Minutes of the LTER Science Council Meeting
May 19, 2007
Portland, Oregon

1. Welcome and Introductions (Magnuson)

The meeting was called to order at 10 a.m. by Chair John Magnuson. Those present are listed at the end of these minutes.

2. Announcements (Magnuson)

a. Minutes of 2006 meeting of the Science Council meeting at Estes Park were approved by consent.

b. Time and Place of Next Science Council Meeting

The 2008 Science Council meeting will be held in Baltimore with the Baltimore Ecosystem Studies site as host.

c. Outgoing Executive Board members

John Magnuson described the service of outgoing EB members Scott Collins (SEV), Mark Ohman (CCE) and Debra Peters (JOR) and thanked them.

d. Incoming Executive Board members

John Magnuson introduced the members of the EB including new members Sarah Hobbie (CDR), Sally Holbrook (MCR), and Steve Pennings (GCE).

e. Future Science Council Meetings. The Executive Board has reconfirmed future meeting sites and hosts as previously agreed by the Coordinating Committee. Note that they alternate from east to west and include several of the relatively new sites:

2008 – Baltimore Ecosystem Study (BES)
2009 – California Coastal Ecosystem (CCE)
2010 – Plum Island Estuary (PIE)
2011 – Moorea Coral Reef (MCR)
2012 – Georgia Coastal Ecosystem (GCE)

f. Phil Robertson begins as LTER Chair of the Science Council and Executive Board at the end of the Science Council Meeting this morning.

3. Action Items. (Magnuson)

a. Science Council recommendations for potential new members of the National Advisory Board.

Magnuson called for nominations for new members of the National Advisory Board. Steve Carpenter suggested the addition of additional distinguished social scientists to the NAB and made several recommendations, as did Nancy Grimm. It was noted that nominations for people with backgrounds in physical science as well as good skills in synthesis would be useful. Robertson agreed to solicit nominations from lead PIs by e-mail.

b. Science Council designations of science topics and program committee members for the Science Council Meeting at Baltimore in Spring 2008.

Steward Pickett described plans for the Science Council meeting in 2008. He indicated that an earlier date was necessary because of the Preakness Stakes during the third week of May. The meeting will be in a hotel somewhere on the seafront, and there will be a field trip that will contribute to our understanding of the kinds of social science interactions proposed in the ISSE. Dan Reed suggested that we revisit the discussion from the Estes Park SC meeting before choosing dates. Bob Waide suggested that we should avoid adding additional meetings to the SC agenda if possible. There was a brief discussion of possible dates, with a tentative schedule of April 29-May 1 but suggestions to look for earlier weeks as well. Waide was asked to look for possible conflicts with dates.

John asked for volunteers for a program committee for the 2008 SC meeting. It was suggested that the host site determine the topic, but this suggestion was not accepted. Nancy Grimm suggested that we look for topics from the leaders of the post-ASM working groups. There was a suggestion that themed working groups are much preferable to sessions of presentation. Robertson suggested that we solicit ideas from sites as well as working groups for a decision by the EB during the summer. Grimm urged that no matter how the themes are selected, there should be a program chair to help coordinate the meeting. Pickett suggested socioecological research in working lands or systems as a possible topic. Grimm suggested that the three major themes of the research plan might form the basis of the program. Reed suggested that we should find a way of providing opportunities for sites to participate in all three workshops.

3. Reports from Current Meeting

a. Writing Team report from this meeting. (Scott Collins and Phil Robertson)

Scott Collins gave an overview of the efforts of the Writing Team. The Writing Team focused on the products of the recent meeting in Athens, which insured that ideas from the sites were filtering up through the process. There was some difficulty getting initial traction, but by the end of the meeting there was significant progress by all of the sub-groups. Documents from each of the groups are due July 1. Process will be as open as possible, so lead PIs will be getting periodic updates over the summer. The initial research plan outline is attached below.

Hobbie asked if synthesis of existing data was still a target of the planning process. Hobbie also asked about the role of the Advisory Group chaired by Jerry Melillo. Collins responded that this group will be disbanded when the planning grant finishes, and that the LTER NAB will take over the advisory role at that time. Collins also indicated that the most important advice would be coming from the Science Council and Magnuson confirmed that view.

