

Quick Unidata Overview

NetCDF Workshop
25 October 2012

Russ Rew

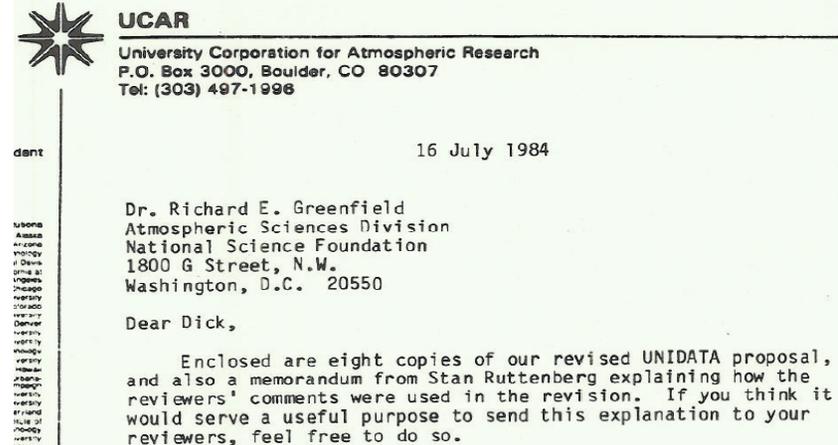




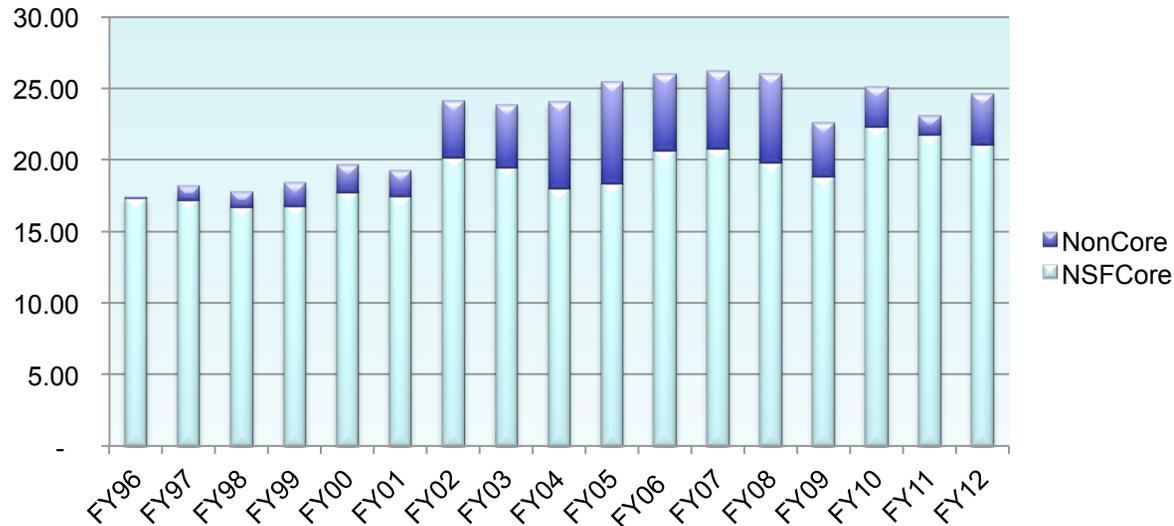
Background

Conceived at a 1983 grass-roots workshop, held in Madison, Wisconsin

Funded primarily by NSF through a core-funding proposal every five years.



Unidata Staffing History 1996- 2012





Mission

To transform the geosciences community, research, and education by providing innovative data services and tools

We do

Facilitate data access

Develop software for data management, analysis, and visualization

Provide comprehensive support, including training

Empower users to also be contributors

Engage in community building and advocacy about data-related issues

We don't

Operate a data center

Do science

Serve K-12 education directly

Provide operational support

Collect data from sensors

Develop curricula

Compete with universities

A Snapshot of Services

Data Access and Distribution

Near real-time data via IDD
Community content and archives via TDS, RAMADDA

Community Services

Advocacy and liaison on data issues to NSF, NWS, NOAA, NASA, OGC, ...

