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Coordinating Committee Meeting, Coweeta Hydrologic Laboratory, October, 1994

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M I N U T E S
LTER Coordinating Committee Meeting
October 19-21, 1994
Coweeta Hydrologic Laboratory

CLOSED SESSION, OCTOBER 19, 1994

In attendance (see attached list): LTER site representatives, Network Office staff (Martin, Nottrott, Vande Castle), NSF representatives (James Gosz & Mike Allen, DEB), and guests

NSF REPORT (James Gosz, DEB)

Reorganization (see chart attached)

There are significant, positive changes taking place at the National Science Foundation. The number of visiting scientist program officers will decrease to 60 or 70 percent of the total. At this time, there are only three permanent program officers and 10 visiting scientists. Tom Callahan is one of the permanent program officers and he will be moved to the Ecosystem Studies program. He will continue to interact with the LTER Program to provide a memory within the system for that program. One permanent program officer will be present for each program (Systematics, Population Biology, Ecology, Ecosystem Studies. In the Long-Term Projects cluster, the permanent position will deal with programs on research collections and survey and inventories. The LTER-LMER projects person would be a rotator, a development that could have distinct advantages. Tom Callahan has been fighting for LTER virtually by himself (and LTER has been the only program whose budget has consistently been increased); another person is needed to focus on interagency aspects and develop linkages with other disciplines.

Thomas Callahan and Mike Allen (for another year) will work together to maximize memory and new ideas in rotator and permanent positions assigned to Long-Term Studies. Gosz solicited suggestions for good candidates to be scheduled in advance, allowing them time to "get their lives together." DEB is trying to develop a longer-range plan and a mechanism for identifying the best people. Candidates should be visionaries who have broad backgrounds and training. These will not just be "proposal jacket processing jobs"; rotators will be involved in developing science initiatives with input from the community. While two-year rotators are preferred, NSF will accept those available for just one. A search is currently being conducted to fill James Estes' position. Scott Collins' position (Ecological Studies) will become permanent.

Gosz urged the LTER community to take advantage of the opportunity these changes provide by taking a more active role in proposing initiatives and guidelines and contributing program officers. The LTER Network is now better organized, more mature, and better able to respond to such changes as opportunities. He noted that the scientific expertise needs to come from within the community, not the agency. He also cautioned that the LTER model is being closely scrutinized across agencies; anything that looks like an entitlement will be viewed with suspicion.

Budget (Gosz)

Biological Sciences doesn't yet have a concrete budget, due to the changes at NSF and the "new" way the agency is doing business. Gosz anticipated that within a month he might know about any augmentation or supplemental opportunities. He distributed an invitation from THE Survey and Inventory PROGRAM to submit proposals. While not a formal program solicitation, this invitation indicates that the program will entertain proposals from LTER sites. This is a standard program that entertains proposals in mid-November and mid-May. Mike Allen is currently the

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relevant program officer since Jim Estes returned to his university. He noted that several such opportunities exist for LTER with the heightened interest in biodiversity and sustainability across programs—although these concepts may be defined differently. He urged the sites, as they look ahead to working on site proposals, to anticipate cross-site or augmentation competitions of some type along biodiversity themes.

Data Sharing Relative to Current Policy (Gosz)

It is now grant proposal policy for some programs at NSF to instruct panelists to look for data sharing components; proposals that don't include data sharing will not fare well. The general NSF policy reads that NSF-funded projects should "share data, samples, physical collections, software, and inventions." While NSF has in the past expected data to be shared, this was never enforced. There will be increased interest at NSF for ways to encourage the scientific community to share data. LTER should take a leadership role in providing the broader scientific community access to datasets on-line. The global change research program is using new language about what is expected from grantees who get funded—schedules and plans for data turnover to a publicly accessible archive must be submitted. Tony Janetos reports that for NASA's field campaigns potential PIs were told that they must contribute to a public archive. The community accepted this proviso, and no one's data got scooped. Gosz noted that the LTER data managers had taken an important step forward on this issue at their September meeting. Although the associated issue of obtaining credit for publishing datasets was not resolved, he noted that on-line LTER datasets would provide a visual model that could indirectly shake loose more funding with a feedback to more models, and so on.

James Brunt, Data Management Committee Chair, reported that there had been a lot of discussion about putting datasets on-line since the September meeting. A table indicating what all sites are doing has been completed, and a preliminary review shows there is no technical reason that sites can't comply. The datasets will be available and queryable on-line to the LTER community for some scientific purpose, and they will include descriptions of metadata standards, access system, and technical capabilities that allow participation. There is more involved in developing the kind of system that would be accessible to anyone in the scientific community. Legal issues will need to be addressed, as will the potential for misuse of data.

An informal poll of the sites as to whether they were "on track" in putting one favorite dataset on-line revealed that most are. Information on which datasets were initially being put on-line was collected (see list attached).

Augmentation Competition "Post Mortem" (Allen)

Two LTER site augmentations have been awarded, one to North Temperate Lakes (Tim Kratz-Upper Midwest Lakes and Their Landscapes: 1800-2100) and the other to Coweeta Hydrologic Laboratory (Judy Meyer-Causes and consequences of land cover change in the Southern Appalachians). Responses to other proposals will be back soon. These first two augmentations will be extremely important in generating more and they will need the Network's support. NSF realizes the need to extend the opportunity to rest of the Network, but it is too early to say how many, or if any, more sites will be similarly "ramped up." The panel felt that in terms of general direction all proposals were good, but the program is money-limited. Many strong proposals sought to expand present work to social and economic aspects. The two awarded thought more in terms of biodiversity.

