

LONG-TERM ECOLOGICAL RESEARCH (LTER) IN LAND/OCEAN MARGIN ECOSYSTEMS

Announcement of Opportunity

Deadline: 15 May 1997

**Directorate of Biological Science, Division of Environmental Biology
Directorate of Geosciences, Division of Ocean Sciences**

NSF Logo

NATIONAL SCIENCE FOUNDATION

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Introduction

To enhance the scope and disciplinary breadth of the Long-Term Ecological Research (LTER) Network, the National Science Foundation (NSF) announces a competition for up to two (2) new LTER sites that focus on **ecological systems at the interfaces of land masses and coastal oceans** (including the Laurentian Great Lakes), hereafter referred to as **land/ocean-margin ecosystems**. Estuaries, coastal wetlands, and coastal reefs are examples of land/ocean-margin 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 land/ocean-margin ecosystems. Coastal areas are sites of intense human activity and rapid population growth. Many research questions in land/ocean-margin ecosystems require highly integrative analyses conducted over long time frames and broad spatial scales.

In recent years, the National Science Foundation has endeavored to expand the disciplinary scope of the LTER Network through competitions to augment research activities at existing LTER sites. This competition for land/ocean-margin LTER sites is a collaborative effort between the Division of Ocean Sciences (OCE) in the Directorate for Geosciences (GEO) and the Division of Environmental Biology (DEB) in the Directorate for Biological Sciences (BIO).

The research proposed to this announcement should emphasize major ecological questions on the linkages between terrestrial and coastal ecosystems. The work should seek to understand the causes of major ecological and environmental changes that influence land/ocean-margin environments, and how the populations, communities, and ecosystems of the

land/ocean-margin ecosystems respond to these changes. In order to achieve major advances in understanding these land/ocean-margin systems, the following elements are encouraged:

- interdisciplinary research coordinated among investigators working within an ecological system,
- experimental studies across a range of appropriate spatial and temporal scales,
- development of conceptual, analytical and numerical models to guide the research and data management activities to facilitate comparisons with research in other systems, and
- comparative approaches encompassing parallel studies in different ecosystems.

Proposals submitted to this competition must explicitly investigate the linkages between terrestrial and coastal ecosystems, and must support the general mission of the LTER Network as outlined below.

The LTER Program

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

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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 land/ocean-margin LTER sites 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 proposals and planning the research for **LTER's in land/ocean-margin ecosystems**, 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, information management, and 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. 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, and to adhere to LTER Network data management policies.

Use of existing federal and state facilities, and collaboration with other long-term research sites or programs, both national and international, is encouraged. Applicants are encouraged, but not required, to consider research sites within existing national research reserve systems. The National Oceanic and Atmospheric Administration (NOAA) supports 21 field laboratory sites throughout the coastal U.S. (including the

Great Lakes) as part of the National Estuarine Research Reserve System (NERRS), and 13 National Marine Sanctuary (NMS) sites that are located in a number of diverse marine habitats. Many of these sites have extensive long-term data sets and support facilities. For specific information concerning NOAA's NERRS and NMS sites, please contact Dr. Michael P. Crosby at (301) 713-3125.

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

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in land/ocean-margin ecosystems. In addition to the traditional LTER core areas, research at land/ocean-margin LTER sites will:

- increase the understanding of the organization and function of land/ocean-margin ecosystems,
- investigate the linkages between these systems and adjacent terrestrial and marine systems, and
- increase the understanding of major natural environmental perturbations in these regions.

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. Proposals will be subjected to initial screening for the requirements in the GPG and this announcement, and will be returned without review or advance notification if deficiencies are found. Proposals will not be forwarded to other Programs if found to be inappropriate for this competition.

Proposals should be clearly identified by a title starting with the acronym, "LTER:," and the following should be placed on the cover sheet in the box for the NSF Organizational Unit, "**LTER, NSF 97-XX.**" Proposals must be limited strictly to 25 single spaced pages for the body of the research narrative, including figures and tables (i.e., introduction, literature review, hypotheses, methods, data analysis, and logistics). Proposals should include explicit plans for the documentation, archiving, and dissemination of research data. All funded participants must adhere to the data management policies applying to recipients of federal funding from OCE and DEB, as well as the LTER Network policies. Proposals should be prepared in the following format:

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 land/ocean-margin 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. 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 including figures and tables.

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, and participation management decisions will be made and how these actions will be implemented. This section may have up to two 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

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widely available as soon as possible, 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? How often will data sets be updated on the World Wide Web? Use up to two pages of text for this section.

Section 6. Budget pages and detailed budget description.

Funding will be provided at \$560,000 per year for up to six years. It is expected from the outset that all projects will seek and document significant extramural funding from sources other than NSF and the home institutions of the investigators.

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 curriculum vitae (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 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.

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 (2.4cm) inch margins on all sides. Proposal originals should be printed on one side of the page only, bound only in the upper left corner, and numbered at the bottom of each page. Number each page of each section in the following format: 1-1, 1-2, ...,

1-5; 2-1, 2-2, ..., 2-25; 3-1, etc. Copies may be double-sided.

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:

Forms and Publications Unit, P-15
4201 Wilson Boulevard
Arlington, VA 22230
Tel: (703) 306-1130
FAX: (703) 644-4278
email: pubs@nsf.gov

The original and twenty (20) copies of proposals, should be marked, "Do not open in mail room," and sent directly to:

Announcement Number NSF 97-XX
Biological Oceanography Program, Rm. 725
Division of Ocean Sciences
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

Proposals may also be submitted electronically. For information, contact the Electronic Proposal Submission Program Director, Division of Information Systems, phone (703) 306-0214, or via e-mail, eps@nsf.gov.

If you have questions or require further information, contact Phil Taylor, Division of Ocean Sciences, phone: (703) 306-1587 or e-mail: prtaylor@nsf.gov, or Scott Collins, Division of Environmental Biology, phone: (703) 306-1479 or e-mail: scollins@nsf.gov.

PROPOSAL REVIEW

Review of proposals and will be handled cooperatively by the Divisions of Ocean Sciences and Environmental Biology. Proposals will be evaluated based on the four general criteria described in the NSF *Grant*

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Proposal Guide and in accordance with established NSF procedures for external merit review. The proposals' responsiveness to the stated goals of the LTER program will also be a major additional factor in the evaluation.

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 are permitted.

AWARDS

Proposals, due by April 15, 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 \$560,000 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). More comprehensive information is available in the *NSF Grants Policy Manual* (NSF 95-26) 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:

Dr. Scott L. Collins
Division of Environmental Biology
(703) 306-1479 ext. 6430
e-mail: scollins@nsf.gov

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

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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, 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.

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