Long Term Ecological Research (LTER)
National Coordination Office

PROGRAM SOLICITATION
NSF 19-544

National Science Foundation

Directorate for Biological Sciences
    Division of Environmental Biology

Directorate for Geosciences
    Division of Ocean Sciences
    Office of Polar Programs

Letter of Intent Due Date(s) *(required)* (due by 5 p.m. submitter's local time):

    January 18, 2019

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

    March 19, 2019

IMPORTANT INFORMATION AND REVISION NOTES

Letters of Intent submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 18-1).

Full Proposals submitted in response to this solicitation should be submitted in accordance with the revised PAPPG (NSF 19-1), which is effective for proposals submitted, or due, on or after January 28, 2019.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

    Long Term Ecological Research National Coordination Office (LTER-NCO)

Synopsis of Program:

    NSF invites proposals for a Long Term Ecological Research (LTER) Network Coordination Office. This office will coordinate network level activities, including synthetic research, education, and outreach programs across the 28 LTER research sites, communicate these activities to diverse audiences, and provide centralized representation of the LTER network to the broad scientific community and the public. The lead PI of the successful proposal will serve as the Office Director and will work with the LTER Science Council and research community to develop and implement strategic goals and future initiatives.

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 Burns, telephone: 703-292-2120, email: jmmburns@nsf.gov

- David L. Garrison, Division of Ocean Sciences, telephone: (703) 292-7588, email: dgarriso@nsf.gov

- Douglas Levey, telephone: (703) 292-5196, email: dlevey@nsf.gov

- Peter H. McCartney, telephone: (703) 292-8470, email: pmccartn@nsf.gov

- John D. Schade, telephone: (703) 292-7139, email: jschade@nsf.gov

- Colette St. Mary, telephone: (703) 292-4659, email: cstmary@nsf.gov

- Daniel Thornhill, telephone: (703) 292-8143, email: dthornhi@nsf.gov

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

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

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

A single award will be made from this solicitation to establish one LTER National Coordination Office, with an initial commitment of five years and the possibility of a five-year renewal.

Anticipated Funding Amount: $800,000

A single award for a maximum of $800,000 per year, for up to 5 years, with the possibility of one 5-year renewal. LTER-NCO funding is subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

Who May Serve as PI:

Principal Investigators, including Co-PIs, on active LTER research awards are not eligible to serve as lead PI or co-PI for this solicitation. Collaborative proposals submitted by PIs from multiple organizations are not allowed for this competition.

Limit on Number of Proposals per Organization:

One proposal per organization.

Limit on Number of Proposals per PI or Co-PI: 1

A PI or co-PI is allowed to submit only a single proposal to this solicitation.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.

- **Preliminary Proposal Submission:** Not required

- **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:**

    Not Applicable

C. Due Dates

- **Letter of Intent Due Date(s)** *(required)* (due by 5 p.m. submitter's local time):

    January 18, 2019

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

    March 19, 2019

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:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

NSF established the Long Term Ecological Research Program (LTER) in 1980 to address ecological questions that cannot be resolved with short-term observations or experiments. The central intellectual aim of the program is to understand a) long-term ecological patterns and processes at multiple spatial scales and b) how diverse components of an ecosystem interact to influence ecosystem function. Each LTER site is organized around a scientific theme specific to its location and ecosystem, and all projects must collect 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. 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 broadly accessible. LTER projects have established broad educational programs and training, have implemented outreach to diverse stakeholders, and have established common criteria and protocols for data management.

Coordination among LTER projects to promote large-scale syntheses is another intellectual goal of the LTER program. These syntheses provide new research findings, derived data sets, and new models that establish future research directions that may also guide development of environmental policy.

The 28 current research sites together constitute the LTER Network (Network), a collaborative effort among more than 1500 scientists and students investigating ecological processes over diverse temporal and spatial scales. The Network extends the opportunities and capabilities of the individual sites to promote synthesis and comparative research across sites. Please refer to https://lternet.edu/ for specific information about the current Network. The Network is self-organized and the coordination among sites is accomplished via a Science Council, Executive Board and series of targeted committees, as detailed at https://lternet.edu/network-organization/#network-coordination.

This solicitation invites proposals for a LTER Network Coordination Office (NCO) that will work closely with the LTER Network to foster and coordinate synthetic research, education, and outreach activities across the Network. The NCO will foster communication among current LTER projects and with the broader scientific community, promote the dissemination of information and resources among LTER projects and to additional stakeholder communities, facilitate meetings and workshops, and promote the LTER Network both nationally and internationally. The Network Coordination Office will facilitate meetings of the Science Council and implement synthetic research activities across the Network and between the Network and the broader science community, including other NSF supported networks and facilities, such as NEON (National Ecological Observatory Network). The NCO will work with the Network to establish priorities for synthesis. The NCO will also support effective communication across the Network on topics including information management, education, outreach, and diversity. The NCO will provide logistical support for a triennial All Scientists' Meeting, Network-wide or targeted committees, and the meetings of Executive Board, which meets twice a year to implement decisions made by the Science Council. The NCO will facilitate these meetings in addition to coordinating with the Network to achieve synthetic research and Network-level education and outreach activities. The Network Office will serve as a gateway for information about the LTER Network and implement scoping workshops to outline future goals and initiatives for synthetic research. The LTER NCO parallels, at least in part, other NSF-supported national science offices (e.g., Ocean Carbon and Biogeochemistry, https://www.us-ocb.org/ Critical Zone Observatory National Office https://www.us-ocb.org/).

