

Long-Term Ecological Research (LTER): New Urban Site

PROGRAM SOLICITATION NSF 19-594



National Science Foundation

Directorate for Biological Sciences
Division of Environmental Biology

Directorate for Social, Behavioral and Economic Sciences

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

December 04, 2019

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

August 14, 2020

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 20-1), which is effective for proposals submitted, or due, on or after June 1, 2020.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Long-Term Ecological Research New Urban Site Competition

Synopsis of Program:

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. Long-term studies are critical to achieve an integrated understanding of how components of ecosystems interact as well as to test ecological theory. Ongoing research at LTER sites contributes to the development and testing of fundamental ecological theories and significantly advances understanding of the long-term dynamics of populations, communities and ecosystems. It often integrates multiple disciplines and, through cross-site interactions may examine 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 publicly accessible.

The LTER program has long recognized the importance of humans in ecological systems and is especially interested in how human activities in urban settings interact with natural processes to determine ecological outcomes. Factors that control urban ecosystems are not only environmental, but also social and economic. These factors and their interactions need to be considered to understand urban ecosystems over long time frames and broad spatial scales.

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.

- Jennifer M. Burns, Office of Polar Programs, telephone: 703-292-2120, email: jmmburns@nsf.gov
- Roberto Delgado, Office of Polar Programs, telephone: 703-292-2397, email: robdelga@nsf.gov
- Douglas J. Levey, Division of Environmental Biology, telephone: (703) 292-5196, email: dlevey@nsf.gov
- John D. Schade, Division of Environmental Biology, telephone: (703) 292-7139, email: jschade@nsf.gov
- Daniel J. Thornhill, Division of Ocean Sciences, telephone: (703) 292-8143, email: DTHORNHI@nsf.gov
- John E. Yellen, Division of Behavioral and Cognitive Sciences, telephone: (703) 292-8759, email: jyellen@nsf.gov

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

- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences

Award Information

Anticipated Type of Award:

Continuing Grant

Estimated Number of Awards:

1

Anticipated Funding Amount:

\$7,126,200

Projects may request up to \$1,187,700 per year for six years. This amount includes \$16,000 per year to support research experiences for two undergraduates and \$24,000 per year for Schoolyard activities. Budgets must be thoroughly justified.

Estimated program budget and average award size/duration are subject to the 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 *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

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* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
 - 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):

December 04, 2019

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

August 14, 2020

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review criteria 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 populations, communities, and ecosystems face long-term change. Identifying the nature of these changes and the mechanisms driving them requires the collection, analysis, and interpretation of data over long periods of time. To address questions that cannot be resolved with short-term observations or experiments, NSF established the Long-Term Ecological Research Program (LTER). Two components characterize LTER research: 1) it is located at specific sites chosen to represent major biomes or ecosystem types, and 2) it emphasizes the study of phenomena over long periods of time based on data collected in five core areas. Ongoing research at LTER sites provides a unique opportunity for researchers to obtain an integrated, holistic understanding of populations, communities, and ecosystems that is not possible through individual, short-term awards. Urban LTER sites have the further stipulation of including a human element in their research program. Research at LTER sites must test important, current ecological theories, which may include consideration of evolutionary processes, to significantly advance understanding of the long-term dynamics of populations, communities and ecosystems.

More than thirty-five years of LTER research have produced unique and valuable knowledge about ecological change in response to natural and human influences. The disciplinary breadth of LTER research includes population and community ecology, ecosystem science, evolutionary biology, urban ecology, oceanography, and social and economic sciences. LTER research has advanced the fields of Ecology and the Earth Sciences and helped to provide the empirical data needed to forecast change. It has also advanced understanding of regional and continental-scale processes, through cross-site analyses of ecological change. Urban LTER sites have also contributed to the development of social-ecological theory as a principal objective.

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 (<https://lternet.edu/policies/data-access>).