Yearly community equipment awards

Software Development

Analysis and Visualization: IDV/
RAMADDA/McIDAS-V, GEMPAK/
AWIPS-II

Remote Data Access: THREDDS
Data Server, ADDE, OPeNDAP

Data Access Infrastructure:
netCDF, CDM, NcML, udunits

Data Distribution and Decoding:
LDM, Unidata decoders

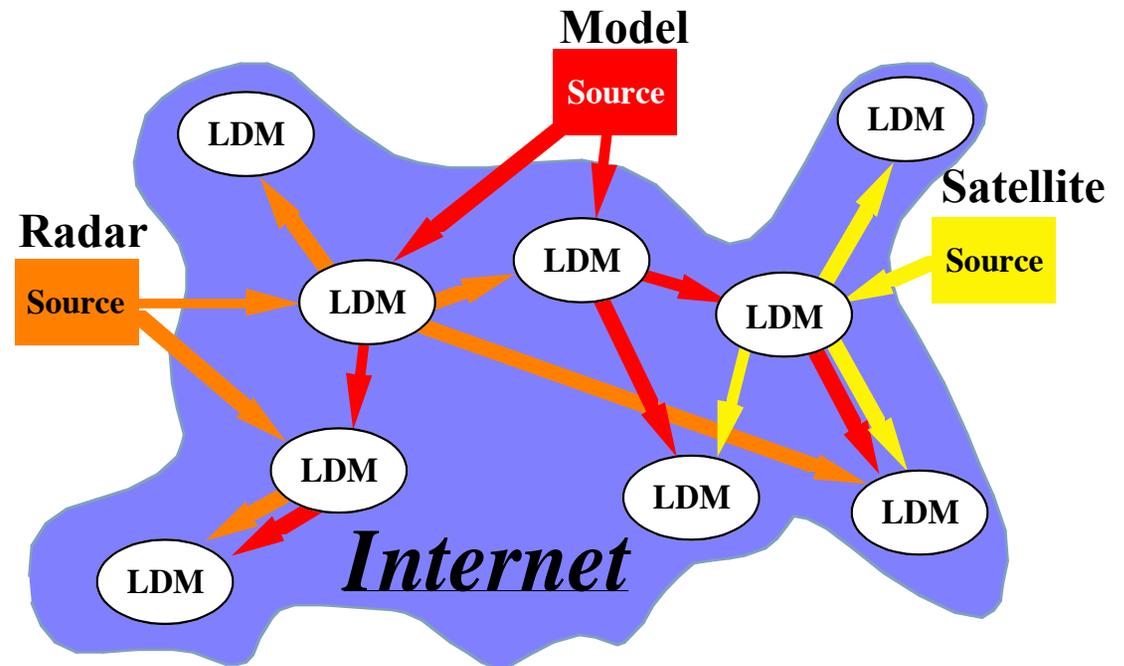
Support Services

Web presence, searchable software support, mailing lists, online documentation, direct support from developers

Training workshops, triennial users workshops, regional workshops, community seminars