Some PIs expressed concern that these first augmented sites will gear up with a bang but, without a longer-range commitment, could stall out in six months. Allen acknowledged that NSF will probably have to make decisions on subsequent awards before any information is back from first two. It was suggested that this is probably a test to see if the Network can work effectively with the two sites funded, and if the two can help promote the idea of augmentation, further reinforcing NSF leadership's view of LTER as a flagship program. NTL and CWT were asked to place their proposals on-line for Network access. (Abstracts will be provided in the Spring 1995 issue of the *LTER Network News*)

JF pointed out that using sites as expert systems, stepping outside to interpret on a larger scale, will very much be the wave of the future in funding for science. He reminded the group what an extraordinary opportunity LTER has and will have in being participatory in the program's future. He noted that while these opportunities can sometimes be painful, the payoff can be monumental.

Network Office Site Review (Allen)

Mike Allen reported that NSF conducted the first on-site review of the Network Office (NET) September 20-21. While the review is not yet completed, in general it was quite positive. Concerns included whether there would be appropriate support and space at the University of Washington to accommodate proposed staff and activities expansion. JF will be using the results of the review to develop the Network Office cooperative agreement, which will replace the grant as funding mechanism. The review addressed two areas: (1) Was NET accomplishing its goals, and (2) What should NET accomplish? As the Network matures, there is a need to reassess directions.

Network Office Program & Budget

Jerry Franklin reported that the full-fledged September LTER Network Office (NET) site review, originally being approached as a pre-proposal discussion, came as a surprise for which there was little time to prepare. The morning of the review, staff learned that the next proposal was to be prepared prior to negotiation for not two, but six years. The new funding mechanism for NET will be a cooperative agreement, along the lines of the University of Michigan model. He noted that cooperative agreements must abide by the same guidelines as site proposals and circulated copies of the draft proposal for site comment. He also reminded representatives that support for NET is not from the competitive pot available to the LTER sites, but from a combination of Environmental Biology, International Programs and Polar Programs sources. If not to NET, these funds would go to other programs, not to the LTER sites.

NET will prepare an annual report for NSF and draft a proposal for the next year's activities, to be submitted to NSF after PI input prior to the fall LTER/CC meeting. There will be an annual site review and a national advisory committee, and NSF and NET will negotiate an agreement subject to an independent panel and Network review. Following review, which will probably occur at two- to three-year intervals, the Office could be moved. The outside review strongly reinforced that NET should not be located at one of sites or at the Synthesis Center. At least for a significant time, it is not desirable for either group to lose identity to the other. By the end of 1995, the new Chair and Executive Director should be fully on board and will be revisiting this issue as/if it arises. For this proposal, the University of Washington has made commitments of additional space, as well as contributions to the salaries of John Vande Castle, the new Executive Director, and support for two research assistants, and the GIS Laboratory manager.

PIs were asked to provide advise to JF within a week in two areas: (1) continuance of work done in past and the expansion as per the LTER/CC's decisions of last spring—recruiting an Executive Director, expanding the committee structure, and providing additional support for the Chair—and (2) what workshops/synthetic activities NET should be involved in over the next two years in some way? In general, NET workshops should not clearly stand alone as separate proposals, or they may not stand up to the peer-review process. Sites were also asked to consider:

- Whether NET should be the permanent home for "orphan datasets" such as North Inlet's.
- Whether NET should look at a broader array of technical innovation, such as measurement technologies, beyond just storage and compiling? A comparison is now of RS/GIS datasets is proposed with U.K.'s Ecological Change Network.
- What level of outreach and involvement is appropriate? Funds are requested for outreach activities associated with beginning a global network (ILTER), defining relationships to other sites and networks, and developing internationally, (\$250,000-\$350,000 total—25 to 30 percent of the budget).

In the discussion on possible workshops that followed, it was proposed that a mechanism to revisit core areas (how do they help/impede?) be identified, and that a series of question-driven workshops to establish standards for each core area be supported. JF noted that if the group came forward with alternatives to the core areas NSF might entertain substitutes; however, simply trashing them wouldn't fly. Any substitute would need to tie the sites together as the core areas have. The group was asked to think further on the issue, and consider the next All Scientists Meeting as the possible forum for five core-driven workshops to identify intellectual standards.

National & International Outreach—Who Will Participate? (Franklin)

JF noted that the collaborative activity initiated under ILTER is not intended to replace the valuable scientist-to-scientist interactions that have occurred in the past. The Network Office (NET) will likely become a clearinghouse of such activity involving the sites. We want many flowers to bloom, but we need to know where the flowers are. The developing international network has begun to look at the same problems that LTER has as a network—namely, who will participate? ILTER will probably work to develop national or regional network nodes, eventually de-emphasizing NET's central role.

JF charged the group to develop a vision of how LTER should relate to both national and international agencies and groups. Through what criteria do we judge "appropriate" partners? Is it enough to simply have a shared goal or mission? We are beginning to use capabilities as a filter. Does a given site have the capability to communicate and exchange data as we do as LTER site? Should LTER define different levels or grades of affiliation or participation? One level might be to encourage outside sites to regularly participate on the DM Committee.

CLOSED SESSION

One representative per site met to vote on the nomination of James Gosz for the next chair of the LTER Network. All sites were present except Niwot and Cedar Creek. Niwot sent in a vote prior to the meeting.

