

Fifth Competition for Long-Term Ecological Research (LTER): Urban LTER

Special Competition

**Directorate for Biological Sciences
Division of Environmental Biology**

**Directorate for Education and Human Resources
Division of Educational System Reform**

**Directorate for Social, Behavioral and Economic Sciences
Division of Social, Behavioral and Economic Research**

Deadline for receipt of proposals: *May 2, 1997*

To enhance the interdisciplinary breadth of the Long-Term Ecological Research (LTER) Network, the NSF announces a competition for up to two (2) new LTER sites that focus on urban ecosystems. With an initial set of six sites selected in 1980, the National Science Foundation established the Long-Term Ecological Research Program to conduct research on long-term ecological phenomena. The present total of 18 sites represents a broad array of ecosystems and research emphases. None of the existing sites explicitly focus on human-dominated ecosystems. Urban ecosystems are formed by and, to a large extent, represent the goals and values of society. Forcing functions within urban ecosystems are not only environmental, but also social and economic, and these factors and their interactions must be considered to understand pattern and process in urban ecosystems over long time frames and broad spatial scales.

In recent years, the Division of Environmental Biology has endeavored to expand the disciplinary scope of the LTER Network through competitions to augment research activities at existing LTER sites. The competition for Urban LTER sites represents a collaboration between the Directorates for Biological Sciences (BIO), Education and Human Resources (EHR), and Social, Behavioral and Economic Sciences (SBE). Proposals submitted to this competition must support the general mission of the LTER Network as outlined below. In addition, activities at *Urban LTER sites must explicitly investigate the interactions and feedbacks between and among social, economic and ecological drivers in urban environments*. Research in an urban environment provides an ideal opportunity for linkages with educational systems and the public. Thus, an Urban LTER will also devote considerable effort and resources to educational and outreach activities.

The LTER Network is a collaborative effort among over 600 scientists and students which extends the opportunities and capabilities of the individual sites to promote synthesis and comparative research across sites. The Network is managed by an Executive Committee and a larger Coordinating Committee, both comprised of representatives of the LTER sites. The LTER Network Office supports, facilitates, and enhances the research and creative activities developed by the LTER Network. In addition, the LTER Network Office plays a leadership role in developing and implementing data and information management standards and protocols for the LTER Network, as well as the broader community of environmental scientists. Additional information about the LTER Network and the LTER Network Office can be obtained from the LTER homepage on the world wide web at <http://lternet.edu>.

An International LTER (ILTER) Network has been developed recently, with the help of the LTER

Network Office. The purpose of the ILTER is to encourage the development of a world-wide network of long-term research sites. Proposals for an Urban LTER may also consider the potential for developing international collaboration in conjunction with ILTER. Information on ILTER can be found at <http://ilternet.edu> .

In developing these proposals and planning the research, potential LTER project groups are expected to demonstrate that they can provide the scientific and organizational coordination of their projects with ongoing research at the 18 existing sites, and, where appropriate, with international sites, as well. Research questions, analytical methods, and information management/data accessibility protocols are all important areas for planned coordination. An LTER proposal may be submitted for a site with ongoing research or for a site which would require an entirely new effort. It should be noted, however, that in previous competitions the existence of major, relevant long-term data bases for a site was viewed positively by peer reviewers. Use of existing federal and state facilities, and collaboration with other long-term research sites or programs, both national and international, is encouraged. Involvement of colleges and universities with predominantly minority student populations is also encouraged. In addition, the Principal Investigator(s) will be expected to make a long-term time commitment to the proposed project, and to participate in relevant LTER Coordinating and Executive committee activities. In general, LTER investigators are expected to contribute to network-level, cross-site and synthesis activities.

PROPOSAL CONTENT

To date, the general mission of the LTER network has been to (1) understand ecological phenomena which occur over long temporal and broad spatial scales, (2) create a legacy of well-designed and documented ecological experiments, (3) conduct major syntheses and theoretical efforts, and (4) provide information necessary for the identification and solution of environmental problems. In general, an LTER site should investigate phenomena that cannot be studied under short-term funding cycles. Instead, LTER research should be developed around a site-specific conceptual framework that generates questions requiring experiments and observations over long time frames and broad spatial scales. The conceptual frameworks of the existing LTER sites are broadly focused around five core areas:

- pattern and control of primary production,
- spatial and temporal distribution of populations selected to represent trophic structure,
- pattern and control of organic matter accumulation in surface layers and sediments,
- patterns of inorganic inputs and movements of nutrients through soils, groundwater, and surface waters, and
- patterns and frequency of disturbance to the research site.

