

## **Final Report for the 2009 LTER All Scientists Meeting by the ASM Spatial Data Working Group**

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One of the main points of discussion during the meeting was a need for an LTER committee to focus on remote sensing and spatial data issues, particularly at the Network level to address ISSE research. The past LTER technology committees considered spatial data as a part of their discussions, but not a primary focus. Now that the Technology Committee has been disbanded, most of the issues covered by the LTER Technology Committee are now included in other committees like the LTER IM, NISAC, and Climate committees. So a focus on spatial data, particularly for Network-level research, is no longer covered in the current LTER committee structure. A Spatial Data Committee could give the LNO advice that could be documented and implemented through agreement by the LTER Executive Board. For instance, a committee could come up with standards that LNO would document and post. An example would be acquisition of specific data or use of tools that could be linked to Google Earth. This committee could also link with the Information Management GIS working group. This group does not focus on remote sensing issues, but, coordinates efforts within the LTER Information Management Committee related to management of spatial data. There is no current path for the GIS committee to get their recommendations implemented except through the IM committee itself, so representation of this IM working group on an LTER Spatial Data Committee would be important. This group agreed that a committee was needed and people agreed to serve as initial members of the committee. Theresa Valentine agreed to serve as the person to represent the IM GIS working group on the committee.

The working group also discussed the role of the LNO for LTER spatial data. One particular LNO role would be to focus on common datasets that can be used for ISSE research – both linking data from standardized platforms as well as making them available. One example for this would be collection of standard data sets like cloud-free Landsat data. LiDAR data is another good example – it comes in many forms, and individual sites have specific needs that might not be ideal for cross-site research. A site might also not acquire data that would be useful for cross-site research. There could be training on basic use of spatial data such as LiDAR. Also to coordinate an inventory of what sites are currently doing and what type of data sites already have.

Linking with other groups is another role for the LNO. For instance, for SAR and other data, the Alaska SAR Facility is an excellent source of information and data that would be useful for ISSE research. Similarly for LiDAR data, the NSF funded NCALM facility has provided data to some LTER sites, and having something like a cooperative agreement for data acquisition could be pursued. Similarly, NEON is going to provide remote sensing data, particularly data for NEON cores sites that are also LTER. They also will be using mobile platforms and this would be an excellent area for LNO coordination efforts. NEON is looking for ways to interact with LTER and LTER is looking for ways to interact with NEON. It seems that this would be a good starting point.

For historical data, LNO could help to make these data more available to LTER researchers. For instance the UC Santa Barbara Map and Imagery Laboratory (MIL) archive of aerial data would be an excellent source of data for cross site research. The UC site has an on-line gazetteer as well as user support services. The data come from both tax dollars as well as commercial sources. The data are limited to primarily terrestrial data, not marine or atmospheric. There are other groups that could support LTER ISSE research as well, not the least being agency organizations within NASA and USGS including the EDC DAAC, the ORNL DAAC and others. The historical data is important, but new data sources such as LiDAR are also essential. For instance, in order to use historical data for cross site

research, the data needs to be orthorectified. To do this a high resolution DEM is needed, such as that from LiDAR data acquisitions.

There has also been a history of efforts and linkages between ORNL and LNO. This could be expanded to include other data. The Global Fiducial Library data is also a good example. LNO originally set up acquisitions for LTER sites and only recently has some data been declassified and made available by the USGS for the JRN and JFR sites. ORNL could have a role identifying data to be declassified. Similarly resources could be identified and used for data analysis – for instance with EDAC – groups that can produce products. In the same way, linkages between LTER and NASA should be strengthened. When research efforts were very close, a web page was developed by the LNO to document these efforts, and this page could be used for future collaborations and research efforts.

The working group also discussed ways to have a better inventory of both GIS and remote sensing data at the sites. Many sites do not include raw remote sensing data in their data holding, and this is not as helpful for cross-site research efforts. Also new research by graduate students at LTER sites often represents cutting-edge efforts that need to be documented so they can be included in cross-site, ISSE research. This type of inventory should be included as part of the LTER NIS.

The working group also pointed out the diversity of remote sensing data and tools that are needed for different aspects of LTER research. For instance, marine remote sensing needs are quite different from terrestrial applications which have historically been more of a focus for LTER. Snow and ice data are important for cryosphere studies but again are applicable to different group of remote sensing scientists. Atmospheric data including cloud types, temperature profiles and similar data would be useful for LTER climatologists but are not usually included in LTER remote sensing activities..

The working group also discussed the need for funding and that any new efforts to include data and data linkages are going to need resources and should be linked to funding activities of the LTER Decadal plan. The groups suggested that the next step was to request post-ASM funding to establish a spatial data committee or at least to discuss remote sensing issues among researchers for a longer period than a 2 hour meeting. Ten member agreed to be part of this initial meeting including M. Gastil-Buhl, Suzanne Sippel, Kyle Cavanaugh, jamie Hollingsworth, Theresa Valentine, John Schalles, Christine Hladik, Mike Gooseff, John Vande Castle and Andrew Fountain. This meeting would include those who expressed interest in cross-site remote sensing efforts and would not necessarily need to include a representative from every site.