

June 30, 2003

Dr James Gosz
Chair, LTERnet Coordinating Committee

Dr Robert Waide
Executive Director, LTER Network Office

Dear Jim and Bob,

Thank you for an excellent and productive meeting of the LTER National Advisory Board (NAB) in Albuquerque, Friday June 20. The members of the Board who were able to participate appreciate the effort you and your staffs made to ensure our comfort and to provide us with all of the information we needed. The following comments summarize our discussions, identify issues that we think should be resolved, and outline our plans for the continued work of the NAB.

First, the strategic planning process that you have initiated appears to be on the right track, as does the discussion of Network science, which should produce some valuable ammunition for NSF in time for the FY06 budget process. We propose some fine-tuning below, but are very supportive in general of the process currently under way, and are impressed by the energy being invested by the Network.

Terminology. We are not alone in being confused by the terms used to refer to various parts of the LTER complex. The NAB needs to distinguish clearly between the activities of the network as a whole and the Network Office, but in practice we find that the boundary between them is frequently blurred. This is exacerbated by the practice of referring to the network as LTERnet and the Network Office as NET. In what follows the Network Office is referred to as the Office, and the network as the Network. We use the term Network science to refer to new, multi-site collaborative projects consistent with the decade of synthesis.

Network-Level Science

Network science. As the Network moves into a new decade of synthesis, it is important that clear mechanisms be laid down for organizing and supporting multi-site projects. Ideas and plans for such projects must come from investigators, who must be encouraged to build the most appropriate collaborations, both inside and outside the Network. New Network science will require new funding, since past experience amply demonstrates that it will not occur in satisfactory amounts through unfunded mandates. The evaluation and prioritization of projects proposed in response to new funding should be left to NSF, which is in the best position to organize the necessary peer reviews and to assess proposed projects against national priorities. We anticipate that this will not lead to equitable funding for Network science across all sites within the Network.

Building on prior research. The Network now has over 20 years of cumulative research and monitoring behind it. While not all future projects for Network science will be able to build on this foundation, it is important that the Network do so as much as possible in its synthesis activities, and highlight the emergent properties that the Network has discovered over these 20 years. Network science can and should make contributions that address dynamics across the years and across a range of spatial scales from a quadrat to the globe. While it is often comfortable to focus synthesis on similar sites, for example, all lakes or all prairies, the Network is positioned to make contributions of synthesis across the ecological diversity of the sites. This should be encouraged in Network science.

Management of Network science. Investigators proposing Network science projects must be clear about the services and support they can expect from the Office. These should be identified in the Office strategic plan, and might include any services that can be offered more efficiently through the Office than through individual sites, in other words services for which there are demonstrable economies of scale. Proposals for Network science should include funds to support such services, as well as funds to support data management (see also section on Governance).

Network science questions. The Network is currently in the process of developing a list of science questions that can be used to stimulate proposals for Network science. We suggest the following as a basis for discussion of the list:

- What would be the ideal team of scientists to study this problem? How many of these scientists are currently in the Network?
- How might research on this topic make use of the 20+ years of Network research and monitoring? Does the cumulative knowledge of the Network allow us to solve the problem immediately (publish results within 3 years), and if not, how long will it take?
- What would be gained by studying this topic collaboratively, rather than at a single site?

In addition, we think it important that the Network identify the bases on which the science questions should be prioritized, and suggest the following:

- The importance of the problem and its solution to society.
- The importance of the role to be played by the Network, and the degree to which the science overlaps the traditional domain of the Network.
- The time needed to find a solution, and the likelihood of success.

Measurement of Network science

We think it is important that appropriate metrics be devised and implemented to assess progress in Network science. These might include tracing the origin of key ideas in ecology, counts of papers authored by researchers from more than one site, related citation counts, counts of proposals submitted and funded, and counts of graduate students supervised from more than one site. Baselines will need to be established soon, so that progress can be measured against them in future years.