Nomination of Next LTER/CC Chair—James Gosz Unanimously Elected

Following the procedure adopted by the Coordinating Committee last (LTER/CC) spring, the Executive Committee solicited nominations and contacted candidates for the next LTER/CC Chair. Fifteen individuals were nominated, all LTER scientists. Both LMER and LTREB PIs were contacted, but no additional nominations were offered. Three nominees—Gosz, Hayden and Magnuson—each received more than one nomination. Of the nominees, three indicated an interest. Magnuson and Hayden both indicated a willingness to serve, but because of pressing site responsibilities preferred not to be considered at this time. The Executive Committee considered James Gosz' qualifications and his interest and ability to devote a significant amount of time to the position over the next several years, and unanimously recommended him to the full Committee. The nomination was seconded by Judy Meyer. Following discussion the group agreed that Gosz' leadership style would suit the future needs of the Network well, and the vote was unanimously in favor. JF will act as executive director for the next year, maintaining ILTER chairmanship during the transition period, eventually passing the responsibility on to Gosz.

LTER/CC MEETING, THURSDAY, OCTOBER 20, 1994

NSF News & Funding Situation (Jim Gosz & Mike Allen)

As a result of last year's push in Congress for NSF to do more strategic research in areas of national need, a long-range strategic plan was requested from the agency. The \$3.2 billion budget is up \$200 million over last year, although the amount targeted for research activities is below that requested in the Administration's budget. A \$50 million increase from \$100 million has been requested for research infrastructure (including research equipment). This is the year to submit for research instrumentation in general.

The Foundation has identified eight strategic themes, several of interest to LTER. These themes are cross-divisional and multi-disciplinary and include Biodiversity, Water and Watersheds, Environmental Technology, and Research Management. (The last two are particularly likely to result in opportunities; special announcements are currently being written.) While DEB would like to offer funds for augmentation, cross-site work and internationalization, opportunities are more likely to be in terrestrial ecology, trace gas or complex experiments of multiple interacting factors and atmosphere-terrestrial feedbacks (including wetlands and streams). When the budget shakedown occurs, they hope to get word out about opportunities electronically with longer lead time than in the past.

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PIs were urged to be thinking now what shape these might take. Biodiversity approaches might be to improve fundamental understanding from genes to landscapes, poorly-known habitats and species, adaptation of organisms to environmental changes (human-economic aspects included), and water-watersheds approaches to improve our predictive understanding of fluxes, changes to water systems, knowledge to develop mitigating strategies, and sustainable economic development—all of which are directly relevant to LTER and are broad enough to include much of what LTER is interested in doing. Due to the division reorganization that has resulted in the Long-Term Projects person being a rotator, LTER has an important opportunity to identify someone with strengths in the areas of restoration and bioremediation.

Standing Network Committees/Committee Structure (Franklin)

At the last meeting, the LTER/CC decided that it wanted to support an expanded committee structure to encourage more LTER investigators to become actively involved in creating Network policies and programs. JF noted that the first task of each committee is to propose a charter, then to decide how chairs should be selected and membership formed, what rights and privileges members should have, the scope and nature of activities to be undertaken, and what should be the financial commitment.

Currently, the Network Office budget includes support for an annual Data Managers (DM) meeting at a level of \$40,000, including a regular meeting and workshop. There are also two proposals under development for workshops in the technology area, and the climate group, which has a supplemental grant that does not include general committee support, submitted a proposal at the meeting. Following a recommendation from the Executive Committee, the DM Committee has proposed that an information management group of three to four principal investigators attend the annual DMs meeting to ensure that Network data management activities are guided by those involved in developing and designing the site research programs.

In general discussion on committee structure, the point was made that the Network doesn't need a separate committee for each problem, but a committee to focus on approaches. It was also noted that committees should be able to meet via electronic means between annual meetings or regular LTER/CC meetings. Before inviting current chairs to report on their committees' activities, JF opened discussion on how committee development had been progressing. Among the suggestions: (1) committees should form a steering committees or "guidance group" which includes members who do not attend LTER/CC meetings; (2) committee chairs should be LTER/CC members, so that activities are led by the sites; (3) committee steering groups should be comprised of lead PIs; (4) technical people should not lead committee activities; critical decisions should be made by PIs; and (5) users and administrators alike should be represented on committees.

Publications (Hayden)

The Publications Committee (LTER/PUB) has been active since the April meeting, communicating primarily via electronic mail throughout the summer to outline Committee structure and procedures. A key issue discussed was how to approach quality control and where to inject it. One model would be for the Committee to review a project at the outline level (helping to determine appropriateness of topic and content), leaving the peer-review responsibility to the editor. In another model, the Committee would be involved in soliciting reviewers. LTER/PUB members are evenly split on this question; Hayden sought the larger groups' views to help finalize these issues. A possible policy might involve the LTER/PUB providing an assistance role in the early stages and quality control in assistance to the publisher during the review process.

Hayden noted that there are publishers interested in doing a series on work at the sites, and that a sequence of books in a series probably involves some sort of commonality. The LTER/PUB could help in setting standards. Some of the concerns that arose from discussion included: (1) the intended product should meet the approval of LTER community up front; (2) an implied censorial power is not comfortable for everyone; (3) a poor quality product might be produced which would reflect badly on the community; (4) agency partners such as USFS have their own editorial process/clearance procedures which sometimes need to be accommodated in joint projects.

It was proposed that the LTER/PUB provide quality control on those publications that speak for the entire network and carry the LTER Network imprimatur, working with publishers to identify appropriate reviewers and ensuring that reviewers are selected. Proposals for network-scale projects should be submitted to the LTER/PUB in the form of a comprehensive outline. All sites voted in favor, some with the proviso that the criteria used is applied equally to

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all proposals. It was also decided that authors and editors of informal Network Office (NET) publications (such as the recent El Niño report) should provide information to NET regarding other related products in advance, to avoid unintended "scoops." Stephanie Martin noted that a recommended citation will be added to future NET science publications and the publication list (as on the El Niño report) to ensure proper attribution.

