



# NOAA Environmental Data Management Workshop

## Participant Information Packet

**May 25 - 26, 2010**

NOAA Auditorium & Science Center  
1301 East-West Highway  
Silver Spring, Maryland

*This packet contains your workshop agenda, information on workshop sessions, exhibits and demos, and a directory of fellow participants. If you require further information or assistance, please visit the registration station or contact one of the workshop representatives listed below:*

*Lewis McCulloch (617) 767-6582*

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Thank you to ESIP for organizing the exhibit and demonstration session.



Thank you to Northrop Grumman Information Systems for sponsoring the morning coffee and afternoon food.





## Welcome to the NOAA Environmental Data Management Workshop

### PURPOSE

The purpose of the Environmental Data Management Committee (EDMC) as stated in the Terms of Reference is:

*“...to coordinate the development of NOAA’s environmental data management strategy, and policy, and provide guidance to promote consistent implementation across NOAA...”*

This workshop will advance a framework for end-to-end lifecycle environmental data management at NOAA by:

- ♦ *Getting NOAA’s environmental data management community on the same page with respect to the end-to-end environmental data management lifecycle and the recently revised NOAA Administrative Order 212-15 and begin development of Procedural Directives to guide implementation.*
- ♦ *Socializing, discussing, and fostering NOAA-wide collaboration to address key environmental data management issues facing NOAA today.*

### GOALS & OUTCOMES

- ❖ **Identify and inform the development of Procedural Directives for specific life-cycle components per NOAA Administrative Order 212-15**
- ❖ **Promote cross-NOAA collaboration in specific areas**
- ❖ **Provide an opportunity for broader community interactions**
- ❖ **Identify and document best practices in specific areas**
- ❖ **Identify current capabilities that can be leveraged across NOAA**

## AGENDA ♦ TUESDAY, MAY 25

**8:30 – 10:00**  
**NOAA Auditorium**

**Environmental Data Management Workshop**  
**Introductory Session**

- Introductory session/plenary speakers
- Overview of NOAA’s Environmental Data Management Policy
  - ♦ Introduce revised NAO 212-15
  - ♦ Review environmental data management lifecycle

*MC: Helen Wood*

*Plenary Speakers:*

*Mary Glackin, Jack Hayes, and Joe Klimavicz*

**10:00 – 10:30**

**Break**

**10:30 – 12:00**  
**NOAA Auditorium**

**Challenges and Opportunities for NOAA**

*MC: Deirdre Jones*

*Panel Speakers:*

*Mohan Ramamurthy, Unidata*

*Mark Reichardt, Open Geospatial Consortium*

*Ferris Webster, Data Archive and Access Requirements Working Group Chair, and*

*Duane Apling, Northrop Grumman Information Systems*

**12:00 – 1:30**

**Lunch – On your own**

**1:30 – 2:30**  
**NOAA Auditorium**

**Overview of select NOAA projects**

Integrated Ocean Observing System, NextGen Weather Information Database, Climate Portal, Global Earth Observation – Integrated Data Environment, National Marine Fisheries Service – Enterprise Data Management

