

## Arctic Research Opportunities Arctic Natural Sciences; Arctic Social Sciences; Arctic System Science; Arctic Observing Network and Polar Cyberinfrastructure

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### PROGRAM SOLICITATION

NSF 14-584

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### REPLACES DOCUMENT(S):

NSF 13-592

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National Science Foundation

Directorate for Geosciences  
Division of Polar Programs

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

October 21, 2014

October 19, 2015

October 18, Annually Thereafter

### IMPORTANT INFORMATION AND REVISION NOTES

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**The Arctic Social Sciences Program will not have a deadline in 2015 and will resume in 2016.** Please consult the [NSF Dear Colleague Letter regarding the Arctic Social Sciences Program \(NSF 15-109\) \(August 18, 2015\)](#).

Revisions to the solicitation include limitations on the number of proposal submissions per investigator for the Arctic Natural Sciences Program; identification of co-review potential between Arctic Observing Network and Polar Cyberinfrastructure Programs; clarification of the scope of the Arctic Observing Network Program; and requirements for data citation in the Results from Prior Research section for all programs identified within this solicitation.

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

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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##### Program Title:

Arctic Research Opportunities  
Arctic Natural Sciences; Arctic Social Sciences; Arctic System Science; Arctic Observing Network

##### Synopsis of Program:

The National Science Foundation (NSF) invites investigators at U.S. organizations to submit proposals to conduct research about the Arctic. Arctic research includes field and modeling studies, data analysis, and synthesis about the arctic region.

The goal of the NSF Section for Arctic Sciences, Division of Polar Programs (PLR), is to gain a better understanding of the Arctic's physical, biological, geological, chemical, social and cultural processes; the interactions of oceanic, terrestrial, atmospheric, biological, social, cultural, and economic systems; and the connections that define the Arctic. The Arctic Sciences and other NSF programs support projects that contribute to the development of the next generation of researchers and scientific literacy for all ages through education, outreach, and broadening participation in science, technology, engineering, and mathematics. Program representatives from polar and other non-polar NSF programs that support arctic research coordinate across NSF, including joint review and funding of arctic proposals and mutual support of special projects with high logistical costs.

##### 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.

- William Ambrose, telephone: (703) 292-8029, email: [wambrose@nsf.gov](mailto:wambrose@nsf.gov)
- Renee D. Crain, Arctic Research Support and Logistics Program Director, 755 S, telephone: (703) 292-4482, email:

[rcrain@nsf.gov](mailto:rcrain@nsf.gov)

- Patrick R. Haggerty, Arctic Research Support and Logistics Program Director, 755 S, telephone: (703) 292-8577, fax: (703) 292-9082, email: [phaggert@nsf.gov](mailto:phaggert@nsf.gov)
- Anna M. Kerttula de Echave, Arctic Social Sciences Program Director, 755 S, telephone: (703) 292-7432, fax: (703)292-9082, email: [akeritul@nsf.gov](mailto:akeritul@nsf.gov)
- Diane McKnight, telephone: (703) 292-4897, email: [dmcknigh@nsf.gov](mailto:dmcknigh@nsf.gov)
- Neil R. Swanberg, Arctic System Science Program Director, 740 S, telephone: (703) 292-8029, email: [nswanber@nsf.gov](mailto:nswanber@nsf.gov)
- William J. Wiseman, Arctic Natural Sciences Program Director, 755 S, telephone: (703) 292-4750, fax: (703) 292-9082, email: [wwiseman@nsf.gov](mailto:wwiseman@nsf.gov)
- Marc Stieglitz, telephone: (703) 292-2461, email: [mstiegli@nsf.gov](mailto:mstiegli@nsf.gov)

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

- 47.050 --- Geosciences

## Award Information

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**Anticipated Type of Award:** Standard Grant or Continuing Grant or Cooperative Agreement

**Estimated Number of Awards:** 75

per year, pending availability of funds.