Hayden requested that e-mail comments on these and other publications issues noted below be sent to LTER/PUB at *pub@LTERnet.edu*. All will be logged. He also noted that the Committee would like to have a PI-level Data Manager representative to inform the discussion on electronic publications. (Anyone interested is urged to contact Hayden.) Other issues: Should the Publications Committee have an advisory role with regard to Network Office products and electronic publications? To what degree should the Committee help in the area of electronic publications?

Technology (Foster)

Chair (pro tempore) David Foster noted he would strongly welcome and encourage involvement of anyone interested in Network technology issues to participate on the Technology Committee (LTER/TECH). The group has not been active lately and is presently in a state of reorganization, but there are new now opportunities for funding and cross-site work. The greatest immediate need is to identify a core group of individuals, users and developers alike (technical people and people with science needs that can be addressed by technology), to become involved. New participants were asked to come forward, especially as some currently involved are not interested in continuing. An e-mail request will be sent to all PIs.

Foster asked the group for ideas of possible efforts the LTER/TECH might undertake. Among those put forward: (1) conduct an overall assessment of technology across the Network, (2) conduct an assessment of remote imagery needs and issues, (3) explore collaboration with a major NSF science/technology center at University of Washington (led by Lee Hood), and (4) Bruce Hayden noted that the NET review panel has a recommendation with regard to technology activities (the results of the review are not yet available). It was agreed that the most important step to take would be to provide a current assessment of the state of technology development in the Network, analogous to the one completed on RS/GIS a few years ago. Since then, there have been major advancements both at the sites and in technology development in general. NSF opportunities may provide supplemental awards to enhance technology use across the network and at individual sites. The NET proposal will contain a request for a technology workshop and a site assessment.

It was noted that some sites have found technical solutions that could be shared with other sites with similar needs, and that it is important to extend new capabilities to all the sites. Teleconferencing was suggested as a good supplemental approach to communicating about technologies. Gosz noted that NSF funding is available for obtaining this capability. JF reminded participants that as the largest organized group of ecological scientists, LTER is expected to be on the cutting edge technologically.

Synthesis (Wharton)

Chair (pro tempore) Robert Wharton reported he had received some suggestions for workshops from the sites in response to his query for comments on standards and ideas for synthesis activities. He requested help in determining a direction and a set of intellectual objectives for the committee and suggested a small workshop to define standards. In the discussion that followed, concerns were expressed about (1) conducting synthesis by committee, (2) the problem of trying to proceed with activities before standards are developed, (3) avoiding the problem of individual method advocates holding sway, (4) avoiding interruption of any standardization work already under way, (5) ensuring that methods are tied to science questions, and (6) having standards in place by the next round of proposals. It was pointed out that the document drafted by Hobbie and others on future directions in LTER research (provided at the meeting for comment) defines several synthesis objectives.

Proposals included: (1) structuring workshops to address developing standards for the first four core areas, (2) structuring the Committee to act as a standards clearinghouse, (3) separating standards development and intellectual synthesis to ensure that the latter doesn't slip into the background, and (4) including sites outside the present network. Wharton invited those interested to meet prior to the next day's meeting to discuss the subject further and report back to the larger group. Jim Gosz noted that it was evidence of LTER's maturity that they are talking about synthesis. (JF remarked that it was almost a revolution at the level of the original MSI document!)

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(Discussion the next morning addressed the need to first define "synthesis" before determining how best to facilitate network-level synthesis. As a start, a series of workshops to develop standardization methods was proposed: (1) soil measurements (physical/chemical biology, Phil Robertson to organize; intended product, a volume of methods); (2) NPP (Indy Burke, similar product); (3) water measurements (not defined further, Charles Driscoll a possible organizer); (4) consumer dynamics (Bob Waide, tentatively); and (5) decomposition (folded back into soils, consult with LIDET re meeting at Kellogg next October). JF noted that, in principal, support for four workshops total was probably feasible over the next two-year period.

Wharton will send the workshop proposals to the sites for further comment. Gosz urged the group to think beyond the ecosystem process level to other areas, such as scaling and biodiversity. He challenged them to develop up front taskforces for a subset of biome-level standards (soils, waters, etc., for forests). There was support for involving the Land-Margin Ecosystem Research (LMER) sites among others and for taking an efficient hierarchical approach. This would involve people from similar systems getting together to develop standards first, then from different systems—thus avoiding ecosystem-level disagreements at the upper level and enabling comparison among broad ecosystem types.

Climate (Greenland)

David Greenland highlighted Climate Committee activities since the All Scientists Meeting and noted the availability of *El Niño and Long-Term Ecological Research Sites*, a new report published by the LTER Network Office that documents the proceedings of the El Niño Workshop at the 1993 All Scientists Meeting. (Report attached.)

The Committee is continuing to pursue the idea of having climate designated as a core area for LTER studies. Most sites have considerable climatic data, but the Committee is discussing what should go on-line as a representative record, not necessarily including all temperatures or satellite data. They agreed a year ago to the generic intention to have climatic data from all sites on-line. Climate data is the most requested and among the most understandable and the least problematic. In discussion, some expressed the view that the job of a committee should be to document its activity on-line. This would provide information for synthesis, and would yield different information than if each site took its own approach. There was some agreement that climate is a logical place to begin standardization and quality control. Greenland noted that it is pointless to establish standards unless they're followed and monitored. NADP, for example, has a very good set of standards and a subcommittee that visits each site to enforce implementation and monitoring.

JF commended Greenland for chairing the Climate Committee so effectively over the years, noting that the committee has been operational in a meaningful way since its inception. Gosz noted that this activity is an extremely important demonstration of what LTER is doing to get this information on-line; it comes close to satisfying NSF's policy without them having to wield a club.