As the LTER Program progresses through its fourth decade, challenges and opportunities arise that demand long-term research. New frontiers have grown out of the recognition that important ecological processes are context-dependent and non-linear, that ecological and evolutionary processes interact continually through feedbacks, and that the effects of environmental change on ecosystem structure and function are poorly understood. The LTER program will continue to provide the basic scientific understanding required to explore these new frontiers.

With this solicitation, the LTER program is especially interested in how human activities in urban settings interact with natural processes to determine ecological outcomes over the long term. Thus, to enhance the scope and disciplinary breadth of the LTER Program, NSF invites proposals to establish a new urban LTER site.

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.

The proposed research must be organized around a suite of compelling questions that deepen understanding of ecological processes and require uninterrupted, long-term collection, analysis, and interpretation of environmental data. LTER research should be developed around a conceptual framework that motivates questions requiring experiments and observations over long time frames. The conceptual framework should explicitly justify the long-term question(s) posed by the research and it should identify how data in LTER core areas and any experimental work contribute to an understanding of the question(s) while testing major ecological theories or concepts. The framework should provide the justification for all studies outlined in the proposal; ideally, it should be informed by analyses of existing long term data. Proposed research should have the goals of achieving a mechanistic understanding of biological responses to past and present environmental change at multiple scales and of using this understanding to predict ecological responses at population, community, and ecosystem levels and social responses to environmental change. Consideration of evolutionary processes is encouraged.

NSF invites proposals to establish a new urban LTER site to enhance the scope and disciplinary breadth of the LTER Program and to complement research carried out at current 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.

Research proposals submitted to this competition should be built around a conceptual framework as previously described but should also integrate at least one social, economic, or cultural process. Potential focal areas may include, but are not limited to:

- Interactions between human and natural systems, including land use and land cover change, and the role of demographic trends as drivers of social-ecological dynamics.
- The feedbacks between human attitudes, beliefs and values, and environmental patterns and processes.
- The role of institutions, governance structures, and socio-political forces in determining how human interactions and ecological processes feedback on each other.
- Integration of engineering and design with natural and social sciences.

NSF encourages proposals that take advantage of opportunities for engagement with decision-makers, including the development of effective plans to promote knowledge co-production with stakeholders.

For purposes of this solicitation, "urban ecosystem" is defined as an area densely populated by humans, typically a city. As such, urban LTER sites should focus on the terrestrial environment, including freshwater systems and coastlines. Because funding for the new urban site will come primarily from the Division of Environmental Biology, research in coastal sites should not focus on adjacent marine or Great Lakes systems. The project should have a basic research theme; applied themes such as ecotoxicology will not be considered.

Core data collection at LTER sites will continue to center on the five areas of: 1) primary production, 2) population dynamics and trophic structure, 3) organic matter accumulation, 4) inorganic inputs and movements of nutrients through the ecosystem, and 5) patterns and frequency of disturbances. Analyses of these data provide the foundation for testing major theories and for identifying new questions that demand long-term study. These five areas focus and integrate LTER research within and among sites.

In addition to data all LTER sites collect in the five core areas, Urban LTER sites must collect data in at least one social, economic, or cultural process, and those data should be integrated with other core data to examine effects of human-environment interactions on urban ecosystem dynamics.

Please read carefully the program-specific review criteria described below.

Proposals also articulate milestones and deliverables for information management (hereafter referred to as data management consistent with wording from the NSF PAPPG https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg). These must include timelines for data release, publication of metadata, and online access through the Environmental Data Initiative (EDI) or other public data repositories discoverable via DataOne (<https://www.dataone.org/>). In addition, the proposal must demonstrate that LTER data access and management policies are being met, as outlined in the LTER Network's Information Management Policy (<https://lternet.edu/policies/data-access>).

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 reviews, panel recommendations, and additional portfolio considerations. Invite/Do Not Invite decisions are binding.
2. Full Proposals: Invited full proposals will receive ad hoc and/or panel 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 the urban focus of this solicitation as defined above will be returned

without review.

