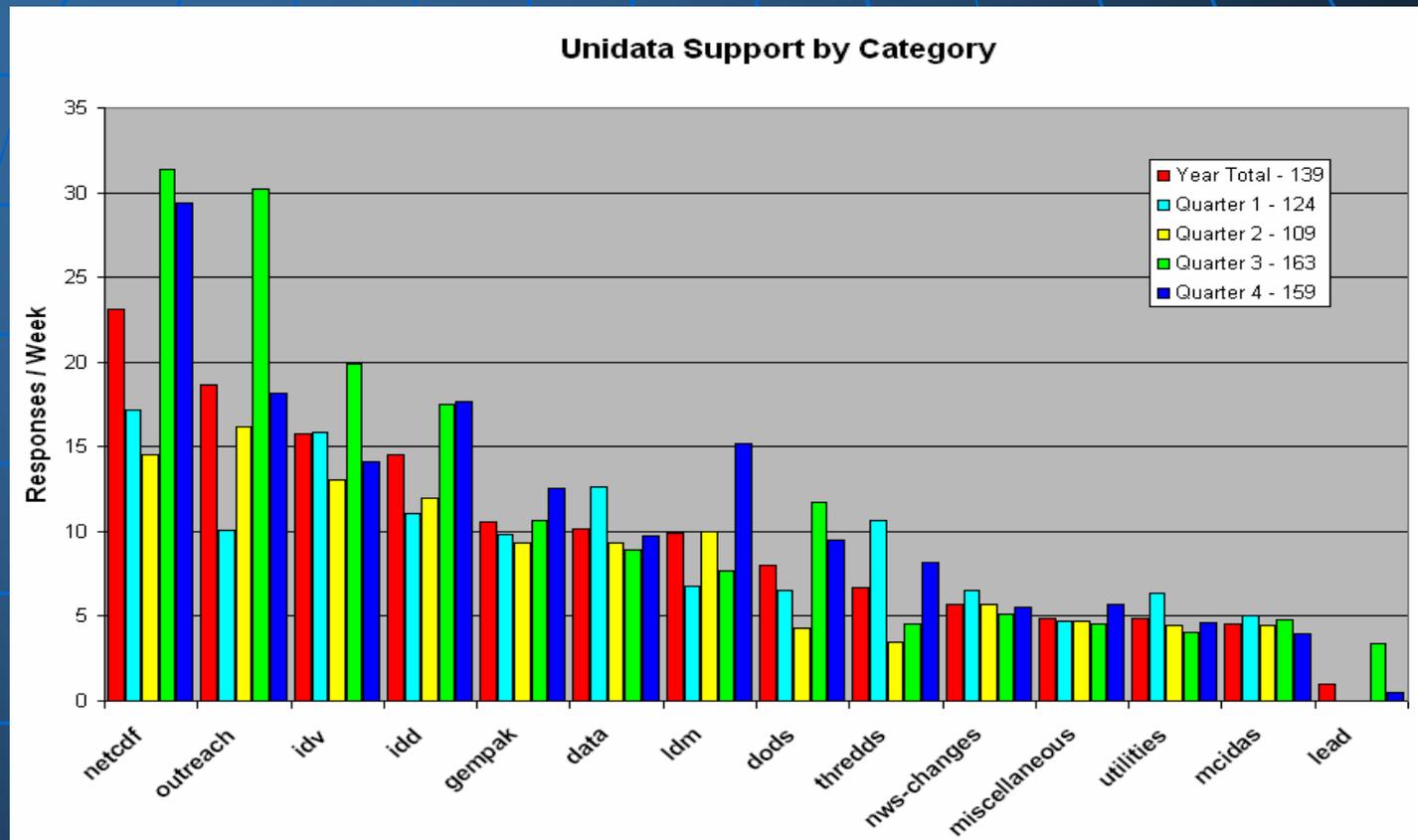
The above individual elements are highly inter-related, but they will be proposed separately to different NSF programs and solicitations.

NSF is very interested in LEAD and has encouraged the PIs to continue the dialog with NSF officials



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Email Support



- The total support load at the UPC is high and has grown in the last two quarters.
- Since 26 January 2006, over 7700 user support inquiries (new and follow-ups) were processed through the Unidata inquiry tracking system. The system allows non-UPC experts to assist other community users.



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Recent Proposal Activity

1. A proposal submitted by OPeNDAP.org to NSF's Software Development for Cyberinfrastructure solicitation (Rew, Co-PI) was funded.
 1. Integration of OPeNDAP's software and Data Access Protocol (DAP) with Unidata's netCDF library.
 2. By sharing the Common Data Model, both DAP and netCDF will have interoperable data models.
2. Virtual Operations Center proposal, led by EOL/NCAR, was withdrawn, but it will be re-submitted to Atmospheric Sciences Mid-size Infrastructure Opportunity program.
3. The UPC and the Shanghai Typhoon Institute of Shanghai Meteorological Bureau (SMB) are collaborating to transfer the Unidata IDV to STI, where it will be further developed into a Tropical Cyclone version of IDV. Unidata and STI will jointly design, develop and test the TC-IDV, Unidata will provide support to STI for the R&D, training and operational applications of the TC-IDV system. Yuan Ho and Don Murray are leading this effort within the UPC.



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State of the Program: A Snapshot

- Community relations : Green
- Data flows : Green
- Software development : Green
- Partnerships : Green
- Staffing : Yellow
- Support : Green
- Finances : Yellow

Questions?