**Anticipated Funding Amount:** \$25,000,000

per year approximately, pending availability of funds.

## Eligibility Information

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**Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- 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.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Foreign organizations: For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.
- Tribal governments, Alaska Native Corporations, and Alaska Native non-profit organizations

**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:**

For the Arctic Natural Sciences program individual PIs may be listed as PI, co-PI, or senior personnel on no more than a total of two proposals submitted to this call. They may be lead PI on only one of these two proposals.

For the annual competitions of the Arctic System Science, Arctic Social Science, Arctic Observing Network, and Polar Cyberinfrastructure programs, there is no PI limitation.

## Proposal Preparation and Submission Instructions

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**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, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is

## 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):

October 21, 2014

October 19, 2015

October 18, Annually Thereafter

## Proposal Review Information Criteria

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### 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

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### Award Conditions:

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

### Reporting Requirements:

Additional reporting requirements apply. Please see the full text of this solicitation for further information.

## TABLE OF CONTENTS

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### Summary of Program Requirements

#### I. Introduction

#### II. Program Description

#### III. Award Information

#### IV. Eligibility Information

#### V. Proposal Preparation and Submission Instructions

- A. Proposal Preparation Instructions
- B. Budgetary Information
- C. Due Dates
- D. FastLane/Grants.gov Requirements

#### VI. NSF Proposal Processing and Review Procedures

- A. Merit Review Principles and Criteria
- B. Review and Selection Process

#### VII. Award Administration Information

- A. Notification of the Award
- B. Award Conditions
- C. Reporting Requirements

#### VIII. Agency Contacts

#### IX. Other Information

## I. INTRODUCTION

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The Section for Arctic Sciences (ARC) in the Division of Polar Programs (PLR) invests in scientific research about the arctic region and provides operational support for arctic research activities. Science programs are suitable for disciplinary, multidisciplinary and broad interdisciplinary investigations directed toward both the Arctic as a region of special scientific interest and a region important to the global Earth system.

A definition of the Arctic is provided by the United States Arctic Research and Policy Act (ARPA) of 1984 Section 112 ([http://www.nsf.gov/od/opp/arctic/iarpc/arc\\_res\\_pol\\_act.jsp](http://www.nsf.gov/od/opp/arctic/iarpc/arc_res_pol_act.jsp)). As this solicitation values studies that link arctic phenomena and the arctic system to lower latitudes, the ARPA definition should not be viewed as constraining the work proposed; however, the proposal must contain a clear statement of how the proposed research will increase our knowledge of the Arctic and, if applicable, its role in the global Earth system. In this solicitation we refer to the Arctic not just as a place defined by geography, but part of the global system made up of its natural and social sub-systems.

## II. PROGRAM DESCRIPTION

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This description provides detailed information on research opportunities to be supported by the following programs:

- **Arctic Natural Sciences Program (ANS)**
- **Arctic System Science Program (ARCSS)**
- **Arctic Social Sciences Program (ASSP)**
- **Arctic Observing Network (AON)**
- **Polar Cyberinfrastructure (ACI)**

The Section for Arctic Sciences encourages proposals that advance our understanding of the Arctic, from projects that seek to advance fundamental disciplinary understanding to complex interdisciplinary work needed to understand the arctic system as a whole. The descriptions below should help guide investigators in determining the appropriate program for their proposals, but proposers are encouraged to contact a program director if they have questions about the fit of a given research topic to a program. This is important because normally a proposal submitted to one program will not be transferred to or considered by another. In addition, please consult the full text of this solicitation for further information on proposal preparation, fieldwork, data management, review criteria, award conditions and other pertinent information.

All proposals should discuss specifically how their results would contribute to increasing our understanding of the Arctic.

