

Long-Term Ecological Research (LTER)

New Site Competition

PROGRAM SOLICITATION

NSF 16-509



National Science Foundation

Directorate for Biological Sciences
Division of Environmental Biology

Directorate for Geosciences
Division of Ocean Sciences
Division of Polar Programs

Preliminary Proposal Due Date(s) (required) (due by 5 p.m. submitter's local time):

February 01, 2016

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

August 02, 2016

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 16-1](#)), which is effective for proposals submitted, or due, on or after January 25, 2016.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Long-Term Ecological Research (LTER) New Site Competition
New Site Competition

Synopsis of Program:

NSF currently supports 25 LTER research sites and, through this solicitation, invites proposals to establish three (3) new LTER sites. Research proposals should address questions in one of two broad ecosystems:

- **Arid/semi-arid ecosystems:** The Division of Environmental Biology (DEB) anticipates support and management of one (1) new site with a focus on arid or semi-arid ecosystems. The location of the research site for proposals submitted to develop a new arid/semi-arid ecosystem LTER must be within the United States, including its territories and protectorates.
- **Ocean/coastal ocean ecosystems:** The Division of Ocean Sciences (OCE) anticipates support and management of two (2) new sites that focus on ocean or coastal ocean ecosystems; defined as ecological systems from the shoreline outward on continental shelves and including the Laurentian Great Lakes, Congressionally defined as interior oceans. Preference will be given to proposals developing a new ocean/coastal ocean ecosystem LTER site located within the United States, including its territories and protectorates, but other locations are not

precluded.

To address ecological questions that cannot be resolved with short-term observations or experiments, NSF established the Long Term Ecological Research Program (LTER) in 1980. Two components differentiate LTER research from projects supported by other NSF programs: 1) the research is located at specific sites chosen to represent major ecosystem types or natural biomes; and 2) it emphasizes the study of ecological phenomena over long periods of time based on data collected in five core areas. The five core areas of long-term data collection are: 1) patterns and controls of primary production, 2) spatial and temporal population dynamics and food web interactions, 3) patterns and controls of organic matter accumulation and decomposition, 4) patterns of inorganic inputs and movements of nutrients, and 5) patterns and frequency of disturbances. The LTER program provides a unique opportunity for researchers to obtain an integrated, holistic understanding of ecosystems that is not possible through individual, short-term awards.

Research at LTER sites must test important, current ecological theories and significantly advance understanding of the long-term dynamics of populations, communities and ecosystems. It often integrates multiple disciplines and, through cross-site interactions, examines patterns or processes over broad spatial scales. Recognizing that the value of long-term data extends beyond use at any individual site, NSF requires that data collected by all LTER sites be made broadly accessible.

The LTER program is a multi-disciplinary, cross-Foundation effort supported by the Division of Environmental Sciences (DEB), the Division of Ocean Sciences (OCE), and the Division of Polar Programs (PLR).

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Saran Twombly, telephone: (703) 292-8133, email: stwombly@nsf.gov
- David L. Garrison, telephone: (703) 292-7588, email: dgarriso@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.050 --- Geosciences
- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 3

Anticipated Funding Amount: \$3,154,000

\$3,154,000 is the approximate total for the first year of funding. Budgets for a new arid or semi-arid site should not exceed \$900,000 per year. New marine sites can request up to \$1,127,000 annually. The expectation is that marine sites will be funded at a higher level than the terrestrial site due to increased costs associated with oceanic field research. Successful projects will be funded for six years. Annual budgets must be well justified and should include \$16,000 to support two Research Experiences for Undergraduate students and \$24,000 for a LTER Schoolyard program. All awards are contingent on availability of funds.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI:

There are no restrictions or limits.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
 - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:**

Not Applicable

- **Other Budgetary Limitations:**

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Preliminary Proposal Due Date(s) (*required*)** (due by 5 p.m. submitter's local time):

February 01, 2016

- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time):

August 02, 2016

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review considerations apply. Please see the

full text of this solicitation for further information.

