

Federation of Earth Science
Information Partners Guide to Winter
Conference 2011

January 4-6, 2011
Renaissance Dupont Circle Hotel
Washington, DC



Federation of Earth Science
Information Partners

MAKING DATA MATTER

The Foundation for Earth Science gratefully acknowledges the support it receives from NASA, NOAA and EPA in making the ESIP Federation community and its meetings possible. Further, we also acknowledge the tremendous volunteer support we receive from you, members of our community, whose contributions and expertise make the ESIP Federation the dynamic organization it has become.

Table of Contents

Special Events.....	5
Breakout Sessions.....	7
<i>Tuesday, January 4.....</i>	<i>7</i>
<i>Wednesday, January 5.....</i>	<i>12</i>
<i>Thursday, January 6.....</i>	<i>18</i>
Poster and Demo Abstracts.....	23
Speaker Bios.....	43

Special Events

Martha Maiden Lifetime Achievement Award for Service to the Earth Science Information Community

In honor of Martha E. Maiden's leadership, dedication and tireless efforts to nurture the ESIP Federation into a vibrant and mature organization, this award was established in 2009 to recognize outstanding service to the Earth science information community. This award honors individuals who have demonstrated leadership, dedication and a collaborative spirit in advancing the field of Earth Science information.

This award is named for Martha E. Maiden, NASA Program Executive for Earth Data Systems. Ms. Maiden is widely credited for nurturing the ESIP Federation in its infancy and has overseen its growth and maturity. This award will be presented on a regular basis, but not less than one time each year.

Time: Lunch on January 4

Recognition of Jim Frew's Service as ESIP Federation President

A special time has been set aside to recognize Jim Frew's service as President of the ESIP Federation. Please join us in thanking Jim for serving as President during the past two years.

Time: Reception on January 4

Breakout Session Descriptions

Tuesday Breakout Sessions (2-3:30)

ESIP 101: Orientation

Date Tuesday, January 4
Time 2:00 PM to 3:30 PM
Location Foggy Bottom
Session Leads Frew/Meyer

Abstract The ESIP Federation has grown its membership during the past several years and has evolved its activities during the same time. For those new to the ESIP Federation or anyone interested in learning more about its activities, join us for an overview presentation that will highlight the history, current activities, opportunities for involvement and how to become a partner. Session leader:

Call-in Information <https://www1.gotomeeting.com/join/773740288>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 773-740-288
 Audio PIN: Shown after joining the meeting

Climate and Energy Policy and User Requirements

Date Tuesday, January 4
Time 2:00 PM to 3:30 PM
Location Mt. Vernon
Session Leads Kumar

Abstract The Policy and User requirements session will include presentations on energy requirements and climate change impact on military installations, DOE's Bio Mass program, and technology transfer and cross-agency data sharing.

Call-in Information <https://www1.gotomeeting.com/join/568761169>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 568-761-169
 Audio PIN: Shown after joining the meeting"

Data Preservation and Stewardship

Date Tuesday, January 4
Time 2:00 PM to 3:30 PM
Location Dupont
Session Leads Duerr

Citation Guidelines and Identifiers

Citation and reproducibility are key concepts underpinning the science enterprise. Given that data have become central to the scientific process in many fields, the ability to cite data in a uniform manner is becoming increasingly important. For these reasons, the Stewardship and Preservation cluster of the ESIP federation has agreed to work on citation recommendations for both data providers and data users over the upcoming year. One of the core issues for citation is data identification, a topic that the cluster has addressed through its identifier assessment and testbed activities. In this session, the status of current data citation practice is reviewed, an update of cluster activities will be given, and a work plan for moving forward over the next year in these areas will be developed.

Abstract

Climate Change Education

Date Tuesday, January 4
Time 2:00 PM to 3:30 PM
Location Georgetown
Session Leads Mooney

The ESIP Education committee is forming a Climate Change Education Working Group (CCEWG) to support member's climate education initiatives. The Working Group will commence with a 90 minute panel-led town hall meeting featuring experts from several ESIP member organizations, including but not limited to NASA, NOAA, GLOBE, EPA, NSF, CLN and GLOBE. This will be followed by a group discussion to establish common ground.

Abstract

Call-in Information 800-508-7631
 * 2720736 *

Tuesday Breakout Session (2-3:30)

Cloud Computing

Date Tuesday, January 4
Time 2:00 PM to 3:30 PM
Location Potomac
Session Leads Yang

Abstract

Many Earth science problems cannot be explored by single computers and solved within a single science community, but through distributed computing paradigms and models interdisciplinary efforts, such problems can be tackled effectively. The emergence of cloud computing provides a potential solution to enable the addressing of the Earth science problems. This session provides the latest development on how cloud computing can help Earth sciences and how Earth sciences can help to shape cloud computing?

GoToMeeting <https://www1.gotomeeting.com/join/574906144>
Call-in Information VOiP or Dial 1 (877) 739-5902
Access Code: 574-906-144
Audio PIN: Shown after joining the meeting

Data Preservation and Stewardship

Date Tuesday, January 4
Time 4:00 PM to 5:30 PM
Location Dupont
Session Leads Duerr

Abstract **Towards an Earth Science Provenance and Context content standard sessions**
 During the first session in this two part track, existing guidance on what information needs to be kept in order to ensure usability and trustability of Earth Science data will be described and discussed. John Moses of NASA will also describe the reality as compared to this guidance as it applies to several NASA missions. Given this background, the remainder of these sessions will be dedicated to developing an action plan for the Preservation and Stewardship cluster to move forward with the development of a content standard for Earth Science provenance and context.

Climate Change Education

Date Tuesday, January 4
Time 4:00 PM to 5:30 PM
Location Georgetown
Session Leads Mooney

Abstract After the break we'll reconvene to set a course of action for 2011.

GCMD Metadata Authoring Workshop

Date Tuesday, January 4
Time 4:00 PM to 5:30 PM
Location Foggy Bottom
Session Leads Stevens

Abstract NASA's Global Change Master Directory (GCMD) enables users to discover and access data, services, and climate visualizations relevant to global change and Earth science research. In this session, participants will learn about the value of metadata and the GCMD for discovering Earth science data, services, and visualizations. In addition, data and services from ESIP members will be highlighted in the updated ESIP portal. A "hands-on" demonstration of our metadata authoring tool will be given and participants will have the opportunity to use the tool for describing their data, services, and visualizations.

Tuesday Breakout Session (4-5:30)

Climate and Energy Policy and User Requirements

Date Tuesday, January 4
Time 4:00 PM to 4:45 PM
Location Mt. Vernon
Session Leads Kumar
Abstract Continued from 2-3:30 Session.
Call-in Information <https://www1.gotomeeting.com/join/568761169>
VoIP or Dial 1 (877) 568-4106
Access Code: 568-761-169
Audio PIN: Shown after joining the meeting"

Energy, Climate & Air Quality Open Discussion for Future ESIP Activities

Date Tuesday, January 4
Time 4:45 PM to 5:30 PM
Location Mt. Vernon
Session Leads Kumar/Falke
Abstract This session will be held jointly with Air Quality to discuss future activities leveraging lessons learned from past successes, identifying current needs, and brainstorming potential projects.
Call-in Information <https://www1.gotomeeting.com/join/568761169>
VoIP or Dial 1 (877) 568-4106
Access Code: 568-761-169
Audio PIN: Shown after joining the meeting"

Earth Science Collaboratory Discussion

Date Tuesday, January 4
Time 4:00 PM to 5:30 PM
Location Potomac
Session Leads Murphy/Lynnes
Abstract We will present a proposed evolutionary path toward a coherent, collaborative framework of Earth science information, data, tools, services and workflows.
GoToMeeting <https://www1.gotomeeting.com/join/574906144>
Call-in Information VoIP or Dial 1 (877) 739-5902
Access Code: 574-906-144
Audio PIN: Shown after joining the meeting"

ESIP Business Meeting	
Date	Wednesday, January 5
Time	10:15 AM to 12:15 PM
Location	City Center Ballroom
Session Leads	Frew/Meyer
Agenda	<ol style="list-style-type: none"> 1. Roll Call 2. Proposed Governance Changes <ol style="list-style-type: none"> a. Repeal Bylaw IV.2.7 b. Revised Partnership Definitions c. Other 3. Consideration of Data Sharing Principles 4. Annual Election Results 5. Election for Vacant Committee Chair Positions 6. Type Caucuses for Type Representative Elections and Type Positions on Administrative Committees (Constitution & Bylaws, Finance & Appropriations and Partnership) 7. Preview of Summer 2011 Meeting in Santa Fe, New Mexico 8. Other Business
Call-in Information	https://www1.gotomeeting.com/join/773740288 VoIP or Dial 1 (877) 568-4106 Access Code: 773-740-288 Audio PIN: Shown after joining the meeting