### A. Arctic Natural Sciences Program (ANS)

The Arctic Natural Sciences (ANS) Program supports disciplinary and interdisciplinary research on arctic processes and phenomena, with particular emphasis on understanding the changing arctic environment. The Program encourages proposals that test hypotheses leading to new understanding of the Arctic and the development of predictive tools. Although proposals to perform monitoring *per se* are discouraged, the program welcomes proposals that utilize the data generated by the Arctic Observing Network to advance scientific understanding of the Arctic.

Proposals submitted to the ANS program should focus on arctic processes; proposals to examine generic processes that could be studied outside the Arctic are more appropriate to other programs within the Foundation. ANS co-reviews proposals relevant to arctic processes that are submitted to many other programs in, among others, the Directorates for Geosciences; Mathematical and Physical Sciences; Social, Behavioral, and Economic Sciences; and Biological Sciences. ANS also formally participates in several cross-foundation competitions each year (recent examples include Paleo Perspectives on Climate Change, SEES Earth System Modeling, and SEES Ocean Acidification). Arctic proposals that are suitable for review within these special competitions must be submitted directly to these competitions rather than to ANS; prospective PIs are encouraged to contact the ANS program directors, prior to proposal submission, with questions about the appropriate "home" for their proposals. Proposals submitted to this solicitation, but which could have been submitted to a special competition, will be returned without review. Individual PIs may be listed as PI, co-PI, or senior personnel on no more than a total of two proposals submitted to the ANS annual competition. They may be lead PI on only one of these two proposals.

Areas of special interest include marine and terrestrial ecosystems, arctic atmospheric and oceanic dynamics and climatology, arctic geological and glaciological processes, and their connectivity to lower latitudes. Within these areas, some clarification of ANS priorities follows. ANS supports projects that emphasize understanding of arctic ecology, especially in the context of a rapidly changing arctic environment. Terrestrial and marine geology and geophysics projects of greatest interest are those that will improve interpretations of the geologic record of environmental change in the Arctic, particularly during the Quaternary. Projects that focus on all naturally occurring forms of arctic snow and ice, including seasonal snow, glaciers, and the Greenland ice sheet, are supported. Understanding the processes responsible for the evolution of permafrost and consequences of changing permafrost remains a priority, as well. The Program supports ocean science projects that advance knowledge of the processes of the Arctic Ocean and adjacent seas and their interactions with and across their boundaries. The development of sensors necessary to observe these processes is also supported by ANS. Given the breadth of research that ANS considers and supports, successful proposals are those that resonate both with disciplinary experts and with a diverse group of panelists who are asked to consider the relevance of each proposal to understanding the Arctic.

### B. Arctic System Science Program

The Arctic System Science Program (ARCSS) funds proposals or groups of proposals that advance our understanding of the Arctic as a system. ARCSS projects are often interdisciplinary and focus on the relationships among the physical, biological, chemical, and human processes that govern the cycling of energy and matter in the arctic system. The cycles of carbon, water, and energy are particularly important to consider in investigating the functioning of the arctic system.

Most successful ARCSS projects do one or more of the following:

- Investigate important relationships among the various components of the arctic system,
- Identify self-regulatory processes, feedbacks, or non-linear responses of the arctic system to physical or biogeochemical drivers,
- Advance understanding of the arctic system and its behavior through synthesis or modeling,
- Explore the consequences of environmental change on the arctic system, for example through impact scenarios or evaluation of vulnerability to multiple drivers,

Address linkages between the Arctic and Earth systems.

All successful ARCSS proposals must identify explicitly how they will place their results in the context of system behavior and demonstrably contribute to system-level understanding. Being interdisciplinary is not sufficient for a proposal to be appropriate for ARCSS. Competitive proposals address interactions among several components of the arctic system, explore emergent behavior in linked subsystems, or otherwise provide essential knowledge, and apply that knowledge to system-level understanding. ARCSS also supports studies that identify and address critical processes that we need to understand in order to advance system level understanding. Such efforts should demonstrate how the results would be incorporated into system models or syntheses. The degree to which the proposed research advances arctic system understanding will be a key factor in judging its intellectual merit and priority for ARCSS.

