Network Development, Community Outreach, and Training

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Network Development, Community Outreach, and Training

- Define the scope
- Successes
- Lessons learned
- Future
Network Development, Community Outreach, and Training

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Define the scope

• “encompass an array of LNO activities that are specifically designed to have positive impacts on both LTER sites and the broader scientific community.”
  – Network development (community building activities)
    • Community databases, OBFS web site, technology evaluation, organization of symposia and workshops
  – Community outreach (building partnerships)
    • Partnership for Biodiversity Informatics, SEEK, NPACI, NBII, RCN (e.g., OBFS), NEON, Santa Fe Institute, Center for Microbial Ecology
  – Training
    • OBFS and LTER
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Network Development

1. Design, implement and maintain web-accessible databases
2. Maintain the infrastructure to support the OBFS web site and mailing list
Network Development

3. Evaluate and implement advanced wireless communication and sensor technologies

Wireless testing at Coweeta showed almost the entire site could be reached from an old fire lookout. The site installed large solar panels to power wireless radio and instruments.
Network Development

4. Develop a web-accessible resource for technology information
Network Development

5. Organize symposia with other disciplines
Community Outreach

1. SEEK
2. PBI
3. NPACI
4. NBII
5. RCN
6. NEON
7. Center for Microbial Ecology
Community Outreach

1. SEEK
2. PBI

UC Davis

Ptolemy I
Ptolemy II

Online Resource for Managing Ecological Data and Information

Ecoinformatics.org is an open, voluntary collaboration of developers and researchers that aims to produce software, systems, publications, and services that are beneficial to the ecological and environmental sciences.

Sub-projects are created and supported by ecoinformatics.org in order to build an active community that is developing informatics solutions for the ecological and environmental sciences. See our Charter for details. Subscribe to mailing list.

The projects supported by ecoinformatics.org are relevant to ecologists and scientists of other disciplines.

We hope that ecologists who are interested in technologies that facilitate the use of data for purposes including archiving, discovery, analysis and classification will use this site to identify tools to augment their activities.

Technologists may use the resources provided by ecoinformatics.org to leverage tools being developed in an open-source, collaborative, standards-aware environment.

Ecoinformatics.org has a low-volume mailing list, which is for public discussion of issues relevant to ecological informatics. You can subscribe by providing your email address:

email address:  

You may also browse the online archive of previous mailing list discussions.

Transferring data from ecoinformatics.org...
Streaming demo: images from SIO research vessel Revelle accessed via "bohemia.splorg.org:6580"
Community Outreach

3. NPACI
   • NCSA
   • UCSD
   • NLADR
Community Outreach

4. NBII

EML implementation
- Standard crosswalks
- Metadata tools training
- NBII nodes collaboration
- Stakeholders workshop organization
- NBII all nodes meeting
- Web services (metadata crosswalk, ontologies)

BDP To Eml crosswalk

EML2BDP crosswalk

Sites EML metadata richness, Aug 05

TIER levels: 0 - 5
Community Outreach

5. RCN (Resource Discovery Initiative for Field Stations)
   - Data Registry and Repository (4,205 entries)
   - Database of Field Station QA/QC and Standard Methods (1,328)
   - EOT—Trainings and Workshops
Community Outreach

6. NEON
Big Science & MREFC

scientific research that requires a massive capital investment, that involves large teams of scientists, and that is expected to yield very significant results—i.e., transform the science
Many important ecological questions that confront society are national in scope.

West Nile Virus in the United States, 1999 - 2002

Drought

Source: Drought Monitor

Ctenopharygodon idella

Source: CDC, Drought Monitor
A continental research platform to provide the capacity to forecast future states of ecological systems for the advancement of science and the benefit of society

- How are ecological systems affected by changes in land use and climate across a range of spatiotemporal scales?

- How do changes in the availability and distribution of the Nation's water affect ecological systems?