Planning

Strategic planning. Both the Network and the Office are developing strategic plans. Substantial progress has already been made on the Network plan. Meetings have been held, overall goals and objectives have been identified along with associated tasks, and metrics are currently being devised to assess progress on each of the tasks. The Office plan clearly needs to be integrated with the Network plan, but we believe that both efforts should occur in parallel. To date the Office plan appears to be less developed relative to that of the Network, so we recommend that efforts be made in the next few months to bring the Office plan to a similar stage of development. We would like to review both plans as they develop; a suitable point might be in late September or October, after the All-Scientists Meeting and the Coordinating Committee have had a chance to review them.

Office strategic plan. The Cooperative Agreement between NSF and UNM requires the Office to "implement a more effective system of management and bi-directional communication between the (Office) and the (Network)", and requires the NAB to review progress on this and related issues in Year 2, in collaboration with the Project Director. The intent is clearly that these issues would be addressed in the Office strategic planning. Thus we think it important that the Office begin the process of identifying its goals and objectives, and associated tasks as quickly as possible, and in parallel with the strategic planning effort for the Network. The plan will need to address the precise relationship between the Office and the Network, the tasks that the Office undertakes *and those that it does not undertake*, the organizational structure and reporting relationships within the Office that allow these tasks to be performed, and the procedures for assessing Office activities both within the Office and by the Network. The plan must also address ways of increasing diversity in the Office, and ways in which the Office can assist in increasing diversity within the Network.

Network strategic plan. The Network strategic planning effort is well under way. The list of tasks identified by the groups is extensive, and will have to be culled and prioritized if it is to be realistic within the constraints of budgets, personnel, time, etc. The strategic plan must make the case for Network science, ideally by identifying one or more major issues faced by society, and then presenting the arguments that show how they can be solved by the Network. We think it important in this regard to address how the Network will work with other groups, both in ecology and in other areas of science, since most problems will be too complex for the Network to address alone.

Education and outreach. Both of the strategic plans should address education and outreach. Education activities currently seem in something of a hiatus in the Office, since the activities in the renewal proposal did not review well. Certain kinds of education and outreach activities are better handled by individual sites, which can leverage resources at their own institutions. The Office needs a clear vision of its role in this context, of what it can reasonably achieve, and of the degree to which it can leverage resources at UNM.

Diversity. In order to increase the long-term impact of the LTER program on science, there needs to be an increased emphasis placed on ensuring that diversity, not only in discipline, but in gender and ethnicity, exists at every level of the decision-making process. This will ultimately have a positive impact on the planning and structure of the Office and the Network and needs to be a part of the strategic planning process as well as the strategic plans. For example, all committees, including those involved hiring, coordination, and executive decisions, should include women and minorities as voting members. Sites also should be encouraged to do more in this respect. Increases in diversity at the committee level could be one of the milestones for quantifying Office and Network success.

International LTER: Given NSF's articulation of the value of the internationalization of scientific efforts, and given the effort and leadership that the Network has exerted to build the International LTER program, the planning effort should consider how to build an intellectual and working framework with international scientists to fulfill the LTER vision and mission, and to promote Network science. As with Network science, we believe the international effort would be strengthened and be more productive of synthesis across sites if it were more question driven and focused on research products.

Governance

Network governance. We urge both the Office and the Network to consider as many alternative models of governance as possible as they address and eventually integrate their respective strategic plans. There are many other models of how to facilitate large-scale science, many of which may provide useful ideas. We think particularly of CUAHSI (Consortium of Universities for the Advancement of Hydrologic Science, Inc; www.cuahsi.org), and PRAGMA (Pacific Rim Application and Grid Middleware Assembly http://www.pragma-grid.net/PR_OpPrincProcFinal_v25Feb.doc), which was roughly based on the Global Biodiversity Information Facility MOU. In short, we encourage much more thinking outside the current box, to ensure that the structure will support the key activities of Network-based research.

Network membership. We encourage the Network to reconsider other forms of membership, such as Affiliate-level membership, participation by various other agency groups in standing "Interagency" committees (in the spirit of a "network of networks"), and other approaches to engage both individuals and institutions to help in fulfilling the mission of the Network. The role of industry should also be considered. While having an open organization is good, growth needs to be considered strategically to benefit the Network. In particular, all members should have a clear set of expectations to meet and consequences for not meeting them. Possible expectations for membership could include agreeing to:

- Adhere to Network policy on data sharing and access.
- Provide key information to the Office to promote the value of the Network.
- Abide by intellectual property principles.
- Support ways to maintain legacy data.