In some cases a particularly large and challenging problem may appeal to a group of researchers, and this may necessitate a group of coordinated proposals to build an integrated project. ARCSS encourages such groups to either self-organize and submit their proposals, either as collaborative efforts or as separate proposals that address a common theme, or to submit workshop proposals to develop plans for large integrated studies. Such proposals must follow NSF workshop proposal guidelines and should be for the purpose of planning, not actually writing proposals. PIs are encouraged to consult with program directors for guidance before submitting large collaborative or workshop proposals.

### **C. Arctic Social Sciences Program**

The Arctic Social Sciences Program encompasses all social, behavioral, and economic sciences supported by NSF. These include, but are not limited to anthropology, archaeology, economics, geography, the science of endangered languages, law and social science, political science, linguistics, science technology and society, social psychology, sociology, traditional knowledge systems, and related subjects.

Although proposals in any of the social sciences mentioned above are welcome, areas of particular interest include culture and environment, resources and economic change, development of social and political institutions, ethnic and regional identities, and knowledge systems. These five research areas are identified and explained in the report, *Arctic Social Sciences: Opportunities in Arctic Research* (Arctic Research Consortium of the United States, June 1999, Fairbanks, Alaska; available for download at [http://www.arcus.org/ASSP/1999\\_report.html](http://www.arcus.org/ASSP/1999_report.html)).

The Arctic Social Sciences Program especially encourages projects that are circumpolar and/or comparative; involve collaborations between researchers and those living in the Arctic; or form partnerships among disciplines, regions, researchers, communities, and/or students (K-12, undergraduate, or graduate). An additional resource for those interested in the interface between social-cultural systems and environmental systems are the Global Human Ecodynamics Alliance (<http://gheahome.org/>) and Arctic Frost (<http://uni.edu/arcticfrost/>) web sites.

Dissertation research proposals are accepted by the Arctic Social Sciences Program. Please consult the "Dissertation Panel Advice to Students" guidelines in the Division of Behavioral and Cognitive Sciences (DBCS: [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12816&org=BCS&sel\\_org=BCS&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12816&org=BCS&sel_org=BCS&from=fund)) with additional proposal preparation guidelines available in the SBE DDRIG general solicitation ([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13453&org=SBE](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13453&org=SBE)). These guidelines are to provide the applicant with a basic outline for their proposals. Applicants should apply to the Arctic Research solicitation and talk to the ASSP program director about funding limits and deadlines, which vary from those in SBE.

Projects involving research with human subjects must ensure that subjects are protected from research risks in conformance with the relevant federal policy known as the Common Rule (Federal Policy for the Protection of Human Subjects, 45 CFR 690). Advice is available at <http://www.nsf.gov/bfa/dias/policy/hsfaqs.jsp#top>.

Applicants proposing fieldwork that may affect cultural or historic properties, i.e. projects that include ground disturbance, should carefully read section "Environmental Policy Considerations of Field Work." Please note, that such projects should NOT anticipate a field season in the year in which they may be awarded.

The Arctic Social Sciences Program considers joint review and funding within ARC, with other NSF programs, other agencies and internal efforts when appropriate. Researchers interested in endangered languages are encouraged to examine the announcement of opportunity on the Science of Endangered Languages ([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12816](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12816)) released to support projects to develop and advance knowledge concerning endangered languages. ASSP will provide co-funding for those projects recommended by the DEL Program that are Arctic relevant.