- How do the patterns and movement of genes and organisms across the continent affect biodiversity and the spread of infectious diseases and invasive species?

www.neoninc.org
Urban to Natural Gradient
Aquatic Arrays

Terrestrial Arrays

Canopy Crane

Observation Platform

Aerial Wire-Network

Javelin Sensor

Tower Receiver

Water Table

Lake

Raft

Buoys

Wireless Sensor

Javelin Sensor

River
1. Collect data

2. Store data

Provide supporting IT for:

3. Curation

4. Data analysis, integration, modeling and visualization

5. Access via customized user Interfaces

6. Collaboration

via standards, software engineering facilities

Taskable sensornets

Web services interfaces

Model-based integration

Internet2, National Lambda Rail, Lambda Grids

Storage & Compute capability

Sensornet data

NEON

Non-NEON

Online data

Non-NEON (LTER, Museum, DIGIR Etc.)

NEON

Paper documents

Other remote data sources

Storage & Compute capability

Integrated Visualization Capability

Replicated

NEON

Non-NEON (LTER, Museum, DIGIR Etc.)
An essential component: *the scientist*

interactive data access and visualization in the field

- Real time access to archived data and models
- Combine system filtering with manual identification, verification, context, sample collection
- Guide node placement, data collection, system debugging

transform physical observations from batch to interactive process
Why multi-scale distributed sensor-networking will transform ecology

Radioastronomy
Single Telescopes

Computing
Supercomputers

Field ecology
Individual observations

… because it has done so over and over again

Very Large Array

Internet

NEON
Transformative in understanding complexity of natural and human environments

Geographically distributed infrastructure connected via cyberinfrastructure into national observatory network

Apply emerging technologies (sensor, analytical, communication, and information) to investigate the structure, dynamics, and evolution of systems in the United States and forecast change.

New collaborative environments (simulation, computation, visualization, and knowledge systems) are needed to facilitate the integration of research, education, and dialog across a wide range of biological, geophysical, and social sciences.

Data repositories and facilities for synthesis
Community Outreach

7. Center for Microbial Ecology
Training

- **OBFS & LTER**
  - May 2003 – 2 sensor and wireless workshops
  - October 20 – November 2, 2002 – Sevilleta
  - October 27 – November 7, 2003 – Sevilleta
  - October 17 - 30, 2004 – UNM
  - October 31 – November 11, 2005 – UNM
  - October 16-27, 2006 – La Selva Biological Station, CR

- **Nov. 2003, Feb. 2004 – LTER Information Managers**

- **SEEK Post-Docs**
  - January 2004
  - January 2005
  - January 2006
  - May 2006

- **ESA Ecoinformatics**
  - August 2004

97% -- met expectations
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Community building and network development do not happen overnight.

- Time
- Trust
- Relationships
Be responsive,
be proactive,
be focused,
be flexible,
be deliberative,
be nimble.
Leverage, leverage, leverage

LTER Network Office
Cooperative Agreement

NBII, NCSA, UCSD
NLADR

Resource Discovery Initiative for Field Stations

DARPA, Mellon Foundation

Science Environment for Ecological Knowledge

NEON, CLEANER, CUAHSI, OOI
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  - OBFS and LTER

- NSF Grant Proposal Guide 04-23
  - What is the intellectual merit of the proposed activity?
  - What are the broader impacts of the proposed activity?
  - How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?
Network Development, Community Outreach, and Training: Future Activities

• Network development (community building activities)
  – Building cyberinfrastructure for ecological community
    • OBFS
    • International Society for Ecological Informatics
    • NBII
    • Planning grant

• Community outreach
  – Partnership for Biodiversity Informatics
  – NEON, CLEANER, CUAHSI, OOI (IOOS)
  – Internet2/NLR
  – Earth & Sky, SACNAS

• Training
  – OBFS ?
  – IGERT ? (U. Mass Boston)
  – LTER
    • Enhancing informatics and synthesis expertise
*Name of Homer Simpson's home internet business which was "bought out" by Bill Gates