III. AWARD INFORMATION

It is anticipated that one award will be made with a budget up to \$1,187,700 per year for six years. Estimated program budget 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 *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

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.

Additional Eligibility Info:

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 PAPPG guidelines apply to preliminary proposals submitted to this solicitation:

- Collaborative proposals must be submitted using the "single proposal" method as described in the PAPPG. Each project must be managed by a single organization with other organizations involved via subawards.
- 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 will 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 PAPPG.
- 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 only 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 urban domain of the project, outline its appropriateness to represent urban ecosystems of the US, and 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 urban 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 six core areas for LTER urban sites: 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, 6) social, economic, and/or cultural processes.
- Present a feasible plan for implementing the broader impacts of the proposed research.

References Cited (limited to 2 pages and following PAPPG 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 Biographical Sketch, but do not list conflicts of interest or collaborators.

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

Single Copy Documents must include the following:

Collaborators & Other Affiliations (COA) information specified in the PAPPG should be submitted using the instructions and spreadsheet template found at <https://nsf.gov/bfa/dias/policy/coa.jsp>.

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 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 PAPPG format.
- The Biographical Sketches are limited to 1 page and restricted to the personnel listed on the first page of the Project Description.
- 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 FastLane or Grants.gov.

- 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 Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 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) 292-8134 or by e-mail from nsfpubs@nsf.gov.

See PAPPG Chapter II.C.2 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 PAPPG instructions.

Submission of Invited Full Proposals

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

- The page limits contained in this solicitation take precedence over those given in the PAPPG.
- Each project must be managed by a single organization with other organizations involved via subawards (see PAPPG). Separately submitted collaborative proposals are not permitted.
- Proposals will be subjected to initial screening for the requirements in the PAPPG and this solicitation.
- 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 and reviews.

Proposal Format: PAPPG 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 section 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.) In addition to the required sections for Intellectual Merit and Broader Impacts, please include the following sections:

1. **Results from Prior Support.** Consult the PAPPG for further guidance.
2. **Proposed Research.** Essential to this section is a clear articulation of a conceptual framework that motivates questions requiring experiments and observations over long time frames. The conceptual framework should explicitly justify the long-term question(s) posited by the research and it should identify how data in LTER core areas and any experimental work contribute to an understanding of the question(s) while testing major ecological theories or concepts. The framework should provide the justification for all studies outlined in the proposal, yield explicit hypotheses or questions, and necessitate collection of long-term data to address them. Proposed research should have the goals of achieving a mechanistic understanding of biological responses to past and present environmental change at multiple scales and of using this understanding to predict ecological responses at population, community, and ecosystem levels, and, as appropriate, evolutionary responses and social responses to future environmental change. For further information see Project Description and Additional Solicitation Specific Review Criteria. Incorporation of contemporary evolution in anthropogenic settings is encouraged (e.g., eco-evolutionary feedbacks).

Proposals should describe in appropriate detail the experiments and observations that will be carried out and explain how these fit into the proposed conceptual framework. Methods and data analyses must be described in enough detail so that reviewers can critically evaluate the quality of these efforts. Likewise, proposed models or model development must be presented in sufficient detail to allow evaluation, including of the model structure. Quantitative modeling, appropriate to the maturity of the site and the problems addressed, should be a component of the research effort. New activities should be conceptually integrated with ongoing, longer-term studies. If cross-site or other collaborative efforts are proposed, they should fit within the overarching conceptual framework and research plan, and PIs should describe how they will advance understanding of site-specific dynamics or relate site-specific results to communities or ecosystems at different spatial scales.

This section of the proposal should conclude with a synthesis that ties together the proposed research activities and shows how they will significantly advance understanding of ecological dynamics at different spatial and temporal scales.

