**NISAC Meeting Report**
15-16 May 2007 Portland State University Portland, Oregon

**Attendees:** Barbara Benson (NTL), James Brunt (LNO), Don Henshaw (AND), Chuck Hopkinson (PIE), Alan Knapp (SGS/KNZ), Bill Michener (LNO), Deb Peters (JRN), Will Pockman (SEV), Ken Ramsey (JRN), Mark Servilla (LNO), Wade Sheldon (GCE), John Vande Castle (LNO), Kristin Vanderbilt (SEV), Bob Waide (LNO), Libe Washburn (SBC)

**NISAC Meeting Bullets and Action Items**

- The committee will now include two co-chairs, one selected from the domain scientist (PI) membership and one from the IM membership. Deb Peters (JRN) agreed to serve a one year term as PI co-chair, and Wade Sheldon (GCE) agreed to serve a two year term as IM co-chair. Will Pockman (SEV) agreed to serve a two year term after the 2008 NISAC meeting.
- The CI Strategic Plan is essentially complete and will be given to the EB to fulfill planning grant obligations by the end of June. Comments have been solicited to focus group participants and will be placed in an appendix to the plan.
- The Committee recommends to the Executive Board that the proposed initiatives of the CI Strategic Plan be proactively advanced to possible funding sources (Motion passed unanimously)
- Potential sources for funding the CI Strategic Plan should be itemized (e.g., BIO, OCI, CISE); reviews of the plan by Susan Stafford, Peter Arzberger, and Peter McCartney may help identify funding opportunities
- NISAC is willing to assume oversight in implementation of the CI Plan
- Briefings for NSF and the AC-ERE on the CI plan should be considered
- A NISAC subcommittee is currently working to define Critical Site Functionality with respect to the CI needed to accommodate new cross-site integrative science. LTER PIs and IMs will be asked to comment on this proposed functionality (July 2007) and ultimately asked to evaluate implementation costs (November 2007).
- The Committee unanimously endorsed the use of PASTA architecture, currently being developed at the LNO, for the LTER Network Information System (NIS)
- The Committee reviewed LNO priorities and recommended that they be accepted in their current state
- The Committee recommends to the IMC that the controlled vocabulary and unit dictionary efforts be given high priority and steps be taken to move these efforts forward expeditiously because of their potential importance to NIS projects. We recommend that the Metadata editor be given lower priority than these activities.
- The Committee unanimously endorsed the proposed network-level approach for auditing access to LTER data and recommended that 1) LNO present a prototype to the LTER Information Managers at the 2007 IM Meeting and 2) LNO share this approach and provide technical documents to external software projects
- The Committee intends to conduct video teleconferences twice per year (September following the IM annual meeting, and February to prepare for the NISAC annual meeting. The annual meeting will be scheduled prior to the annual Science Council meeting, but preferably not directly associated with this SC meeting.

**Cyberinfrastructure (CI) Strategic Plan Report -** Don Henshaw and James Brunt presented the current status of the CI Strategic Plan and described the proposed CI initiatives. The CI-Core (Brunt, Benson, Vande Castle, Porter, and Henshaw) has completed drafting the CI Strategic Plan Version 3. This document is deemed 95% complete and is considered a working document. This version has been sent to focus groups and other participants in this CI planning process for comments by the end of May 2007, and groups are requested to identify plan components of interest for potential partnership with LTER. The CI Plan was presented at NSF to the LTER Executive Board (EB), the National Advisory Board, and some NSF program officers. CI-Core intends to place all comments into an appendix of the CI Plan and send this document to the EB to fulfill planning grant obligations. The CI-Core funding has ended and this group intends to pass responsibility for CI implementation to NISAC.

**CI Strategic Plan Discussion -** Parts of the CI Plan may be mature now and should be implemented. A forward-looking document with an assessment of where we are now and a prioritized plan for getting from point A to point B is needed for NSF. Potential mechanisms to get money are: reinstitute recurrent supplements to LTER sites, new proposals to targeted programs, or increments to the LNO proposal. The reinstitution of regular technology supplements may be necessary to bring sites up to a critical level of functionality. Augmentation to site funding for CI could be considered (analogous to asking SBE for social science funding).