Discovery Feed Services: OpenSearch, Dataset Casting, Collection Casting, and Service Casting	
Date	Wednesday, January 5
Time	10:15 AM to 12:15 PM
Location	Georgetown
Session Leads	Hua
Abstract	<p>The set of ESIP Discovery web services encompass the overlapping conventions of Earth science data-oriented OpenSearch, Data-Collection Casting, Data-Granule Casting, and Service Casting feed standards. With multiple distributed Earth science data systems already implementing these casting standards, a need has arisen to develop interoperable and community-driven conventions. We will cover interoperability use cases, setup a governance process for moving forward, discuss key issues, and settle on an initial ESIP Discovery Cast Response format.</p>

Data Preservation and Stewardship

Date	Wednesday, January 5
Time	1:45 PM to 3:15 PM
Location	Foggy Bottom
Session Leads	Duerr
Abstract	Continued from Tuesday 4-5:30 Session

Air Quality

Date	Wednesday, January 5
Time	1:45 PM to 3:15 PM
Location	Dupont
Session Leads	Falke
Abstract	<p>The Air Quality Workgroup breakout session will provide brief updates from multiple air quality related projects along with three in-depth discussions. The brief project updates from efforts across the community will focus on advances in interoperability as well as any work in evaluating and maximizing the impact of data in research and decision support. Three in-depth discussion topics are planned:</p> <ul style="list-style-type: none"> • Air Quality Cyberinfrastructure Recommendations Review – from the EPA CyAir project • GEOSS Mid-Term Evaluation and Review • GEOSS Air Quality Community of Practice Planning
Call-in Information	<p>Phone: 866-489-0573 (US, Canada, VOIP); 205-354-0149 (international) Meeting Code: *2279431* Screenshot: https://www1.gotomeeting.com/join/169019561</p>

Level 2 Data Search and Subset Tools

Date	Wednesday, January 5
Time	1:45 PM to 3:15 PM
Location	Georgetown
Session Leads	Raskin
Abstract	<p>Finding and extracting Level 2 (swath) data of interest can be a lengthy endeavor for a scientist or data end-user. Depending on the actual data involved, there can be many hurdles to cross over before a user can get at the data they are interested in. Searching for the data presents the first challenge, as many swath data products are not easily identified by region of interest, and there may be additional search criteria the user would like to impose to filter out unwanted data. Extracting swath data is the second challenge, as there tends to be a lot of variation among data sets, and some expert knowledge can be required of the user in order to properly extract the data of interest. Tools that aid users of the data in searching for and extracting Level 2 (swath) data will be presented and discussed.</p>
Call-in Information	<p>https://www1.gotomeeting.com/join/574906144 VOiP or Dial 1 (877) 739-5902 Access Code: 574-906-144 Audio PIN: Shown after joining the meeting</p>

Energy

Date	Wednesday, January 5
Time	1:45 PM to 3:15 PM
Location	Mt. Vernon
Session Leads	Kumar
Abstract	<p>This session will provide presentations from NOAA on Climate Services support to the Energy and Water sectors and from NASA on assessing the utility of Earth observation measurements informing energy sector applications. This will be followed by advances in GFDL and availability of high resolution global climate model data for analysis, uncertainty quantification for assessments of energy impacts, and wind forecasting for power generation.</p>
Call-in Information	<p>https://www1.gotomeeting.com/join/568761169 VoiP or Dial 1 (877) 568-4106 Access Code: 568-761-169 Audio PIN: Shown after joining the meeting</p>

Wednesday Breakout Sessions
(1:45-3:15)

Semantic Web Testbed and Tutorial

Date Wednesday, January 5

Time 1:45 PM to 3:15 PM

Location Potomac

Session Leads Fox

Abstract This 6 hr session presented over two half-days is intended to provide both the novice/ beginner/ manager and those already familiar with semantic web technologies in the context of an end-to-end application example. Material to be covered includes: Motivation and use case development. Use case analysis and model/ ontology development, technology and infrastructure options and methods for choosing. implementation and simple application development, user testing and discussion.

Call-in Information <https://www1.gotomeeting.com/join/453481584>
VoIP or Dial 1 (877) 739-5902
Access Code: 453-481-584
Audio PIN: Shown after joining the meeting"

Data Preservation and Stewardship

Date	Wednesday, January 5
Time	3:45 PM to 5:15 PM
Location	Foggy Bottom
Session Leads	Duerr
Abstract	<p>Towards an Earth Science Provenance and Context ontology sessions</p> <p>During the second session in this two part track, an overview of the leading provenance ontologies will be given, the gaps in these ontologies for Earth Sciences reviewed, and a number of pre-existing use cases discussed. Over the course of the session, additional use cases will be developed and a plan or roadmap for developing an Earth Science specific Provenance/Context Ontology within the cluster will be developed.</p>

Air Quality

Date	Wednesday, January 5
Time	3:45 PM to 5:15 PM
Location	Dupont
Session Leads	Falke
Abstract	Continued from 1:45-3:15 Session
GoToMeeting	https://www1.gotomeeting.com/join/169019561
Call-in Information	Phone: 866-489-0573 (US, Canada, VOIP); 205-354-0149 (international) Meeting Code: *2279431*

Energy

Date	Wednesday, January 5
Time	3:45 PM to 5:15 PM
Location	Mt. Vernon
Session Leads	Kumar
Abstract	Continued from 1:45-3:15 Session
GoToMeeting	https://www1.gotomeeting.com/join/568761169
Call-in Information	VoiP or Dial 1 (877) 568-4106 Access Code: 568-761-169 Audio PIN: Shown after joining the meeting"

Wednesday Breakout Sessions
(3:45-5:15)

Semantic Web Tutorial

Date Wednesday, January 5

Time 3:45 PM to 5:15 PM

Location Potomac

Session Leads Fox

Abstract Continued from 1:45-3:15 Session

GoToMeeting <https://www1.gotomeeting.com/join/453481584>

Call-in Information VoIP or Dial 1 (877) 739-5902
Access Code: 453-481-584
Audio PIN: Shown after joining the meeting"

Data Preservation and Stewardship

Date Thursday, January 6
Time **10:30 AM to 12:00 PM**
Location **Foggy Bottom**
Session Leads **Duerr**
Abstract Continued from Wednesday 3:45-5:15

ESIP Testbed

Date Thursday, January 6
Time **10:30 AM to 12:00 PM**
Location **Dupont**
Session Leads **Raskin**
Abstract The ESIP Products and Services Committee is establishing a Testbed to explore various standards, protocols, best practices, and technologies. The initial content for the Testbed include: i) expert skills, ii) unique object identifiers, iii) semantic web technologies, and iv) web portals. This session will discuss progress, strategies, and future opportunities for the Testbed.
<https://www1.gotomeeting.com/join/574906144>
Call-in Information VOiP or Dial 1 (877) 739-5902
 Access Code: 574-906-144
 Audio PIN: Shown after joining the meeting

Semantic Web Tutorial

Date Thursday, January 6
Time **10:30 AM to 12:00 PM**
Location **Potomac**
Session Leads **Fox**
Abstract Continued from Wednesday
GoToMeeting <https://www1.gotomeeting.com/join/453481584>
Call-in Information VoIP or Dial 1 (877) 739-5902
 Access Code: 453-481-584
 Audio PIN: Shown after joining the meeting"

Decisions Workshop: From Insight to Impact: Managing YOUR Data Through Evaluation

Date Thursday, January 6
Time 10:30 AM to 12:00 PM
Location Mt. Vernon

Session Leads Doucette/Prados

Sponsored by the Decisions Cluster, this workshop covers evaluation basics and GEO as a Case Study for how to improve the value of ESIP member activities through evaluation. Does not require previous experience with project evaluation

Abstract

Interventions and programs are implemented within complex environments that present challenges in evaluating efficiency and effectiveness and attributing outcomes and impact to specific actions. A general problem in evaluation efforts — and what often causes them to fall short of their intended objectives — is the failure to fully articulate a theory of change that includes the identification of critical mechanisms that support optimal outcomes; to select measurable objectives that are actionable, meaning that they are linked to practices that an organization can actually do something about; to incorporate diverse stakeholders including end-users; to craft the evaluation in terms of its role in data-driven decision-making; and, lastly to effectively communicate the return on investment in terms of not only cost, but human and social capital.

This workshop will provide an interactive opportunity for participants to become more familiar with effective evaluation approaches that include a focus on crafting a theory of change that characterizes the outcome goal(s) and impact as well as identifying the mechanisms of change – moving from activity to results. Matching evaluation levels with the objectives to be achieved (e.g., linking gap analysis with theory of change, etc.) will be addressed, as well as optimizing the actionability of evaluation efforts. The workshop will examine performance measurement strategies that support actionable data. Data based decision-making, value-based issues, and practice-based evidence related to evaluation and monitoring (M & E) activities (process, outcome, and impact) will be emphasized. A case study approach, focusing on the work of the Group on Earth Observations will be used as an illustrative example of how members of the Federation of Earth Science Information Partners can better use evaluation tools to achieve outcomes and to optimize the impact of their work.