### **D. Arctic Observing Network**

Science-driven proposals that will contribute to the development of AON will be accepted in response to this solicitation. The goal of AON is to enhance the observing capability required for the scientific investigation of arctic system change and its global connections. AON encompasses physical, biological, social, cultural, and economic observations, including indigenous knowledge, of the land, ocean, cryosphere, atmosphere (troposphere and stratosphere) and social systems. All proposals must include a scientific rationale and an explanation as to why the proposed activity, data (including frequency and duration of observations) and geographic location are essential to research that will advance the understanding of arctic system change. Proposals for continuation of existing AON projects must provide evidence that the data obtained so far (i) have been archived at an appropriate long-lived and publically accessible archive, and (ii) contribute to the needs of the broader scientific community. Projects that make observations and develop derived products that contribute to documented societal needs are also encouraged. Proposals for new AON projects must describe how the proposed activity complements and/or adds to the existing suite of observing activities. New networks may also leverage existing investments in observing networks to develop interdisciplinary or multi-disciplinary measurement systems. A letter of support from the PI, agency lead, or responsible manager of the existing network is required as supplemental documentation. The letter should include information about the lifetime of the leveraged network.

The AON Program supports studies that improve capability for long-term measurement of Arctic system variables. Proposals that involve process study, model development, or short-term deployments may be better suited to other NSF arctic programs. Prospective PIs should contact the relevant program officer to discuss the project to determine if it is within the AON program scope.

The AON Program will also consider proposals for (1) the development of resilient sensors, platforms, real-time communications packages, and measurement systems that are critical to AON, (2) observing network design, including optimization of the system of networks for informed deployment and systematic observation and (3) development of value-added products that leverage AON-supported information streams. Proposers should take into account other complementary observing efforts, existing global or regional protocols and measurement methodologies, best practices for community engagement and inclusion of indigenous knowledge, and the needs of modelers to simulate, understand and predict change.

Proposals focusing on observing system data management; data access and discovery, including the development of interoperable web services, application software, data visualizations, and online data integration tools that leverage AON and related observational information streams; and the development and deployment of 'smart' sensors that might require development and use of existing

cyberinfrastructure will be considered and co-reviewed with the Polar Cyberinfrastructure Program. Prospective PIs should contact the relevant program officers to discuss the suitability of their project to co-review.

In 2006, the NSF AON program was developed in large measure to support the Observing Change component of SEARCH, and there continues to be a strong link to the community discussions in that forum. Proposers are encouraged to familiarize themselves with SEARCH reports (<http://www.arcus.org/search/index.php>).

All AON projects must conform to the SEARCH data policy ([http://www.arcus.org/search/downloads/SEARCH\\_DataPolicy\\_051207.pdf](http://www.arcus.org/search/downloads/SEARCH_DataPolicy_051207.pdf)). The only exceptions to this policy are some instances with social science and indigenous knowledge data, where respect for confidentiality, intellectual property rights, or proprietary information sources might take precedence. In these cases, the proposer should follow the data policy for the ASSP program (Sec. IIB) and discuss their plan with the AON or ASSP Program Directors prior to submitting a proposal. Exceptions can also be made in cases where data release might cause harm.

AON data are considered to be community data and not subject to any embargo period. Proposals must include a data and information management plan that describes how free and rapid access to quality-controlled and fully-documented data and information by all researchers, and others, will be achieved during the course of the award, e.g., via a project website and/or a recognized data repository. Proposers should be aware that posting graphs on a website is not sufficient. The plan must include transfer of all data to a recognized data repository by the conclusion of the award. Value-added products and cyberinfrastructure tools and services developed for AON must include transparent documentation of development as part of its outreach to users.

Proposers to the AON program are encouraged to include a project management outline that details phases of effort, responsible personnel, and milestones for development and delivery of data, products, or design.