Details on sampling methods and design for the collection of data in the five core areas and the additional human-related area, as well as other planned activities, are important. **Reference to established methods through links to websites is not allowed.**

3. **Education and Outreach Activities.** Describe your proposed 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 Research Experiences for Undergraduate (REU) students per year.

References Cited: Follow guidance in the PAPPG.

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. A maximum of \$1,187,700 per year may be requested for six years.

All awards are subject to the availability of funds. Thorough justification of items requested in the budget is required. Explain why you need the funds requested to carry out specific aspects of the proposed research. Justification for general purpose equipment such as boats and other field vehicles must describe its primary or exclusive use for the proposed research.

Funds to defray the costs of preparation and participation in a mid-term review should be included in the budget request.

Funds for two REU students (up to \$16,000/year) must appear as Participant Support Costs. All REU expenses should be budgeted as described in the REU solicitation ([NSF 19-582](#)), justified, and accompanied by a table that includes requests for stipends, travel, and other expenses. Up to \$24,000/year should be requested for a well-justified Schoolyard program. Again, itemize expenses and place materials and supplies on line G.1.

Current and Pending Support: Provide this information for PI, co-PI and any other senior personnel, as specified in the PAPPG. This proposal is considered a pending support activity.

Facilities, Equipment and Other Resources: Describe other sources of anticipated funding, how LTER funds may be leveraged at your site, and what other in-kind services are provided and by whom. **The description should be included in the *Facilities, Equipment and Other Resources* section of the proposal, should be narrative in nature, and should not include any quantifiable financial information.** For further information please see the PAPPG.

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

Data Management Plan (DMP) (maximum of 5 pages): Since this document exceeds the NSF limit of two pages, it must be submitted as a separate supplemental document. A separate document must also be uploaded into the DMP module in Fastlane that states 'As instructed in the solicitation, this information is being submitted as Other Supplementary Documentation'.

NSF places high priority on the availability of site-based data to a broad research community, with particular emphasis on data related to core research areas and data directly supporting site publications. It is expected that data derived from LTER funding will be made freely and publicly available within a maximum of two years of collection, and that LTER data and data products used in published manuscripts will also be publicly available. The DMP should document the complete data life cycle within the site's research and education mission (e.g. <https://www.dataone.org/data-life-cycle>). It should describe how data management is involved in experimental design, data collection, processing, validation, documentation, curation, access, analysis, and publication. The DMP should also document policies and procedures for meeting the site's obligation for dissemination of data and related products in accordance with the NSF PAPPG (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg), the BIO Directorate's Guidance on Data Management Plans (https://www.nsf.gov/bio/pubs/BIODMP_Guidance.pdf), and the LTER Network's Information Management Policy (<https://lternet.edu/policies/data-access>). It should specify clearly what datasets will be produced and where and when they will be made public. Policies regarding prioritization, delay, or limits on access must be justified. In the event of an award, annual reports should include a report on progress on the collection and publication of these datasets.

NSF does not currently prescribe where data must be deposited to satisfy this objective other than it must be in a national, public data repository in addition to any local data web page the LTER site may maintain. Currently, the Environmental Data Initiative (<https://portal.lternet.edu/nis/home.jsp>) is supported by NSF to make data repository services available to all LTER sites. Other repositories that may be used include the Biological and Chemical Oceanography Data Management Office (<http://www.bco-dmo.org/>), The Arctic Data Center (<https://arcticdata.io/>), and the Knowledge Network for Biocomplexity (<https://knb.ecoinformatics.org/>). At this time, all of these repositories are federated by the DataONE project (<https://www.dataone.org/>) and all LTER data should be discoverable via this portal. Sites are responsible for knowing the standards for data and metadata quality set by these repositories and for ensuring that their data meet them (see <https://im.lternet.edu/> for further guidance). However, note that renewal proposals for Arctic or Antarctic sites must meet additional data management and data reporting requirements as outlined in DCL 16-055 (or as updated).