Award Administration Information

Award Conditions:

Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

All ecological communities and ecosystems face long-term change. Identifying the nature of these changes and the mechanisms or processes driving them requires the collection, analysis, and interpretation of data over long periods of time. The LTER program provides a unique opportunity for researchers to obtain an integrated, holistic understanding of ecosystems that is not possible through individual, short-term awards. LTER research is located at specific sites chosen to represent major ecosystem types or natural biomes and it emphasizes the study of phenomena over long periods of time based on data collected in five core areas: 1) patterns and controls of primary production, 2) spatial and temporal population dynamics and food web interactions, 3) patterns and controls of organic matter accumulation and decomposition, 4) patterns of inorganic inputs and movements of nutrients, and 5) patterns and frequency of disturbances. Research at LTER sites must test important, current ecological theories and significantly advance understanding of the long-term dynamics of populations, communities and ecosystems. Existing projects often include integrative, cross-site research.

Over thirty years of LTER research have produced unique and valuable knowledge about ecological change in response to natural and human influences. LTER research has advanced the field of ecology and helped to provide the empirical data needed to forecast change. It has also advanced understanding of continental-scale processes, through cross-site analyses of ecological change. At some sites, social scientists have been engaged to examine questions of socio-ecological connections among organisms, biological processes, and the abiotic environment.

The LTER Program faces new demands for long-term research as it enters its fourth decade. Long-term data are necessary to advance our understanding of complex biological systems, important ecological processes that are context-dependent and non-linear, ecological and evolutionary processes that interact continually through feedbacks, and the effects of ongoing climate and environmental change that are currently unknown. These are a few of the frontiers particularly appropriate for LTER research.

To enhance the scope and disciplinary breadth of the LTER Program, NSF invites proposals to establish three new LTER sites. Research proposals submitted to this solicitation competition should address questions in one of two broad ecosystems:

- **Arid/semi-arid ecosystems:** The Division of Environmental Biology (DEB) anticipates support and management of one (1) new site with a focus on arid or semi-arid ecosystems. Arid lands are experiencing rapid changes due to climate, land use, fire, and shifting biotic interactions. Reduced productivity, shifts in vegetation structure, changes in plant-soil feedbacks, and the importance of legacy effects underscore the complex interactions responsible for dynamics of arid and semi-arid ecosystems.
- **Ocean/coastal ocean ecosystems:** The Division of Ocean Sciences (OCE) anticipates support and management of two (2) new sites that focus on ocean or coastal ocean ecosystems, here meaning ecological systems from the shoreline outward on continental shelves and including the Laurentian Great Lakes, Congressionally defined as interior oceans. The LTER program recognizes the critical need to understand the resilience and sustainability of coastal ocean systems in the face of environmental change, including activity by humans.

Evaluation of proposals will place priority on: a) evidence of an intellectual framework that links diverse studies through explicit predictions; b) testing core ecological principles or concepts; c) promoting an integrated understanding of how processes interact across components of an ecosystem, including the five core areas mentioned above; d) identification of a site that convincingly characterizes a major biome; and e) an investigative team with the expertise to manage and conduct a cohesive research program.

The LTER Program comprises a collaborative network of over 1,200 scientists and students investigating ecological processes over long temporal and broad spatial scales. The LTER network governance expands the opportunities and capabilities of individual sites to promote synthesis and comparative research across sites. Additional information about the LTER Program and network activities can be obtained from the LTER homepage at <http://www.lternet.edu>.

II. PROGRAM DESCRIPTION

The LTER program enables research to advance the understanding of long-term ecological dynamics, processes, and phenomena. It provides researchers a unique opportunity to obtain an integrated, holistic understanding of populations, communities, and ecosystems that is not possible through individual, short-term awards.

Current LTER projects or sites each address a suite of integrated questions that test major ecological theories or concepts. These questions arise from ongoing analyses of long-term data and demand study on decadal time scales. The research seeks to achieve a mechanistic understanding of biological responses to past and present environmental changes at multiple scales, and to use this understanding to predict ecological, evolutionary, and – if appropriate – socio-ecological responses to environmental change. As described above, each site collects long-term data in five core areas, and many also implement manipulative, long- and short-term experiments. Results from this research significantly advance an integrated understanding of site-specific dynamics. They also provide opportunities for cross-site or synthetic research.