Hobbie suggested that discussions in larger groups are valuable to understand the process. There was a discussion about the amount and means of providing feedback to sites. Barbara Bond suggested that enhanced communications by PolyCom should be considered this summer. Robertson agreed to organize such discussions between September 1 and the finalization of the planning grant report.

b. Trends Synthesis Workshops

Primary production (Alan Knapp; see attached report)
The primary production working group initiated its meeting with presentations from 17 sites and was able to identify 20 data sets with an average length of 13 years. The challenge is to make disparate data sets comparable, and the group made significant progress on this challenge. Several research

questions have been identified that can be addressed with these data sets. Several commitments were reached: 1) to continue as a synthesis group, 2) to sharing all data with each other, 3) Emily Stanley added to leadership team, 4) process for moving forward defined, 5) expanding number of data sets for analysis, 6) harvesting data and compiling in common format, 7) analysis of data over winter for another meeting in spring 2008, and reporting back to SC in 2008. The group is committed to actively looking for funds for further work through NCEAS, LNO, or NSF.

Waide asked whether there was a plan for managing the data set that will come from this working group and urged leadership to include information managers in the planning process.

Biogeochemistry (Julia Jones; see attached report)
The discussion of this group revolved around what could be done with existing data, focusing on the data from the TRENDS data base particularly for stream export data. There was a discussion of developing a ChemDB database and a recommendation to move forward on such a database. Soil properties were also discussed, but it wasn't clear whether sufficient carbon data existed to develop common database. It may be that there are data that did not meet the TRENDS criteria because they are designed to measure spatial rather than temporal variability (Waide). A space for time approach might lead to discovery of additional data (Gholz). Careful consideration of the structure of existing data sets is necessary before a new database is attempted (Henshaw).

Discovery through Synthesis (Mark Ohman; see attached report)
The common theme chosen by the working group was an evaluation of climate-scale drivers of climate at different time scales and their effect on different functional levels or trophic groups. The object would be to determine the spatial imprint of different climate drivers and to determine which regions or trophic groups are affected by one scale or another. The approach will include both direct and indirect effects of climate, and there will be a strong focus on threshold effects and other non-linearities. Tony Joern agreed to lead in the development of an NCEAS proposal. There would be interactions between this group and the primary productivity group.

Bob Waide invited leaders of all three groups to discuss with him how the LNO might facilitate next steps.

c. Ecosystem Services Workshop (Stuart Chapin)

One of the most exciting outcomes of the ASM was the presentation of the ISSE framework. Chapin along with Ann Kinzig and Steve Carpenter decided to organize a workshop on one aspect of that framework, ecosystem services. All sites sent in information and participated in the workshop. Two synthesis papers came out of the workshop, one on biofuels and one focused more broadly on the synergies and tradeoffs in ecosystem services. It was interesting that the same drivers, population and land cover change and climate change, seemed to be important for most sites. Important services were also similar across sites.

4. Comments from NSF (Henry Gholz)

Supplement status – Over $2 millions in supplements this year. All 26 requests in the area of integrated research and education will be funded jointly by BIO, GEO, and OPP collectively. There were 20 requests for social science. There are now four SBE program officers working with Henry. Ten of these proposals will be funded. About 10 of 19 international requests will be funded. DEB also supported TRENDS and social science work through supplements to LNO, JOR, and CWT.

The NSF 2007 budget received a 7% boost, which translated to 4% to BIO. Bills are being debated for 2008 budget. There is no environmental pot of gold in 2008 budget, which focuses on other things. There may be an environmental initiative in 2009 budget. We should be focusing on 2009 budget initiative, which may provide an umbrella for ISSE funding.

Proposals addressing goals of the strategic plan would be welcome. Options include: 1) increase in renewal budgets to implement ISSE goals (being discussed within NSF) or 2) aggregate proposals from groups of sites.

There is a continuing discussion of the wisdom of including social scientists on renewal panels, for sites without SBE funding, which is a topic that should be discussed by LTER. Henry suggests that until there is some funding for social science research, review criteria should not be changed.

5. Report from the Chair of the Science Council and Executive Board (Magnuson)

Magnuson made a few brief comments. The new governance system seems to be working. Details of the governing system as it exists and was developed through the Planning Grant Process and approved by the previous Coordinating Committee in 2006 were presented by John at the plenary session on Thursday morning. Since the last Science Council meeting we had seven Executive Board meetings; most were via Polycom. The use of Polycom is working for these and saves travel, and time. To be effective these meetings should be less than 2 hours in duration. Each of the standing committees was reviewed by the Executive Board; two were disbanded and commendation and suggestions were provided to the remaining committees. The letters to each committee chair are on the web. The minutes of all meetings of the Science Council and Executive Board are posted on the web. John hoped that the communication between the Executive Board and the full Science Council have been sufficient so that the Science Council remained current on the activities and decisions being made in their behalf. The 2006 ASM was great success, largely attributable to the efforts of the LNO staff. John truncated the rest of his report because of time constraints.

