This solicitation has been archived and replaced by NSF 21-515.

EarthCube: Developing a Community-Driven Data and Knowledge Environment for the Geosciences

PROGRAM SOLICITATION
NSF 20-520

REPLACES DOCUMENT(S):
NSF 16-514

National Science Foundation

Directorate for Geosciences

Directorate for Computer and Information Science and Engineering
Office of Advanced Cyberinfrastructure

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

March 12, 2020

Science-Enabling Data Capabilities and Pilots

Full Proposal Target Date(s):

March 12, 2020

EarthCube Research Coordination Networks

IMPORTANT INFORMATION AND REVISION NOTES

The EarthCube solicitation has been updated to add a new focus area, Pilots, and to update solicitation deadlines for 2020. The solicitation will no longer be revised through amendments. Instead, the solicitation will be refreshed with new opportunities and with a new NSF number.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 19-1), which is effective for proposals submitted, or due, on or after February 25, 2019.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

EarthCube

Synopsis of Program:

EarthCube is a community-driven activity sponsored through a partnership between the NSF Directorate for Geosciences (GEO) and the NSF Office of Advanced Cyberinfrastructure (OAC) in the Directorate for Computer & Information Science & Engineering's (CISE) to transform research in the academic geosciences community. EarthCube aims to create a well-connected and facile environment to share data and knowledge in an open, transparent, and inclusive manner, thus accelerating our ability to understand and predict the Earth system.

Achieving EarthCube will require a long-term dialog between NSF and the interested scientific communities to develop cyberinfrastructure that is thoughtfully and systematically built to meet the current and future requirements of geoscientists. New avenues will be supported to gather community requirements and priorities for the elements of EarthCube, and to capture the best technologies to meet these current and future needs. The EarthCube portfolio will consist of interconnected projects and activities that engage the geosciences, cyberinfrastructure, computer science, and associated communities. The portfolio of activities and funding opportunities will evolve over time depending on the status of the EarthCube effort and the scientific and cultural needs of the geosciences community.

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.

- Eva Zanzerkia, Directorate for Geosciences, Earth Sciences Division, telephone: (703) 292-4734, email: ezanzerk@nsf.gov
- Amy Walton, Directorate for Computer and Information Science and Engineering, Division of Advanced Cyberinfrastructure, telephone: (703) 292-4538, email: awalton@nsf.gov
- Sean C. Kennan, Directorate for Geosciences. Ocean Sciences Division, telephone: (703) 292-7575, email: skennan@nsf.gov
- Subhashree (Shree) Mishra, Directorate for Geosciences, Division of Atmospheric and Geospace Science, telephone: (703) 292-8521, email: sumishra@nsf.gov
- Colleen Strawhacker, Directorate for Geosciences, Office of Polar Programs, telephone: (703) 292-7432, email: colstraw@nsf.gov
- Peter Milne, Directorate for Geosciences, Office of Polar Programs, telephone: (703) 292-4714, email: pmilne@nsf.gov

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

- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 6 to 12

The number of awards will be determined based on the results of the merit review process and availability of funds.

Anticipated Funding Amount: $5,000,000 to $10,000,000

Subject to availability of funds. The size of awards will vary based on the scope and complexity

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.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

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 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 Research.gov: *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

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

  March 12, 2020

  Science-Enabling Data Capabilities and Pilots

- **Full Proposal Target Date(s)**:

  March 12, 2020

  EarthCube Research Coordination Networks

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:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

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IX. **Other Information**

I. INTRODUCTION

EarthCube is a community-driven activity aimed at transforming the conduct of geosciences research and education. This effort is a partnership between the NSF Directorate for Geosciences (GEO) and the NSF Office of Advanced Cyberinfrastructure (OAC) in the Directorate for Computer & Information Science & Engineering (CISE). The goal of EarthCube is to create a well-connected and facile environment to share data and knowledge for all of the geosciences in an open, transparent, and inclusive manner and to accelerate our ability to understand and predict the Earth system.

In this solicitation, geosciences refers to the academic research communities supported by the Geosciences Directorate at NSF, and includes the domains of atmospheric and geospace sciences, ocean sciences, Earth sciences, and polar sciences. Further details on the scientific topics that are supported in the geosciences can be found within descriptions of individual GEO programs (https://www.nsf.gov/funding/programs.jsp?org=GEO).