Call-in Information

<https://www1.gotomeeting.com/join/311872985>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 311-872-985
 Audio PIN: Shown after joining the meeting

Data Stewardship Alliance

Date Thursday, January 6

Time 10:30 AM to 12:00 PM

Location Georgetown

Session Leads Habermann

Everyone knows that keeping up with changes in technology is difficult, particularly when a new technology makes current capabilities obsolete. Systems that have developed and evolved over the years are stressed by new demands and drivers. People with proven expertise resist adoption of new approaches. These challenges are exacerbated by the fact that the way ahead is generally hazy. Uncertainty about the best approach can lead to costly dead-ends and even successful projects run the risk of eventual failure because of unforeseen twists in the adoption process.

This period of high uncertainty and risk is termed the "Era of Ferment". It is a particularly bad time for interoperability, as groups go their own way in attempts to define "the way". Pressure to meet deadlines makes custom solutions attractive and, in the end, even small initial differences develop into chasms that make sharing data and results expensive and time consuming.

Abstract

We are on the threshold of an Era of Ferment initiated by the emergence and adoption of new ISO standards for documenting observations, products, and services. These standards significantly extend the breadth of previous standards and make it possible to address pressing challenges in transparency, understanding and preservation. Recognition of these benefits has driven many organizations to adopt these standards, but they now face the uncertainties and risks associated with the transition.

It is clearly important to escape this Era of Ferment as soon as possible. This session initiates progress towards that goal with ESIP members who understand that identifying common approaches and conventions is critical. We need to minimize risk and uncertainty and grow a community of practice aimed at creating and sharing high-quality data, products and services that are documented for understanding across disciplinary and national boundaries now and in the future. ESIP is clearly a great place to start!

Call-in Information

<https://www1.gotomeeting.com/join/773740288>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 773-740-288
 Audio PIN: Shown after joining the meeting

Data Preservation and Stewardship

Date Thursday, January 6
Time **1:30 PM to 3:00 PM**
Location **Foggy Bottom**
Session Leads **Duerr**
Abstract Cluster business meeting

- Chair/co-chair election - 15 min
- Summarize results and plans from sessions ~ 30 min
- Moving testbed activities forward ~ 30 min

Semantic Web Testbed and Tutorial

Date Thursday, January 6
Time **10:30 AM to 12:00 PM**
Location **Potomac**
Session Leads **Fox**
Abstract Continued from Wednesday
<https://www1.gotomeeting.com/join/453481584>
Call-in Information VoIP or Dial 1 (877) 739-5902
 Access Code: 453-481-584
 Audio PIN: Shown after joining the meeting

IT & Interoperability

Date Thursday, January 6
Time **1:30 PM to 3:00 PM**
Location **Dupont**
Session Leads **Ramachandran**
Abstract **Business Meeting**
IT&I Plans for 2011

- Rant and Rave Webinar Feedback
- Speaker/Topics Line up
- Online Technology Tutorials
- Semi-structured publishing status and current plans
- Interoperability, technology demonstration projects

Call-in Information <https://www1.gotomeeting.com/join/574906144>
 VOiP or Dial 1 (877) 739-5902
 Access Code: 574-906-144
 Audio PIN: Shown after joining the meeting

MENDS

Date Thursday, January 6
Time **1:30 PM to 3:00 PM**
Location **Georgetown**
Session Leads **Khalsa**

Abstract NASA ESDIS has formed a team of data systems and metadata experts to analyze requirements and recommend the best approach for NASA Earth Science data systems to align with the international metadata standard ISO 19115. The team considered the applicability, limitations, and possible profiles of this standard for the diverse data sets maintained by NASA data centers and missions. The team's initial findings and recommendations regarding to how reach the interoperability goals of NASA using these standards will be discussed. We are also pleased to have David Danko, lead of the Project Team revising the ISO 19115 standard, attending the session. He will describe the current status of the revision process and discuss applications of ISO 19115 to data quality and lineage metadata.

Call-in Information <https://www1.gotomeeting.com/join/773740288>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 773-740-288
 Audio PIN: Shown after joining the meeting

Decisions Workshop: From Insight to Impact: Managing YOUR Data Through Evaluation

Date Thursday, January 6
Time **1:30 PM to 3:00 PM**
Location **Mt. Vernon**
Session Leads **Doucette/Prados**

Abstract Continued from 10:30-12:00

Call-in Information <https://www1.gotomeeting.com/join/311872985>
 VoIP or Dial 1 (877) 568-4106
 Access Code: 311-872-985
 Audio PIN: Shown after joining the meeting

Poster and Demo Abstracts

Advances in Establishing a National Geoinformatics Community

Gundersen, L. C.; Whitmeyer, S.J., Walker, J. D.; Allison, M. L.; Babaie, H. A.; Cervato, C.; Fils, D.; Richard, S. M.; Arrowsmith, R.

The National Geoinformatics Community (NGC) effort is aimed at addressing critical issues in informatics and earth sciences by creating and making accessible community based solutions. The scientific, societal, and educational problems the geosciences community is being asked to address are increasingly complex and require the application of multiple datasets and advanced software for integrated data analysis. However, we cannot integrate data we cannot find, understand/evaluate, or trust. It is critical that data and tools are persistent and do not disappear at the end of projects or with time. The NGC intends to encourage collaboration across geoscience communities through recording and disseminating community efforts, identifying and facilitating the development of community standards and needs, and exploring social aspects of data & knowledge sharing and ownership. Recent NGC initiatives include an NSF-funded workshop in Fall 2010 that gathered more than 50 members of the geoinformatics and geoscience communities to discuss and advance technology and education & outreach issues. Salient themes of the workshop include identification and discussion of: 1) existing resources and knowledgeable practitioners in education, outreach, and technology, 2) impediments to progress, and 3) the necessary future resources for advancing knowledge and interoperability. Subsequent Town Hall meetings at the 2010 Geological Society of America and American Geophysical Union meetings validate the need for such an organization and the desire on the part of the community to work together to provide a network of data, knowledge, and tools.

Beaver Creek -- From Ruin to Rehabilitation (Poster and Demo)

Marlene Taylor

Beaver Creek, a 40-mile-long creek in north Knox County, Tennessee, became the victim of rapid, unchecked development in the watershed. Stormwater runoff, carrying heavy sedimentation and other pollutants, and removal of protective vegetation along the stream banks destroyed the creek's structure and ecosystem. From a grassroots initiative people in the watershed began a 12-year process of

raising awareness, changing development and land-use practices, and re-establishing Beaver Creek's natural structure and flow.

The launch of People for the Planet, is a multimedia blog on how people are working for a cleaner, greener environment. The first article is a multimedia blog about people working for a cleaner, greener environment.

Building An Online DEM Data Sharing and Exploring System (Poster and Demo)

Weiguo Han, Liping Di, Peisheng Zhao, Yuanzheng Shao

DEM Explorer (<http://ws.csiss.gmu.edu/DEMExplorer>) powered by GeoBrain is implemented to share and explore the common DEM datasets (including SRTM, ASTER GDEM, GTOPO30 and SRTM30_Plus) based on Service Oriented Architecture (SOA). This application offers user an easy, quick, intuitive and interoperable way to customize, retrieve, visualize and analyze DEM data for the area of interest (AOI) such as dragged polygon, rectangle, or any specified administrative boundary of county (for the United States), state/province, and country/district. Users could obtain not only the original DEM files predefined spatial extent by selecting them directly, but also AOI DEM data with preferred format and projection through response and interactive user interface of DEM Explorer or standard Web Coverage Service (WCS) getCoverage request. Elevation query, slope, aspect, contour, color relief, terrain ruggedness index (TRI) and topographic position index (TPI) are integrated in this system to generate detailed terrain characteristics for further analysis. Common DEM based hydrological models including compound topographic index (CTI), stream network, flow accumulation and direction, and drainage basin are aggregated to learn hydrological features. In addition, DEM Explore permits users to invoke more DEM data relates Web services on their own through its flexible and extensible framework. This system has been adopted and reused by USGS to distribute ASTER Global DEM to global users in their DEMEX (<http://demex.cr.usgs.gov/DEMEX/>).

Building Format Agnostic Metadata Repositories

Matthew Cechini

This presentation will discuss the problems that surround persisting and discovering metadata in multiple formats; a set of tenets that must be addressed in a solution; and NASA's Earth Observing System (EOS) ClearingHouse's (ECHO) proposed approach.

In order to facilitate cross-discipline data analysis, Earth Scientists will potentially interact with more than one data source. The most common data discovery paradigm relies on services and/or applications facilitating the discovery and presentation of metadata. What may not be common are the formats in which the metadata are formatted. As the number of sources and datasets utilized for research increases, it becomes more likely that a researcher will encounter conflicting metadata formats. Metadata repositories, such as the EOS ClearingHouse (ECHO), along with data centers, must identify ways to address this issue.

In order to define the solution to this problem, the following tenets are identified:

- There exists a set of 'core' metadata fields recommended for data discovery.
- There exists a set of users who will require the entire metadata record for advanced analysis.
- There exists a set of users who will require a 'core' set metadata fields for discovery only.
- There will never be a cessation of new formats or a total retirement of all old formats.
- Users should be presented metadata in a consistent format.