6. Report from the Executive Director of the LTER Network Office (Waide)

Waide's report was brief because of time constraints. LNO will purchase 50 PolyCom units and send two out to each site in June. Sites should think ahead about who will have use of these units. Henshaw asked whether one of these units was to go to the site information management. Waide sent a letter from Donata Renfrow to sites offering her services to produce site videos. Contact her directly.

The LNO renewal proposal will be submitted in 2008. This provides an opportunity to re-structure and re-orient activities of the LNO. We will be working closely with the EB, site representatives, and the chairs of the standing committees to make sure certain that the proposal addresses network needs. We have already circulated a draft outline to the EB to start discussion.

LNO is having some turnover in staff. We are searching for a replacement for Pam Madrid. Please send requests to office_support@lternet.edu or tech_support@lternet.edu to make sure that your requests are attended to. Greg Shore is retiring and his replacement has been hired. Bob noted that he had an enjoyable time on his 3-month mini-sabbatical working on the Luquillo site volume, and commended James Brunt for a great job in running the LNO in Bob's absence.

7. Thank you to and comments from outgoing Executive Board members (Magnuson)

Mark Ohman encouraged sites to participate in the Executive Board. He felt that his understanding was broadened substantially by his tenure on the EB. Collins commented that participation in the EB is

highly valuable especially as the EB has become more important in governance, and noted that the discussions that occur in the EB are important for resolving many Network issues.

8. Questions and issues from the Science Council to Magnuson and/or Waide

Hobbie asked Magnuson how much time the new chair should have to allocate for the job. Magnuson indicated that 40% time was the amount needed.

9. Installation of New Chair of the Science Council and Executive Board.

Phil Robertson was escorted to the podium by John Hobbie and Bob Waide and installed as chair.

10. New Business. (Robertson)

Robertson, Waide, Hobbie, and others made remarks of appreciation for the outstanding service of John Magnuson as interim chair of the Network, and Bob Waide on the Network's behalf presented John with a donation to the John J. Magnuson Limnological Library Fund. In addition, John was presented with a reproduction of the LTER logo signed by attendees at the SC meeting; this will be framed and sent to him later.

11. Adjourned at 12 noon.

12. Meeting participants

Chair John Magnuson

Site Representatives (5 sites absent):

AND	Barbara Bond	KNZ	Tony Joern
ARC	John Hobbie	LNO	Robert Waide
BES	Steward Pickett	LUQ	Nicholas Brokaw
BNZ	Terry Chapin	MCM	William Lyons
CAP	Nancy Grimm	NTL	Steve Carpenter
CCE	Mark Ohman	NWT	Mark Williams
CWT	Ted Gragson	PAL	Hugh Ducklow
FCE	Evelyn Gaiser	SBC	Dan Reed
GCE	Adrian Burd	SEV	Scott Collins
HFR	Serita Frey	SGS	Mike Antolin
KBS	Phil Robertson	VCR	Mark Brinson

Committee Representatives:

Graduate Student	John Kominoski
Information Management	Corinna Gries
Climate	Doug Goodin
Education	Carol Landis
International	Patrick Bourgeron
Publications	Alan Knapp

Others Present:

Henry Gholz (NSF) and about 10 site scientists, including speakers noted above.

Attachment 1. Item 3a – Writing Team Report

LTER Network Research Plan – Initial Outline for Writing Team
Version: May 1, 2007

I. Introduction (Collins, Robertson*)
Blending research, education and CIS (Benson, Moore)

II. Conceptual framework & theoretical foundations (Carpenter, Collins*, Grove)

III. Network level Science (30 p)

1. Urbanization, Exurbanization, and Working Systems
   A. Suburbanization / Exurbanization
   B. Working Systems
      Anderson, Foster, Gragson, Grimm*, Gross, Henshaw, Peters, Swinton*

2. Ecological and Social Responses to Climate Change and Variability
   C. Storms, Large Oscillations, and Climate Feedbacks
   D. Flooding and Sea Level Change
   E. Loss of the Cryosphere
      Benson, Boone, Ducklow*, Ogden*, Servilla, Waide, Whitmire, Williams*