In 2014 the Advisory Committee for GEO issued the *Dynamic Earth: GEO Imperatives and Frontiers 2015-2020* report: https://www.nsf.gov/geo/acgeo/geovision/nsf_acgeo_dynamic-earth-2015-20.pdf, identifying the priorities and focus areas for the geosciences in the next five years. In this effort NSF encourages the community to systematically build cyberinfrastructure for the geosciences that is guided by community dialogue, governance, and a common vision. The EarthCube program endeavors to create an environment that is extendable, manageable, and employs or creates technologies that meet the current and future needs of the geosciences community. EarthCube will foster the training and development of data scientists and cyber-savvy geoscientists. It is expected that EarthCube will build off present NSF and Federal investments in geosciences cyberinfrastructure and will integrate state-of-the art cyberinfrastructure, software development and computer science techniques.

The program is interested in the intersection of EarthCube activities and NSF's 10 Big Ideas, including Harnessing the Data Revolution, Navigating the New Arctic(https://www.nsf.gov/geo/opp/arctic/nna/index.jsp), Rules of Life and others: https://www.nsf.gov/news/special_reports/big_ideas/.

The EarthCube program is designed to be responsive to the needs of and input from the geosciences community, as well as technological advances. Funding opportunities will be based on themes, requirements, and other strategic or community documents from open community activities fostered by EarthCube such as, but not limited to, community meetings, workshops and design and demonstration activities. For information on EarthCube community governance, activities and directions see: (https://www.earthcube.org/info/about/earthcube-governance.)

II. PROGRAM DESCRIPTION

This Solicitation supports two funding opportunities to advance geosciences research:

1. **Science-Enabling Capabilities and Pilots:** This opportunity builds capabilities to improve geosciences data use and reuse for observational, experimental, and computational research that is interoperable with emerging standards and resources. It also solicits pilot efforts to integrate different datasets and tools from multiple GEO disciplines.

2. **EarthCube Research Coordination Networks (RCNs):** This opportunity supports the formation of RCNs closely tied to the science and data needs of core geosciences programs and domains supported by GEO.

In addition to these solicited opportunities, the EarthCube program will accept requests for supplements to support adoption of emerging EarthCube open web standards and existing cyberinfrastructure by science projects and data resources. Supplements must abide by the guidelines for supplements in the PAPPG. Prospective PIs should contact an EarthCube program director to discuss a potential supplement. The EarthCube program will accept requests for supplements of the following types:

1. **Science adoption:** Target broadening or enhancing existing geoscience projects to achieve new research and education outcomes through adoption of existing data and software tools (including, but not limited to, products from EarthCube projects). Possible projects include the adoption of data standards to support the science goals of a project.

2. **Data resource adoption:** Support data facilities and data resources to adopt robust standards and/or implementation of pilot tools/activities to improve discovery, interoperability and access to data and cyberinfrastructure services. In conjunction with EarthCube/Council of Data Facilities developments, these awards would facilitate adoption of new semantic web standards and machine-readable publishing patterns, such as for the EarthCube data repository and resource registries. These awards are meant for an initial implementation of these standards and are not meant to sustain existing core functions of data facilities.

Both types of supplements must satisfy the following requirements. 1.) Integration with EarthCube. Projects must integrate with the EarthCube data and resource registries. These registries are indexed for searching by several data providers, as well as through an EarthCube interface. Funds can be used to work with EarthCube through the EarthCube Office or Governance committees. 2.) Metrics, Assessment, and Sustainability. Projects must address how their efforts will be sustainable after the funds are expended, and/or how tools will be made available to the broader community after the end of the award period. Integration into other efforts, such as the operation of scientific facilities, is appropriate. Products must be made publicly available, preferably using open source standards where appropriate.

Funding Opportunities

1. **Science-Enabling Capabilities and Pilots**

   Description of the Activity:

   The Science-Enabling Capabilities and Pilots opportunity advances the capability of geoscientists to conduct their research by improving use

and reuse of observational, experimental, and computational data in ways that are interoperable with emerging open web standards and makes use of resources from EarthCube, other NSF-funded infrastructure, federal agencies, academic institutions, and commercial enterprises. Projects will implement software, tools, standards, and other infrastructure to improve data management, discovery and access. Enabling data assimilation, analysis, visualization, integration, or other data manipulation, are appropriate and the focus of Pilots.