The five core areas help to focus and integrate LTER research within and across sites. These core areas are broadly defined and must be incorporated into the research to be conducted in an urban ecosystem. In addition to the traditional LTER core areas, an Urban LTER will:

- examine the human impact on land use and land-cover change in urban systems and relate these effects to ecosystem dynamics,
- monitor the effects of human-environmental interactions in urban systems, develop appropriate tools (such as GIS) for data collection and analysis of socio-economic and ecosystem data, and develop integrated approaches to linking human and natural systems in an urban ecosystem environment, and
- integrate research with local K-12 educational systems.

Promising areas of interaction with the school system may involve middle and high school students in surveys of functional ecosystems, linked to standards-based classroom curriculum, leading to substantive and genuine participation in the LTER's field and laboratory research activities. Students may become a broad resource for the site providing significant learning and problem-solving

opportunities. High-quality science curriculum modules may be developed in partnership with the LTER. Educational involvement in the LTER's enterprise should take advantage of web-based participation in problem solving activities and is an opportunity to more fully engage local schools as value-added partners in promoting a deeper appreciation of the area's ecological characteristics and its social dynamics.

Proposals should be developed as follows using the format and forms contained in NSF's Grant Proposal Guide (GPG, NSF 95-27) which can be obtained over the World Wide Web at <http://www.nsf.gov/bfa/cpo/start.htm> . Please note the page limits contained in this announcement take precedence over those given in the GPG.

Section 1. Results from prior NSF support. A maximum of 5 pages of text may be used for this section.

Section 2. Develop and explain the conceptual framework that provides the unifying theme for the proposed LTER research. Describe in some detail the long-term experiments, sampling protocols, and monitoring to be done, and explain how they fit into your conceptual framework. Describe the methods and data analyses so that the quality of these long-term efforts can be critically evaluated by reviewers. In addition, describe any short-term, mechanistic experiments, empirical studies, sampling programs, modeling efforts, etc., that will be conducted. Again, describe the methods and planned analyses in detail and explain how these short-term studies fit into the conceptual framework. Also, relate these efforts to the proposed long-term studies. Long-term studies in urban ecosystems pose unique problems that may not exist in remote and well-protected sites. The proposal should explicitly address how the site will conduct and manage long-term research in an urban setting in which equipment and experiments are potentially subject to frequent and unplanned human and other intrusions. Close this section with a synthesis that ties together the proposed research activities.

Overall, an LTER site should be conducting hypothesis-driven, long-term research coupled with short-term mechanistic studies to derive understanding of long-term dynamics. Modeling efforts are important, and should be discussed in detail where appropriate. This section may have a maximum of 25 pages of text.

Section 3. Literature Cited in Sections 1 and 2.

Section 4. Describe the research management plan for the proposed site. Specifically, describe how funding, research, K-12 school system, and community participation decisions will be made and how these actions will be implemented. This section may have up to three pages of text.

Section 5. One of the real strengths of the LTER network is the quality and emphasis on information management and metadata standards. It is expected that data derived from LTER funding will be made freely and widely available within two years of collection, although exceptions are made for graduate student research. Describe the proposed information management system and metadata standards to be used at your site. How will the data manager be involved in the design of research projects? What mechanisms will you employ to assure that researchers contribute their data to the LTER databases? What criteria, if any, will be used to limit or provide other researchers access to data sets? What types of usable data sets will be available to the K-12 school community? How often will data sets be updated on the World Wide Web? Use up to three pages of text for this section.

Section 6. Budget pages and detailed budget description. Funding will be provided for up to \$700,000 per year for up to six years. Cost sharing should be entered on line M of NSF form 1030.

Describe any cost sharing, other sources of funding, how the LTER funds will be leveraged at your site, and what other in-kind services will be provided and by whom.

Section 7. Provide a one page CV for each core scientist, and for key international participants, if relevant. List only FIVE publications per investigator on their CV. Also, provide an alphabetical list of all scientific, educational, and community collaborators and a list of conflicts of interest for the PIs and other LTER participants whose CVs' appear in the proposal rather than listing these separately on each CV. Educational collaborators must include, at a minimum, the school system and the site's NSF-supported Urban Systemic Initiative (USI) or Comprehensive Partnership for Mathematics and Science Achievement (CPMSA), as appropriate.

Section 8. Current and Pending support of each investigator.

