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2007 LNO Annual Report to the Executive Board

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Annual Report of the Long Term Ecological Research Network Office (2006-2007)

Introduction

This report summarizes activities and accomplishments of the LTER Network Office (LNO) during the period March 1, 2006 until February 28, 2007. Along with the survey of sites administered by the Executive Board, this document will be used to facilitate the annual review of LNO performance. The present report includes a description of efforts undertaken in response to the Executive Committee's recommendations from 2005-2006 as well as a summary of major accomplishments of the LNO during the last year. A detailed listing of LNO activities is available upon request.

Response to Executive Committee Review

The LTER Executive Committee decided to accept the recommendations of the mid-term review of the LNO in lieu of a separate evaluation for 2005-2006. The principal recommendations are listed below along with our response to those recommendations.

Recommendation: The SRT recommends that NSF demand a higher level of evidence for the desired impacts of the LNO on the LTER Network. To accomplish this, new metrics of performance must be developed to focus on the overarching role of the LNO in the Network. This shift in reporting may entail less detailed documentation of fine-grained specific lists of tasks performed. We believe, however, that such a loss of detail is unimportant if the LNO demonstrates accomplishments at the larger and more relevant scale of salutary effects on the Network. Impacts of this broader nature are ultimately more important to the success of the LTER Network as a whole.

Response: Upon the recommendation of Henry Gholz, we entered into a partnership with the National Center for Ecological Analysis and Synthesis, whose recent review also recommend an expanded set of performance metrics. We hoped to be able to capitalize on a Foundation-wide effort to develop new metrics for science. Unfortunately, efforts to collaborate with the Foundation's program were not successful, and NCEAS is apparently no longer interested in the collaboration. Thus, LNO will have to address this recommendation individually, in coordination with the Executive Board.

Part of this recommendation focused on the need to provide information on the overarching role of the LNO to the LTER Network rather than a detailed description of all activities. The format and content of this report is an initial effort to address this concern by focusing on those LNO activities that have the greatest impact on the Network.

Recommendation: The LNO should begin developing strategies for meeting synthesis goals across a range of funding scenarios

Response: The LNO has begun to address this recommendation by setting the goal of tripling the amount of funds available for small group synthesis meetings. We were able to meet this goal by providing $156,000 for post-ASM working groups. However, our ability to maintain a higher level of funding will be impacted by new costs associated with the revised LTER governance structure as well as a projected flat budget for the LNO renewal in 2009. We will continue to work with the Executive Board and the Science Council to advance synthesis goals developed as part of the LTER planning process.

Recommendation: The LNO should establish a mechanism for better assessing the outcome of the small grants that it provides for synthesis.

For the current cohort of working group awards, we have initiated a more rigorous and detailed system for monitoring progress and assessing added value of small synthesis grants. This system will include a quarterly review of active small grants and a more determined approach to collecting information about the products of associated working groups. A standardized reporting form will be developed to facilitate reporting.

Recommendation: The LNO should analyze the steps needed to implement technologies in tight coordination with the defined research needs of the LTER Network and take appropriate action to shorten the lag between development and implementation of IM technologies that address priority needs of the sites.

Response: The cyberinfrastructure plan developed as part of the planning process should provide a roadmap for prioritizing the activities of the LNO with regard to technology development. LNO staff members have already begun to organize activities in parallel with this plan. Continued close collaboration with the Network Information System Advisory Committee (NISAC) is a key factor in developing these priorities. There are two important obstacles to addressing this recommendation. The amount of time allocated by NISAC to addressing Network priorities may be insufficient for speedy progress. As important, funding to support staff at the LNO engaged in development of the LTER Network Information System will decline under current budget projections from NSF. These issues must be resolved with the assistance of the Executive Board.

Recommendation: The LNO should develop more effective mechanisms for: (a) promoting the availability of communication services and features, (b) assessing whether those services meet the needs of the Network, (c) making appropriate improvements driven by user needs, and (d) consulting with Sites prior to changes in information exchange and other protocols that have the potential of adding undue burdens on Site personnel.