II. PROGRAM DESCRIPTION

The LTER Network Coordination Office is expected to work with the LTER Network and broader research communities to share discoveries, research opportunities, and education and outreach activities. It will have two main responsibilities: A) facilitate coordination and communication among all LTER projects and with a diverse range of stakeholders, including the management of the Network website and B) foster synthesis through sponsorship of synthetic research activities, organization of meetings, providing access to synthesis and other meeting products via the Network website, and facilitating future LTER initiatives and directions in collaboration with the LTER Science Council. It is intended to be a service organization and should not promote its own scientific or outreach agendas. While acknowledging the LTER Science Council's leadership role in guiding current and future Network priorities, NSF welcomes novel and creative approaches to advancing the Network, defining essential activities or committees, and seeking advice from both within and outside the LTER community.

The Principal Investigator (PI) will serve as Director of the Office and will work closely with all LTER PIs and co-PIs to achieve the following goals:

- Foster coordination, collaboration, and communication among all LTER projects
- Foster the development of strategic plans and future synthetic research directions
- Foster synthesis activities across research communities using a variety of means that could include small workshops, larger working groups, or postdoctoral research initiatives
- Promote the dissemination of information and resources among projects and to additional stakeholder communities, including outreach to local, regional, national, and international audiences of scientists, educators, students, and others
- Organize regular meetings of the LTER Science Council and the All Scientists' Meeting (which is supported by a supplement to the award) and work with the NSF to organize an annual LTER symposium hosted by the NSF
- Organize a limited number of scoping workshops, short courses, or sessions at international and national meetings, and support the Network's committees and working groups
- Identify opportunities to leverage resources
- Serve as a liaison and promote interactions among LTER and NEON, as well as other relevant scientific groups or organizations, including observational, synthesis, and modeling programs funded by NSF
- Represent the LTER Network at research and educational conferences and at other events
- Maintain and update a central LTER website that connects site specific pages and
- Maintain a centralized personnel database and a cumulative catalogue of LTER products.

Please see the Budget section of the Proposal Preparation Instructions (Section V.B) below for additional guidance about activities that the Network Office should anticipate supporting.

Structure of the Network Office:

NSF anticipates that successful operation and management of the Network Coordination Office will require an engaged senior-level scientist (the proposal PI) who is familiar with the LTER program as well as with ecological science or environmental biology across habitats, ecosystems, and biomes. This individual will have a part-time appointment as the Office Director with responsibility for oversight and management of all office activities. Additional personnel may be budgeted to support the enterprise.

III. AWARD INFORMATION

The award will be made as a Cooperative Agreement to the lead institution with an initial commitment of five years of support and a possibility of renewal for five additional years. Oversight of the office is the responsibility of the managing Program Director in consultation with the Cross-Directorate LTER working group and the leadership of the participating Directorates. Support for each year of the Cooperative Agreement will be contingent upon satisfactory annual review, focused on the Office's progress and future plans, with an emphasis on the aspects detailed in this solicitation. In year 4, the NSF will decide to either recompete the operation of the NCO, or to invite the incumbent (the successful organization from this solicitation) to submit a renewal proposal for five additional years of NSF support. If the renewal proposal is considered not competitive, it will be phased out over an appropriate time frame at a reduced funding rate.

The successful Network Office proposal will be funded at a rate of $800,000 per year, for a total of $4,000,000, pending availability of funds. A single award is anticipated. The successful site will be eligible for renewal. Please see additional budget comments below.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

> Proposals may only be submitted by the following:
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> - Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
> - Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

Who May Serve as PI:

> Principal Investigators, including Co-PIs, on active LTER research awards are not eligible to serve as lead PI or co-PI for this solicitation. Collaborative proposals submitted by PIs from multiple organizations are not allowed for this competition.

Limit on Number of Proposals per Organization:

> One proposal per organization.

Limit on Number of Proposals per PI or Co-PI: 1

> A PI or co-PI is allowed to submit only a single proposal to this solicitation.

Additional Eligibility Info:

> Collaborative Proposals submitted from multiple organizations are not allowed for this solicitation. Subawards may be budgeted as needed.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required)*

Required. Letters of intent should include the names of PIs and Other Senior Personnel as well as institutions that will be involved.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

Submission by an Authorized Organizational Representative (AOR) is required when submitting Letters of Intent.