ECHO has undertaken an effort to transform its metadata ingest and discovery services in order to support the growing set of metadata formats. In order to address the previously listed items, ECHO's new metadata processing paradigm utilizes the following approach:

- Identify a cross-format set of 'core' metadata fields necessary for discovery.
- Implement format-specific indexers to extract the 'core' metadata fields into an optimized query capability.
- Archive the original metadata in its entirety for presentation to users requiring the full record.
- Provide on-demand translation of 'core' metadata to any supported result format.

With this identified approach, the Earth Scientist is provided with a consistent data representation as they interact with a variety of datasets that utilize multiple metadata formats. They are then able to focus their efforts on the more critical research activities which they are undertaking.

CIERA, the Community Initiative for Emissions Research and Applications

Gregory J. Frost, NOAA/ESRL & Univ. Colorado/CIRES; Claire Granier, Université Pierre et Marie Curie/LATMOS, NOAA/ESRL & Univ. Colorado/CIRES; Jean-François Lamarque, NCAR/ACD & CGD; Gabrielle Pétron, NOAA/ESRL & Univ. Colorado/CIRES; Steven J. Smith, DOE/PNNL & Univ. Maryland/JGCRI; Megan L. Melamed, AAAS Fellow, EPA/NCER; Paulette Middleton, Panorama Pathways; Stefan Falke Northrop Grumman; Terry Keating, EPA/OAR

CIERA is building a holistic community effort to understand and improve emissions information by:

- Providing dynamic access to emissions data portals and tools
- Communicating about emissions data
- Connecting air quality & climate emissions
- Facilitating systematic emissions evaluations and assessments
- Promoting robust two-way exchanges between emissions research and development

We invite you to stop by the poster to discuss how community activities best address the emissions information needs of scientific researchers and society. Please also visit ciera-air.org <<http://ciera-air.org>> for more information.

Continuing the Connections: Sustaining the ESIP Education Community

Becky Reid, Margaret Mooney

Poster will demonstrate website/wiki that ESIP teachers use to stay connected with each other and share lesson plan ideas after the Summer Meeting.

CyAir: Cyberinfrastructure for Air Quality Management

Terry Keating¹, Tim Dye², Stefan Falke³, Steve Ludewig², Uma Shankar⁴, Shawn McClure⁵, Glynis Lough⁶ (¹U.S. Environmental Protection Agency, ²Sonoma Technology, Inc., ³Northrop Grumman, ⁴Univeristy of North Carolina, ⁵Colorado State University, ⁶Battelle Memorial Institute)

Cyberinfrastructure for Air Quality Management (CyAir) is a project designed to contribute to the planning, development, maintenance, and coordination of systems to help the air quality community better utilize air quality-related information. As

part of this effort, over 50 interviews were performed with data providers and data users to assess the current state of data exchange and identify needs and issues. In addition, other efforts and past cyberinfrastructure assessments were reviewed. The interview responses and other information were used to analyze gaps between the current state of air quality data exchange and the envisioned cyberinfrastructure. An initial set of recommendations was formed to address key needs and issues identified during this assessment. The recommendations focus on the foundational elements of an air quality cyberinfrastructure and include data access standards, metadata standards, and data systems and projects that implement those standards. During this phase of the CyAir project, comments and suggestions regarding the initial recommendations are being actively solicited.

EPA's Data Finder

Ethan McMahon

EPA's Data Finder (www.epa.gov/data <<http://www.epa.gov/datafinder>>) is a single place to find EPA's data sources. Data Finder organizes currently-available data sources into topics using EPA's Web taxonomy so people can discover the many datasets that are available. The site includes the Data Finder Forum to engage data users about the data they are looking for. In addition, EPA plans to direct people to data finders at other federal agencies. See a demonstration of this simple and useful tool.

Evolving Toward a Coherent, Collaborative Framework for Earth Science Data, Tools and Services

Christopher Lynnes and Kevin Murphy

The diversity of Earth science data, tools and services represents a major strength of the community. However, this diversity often presents a challenge to bringing analysis tools and services to bear on the data. At the same time, while the infusion of information technology throughout the community is common, the infusion and reuse of science technology (e.g., analysis algorithms and techniques) within the community is less systematic. We will present a proposed evolutionary path toward a coherent, collaborative framework of Earth science data, information, tools, services and workflows. This framework would enable scientists to use many more tools on more datasets, and to easily share analysis tools, workflows and results throughout the community.

GRIP Collaboration Portal: Information Management for a Hurricane Field Campaign

Conover, H, Kulkarni, A, Garrett, M, Smith, T, ITSC, UAHuntsville, Huntsville, AL, USA; Goodman, H M, NASA Marshall Space Flight Center, Huntsville, AL

NASA's Genesis and Rapid Intensification Processes (GRIP) experiment, carried out in August and September of 2010, was a complex operation, involving three aircraft and their crews based at different airports, a dozen instrument teams, mission scientists, weather forecasters, project coordinators and a variety of other participants. In addition, GRIP was coordinated with concurrent airborne missions: NOAA's IFEX and then NSF-funded PREDICT. The GRIP Collaboration Portal was developed to facilitate communication within and between the different teams and serve as an information repository for the field campaign, providing a single access point for project documents, plans, weather forecasts, flight reports and quicklook data. The portal was developed using the Drupal open source content management framework. This presentation will cover both technology and participation issues.

Specific examples include: Drupal's large and diverse open source developer community is an advantage in that we were able to reuse many modules rather than develop capabilities from scratch, but integrating multiple modules developed by many people adds to the overall complexity of the site. Many of the communication capabilities provided by the site, such as discussion forums and blogs, were not used. Participants were diligent about posting necessary documents, but the favored communication method remained email. Drupal's developer-friendly nature allowed for quick development of the customized functionality needed to accommodate the rapidly changing requirements of GRIP experiment.

Group on Earth Observations Critical Earth Observation Priorities

Lawrence Friedl, Erica Zell, Glynis Lough, Adam Carpenter, Amy Huff

The Group on Earth Observations (GEO) User Interface Committee led a task to identify Earth observations within and across the GEO Societal Benefit Areas (SBA). The result is a prioritization of the most critical Earth observations common to many GEO SBAs. As a next step, the GEO User Interface Committee will conduct a gap analysis on the current and planned availability of the most critical Earth observations.

Libre

Ruth Duerr, Mark Parsons and Timy Gonzalez

An international network of scientific and data management organizations concerned with the scientific quality, integrity, and stewardship of data is developing the Polar Information Commons (PIC). The PIC utilizes the Science Commons Protocol for Implementing Open Access Data, including establishment of community norms to encourage appropriate contributions to and use of PIC content. Data descriptions (metadata) are not necessarily registered in formal repositories or catalogues. They may simply be exposed to search engines or broadcast through syndication services such as RSS or Atom. The data are labeled or branded as part of the PIC and are, therefore, open for use without restriction. The PIC label also alerts data centers around the world to new polar data. These data centers then assess and acquire important data for formal archiving, curation, and access through national and global data systems. The intent is to enable rapid data access without qualification, while establishing a process for long-term preservation and stewardship of critical data. This poster will review the ethical and legal basis for sharing polar data and information, as well as the technologies being employed to make the PIC a reality.

Maximize Data Sharing with Open Source Tools

Christine White, Esri SDI Solutions Team

In current economic times, geospatial programs are being challenged to maximize data sharing capability & efficiency with decreasing financial & staff resources. Because of this, base technology that is free and open is often a critical requirement. The open source Geoportal Server software allows organizations to deploy their own metadata catalog for resource sharing, viewing, downloading, and connecting to other catalogs through standards-based protocols. This poster shows how a Geoportal catalog can be deployed using completely free components, and the standards and sharing protocols used in such a catalog.

MODIS Web Services Synchronous Post-processing Approach

Robert Wolfe¹, Ed Masuoka¹, Larry Gilliam², Ali Rezaiyan², Neal Most², Cid Praderas³, Greg Ederer³, Karen Horrocks³, Gang Ye³ (¹NASA GSFC, ²INNOVIM, ³Sigma Space)

Web Services are available for MODIS (Moderate Resolution Imaging Spectro-radiometer) Level 1 and Atmospheric data archived at NASA GSFC in the MODAPS

(MODIS Adaptive Processing System). Since early 2010, the Level 1 and Atmospheric Archive and Distribution System (LAADS) Web Services Interface has provided the same capabilities for accessing MODIS data as the standard user-interactive GUI. This Web Service interface allows users to automate MODIS data search and ordering, as well as, post-processing activities that include subsetting, reformatting and reprojection. In addition, Web Clients customized to specific user needs can now include MODIS data in their list of products. Open Web Service standards like OpenSearch have been or are being implemented. One of these new capabilities is support of the OGC compliant web services WMS and WCS. These new services will allow for immediate delivery of products to meet users' needs. As part of the implementation of these new services, the current asynchronous "batch" post-processing architecture is being upgraded to include a synchronous capability that returns post-processed products quickly. We will present the implementation details of the synchronous approach that will provide this new capability.