Graduate Students (Greenberg)

Elected LTER Student Committee Chair Josh Greenberg acknowledged Caroline Bledsoe's guidance and support in getting a committee established following last year's All Scientists Meeting. The students have set up an on-line bulletin board (students@lternet.edu) with assistance from the Network Office and met a second time at the August ESA meeting in Knoxville, TN. Activities considered for the future include developing student information packets, strengthening interaction with PIs, and possibly creating a Mosaic page linked to the LTER home page. PIs were asked for their ideas and assistance on how to support student work at the sites.

In support of students conducting intersite research, Greenberg proposed that an intersite scholarship program be instituted for a trial period (probably a year). Students could apply for funds through a review group including one student to do comparative work at other sites (\$2,000 per student, 10 per year). Results could be written and presented in the newsletter and/or on-line. PIs were generally supportive of the proposal; however, some felt the students were thinking too small, that they'd need travel and supplies for a year, over and above what they're doing at their sites. It was noted that some of the best research at the sites is being done by LTER graduate students. Others felt the program should start small, but still as a network activity. Several PIs remarked that they would be happy to consider requests from students. NSF representatives cautioned that it would be important not to appear to create a select group, and that much

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of such work could already be feasible under the dissertation improvement program. Such seeding could be useful, so long as it is not tied to developing a proposal. JF noted that LTER has done little to promote students, reminding PIs that NSF had challenged them in the past and they'd "dropped the ball."

It was proposed and unanimously approved that \$20,000 would be requested in the NET proposal to stimulate student participation in intersite activities. (CPR voted yes with the caveat that the resulting data be published.)

Data Management (James Brunt)

Data Managers Committee Chair James Brunt reported that the Data Managers (DMs) have been organized since 1980 and that, as a group, they are moving more and more towards intersite cooperation. DMs now have a task force of six individuals (PI-level or proposal developers) that elects one person to report to the LTER/CC. This year's annual meeting included special sessions on metadata and involved several outside agency people. Due to its success, DMs propose to bring in more representatives from outside agencies at future meetings. A draft of the 1994 meeting report will be circulated electronically for comment.

The 1988 MSI document will be revised as the Recommended Technological Capabilities document, or RTC. This activity will be led by John Briggs at Konza Prairie. Drafts will be circulated to PIs for comment. The RTC is perceived as an important step toward achieving the goal of putting datasets on-line. While it is easy to put data on line with current technology, Brunt noted, there is much more involved in making it useful for research. Site datasets will be on-line this year, but in just a flat form. The next step will be to move to queryable datasets with standards in place. To ensure that science drives the RTC process, the Executive Committee decided that a team of three to four PIs should meet with the Committee. Just five to six DMs have PI status now. This will be even more critical in the near future as the Data Managers will also be "on point" in ILTER activities. Interested PIs were urged to come forward to help advance this activity.

BioScience Article (Hobbie)

John Hobbie circulated a working draft of the document he and several PIs have been working on, a collective statement of LTER science looking to the next decade, based on the *LTER2000* document, which will be submitted to *BioScience*. He acknowledged the need to include more site case histories and language that explains the different levels of work at sites. The paper will probably include about two case histories per section, related figures, four to five references for each section, photos and site maps. He noted that case histories should be from the published research. Each section author will be listed as an editor with Hobbie.

During discussion other suggested changes included: (1) add a comment to the introduction on LTER's goals, (2) note mechanisms correctly and clearly with reference to current ones to be consistent, (3) try to get across the idea that the parts of LTER are at different stages and take different approaches, and (4) sketch a vision of where LTER is going in the conclusion in terms of these different stages of maturation.

There was some discussion about whether *BioScience* was the best venue; Hobbie will also try *Science*. The group agreed that the draft was a good start and there was general support to move ahead, with site input due to the section authors in two weeks (from the time of the meeting). Hobbie noted that the revised draft will be sent to the Publication Committee for a quality-control review, since this is a network-scale publication. JF thanked him for initiating and advancing the activity.

AFTERNOON, October 20

All-Site Bibliography & DREAM SUITE Project (Bledsoe & Hastings)

Caroline Bledsoe gave a brief history of her contribution to LTER over the past six years, from developing the first personnel directory with Robert Robbins (NSF) to working on activities ranging from the Network of Networks, Trace Gas Network, Belowground Root Biology Group, and the Graduate Student Committee to her present subcontract at NET for the bibliographic project. She showed an on-line bibliography usage table, described search capabilities and limitations, and noted that she and Harvey Chinn will submit two publications to *BioScience*.

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Bledsoe and Jordan Hastings (MCM) will lead a synthesis project funded through a combination of cross-site supplements and Network Office support to develop and use software tools for synthesis of root biomass data from a number of LTER and non-LTER sites. They will start with XROOTS, Exploration of Root Observations and Organized Technical Software. Workshops over the two and a half years of the project include: Agroecosystems (Alvin Smucker/KBS), Grasslands (Bill Lauenroth/CPR), Forest Ecosystems (Ron Hendrick, CWT). Root biomass, site data, climatic data, and soils data are needed from the sites for these workshops.

Jordan Hastings provided an overview of the Tool Suite part of the project, a data and information system conceptually divided into two functions: reference and maintenance programs. The design will be frozen at some point, and real data loaded and linked to the bibliography. Applications will be coordinated with the database design and a review of the ecological literature, and developed interviews with practicing root scientists. The tools currently available which come closest to what biologists need will be assessed, and existing projects and programs or components thereof will be used to create the best package. Organizing committees of the workshops will also use these tools in cooperation with site data managers to install and distribute them networkwide. Hastings noted that the ideal Tool Suite for ecologists is likely to come from small projects like this and from collaboration with public and commercial groups.