*MC: Deirdre Jones*

*Panel Speakers:*

*Jeff de la Beaujardiere*

*Thomas Day*

*David Herring*

*Ken McDonald, and*

*Jim Sargent*

**2:30 – 5:30**  
**NOAA Science Center**

**Exhibit and Demonstration Session**

Organized by Federation of Earth Science Information Partners

## AGENDA ♦ WEDNESDAY, MAY 26

**8:30 – 9:15**  
**NOAA Auditorium**

**Direction/Charge for Breakout Sessions**  
*Lead: Helen Wood*

**9:30 – 12:00**  
**SSMC-3, Room 4527 ➤**

**Morning Breakout Sessions**

**Breakout: Documenting Environmental Data**  
*Session Leads: Ted Habermann and Kim Jenkins*

**NOAA Auditorium ➤**

**Breakout: Data Access Services**  
*Session Leads: Ken McDonald and Jeff de la Beaujardiere*

**12:00 – 1:00**

**Lunch**

**1:00 – 3:30**

**Afternoon Breakout Sessions**

**NOAA Auditorium ➤**

**Breakout: Data Interoperability and Use**  
*Session Lead: Jason Marshall*

**SSMC-3, Room 4527 ➤**

**Breakout: Long-term Preservation and Stewardship**  
*Session Leads: Steve DeIGreco & Nancy Ritchey*

**3:30 – 4:00**

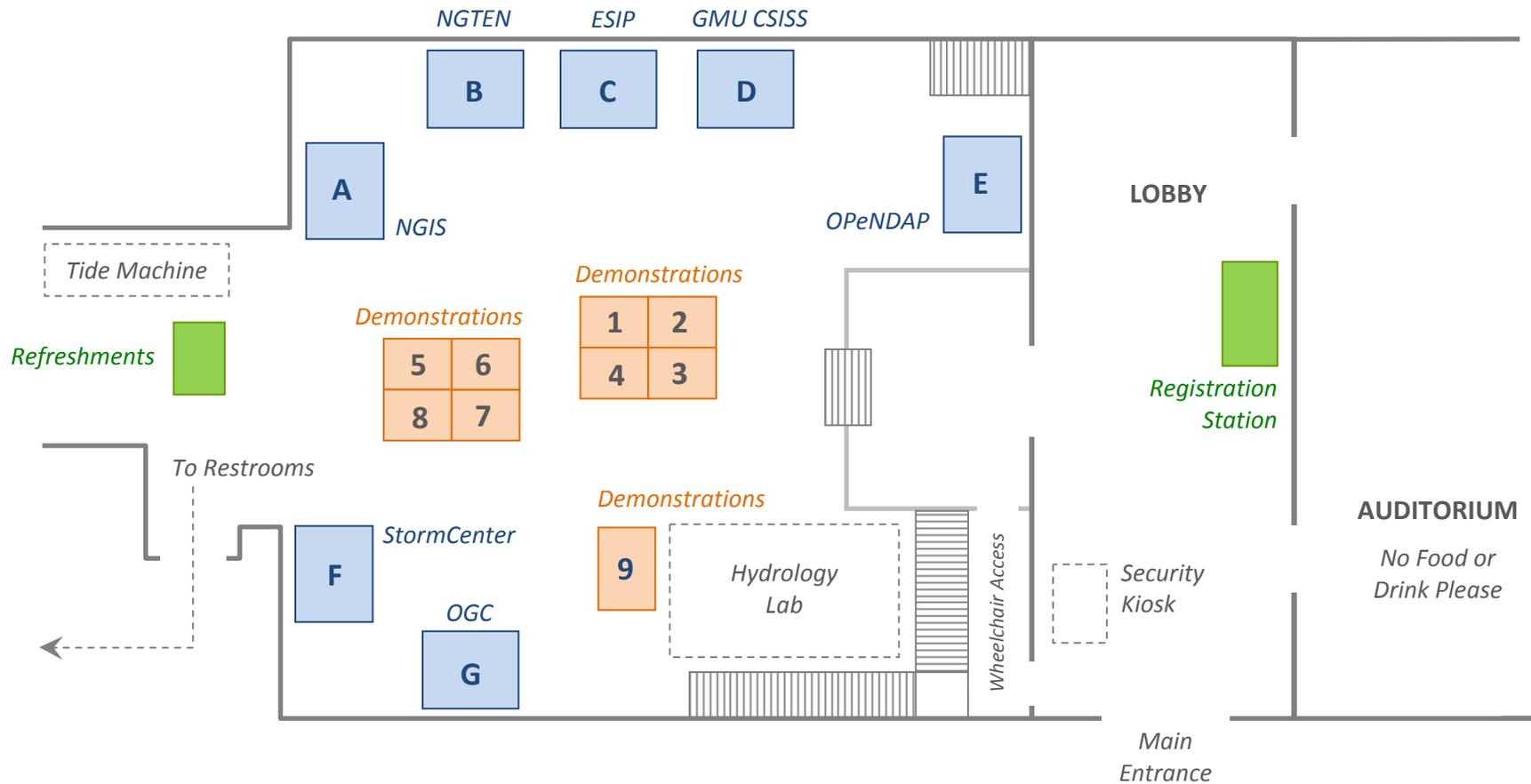
**Break**

**4:00 – 5:00**  
**NOAA Auditorium**

**Environmental Data Management Workshop**  
**Closing Session**

# NOAA Environmental Data Management Workshop: Exhibit and Demonstration Session

## Floor Map of NOAA Science Center



# NOAA Environmental Data Management Workshop: Exhibit and Demonstration Session

## Key for Exhibits

*All Exhibits will be available from 2:30 to 5:30 pm. Please see the page noted for details about each exhibit.*

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## Exhibit Descriptions

### Exhibit A

#### Northrop Grumman Information Systems (NGIS)

*Los Angeles, California (Headquarters)*

Contacts:	<b>Stefan Falke</b> <i>Manager, Information Systems</i>
Description:	<p>Northrop Grumman has been designing architectures and developing infrastructures in prototyping Climate Knowledge Integration Centers (CKIC) that gather and synthesize data from multiple sources in generating information tailored for regional and local decision making. The demonstration presents some of the progress to date, including:</p> <ul style="list-style-type: none"><li>• Implementation of web standards, including OGC web services, netCDF-CF conventions and interoperability efforts with the GEOSS Architecture Implementation Pilot</li><li>• Research in Regional Climate Modeling for climate change impacts and adaptation, including development of Decision Aids to translate scientific data from climate models into meaningful actionable information for strategic decision-making.</li></ul>

### Exhibit B

#### National Geospatial Technology Extension Network (NGTEN) Cooperative Extension Service

*College Station, Texas*

Contacts:	<b>Amy Hays</b> <i>Extension Program Specialist</i> <i>Texas AgriLife Extension Service, Texas A&amp;M Institute of Renewable Natural Resources</i>
Description:	<p>The National Geospatial Technology Extension Network (NGTEN) is a collaborative partnership of Land Grant, Sea Grant, and Space Grant specialists across the US. The mission of NGTEN is to facilitate the practical use of Earth systems science and technology, and help meet the growing demand for a spatially literate workforce. This is made possible through seeds sown by NASA, USDA and NOAA, and the science and education networks provided by University-based Land Grant (Cooperative Extension), Space Grant, Sea Grant and other local partners.</p> <p>Specialists that serve in states are called Geospatial Extension Specialists and their role is to act as a knowledge broker, or the two-way conduit between research, applications development and practice.</p> <p>GES' build on existing Earth science capabilities, which include Earth observations from space, modeling and systems engineering, geographic information systems (GIS), the global positioning system (GPS) and spatial decision support systems (SDSS). The National Geospatial Technology Extension Network (NGTEN) is an informal network that helps Geospatial Extension Specialists (GES) that share ideas, leverage successful</p>

## Exhibit Descriptions

educational programs and geospatial applications, and ultimately identify the “best of the best” for implementation locally. NGTEN assists the USDA, NASA, and NOAA in helping to identify critical needs in the public sector and how those agencies can participate in meeting those needs through data, technology, and training. In each state, NGTEN members work with their Universities, communities, and partners to assist facilitating data transfer, development of applications and tools, discovery of data needs, and development of best practices and standards for data legacy. By working together as a network, they share ideas, participate in joint training, and work to identify emerging geospatial needs. NGTEN serves as a resource for USDA, NASA, NOAA and other geospatial organizations to connect with the public and expand the use of geospatial tools and technologies.