NASA Applied Sciences Remote Sensing Education and Training

Ana I. Prados, Richard Kleidman. and Lawrence Friedl

The NASA Applied Sciences Program conducts professional training activities in Air Quality Applications of Earth Science data. The goal of the program is to train end-users on how to access, visualize interpret, and apply NASA Earth Science Data in their professional area. The program has conducted 14 national and international capacity building workshops since January 2009 in the U.S, Central America, Europe and Asia reaching over 350 current and potential end-users. The trainings include guided hands-on activities on the utilization of web-tools for remote sensing data access, and Case Studies with step by step instructions for how to use satellite data and web-tools to analyze air quality events which a decision-maker may encounter. The program has trained air quality managers and planners, forecasters, modelers, health scientists and technical professionals, researchers, and students with a wide range of expertise in satellite remote sensing applications. Future trainings in agricultural and water resources management applications are currently being planned. The project Applied Remote Sensing Education and Training (ARSET) website can be accessed at <http://arset.gsfc.nasa.gov>.

NODC Supports the Deepwater Horizon Incident

Kelly Logan

Following the Deepwater Horizon (DWH) Incident on April 20, staff at the National Oceanographic Data Center (NODC) extracted historical Gulf of Mexico data from its online archive and compiled it into a public format for access and availability.

NODC's National Coastal Data Development Center's (NCDDC) extensive Gulf resources and interactive maps, which are continuously updated with data, were also included.

NCDDC supports the Joint Analysis Group (JAG) for Surface and Sub-Surface Oceanography, Oil and Dispersant Data. NCDDC compiled and processed the data observations, and also hosts the JAG website. NOAA's Office of Response and Restoration (OR&R) passes various DWH data sets to the National Coastal Data Development Center (NCDDC) for quality control and official transfer to NODC's Marine Data Stewardship Division, where it is permanently archived. Once the data is archived, the data is made public on the NODC website.

NODC provides the original data as it was received by data submitters through the Ocean Archive System (OAS) and other Web services. The data center also offers climatology products, ocean profile data, fisheries closure data, coastal ecosystem maps, ocean currents data, and satellite data, as well as a selected bibliography dealing with resources on oil spills, response, and restoration created by the NOAA Central Library.

For more information on NODC's support to the DWH Incident, please visit: <http://www.nodc.noaa.gov/General/DeepwaterHorizon/support.html>

Scientist-Teacher-Student Interactions: Experiences around the Fall 2010 A-Train Symposium

Dan Oostra, Lin Chambers, Matt Rogers, Donna Charlevoix, Teresa Kennedy

In late October 2010, the second A-Train Science Symposium was held in New Orleans, LA. (The first such event was hosted by CNES in France in 2007.) In conjunction with the symposium, a multi-faceted education event was conducted. This included:

- Onsite one-day teacher workshops for local teachers introducing remote sensing and the use of satellite data in the classroom
- Visits by scientists to local classrooms for direct interaction with students the day after the symposium
- A Student-Scientist Observation Campaign to engage A-Train scientists in a social media website with teachers and students from around the world.

This poster summarizes the impact of the various elements of this Earth science communication event.

Searching for and Retrieving Swath Data Using Virtual Tiles

Matthew Henderson, Charles Thompson, Jean-Francois Piolle, Sylvain Gerard

Searching for and extracting swath data of interest across entire archives is a non-trivial problem. The brute force technique of opening each file to search for data is an impractical solution. Other techniques such as the backtrack algorithm require specific metadata be available in order to work properly, and still can only provide granule level search capability. A simple solution which helps to address this problem involves using virtual tiles that store metadata for each data set.

Semantic Sea Ice Interoperability Initiative

Mark A. Parsons, Ruth Duerr, Peter Fox, Timy Gonzalez, Siri Jodha Singh Khalsa, Deborah McGuinness, Peter Pulsifer

SSIII seeks to enhance the interoperability of sea ice data and to establish a network of practitioners working to enhance semantic interoperability of all Arctic data. SSIII is a collaborative project between NSIDC and the Rensselaer Polytechnic Institute (RPI) Tetherless World Constellation project. We seek to build on the work initiated under the International Polar Year (IPY) and create a community of practice working to improve interoperability within the Polar Information Commons (PIC) , the Sustained Arctic Observing Network (SAON), and broader global systems. We initially focus on the scientific understanding of sea ice, but over time, we will explore the knowledge and perspectives of Arctic residents. We collaborate closely with the Exchange for Local Observations and Knowledge in the Arctic (ELOKA) project. This poster will present our initial use cases and concept maps leading to the creation of the ontology as they are developed. We eagerly encourage feedback from Arctic scientists and data mangers.

Social Business Intelligence from Open Government Data (Poster and Demo)

Brand Niemann

Theme: Social Business Intelligence from Open Government Data.

Problem: Decision-makers need to see data, metadata (e.g. data quality), and visualizations organized in dashboards that use state-of-the-art analytics and statistics.

Objective: Data to support decision-making are extracted from various sources into Excel spreadsheets which are in-turn imported into Spotfire Analytics. The methodology, metadata, and results are captured in the Mindtouch 2010.

Alternatives: Decisions are not fact-based or communicated in effective visualizations to the public in a transparent and open manner.

Consequences: The public has a high-level of mistrust for government and its leaders.

Recommendations: Students and Practitioners should become aware of Data Science and Graduate Classes in Data Science. A free one year trial of the Spotfire Analytics software is available. More information is available at CIOs Learning Web 2.0 Wikis.

Sources of information:

NASCIO on Business Analytics, February 2010.

http://semanticcommunity.info/CIOs_Learning_Web_2.0_Wikis/NASCIO_on_Business_Analytics

Strategic Use of Analytics in Government, September 17, 2010.

<http://spotfire.tibco.com/community/forums/t/1065.aspx>

How Data Analytics Will Solve Our Biggest Problems which links to "The Big Idea" feature in the November Harvard Business Review.

<http://spotfireblog.tibco.com/?p=3852>

<http://hbr.org/2010/11/the-big-idea-the-next-scientific-revolution/ar/1>

Spatial Cloud Geoprocessing

Qunying Huang, Min Sun, Jing Li

Intensive computing is highly demanded for supporting geospatial processing. However, the bridging between generic computing and geospatial processing is a critical issue for Earth sciences. Through the development of kernel GIS functionalities, algorithms and models with standards, e.g. buffer, overlay, intersect, we can compose any sort of functionalities to process any intended applications across different domains. OGC Web Processing Service (WPS) is such a standard way to offer GIS functionality to users within network and has been an important element of geospatial processing service cloud. This research develops and deploys a WPS service under CISC (<http://cisc.gmu.edu>) cloud infrastructure as a cloud service which can be accessed online by Earth Scientists. A client that

provides the users to access the WPS service is also developed. The study case, enabling the users to run the dust storm model by calling the deployed WPS service, is used to demonstrate the advantages of utilizing cloud computing and WPS to support geospatial analysis on line.

State Tectonics

Annie Byrnes

This website provides an interactive map of the United States where visitors can find information on tectonics in terms of geography, history, and current risk for their particular region.

Sun's Intensity at Blue Hill Observatory

Matthew Rogan

While working with Blue Hill Observatory in Milton, MA I discovered a 125 year collection of charts from a Campbell-Stokes Sunshine Recorder. I wanted to show that the burns made on these sheets can be measured to yield a useful quantity that represents the suns intensity. After scanning several years of these charts into a computer database I used digital image analysis software developed by John Pickle to determine the size of each burn per hour. I have created a data set that shows the size of these burns every hour for every day for 5 years. When compared with other observations at BHO this data could be used to understand and possibly quantify particulate matter in the atmosphere or the effect of sunspots.

The CEOS Atmospheric Composition Portal - Beta

Stefan Falke, Northrop Grumman; Erin Robinson, ESIP; Chris Lynnes, NASA GSFC; Greg Leptoukh, NASA GSFC; Young-In Won, NASA GSFC; Peisheng Zhao, NASA GSFC; Wenli Yang, NASA GSFC; James Johnson, NASA GSFC; Frank Lindsay, NASA GSFC; Karen Moe, NASA GSFC; Richard Eckman, NASA; Oleg Goussev, DLR; Séverine Bernonville,

The Atmospheric Composition Constellation (ACC) and the Workgroup for Information Systems and Services (WGISS) within the Committee on Earth Observation Satellites (CEOS) is developing a portal to support interoperability among the atmospheric composition research and applications communities. The initial effort has resulted in a beta prototype of a website that uses a standards-

based framework to provide access to remotely sensed atmospheric composition data, metadata and visualization and analysis tools. We are seeking beta testers for the AC Portal and partnerships with other atmospheric composition community members interested in connecting data products, data analytical tools or other capabilities. Please stop by the poster and visit <http://wdc.dlr.de/acp/> for more information.