Response: Efforts to address this recommendation are underway. Revisions to the LTER web pages will improve the effectiveness of information transfer regarding available services to sites. Surveys regarding needs for new technology are being conducted as part of the planning process. However, these surveys need to be institutionalized to continue to collect pertinent information once the planning process comes to an end. One

obstacle to completing this task is the need to revise the annual site survey to continue to collect this information. In addition, a more aggressive campaign to consult with sites regarding new protocols has been implemented. All changes in information exchange procedures that affect the sites are preceded by a request for comments (RFC) the results of which are summarized and fed back to the sites. The success of this campaign depends in part on the cooperation of sites.

Major Findings

Executive Summary

The Scope of Work for the LTER Network Office (LNO), described in the Cooperative Agreement, comprises ten core task areas (see Research and Education Activities above). During the course of strategic planning undertaken under the present Cooperative Agreement, we have reorganized LNO tasks into a smaller number of groups that better reflect the operation of the LNO as it has evolved over time (see Figure 1). These six groups more closely link activities conducted by the LNO to the objectives of the LTER Network and emphasize the important supporting function that these activities play in facilitating Network research and education.   We anticipate that this grouping of activities will guide our operations during the remaining two years of the Cooperative Agreement and provide structure for a renewal proposal, depending on modifications to the LNO charge that may arise from the LTER Network planning process. We organize the findings described in this Executive Summary around this new structure.   In the section that follows the Executive Summary, we provide more detail on specific accomplishments categorized as Service to LTER sites, Service to the LTER Network, Service to NSF, and Service to the Broader Community.
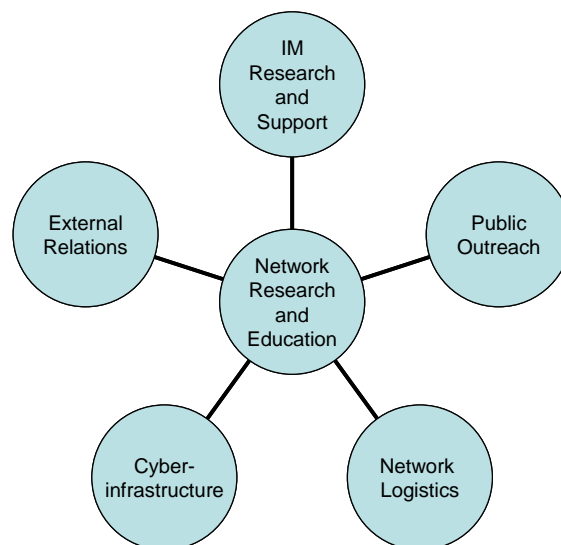

Figure 1. The organization of LNO core tasks in support of Network research and education.

We summarize below the 13 most significant accomplishments of the LNO during the past year.

Network Research and Education – Members of the Network Office staff participated in multiple aspects of the LTER planning activity. Bob Waide worked with the Science Task Force to plan and implement various stages of the planning process. He also was a member of the Governance Team that successfully devised revisions to the governance of the LTER Network that were later approved by the Coordinating Committee. As members of the LTER CI Core team, John Vande Castle and James Brunt worked with CI Team members on the development of the LTER CI strategic plan. As part of the LTER Information Management meeting during the ASM, John led a working group of data managers to provide input to update the LTER CI assessment he conducted in 2005. This survey update will be compared to the previous CI survey of 2005 to not only evaluate the CI capability of the LTER Network, but to demonstrate the dynamic CI capabilities of the Network. John co-chaired and organized the LTER CI Planning Modeling Workshop in Charlottesville, VA which was the final "focus group" meeting of the CI planning effort. James was instrumental in writing the CI Strategic Plan that will form part of the initiatives document, "Integrative Science for Society and the Environment". Mark Servilla of the LNO contributed to this document and is a member of the writing team to develop a proposal based on this initiative.

