

Title: Nitrogen Budgeting at LTERs: Relation to Carbon Sequestration

Session: Friday PM

Organizer: [Herman Sievering](#)

Key Participants: Bill Munger (HFR), Jed Sparks (HBR): Co-organizers, and at least one person from all other LTERs

Keywords: Nitrogen, Carbon, Budgets, Growth, Sequestration

Abstract: Application of ecosystem research for carbon policy formulation requires that fundamental ecosystem processes be characterized at appropriate scales of resolution and with known degrees of confidence. A key example is attribution of the large North American C sink. Eastern US forest re-growth and potential enhanced growth due to atmospheric nitrogen (N) deposition is often mentioned as a major factor in this attribution. Atmospheric N is present in both reduced and oxidized states and may be deposited directly to foliage or to underlying soils. This variability complicates our ability to quantify the impact of atmospheric N deposition on C sequestration at terrestrial ecosystems. For example, N deposition retained in the canopy of spruce stands accounts for only 5% to as much 40% of annual N growth requirement. Nitrogen deposition may have a chronic effect on terrestrial ecosystems. Long-term measurements are a key to extracting trends in carbon accumulation from inherent variability.

The goals of this workshop are:

- a) Evaluate existing data on N and C cycling at LTER sites to compare atmospheric and soil inputs of N as well as N reallocation, evidence of foliar N assimilation, and relationships between N inputs and C sequestration;
- b) Provide a framework for further investigation and synthesis using existing LTER data sets;
- c) Formulate testable hypotheses and identify critical data gaps that will serve as a guide for future LTER cross-site research.

Title: Information Technology for the Decade of Synthesis: Tools for Data Synthesis in the Present and the Future

Session: Friday PM

Organizer: [Todd Ackerman](#)

Key Participants: Todd Ackerman (NWT), Ken Ramsey (JRN), Peter McCartney (CAP)

Keywords: Information Management, Cross-site, Data, Tools

Abstract: The Decade of Synthesis will require the LTER Network to integrate diverse data sets from individual site-based research programs in order to foster cross-site studies. The focus of this workshop will be on tools that are currently being developed to aid in such integration as well as on desires for future products. We will explore data integration methods through formal presentations of current synthesis research, tools in development, and the needs for future products. Round table discussions will follow the presentations to solicit researcher needs.

Presentations:

1) Greg Newman, Natural Resource Ecology Laboratory, Colorado State University.

"Hand-crafted Data Management: IT Tools Built to Last"

2) Wade Sheldon, GCE LTER.

"Software tools for automated metadata creation, metadata-mediated data processing and quality control analysis -- real-time processing solutions for real-time data"

3) Chad Berkley, NCEAS.

"Tools for Creating and Executing Scientific Workflows"

4) Corinna Gries/Peter McCartney, CAP LTER.

"Southwest Environmental Informaton Network: Using EML to mediate data discover, access and visualization"

Title: Current and Future LTER Research on Invasive Species Issues

Session: Friday PM

Organizer: [Timothy Seastedt](#)

Key Participants: Alan Knapp, William Lauenroth, Mendy Smith

Keywords: nonindigenous species, invasibility, invasions

Abstract: Public interest groups and policy makers have identified species invasions as an issue of environmental and economic concern. Invasive species questions were identified in the 2002 20-yr LTER review and 2003 Coordination Committee meeting as important components of an emerging network-wide scientific initiative. The LTER program is preadapted to provide the research that can identify the mechanisms and drivers of species change. Nonindigenous species questions are nested within the larger framework of issues involving the causes and consequences of biotic change. Integrated, cross-site research efforts can be nested within experimental and descriptive efforts focused at understanding causes and consequences of biodiversity, succession, restoration, and role of biota in global environmental change. Presentations will center on new results from LTER sites on patterns and causal mechanisms of invasions, and tests of ecosystem invasibility. These will be followed by a discussion that will examine a) Mark Davis's (BioSci. 2003) hypotheses as foci for ongoing and new LTER efforts and b) explore ways to conduct invasive species research within the broader framework of LTER programs involved in the analysis of species change.

Title: SNOW AND ECOSYSTEMS IN A CHANGING CLIMATE:from pole to pole and mountains to the sea

Session: Friday PM

Organizer: [Mark Williams](#)

Key Participants: Peter Groffman, Mark Williams, others being contacted

Keywords: snow ecosystems climate soil permafrost

Abstract: Snow properties (depth, duration, meltout) respond in a non-linear fashion to changes in climate. Moreover, soil and air temperatures in many snow-covered ecosystems are near 0 degrees C. Consequently, the response of ecosystems to changes in snow properties may be both larger than expected in magnitude and in a counter-intuitive direction. For example, less snowfall in the NE may result in colder soil temperatures. A warming climate may result in colder air temperatures in Antarctica. Warming air temperatures in the Arctic may result in more snowfall, increased soil temperatures above that caused by increased air temperature, and hence a larger increase than expected in the active layer of permafrost zones. Goals of the workshop include: (a) a short report summarizing activities along thematic lines; and (b) development of a cross-site proposal.

Title: Predicting species responses to increased resource availability

Session: Saturday AM

Organizer: [Katharine Suding](#)

Key Participants: Steven Pennings, Daniel Milchunas, Christopher Clark, Laura Gough, Katherine Gross, Scott Collins

Keywords: nitrogen, fertilization, diversity, traits, synthesis,

Abstract: When a N-limited system is fertilized, productivity increases and diversity generally declines, a pattern that many experiments at LTER sites demonstrate. This working group will address plant species responses related to this diversity-productivity shift: what functional groups increase in relative abundance, what species are lost, and how community structure and system characteristics interact with these changes. The workshop's format will consist of a limited series of talks followed by substantial discussion periods concerning conceptual frameworks and specific data analysis/modeling issues. The principle goals of this workshop will be to foster communication among scientists working on issues concerning species-resource dynamics and to advance an ongoing synthesis effort of N-addition experiments across LTER sites.

Title: LTER Network Research Initiative V. Extinctions/ Invasions:

Session: Saturday PM

Organizer: [Timothy Seastedt](#)

Key Participants: Tim Seastedt, Kate Suding

Keywords: Strategic planning

Abstract: As part of the LTER Strategic Planning activity, the Coordinating Committee has decided to develop a proposal for a planning grant to NSF to develop a long-term plan for cross-site and synthetic research. This effort is a major undertaking that is likely to determine the direction that the LTER Network will take over the next decade and perhaps beyond. The development of this proposal is an important step in augmenting site science, in formalizing LTER synthesis activities, and in determining the eventual composition of the LTER Network. This workshop is one of a series of workshops designed to identify and develop science themes for inclusion in the proposal. Each workshop will initiate a process to 1) define and refine the principle question appropriate to each theme, 2) develop the knowledge and leadership needed to address this question, 3) define the research required, and 4) prepare a mini-proposal (3 pages) for each theme that can be included in an LTER Network Planning Grant Proposal.

Sample questions that might be addressed under this theme include (but are not limited to):

What are the effects of invasion, and how do the characteristics of successful invaders lead to observed effects?

What are the causes and consequences of species invasions? (what features of communities make them susceptible and resistant to invasive species?)

What are the impacts of species invasions and extinctions? What are background levels of species turnover?

What roles have humans played in the introduction and relative success of invasive species?