Internet Data Distribution

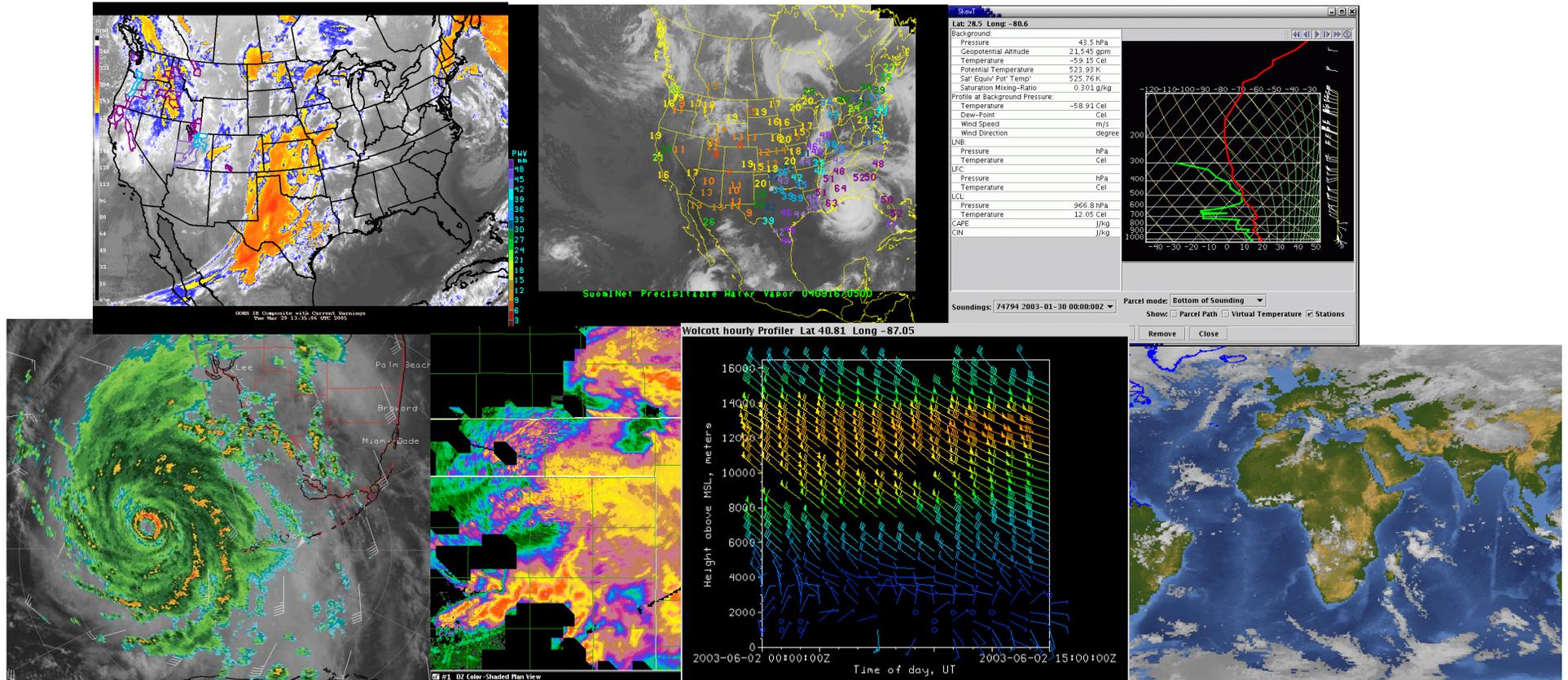
- ❖ Over 230 institutions worldwide are participating in the Unidata-operated real-time data distribution system.
- ❖ The IDD uses significant Internet bandwidth: over 13 *Tbytes/day*



The Unidata IDD is like a utility: data flows 24x7, and recipients use the data and our tools without needing to know much about Unidata.