NISAC is willing to assume implementation of the CI Plan and is currently working on the Critical Site Functionality document. Funding sources at NSF need to be identified, e.g., BIO, OCI, CISE. Another briefing to NSF is needed, and possibly to AC-ERE, a cross-directorate advisory committee chaired by Susan Stafford, at their fall meeting. Peter McCartney, Susan Stafford, and Peter Arzberger could look at the CI plan and give us ideas for funding at NSF.

**Trends Pasta architecture description and progress report -** Mark Servilla, NIS Lead Scientist at the LNO, presented an overview of the PASTA (Provenance Aware Synthesis Tracking Architecture). PASTA is being evaluated as the core network architecture for the LTER Network Information System, and is currently being deployed as the Trends Project's data management system. NISAC provided suggestions to Dr. Servilla for improving the overall presentation of the PASTA architecture to increase acceptance, including the renaming of core components to better match science-level concepts. The NISAC unanimously endorsed the use of PASTA for the LTER NIS.

**Trends reports -** Deb Peters updated NISAC on the status of the EcoTrends book which is anticipated to be delivered to the publisher in Fall, 2007. The name of the Trends project has been changed to EcoTrends due to conflicts with an ORNL project named Trends. The new name matches the EcoTrends website address (http://www.ecotrends.info/). The web site will be completed prior to the announcement of the book release.

Ken Ramsey demonstrated the EcoTrends graphs page and search interface (http://jornada-www.nmsu.edu/ims/trends/index.php) that is being used by the Trends Editorial Committee to finalize graph formatting issues and selection of graphs for EcoTrends book chapters. Additional graphs, not selected for the book, will be available on the once the EcoTrends website is completed.

**Conference call with Peter McCartney at NSF –** Peter McCartney (BD&I, NEON) discussed the LTER CI Strategic Plan and other committee activities. Peter's comments:

- Look for common elements of the LTER CI Plan with those of other large observatory programs (NEON, WATERS, CUAHSI, OOI, etc.) for collaboration opportunities
- Workshops might be funded inviting input on design of new programs, creative ways to promote group contributions, or mechanisms that might improve efficiencies
- Watch for upcoming OCI funding announcements (Chris Greer, Kevin Thompson)
- Limits to scale in LTER deployment could benefit from leveraging more centralized NEON approaches, particularly in sensor management. Contact Marshall Peterson (NEON Technology Chief), who will be developing NEON production systems
- CI Plan implementation should develop concrete use cases between science questions addressed and infrastructure in place or planned
- LTER should focus on question-driven functionality, usability of tools, and shared infrastructure, but off-load core CI development

**NISAC Chair election and membership rotations -** The committee discussed rotation of the NISAC chair position, which has been occupied by Don Henshaw since the committee was formed. The committee members voted to alter the committee governance structure to include two co-chairs, one selected from the domain scientist (PI) membership and one from the IM membership. Deb Peters (JRN) agreed to serve a one year term as PI co-chair, and Wade Sheldon (GCE) agreed to serve a two year term as IM co-chair. Will Pockman (SEV) agreed to serve a two year term after the 2008 NISAC meeting. Don Henshaw stepped down as committee chair, but will continue to serve on the committee until a replacement IM member can be chosen by the IM committee at their August 2007 meeting. Alan Knapp agreed to remain on the committee for another year, so no other changes to the membership are needed.

**LTER Planning Grant - Athens Meeting overview -** Barbara Benson updated the group on the science planning at the Site Reps meeting in Athens, GA on April 3-5, 2007 and the organization, tasks and timeline for the Writing Team.