FY 1994 Special Competition for Cross-Site/International Research Awards

James Gosz and Mike Allen reported that NSF constructed an interdisciplinary panel for the FY 1994 Special Competition for Cross-Site/International Research. The dynamics in the panel proved to be almost as important as the proposals: reviewers were solicited from sociology, archaeology, and other disciplines. For the international awards, international reviewers were also brought in. Review comments were written before panelists met as a group. Awardees were:

John Aber (HFR). Forested and agricultural landscapes of New England and Ireland

Caroline Bledsoe (UC Davis/NET). A comparison of belowground productivity at a number of sites in North America.

Dave Coleman (CWT). Interaction between biodiversity and decomposition processes at three moist, warm, broad-leaved forest sites (Luquillo, La Selva, Coweeta) on similar soil types. Will coordinate with LIDET decomposition team.

Anne Giblin (ARC). Comparison of the stoichiometric relationships among benthic fluxes of oxygen, carbon, sulfur, nitrogen and phosphorous from sediments in a variety of lakes (Hubbard Brook, North Temperate Lakes, Arctic).

Dave Greenland (AND/NWT). Comparative climatological analysis of the LTER sites.

Mark Harmon (AND). Comparison of the carbon dynamics of two major coniferous forest regions (the Pacific Northwest and northwestern Russia) to determine the major factors controlling the spatial and temporal patterns of carbon stores and fluxes.

Bill Lauenroth (CPR). With Indy Burke and Osvaldo Sala (temperate grassland site in Patagonia), looking at differing controls on decomposition with a strong international component. Ongoing collaboration building on approximately 10 years of work.

John Magnuson (NTL). Intersite project to work with international sites (Northern Highland Lake District) on (1) landscape organization of lake districts in respect to landscape position, (2) area turnover species in lakes, and (3) ice phenologies as climate change and variability indicators.

Ed Whitelaw (an economist with an LTER-oriented grant). Intersite project to describe/explain linkages between ecosystems and local/regional economies at six LTER sites (AND, BNZ, CWT, HBR, SEV, NTL) and examine whatever feedbacks exist.

Site Science Reports—"An exciting discovery or new approach" (not all recorded)

H.J. ANDREWS (Swanson)—HJA has been working with NASA and the Forest Service looking at landuse and ownerships in the Cascades and Western Washington from the early 70s to the present time, and changes to attributes such as carbon stores. They're also conducting peak flow analysis with 40 to 50 years of data from small experimental watersheds, looking at effects of landuse, cutting and roads and changes in peak flows. The "stream team" has obtained funding from other sources to install restoration experiments. Those installed under LTER will be compared with above- and below-treated reaches over four to five years, looking at trout growth, carbon flux and invertebrate densities. As expected, the treated reach is increasing rates of production to the aquatic community.

ARCTIC TUNDRA (Hobbie)—Three new laboratories have been established with NSF support. Neal Laine visited in August. Bruce Peterson's N₁₅ addition to streams model using stable isotopes appears to work for streams at other sites. (A workshop involving CWT and AND is planned). An arctic land-atmosphere group, ITEX (international tundra experiment), is using Toolik Lake in an effort involving 20 arctic sites using ARC methods and manipulations for measuring leaf growth, etc. (Judy Meyer suggested a possible collaboration with CWT.).

BONANZA (Viereck)—BNZ is bringing the Caribou-Poker Creek Watershed formally into the system. Such experimental watersheds have always been a part of the University program, but not the LTER program. The site will be getting a new bridge, improving access to a number of research areas on both sides of the river.

CENTRAL PLAINS (Burke)—CPR has begun a new grazing experiment, a large study on how grazing influences soil organic matter, comparing grazed and ungrazed areas. Their interpretation: grazing creates less variation than plant presence vs. absence. They've found that the review process is a way to help the site grow. Based on the result of their site review, they have been addressing a deficit in data management. Called in Brunt (SEV), Michener (NIN), and a specialist from UC Santa Barbara for a thorough review, and they recommended adding personnel.

HUBBARD BROOK (Fahey)—The Hubbard Brook Foundation was recently incorporated. Element cycling—particularly calcium—drives much of the work at HBR. Their annual session on birds captures the attention of the local community. Recent work shows that the neotropical bird population is declining; the big spikes in population may be linked to masking of tree seeds.

HARVARD FOREST (Foster)—As a result of the augmentation proposal process, HFR has new collaborators—a paleolimnologist and a policy person from the Kennedy School of Government to look into forest management policy in the area. Several collaborative projects are ongoing with Luquillo. The site has a recent article in UPRO on wind disturbance and hurricane disturbance. They've found that synthesis papers going back to original proposal are still relevant, but they've gone back to reinterpret the landscape in light of historical events. It now appears that disturbance at the site is linked to an early significant salvage logging operation—human rather than natural disturbance.

JORNADA (Schlesinger)—Jornada will be featured in an upcoming article in *Discover* magazine that describes the entire set of measurements and an informal cross-site comparison of grassland and shrublands between Central Plains, JRN, and sites in the Great Basin comparison.

KONZA (Knapp)—KNZ PIs are writing a synthesis volume; Bruce Hayden to co-author the climate chapter. Konza looks at questions in tallgrass prairie belowground, whether it is a source or sink for carbon. They are establishing a crop micrometeorologist collaboration with DOE, USDA and others to put up four towers in burned and unburned and grazed fields to collect annual estimates. The instrumentation, which measures energy, water and carbon flux, is mostly belowground and fairly unobtrusive, making it both fire and weatherproof.