#### **E. Polar Cyberinfrastructure**

NSF's concept of cyberinfrastructure (CI) encompasses high-performance computing (HPC), stewardship and utilization of scientific data, and virtual organizations (VOs). The Section for Arctic Sciences will consider proposals that promote effective collaboration between arctic and cyberinfrastructure researchers. Priority will be given to proposals that provide significant benefit to the arctic research community including (i) cost-effective transfer of data from remote field locations, (ii) long-term sustainable curatorship, standardization, management and discovery of data and metadata, (iii) visualization, manipulation, and analysis, particularly for understanding complexity, (iv) access and interoperability across scientific disciplines, (v) promote effective use of HPC for direct and sustainable advances in current arctic research and (vi) e-learning and educational tools based on cyberinfrastructure components. Proposals that establish or enhance VO resources for arctic research, and its broader impacts, are also encouraged. It is anticipated that the Program will work collaboratively with NSF's Division of Advanced Cyberinfrastructure and NSF's EARTHcube Program for reviewing and funding purposes. Interested proposers are encouraged to visit the web site for NSF's Division of Advanced Cyberinfrastructure (<http://www.nsf.gov/div/index.jsp?div=ACI>) to obtain current reports that explain NSF's expectations for the various components of CI. Researchers are also encouraged to visit the website (<http://www.nsf.gov/geo/earthcube/>) for NSF's EARTHcube activities and initiatives.

#### **ADDITIONAL OPPORTUNITIES**

##### **Other NSF Funding Opportunities**

See Section IX on Other Programs of Interest and consult the NSF online program guide to browse for funding opportunities ([http://www.nsf.gov/funding/browse\\_all\\_funding.jsp](http://www.nsf.gov/funding/browse_all_funding.jsp)).

### **III. AWARD INFORMATION**

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Pending availability of funds, \$25,000,000 may be available for proposals to this solicitation. This does not include logistics support that may be provided through the Arctic Research Support and Logistics program. NSF estimates 75 awards per year as standard or continuing grants, or cooperative agreements. The number of awards and average award size and duration are subject to the availability of funds.

### **IV. ELIGIBILITY INFORMATION**

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#### **Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- 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.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Foreign organizations: For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.
- Tribal governments, Alaska Native Corporations, and Alaska Native non-profit organizations

#### **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:

For the Arctic Natural Sciences program individual PIs may be listed as PI, co-PI, or senior personnel on no more than a total of two proposals submitted to this call. They may be lead PI on only one of these two proposals.

For the annual competitions of the Arctic System Science, Arctic Social Science, Arctic Observing Network, and Polar Cyberinfrastructure programs, there is no PI limitation.

#### Additional Eligibility Info:

Only U.S. organizations are eligible to submit proposals under this solicitation.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto: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: ([http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://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](mailto: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. Chapter II, Section D.5 of the Grant Proposal Guide provides additional information on collaborative proposals.

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

**Proposals may be returned without review for failing to comply with the Grant Proposal Guide (GPG) or NSF Grants.gov Application Guide, this solicitation and the instructions that supplement the GPG and NSF Grants.gov Application Guide.**

**Additional required information in the section "Results from Prior Research"**

**Under the section of Results from Prior Research, PIs must indicate where data from NSF-funded awards are archived and available.**

#### Revised Proposals

The procedure for revising and resubmitting a proposal to this solicitation is as follows: 1) a detailed letter must be sent to the cognizant Program Director describing the way in which the proposal has been revised in response to reviewer and panel comments and 2) a brief description of how the resubmitted proposal has been revised in response to reviewer and panel comments must be included in the body of the Project Description section of the proposal.

#### Principles for the Conduct of Research in the Arctic

Researchers should conform to the *Principles for the Conduct of Research in the Arctic*, approved by the U.S. Interagency Arctic Research Policy Committee (IARPC) in 1990 (<http://www.nsf.gov/geo/plr/arctic/conduct.jsp>). Proposers may also find the "Guidelines for Improved Cooperation between Northern Communities and Arctic Researchers" helpful (<http://archive.arcus.org/guidelines/document.html>).