Network Research and Education – The LNO acquired $80,000 through a proposal to NSF, which, combined with $50,000 already available, provided funds to facilitate the further development of scientific ideas and collaborations arising from the 2000 All Scientists Meeting (ASM). The availability of such support after previous All Scientists Meetings resulted in the preparation of numerous publications and proposals advancing ideas developed at these meetings. The LNO organized a call for proposals for research working groups that resulted in 31 requests for support. LNO staff provided information to interested participants, designed and distributed the call for proposals, received proposals and assigned reviewers from the Executive Board, summarized reviews, and coordinated the evaluation of the proposals. Results from the review of proposals are not yet available, but we anticipate funding approximately 20 new working groups.

Network Research and Education – The Science Environment for Ecological Knowledge (SEEK) project continued to advance development of software under the Kepler Workflow System. Key successes included the development of code that facilitates the automatic transformation of a conceptual workflow to an executable workflow, code that extended GIS capabilities for exploring ecoregion-based biodiversity data, and code that enhances ontologies, conceptual actors and workflows for ontology-driven composition and validation of scientific grid workflows. (See Contributions to other Disciplines).

Network Logistics - The LNO coordinated the 2006 All Scientists Meeting at the YMCA of the Rockies in Estes Park, CO (Figure 2). LNO staff prepared a supplement proposal to obtain $265,000 in funds for this meeting from NSF, served on the ASM

program committee, implemented the program devised by the program committee, communicated details of the meeting to the LTER and other communities, coordinated schedules for multiple disciplinary meetings associated with the ASM, scheduled venues for meeting activities, arranged contracts with vendors, managed the finances for the meeting, arranged local transportation, and provided for the needs of meeting attendees. Twelve members of the LNO staff attended the meeting to coordinate onsite activities for the 800 attendees, which included 24 international scientists and students. The scientific program included three plenary presentations, a session on the history and future of LTER, briefings on LTER planning grant and TRENDS projects, 54 self-organized research and education working groups, 15 planning grant working groups, and 439 posters. The goal of providing an environment for research interchange and innovation was successfully completed within budget, and initial feedback from participants was extremely positive.

Figure 2. The LTER community at the 2006 All Scientists Meeting

Network Logistics – Staff of the LNO facilitated 66 meetings, working groups and trainings involving 1503 individuals. These meetings focused on research, education, administration, and planning for the LTER Network. In particular, the LNO supported the LTER Planning Grant by providing logistical assistance for a wide variety of planning grant activities, including meetings of the Science Task Force, the Science Task Force Advisory Committee, Governance, Education, and CI teams, LTER site representatives, and research working groups for each of the Planning Grant research themes. John Vande Castle provided additional organizational and logistical support for

the CI team by maintaining and updating information on the CI Planning Grant Wiki (http://intranet.lternet.edu/planning/index.php/Cyberinfrastructure).

Infrastructure Development – With changes in LTER governance and the need for more frequent interaction between LTER scientists, the LNO, in collaboration with Office of Research and Media Technology Services at the University of New Mexico, acquired, tested, and deployed a Polycom MGC-50+ video-teleconferencing bridge that can host multiple, simultaneous meetings up to a maximum of 48 endpoint connections (Figure 3). The Polycom MGC-50+ Bridge at LNO intelligently links individual conference sessions in a multi-channel system that gets around problems that can occur in attempting to match characteristics of different connections. The LTER Executive Board has now held several extensive video conferences in this meeting format with good results. To speed the adoption of this technology, LNO has purchased seven standalone VTC units to loan to committee members that may be having local difficulties with equipment. In addition preparations are in progress to assist all LTER sites in having VTC capability available to all investigators for use in LTER research efforts.

Figure 3.   LNO Systems Analyst David Farris at the con of the Polycom Bridge.

External Relations – Members of the LNO were instrumental in the ongoing design and development of several national and international environmental observatory systems, including WATERS, IndoFlux, NEON, the USDA Long Term Agricultural Research network, and the National Phenological Network (see Contributions within Disciplines).