The Data Conservancy: An NSF DataNet Program Partnership

Ruth Duerr, Sayeed Choudhury

Data Conservancy is part of NSF's DataNet vision: to enable researchers to tap the power of scientific data to address the grand challenges facing society, by solving the broad challenges of scientific data curation. These challenges include long-term data preservation and access, with systems and services that empower science-driven information integration. These systems and services must be economically and technologically sustainable, and founded on a reliable data preservation network. The Data Conservancy is researching and developing answers to these challenges, by simultaneously examining technical, scientific, business, and educational needs.

The National Oceanographic Data Center Celebrates 50 Years of Scientific Data Stewardship

Kelly Logan

In 2010, the National Oceanographic Data Center (NODC) celebrated 50 years of scientific data stewardship, as the center began operating on November 1, 1960. In 2011, NODC continues its celebration, given that it was formally dedicated by the administration of the U.S. Navy Hydrographic Office, in January, 1961.

Over the years NODC has impacted the global oceanographic community by preserving and providing access to scientific quality ocean data and information for current and future generations, and providing oceanographic researchers around the world a place to preserve valuable ocean data for the benefit of future generations. NODC is recognized globally as an authoritative long term ocean archive for ocean data and information. NODC's products are also used as a leading source to monitor global ocean climate changes. Today, the center maintains the world's largest collection of oceanographic data.

To learn more about NODC's 50 years of scientific data stewardship, please visit: <http://www.nodc.noaa.gov/General/anniversary50.html>

The National Oceanographic Data Center History

Kelly Logan

The National Oceanographic Data Center (NODC) opened its doors on November 1, 1960, with 29 employees ready to take on the challenge of compiling, sorting, and organizing the disparate collections of oceanographic data into a single system. Later, in January of 1961, NODC was formally dedicated by the Honorable James H. Wakelin, Jr., the Assistant Secretary of the Navy for Research and Development. Three hundred guests were present, including members of Congress and representatives of supporting agencies. Dr. Woodrow C. Jacobs was appointed the first NODC Director.

In 1970, NODC was formally transferred from the U.S. Navy Hydrographic Office to the newly formed National Oceanic and Atmospheric Administration (NOAA), under the Department of Commerce. As the science of oceanography grew and developed over the decades, so did the Data Center. In 2000, the National Coastal Data Development Center was incorporated into NODC, expanding its focus from global oceans to include coastal ocean areas.

The mission of NODC is to provide scientific stewardship of marine data and information. NODC is currently celebrating fifty years of scientific data stewardship. Today the center maintains the world's largest collection of oceanographic data.

To learn more about NODC and its history, please visit:
<http://www.nodc.noaa.gov/General/anniversary50.html>

The Value of Metadata: Using the Global Change Master Directory (GCMD) to Promote and Discover Your ESIP Related Data, Services, and Climate Visualizations (Poster and Demo)

Tyler Stevens; Scott Ritz; Michael Morahan; Alicia Aleman; Stephanie Grebas; Lola Olsen

NASA's Global Change Master Directory (GCMD) assists the scientific community in the discovery and access of Earth science data, services, and climate visualizations. More than 25,000 metadata documents can be found in the directory - many from ESIP members. Controlled science keywords are essential within the metadata to normalize the search results. The ESIP portal, a virtual subset of the directory, allows ESIP members and the scientific community to search and access their data and services. Access to an intuitive and efficient metadata authoring tool will help facilitate contributions to the portal. The docBUILDER metadata authoring tool is available online and allows the scientific community and ESIP members to easily

contribute and maintain their data, service, and climate visualization metadata in a centralized location.

The Waypoint Planning Tool: Real Time Flight Planning for Airborne Science

He, M, ITSC, UAHuntsville; Goodman, H M, Blakeslee, R P, Hall, J M, NASA Marshall Space Flight Center, Huntsville, AL

NASA Earth science research utilizes both spaceborne and airborne real time observations in the planning and operations of its field campaigns. The coordination of air and space components is critical to achieve the goals and objectives and ensure the success of an experiment. Spaceborne imagery provides regular and continual coverage of the Earth and it is a significant component in all NASA field experiments. Real time visible and infrared geostationary images from GOES satellites and multi-spectral data from the many elements of the NASA suite of instruments aboard the TRMM, Terra, Aqua, Aura, and other NASA satellites have become norm. Similarly, the NASA Airborne Science Program draws upon a rich pool of instrumented aircraft. The NASA McDonnell Douglas DC-8, Lockheed P3 Orion, DeHavilland Twin Otter, King Air B200, Gulfstream-III are all staples of a NASA's well-stocked, versatile hangar. A key component in many field campaigns is coordinating the aircraft with satellite overpasses, other airplanes and the constantly evolving, dynamic weather conditions. Given the variables involved, developing a good flight plan that meets the objectives of the field experiment can be a challenging and time consuming task. Planning a research aircraft mission within the context of meeting the science objectives is complex task because it is much more than flying from point A to B.

Flight plans typically consist of flying a series of transects or involve dynamic path changes when "chasing" a hurricane or forest fire. These aircraft flight plans are typically designed by the mission scientists then verified and implemented by the navigator or pilot. Flight planning can be an arduous task requiring frequent sanity checks by the flight crew. This requires real time situational awareness of the weather conditions that affect the aircraft track.

Scientists at the University of Alabama-Huntsville and the NASA Marshall Space Flight Center developed the Waypoint Planning Tool, an interactive software tool, that enables scientists to develop their own flight plans (also known as waypoints) with point-and-click mouse capabilities on a digital map draped with real time satellite imagery.

The Waypoint Planning Tool has further advanced to include satellite orbit predictions and seamlessly interfaces with the Real Time Mission Monitor which tracks the aircraft's position when the planes are flying. This presentation will

describe the capabilities and features of the Waypoint Planning Tool highlighting the real time aspect, interactive nature and the resultant benefits to the airborne science.

Tools and Examples that Improve the Interoperability of NASA HDF-EOS Data

MuQun Yang and Hyo-Kyung Lee

We present tools and examples that improve the interoperability of NASA HDF-EOS data. The tools include OPeNDAP handlers and converters that help netCDF software to access HDF-EOS data. The examples include the complete source codes for NCL, IDL and Matlab. These tools and examples are maintained by The HDF Group through the new HDF-EOS Tools and Information Center website.

Tools for Reusing Earth Science Software

James Smith, Chris Mattman, Bob Downs, Neal Most, Larry Gilliam

Software reuse offers potential opportunities and benefits for Earth science. Tools currently under development can contribute to various aspects of existing efforts and to the new Earth science Decadal Survey missions including SMAP, and ICESAT-2 amongst others. The Reuse Enablement System, developed by the NASA Earth Science Data Systems (ESDS) Software Reuse Working Group (SRWG) is currently being piloted and can be used as a catalog to register reusable software and utilities. These assets are contributed by new missions and from previous missions for reuse in future missions and projects. The Reuse Readiness Levels (RRLs), also produced by the SRWG and recently released in a citeable, versioned 1.0 document, offer capabilities to measure the potential reusability of software assets and to determine areas where the assets should be improved for reuse. The combination of the RES and the RRLs form an effective toolkit for assessing assets for reuse in the NASA Earth Science Enterprise.

Towards Societal Benefits and Sustainability - Bringing Earth Observations into Environmental Applications for Decision Makers (a series of posters from EPA's Advanced Monitoring Initiative)

Assessing the Condition of the U.S. West Coast using Benthic Organisms

Coastal regions represent only 17% of the total contiguous land area of the U.S. but they are home to more than 53% of the population. This places a tremendous pressure on our nations coasts. To protect this important resource, methods of assessing the condition of our coastal environments. The use of benthic species and the River InVertebrates Prediction and And Classification System, an indicator originally developed for river systems, are being evaluated to assess coastal condition.

Changes in Latitude, Changes in Attitude – Emerging Biogeographic Patterns of Invasion in the North Pacific

Over the last few decades, it has become clear that invasions of near-coastal and estuarine species are a major ecological and economic issue in bays and estuaries of the North Pacific. To develop a coordinated basin-scale view of near-coastal invasions in the North Pacific, a partnership has designed and developed a database to synthesize the patterns of invasion in the North Pacific.

Enhancing Data Access and Analysis for Decision Makers

Integrated Earth facilitates environmental data visualization, exploration and analysis by providing intuitive access to a wide variety of data and enabling decision makers to do simple geospatial analysis such as buffers, overlaps, and intersections.

Evaluating the Effectiveness AQ Regulatory Actions from Source to Health Outcomes

Assessing whether air quality management activities are achieving the originally anticipated results from sources through outcomes requires: (1) the use of indicators that capture changes in source emissions, ambient air concentrations, exposures, and health outcomes; and (2) the ability to characterize the processes that impact the relationships among these indicators.

Interoperable Integration of Water

The US has enhanced its water quality monitoring data by providing common data standards and web services in a portal so that water quality managers and the public can easily access integrated monitoring data from multiple sources.

Predicting Beach Water Quality

Standard beach monitoring takes 18-24 hours for results. Virtual Beach helps managers build multivariate statistical models to predict bacteria concentrations in near real-time, based on readily-measurable conditions, e.g. rainfall, nearshore currents, wave height, cloud cover, water clarity, and stormwater discharge.