As a group, NGTEN covers 17 areas of need across USDA, NOAA, and NASA. Specialists create technology applications, conduct research, develop outreach and education programs, and provide resources to their states and through the NGTEN network. Specialists often cross-populate between science and applications, as well as serve multiple state needs. In 2008, NGTEN was instrumental in launching a "Community of Practice" through the USDA eXtension initiative. NGTEN developed a portal for the resource area of geospatial technology (<http://www.extension.org/geospatial-technology>) which allows for information dissemination, collaborative work spaces, training modules, and a variety of tools and resources that the public can access to learn more about how geospatial technologies are applied as well as the various uses and applications across the globe. This portal serves to provide relevant, science-based information that can make a difference in the daily lives of citizens.

For more information, please visit:

NGTEN <http://www.geospatialextension.org>

eXtension <http://www.extension.org/geospatial%20technology>

### Exhibit C

## Federation of Earth Science Information Partners (ESIP)

*Raleigh, North Carolina*

#### Contacts:

**Carol B. Meyer**  
*ESIP Executive Director*

#### Description:

The Federation of Earth Science Information Partners (ESIP Federation) is a broad-based community comprising researchers and associated groups that produce, interpret and develop applications for Earth and environmental science data. The ESIP Federation was formed in 1998 in response to a National Research Council recommendation calling for the involvement of community stakeholders in the development of NASA’s EOSDIS as a critical element of the U.S. Global Change Research Program. It now includes 115 member organizations, including NOAA, NASA and USGS data centers, government research laboratories, research universities, education resource providers, technology developers, and various nonprofit and

## Exhibit Descriptions

commercial enterprises.

The ESIP Federation's work is dedicated to providing the most up-to-date science-based information to researchers, educators and decision makers who are working to understand and address the environmental, economic and social challenges presented by a dynamic planet. By providing a community forum in which all Earth and environmental data stakeholders can meet on a peer-to-peer basis, the ESIP Federation fosters collaborations and technical innovations aimed at making Earth and environmental science information accessible, usable and relevant to consumers outside of the research community.

The ESIP Federation evolved from its early days of being an advisory body to NASA into being a dynamic forum in which data, technical and science experts from across agencies, academia and the private sector collaborate. Through collaboration, the ESIP Federation helps define best practices and community standards for the Earth and environmental information community. The ESIP Federation routinely participates in community efforts, including active contributions to building the Global Earth Observing System of Systems (GEOSS). The outcome of the community's efforts has resulted in better collaboration, knowledge exchange and an emerging consensus on best practices within this dynamic community. [www.esipfed.org](http://www.esipfed.org)

### Exhibit D

## Center for Spatial Information Science and Systems (CSISS) at George Mason University (GMU)

*Greenbelt, Maryland*

#### Contacts:

**Yuqi Bai**

*Research Assistant Professor*

**Yuanzheng Shao**

*Research Assistant*

#### Description:

The Center for Spatial Information Science and Systems (CSISS), George Mason University (GMU) is going to demonstrate our achievements in promoting NOAA data in OpenGIS Consitum Web Service Pilot (OWS), Global Earth Observation System of Systems (GEOSS) AIP activities in the last several years.

In particular, we will demonstrate the following software packages, or online systems:

1. Prototype of Persistent OpenGIS CSW interface for NOAA data based on SNAAP package
2. Prototype of Persistent OpenGIS Web Coverage Service for NOAA GOES data
3. Standards-compliant data discovery and order interface for NOAA data
4. Severe Weather Detection Service based on NOAA GOES data

## Exhibit Descriptions

### Exhibit E

#### OPeNDAP : The Open-source Project for a Network Data Access Protocol

*Narragansett, Rhode Island*

Contacts:

**Daniel Holloway**  
*OPeNDAP*

Description:

Hyrax is the next generation server from OPeNDAP. It utilizes a modular design that employs a lightweight Java servlet to provide the public-accessible client interface, and a back-end daemon to handle the heavy lifting. This design is very flexible and can be adapted to many different deployment strategies from those used by large data centers to serving data using a single laptop computer. The server supports a number of widely-used data formats, has a very simple interface for customization allowing sites to tailor it for their own in-house systems or formats and has an active community of users and developers. In addition to support for OPeNDAP's Data Access Protocol, Hyrax supports Unidata's THREDDS and NCML. THREDDS catalogs provide a concise machine-readable catalog for data. NCML provides, among other things, a way for new data sets to be built up by aggregating existing ones together. In addition to the DAP and ASCII return types, Hyrax can also return data encapsulated in netCDF files.

Hyrax 1.6.1 has recently been released. See [www.opendap.org](http://www.opendap.org).

### Exhibit F

#### StormCenter Communications, Inc.

*Baltimore, Maryland*

Contacts:

**Dave Jones**

*Founder, President & CEO*

**Rafael Ameller**

*Director of Technology*

**Sarah Maxwell**

*Meteorologist, Environmental  
Content Producer*

Description:

StormCenter will be demonstrating its newly developed visualization and collaboration tool to connect NOAA NWS SR HQ with FEMA Region VI and the Texas Governor's Division of Emergency Management (GDEM) using its Envirocast® Vision™ Collaboration Module (EVCN). EVCN enables real-time decision support services to be supplied by the NWS to other federal and state agencies for rapid and improved decision making. This project also integrates NASA data for enhanced decision making and improved decision support services and will be expanding its data access capabilities to take advantage of NASA, NOAA, USGS, EPA and many other observation, model and environmental data sources to improve decision making across multiple agencies, organizations, municipalities and governments for the end user to take advantage of the ever increasing data sources produced by government and private corporations.