External Relations - Interactions with outside CI experts brought in for the CI planning activities resulted in the implementation of LTER data searches directly through the ORNL DAAC's "Mercury"-based search system. Discussions by John Vande Castle and other LNO staff with technical and scientific staff of the Oak Ridge NASA DAAC resulted in registration of data in the LTER Metacat to enable direct searches through the NASA system. This success resulted from a long-term interaction with the ORNL DAAC by both LNO and members of the LTER IM community. This capability is a concrete example of the significance of our current NBII collaboration and ongoing EML

implementation support. More information on this can be found in the ORNL Newsletter at: http://www-eosdis.ornl.gov/news/lter_mercury_news.html

External Relations - John Vande Castle continued to manage the acquisition of Very High Resolution Reconnaissance Imagery, MODIS time series subsets, International Space Station photography, and the deployment of Aerosol Robotic Network (AERONET) sun photometers at LTER sites. Vande Castle was the point of contact with relevant agencies for the acquisition of these data for all sites in the LTER Network.

External Relations - In August of 2006 John Vande Castle took on a half-time appointment as Executive Director for the Center for Rapid Environmental Assessment and Terrain Evaluation (CREATE) at the University of New Mexico (http://www.unm.edu/create/). John will focus on activities of the Center beyond the current funding cycles. He retains a half-time commitment as Associate Director for Technology at the LTER Network Office. CREATE acquires near real-time remotely sensed data from environmental satellites for rapid assessment of changing environmental conditions. This joint appointment is meant to provide close interaction between the remote sensing activities of CREATE and the LTER program, particularly regarding the direct use of data from environmental satellites by LTER sites.

External Relations - William Michener, Associate Director for Development for LNO, continue to serve as co-director of the National Ecological Observatory Network (NEON) Project Office and subsequently as an advisor to NEON, Inc. This organization plays a key role in managing the NEON Design Consortium, under which NEON will be fully planned, designed and budgeted. Michener's contributions to this project were supported through a Cooperative Agreement between the National Science Foundation and the American Institute of Biological Sciences.

Information Management Research and Support - Major advances have been made this year in the design and development of the Network Information System. A framework to support ecological synthesis has been developed by the NIS team building on successful deployment of ecological metadata language (EML), the Metacat repository, and Metacat Harvester. This framework, code-named PASTA (see Figure 4), is efficient because it builds on existing investments and experiences, integrative because it adopts standard interfaces and approaches, and innovative because it incorporates data provenance and data quality into the design. The PASTA data warehousing architecture has been prototyped using the dynamic part of TRENDS project as a case study and demonstrated to scientists on the TRENDS editorial committee. PASTA has been reviewed by the Network Information System Advisory Committee (NISAC), members of the SEEK development team, the TRENDS technical committee, and the LTER IM committee with positive results. A modular architectural/functional design has allowed us to partner with groups like SEEK and the National Center for Ecological Analysis and Synthesis (NCEAS) on backend components and professional design consultants on front-end components. While there is much to be done to bring PASTA into production, we feel that early prototyping effort, using TRENDS datasets, will pay off and accelerate development by giving us material with which to solicit partners and proposals. We have

submitted proposals this year to the NSF Biological Databases and Informatics (BDI) program and OCI-SDCI to continue this work.
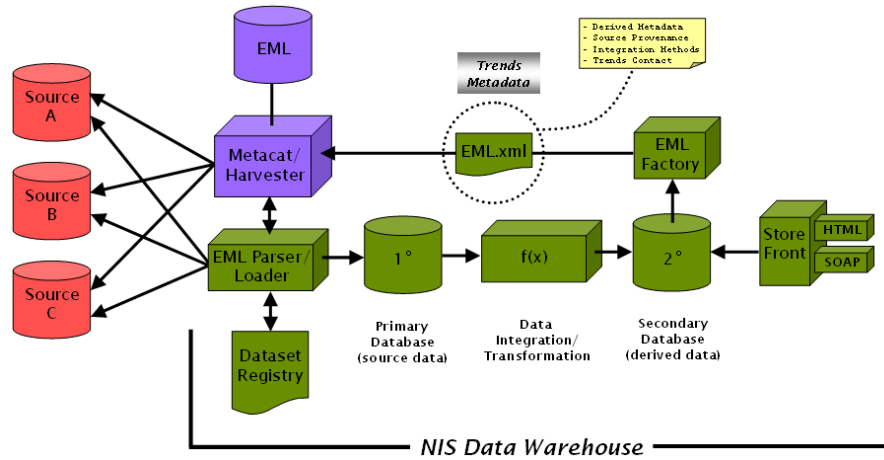