The proposal text should be single-spaced with a 12-point font (or larger) and one inch margins on all sides. Figures and tables may be reproduced on the back side of the 25 text pages of Section 2, only. Do not include figures and tables on separate pages. Number each page of each section (text pages only) in the bottom center of the page in the following format: 1-1, 1-2; 2-1, 2-2, ..., 2-25; 3-1, etc.

PROPOSAL EVALUATION

Proposals will be evaluated by an advisory panel based on how well the proposal addresses the criteria listed in Proposal Content (Pg. xx). Additional criteria are:

- quality of the research, including the technical soundness of the proposed approach, capability of the investigators, and the adequacy of the institutional resources available or proposed,
- the potential of the proposed activities to contribute to an integration and understanding of the social, economic, and ecological interactions in urban ecosystems,
- the added value of the proposed activities to the science and mathematics education reform efforts in the city, particularly those supported by NSF,
- the integration of research, educational activities, and public outreach,
- quality of the information management protocols and metadata standards, and
- management plan of the research team, including the integration of the site into current LTER Network research and coordination activities.

Proposed cost-sharing and in-kind support may be considered in the evaluation process.

SUBMISSION PROCEDURE

Other than instructions stipulated above, preparation and submission of proposals must follow the guidelines given in the Grant Proposal Guide (GPG) (NSF 95-27). Required NSF forms are found in the GPG which can be obtained from:

4201 Wilson Boulevard
Arlington, VA 22230
Tel: (703) 306-1130
FAX: (703) 644-4278

The original and nineteen (19) copies of proposals, including the copy bearing the signed cover page, should be mailed directly to:

Dr. Scott L. Collins
Division of Environmental Biology, Rm. 635
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

Please print on the box, "**Do not open in the mailroom.**"

WHO MAY SUBMIT

U.S. organizations, including academic institutions, free-standing research institutions, scientific societies, and consortia of such institutions with appropriate research and educational programs in environmental biology, are invited to submit proposals. Proposals involving multi-institutional arrangements (i.e., including combinations of several universities, federal laboratories, private-sector research laboratories, state and local government laboratories, and public school systems) are permitted. A single institution must accept overall management responsibility.

AWARDS

Proposals, due by May 2, 1997, will be evaluated by panel and their disposition communicated to applicants by August 1997. The award(s) will be made by 15 October 1997 with support up to \$700,000 per year. The initial award will be for six years with continued support dependent on submission of meritorious renewal proposals, periodic in-depth site visits, and pending the availability of funds.

Awards made as a result of this competition will be administered in accordance with the terms and conditions of NSF GC-1, "Grant General Conditions," FDP-III, "Federal Demonstration Project General Terms and Conditions," depending on the grantee organization. Copies of these documents are available at no cost from the NSF Forms and Publications Unit, phone (703) 306-1130, or via e-mail (pubs@nsf.gov). These documents also are available electronically at <http://www.nsf.gov:80/bfa/cpo/start.htm#gac>. More comprehensive information is available in the NSF Grants Policy Manual (NSF 95-26), available electronically at <http://www.nsf.gov:80/bfa/cpo/gpm95/start.htm> or for sale through the Superintendent of Documents, Government Printing Office, Washington, DC 20402 (phone: (202) 783-3238).

ADDITIONAL INFORMATION

Information on the existing Long-Term Ecological Research Program and the LTER Network Office is available at www.lternet.edu. Additional information and advice regarding LTER proposals and the integration of new sites into the LTER network can be found at <http://lternet.edu/propinfo>.

Potential applicants are encouraged to contact either:

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Dr. Eric Hamilton
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The Foundation provides awards for research in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for the research findings or their interpretation.

The Foundation welcomes proposals from all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research related programs described here. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF projects. See the program announcement or contact the program coordinator at (703) 306-1636.

Privacy Act and Public Burden. The information requested on proposal forms is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees; to provide or obtain data regarding the application review process, award decisions, or the administration of awards; to government contractors, experts, volunteers, and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF 50, Principal Investigators/Proposal File and Associated Records, and NSF-51, 60 Federal Register 4449 (January 23, 1995). Reviewer/Proposal File and Associated Records, 59 Federal Register 8031 (February 17, 1994). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Herman G. Fleming, Reports Clearance Officer, Division of Contracts, Policy, and Oversight, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230.

The National Science Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD, dial (703) 306-0090; for FIRS, 1-800-877-8339.

Catalogue of Federal Domestic Assistance Numbers: CFDA 47.074, 47.075, and 47.076.

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