Current Data for Education and Research



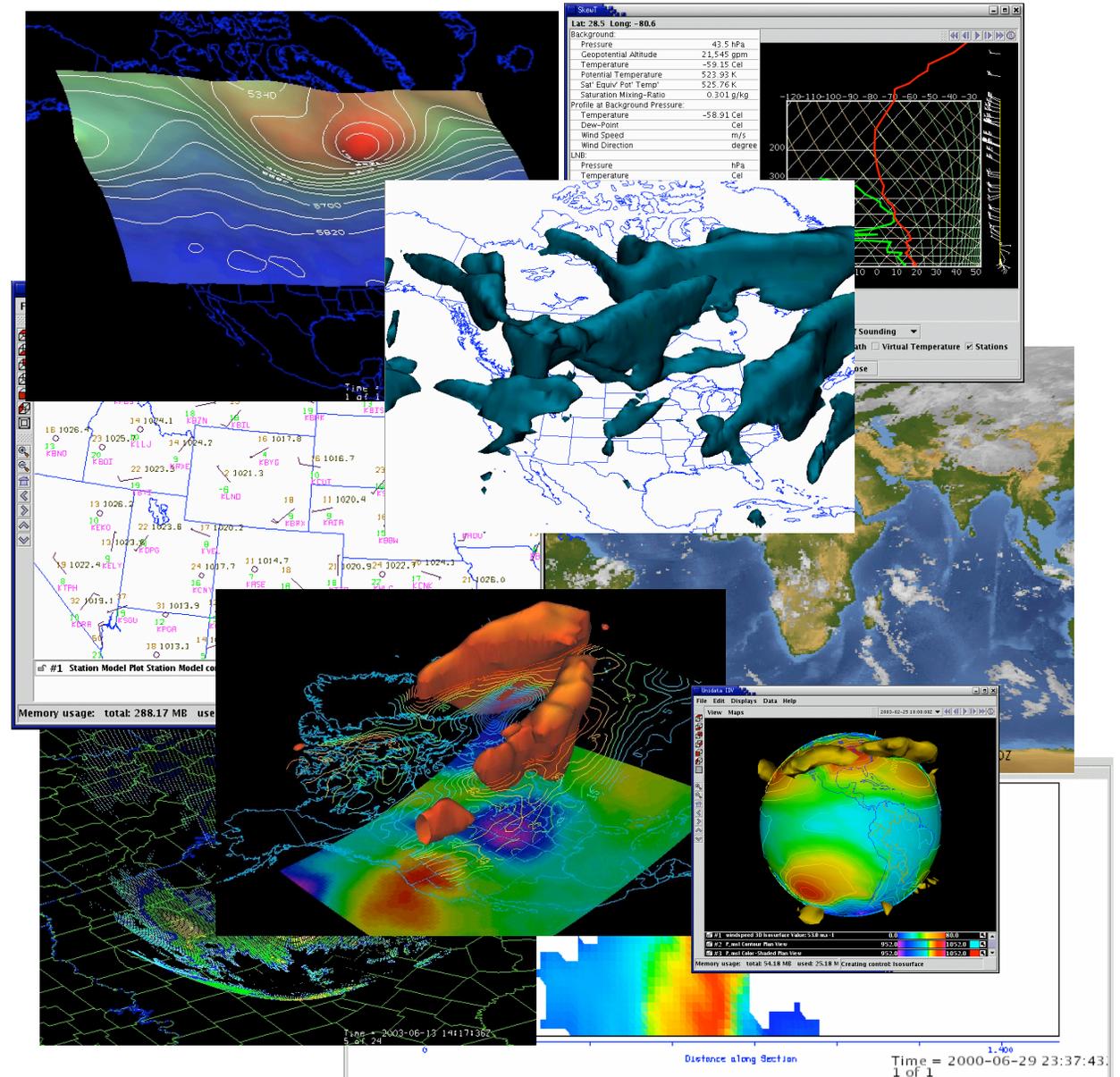
We provide access to weather data like surface & upper-air obs., radar and global lightning data, satellite imagery, model output, aircraft observations, text forecasts & bulletins, COSMIC Radio Occultation observations, etc.

We support applications (IDV, GEMPAK, and McIDAS) for analyzing and visualizing the data.



Integrated Data Viewer

- ❖ Unidata's most popular scientific analysis and visualization tool
- ❖ Freely available 100% Java framework and reference application
- ❖ Provides 2- and 3-D and time animated displays of geoscience data, publication-quality graphics
- ❖ Integrates data in diverse formats from local and remote sources
- ❖ Built on VisAD, makes use of many Unidata technologies