3. Biotic, Water and Nutrient Changes in Socio-ecological Systems
   F. Trophic Structure, Biodiversity, and Invasive Species
   G. Water Availability and Nutrient Delivery & Processing
      Brunt, Carpenter, Covich*, Groffman, Grove, Moore, Polaski, Reed*

IV. Integration of Transdisciplinary Research, Education, and CyberInfrastructure (7p)

1. Education (Anderson*, Moore, Whitmer)
2. CyberInfrastructure (Benson*, Brunt, Henshaw, Servilla)
3. Transdisciplinary Research (Carpenter*, Collins, Gragson, Grove, Ogden, Peters, Swinton*,
   Waide)
4. Capacity building (Collins, Robertson, Waide*)

V. Program management (Magnuson*, Robertson, Waide)
VI. Benefits to society (Carpenter, Collins, Grove*, Polaski)
VII. Significance (Collins, Robertson)
VIII. Literature Cited

Note: The writing team is using as a foundation for Network-level Science the socioecological models (loop diagrams) provided by all sites in January, grouped by the Science Task Force at its Albuquerque meeting in February, and further refined by site representatives at the April Planning Grant workshop in Athens.

Attachment 2. Item 3b – Trends Reports

1. Discovery Report (Tony Joern, Mark Ohman)

Mark Ohman chaired productive and wide-ranging discussions among 15-20 LTER scientists in the newly constituted "Trends Discovery Group". The explicit goal of these group discussions was to identify and develop viable questions that can be asked using the current Trends Project database. No preconceptions about directions that discussions might take existed, and there was no advanced preparation by the group as a whole prior to meeting. It became clear that many interesting questions regarding the temporal dynamics of ecological processes can be addressed using current Trends data. After discussing alternatives, the group focused on ways to assess the contributions of major periodic climate drivers (e.g., ENSO, Pacific Decadal Oscillation, North Atlantic Oscillation, and others) operating at different frequencies to the dynamics of representative groups at different trophic levels, including the dynamics of community food webs. It seemed particularly interesting to examine how these extrinsic influences varied at along latitudinal and productivity gradients or from coastal to mid-continental transects with respect to their influence on different trophic groups over the range of communities represented at LTER sites. Data from the LTER network are particularly suited for addressing this problem because of the long-term nature of the datasets, the availability of data for many taxa that can be grouped into recognized trophic categories, and the spatially distributed nature of LTER sites along major continental-scale gradients. As a result, this project has the potential to develop into a major LTER synthesis activity.

Recommendations for actions to continue moving the activities of this working group forward were developed at the conclusion of the session. Anthony Joern will organize the project. The next steps for this Trends Discovery working group include: (a) evaluating the kinds of data available at all LTER sites so that we can more fully populate our matrix with representative examples from all trophic levels, (b) working with Deb Peters (coordinator of the Trends Project) and the LTER Network Office to solicit help in obtaining LTER data not currently available as part of Trends but clearly needed for the project to succeed, (c) organizing a database of climatic indices needed to examine the proposed trends and evaluate their suitability for the project, (d) obtaining funds to host one small meeting among participants to further organize our thoughts and approaches, and to develop a final strategy and proposal for a formal working group at NCEAS, and (e) developing a research-focused group project based on representative sites in the LTER network to justify the approach. We plan to complete planning activities by November 2007, with the NCEAS proposal due in January 2008. (f) The group is also seeking other long-term data sets for regions not covered by LTER sites to incorporate into the analysis.

2. Biogeochemistry Report (Julia Jones, John Melack)

Participants were Julia Jones (AND), Merryl Alber (GCE), Mary Cadenasso (BES), Cliff Dahm (SEV), Serita Frey (HFR), Doug Goodin (KNZ), John Hobbie (ARC), Sherri Johnson (AND), John Kominoski (CWT), Berry Lyons (MCM), Karen McGlathery (VCR), John Melack (SBC), and Whendee Silver (LUQ).

Summary of discussions

1. *Value of this workshop.* **Examination of the Ecotrends data was limited because only wet atmospheric deposition are currently available.** Hence, the discussion largely concerned

what could be done with other data sets known to exist within the LTER, expected to exist or those that could be developed.