**Exhibit G**

**Open Geospatial Consortium (OGC)**

*Herndon, Virginia*

Contacts:

**Mark Reichardt**

*OGC President & CEO*

**George Percivall**

*OGC Chief Architect*

Description:

The OGC is an international consortium of more than 390 companies, government agencies, research organizations, universities and not-for-profit organizations participating in a consensus process to develop publicly available geospatial standards. OGC Standards support interoperable solutions that "geo-enable" the Web, wireless and location-based services, and mainstream IT.

OGC Standards help to improve data sharing and reuse within and across disciplines, and make it easier to mobilize new sources of information and new technologies to address increasingly complex social, environmental and economic problems.

The OGC has developed a range of OGC Web Service (OWS) standards to improve the ease at which location or geospatial information can be discovered, accessed, fused and applied to increasingly complex problems facing decision makers worldwide. In the past several years, OGC members have emphasized standards development in support of broad geosciences objectives in the areas of hydrology, climate change, weather ocean observation, geology, and environmental science. Recently, OGC released a family of Sensor Web Enablement standards which provide rapid and real time access to a range of fixed and mobile sensors, and the ability to access, integrate, fuse and apply sensor information for decision making in a location and temporal context. This coupled with the release of the OGC Web Processing Service provides a significant level of standards-based capability to help advance the objectives of the earth science community.

## Demonstration Descriptions

### Demo Station 1

#### The Digital Atlas

*Providing Access to NOAA's Exploration Data and The Okeanos Atlas*

Presenter: **Susan Gottfried**, NOAA/NESDIS

Description: *The Digital Atlas: Providing Access to NOAA's Exploration Data:*

*OER's Integrated Product Team for Exploration Data Management and Dissemination has collaboratively implemented an End-To-End (E2E) Data Management Plan, ensuring that the sound scientific data and information products resulting from OER's global, interdisciplinary explorations are broadly accessible to decision makers, scientists, educators, and the public. This demonstration will show the Digital Atlas, which is the OER portal to distributed exploration information.*

*The Okeanos Atlas:*

*Using Google technology, follow the adventures of the NOAA Ship Okeanos Explorer, America's ship dedicated to exploration, and learn how to access data and information products resulting from Okeanos expeditions.*

### Demo Station 2

#### World Ocean Database and World Ocean Atlas

Presenter: **Andy Allegra**, NOAA/NESDIS

Description: *World Ocean Database 2009 is the largest, most comprehensive collection of scientific ocean data, containing records dating as far back as the late 1700's. This demonstration will show direct access methods to the quality controlled data and metadata, as well as the statistical and analyzed climatology fields of the World Ocean Atlas. Data types include temperature, salinity, oxygen, nutrients, CO2, biology data, and more.*

### Demo Stations 3 and 4

#### NOAA's NOMADS / OceanNOMADS

*National Operational Model Archive & Distribution System*

Presenter: **Glenn Rutledge**, NOAA/NESDIS & **Jordan Alpert**, NOAA/NWS

Description: *The NOAA National Operational Model Archive and Distribution System (NOMADS).*

*For nearly 10 years the NOMADS collaboration has advanced the concept of an open standards, format neutral data access methodology. Last year NOMADS was adopted*

## Demonstration Descriptions

by the NWS with 24/7 operational servers in Dallas TX, Boulder CO, and Silver Spring MD. The NOMADS partners (NWS, NCEP EMC and CPC; NODC, NCDDC, PMEL, GFDL, NCAR, COLA and Unidata) continue to advance the type and quantity of data served (100's of TB/mo).

This presentation will demonstrate new capabilities built from this simple open standards data sharing philosophy with an on-line, multi-model Probability Density Function (PDF's) application using NCEP Global Ensemble suite feeding an RSS feed to cell phone technology for agricultural purposes. This capability is currently being used and advanced by the World Bank. Additionally, this presentation will provide an short overview of the FY10-14 National Climate Model Portal (NCMP) that will be an extension of NOMADS to include a National Reanalysis Clearinghouse for Observations; a Regional downscaling capability being developed under NCMP at the new NOAA Cooperative Agreement for Climate Studies at Asheville, and an new NCMP Earth System Grid capability to support the IPCC CMIP Assessment Report (AR).

For more information on NOMADS please visit <http://nomads.ncdc.noaa.gov/> or <http://nomads.ncep.noaa.gov/>

### Demo Station 5

#### GEO-IDE / UAF Grid

*Global Earth Observation – Integrated Data Environment / Unified Access Framework for Gridded Data*

Presenter: **Steve Hankin, NOAA/OAR & Kevin O'Brien, NOAA/OAR**

Description: *The Unified Access Framework for Gridded data (UAF Grid) project is a NOAA-wide effort to develop a gridded dataset integration capability. The project is being developed as an initial prototype of NOAA's Global Earth Observation – Integrated Data Environment (GEO-IDE) initiative.*

*The capability is being developing using several de facto standards: netCDF, which provides the abstract data model, software libraries and a persistent binary format; the Climate and Forecast (CF) metadata conventions; the OPeNDAP protocol for web transport of data subsets; THREDDS XML catalogs which provide a distributed topology connecting data suppliers; and an OGC compatibility layer that provides access to the grids through WMS and WCS.*

*The initial focus has been to develop a NOAA-wide THREDDS catalog of CF-compliant datasets (e.g. model outputs, satellite products, High Frequency radar observations, etc.) and to connect the catalog to several popular client tools (e.g. MatLab, LAS, ERDDAP, Google Earth, etc.) to enable direct access and use of the datasets.*

## Demonstration Descriptions

### Demo Station 6A (2:00 – 4:00)

#### IOOS DMAC

*Integrated Ocean Observing System Data Management & Communications*

Presenter: **Jeff de la Beaujardiere**, NOAA/NOS

Description: *The Integrated Ocean Observing System (IOOS®) is a federal, regional, and private-sector partnership working to enhance our ability to collect, deliver, and use ocean information. IOOS delivers the data and information needed to increase understanding of our oceans and coasts, so decision makers can take action to improve safety, enhance the economy, and protect the environment.*