Figure 4 - Provenance Aware SynThesis Architecture (PASTA) Diagram

Information Management Research and Support – Progress continues to be made in the development of the LTER Metadata/Data Catalog – this work includes continued development and improvement the LTER Metacat database, the Metacat Harvester, the Metacat Advanced Query Interface, the Metacat Browse Interface, and site support tools for creation of Ecological Metadata Language (EML) documents. The Metacat interface has been extended to allow site-specific customization of the presentation layer. Search performance of the metadata/data catalog has been greatly improved by indexing key terms and identified key vocabulary terms within EML. The controlled vocabulary index in the Browse Catalog returns near-instantaneous search results for terms in the vocabulary list. Deployment and operation of the Metadata/Data Catalog has resulted in the registration of nearly 25,000 metadata documents; over 5,500 of which are from the LTER Network. Utilizing the indexed relations within the Metacat database for the Advanced Query Interface has improved performance by a scale of 5 to 10. The Metacat Harvester automatically harvests EML documents from 22 of 26 LTER Network sites.
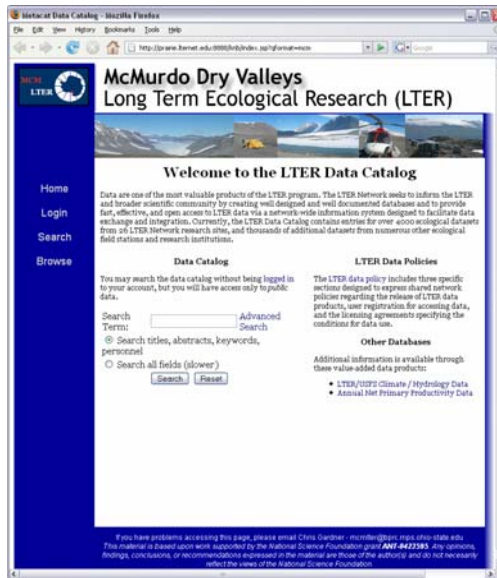
Figure 5. McMurdo Custom View of LTER Data/Metadata Catalog

Detailed Accomplishments

The LNO core tasks described in Figure 1 are designed to provide services to the LTER Network, LTER sites and scientists, the scientific community, and the National Science Foundation. Many of the activities defined under these core tasks are of benefit to more than one of these constituencies. Most of the LNO's efforts address network priorities as established by LTER governing bodies and embodied in the LTER bylaws, planning documents, and committee recommendations. Service to LTER sites takes a variety of forms including support for travel, meeting coordination, technical advice, support of communications and database systems, and response to requests from individual investigators. The LNO shares publicly-funded information and discoveries from LTER research with the broader scientific community, policy makers, and the public. In addition, LNO staff members often contribute to community-wide initiatives involving education, research planning, and the development of emerging networks. On occasion, the LNO receives requests for information or assistance from NSF. The following section provides information on specific accomplishments of the LNO in each of the six core task areas.

Network Research and Education

Through collaboration with the TRENDS working group and the National Center for Ecological Analysis and Synthesis, LNO staff continued the development of a new data module for the LTER Network Information System. This data module will consist of dynamic data sets representing information that will be contained in the TRENDS book, part of the LTER-Oxford book series. These data sets will be registered and available through the LTER Metacat.

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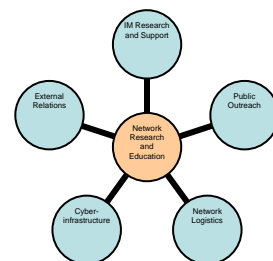
Senior LNO staff coordinated cross-site research activities involving LTER and non-LTER investigators by serving as intermediaries between sites and investigators and by providing letters of support for proposals for work at LTER sites.