All current LTER sites have developed educational activities appropriate for all levels of learning. They execute thorough data management plans that include timelines for data release, publication of discovery-level metadata, and online access for all core data through the LTER Network Information System. NSF recognizes that human decisions, behavior, and actions may contribute to LTER research. New proposals may elect to include social science research if it helps to advance or to understand key, conceptually-motivated ecological questions.

The LTER program supports 25 sites that examine Arctic and Antarctic ecosystems (Arctic LTER, McMurdo Dry Valleys LTER, Palmer LTER), forest ecosystems (Andrews Forest LTER, Bonanza Creek LTER, Coweeta LTER, Harvard Forest LTER, Hubbard Brook LTER, Luquillo LTER), urban ecosystems (Baltimore Ecosystem Study, Central Arizona-Phoenix LTER), coastal ecosystems (Florida Coastal Everglades LTER, Georgia Coastal Ecosystems LTER, Plum Island Ecosystems LTER, Santa Barbara Coastal LTER, Virginia Coastal Reserve LTER), marine ecosystems (California Current Ecosystem LTER, Moorea Coral Reef LTER), grassland and prairie ecosystems (Konza Prairie LTER, Cedar Creek Ecosystem LTER, Sevilleta LTER), agroecosystems (Kellogg Biological Station LTER), alpine ecosystems (Niwot Ridge LTER), arid land ecosystems (Jornada Basin LTER), and freshwater ecosystems (North Temperate Lakes LTER).

NSF invites proposals to establish three new LTER sites in order to enhance the scope and disciplinary breadth of the LTER Program and to complement research carried out at current sites. Research proposals submitted to this solicitation competition should address questions in one of two broad ecosystems:

- Arid/semi-arid ecosystems: The Division of Environmental Biology (DEB) anticipates support and management of one (1) new site with a focus on arid or semi-arid ecosystems.
 - Almost one third of the total land area of the world is classified as arid or as dryland, based on the definitions below. These environments are extremely diverse in terms of their land forms, soils, fauna, flora, water balances, and human activities. Arid lands are experiencing rapid changes due to climate, land use, fire, and shifting biotic interactions. Reduced productivity, shifts in vegetation structure, changes in plant-soil feedbacks, and the importance of legacy effects underscore the complex interactions responsible for dynamics of arid and semi-arid ecosystems
 - For the purposes of this solicitation, semi-arid ecosystems are defined as those for which annual precipitation varies from 300-600 to 700-800 millimeters (11.81 – 31.5 inches), with summer rains, and from 200-250 to 450-500 millimeters (7.9 – 19.7 inches, with winter rains. Native vegetation is represented by a variety of species, such as grasses and grass-like plants, forbs, half-shrubs, shrubs and trees. Arid ecosystems experience highly variable rainfall, with annual amounts ranging between 100 and 300 millimeters (3.94 – 11.8 inches). Vegetation is generally sparse, represented by annual and perennial grasses and other herbaceous vegetation, shrubs and small trees. Arid or dryland climate is characterized by significant diurnal fluctuation in temperatures. Semi-arid and arid ecosystems occur in tropical, temperate, and high-latitude climatic zones. The location of the research site for proposals submitted to develop a new arid/semi-arid ecosystem LTER must be within the United States, including its territories and protectorates.
- Ocean/coastal ocean ecosystems: The Division of Ocean Sciences (OCE) anticipates support and management of two (2) new sites that focus on ocean or coastal ocean ecosystems, here meaning ecological systems from the shoreline outward on continental shelves and including the Laurentian Great Lakes, Congressionally defined as interior oceans. The LTER program recognizes the critical need to understand the resilience and sustainability of ocean or coastal ocean ecosystems in the face of environmental change, including activity by humans. Investing in additional ocean or coastal ocean LTER sites that address nationally important ecological and sustainability issues in marine systems requires long-term studies and observation. Presently there are eight marine sites. The last competition for establishing new LTER sites was in 2003 and resulted in establishment of the Moorea Coral Reef LTER and the California Current Ecosystem LTER. Preference will be given to proposals developing a new ocean/coastal ocean ecosystem LTER site located within the United States, including its territories and protectorates, but other locations are not precluded.