Submitters should familiarize themselves with policies and best practices recommended in the LTER Network's Information Management Policy (<https://lternet.edu/policies/data-access>) and the LTER Information Management Guidelines (<https://im.lternet.edu/>). These documents, vetted by the LTER Network governance, identify standards that members of the LTER community have agreed to meet and be reviewed against. They cover policies regarding the timely publication of data, requirements for accessing LTER data, and terms of appropriate use of LTER data. They also provide community standards for data management, assessment metrics and procedures, technological recommendations, and network collaboration.

Project Management Plan (maximum of 3 pages): This section should include a cohesive management plan that is adequate for a project of the size and complexity proposed. The plan should describe how decisions related to funding, research, and personnel will be made and implemented. The Project Management Plan also must address continuity of leadership and succession planning, including descriptions of efforts to recruit new scientists to the project, and efforts to increase diversity among site participants. New participants bring new ideas and fresh perspectives, which are likely to enrich the development of research at the site.

Postdoctoral Mentoring Plan (limited to one 1 page). A single postdoctoral mentoring plan must be included if salaries for post-doctoral researchers are included on the postdoctoral scholars line in the proposal budget or any subaward budgets.

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.

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.

Single-Copy Document:

Collaborators & Other Affiliations (COA) information specified in the PAPPG should be submitted using the instructions and spreadsheet template found at <https://nsf.gov/bfa/dias/policy/coa.jsp>.

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:

- 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.

- The invited full proposal must be submitted to this Program Solicitation (not the PAPPG). 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:

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):

December 04, 2019

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

August 14, 2020

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. 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: <https://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 or Research.gov may use Research.gov 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 PAPPG 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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. 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. (PAPPG 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 PAPPG 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 scientific goals of the proposed research will be evaluated based on the following principles:

1. Formulation of a conceptual framework that motivates new research questions of broad interest to ecologists and other environmental biologists
2. Identification of important, general ecological questions that a) derive from and extend major ecological theories, and b) require collection of long-term data in the six core areas.
3. Conceptually-based predictions that link processes and observations across levels of organization (population, community, and ecosystem) or across temporal or spatial scales. Where appropriate, collaborations within or outside of the LTER network of sites may be included.
4. Development, refinement, and testing of quantitative models that provide a mechanistic understanding of ecological processes fundamental to the conceptual framework and inform future work.
5. Integrated approaches to examine effects of human-environment interactions on urban ecosystem dynamics.
6. Evidence of a research team with the expertise required to accomplish the proposed research

B. Review and Selection Process

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

Ad hoc Review and/or Panel Review.

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) 292-8134 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 *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

Mid-Term Reviews: Awardees will be required to participate in site visit reviews at a mutually agreed upon time during the award period, normally around the mid-term of the award.

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 Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

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:

- Jennifer M. Burns, Office of Polar Programs, telephone: 703-292-2120, email: jmmburns@nsf.gov
- Roberto Delgado, Office of Polar Programs, telephone: 703-292-2397, email: robdelga@nsf.gov
- Douglas J. Levey, Division of Environmental Biology, telephone: (703) 292-5196, email: dlevey@nsf.gov
- John D. Schade, Division of Environmental Biology, telephone: (703) 292-7139, email: jschade@nsf.gov
- Daniel J. Thornhill, Division of Ocena Sciences, telephone: (703) 292-8143, email: DTHORNHI@nsf.gov
- John E. Yellen, Division of Behavioral and Cognitive Sciences, telephone: (703) 292-8759, email: jyellen@nsf.gov

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188
FastLane Help Desk e-mail: fastlane@nsf.gov
Research.gov Help Desk e-mail: rgov@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 <https://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 (FASSED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 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:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **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 [System of Record Notices](#), NSF-50, "Principal Investigator/Proposal File and Associated Records," and NSF-51, "Reviewer/Proposal File and Associated Records." 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
Alexandria, VA 22314

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