2. *Clarification of Ecotrends data?* Some datasets appeared to show nutrient concentrations and/or fluxes for molecule (e.g., NO_3, NH_4) rather than for the element in the molecule (e.g., NO_3-N). The elemental units are more appropriate; each dataset needs to be checked to make sure they are consistent within and between sites. **Specific requirements for units** were suggested. (see Friday's discussion about Chem-DB, below).
3. *Synthesis based on existing Ecotrends data for biogeochemistry?* Atmospheric wet deposition and concentrations are currently online on the Ecotrends webpage for a number of sites, and lend themselves to comparison. **Possible analyses of these data** were discussed, and hypotheses included:
    a. Declining trends of atmospheric deposition of nitrate-N in eastern sites compared with rising trends in western states may be explained by westward migration of people, exurban expansion, and perhaps associated automobile use and/or power generation.
    b. Declining trends of atmospheric deposition of S and H for most sites may be the result of Clean Air Act standards applied to power plants.
    c. The relationships of trends to PDO, ENSO, PDSI could be tested.
4. *Synthesis based on future Ecotrends data.* **We look forward to learning when the remaining data have been made available on the Ecotrends website. The LTER network seems poised to answer biogeochemical questions that synthesize (1) records of varying length among sites (not hitherto collected in Ecotrends) or (2) long-term trends among sites. These efforts would benefit from (a) experiments (e.g. N fertilization, warming, etc.); (b) process studies; and/or (c) budgets** containing inputs, standing stocks, and outputs at each site (including all inputs, not just atmospheric deposition).
5. *Helping to build Ecotrends for future biogeochemistry synthesis*. The Ecotrends project helped us to understand that the LTER network is just beginning to develop synthetic databases relevant to biogeochemistry. However, the Ecotrends effort in biogeochemistry is hampered by the lack of a centralized, functional database of key measurements for biogeochemistry that involves all LTER sites. **We agreed that the LTER network needs a Chem-DB, analogous to Clim/HydroDB (http://www.fsl.orst.edu/climhy/).** Creation of such a database would accelerate our ability to participate in EcoTrends.
6. *LTER Network support for Chem-DB.* We began developing a plan to initiate the establishment of a Chem-DB for the LTER and associated sites. This effort will be presented to the LTER network in the form of a table describing the available datasets at all LTER sites that would be required, in our view, for cross-network synthesis of biogeochemistry.

3. NPP Workshop (Alan Knapp, Melinda Smith)

The workshop was attended by ~18 people representing AND, ARC, BNZ, CCE, FCE, HBR, JRN, KNZ, LUQ, MCM, NTL, NWT, PAL, PIE, SBC, SEV, SGS, and VCR.

The original goals of the workshop were to:

1. Conduct a data assessment – through short site presentations
2. Educate ourselves regarding the available data and its limitations
3. Discuss data compilation/comparability issues
4. Search for pattern
5. Begin preliminary analyses/Data exploration
6. Plan for the future

We accomplished the following:

- 17 presentations were made and ~20 data sets were identified with a mean length of ~13 years
- Mendy Smith provided a set of compelling questions that could potentially be addressed by the data (based on analyses of anomalies) and the group agreed to pursue this course of action. Some examples of these questions are:
    - How do the dynamics and amplitude of change vary among this wide range of ecosystems?
    - What are the key drivers of change and dynamics? Is there convergence among ecosystems to a few key drivers?
    - How do ecosystems vary in their sensitivity to there drivers and is there predictive value in this sensitivity?
- Stuart Chapin then provided a conceptual framework based on potential drivers of alterations in key resources that would mechanistically link to anomalies in NPP.
- The group then agreed that the current leadership should be expanded to include a member more familiar with data and issues NPP in aquatic ecosystems, which will be particularly important in the analytical phase of the project. Emily Stanley (NTL) volunteered and was unanimously endorsed by the group.

The group then unanimously made the following commitments:

- To continue as a synthesis group
- To share our data
- To provide these data in a form and with metadata to be determined by the working group leaders and in collaboration with an IM to be solicited from the LNO.
- To harvest and compile these data in the format that permits analysis by the fall of 2007.
- The group also committed to expanding the collective data set – by contacting colleagues and being inclusive of others within or outside the LTER Network.
- The group hopes to have data analysis underway by the winter of 07-08
- The group agreed to meet again in early spring 08 to assess the preliminary analysis, interpret and move forward toward a final synthetic product.
- We committed to reporting back to the Science Council at next year's meeting
- The group agreed that we should to attempt to find funding via NCEAS or other sources to support this process, but we also recognized that to maintain the momentum of the Portland workshop, support from the LTER Network will be requested to insure that future meetings can be scheduled and progress can be insured.