There are two components to this opportunity:
Capabilities Projects must be driven by identified scientific needs, such as those identified in major community reports, and demonstrate close coordination with scientific community efforts and their science goals. Possible science partners for project implementations include, but are not limited to, existing scientific RCNs, community science experiments, observatories, or other geosciences community organizations. If projects engage with scientific communities through existing efforts, then they must distinguish who will be involved and how new science outcomes, or significant reduction in the time to science, will be enabled specifically by the project.

Pilot Projects should demonstrate lightweight and sustainable approaches to interoperability within a short (12 to 18 month) time period that improve the time to science or enable new scientific inquiry and discovery and that can be models for infrastructure across the entire geosciences. Shared cyberinfrastructure implementations that demonstrate increased resiliency, promulgation of best practices and standards, and/or federation of existing geoscience CI facilities and resources are appropriate for Pilots.

Pilot Projects will promote tool and data interoperability through semantics and APIs, and reuse of existing components. Demonstrations should have an application environment, taken from existing CI, where geoscientists can interact with data and tools in existing workflows and develop new ones. Use of notebook environments (e.g. RMarkdown, Jupyter, MATLAB live scripts, etc.) is encouraged. Pilots must be framed around targeted use scenarios. The use scenarios should be described and justified for their impact on interoperability and extensibility across the geosciences. Examples include:

1. Find, access, integrate and analyze together different datasets from at least 2 NSF/GEO divisions (Atmosphere and Geospace; Earth; Ocean; Polar). Datasets may be constrained by time or spatial coordinates, or may incorporate real-time data.

2. Find, access, and use at least 2 geospatial or temporally bounded data sets for use with at least one external model, preparing the data for proper scaling, density, and coverage to achieve a statistically significant model outcome. Datasets should come from at least 2 NSF/GEO divisions.

Pilot projects must leverage functionality from other major cyberinfrastructure efforts. EarthCube community documents have identified concepts for interoperable infrastructure as well as existing technical resources and infrastructure that may be applicable to the geosciences. These documents are available at https://www.earthcube.org/info/about/earthcube-governance. In addition, EarthCube's GeoCODES discovery resource (https://www.earthcube.org/geocodes) provides the basis that interoperability and integration Pilots should build from. Aspects of GeoCODES that can be used in Pilots include:

- The schema.org (P418/P418GUI/P419) dataset and data repository discovery service
- Access to NSF-GEO data repositories
- Access to tools in the Resource Registry and/or other tool resources
- Discover/use data sets and compatible models

Pilots will demonstrate robust outcomes within 12 to 18 months of funding with an additional 6 months to finalize the goals of the pilot, obtain feedback, or incorporate sustainability plans. In addition, Pilots and their demonstrations of interoperability should become artifacts (i.e., new resources) for future researchers to examine and build upon and explore.

Specific Requirements:

1. Advancing Geosciences Research: Capabilities proposals must clearly describe a specific scientific challenge that will be advanced through the efforts of the project. Projects must have clear plans for engagement with the scientific community beginning in the first year and continuing through the full duration of the project. Proposals should describe mechanisms for geoscientist engagement and must address how outreach activities will produce sustained user engagement and adoption. Development of functional, accessible, and useful interfaces and resources to disseminate products to geoscientists beyond the core research team should be included and be well described. Proposals will be evaluated on the value and potential success of the described scientific challenge.

   Pilot projects are intended to cross geosciences domains. Proposals should identify the domains of the geosciences that will be part of the pilot, justify why they represent a broad swath of the discipline - cutting across NSF/GEO divisions - and motivate the integration of these domains through science use cases and involvement of scientists from the engaged fields.

2. Reuse of Existing Tools/infrastructure: Projects must describe how they are using or repurposing existing cyberinfrastructure (including, but not limited to, products of prior EarthCube projects). These are implementation projects for use by the scientific community, and do not necessarily require research or innovation in cyberinfrastructure. If new tools or cyberinfrastructure are proposed, proposals must explicitly justify why existing infrastructure is not appropriate or sufficient. How new components can be integrated with EarthCube's GeoCODES effort and into existing infrastructure must be described and will be evaluated.