- Submission of multiple Letters of Intent is not permitted

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 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) 292-7827 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 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.

In addition to the required sections labeled "Intellectual Merit" and "Broader Impacts", proposals should include the following information as part of the 15-page Project Description in labeled sections:

1. A "Synthetic Research" plan for fostering synthetic research activities that are broadly inclusive of Network and non-Network scientists including

    - A mechanism for the selection of topics,
    - The synthetic activities themselves, and
    - The means to promote broad participation.

2. A "LTER Community Engagement" plan for maintaining a broadly inclusive and cooperative LTER community
3. A plan for effective "Communication with Diverse Audiences"
4. A "Management Plan" that stipulates how the office will operate to effectively coordinate network research, educational, and outreach activities in collaboration with the LTER Science Council. This plan should provide a detailed staffing plan.
5. A "Qualifications of the PI and Institutional Host" section that includes

    - Evidence that the lead PI has experience managing large, distributed projects
    - Evidence that the lead PI is familiar with the LTER program and with other long-term environmental research
    - Evidence that the lead PI is an effective leader and
    - Demonstrated institutional capacity for the proposed efforts.

Collaborative proposals submitted as separate submissions from multiple organizations are not allowed for this solicitation and will be returned without review.

Supplementary Documents:

A list of Project Personnel and Partner Organizations

Provide current, accurate information for all personnel and organizations involved in the project. NSF staff will use this information in the merit review process to manage reviewer selection. The list must include all PIs, co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdoctoral Researchers, and project-level advisory committee members. This list should be numbered and included (in this order) Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line. For example:

1. Mary Smith XYZ University PI
2. John Jones University of PQR Senior Personnel
3. Jane Brown XYZ University Postdoctoral Researcher
4. Bob Adams ABC Inc. Paid Consultant
5. Mary White Welldone Institution Unpaid Collaborator
6. Tim Green ZZZ University Subawardee

Single Copy Documents:

Collaborators and Other Affiliations Information:

Proposers should follow the guidance specified in Chapter II.C.1.e of the NSF PAPPG.

Note the distinction to the list of Project Personnel and Partner Organizations under Supplementary Documents above: the listing of all project participants is collected by the project lead and entered as a Supplementary Document. The Collaborators and Other Affiliations are entered for each participant and, as Single Copy Documents, are available only to NSF staff.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

In addition to support, including travel, required for operation of the Network Office, the budget should request support for the following LTER Network activities:

1. One Science Council meeting per year, to include travel and per diem expenses for approximately 60 participants, venue rotates among LTER sites.
2. Synthesis working groups and scoping workshops, to include travel and per diem expenses for 8- 10 participants, for at least 2 activities per year.
3. Meetings of LTER Committees, such as the Information Managers, or to coordinate educational activities, as needed, including travel and per diem expenses for participants.
4. Meetings of an LTER executive board to include travel and per diem expenses for approximately 10 individuals drawn from the LTER community and from broader scientific communities, for 1-2 meetings/year.
5. An annual NSF-hosted LTER symposium. Travel for approximately 10 speakers and participants to the NSF

Meetings may be in person or virtual, as appropriate.

NSF recognizes that exact levels of support for these activities likely cannot be determined in advance. We expect to accommodate adjustments as needed via budget reallocations, supplemental support, or other available mechanisms.

C. Due Dates

- **Letter of Intent Due Date(s)** *(required)* (due by 5 p.m. submitter's local time):

  January 18, 2019

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

  March 19, 2019

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 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

Each proposal will be evaluated on the following, additional criteria:

- Do the Lead PI, team, and institution have demonstrated expertise in managing large, distributed projects?
- Does the Lead PI have demonstrated familiarity with LTER and with long-term environmental research?
- Does the Lead PI show evidence of effective leadership?
- Do the Lead PI and other personnel have a cogent plan and experience communicating with diverse audiences?
- Is there sufficient institutional capacity for the proposed effort?
- Is a clear and convincing management plan presented?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, or Site Visit Review.

The proposals will be reviewed under the methods identified under Proposal Review Method.

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 *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.

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 Burns, telephone: 703-292-2120, email: jmmburns@nsf.gov

- David L. Garrison, Division of Ocean Sciences, telephone: (703) 292-7588, email: dgarriso@nsf.gov

- Douglas Levey, telephone: (703) 292-5196, email: dlevey@nsf.gov

- Peter H. McCartney, telephone: (703) 292-8470, email: pmccartn@nsf.gov

- John D. Schade, telephone: (703) 292-7139, email: jschade@nsf.gov

Colette St. Mary, telephone: (703) 292-4659, email: cstmary@nsf.gov

- Daniel Thornhill, telephone: (703) 292-8143, email: dthornhi@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.

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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 (FASED) 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**   (703) 292-5111
  (NSF Information Center)**:**

- **TDD (for the hearing-impaired):**   (703) 292-5090

- **To Order Publications or Forms:**

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

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
Alexandria, VA 22314

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