Proactive Monitoring Protects Crops from Pests

A new imaging technology has been shown to provide a monitoring capability to inform growers and governments about the sustained effectiveness of pest resistance in GM crops which eliminates the use of broad spectrum pesticides. Extensions of this technology allow decision makers to estimate benefits such as productivity for biofuel applications, nitrogen requirement for precision application, and carbon exchange for global warming impact assessments.

Roadside Green Infrastructure Yields AQ Improvements

The presence of high pollutant concentrations near roads is an international health concern; studies show that people living, working, and going to school near large roads experience more adverse health effects than the general population. The ability of vegetative barriers to filter and alter the dispersion of traffic emissions has been monitored and modeled to show that ultrafine particles can be significantly reduced downwind of the barriers.

Upper Midwest Aerospace Consortium

Doug Olsen, Soizik Laguette

The Upper Midwest Aerospace Consortium (UMAC), centered at the University of North Dakota, has been a member of the ESIP Federation since its inception. Current research and opportunities for collaboration will be presented.

User Registration for NASA Earth Science Data

Andrew Mitchell, Kevin Murphy

As NASA's Earth Observing System Data and Information System (EOSDIS) systems have evolved over the years, most of the EOSDIS data are now available to users via anonymous on-line access. Although the changes have improved the dissemination efficiency of earth science data, the anonymous access has made it difficult to characterize users, capture metrics on the value of EOSDIS and provide customized services that benefit users. As the number of web-based applications continues to grow, data centers and application providers have implemented their own user registration systems and provided new tools and interfaces for their registered users. This has led to the creation of independent registration systems for accessing data and interacting with online tools and services. The user profile information maintained at each of these registration systems is not consistent and the registration enforcement varies by system as well.

Speaker Bios

Charles S. Baker, NOAA, Satellite and Information Service

Charles S. Baker was appointed NOAA's Deputy Assistant Administrator for Satellite and Information Services in March 2007. In that capacity, he serves as chief operating officer for NOAA Satellite and Information Service, an organization with 850 staff members, a budget of nearly \$1 billion a year, and 15 satellites on orbit. Within the NOAA Satellite and Information Service, his areas of responsibility include customer service, performance management, satellite operations, processing and distribution of time-critical satellite data, development of new satellite data products, archiving environmental data, information technology, regulation of the U.S. commercial remote sensing industry, human capital management, and regional collaboration.

From 2004 to 2007, Mr. Baker served as Chief Financial Officer and Chief Administrative Officer. In that role, he served as the overall business manager for the organization, having responsibility for budget, strategic planning, cost estimating, earned value management, human resources, training, facilities, property accounting, and safety.

The NOAA Satellite and Information Service is dedicated to providing timely access to global environmental data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life. To fulfill its responsibilities, the organization acquires and manages the Nation's operational environmental satellites, provides data and information services, and conducts related research. From 1987 to 2004, Mr. Baker worked in the Office of the Under Secretary of Defense (Comptroller), for 13 years as a budget examiner and for four years as Associate Director for Investment, his first position in the Senior Executive Service. As Associate Director, he had oversight of Navy and Air Force research, development, and acquisition budgets totaling nearly \$100 billion per year. He provided leadership to a team of budget examiners who conducted program-by-program budget reviews and recommended budget adjustments to the Deputy Secretary of Defense. Following the events of September 11, 2001, Mr. Baker led the formulation of the investment portions of the emergency budget request.

Mr. Baker began his civil service career with the Department of the Navy in 1974, holding a series of positions in the Naval Sea Systems Command, the Naval Supply

Systems Command, the Naval Material Command, and the Office of the Navy Comptroller.

Mr. Baker is a life-long resident of the Washington DC metropolitan area, graduating from Annandale High School in Annandale, Virginia. His undergraduate degree is from the University of North Carolina at Chapel Hill, with a double major in History and Spanish.

Mr. Baker is a member of the Senior Executives Association, the American Meteorological Society, and the American Geophysical Union. He has taught numerous courses on the Defense budget process and on the Planning, Programming, Budgeting, and Execution System (PPBES).

Kathlene Butler, EPA, Office of Inspector General

Kathlene Butler is interested in solving environmental pollution problems by using existing, geographic data to target the riskiest problems. She believes that on-the-ground data collection combined with out-in-space remote sensing can help us to locate and solve stealthy pollution problems. She also believes that a federal network of remote sensing partnerships could improve the efficiency of national-scale policy development and analysis.

Kathlene has worked on environmental protection issues in the state and federal government, in academia, and in the nonprofit sector for 15 years. Her work has included research in wetlands, drylands, agriculture, forestry, ecological engineering, ecosystem services, ecological modeling, environmental enforcement, voluntary corporate environmental programs, and the state-federal environmental regulatory system. Currently, Kathlene works for the EPA Office of Inspector General evaluating the effectiveness of EPA's water and enforcement programs. Kathlene is also a part-time graduate student at the University of Maryland, working toward a PhD in geography with a focus on using remotely sensed data in ecological modeling. She earned a Bachelor of Science degree in environmental sciences from Stetson University and a Master of Science degree in environmental engineering sciences from the University of Florida. She also served as a US Peace Corps volunteer in Morocco.

Maria Elena Campisteguy, Metropolitan Group

Maria Elena brings to the Metropolitan Group more than 27 years of experience in strategic communication, resource development and organizational development, providing clients with an integrated approach to challenges. She is the principal in

charge of MG's Washington, D.C. office and leads the firm's multicultural communication practice.

Maria Elena has designed and implemented hundreds of outreach and public will building campaigns, programs and diversity trainings to increase grassroots and constituent participation and engagement, and change attitudes and behaviors of traditionally hard-to-reach communities. She has extensive experience designing and facilitating processes and initiatives that bring diverse groups to the table to work towards a common vision. Over the years, Maria Elena has worked with the Earth Science Information Partners and Foundation for Earth Science on strategic planning, communication and fundraising.

She is passionate about the importance of increasing the relevancy of environmental organizations to more people. She has worked extensively with science-based organizations to help them tell their story in ways that resonate and create an emotional connection with people while not taking away from the significance of their data. She is principal author of "Increasing Relevance, Relationships and Results," a MG article on principles and practices for effective multicultural communication and co-authored "The Power of Effective Communications".

Ann Doucette, The Evaluators' Institute, George Washington University

Dr. Doucette has broad experience in the management, analysis, and evaluation of diverse intervention programs, the development of accountability and outcomes monitoring systems at individual and system levels; research methodology, data collection strategies, psychometric and measurement techniques, and applied statistical analysis, including both quantitative and qualitative approaches. Dr. Doucette has been a faculty of The Evaluators' Institute, which she now directs, since 2003. She has developed courses and teaches Applied Measurement for Evaluation, Comparative Effectiveness, and Making Evaluation Data Actionable.

Dr. Doucette has worked with federal and state organizations, universities, community groups, public schools, commercial health plans, foundations, USAID, and the United Nations – International Fund for Agricultural Development regarding evaluation management and design, analytic modeling, assessment, testing and measurement in the areas of poverty reduction and disparity, health and behavioral health care, school reform (urban and minority education), social, organizational and environmental systems, and conflict and cooperation models. Her expertise includes the development of performance and outcome measurement systems that target accountability, efficiency, quality monitoring, outcomes and impact for system and individual levels of intervention/care. Her work includes a specialized emphasis on measurement, which she considers fundamentally critical for

evaluation practice, and a complex adaptive systems perspective. She has developed several assessment measurement approaches using Item Response Theory (IRT) to generate measures having greater precision using brief, less burdensome instrumentation, which have the potential to lead to computer-adaptive applications and real-time data usage.

Dr. Doucette has served on several technical advisory panels. She received her doctoral training at Columbia University.

Peter Fox, Tetherless World Constellation, Rensselaer Polytechnic Institute

Peter Fox is a Tetherless World Constellation Chair and Professor of Earth and Environmental Science and Computer Science at Rensselaer Polytechnic Institute. Previously, he was Chief Computational Scientist at the High Altitude Observatory of the National Center for Atmospheric Research. Fox has a B.Sc. (hons) and Ph.D. in Applied Mathematics (including physics and computer science) from Monash University. His research covers the fields of solar and solar-terrestrial physics, ocean and environmental informatics, computational and computer science, and distributed semantic data frameworks. The results are applied to large-scale distributed scientific repositories addressing the full life-cycle of data and information within specific science and engineering disciplines as well as among disciplines. Fox is chair of the International Union of Geodesy and Geophysics Union Commission on Data and Information and past chair of the AGU Special Focus Group on Earth and Space Science Informatics, is an associate editor for the Earth Science Informatics journal, is a member of the editorial board for Computers in Geosciences. Fox serves on the International Council for Science's Strategic Coordinating Committee for Information and Data.

http://tw.rpi.edu/wiki/Peter_Fox

Lawrence Friedl, NASA, Earth Science Division's Applied Sciences Program

Lawrence Friedl serves as the Acting Director of the NASA Earth Science Division's Applied Sciences Program. The Program supports efforts to discover and demonstrate innovative and practical applications of Earth science in public and private organizations'. Since 2002, Lawrence has also served as Acting Deputy Director for Applied Sciences, National Applications Lead, and Program Manager for Climate applications, Air Quality applications, Coastal Management applications, and Water Management applications.