LUQUILLO (Zimmerman)—Puerto Rico has experienced a drought since May, the driest period recorded, although in Luquillo Forest there is still some rainfall. At the annual meeting in January LUQ researchers will begin looking at the effects. Jean Lodge has an article in a recent issue of *Tree* on nutrient pulses, hurricanes, and steady state. A grad student had an article in *Kansas Journal* that was picked up as a "hot paper" in *Science News*. Recently funded by NASA to look at land management and relationship to global climate and the effect of land use on forest recovery. The project also involves the Institute of Tropical Forestry and David Foster at Harvard Forest.

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MCMURDO (Wharton)—MCM completed its first LTER season last fall and winter, and the data is just back from placing a network of stream gauges and soil transects in Taylor Valley. Polar Programs funded a GIS workshop in which PAL and MCM were major players. MCM has been asked to put on workshop in Santa Fe, NM concerning environmental management of the site. Antarctic sites don't compete for augmentation awards as do other LTERs; because of their unique funding arrangement, they have to go through Polar Programs to extend their research activities. With additional support from Polar Programs, MCM will be offering post-docs (sites were encouraged to refer potential candidates). Twenty-six scientists and students, and two New Zealanders, will be conducting the 1994-5 field season between now and February.

NIWOT (Diggle)—Niwot researchers have nearly completed monitoring biotic activity under snow, and a new fence was put in place last winter. Tim Seastedt recently returned from Austria, where he was exploring a formal collaboration with the University of Innsbruck. New faculty positions at Boulder are expected to enhance the LTER Program.

PALMER (Ross)—PAL completed its August 1993 winter cruise off Palmer peninsula looking at ice vs. water habitat, (1) measuring the light field under ice, (2) taking water samples, and (3) collecting and censusing grazers. They found that the most activity is concentrated in the ice habitat in winter. Looked at the distribution of larval krill, they found that krill were not in the water column. The surprise was that not only was microbial activity higher than in water column, but that the ice was a hotter spot in terms of production than in summer.

SEVILLETA (Brunt)—SEV is moving into second funding cycle with work based on a watershed system using swap models and solar flux models (they will hire a new post-doc in this area). Based on existing datasets they are developing international efforts with Hungary and Mexico (Mapimí MAB site with Jornada), and are meeting with CPR and JRN on an intersite grassland project. Other collaborations include: Kitchell/stable isotope studies, agricultural and non-agricultural lands adjacent to wetlands; Kay Gross/EROL grant to do work at Sevilleta.

VIRGINIA COAST (Hayden)—Have recently established relationships with one of counties they're located in to develop GIS for the county and share bird nesting site and annual bird count datasets. New outside collaborators include a DOE person from the U of V, who is looking at the sedimentary platform to mainland, the rate and fate of transfer, and tracers of bacterial transports to marshes from well-field. VCR is engaged in a campaign to buy land (\$2 million) for a long-term lab facility.

Network Office (Vande Castle & Nottrott)

John Vande Castle reported that recent technological improvements at the Network Office have enabled reprocessing of data from the LTER-NASA collaborative experiment. Thanks to the assistance of Diane Wickland's group at NASA, Mission Earth data can now be accessed, as well as the Oak Ridge biogeochemical archive including FIFE, OTTER and other datasets. The data scanner has come on-line, and the sites are being solicited for their input as to where sun photometers should be deployed. The LTER-NASA proposal for a land-cover classification/assessment is progressing; the 13 participating sites are sending evaluations to Warren Cohen (AND) for a November 1 deadline. This is presently the largest dataset in Network.

Rudolf Nottrott provided a demonstration of some of the new LTERnet capabilities utilizing Mosaic public domain software. Gil Calabria, Coweeta data manager, demonstrated the Mosaic home page put on-line for Coweeta since the September 1994 Data Managers meeting. Most of the sites are engaged in similar activity.

(Other Network Office activities not reported at the meeting: Adrienne Whitener worked with Beth O'Grady at Coweeta to organize and coordinate the LTER/CC meeting and travel and has been assisting in preparation of the budget for the upcoming Cooperative Agreement. Lynne Hendrix coordinated much of the preparations for the International LTER meeting in the United Kingdom in August and the September Data Managers meeting in Seattle. Daniel Pommert has departed the Network Office for a year in Egypt and has been replaced by Raymond Bero, recently of CERL. Stephanie Martin has been developing or is planning to develop: (1) a Mosaic version of the general LTER program information contained in the brochure, (2) "LTER Fact Sheets" to feature significant LTER intersite experiments and synthesis activities, and (3) a "pocket-sized" update of the 1991 site directory. Other publicity/public information tools are being considered for development over the next budget period, to include site press packets and presentation materials, portable loaner displays on synthesis experiments, an LTER poster, a simplified brochure, and others. (Sites should contact Stephanie with any suggestions.)

Canada (Bruce LaZerte)

Bruce LaZerte, Aquatic Science Section, Ontario Forest Research Institute, Ministry of Environment and Energy, provided a brief overview of long-term ecological research development in Canada with a few comments on the work of his section (See information attached.)

Missouri Ozark Forest Ecosystem Project (Brian Brookshire)

Brian Brookshire gave a presentation on the Missouri Ozark Ecosystem Project (featured in Issue #15 of the *LTER Network News*) and invited LTER site scientists to consider the Project for individual or multiple site investigations. (See information attached.)

International Activities (Franklin)

The International LTER (ILTER) steering committee met at Rothamsted Station in the United Kingdom August 27-28 with 18 members representing seven countries. The group focused primarily upon mission definition and development of an action program for improved communications among sites and scientists. (Further detail in the current issue of the *Network News*.) Meetings of the ILTER Steering Committee are planned for Hungary (1995), Latin America (1996), China (1997), Canada (1998), Africa (1999), and the United States (2000).