### Demo Station 6B (4:00 – 5:30)

#### MADIS

*Meteorological Assimilation Data Ingest System*

Presenter: **David Helms**, NOAA/NWS

Description: *The Meteorological Assimilation Data Ingest System (MADIS) is dedicated toward making value-added data available from the National Oceanic and Atmospheric Administration's (NOAA) Earth System Research Laboratory (ESRL) Global Systems Division (GSD) for the purpose of improving weather forecasting, by providing support for data assimilation, numerical weather prediction, and other hydrometeorological applications.*

*MADIS subscribers have access to an integrated, reliable, and easy-to-use database containing the real-time and archived observational datasets described below. Also available are real-time gridded surface analyses that assimilate all of the MADIS surface datasets (including the highly-dense integrated mesonet data). The grids are produced by the Rapid Update Cycle (RUC) Surface Assimilation System (RSAS) that runs at ESRL/GSD, which incorporates a 15-km grid stretching from Alaska in the north to Central America in the south, and also covers significant oceanic areas. The RSAS grids are valid at the top of each hour, and are updated every 15 minutes.*

## Demonstration Descriptions

### Demo Station 7

#### Climate Portal

Presenter: **David Herring**, NOAA/OAR

Description: *With the rapid rise in the development of Web technologies and climate services across NOAA, there has been an increasing need for greater collaboration regarding NOAA's online climate services. The drivers include the need to enhance NOAA's Web presence in response to customer requirements, emerging needs for improved decision-making capabilities across all sectors of society facing impacts from climate variability and change, and the importance of leveraging climate data and services to support research and public education. To address these needs, NOAA embarked upon an ambitious program to develop a NOAA Climate Services Portal (NCS Portal).*

### Demo Station 8

#### Unidata

Presenter: **Mohan Ramamurthy**, Unidata

Description: *Unidata's mission is to provide the data services, tools, and cyberinfrastructure leadership that advance Earth system science, enhance educational opportunities, and broaden participation. The Unidata Program Center (UPC) (<http://www.unidata.ucar.edu/>) is managed by the University Corporation for Atmospheric Research and sponsored primarily by the National Science Foundation through a proposal process and a longstanding cooperative agreement.*

*Over 170 institutions worldwide participate in the Unidata data sharing network and many more institutions use Unidata tools and technologies in education, research, and operations. While Unidata's primary mission of serving the academic community remains unchanged through the years, the user base has broadened and its activities and responsibilities have grown as community needs have evolved. Today, participation in Unidata has grown to more than 1,500 academic institutions and 7,000 organizations worldwide, including universities, labs, private sector companies, and non-governmental organizations.*

*As the enabler of a broad community, the UPC*

- *Acquires and distributes data to facilitate Earth system education and research*
- *Develops software for accessing, managing, analyzing, visualizing, and effectively using those data*
- *Provides comprehensive support to users*
- *Conducts annual training workshops on Unidata software packages*
- *Facilitates advancement of standards, conventions, and interoperability*
- *Provides leadership in geosciences*

## Demonstration Descriptions

- *Assesses and responds to community needs*
- *Advocates on behalf of the university community on data issues and negotiates data agreements*
- *Fosters community interaction and engagement to promote sharing of data, tools, and ideas*
- *Grants equipment awards to universities to enable and enhance participation in Unidata*

*Unidata's hallmark has been democratizing access to data and tools by serving both large and small institutions in higher education. The program benefits from the diversity of its user community, spanning the technological, educational, and scientific spectra. Unidata-provided cyberinfrastructure has enriched university courses by facilitating educators' efforts to incorporate applications of real-time data and state-of-the-art tools into student-centered learning experiences, enhanced productivity of students and researchers, and transformed the culture in atmospheric science departments. Unidata has experienced a gradual but natural evolution from a program focused primarily on synoptic scale meteorology to one that serves a broader geosciences community. Unidata has attracted a broader community because it has been successful in providing tools and services that are interoperable, extensible, platform independent, and free. The quality, robustness and maturity of Unidata tools and services have resulted in their broader use by the U. S. National Weather Service and other weather agencies around the world, NOAA laboratories, NASA, USGS, and ECMWF, as well as other organizations and many companies in the private sector. In the process, Unidata has become a cornerstone data facility upon which the university geosciences community and many other stakeholders have come to rely.*

*During the NOAA Environmental Data Management Workshop demonstration period, an overview of Unidata will be presented along with a demonstration of some of Unidata tools and technologies.*

### Demo Station 9

#### NMFS Enterprise Data Management

*InPort, & Fisheries One-Stop-Shop*

Presenter: **Jim Sargent**, NOAA/NMFS

Description: *Projects to be demonstrated in this session include (1) the Enterprise Data Management (EDM) program itself, (2) InPort, our metadata repository, and (3) our Fisheries One-Stop-Shop portal/website.*

## Documenting Environmental Data

<b>Date</b>	Wednesday, May 26
<b>Time</b>	<b>9:30 AM to 12:00 Noon</b>
<b>Location</b>	<b>SSMC-3, Room 4527</b>
<b>Session Leads</b>	<b>Ted Habermann and Kim Jenkins</b>
<b>Overview</b>	This breakout session focuses on the documentation of NOAA Observations and Products using several dialects (FGDC, ISO, THREDDS, and netCDF Conventions) and the development of a community for sharing experiences, expertise and tools to support that effort.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>♦ Increase awareness of the benefits of standard approaches to documentation early in the data lifecycle by bridging the gap between metadata experts, observing system managers, and data providers</li> <li>♦ Introduce the GEO-IDE Wiki as an environment for sharing information about experiences, expertise and tools</li> <li>♦ Identify a handful of micro-pilots that build bridges between existing documentation approaches and familiarize members of the community with current work across NOAA and partners in the global environmental community</li> <li>♦ Focus attention on connecting existing documentation to national and international portals (GeoSpatial One-Stop, Data.gov, and GEOSS)</li> </ul>