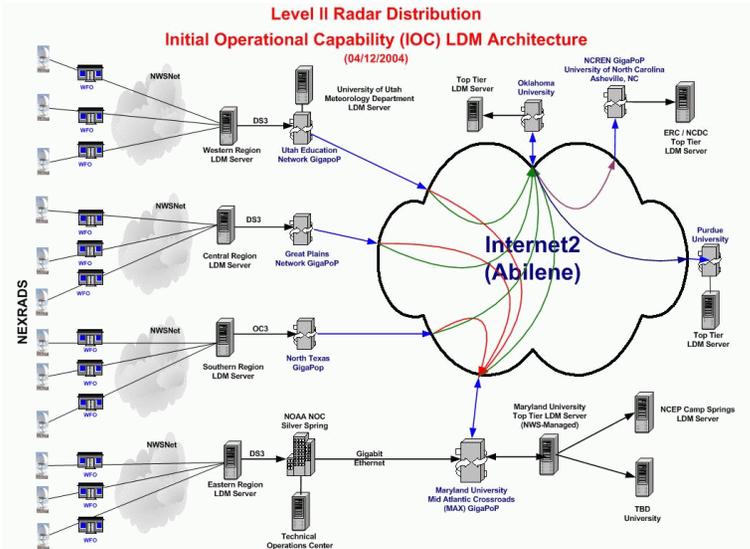


Unidata & Cyberinfrastructure

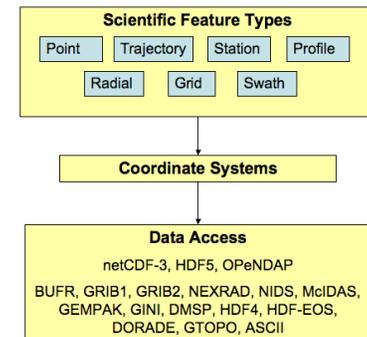
Unidata's technologies are also used by government agencies and research institutions worldwide.

They include NCAR, UNAVCO, NWS, NCEP, NOAA Labs, NASA, U. S. Navy, JMA, CMA, KMA, ECMWF, and BMRC.

In addition, dozens of companies like the Weather Channel, Weather Underground, WSI, and Weathernews use Unidata tools for their real-time data distribution needs.



Unidata's Common Data Model



The screenshot shows the IPCC website header with logos for WMO and UNEP. The main content area features a banner for 'Climate Change 2007' with the text: 'The Physical Science Basis of Climate Change the first volume of the new IPCC assessment report, has been released in Paris, 2 February 2007'. A sidebar on the left contains navigation links: 'About IPCC', 'Activities', and 'Calendar of Events'. A search box at the top left is labeled 'IPCC web sites'.

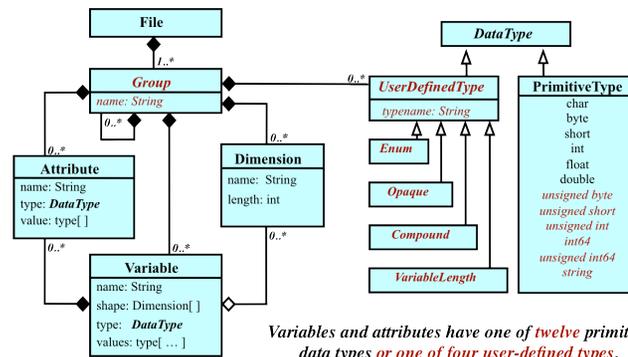
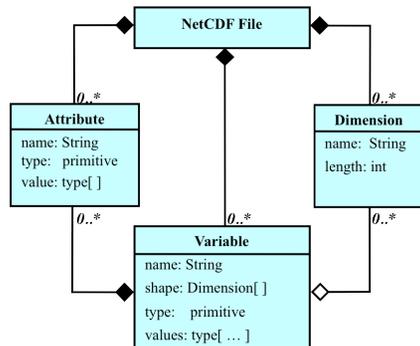
The image displays the 'CMIP5 Coupled Model Intercomparison Project' logo. Below the main title, it reads 'WCRP World Climate Research Programme'.

The metadata is constrained by the [CF convention](#) (NetCDF Climate and Forecast (CF) Metadata Convention) and as specified in the CMIP5 tables.