Proposals submitted to this competition must support the general mission of the LTER Program, focusing on site-specific questions that promote an integrated understanding of how a particular ecosystem is structured and functions. The research should be innovative and justify the need for long-

term support. A new LTER site should conduct hypothesis-driven, long-term research that is coupled with short-term mechanistic studies to derive an understanding of long-term dynamics. Modeling efforts are important and should be discussed in detail where appropriate.

The research proposed should emphasize major ecological processes and questions or hypotheses that will advance current understanding of arid- or semi-arid and ocean or coastal ocean ecosystems. It should seek to understand the predominant causes of ecological variability and long-term change, and how populations, communities, and ecosystems respond to this change. Research that extends the traditional ecological disciplines represented at ongoing LTER sites by incorporating elements of evolutionary or physiological ecology, for example, are encouraged.

The following elements are encouraged in proposals for new LTER sites:

- an unifying conceptual framework, based on key ecological theories, that integrates the questions and the research activities (e.g., sampling, experiments, modeling) proposed;
- development of conceptual, analytical, or numerical models to guide the research;
- inter-disciplinary, process-oriented research that is coordinated among investigators;
- experimental studies across a range of appropriate and manageable spatial and temporal scales;
- plans for documenting, archiving, and disseminating research data in accordance with current LTER standards(see <http://lternet.edu>);
- describe the domain of the proposed project that is adequate to outline the larger biome or region that would be characterized and to justify the site chosen as appropriate for new, long-term ecological research;
- evidence of a research team with the expertise required to accomplish the proposed research.

This solicitation will establish new LTER projects or sites. A proposal may be submitted for a site for which long-term data exist or for a site that requires an entirely new effort. Use of existing federal and state facilities, and collaboration with other long-term research sites or programs are encouraged. Prospective investigators may wish to contact current LTER Principal Investigators to learn more about the structure and management of an LTER site.

Review Process: A two-stage review process will be used for the opportunities described above.

1. **Preliminary Proposals:** All proposers must submit a preliminary proposal that outlines the major goals of the project including the components described below. Preliminary proposals typically will be reviewed by a panel of outside experts. The Program Directors will communicate the decision to Invite/Do Not Invite full proposals via FastLane and those decisions will be based on the panel recommendations and additional portfolio considerations. Invite/Do not Invite decisions are binding.
2. **Full Proposals:** Invited full proposals will receive panel review and ad hoc review at the discretion of the program as described in Section VI of this Solicitation. Full proposals that were not invited or that do not address one of the two ecosystems as defined above will be returned without review.

III. AWARD INFORMATION

Budgets for a new arid or semi-arid site should not exceed \$900,000 per year. New marine sites can request up to \$1,127,000 annually. The expectation is that marine sites will be funded at a higher level than the terrestrial site due to increased costs associated with oceanic field research. Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI:

There are no restrictions or limits.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals (*required*): Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

The following exceptions and additions to the GPG guidelines apply to preliminary proposals submitted to this solicitation:

- Collaborative proposals must be submitted using the "single proposal" method as described in Chapter II., Section D.5.a. of the GPG. Each project must be managed by a single organization with other organizations involved via sub-awards.
- Submission of a preliminary proposal is required to be eligible for invitation for a full proposal. Preliminary proposals that are not compliant with the guidelines may be returned without review. It is the submitting organization's responsibility to ensure that the proposal is compliant with all applicable guidelines.
- Preliminary proposals must contain the items listed below and strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to Web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet the formatting requirements for font size, characters per inch, margins, etc. as specified in the GPG.
- Results from prior support are neither required in, nor excluded from preliminary proposals. It is up to the individual submitters to determine if this information represents an efficient use of the limited Project Description space in support of their request.
- Preliminary proposals should contain an overview of the proposed research with sufficient detail to allow assessment of the major ideas and approaches to be used.