**Minimum Site Functionality (Critical Network Functionality) -** Kristin Vanderbilt presented the Minimum Site and Network Functionality document, which has been renamed the Critical Network Functionality document based on committee feedback. This document will be updated with comments and figures illustrating the science driving the CI requirements. After being re-circulated to the whole NISAC committee, the document will be sent to site PIs for comment. After PI comments are incorporated into the document, it will be re-sent to the sites with a request to put a dollar amount on achieving Year 1-2 functionality. In this way, we will obtain a range of implementation costs across the network.

Will Pockman summarized some of the key points for implementing CI based on a science example, "Changes in species composition and diversity with shifting land use, human impacts, climate change, nutrient delivery and arrival of new species". The development of minimum site or minimum network functionality requires an assessment of how cross-site projects will change the CI needs of existing sites and of the network as a whole. Although many cross-site projects will expand the collection of data that is similar to current site-based studies, the incorporation of sociological and economic approaches may significantly change the CI required by individual sites and the network. The current development of cross-site projects for the final ISSE document does not permit construction of a detailed example; however, some key commonalities are clear from the products of the Athens meeting.

1) Additional storage capacity will be required to deal with increased use of GIS and remote sensing data.

2) Development of automated and visual QA/QC tools is needed to deal with the increased role of high frequency continuous data streams
3) Capability to trigger sampling based on real-time analysis of multiple data streams is needed (e.g. to study connections among public perception, policy maker decision making and climate and biotic triggers).
4) A strategy is needed for supporting network personnel (site-based, LNO or from outside LTER) with expertise in programming, modeling, GIS, and all aspects of sensor network implementation (sensor development, platform development, data management, etc.) required for cross-site projects. This should include identification of the resources that can be located at individual sites and those that could/should be located at LNO.
5) All cross-site projects will benefit from a clearinghouse (probably located at LNO) for sharing data acquisition, management and analysis tools developed by individual projects.

**CI Survey Report –** John Vande Castle reported on the results of the LTER site cyberinfrastructure survey conducted in early 2007. The survey follows an earlier 2005 survey and tracks site resources and progress in the acquisition, development and use of cyberinfrastructure including personnel.

**Exec Board IM Committee Review –** Don Henshaw reported on the EB decision to give responsibility for spatial data and technology issues related to sensor network management to the IM Committee. The status of the network-level IM webpage and current activities planned for the IM meeting in San Jose in August were reported.

**GAO Survey Report -** The Government Accountability Office (GAO) is looking at how climate research data is shared between researchers, specifically federally funded researchers supported by NSF, NOAA, NASA, and DOE. Don Henshaw, James Brunt, and Suzanne Remillard (AND, ClimDB/HydroDB contact) spoke via conference call with Carolyn Garvey and others at the GAO to answer questions regarding the practical issues in operating data centers such as LTER.

**QA Workshop Report -** Wade Sheldon (GCE) reported on preliminary results and planned products from the post-ASM workshop on quality management for derived data, held at JRN in February 2007.

**LNO NIS Status Report -** Mark Servilla provided the LNO Network Information System Status Report to the NISAC, including an outline of active projects and their associated priorities and targeted end dates. Priorities were divided into three classes: high, medium, and low. The NISAC reviewed priorities and recommended that they be accepted in their current state.

**Data Access Auditing -** Mark Servilla presented a Request For Comment document that proposes a Network-level approach to implement data access auditing across LTER data for conformance to the LTER Data Access Policy. The NISCA unanimously endorsed the proposed approach and recommended that a prototype be presented to the LTER Information Managers during the 2007 Information Managers meeting, along with potential report based products to display audit information, for direct feedback. Further, the NISAC recommended that LNO NIS provide technical documents describing the implementation to external software projects ( e.g., Kepler) for synergistic development and concordance between software applications and the data access auditing approach.

**Attendance Notes:** Deb, Chuck, and Alan were unavailable on Wednesday the 16th. Barbara Benson (NTL) joined the meeting on the afternoon of the 15$^{th}$ and all day on the 16th. Peter McCartney (NSF) participated in a conference call on the 15th.