

Report from the LTERMapS Product Oriented Workshop:

The purpose of the meeting was to complete the pilot project for LTERMapS Phase 2 and develop a strategy for expanding the application to all LTER sites.

The purpose of the LTERMapS project is to provide a data discovery and cartography tool for integration into the NIS through linkages with EML and PASTA. The project will offer detailed information for each LTER site using a common mapping interface for all sites. The following data will be included: all information currently available with the phase one application (SiteDB data), digital elevation model (DEM), roads, hydrography, research plot locations of core research plots, structures, imagery, and EcoTrends socioeconomic county level data. LTERMapS will also utilize Ecological Metadata Language (EML) documents to display study site location data for LTER datasets. The base data layers were identified in the 2007 GIS Working Group GIS Recommendations for LTER Sites (<http://intranet.lternet.edu/im/node/480>).

The LTERMapS project is intended to be the spatial data component of the network-wide NIS development. The project exposes and merges heterogeneous GIS data from the 26 LTER sites into a standard format available for the Network and broader community to perform synthetic analysis, data discovery, and visualization. Goal 3.1 of the NIS is to increase data quality through standard approaches. This project will use site level GIS data to develop templates for display and analysis products that will be deployed for all LTER sites. The project will also provide a network wide map of the EcoTrends socioeconomic county level data and the Network Basemap data gathered through the Hollingsworth IM Buyout proposal. Examples of background data are world ecoregions and global climate model output, though the open nature of our framework would be flexible as new data options arise.

3. Proposed Products:

- Completion of beta application (implemented on 5 LTER sites)
- Operational plan for transfer to all LTER sites.
- Video Teleconference with LTER Information Managers and interested PI's.
- Presentation at Science Council Meeting or other venue to get feedback from LTER scientists..
- Best practice document on using geographic tags in EML to highlight site study locations in web applications.
- Recommendations to NISAC on integrating spatial data into the PASTA framework.

4. Proposed Tasks:

- Discuss options for integrating spatial data into PASTA
- Develop map templates for a common symbology and cartography for LTER Sites.
- Design the backend database

- Develop internet mapping Web application using ESRI tools
- Construct web services and links to existing on-line resources
- Inventory cross-site background layer needs and availability.
- Develop process to use geographic tags in EML to expose location data in mapping application.

Meeting summary: The core group decided to scale back the number of participants to pilot sites, and to focus our efforts on building the infrastructure at the LNO (SDE server), working on the application framework, migrating base data sets into the LNO server, and coordinating with Mark Servilla on the design of the GEONIS.

Attendees were: Adam Skibe (KNZ), Theresa Valentine (AND), Jonathan Walsh (BES), Jamie Hollingsworth (BNZ), Aaron Stephenson (NTL), Inigo San Gil (LNO,MCM), Yang Xia (LNO), John Vande Castle (LNO), and via VTC Travis Duce (GCE). The group also met with Bob Waide, and other members of the LNO.

Several issues were discovered and resolved with systems at the LNO. The version of SQL Server installed was not sufficient to work with ArcSDE, and SiteDB was configured in MySQL which can't be read directly from ArcGIS products. After reviewing many options, the group decided to use PostgreSQL (open source) database and installed that with ArcSDE and ArcGIS server on a machine at the LNO. This will give the group remote access to the machine. Plans are underway to make changes to SiteDB, and expand it for use in tracking study locations. Several problems were corrected around the issue of how latitude and longitude data were being collected, and it took several attempts and web searches to determine that ESRI doesn't work with MySQL. This is a problem because LTERMapS would like to connect directly to the database. This model works best because users make updates in SiteDB, and the results are updated in LTERMaps and other applications automatically. The LTERMaps team is coordinating requests with the group looking at SiteDB upgrades.

The group met with Mark Servilla on development of the GEONIS module of the NIS. The result was a better understanding of how all the pieces fit together, the role of PASTA, and timing issues related to when PASTA can work with other data formats. (see attached document with diagram). The group focused on providing the geographic context for SiteDB and Clim/HydroDB as the first steps in implementing the GEONIS.

Core Data: The pilot site digital elevation model (DEM) data were projected into a global web projection and an image service was created. We are still waiting for a better DEM from MCM. A model was developed to move site watershed data into a common SDE format. We decided to use the National Hydrological Dataset (NHD) for a nation-wide hydrological system.

Front end application. The group looked at different ESRI JavaScript API samples to pick a starting point for the web application. A decision was made to use the basic sample, and build from there. Several additional features (widgets) were identified and added to the sample. These include bookmarks, a

popup information window, legends with visible layers, and features that would page through records/features, query related records (to link to Clim/HydroDB and SiteDB), displaying features in a datagrid, query results in a chart or graph, geoprocessing, and find and identify. Additionally, we looked at graphs produced in Clim/HydroDB and the underlying queries that were used to produce the graphs.

Travis Duce worked on converting LTERMapS version 1 to the version 3.0 of Google Maps via VTC.

Accomplishments to date:

1. Server up and running at the LNO, with appropriate software. LTERMapS team is able to access the server remotely.
2. Image service for pilot site DEMs is running on LNO server. All DEMs in same projection.
3. JavaScript API skin is in place, and widgets are being added.
4. Map Services produced for Jamie Hollingsworth IM buyout are available for use within the web application.
5. Initial outline for the GEONIS was developed, with diagram showing relationship to PASTA.
6. LTERMapS version 1 upgraded to Google Maps version 3.0 (currently waiting for LNO to update the application).
7. Updated latitude and longitude data in SiteDB and updated web entry form to reflect changes.
8. Modifications to FGDC2EML stylesheet have been completed, providing a tool to create EML 2.1 metadata from FGDC metadata.

Future Plans:

1. Document instructions for customizing and using FGDC2EML2.1 stylesheet. Provide training to LTER Information Managers.
2. Prepare best practices document on using geographic tags and the FGDC2EML stylesheet to complete EML.
3. Complete model for moving local DEM and watershed data into the GEONIS database. Transfer the process to LTER Information Managers.
4. Complete a beta JavaScript application, using pilot site data.
5. Continue to work with the SiteDB revision group, to insure that the revision will be usable with ArcGIS products.
6. Develop workflows and models for moving spatial data from local EML files into the GEONIS, while further refining the proposed structure of the GEONIS.
7. Present the GEONIS strategy/diagram to the NISAC.
8. Provide LTER scientists with a demonstration of a beta application (perhaps at the science council meeting).
9. Prepare a Spatial Data Edition of DataBits, highlighting recent work.
10. Research options for using geographic tags in EML to display study sites within Druple websites.