Preliminary proposals must include the following components:

Cover Sheet: Select the LTER program solicitation number from the pull-down list. Check the box indicated for the preliminary proposal. Entries on the Cover Sheet are limited to the Principal Investigator and a maximum of four co-Principal Investigators. Leave blank the fields for Requested Amount, Requested Duration and Start Date for the grant.

Title of Proposed Project: Title should begin with the prefix: "Preliminary Proposal:" followed by "LTER:".

Project Summary (1 page): Provide an overview of the LTER research, addressing separately the intellectual merit and broader impacts. The summary should be written in the third person, informative to those working in the same or related field(s), and understandable to a scientifically or technically literate reader.

Project Description (Maximum of 8 pages total): The first page of the project description should provide a list of project personnel plus each person's institutional affiliation. Divide the list into two sections: the first section must contain all PI(s), co-PI(s), and sub -award lead senior investigators. The second section of the list should contain other senior personnel and may include post-doctoral scholars. Any individual for whom a biographical sketch is included in the preliminary proposal must be on one of

these lists.

Use the remaining 7 pages to address the intellectual merit and broader impacts of the research. The preliminary proposal project description must:

- Present a clear conceptual framework that underlies the research approach and that leads to predictions about ecological dynamics over space and time.
- Provide adequate information to describe the domain of the project, to outline the larger biome or region that it would characterize, and to justify the site as appropriate for long-term ecological research.
- Articulate key ecological questions that are critical to obtaining an integrated understanding of how diverse components of the targeted ecosystem interact.
- Describe the general approaches that will be used, including both observational and experimental, if appropriate, to answer research questions at relevant temporal and spatial scales.
- Incorporate long-term data collection in the five core areas: 1) patterns and controls of primary production, 2) spatial and temporal population dynamics and food web interactions, 3) patterns and controls of organic matter accumulation and decomposition, 4) patterns of inorganic inputs and movements of nutrients, and 5) patterns and frequency of disturbances.
- Develop models that are predictive and assimilate models with data.
- Present a feasible plan for implementing the broader impacts of the proposed research.

References Cited (limited to 2 pages and following GPG for format).

Biographical Sketches (limited to 1 page per person): Provide a one-page biographical sketch for each PI and senior scientist listed on the first page of the project description. List up to 10 publications or products per investigator on each Bio Sketch, but do not list conflicts of interest or collaborators. Conflicts of interest and collaborators are to be listed separately as described below under Supplementary documents.

No budget or budget justification should be submitted. Please leave blank the Requested Amount box on the FastLane Cover Sheet.

Supplementary Documents must include the following, but the order is not important:

- An alphabetical, combined Conflict of Interest document. This should be presented as an alphabetized table identifying conflicts of interest for the PI, all co-PIs, and all Senior Personnel. The table should be organized, by columns, as: A. Last and first name of the individual in conflict, B. institutional affiliation of the conflict, C. type of conflict, and D. name of the PI, co-PI, or Senior Personnel holding the conflict. Conflicts to be identified are (1) Ph.D. advisors or advisees, (2) collaborators or co-authors within the past 48 months, (3) postdoctoral researchers and Masters students within the past 48 months, (4) any other individuals with whom, or institutions with which, the research personnel (PIs, co-PIs, other named personnel) have financial or other professional ties, including advisory committees (specify type), and (5) friends, family members, or other individuals from whom an objective evaluation would be unlikely. *Do not list conflicts separately on each biographical sketch.*
- If applicable, a list of Partner Institutions.

Single Copy Documents: Applicants must complete the Proposal Classification Form. The Proposal Classification Form is required for all submissions to BIO; FastLane will not allow processing of the proposal without it.

No other items, appendices or supplementary documents are permitted for preliminary proposals.