The data is in the [NetCDF](#) form. It can be written in NetCDF3 or NetCDF4 formats. The new NetCDF4 is able to take advantage of its compression and chunking capabilities. Compression is controlled with the MIP tables using the shuffle, deflate and

NetCDF Continues to be Widely Used

A file has a top-level unnamed group. Each group may contain one or more named subgroups, user-defined types, variables, dimensions, and attributes. Variables also have attributes. Variables may share dimensions, indicating a common grid. One or more dimensions may be of unlimited length.



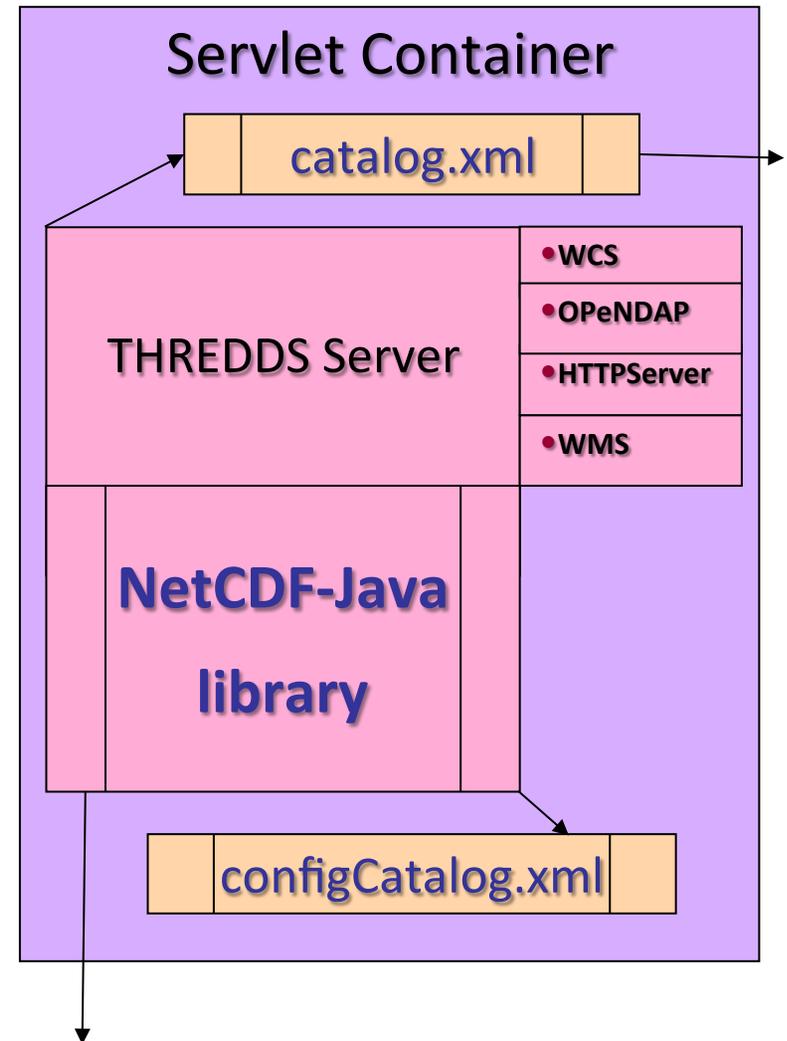
Variables and attributes have one of twelve primitive data types or one of four user-defined types.

- ❖ NOAA NESDIS has adopted netCDF-4 and CF metadata as the standard intermediate file format for new satellite products
- ❖ NASA's Earth Science Data Systems Standards Process Group has endorsed netCDF-3 and -4 as standards
- ❖ NetCDF will be used in the CMIP5 archive of climate models for the fifth assessment report of the IPCC
- ❖ The Open Geospatial Consortium (OGC) has adopted netCDF as an OGC binary encoding standard
- ❖ NetCDF-4 will be used for GOES-R data products



THREDDS Data Server (TDS)