John Vande Castle continued to work with USGS/Reston contacts for the operational acquisition of high resolution reconnaissance data for LTER sites. This work included providing information for special acquisition of coastal LTER sites to collect additional information during the 2004 hurricane season. Very high spatial resolution data is now required on an on-going basis for all LTER sites. These data are now being operationally archived through the USGS and can be accessed by LTER researchers with proper security clearance. It is presumed that all these data will be available on a declassified basis in the near future, or within 20 years according to current US regulations. A dedicated LTER web page exists to describe these data and provide information on how the data can be accessed.

Bob Waide continued his collaboration in a NASA-funded project to conduct LIDAR overflights of selected LTER and non-LTER sites. The goal of this project is to develop techniques for surveying biodiversity using forest structure measures derived from radar data. At present, five LTER sites (HBR, HFR, CWT, SEV and AND) are involved in the project.

John Vande Castle attended the Fall AGU Meeting as lead author on a poster depicting CI collaborations and activates of LNO as well as co-author (with William Stefanov) of LTER-NASA collaborations related to land classification/analysis using International Space Station data of LTER sites - December 11-15, San Francisco, CO

John Vande Castle collaborated with William Stefanov of NASA/Johnson Space Flight Center and John Briggs of the CAP LTER site on a ROSES proposal to NASA entitled "Investigation of Biophysical Response to Disturbance Using Spatial Metric Analysis of Multitemporal ASTER And MODIS Data" which is currently in panel review.

Network Logistics

The LNO facilitated the sixth annual LTER mini-symposium at NSF. The mini-symposium focused on LTER research that integrates the social and ecological sciences.

We administered funds from the NSF under our Cooperative Agreement as well as funds contributed by the University of New Mexico as cost-sharing for the Cooperative Agreement.
Marjorie McConnell, our Senior Program Manager, instituted mechanisms to track expenditures for multiple accounts in real time. She supervised Doug Swearingen and Andrea Briscoe, who tracked and assigned expenditures and prepared reports for the Senior Staff. Marjorie McConnell tracked reporting requirements and assured that all reports were submitted to agencies in a timely manner.
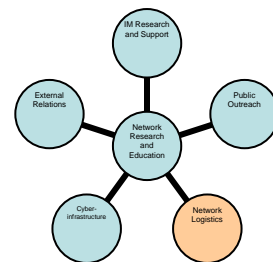
During the present year, the following separate grant accounts were managed: 1) OBFS administrative database (Mellon Foundation), 2) the Resource Discovery Initiative for Field Stations (NSF), 3) the Science Environment for Ecological Knowledge (NSF), 4) National Biological Information Infrastructure (USGS), 5) Predictive Modeling Visualization (DARPA), 6) the NEON Design Consortium (AIBS/NSF), 7) a CI-TEAM demonstration project (NSF), 8) a sub-contract from a joint project with the University of Maryland (NASA), and 9) LTER Network Strategic Planning Activity.

We created and reconciled sub-accounts for 16 LTER cross-site working groups.

We organized meetings and maintained communications for two significant grants addressing global IT infrastructure (SEEK and RCN).
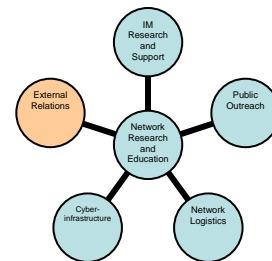
Infrastructure Support

Greg Shore, Jeanine McGann, and Marshall White manage LNO infrastructure, applications, and information and provide 24/7 access to LTER sites requesting assistance via the LNO request tracking system. LNO staff responded to 307 outside requests through this system between September '05 and September '06 – of these were 190 unique individuals making requests. This is up from 230 requests from 138 individuals in the previous year. This increase is attributed to additional planning grant activities and the development of video teleconferencing capabilities.
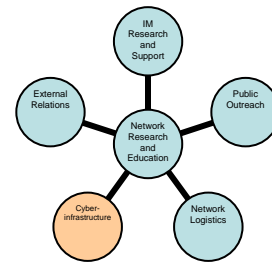
LNO staff continued support and development work on the Ecoinformatics Training and Usability Testing Lab including adding new dedicated server installations and ergonomic modifications. This one-of-a-kind laboratory continues to draw praise for its design and ease of use. The lab was used for 12 training and other sessions in 2006.