Among his responsibilities, Lawrence represents the United States and NASA on the international Group on Earth Observations (GEO) and the GEO User Interface Committee. He is the NASA representative to the interagency Civil Applications Committee. He is a member of the American Geophysical Union and the Air & Waste Management Association.

Lawrence joined the United States government as a Presidential Management Fellow. From 1997-2002, he worked at the EPA Office of Research and Development, focusing on applications of geospatial data and technology. In the early 1990s, he served as a Space Shuttle Flight Controller in NASA's Mission Control Center for 15 missions, including several Earth science missions.

Lawrence received a Masters degree in Public Policy in 1996 from Harvard University's Kennedy School of Government, specializing in Science and Technology Policy. He received a Bachelors degree in Mechanical & Aerospace Engineering from Princeton University. He also received a certificate in Space Policy and Law from the International Space University.

James E. Geringer, Esri

James E. Geringer (Jim) served as Governor of Wyoming from 1995-2003. Governor Geringer brought unique experience to this role having served in the US Air Force and at NASA working on unmanned space programs (remote sensing, interplanetary launches and the Global Positioning Satellite System). A farmer, consultant and former state legislator, Governor Geringer currently serves as Director of Policy and Public Sector Strategies for the Environmental Systems Research Institute (Esri) where he works with senior elected and corporate officials on how to use geospatial technology for place-based decisions in business and government.

As Governor, he focused on improving education through standards, accountability and technology, with particular attention to better jobs for young graduates so that they wouldn't have to leave Wyoming. Governor Geringer implemented strategic planning tied to performance based budgeting and advocated the use of technology both in state government for integrated service delivery and in the private sector to broaden higher paying jobs. Governor Geringer changed how natural resource agencies among state, federal and local governments worked through consensus rather than confrontation and heserved on several national panels to increase achievement in the STEM professions. (Science, Technology, Engineering, Math)

Governor Geringer serves on many Boards including:

- Chairman of the Western Governors University Board of Trustees
- Vice-chair of the Association of Governing Boards for Universities and Colleges

- Member of the Committee on America's Climate Choices under the National Research Council
- Member of the Biosphere 2 Advisory Board
- Served on the Mapping Sciences Committee under the National Research Council
- Community Resilience Committee under Oak Ridge National Laboratories
- Western Interstate Energy Board
- Co-chair of the Policy Consensus Initiative

A native of Wheatland, Wyoming, he graduated from Kansas State University with a BS in Mechanical Engineering. He and his wife Sherri have 5 children, 10 grandchildren and one great grandchild. He currently resides near Cheyenne, Wyoming.

Linda C. Gundersen, USGS, Office of Science Quality and Integrity

Linda Gundersen is the newly appointed Director of the Office of Science Quality and Integrity at the U.S. Geological Survey. She spent the last ten years as the Chief Scientist for Geology and has worked as a geologist and program manager with the USGS since 1979. The first half of her career focused on conducting and managing research projects in geochemistry, ore deposits, and interdisciplinary studies of radionuclides in rocks, soils, and water; eventually assessing the geologic radon potential of the United States. She received numerous grants from DOE and EPA and worked with diverse partners in the health and geological science communities. In 1995, she became the Program Coordinator for Energy Resources and in 1996 became the Program Coordinator of the Mineral Resources Program. She served on the National Academy of Sciences Committee on Risk Assessment of Exposure to Rn in Drinking Water from 1997-1999. She has received the DOI Superior Service and Meritorious Service Awards, the Unit of Excellence Award, the Secretary of the Interior's Bronze Executive Leadership Award, and is a Fellow of the Geological Society of America. She has published 70 papers and presented hundreds of talks in the fields of geology, geoinformatics, and science management. Ms. Gundersen's academic background includes undergraduate and graduate work in structural geology and geochemistry at the State University of New York at Stony Brook and at the University of Colorado, Boulder.

Ted Habermann, NOAA, National Geophysical Data Center

Dr. Ted Habermann works at NOAA's National Geophysical Data Center (NGDC) in Boulder Colorado. He has recently been working on a number of projects that integrate geospatial databases, international documentation standards and internet

mapping. His group at NGDC manages the NOAA Metadata Manager and Repository (NMMR) that includes metadata for several thousand datasets produced and stewarded by NESDIS and the NOAA Data Centers. These records are provided in multiple standards (FGDC, DIF, NcML, THREDDS, and ISO) and views (FAQ, Text, HTML). His group is also active in the creation and sharing of ISO metadata for the NOAA Office of Climate Observations, the NOAA Observing System Architecture (NOSA), the GOES-R Project, the Group for High-Resolution Sea Surface Temperature (GHRSSST) and the Integrated Ocean Observing System (IOOS). This work has included translating several thousand metadata records from FGDC to ISO using several approaches, development and sharing of ISO best practices, and participation in developing revisions to the ISO Standards.

Mary E. Kicza, NOAA, Satellite and Information Service

Mary E. Kicza is the NOAA Assistant Administrator for Satellite and Information Service. NOAA Satellite and Information Service is dedicated to providing timely access to global environmental data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life. In this role, Ms. Kicza leads the acquisition and operation of the Nation's civil operational environmental satellite system. She also leads efforts for research and development of products and programs to archive and provide access to a variety of Earth observations via three national data centers.

Ms. Kicza is a leader in the international Earth observation community, serving as the Principal for NOAA to the Committee on Earth Observation Satellites (CEOS). From 2007 to 2009, Ms. Kicza was the Chair of the CEOS Strategic Implementation Team. In this capacity, she mobilized space agencies worldwide to achieve demonstrated results in implementing the Global Earth Observation System of Systems. Ms. Kicza is currently the Co-Chair of the NOAA-Environment Canada Cooperation Steering Committee. In addition, Ms. Kicza serves as the Co-Chair of the NOAA Observing Systems Council, a group which coordinates observing systems requirements and provides resource recommendations for NOAA's observation platforms. She is also a member of the NOAA Executive Council, NOAA's executive decision making body.

Before coming to NOAA, Ms. Kicza was the Associate Deputy Administrator for Systems Integration at the National Aeronautics and Space Administration (NASA). In this position, she was responsible for assuring that NASA mission and mission support elements were effectively aligned and integrated. She served previously as the Associate Administrator for Biological/Physical Research, the Associate Center Director for Goddard Space Flight Center, the Assistant Associate Administrator for Space Science, and the Deputy Director of the Solar System Exploration Division. Ms. Kicza began her career as an engineer at McClellan Air Force Base in California,

before joining NASA in 1982 as a lead engineer supporting Atlas Centaur and Shuttle Centaur launch vehicles.

Ms. Kicza has served with distinction in a variety of technical, managerial, and leadership posts, supporting the development, launch, and operation of satellite systems as well as multi-faceted research and development programs. She has significant experience in building and maintaining effective relationships with the Office of Management and Budget, the Office of Science and Technology Policy, the Defense Department, Congress, the aerospace industry, and a diverse research community. Ms. Kicza has earned two SES Meritorious Service Awards, NASA's Distinguished Service and Scientific Achievement Medal, and numerous other awards. Ms. Kicza received her Bachelor's Degree in Electrical and Electronics Engineering from California State University and a Master's Degree in Business Administration from the Florida Institute of Technology.

Tom Moritz, Monk, Bean & Moritz

Tom Moritz is a scholar, knowledge manager and advocate for knowledge equity. His recent work is focused on the problem of "data as evidence". This means consideration of all aspects of data as the primary resource for evidence-based policy formation and decision making.

Most recently he has worked at the Internet Archive in San Francisco and at The Getty Research Institute in Los Angeles where he served as Chief, Knowledge Management (and Associate Director for Administration) under two Directors. He has worked as a librarian and information manager in the public sector and, primarily, in the non-profit private sector, has won grants from the Mellon Foundation, the Sloan Foundation and the US National Science Foundation. In the Fall of 2005, he served as Visiting Assoc. Prof. at the Pratt Institute Graduate School of Library and Info. Science in Brooklyn, NY. At the American Museum of Natural History he was Harold Boeschstein Director of Library Services, managed scientific publishing and was responsible for the digitization and open release of the full runs of AMNH scientific series.

For over 25 years, he has served as an adviser on knowledge management in Africa, Asia, Europe, the Pacific and The Americas, led in the formation of the Biodiversity Heritage Library Project and the UNEP-based Conservation Commons. He led in the development and release of the first World Database on Protected Areas. He serves on numerous advisory bodies -- including the US National Science Digital Library (NSDL) and the US National Biological Information Infrastructure (NBII), on visiting committees and peer review panels and is author of numerous publications and presentations.