Preliminary Proposal Checklist for Compliance: Prior to submission, please review your preliminary proposal against this checklist to ensure that it is fully compliant with the guidelines provided in this solicitation:

- On the Cover Page, nothing is entered into the Requested Amount or start date boxes; the Beginning Investigator box is checked if applicable.
- The Title begins with the prefix "Preliminary Proposal:" followed by "LTER:"
- The Project Summary is limited to 1 page, includes as separate sections an Overview, the

- Intellectual Merit, and the Broader Impacts of the proposed activity.
- The Project Description is limited to 8 pages and addresses both the Intellectual Merit and Broader Impacts of the proposed research as separate sections. The first page of this section contains only a list of project personnel, including institution and planned status (e.g., PI, co-PI, subaward lead, other senior personnel).
- The References Cited is limited to 2 pages and conforms to the GPG format.
- The Biographical Sketches are limited to 1 page.
- Ensure that your final submitted PDF conforms to the typeface size limits (10-11 pt depending on font), line spacing maximum (no more than six lines of text per vertical space of one inch) and margins (at least one inch on all sides of page) specified in the GPG.
- Items that should NOT be included in a Preliminary Proposal: Budget, Budget Justification, Facilities, Equipment and Other Resources, Current and Pending Support, Letters of Collaboration, Data Management Plan, Postdoctoral Mentoring Plan, RUI Impact Statement, Certification of RUI Eligibility, or any other Supplementary Documents.

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

See Chapter II.C.2 of the [GPG](#) for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

The following instructions supplement the GPG and NSF Grants.gov Application Guide guidelines:

- The page limits contained in this solicitation take precedence over those given in the NSF Grant Proposal Guide (GPG).
- Each project must be managed by a single organization (see Chapter II., Section D.5.a of the NSF GPG) with other organizations involved via sub-awards.
- Proposals will be subjected to initial screening for the requirements in the GPG and this solicitation. Those that do not meet specific requirements will be returned without review.
- Full proposals will be accepted only from PIs who have submitted preliminary proposals and have been invited to submit a full proposal.
- Full proposals should not deviate substantially from the preliminary proposal in the scope of the project. PIs may incorporate responses to the preliminary proposal panel summary.

Collaborative Proposals: Collaborative proposals must be submitted using the "single proposal" method as described in Chapter II., Section D.5.a. of the GPG. Each project must be managed by a

single organization with other organizations involved via sub-awards.

Proposal Format: GPG guidelines should be strictly adhered to with exception of the following:

Cover Sheet: The title must start with the acronym, "LTER:" followed by the substantive title.

Project Description: (This sections is a maximum of 25 pages of text, with an additional 7 pages allowed for figures. No substitution of text for figures, or figures for text, will be accepted.) Please include the following sections:

1. **Results from Prior Support.**
2. **Proposed Research.** Essential to this section is a clear articulation of the conceptual framework and individual questions that constitute an integrated research plan that includes long-term data in five core areas: 1) patterns and controls of primary production, 2) spatial and temporal population dynamics and food web interactions, 3) patterns and controls of organic matter accumulation and decomposition, 4) patterns of inorganic inputs and movements of nutrients through soils, groundwater and surface waters, and 5) patterns and frequency of disturbances. Proposers should describe the domain of the proposed project and outline the larger biome or region that it would characterize. Authors should develop and explain the conceptual framework that provides the unifying theme for the proposed research. Describe in some detail the long-term experiments, sampling, and sampling protocols that will be used and explain how each fits into the conceptual framework. Describe methods and data analyses in sufficient detail that the quality of these efforts can be critically evaluated by reviewers. In addition, describe any short-term, mechanistic experiments, empirical studies, sampling programs, or modeling efforts that will be conducted. Describe methods and planned analyses in detail and explain how these short-term studies fit into the conceptual framework. Likewise, proposed models or model development must be presented in sufficient detail to allow evaluation, including the model structure and how models account for sources of uncertainty. Conceptually integrate shorter-term efforts with proposed long-term studies. Outline any planned regional, cross-site, or other collaborative efforts involving the LTER network if they are not part of your core program. Close this section with a synthesis that ties together the proposed research activities.
3. **Education and Outreach Activities.** Describe your outreach program, including educational activities at all levels, public activities, media interactions, implications/applications of your research to policy and management, etc. Educational activities should include development of a LTER Schoolyard program that targets K-12 education (<http://www.lternet.edu/education/overview>) and support for two REU students.