External Relations

We continued to coordinate interactions between the LTER Network and NSF, the U.S. Geological Survey, the U.S. department of Agriculture, the National Biological Information Infrastructure (NBII), other agencies, and other national and international networks. Specific activities included the organization of NSF participation in LTER meetings, conference calls, and videoconferences.

We responded to multiple requests for information from individuals and organizations about the LTER Network.

John Vande Castle and James Brunt were invited to the NSF Surficial Earth Science Cyberinfrastructure Summit in Washington D.C., gave a talk on "Cyberinfrastructure Challenges and Planning within the LTER Network**"** and interacted with participants including of representatives of CUAHSI. This interaction continued with a visit to LNO by David Maidment which eventually lead to significant interaction with Mark Servilla and the TRENDS project culminating in a working group at the all 2006 all-scientists meeting.

LNO staff improved the existing metadata crosswalk between the EML and the government standard, the Biological data profile (BDP). They also:
- Developed internet application to crosswalk application public.
- Finished Stylesheet for crosswalk from BDP to EML, although because of content coverage mismatch issues, a wrapping script (in the works) would be necessary to produce valid EML.
- Improved the existing ESRI to EML crosswalk.
- Made the LTER metadata available to the NBII metadata clearinghouse.
- Made the NBII metadata entry tools available to the LTER community.

Inigo San Gil, Mark Servilla, and Duane Costa developed an automated procedure to create a harvest list to place all standardized LTER metadata in the NBII clearinghouse and also automated the updating of LTER metadata records in the NBII clearing houses.

LNO staff developed simple EML parsers that leverage the high-quality metadata quality EML documents for use in data synthesis. These parsers were used in a two projects with McMurdo Dry Valleys LTER and the Cedar Creek Natural History Area LTER to demonstrate the usefulness of high-quality metadata to the synthesis process.

Information Management Research and Support

Deployment and operation of the Metadata/Data Catalog has resulted in the registration of nearly 25,000 metadata documents; over 5,500 of which are from the LTER Network. The Metacat Harvester automatically harvests EML documents from 22 of 26 LTER Network sites. LNO staff continued development and/or deployment of the LTER Metacat database, the Metacat Harvester, the Metacat Advanced Query Interface, the Metacat Browse Interface, and site support tools for creation of Ecological Metadata Language (EML) documents. Specifically, they:
- Extended current Metacat Data Catalog interface to allow site-specific customization of the presentation layer (collaborated with MCM for prototype).
- Utilizing the indexed relations of key EML terms within the Metacat database for the Advanced Query Interface has improved search performance by a scale of 5 to 10 times.
- Added indexed search capability for the Metacat Data Catalog based on vocabulary identified through the LTER Controlled Vocabulary project. This index in the Browse Catalog returns near-instantaneous search results for terms in
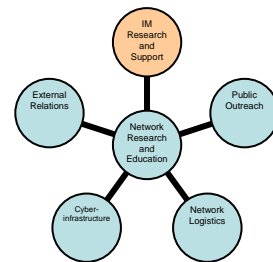
the vocabulary list.

Web Services Model development – The LTER Web Services Model is a project analyzing current web service technologies that may be applied to simple data management and integration challenges associated with the LTER Network. The canonical problem that is currently being studied is the synchronization of LTER Network-wide databases, such as the Personnel database, Site database, Climate database, Hydrologic database, and potentially the new Trends Project/NIS Data Module Support database. A SOAP-based web service model was developed that demonstrated web services for use in updating the LTER Personnel database. The Web Service Model proposes a web service interface based on the Simple Object Access Protocol for interacting with LTER databases. This prototype demonstrates both query, update, and insert capability.