The process of identifying primary ILTER participants has begun with La Selva and the Smithsonian Tropical Research Institute (STRI). The Connectivity Committee will look at current capabilities and what it would take to bring these sites up to a comparable level or to the capacity of a node in a global network. JF noted that full partners need comparable communication and data sharing facilities, as well as a shared mission.

LTER Collaboration/Affiliation (Franklin)

JF asked the group to reflect on where we are as a network. He noted that there are many ways to incorporate other types of sites. As the network-to-network concept has evolved, we've been contacted by DOE ParkNet, NBS, individual sites like Barro Colorado and La Selva, and others who would like to have a closer relationship with the LTER Network. There has always been the question of degrees of comparability in terms of technical capability, various levels of an extended network.

It is no longer in LTER's best interests, JF noted, to "stiff-arm" these approaches. LTER needs to develop mechanisms and criteria for an expanded approach to incorporate other sites. The pressure is growing to actively engage this subject, and we'll be in a much better position if we look ahead. We can't claim we're too busy. For the near-term, NSF has chosen the alternative of augmenting existing sites, but we can't rely solely on NSF support if we want a better-distributed network.

By what criteria would you recognize a partner? What do we do about single sites, not affiliated with networks? Among the comments: (1) We shouldn't be so strict in selecting affiliates (2) We should include non-LTER sites as question-driven affiliates (3) If formalizing a partnership, do we add expectations and/or responsibilities? (4) What is the time drain for the sites? (5) Will an increase in collaboration dilute site work? (6) What is the scientific payoff? (7) What would the impact be on the Network Office? (8) The partner's sponsoring agency should have to buy in and support the site(s) at the LTER level (9) The Memoranda of Agreement might be an appropriate mechanism for collaborations (10) We need a list of criteria, a classification for partnership before we can proceed (11) The intensity of the relationship should vary with the level of affiliation (12) The network-of-networks idea seems to be developing as an exchange between equals, a way out of increasing responsibilities (13) The LTER Network might evolve into acting as a clearinghouse for the long-term.

Bruce Hayden noted that the Hungarians seek a blessing from the LTER/CC and have indicated that they will do all that LTER does. They want a stamp of LTER approval and some benefit of affiliation, and they intend to redesign their terrestrial ecology program based on the LTER model. Such programs want to do research with us, learn

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techniques and technologies, but they are also looking for sources of money and ways to leverage dollars within their own countries. One initial approach, already being explored through the ILTER network, is for individual sites to identify and develop question-driven satellite sites.

It was decided that a subgroup of the Executive Committee would be developed to explore alternative ideas on how to proceed on this issue.

LTER/CC Meeting Schedule

Next LTER/CC Meeting: April 19-25, 1995. This will be a small meeting at the Virginia Coast Reserve site. Travel will be via the Norfolk airport. Meeting and travel details will be sent via electronic mail from the Network Office as usual.

Fall 1995 LTER/CC Meeting: JF suggested that the October meeting be held at Skamania Lodge on the Columbia River near Portland, Oregon instead of in Seattle at the Network Office as previously announced. Other suggestions included (1) Tucson, Arizona in conjunction with a biosphere program meeting (Jordan Hastings/MCM) and (2) Lincoln, Nebraska at the Soil Conservation Service (James Gosz/NSF). The date and location were not finalized.

Next All Scientists Meeting

JF suggested the group revisit the issue of where to site and what time of year to hold the next All Scientists Meeting. He noted that alternative times of year would allow use of university campuses, which tend to be lower-cost than commercial facilities. Summer is not good because of conflicting society meetings and field seasons. January is not suitable because the two Antarctic sites are fully involved in their field season at that time and would not be able to participate.

During discussion it was suggested that the meeting be scheduled to follow the ESA meeting, thus saving on travel cost and presentation/poster development time, or that it be located at the Keystone Center, Snowbird, or Jackson Hole. Jerry polled the sites for time-of-year preferences and most preferred mid-September or January. It was decided to meet in mid-September 1995 as in 1993.

Executive Committee Position Nominees Requested

Nominees are requested for a replacement for Tim Seastedt on the Executive Committee. Send names to Jerry Franklin via electronic mail by December 15.

Attachments:

- List of Participants
- NSF Reorganization Chart
- On-Line Data Sets at LTER Sites
- Climate Committee Report
- Missouri Ozark Forest Ecosystem Project (MOFEP) information
- Ontario Forest Research Institute (OFRI) information

PARTICIPANTS
LTER Coordinating Committee Meeting
Coweeta Hydrologic Laboratory
October 19-21, 1994

AND Fred Swanson, Art McKee

ARC John Hobbie, Gus Shaver

BNZ Les Viereck

CPR Indy Burke, Bill Lauenroth

CWT Judy Meyer, Wayne Swank, Gil Calabria, Dave Coleman, Jim Vose,
Dac Crossley, Bruce Haines, Bruce Wallace

HFR David Foster, Mike Binford

HBR Tim Fahey

JRN Bill Schlesinger

KBS Phil Robertson

KNZ Alan Knapp, John Blair

LUQ Robert Waide, Jess Zimmerman

MCM Bob Wharton, Jordan Hastings

NET Jerry Franklin, Caroline Bledsoe, Josh Greenberg, John Vande Castle,
Rudolf Nottrott, Stephanie Martin

NWT Pam Diggle

NSF James Gosz, Mike Allen

NTL John Magnuson, Tim Kratz

PAL Robin Ross, Ray Smith

SEV James Brunt

VCR Bruce Hayden, John Porter

Guests: Brian Brookshire & Eric Kurzejeski, Missouri Department of Conservation
Bruce LaZerte, Ontario Ministry of Energy & the Environment
Ed Whitelaw, ECO Northwest