3. Sustainability: Proposers must include a section in their Project Description describing their plans for the sustainability of the project outcomes (infrastructure, tools, and conceptual advancements) beyond the duration of the award. Plans should specifically describe how products and outcomes would be sustained without further NSF funding to the project team beyond award completion. Project plans may acknowledge existing challenges for achieving sustainability and explore novel approaches for addressing these challenges, in line with existing resources and norms of relevant scientific communities. Plans will be evaluated on the viability of the sustainable resource, the fit to the infrastructure being developed and the likelihood of integration into a long-term system. Examples include use and dissemination of open source code, development and adoption of standards for data interoperability, and incorporation into larger cyberinfrastructure entities (including those associated with academic institutions, scientific facilities or private companies).

4. Metrics and Assessment: Proposals must include usage metrics to demonstrate broad and measurable tool adoption for a variety of scientific applications. Plans are needed for clear documentation of any standards used and integration with EarthCube data and resource registries during the course of the project.

5. Participation with EarthCube and Community Engagement. Projects must participate in EarthCube governance committees and activities like the Annual meeting. Funds including travel costs to attend the annual meeting, must be included in the project budget.

How project personnel will participate must be described in the proposal. Support for postdocs and graduate students to be cross trained in the geosciences and cyberinfrastructure or data science is strongly encouraged. Coordination with the scientific community and outreach activities should also be described in the context of extending and measuring use. Where appropriate, plans for adoption of novel methods for assessing scientific impacts of the project are encouraged.

2. **EarthCube Research Coordination Networks (RCNs)**

Proposal Submission: Proposals will be accepted after discussion with program directors and agreement that a proposal should be submitted. Proposals must list the programs and/or program directors that have agreed to the submission in a Single Copy Document. Proposals without this information will be returned without review.

EarthCube RCN proposals may be submitted after the Target Date with permission of an EarthCube Program Director. Permission must be given by email and indicate the agreed upon date of proposal submission.

Description of the Activity:

The goal of 2020 EarthCube Research Coordination Networks (RCNs) is to be closely tied to the science and cyberinfrastructure needs of core geosciences programs and domains supported by GEO. To that end, potential proposers must coordinate EarthCube RCN ideas and discuss the submission of any EarthCube RCN proposal with the relevant GEO program directors.

EarthCube RCNs provide opportunities for academic geosciences communities to organize, seek input, come to consensus, and prioritize data, modeling, and technology needs, data science challenges and data standards within and across domains. Other opportunities exist to realize cyberinfrastructure development and build tools and services. Outcomes from the RCN must be tangible and directed towards moving geoscientists closer to shared goals. RCNs are an important information and feedback mechanism within the EarthCube process. Results from these projects will provide feedback for the direction of EarthCube.

EarthCube RCNs should 1) build and strengthen partnerships between geo- and cyber/computer/data scientists; 2) foster new collaborations that lead to better scientific outcomes; 3) expose participants to new ideas, methodologies, approaches, tools, and utilities; 4) reduce redundancies and duplication of effort; and 5) expose best practices and “lessons learned” in data management.

EarthCube RCNs may center around:

- The development of community standards, data citation or other community plans for data management in one or more fields of the geosciences. This will help communities address NSF requirements for data management plans in proposals.
- The articulation of common cyberinfrastructure and technology grand challenges across different geosciences disciplines, including dialog towards designing potential solutions for data integration, computation, modeling, software and/or visualization needed to meet future scientific and education goals.
- Identifying and articulating geosciences research grand challenges that are convergent with NSF Big Ideas, such as Harnessing the Data Revolution, Navigating the New Arctic, and Rules of Life.

Specific Requirements:

1. Focus/Topic: EarthCube RCN proposals must be rooted in the academic geosciences community. Proposals must specify what activities will be undertaken, what groups will be involved, what products will be generated by network activities, and how information about the network and opportunities to participate will be disseminated. The proposal should also outline the expected benefits of the network's activities in moving one or more geosciences fields forward in scientific goals through cyberinfrastructure, data science or open data standards. The specific outcomes from the RCN should be described.