- Participate actively in Network activities (e.g. working groups, All-Scientist Meeting, research, data sharing)

Bylaws. The Bylaw drafting effort is a useful way of codifying current practice, and fills a gap that is badly needed now that the Network has evolved to its current size. Bylaws will also need to provide the framework for the future, and as such they must anticipate both future opportunities and future obligations. The Bylaws should also define reporting responsibilities, and we are particularly concerned that they define clear relationships between the Office and the Network, and their respective officers. Specifically, we suggest that the Executive Director of the Office (recognizing that he/she also has a responsibility to NSF through the Cooperative Agreement) should be responsible to the Coordinating Committee of the Network, reflecting the role of the Office in supporting the activities of the Network.

National Advisory Board: We have several requests with respect to future activities of the NAB, many of which could be incorporated in the Bylaws:

1. Would it be possible to add an NAB page to the LTER site, listing the members and their coordinates, and including bios and photographs, and links to member sites?
2. We suggest that the Bylaws establish that the NAB meets at least annually.
3. We suggest a partial replacement of 1/3 of the NAB each year, working towards a 3-year normative period of service.
4. The current draft of the Bylaws is somewhat ambiguous with respect to appointments to the NAB (Article VI Section 3). A simple fix would be to delete the rest of the sentence from "and/or Executive Director...".
5. We like the current size of the NAB, but think it would be useful to consider representatives from agencies, the private sector, and NGOs in future appointments.
6. We will provide you with a written report after each meeting. We will write it in the expectation that it will also be forwarded to NSF, but will invite your comments before doing so.

Vision and mission: Finally, we offer preliminary suggestions for statements of vision and mission that will need to precede the goals in the strategic plan, and have also slightly edited the goals from the ones included in the documents you provided to us:

The LTER Network: What It Is

The LTER Network is a collaborative organization of separate site-based research programs presently funded at 24 locations around the United States. The LTER Network's work is facilitated by the LTER Network Office, presently based at the University of New Mexico. The Office operates under a Cooperative Agreement funded by the National Science Foundation's Biological Science Directorate's Long Term Ecological Research Program, while the sites operate under grants from the same organization.

LTER Network Vision

The vision of the LTER Network is a society in which exemplary science contributes to the advancement of the health, productivity, and welfare of the nation's ecosystems, in turn advancing the health, prosperity, welfare, and security of the nation as a whole.

LTER Network Mission

The mission of the NSF Network is to provide the scientific community, policy makers, and society with the knowledge and predictive understanding necessary to conserve, protect, and manage the nation's ecosystems, their biodiversity, and the services they provide.

LTER Network Goals

The Goals of the LTER Network are:

1. To understand the dynamics of a diverse array of ecosystems at multiple spatial and temporal scales.
2. To inform the broader scientific community by creating well-designed and well-documented scientific databases.
3. To synthesize these understandings gained to create general ecological knowledge, ecological theory, and the ability to model ecosystem function.
4. To provide legacies of well-designed and well-documented long-term observations, experiments, and archives of samples and specimens for present and future generations
5. To educate new generations of ecosystem scientists and investigators by providing opportunities for training, learning, and teaching
6. To reach out to the broader ecological community, policymakers, resource managers, and the general public by providing knowledge and capability to address complex environmental challenges.

Next Meetings: As noted earlier and based on the timelines presented to us by you, we expect and look forward to review both strategic plans in September or October, either by teleconference or in a meeting. During our discussion you indicated that it might be advisable for the NAB to join you at NSF in February. We are willing to do that, provided we have been sufficiently engaged in the process to understand the plan fully, and support the process and the product of your efforts at that point.

Thank you once again for your hospitality. We hope the comments above are helpful, and look forward to working with you in the future.

Yours sincerely,

Paul G. Risser, Chair
National Advisory Board

Copies to Members of the National Advisory board