## Data Access Services

<b>Date</b>	Wednesday, May 26
<b>Time</b>	<b>9:30 AM to 12:00 Noon</b>
<b>Location</b>	<b>NOAA Auditorium</b>
<b>Session Leads</b>	<b>Ken McDonald and Jeff de la Beaujardiere</b>
<b>Overview</b>	This breakout session focuses on the approaches to delivering environmental data to customers/users via a variety of web services.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>♦ Highlight current activities, projects, and approaches to providing access to environmental data</li> <li>♦ Discuss opportunities, strengths, weaknesses, and limitations in delivering web services within NOAA</li> <li>♦ Document recommended approaches to encourage convergence within NOAA</li> </ul>

## Data Interoperability and Use

<b>Date</b>	Wednesday, May 26
<b>Time</b>	<b>1:00 to 3:30 PM</b>
<b>Location</b>	<b>NOAA Auditorium</b>
<b>Session Leads</b>	<b>Jason Marshall</b>
<b>Overview</b>	This breakout session focuses on various approaches for accessing and consuming web services within a variety of client applications.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>♦ Highlight current activities, projects, and approaches to accessing and consuming data via web services within client applications</li> <li>♦ Discuss opportunities, strengths, weaknesses, and limitations in consuming web services within NOAA</li> <li>♦ Summarize best practices and challenges for utilizing web services within client applications; discuss options for improvement</li> </ul>

## Long-term Preservation and Stewardship

<b>Date</b>	Wednesday, May 26
<b>Time</b>	<b>1:00 to 3:30 PM</b>
<b>Location</b>	<b>SSMC-3, Room 4527</b>
<b>Session Leads</b>	<b>Steve Delgreco and Nancy Ritchey</b>
<b>Overview</b>	This breakout session focuses on issues related to the long-term preservation and stewardship of NOAA's environmental data.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>♦ Familiarize participants with the "NOAA Procedure for Scientific Records Appraisal and Archive Approval" process</li> <li>♦ Outline the way forward for the development of a "How to Archive" concept of operations building on the work of the Archive Architecture Team</li> <li>♦ Discuss the Open Archival Information System - Reference Model (OAIS-RM) as a common language for discussing the long-term preservation and stewardship of information</li> <li>♦ Discuss preservation and stewardship standards such as configuration management, data migration, and common data model</li> <li>♦ Data stewardship and information preservation in the "cloud;" federation, dynamic processing, and work flows in a widely distributed system</li> </ul>

## Speaker Biographies



### **Mary M. Glackin**

***Deputy Under Secretary for Oceans and Atmosphere  
National Oceanic and Atmospheric Administration (NOAA)***

Mary M. Glackin has been the Deputy Under Secretary for Oceans and Atmosphere since December 2, 2007. In this role she is responsible for the day-to-day management of NOAA's domestic and international operations.

Glackin has more than 15 years of senior executive level experience working in numerous NOAA line offices. She served as the acting Assistant Administrator for Weather Services and Director, National Weather Service from June 12, 2007, through September 15, 2007.

Before that, she was the Assistant Administrator for the National Oceanic and Atmospheric Administration's (NOAA) Office of Program Planning and Integration. From 1999 until 2002, she served as the Deputy Assistant Administrator for the National Environmental Satellite, Data, and Information Service of NOAA. From 1993 to 1999, she worked as the Program Manager for the Advanced Weather Interactive Processing System (AWIPS) with the National Weather Service (NWS), NOAA. Prior to this, Ms. Glackin was both a meteorologist and computer specialist in various positions within NOAA where she was responsible for introducing improvements into NWS operations by capitalizing on new technology systems and scientific models.

She is the recipient of the Presidential Rank Award (2001), Charles Brooks Award for Outstanding Services to the American Meteorological Society, the NOAA Bronze Medal (2001), the Federal 100 Information Technology Manager Award (1999), the NOAA Administrator's Award (1993), and the Department of Commerce Silver Medal Award (1991). She is a Fellow of the American Meteorological Society and a member of the National Weather Association and the American Geophysical Union.

Ms. Glackin has a B.S. degree from the University of Maryland

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### **John L. "Jack" Hayes**

***Assistant Administrator for Weather Services,  
National Oceanic and Atmospheric Administration (NOAA)  
Director, National Weather Service (NWS)***

John L. "Jack" Hayes is the National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Weather Services and National Weather Service (NWS) Director. In this role, Dr. Hayes is responsible for an integrated weather services program, supporting the delivery of a variety of weather, water, and climate services to government, industry, and the general public, including the preparation and delivery of

weather warnings and predictions, and the exchange of data products and forecasts with international organizations.

Dr. Hayes returned to the NWS in 2007 after serving as the director of the World Weather Watch Department at the World Meteorological Organization (WMO), a specialized agency of the United Nations located in Geneva, Switzerland. In that position, he was responsible for global weather observing, weather data exchange telecommunications, and weather data processing and forecasting systems.

Before joining the WMO, Dr. Hayes served in several senior executive positions at NOAA. As the Deputy Assistant Administrator for NOAA Research, he was responsible for the management of research programs. As Deputy Assistant Administrator of the National Ocean Service (NOS), he was the chief operating officer dealing with a multitude of ocean and coastal challenges, including the NOS response to the Hurricane Katrina disaster in August 2005. As Director of the Office of Science and Technology for the NWS, Dr. Hayes had oversight of the infusion of new science and technology essential to weather service operations.