2. EarthCube Participation**:** Participation and involvement in EarthCube Governance, including meetings, events and sharing information between RCNs and other EarthCube projects is required. Funds should be allocated to support representatives in EarthCube meetings and activities. Proposals must include a section on how the network will interact with EarthCube Governance activities.

3. Steering Committee: Each RCN must have a steering committee primarily composed of academic geoscientists. Researchers with a cyber, data and/or computer science background should also have key roles within the network, and these should be described in the proposal. The Steering Committee should reflect the diversity of the network's participants and be responsible for the network's success, but remain a manageable size. The proposal should articulate the roles of the Steering Committee members and the reasons for their selection.

4. Network Participants: The size of an RCN is expected to vary depending on the topic or issue and network needs. It is expected that a network will involve investigators at diverse organizations, including different levels of academic institutions. The inclusion of new researchers, post-docs, graduate students, and undergraduates is strongly encouraged. Proposals should clearly articulate well-developed mechanisms that will maintain openness, ensure access, and actively promote participation by interested parties. Although inclusion of federal agencies, international organizations and commercial partners is welcome, RCNs are intended to serve the needs of geoscientists in US academic institutions. NSF funding predominantly supports participation by US researchers. Any proposed international collaboration should articulate how it strengthens the project's activities. Participants from institutions outside the US are encouraged to seek support from their respective funding organizations. NSF funds may not be used to support the expenses of international scientists and students at their home institutions.

5. Outcomes: EarthCube RCNs must produce an outcome within 24-30 months. They must promote effective communication and provide opportunities for collaboration focused on actionable improvements for the academic geosciences community. Any outcomes of the RCN, including discussion forums, documents, policies and practices must be openly shared with the academic community. Proposals should detail mechanisms that will be used to serve these materials.

Funds from this program may not support independent, individual research projects of the participants; nor are they to be used as a mechanism for a mini-grant awarding program. Note that funds requested to support activities of the network participants, such as participant travel, materials and supplies for the network projects, and network retreats should be listed as "participant support" in the proposed budget and managed by the submitting organization.

III. AWARD INFORMATION

Estimated Number of Awards: 6-12

The number of awards will be determined based on the results of the merit review process and availability of funds. The size of awards will vary based on the scope and complexity of the funding opportunity and the projects supported under this call.

Anticipated Funding Amount:

$5,000,000 to $10,000,000, subject to availability of funds.

Estimated Award Size and Duration:
Science-Enabling Capabilities and Pilots:
Capabilities are a maximum of 36 months with budgets that are commensurate with the size and scope of the project and scientific impact.
Pilots are a maximum of 24 months with budgets that are commensurate with the size and scope of the project.

RCNs:
A maximum of 36 months and a maximum of $300,000

IV. 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.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

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:

Proposals involving non-NSF FFRDC or Federal agency personnel must be approved prior to submission to ensure appropriate submission parameters related to funding personnel at these institutions. PIs should contact the cognizant PO. In all cases non-NSF FFRDC or Federal agency contributors must appear in one of two ways: (1) a subaward on a proposal submitted by an academic or non-profit institution or (2) a proposal that is submitted as part of a collaborative effort lead by an academic or non-profit institution.

NSF-funded FFRDCs are exempt from the above restriction and may submit proposals without restriction.

Please be aware that if you have not received NSF funding you will be required to submit additional information before an award can be recommended. Please refer to the Prospective New Awardee Guide for information and preparation of the necessary documentation: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pnag.

For-profit organizations may participate as subawardees on proposals that are led by eligible institutions. The purpose of EarthCube is to serve closely the needs of the academic geosciences community and this type of partnership ensures that close connections between for-profit efforts and academic institutions are maintained.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via FastLane, Research.gov, 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 Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award Policies and 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. The Prepare New Proposal setup will prompt you for the program solicitation number.
- 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.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. PAPPG Chapter II.D.3 provides additional information on collaborative proposals.

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.

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

A. Cover Page - The title of the proposed project should begin with the words, "EarthCube Data Capabilities:", "EarthCube Pilots:", or "EarthCube RCN:".

   For collaborative proposals arranged as separate submissions from multiple organizations, the project title must begin with the words "Collaborative Research:" followed by the applicable solicitation specific prefix noted above.