Network Information System Development – Developed prototype network-level architecture for synthesis in the LTER Network. Information Management Staff worked closely with LTER and NCEAS technologists to explore architecture options during meetings of the Trends Editorial Committee and demonstrated technical design and prototype of this architecture at the 2006 ASM. The Trends Project/NIS Data Module Support prototype is a network-level architecture for automating synthesis at the LTER Network demonstrates capabilities that meet the requirements for "comparative analysis" as outlined in the original NSF call for proposals. The prototype design utilizes a hybrid data warehouse model, which supports automated updates, transformations, and metadata documentation.

LTER Controlled Vocabulary – Continued the research and development of vocabulary based on content within the LTER Metacat database, LTER Bibliography, and LTER Data Table of Contents. Added indexed search capability to Metacat Data Catalog interface based on vocabulary key words. Continued analysis of vocabulary words found within the LTER Metacat database, LTER Bibliography, and LTER Data Table of Contents will provide a concise set of vocabulary words. This final set of vocabulary words are being compared to vocabularies supported by other Federal and education ecological and environmental vocabularies. A preliminary set of vocabulary terms have been used to demonstrate near-instantaneous search results when embedded as part of the LTER Data Catalog Browse interface.

Metadata Standardization – Provided on-site and remote assistance to individual LTER sites to transform the site's metadata to the network standard, the EML. Made available most of the LTER metadata in a common standard portable format. This effort as result of a continued major partnership with the National Biological Information Infrastructure (NBII), now in it's 3rd year and providing technical support and tool development for metadata use and interoperability.

Software development for SEEK project – Developed automatic transformations from conceptual workflow to executable workflow. Revised EMLSource2000 actor to use for user-specified metadata/data repositories and develop clustering Web services, compose

workflow for exploring species distributions. Extended JUMP GIS for exploring ecoregion-based biodiversity data. Developed web services and workflow for environmental modeling. Created ontologies, conceptual actors and workflows for ontology-driven composition and validation of scientific grid workflows in Kepler.

Public Relations

(see also Outreach section)

LNO staff members frequently responded to requests for information from NSF, including advance notice of significant publications and media releases describing results from LTER research.
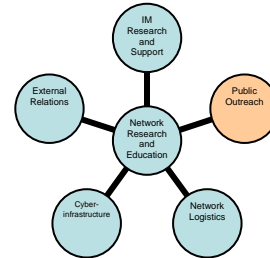
We added material to the existing intranet and LTERnet pages as necessary to support the NSF Mini-symposium, meetings of the Executive and Coordinating Committees, the 2006 All Scientists Meeting, the meeting of the LTER National Advisory Board, various LTER Committees pages, and the LTER Planning Project.

Jeanine McGann edited and proofread newsletters and online Network News, made updates to Network News Portal as needed between editions of the biannual newsletter, updated the document archive, posted opportunities for jobs/students/grad students/undergrad, etc., edited committee web pages and mailing lists as required to reflect new members and governance structures, facilitated story and site features as required, changed passwords, edited database entries for personnel, site characteristics, bibliography, and others as requested, uploaded and managed images in image gallery, created new pages and virtual web servers as needed for new projects and LTER sites, and edited main web pages to reflect changes in publications and program content.

Other Activities

Bob Waide visited two LTER sites (Andrews, Jornada) to assess needs of sites and scientists and provide information on LNO activities.

The Executive Director participated in the activities of the Executive Committee/Board, the Coordinating Committee, the Science Council, and the Science Task Force for the Planning Grant.

The Executive and Associate Directors participated in the activities of the NIS Advisory Committee, the Information Management Committee, the Information Management Executive Committee, the International Committee, and the Technology Committee.

The Executive and Associate Directors served on the governance and cyberinfrastructure working groups for the LTER planning project.

LNO prepared or edited reports and minutes from Coordinating Committee/Science Council, Executive Committee/Board, Information Management (IM) Committee, and IM Executive Committee/Network Information System Advisory Committee meetings, teleconferences, and video conferences and posted these reports on the appropriate LTER web page.

Bob Waide served on the editorial committee for the TRENDS book in the Oxford series and the LNO provided support for the first meeting of this committee.

We produced separate annual reports to the LTER Coordinating Committee, and the University of New Mexico.

We prepared for and were exposed to reviews from the LTER Executive Committee and the University of New Mexico.