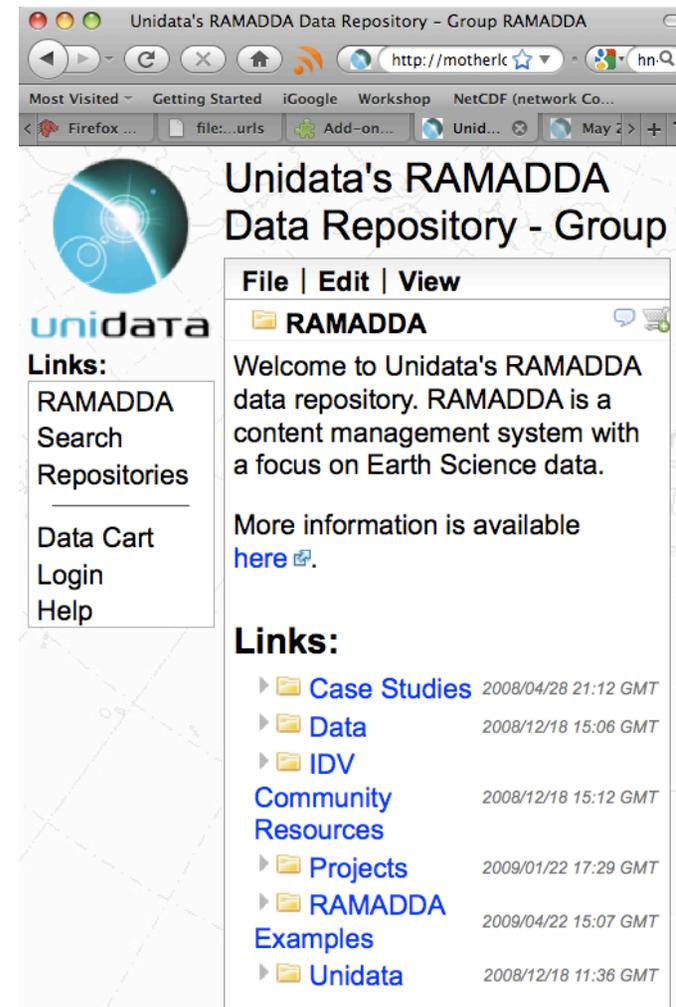
- THREDDS catalog provides data and metadata inventory, can be generated statically or dynamically
- Reads netCDF, OPeNDAP, HDF5, GRIB, NEXRAD, and other formats through a common interface
- Can use NcML to modify and create virtual aggregations
- Has integrated servers for multiple protocols
 - OPeNDAP
 - HTTP
 - Open Geospatial Consortium (OGC) Web Coverage Service
 - OGC Web Map Service (contributed)
 - nclSO metadata service
- 100% Java, easy to install, configure, secure





Other Unidata Technologies and Projects

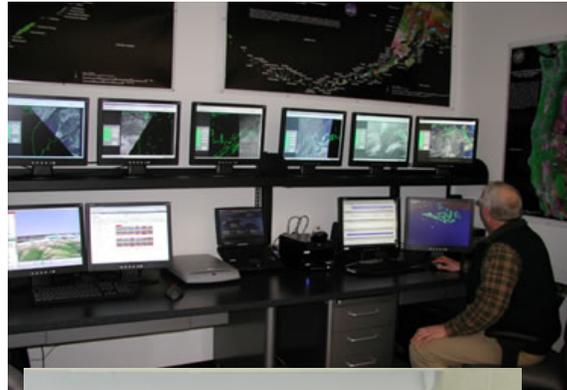
- ❖ Supporting GEMPAK users in transition to IDV or AWIPS-2
- ❖ Involvement in standards, CF conventions
- ❖ OPULS (OPeNDAP-Unidata Linked Servers) to specify DAP4, implement clients and servers
- ❖ THORPEX Interactive Grand Global Ensemble (TIGGE) project
- ❖ RAMADDA: web-based scientific data content repository, publishing platform, and collaboration environment