B. Project Description - For all projects, in addition to intellectual merit and broader impacts, the project description should describe how the work meets the Specific Requirements and any additional review criteria indicated. The Project Description must include a Management plan that describes plans and procedures for the development, assessment and sustainability of the proposed activity. The plan should include a list of all participating members of the collaboration, including non-funded participants, their institutions and roles in the project. RCNs should begin with a list of the Steering Committee members and their institutions.

C. Budget - In a collaborative project, any institution with a budget of less than $250,000 must be included as a subaward in the budget of the Lead Institution's proposal, and not as a separate proposal.

D. Additional Supplementary Documents -
   1. Personnel List: Each proposal must submit a single unified participant list for the entire project. For each person known at the time of proposal submission, provide the last name, first name, and institution/organization. Undergraduate students, graduate students, and postdoctoral researchers not yet specifically identified do not need to be included in this list. Proposals lacking the list of project personnel will be returned without review.
   2. Letters of Collaboration must be provided for any organization or individuals that are mentioned in the Project Description but are not receiving funds (i.e., mentioned in the proposal and not listed in any of the associated budgets).

E. Single Copy Document - RCN Proposals must submit a single copy document with a list of the programs and program directors within GEO that were contacted and have agreed to interest in this RCN.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

March 12, 2020

Science-Enabling Data Capabilities and Pilots

- **Full Proposal Target Date(s)**:

  March 12, 2020

  EarthCube Research Coordination Networks

For EarthCube Research Coordination Networks (RCN) submissions: Proposals will be accepted after discussion with program directors and agreement that a proposal should be submitted. Proposals must list the programs and/or program directors that have agreed to the submission in a Single Copy Document. Proposals without this information will be returned without review. EarthCube RCN proposals may be submitted after the Target Date with permission of an EarthCube Program Director. Permission must be given by email and indicate the agreed upon date of proposal submission.

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

Science Enabling Capabilities and Pilots:

Proposals will be evaluated on how successfully they meet the Specific Requirements:

1. Advancing Geosciences Research
2. Reuse of Existing Tools/infrastructure
3. Sustainability
4. Metrics and Assessment
5. Participation with EarthCube and Community Engagement

Research Coordination Networks:

Proposals will be evaluated on how successfully they meet the Specific Requirements:

1. Focus/Topic
2. EarthCube Participation
3. Steering Committee
4. Network Participants
5. Outcomes

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 Internal NSF Review.

Specific additional review criteria are articulated for each focus area listed in this solicitation. Review will be conducted by panel and/or ad hoc 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.

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:

- Eva Zanzerkia, Directorate for Geosciences, Earth Sciences Division, telephone: (703) 292-4734, email: ezanzerk@nsf.gov
- Amy Walton, Directorate for Computer and Information Science and Engineering, Division of Advanced Cyberinfrastructure, telephone: (703) 292-4538, email: awalton@nsf.gov
- Sean C. Kennan, Directorate for Geosciences. Ocean Sciences Division, telephone: (703) 292-7575, email: skennan@nsf.gov
- Subhashree (Shree) Mishra, Directorate for Geosciences, Division of Atmospheric and Geospace Science, telephone: (703) 292-8521, email: sumishra@nsf.gov
- Colleen Strawhacker, Directorate for Geosciences, Office of Polar Programs, telephone: (703) 292-7432, email: colstraw@nsf.gov
- Peter Milne, Directorate for Geosciences, Office of Polar Programs, telephone: (703) 292-4714, email: pmilne@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.

Related Programs:

The National Science Foundation (NSF)'s Harnessing the Data Revolution (HDR) Big Idea is a visionary, national-scale activity to enable new modes of data-driven discovery, allowing fundamentally new questions to be asked and answered in science and engineering frontiers, generating new knowledge and understanding, and accelerating discovery and innovation. The HDR vision is realized via a coordinated set of program solicitations resulting in an ecosystem of inter-related activities consisting of (1) research in foundations of data science; frameworks, algorithms, and systems for data science; and, data-driven research in science and engineering, (ii) cyberinfrastructure, and, (iii) education and workforce development—all of which are designed to amplify the intrinsically multidisciplinary nature of the data science challenge. The HDR Big Idea will establish theoretical, technical, and ethical data science frameworks, and apply them to practical problems in science and engineering, and in society more generally.

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 (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** (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