## ***Speaker Biographies***

Dr. Hayes was also an executive in the private sector and the military. He was general manager of the Automated Weather Interactive Processing System (AWIPS) program at Litton-PRC from 1998 through 2000. AWIPS is the interactive computer system used by all weather service forecasters. From 1970 through 1998, Dr. Hayes spent a career in the United States Air Force. He held a variety of positions, culminating his career as the Commander of the Air Force Weather Agency in the rank of Colonel.

Dr. Hayes received both his Ph.D. and Master of Science degrees in meteorology from the Naval Post Graduate School in Monterey, California. A Fellow in the American Meteorological Society, he also graduated from Bowling Green State University, with a bachelor's degree in mathematics.

Dr. Hayes has been married to his wife, Sharon, for over 37 years and has three grown children.

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### **Joe Klimavicz**

***Chief Information Officer & Director, High Performance Computing & Communications  
National Oceanic and Atmospheric Administration (NOAA)***

Mr. Joseph F. Klimavicz was named National Oceanic and Atmospheric Administration (NOAA) Chief Information Officer (CIO) and Director, High Performance Computing and Communications in January 2007. In this position, he is responsible for implementing the Clinger-Cohen Act, Federal Information Security Management Act, and other statutory requirements regarding the acquisition, management, and use of NOAA's information and information technology resources, to include NOAA's high performance computing and communications infrastructure. Mr. Klimavicz is also responsible for NOAA's Homeland Security Program to ensure business continuity in event of a terrorist attack, major disaster, or other emergency, and he serves as the Department of Commerce Senior Agency Official for Geospatial Information (SAOGI). He previously served in the Department of Defense (DOD) as the National Geospatial-Intelligence Agency Deputy CIO, and as the DOD SAOGI.

Mr. Klimavicz has served over 20 years in the federal government. He began his career with the Central Intelligence Agency (CIA) as an imagery scientist, developing photogrammetric math models in the National Photographic Interpretation Center, and subsequently, served in line management positions within the CIA and the DOD, leading the development of information technology investment plans, and managing information technology acquisitions and operations.

In March 2010, Mr. Klimavicz was elected President of the Government Information Technology Executive Council (GITEC), a non-profit organization of Government Executives formed in 1996 to support Government delivery of high quality and cost-effective services.

Mr. Klimavicz received a Bachelor of Science degree from Virginia Polytechnic Institute and State University in 1983 and a Master of Engineering degree from Virginia Polytechnic Institute and State University in 1988. Major areas of study included geodesy, photogrammetry and imaging systems.

Mr. Klimavicz lives in Vienna, VA., with his wife, Brenda and their three daughters.

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## Speaker Biographies



### **Helen M. Wood**

***Senior Advisor & GEOSS Integration Manager  
National Oceanic and Atmospheric Administration (NOAA)***

Helen M. Wood is Senior Advisor and Global Earth Observation System of Systems (GEOSS) Integration Manager for the U.S. National Oceanic and Atmospheric Administration (NOAA). She co-chairs and represents NOAA on the Subcommittee on Global Earth Observation (USGEO) under the U.S. National Science and Technology Council (NSTC). The USGEO provides leadership and coordination to help assess, plan and integrate the Earth observation activities and programs of the U.S. Federal government in order to maximize societal benefits from these investments. Wood is chair of the NOAA Environmental Data Management Committee, which is charged with improving lifecycle management of NOAA's valuable environmental data.

Wood is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in which she has held numerous positions including IEEE Vice President and Member of the Board of Directors, and President of the IEEE Computer Society. She is actively involved in both the Computer Society and the Geosciences and Remote Sensing Society of the IEEE; was recognized as IEEE Engineering Manager of the Year; and received the Computer Society's highest award for distinguished service to the computing profession. She was awarded the Meritorious Service Award by the American National Standards Institute for her leadership and contributions to computing and communications standardization.

She has twice received the U.S. Department of Commerce Gold Medal, as well as the Silver and Bronze Medals. She has also been awarded the Presidential Meritorious Executive Award. She holds a B.S. in Mathematics from the University of Maryland and an M.S. in Computer Science from The American University.

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### **Deirdre Reynolds Jones**

***Director, Systems Engineering Center  
Office of Science and Technology, NOAA's National Weather Service (NWS)***

Deirdre Reynolds Jones joined the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) in 1992 at the Radar Operations Center (ROC) in Norman, OK. She held positions quality assurance and engineering management. A product of the Department of Commerce Senior Executive Service Candidate Development Program, Ms Jones was appointed to the NWS Office of Science and Technology in 2001 where she is the Director of the Systems Engineering Center. Currently, she oversees technical implementation of several NOAA weather system projects, including system improvements for the Advanced Weather Interactive Processing System (AWIPS) and the Next Generation Weather Radar (NEXRAD).

Prior to joining the NWS Ms Jones worked nine years with Vitro Corporation on the Ground Launched Cruise Missiles (GLCM) program. She improved the integration and test programs for the GLCM Weapons Control System software. In 1987, she moved to Oklahoma with Vitro where she became Chief Engineer for Vitro's Oklahoma City Engineering Office until its closing in 1990.

Ms Jones holds a Master of Science in Systems Management from the University of Southern California (USC). She is also a graduate of Rensselaer Polytechnic Institute (RPI) with a Bachelor of Science degree in Electrical Engineering. She resides in Silver Spring, Maryland with her spouse of eighteen years, Bobby Jones.

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## Speaker Biographies



### **Dr. Mohan Ramamurthy**

*Director, Unidata*

*University Corporation for Atmospheric Research, Boulder Colorado*

Dr. Mohan Ramamurthy is the Director of UCAR's Unidata Program and is a scientist at the National Center for Atmospheric Research. Unidata is a national facility, funded by the National Science Foundation, and its mission is to provide the data services, tools, and cyberinfrastructure leadership that advance Earth system science, enhance educational opportunities, and broaden participation. Unidata serves users in thousands of institutions worldwide, and it has 23 staff members and an annual budget of approximately \$4.6M.