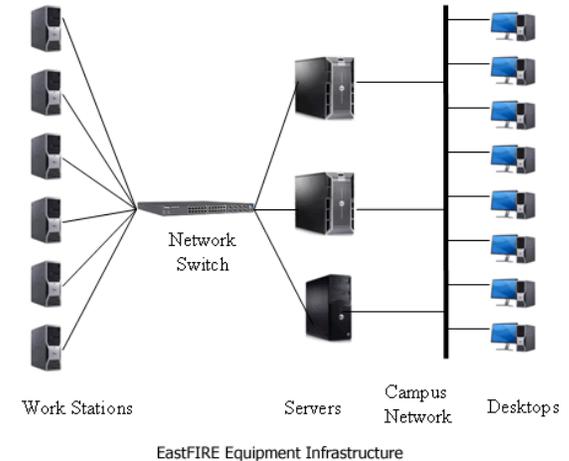
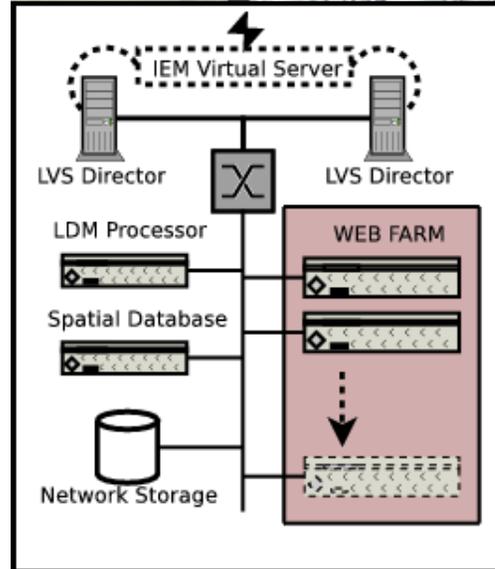


Community Equipment Awards

- ❖ The primary purpose is to encourage new universities to join the Unidata community, and for existing members to enhance their participation;
- ❖ A total of \$100K is allocated each year for this program;
- ❖ Over the past 8 years, we have funded equipment at over 50 universities.



Modis image of the Georgia Bugaboo Scrub Fire





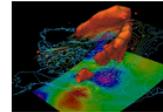
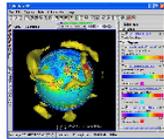
Workshops

Unidata Regional Workshop

hosted by

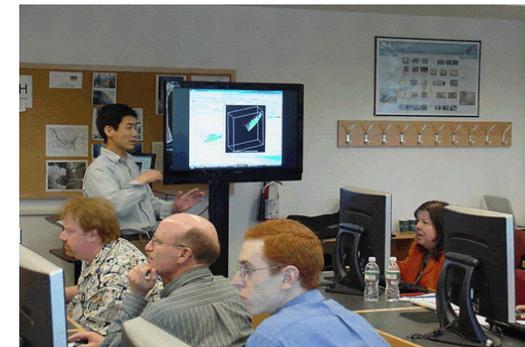
**Plymouth State University
Judd Gregg Meteorology Institute
Boyd Science Center
Plymouth, NH**

May 18-20, 2008



This 2½ day workshop will allow for hands on instruction with [Integrated Data Viewer \(IDV\)](#) software. Participants will be a mixture of university faculty and students, research scientists, K-12 teachers, and other interested individuals from across the New England region. Representatives from Unidata will be onsite to provide tutorials on IDV and to discuss other Unidata projects and initiatives.

- Unidata, with funding from UOP's JOSS program and help from the Universidade de São Paulo, hosted a Latin American Data Workshop in August 2008 on the USP campus in São Paulo, Brazil.



2009 Unidata Users Workshop Using Operational and Experimental Observations in Geoscience Education June 8 - 12, 2009 in Boulder, CO

See the [RAMADDA Workshop site](#) for schedule, presentations and data.

The workshop will provide participants an opportunity to learn about the latest advances in observing technologies and techniques and their use in education, research, and operations. Scientists, engineers, and faculty will present an array of educational and instructional sessions showcasing various observing system with special emphasis on their usefulness in teaching and student learning.

Sponsored by the National Science Foundation



2009 Training Workshop for Unidata Software

Sign up now, Registration closes on July 1st!

[Click Here To Register](#)

The Unidata Program Center is pleased to announce its 2009 Software Training Workshop.

Unidata's training workshops are