Biographical Sketches (limited to 1 page per person). Provide a one-page biographical sketch for all PIs, co-PIs, and Senior Personnel. These documents should include up to 10 publications or products related to the proposed research, but should not include a list of collaborators or conflicts of interest.

Budget and Budget Justification. Provide a budget for each of the six years. FastLane or Grants.gov will automatically provide a cumulative budget. The proposed budget should be consistent with the needs and complexity of the proposed activity. Funds allocated for research, education, broadening participation, and knowledge transfer areas must be discernible. Justification for general purpose equipment such as boats and other field vehicles must describe its primary or exclusive use for the proposed research. The budget must include support for up to \$24,000 per year for a well justified LTER Schoolyard program. Additional educational support includes up to \$16,000 per year for two (2) Research Experiences for Undergraduate students. Plans for REU student mentoring and involvement in research activities must be included. Funds requested for Schoolyard and REU activities must be requested as Participant Support and described separately in the budget justification.

Supplementary Documents must include the following (order is not important):

- **Data Management Plan (limited to 2 pages).** Core data sets generated at a site must be available electronically and accompanied by metadata that meet LTER standards for the Network Information System (NIS) (<https://portal.lternet.edu/nis/home.jsp>). This section must provide a description of the data and information management system and metadata standards to be used at the site. It is expected that data derived from LTER funding will be made freely and publicly available as soon as possible, and not to exceed 2 years after collection, via the LTER NIS Data Portal. This section should include expected milestones and deliverable products from data management. NSF places high priority on the availability of site-based data to a broad research

community. This section should include descriptions of how data management will be implemented in the design of research projects; how the data manager will be involved in designing research projects; and the mechanisms employed to ensure that researchers contribute their data to the NIS Data Portal. Proposers should describe the resources that will be dedicated to harvesting, documenting, archiving, managing, and making data accessible. For proposals that address ocean or coastal ocean ecosystems, data management should be consistent with the requirements described in the Division of Ocean Sciences Sample and Data Policy.

- **Project Management Plan (limited to 3 pages).** Describe how the proposed research, which could involve a number of individuals and diverse projects, will be managed. This must include a cohesive management plan that is adequate for a project of the size and complexity proposed.
- **Postdoctoral Mentoring Plan (limited to one 1 page).** A single postdoctoral mentoring plan must be included if salaries are listed for post-doctoral researchers on the appropriate line in the budgets requested.
- **Ship time request, if applicable:** Proposals may require the scheduling of ship time. These proposals must include a completed NSF-UNOLS Request Form (NSF Form 831). The UNOLS form may be obtained from the NSF Division of Ocean Sciences Ship Operations Program by calling (703) 292-8581, or directly from the UNOLS website at <http://www.unols.org/>.
- **Letters of Collaboration.** Supplementary Documents may include letters of collaboration from individuals or organizations that are integral to the proposed project but are neither senior personnel nor supported by subawards. This may include subsidiary involvement in some aspect of the project, cooperation on outreach efforts, or documentation of permission to access materials or data. Letters of collaboration should focus solely on affirming that the individual or organization is willing to collaborate on the project as specified in the project description. No endorsements of the potential value or significance of the project may be included. The template that must be used for the preparation of letters of collaboration is provided below.

Each letter of collaboration must be signed by the designated collaborator. Requests to collaborators for letters of collaboration should be made by the PI well in advance of the proposal submission deadline, because they must be included at the time of the proposal submission. Letters deviating from this template will not be accepted and may be grounds for returning the proposal without review.

Template to be used for letters of collaboration:

To: NSF _____(Program Title)_____ Program

From: _____

(Printed name of the individual collaborator or name of the organization and name and position of the official submitting this memo).

By signing below (or substitute: transmitting electronically), I acknowledge that I am listed as a collaborator (or substitute: contributor) on this proposal, entitled "_____(proposal title)_____", with _____(PI name)_____ as the Principal Investigator. I agree to _____(description up to 140 characters)_____, as described in the project description of the proposal, and I commit to provide or make available the resources specified therein.

Signed: _____

Organization: _____

Date: _____

Please note that generic letters of general support are not allowed.