Dr. Ramamurthy studied weather processes and prediction, including mesoscale phenomena such as snowbands, gravity waves, and hurricanes, and conducted research in data assimilation and ensemble forecasting for 25 years. His current interests are focused on information technology, interactive-multimedia instruction and learning, scientific data services, and more broadly the application of cyberinfrastructure in the geosciences. Dr. Ramamurthy has published more than 50 peer-reviewed papers on many topics in meteorology, information technology, and geoscience education.

Dr. Ramamurthy joined UCAR in 2003 after spending nearly 17 years on the faculty in the Department of Atmospheric Sciences at the University of Illinois at Urbana-Champaign. Dr. Ramamurthy has a bachelor's and master's degrees in Physics from the University of Poona in India. He earned his Ph. D. in Meteorology from the University of Oklahoma, where his doctoral research dealt with the analysis of data and modeling of disturbances associated with monsoons. Dr. Ramamurthy is a Fellow of the American Meteorological Society.

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### **Mark Reichardt**

*President and Chief Executive Officer*

*Open Geospatial Consortium (OGC)*

Mark Reichardt is President and Chief Executive Officer of the Open Geospatial Consortium, Inc. (OGC). Mr. Reichardt has overall responsibility for Consortium operations, overseeing the development and promotion of OpenGIS® standards and working to ensure that OGC programs foster member success. He works with other standards development organizations and professional associations to establish alliance agreements to assure that OGC standards and other standards work together fluidly. Such coordination is critical, for example, to support standards that enable the full integration of geospatial information with real time sensor data and Building Information Models (BIM) used in architecture, engineering, construction and full life cycle management of buildings and other physical infrastructure. Mr. Reichardt joined the Consortium in November 2000 as Director of Marketing and Public Sector Programs; became the President of OGC and a member of the Board of Directors in September, 2004; and was appointed President and CEO in January 2008.

Before joining the OGC, Mr. Reichardt was involved in technology modernization and production programs for the US Government. In the mid 1990's, he was a member of a DoD Geospatial Information Integrated Product Team (GIIPT) formed to help transition the DoD mapping mission to a more flexible and responsive geo-information based paradigm. Under Mr. Reichardt's leadership, the GIIPT Production Team validated the ability of commercial off the shelf hardware and software to meet many of the DoD functional requirements for geospatial production operations.

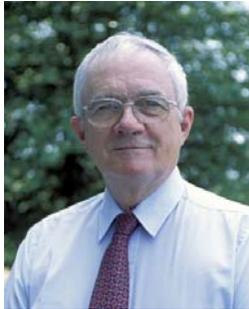
In 1998 Mr. Reichardt accepted an assignment with Vice President Gore's National Partnership for Reinventing Government to manage a program to illustrate how the use of geospatial information and technologies could improve local to federal government coordination. In early 1999, Mr. Reichardt was selected to establish and lead an international Spatial Data Infrastructure (SDI) program for the US Federal Geographic Data Committee. In this

## ***Speaker Biographies***

position, Mr. Reichardt helped to establish globally compatible national and regional SDI practices in Africa, South America, Europe, and the Caribbean. He was instrumental in establishing several nation-to-nation collaborative SDI agreements.

Mr. Reichardt serves on the Board of Directors of the Global Spatial Data Infrastructure Association and on the BuildingSmart Alliance Board of Direction.

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### **Ferris Webster**

***Chairman***

***NOAA Data Archiving and Access Requirements Working Group (DAARWG)***

Ferris Webster is Emeritus Professor of Oceanography in the College of Earth, Ocean, and Environment of the University of Delaware. He was born in Canada and received B.Sc. and M.Sc. degrees in Physics at the University of Alberta. He obtained a Ph.D. in Geophysics at the Massachusetts Institute of Technology. Beginning then at the Woods Hole Oceanographic Institution, he held a number of scientific positions, becoming Senior Scientist, Chairman of the Physical Oceanography Department, and then Associate

Director for Research. During this period, he spent a sabbatical year at the National Institute of Oceanography in England.

Between 1978 and 1982, Dr. Webster served as Assistant Administrator for Research and Development of the National Oceanic and Atmospheric Administration (NOAA). He joined the College of Marine Studies of the University of Delaware in 1983, where he served as Director of the Oceanography Program. From 1994 to 2008 he served as chairman of the Panel on World Data Centers of the International Council for Science.

His research interests include the role of the ocean in climate change, ocean variability, time-series analysis, and oceanographic data management and processing. He has contributed to the study of time-variable ocean currents, and has studied the processes of Gulf Stream meanders. Recent work involved data management and computer-based information management systems for the Global Observing Systems.

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### **Duane L. Apling**

***Northrop Grumman Information Systems (NGIS)***

Mister Apling began his career as a United States Air Force officer working at the Air Force Global Weather Central in Omaha, Nebraska, analyzing remotely sensed imagery data to support cloud cover forecasting for overhead reconnaissance systems. As a staff officer, he investigated and improved quality management processes and mainframe computing workflows to minimize forecasting timelines and maximize forecast skill. After leaving the Air Force, Mister Apling joined The Analytical Sciences Corporation, where he participated in diverse projects involving meteorology, remote sensing, climatology, mathematical modeling, systems analysis, and operations research. Presently, Mister Apling is with Northrop Grumman and is involved in developing decadal and long-range climate products tailored to meeting end-user needs; and in identifying and developing the enabling technologies which bridge gaps from the science and research community to the emerging new community of public and private decision makers dealing with the practical impacts of adaptation to climate change.

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\*AM Breakout Sessions: DocED = Documenting Environmental Data  
DataAS = Data Access Services

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LTP&S = Long-term Preservation and Stewardship

## Workshop Participant List

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\*AM Breakout Sessions: DocED = Documenting Environmental Data  
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