- **BIO Proposal Classification Form.** Applicants must complete the Proposal Classification Form.

Single-Copy Document:

- **An alphabetical, combined Conflict of Interest document.** This should be presented as an alphabetized table identifying conflicts of interest for the PI, all co-PIs, and all Senior Personnel.

The table should be organized, by columns, as: A. Last and first name of the individual in conflict, B. institutional affiliation of the conflict, C. type of conflict, and D. name of the PI, co-PI, or Senior Personnel holding the conflict. Conflicts to be identified are (1) Ph.D. advisors or advisees, (2) collaborators or co-authors within the past 48 months, (3) postdoctoral researchers and Masters students within the past 48 months, (4) any other individuals with whom, or institutions with which, the research personnel (PIs, co-PIs, other named personnel) have financial or other professional ties, including advisory committees (specify type), and (5) friends, family members, or other individuals from whom an objective evaluation would be unlikely. Do not list conflicts separately on each biographical sketch.

Invited Full Proposal Checklist for Compliance: Prior to submission, please review your invited full proposal against this checklist to ensure that it is fully compliant with the guidelines provided in this solicitation:

- The Project Summary includes as separate sections an Overview, the Intellectual Merit, and the Broader Impacts of the proposed activity.
- The Project Description includes as separate sections, the Intellectual Merit and Broader Impacts of the proposed research.
- The Biographical Sketches.
- The Data Management Plan, and (where applicable) Postdoctoral Mentoring Plan, have been uploaded into Supplementary Documents.
- It is recommended that a list of suggested reviewers be submitted as a Single Copy Document in FastLane, including the individuals' names, institutions, and areas of expertise, email addresses, and URLs if available.
- Letters of Collaboration conform to the provided template and are loaded into Supplementary Documents. Generic letters of support are not allowed.
- Ensure that your final submitted PDF conforms to the typeface size limits (10-11 pt depending on font), line spacing maximum (no more than six lines of text per vertical space of one inch) and margins (at least one inch on all sides of page) specified in the GPG.
- The invited full proposal must be submitted to this Program Solicitation (not the GPG). After selecting the solicitation, from the pull-down menu, select the Program that reviewed the Preliminary Proposal.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Federal agency scientists and scientists based in other countries may participate contingent on funding from other federal agencies or foreign agency partners, but not via NSF funding.

C. Due Dates

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. submitter's local time):
February 01, 2016
- **Full Proposal Deadline(s)** (due by 5 p.m. submitter's local time):
August 02, 2016

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane

Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <http://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

Proposers that submitted via FastLane are strongly encouraged to use FastLane to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the [GPG](#) as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: https://www.nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the

national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. ([GPG](#) Chapter II.C.2.d.i. contains additional information for use by proposers in development of the Project Description section of the proposal.)

Reviewers are strongly encouraged to review the criteria, including [GPG Chapter II.C.2.d.i.](#), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

The following additional merit review criteria will be used to evaluate the scientific goals of the proposed research:

1. evidence of an intellectual framework that links diverse studies through explicit predictions;
2. testing core ecological principles or concepts;
3. promoting an integrated understanding of how processes interact across components of an ecosystem, including the five core areas: 1) patterns and controls of primary production, 2) spatial and temporal population dynamics and food web interactions, 3) patterns and controls of organic matter accumulation and decomposition, 4) patterns of inorganic inputs and movements of nutrients, and 5) patterns and frequency of disturbances;
4. identification of a site that convincingly characterizes a major biome or region;
5. a research team with the expertise to manage and conduct a cohesive research program.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer and/or panel. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process).

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

Each LTER award will be reviewed by an external mid-term review team after 3 years of operation. Through these reviews, NSF receives peer evaluation of the progress a site is making on research proposed in its most recent proposal.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Saran Twombly, telephone: (703) 292-8133, email: stwombly@nsf.gov
- David L. Garrison, telephone: (703) 292-7588, email: dgarriso@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF [Grants Conferences](#). Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <https://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

Send an e-mail to: nsfpubs@nsf.gov

or telephone: (703) 292-7827

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and [NSF-51](#), "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. 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 the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

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