#### Proposals Involving Human Subjects

The NSF Grant Proposal Guide ([http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg)) provides procedural information for projects with human subjects in the section Projects Involving Human Subjects. Investigators must ensure that human subjects are protected from research risks in conformance with the relevant federal policy known as the Common Rule (*Federal Policy for the Protection of Human Subjects*, 45 CFR 690). Additional information is available at <http://www.nsf.gov/bfa/dias/policy/guidance.jsp>. Letters of permission or approval, such as those from Native organizations or communities in which the work will take place, should be included in the Supplementary Documents section of the proposal.

#### Proposals Involving Arctic Field Work and other Third Party Support

The Arctic Research Support and Logistics (RSL) program was created to enhance safe access to the Arctic, and improve interactions with arctic communities. RSL has an annual budget to operate, maintain and upgrade facilities and infrastructure, purchase services from third-party support providers and contribute to proposal funding for research support and logistics activities. Proposals involving field work in the Arctic must describe the field work in the body of the proposal and include a schedule of proposed work. Investigators may include logistics costs directly in the proposal budget, if they will be making arrangements themselves. Alternatively, investigators may utilize third-party logistics providers for services. If using a third-party to provide logistics (see partial list below), the proposal must include a letter from the organization in the Supplementary Documents section of the proposal. The letter should be 1-2 pages long and include a description of the scope of work and a cost estimate. Prior to award, all proposals will be evaluated for total logistics costs and feasibility whether the logistics are in the proposal budget or provided by a third party. Third-party support providers include NSF's arctic logistics contractor, CH2M HILL Polar Services (CPS), UNAVCO, Incorporated Research Institutions for Seismology (IRIS), Ice Drilling Program Office (IDPO)/Ice Drilling Design and Operations (IDDO), requests for ship time, National Ice Core Laboratory (NICL), and others. A more detailed list is on the RSL website ([http://www.nsf.gov/od/opp/arctic/res\\_log\\_sup.jsp](http://www.nsf.gov/od/opp/arctic/res_log_sup.jsp)).

CPS is the prime contractor to NSF for arctic research support and logistics services (<http://www.polar.ch2m.com>). CPS provides services to the arctic research community including preparing logistics estimates for proposal submissions to NSF. Please allow 4-6 weeks for the preparation of these estimates prior to the deadline. Other support providers may require similar lead-time to meet proposal deadlines. Proposals requesting support for field work should be submitted with adequate time for proposal review and decision-making, up to six months, and an additional six months for logistics planning and budgeting. Thus, proposals submitted to this announcement should plan to go to the field no sooner than one year after the deadline.

Ice cores collected under the Arctic Programs are currently stored at the National Ice Core Laboratory (NICL - <http://nicl.usgs.gov>). NICL, a government-owned facility for storing, curating, and studying ice cores recovered from the ice-covered regions of the world, is supported through an Interagency Agreement with the United States Geological Survey. NICL provides NSF- and USGS-funded principal investigators and their collaborators with the capability to examine and measure ice cores while preserving the integrity of these cores in a protected environment. Investigators who plan to request ice cores from NICL should include with their proposal a letter showing the request and approval which may be subject to funding.

The Ice Drilling Program Office (IDPO) at Dartmouth College and the Ice Drilling Design and Operations (IDDO) at the University of Wisconsin-Madison are collectively known as IDPO/IDDO or as the U.S. Ice Drilling Program. IDPO/IDDO is supported by the Division of Polar Programs as a collaborative award to meet the drilling requirements of all programs of the Division of Polar Programs. IDPO focuses on ice drill development for NSF-supported remote field projects. IDDO focuses on fielding the drill equipment in support of investigators requesting technical support. To request support from IDPO/IDDO, investigators should contact IDPO/IDDL (<http://www.icedrill.org>). Investigators should include with their proposal the letter provided by IDPO/IDDO describing the equipment, services and a cost estimate (budget and justification) for the equipment or drilling support that would be required if the project is funded.

Projects working near arctic communities are encouraged to both discuss the proposed work with those communities while the project is being developed and to bring results back to the community following each field season and/or the end of the project. Investigators should include travel funds for this in their proposal budget. The RSL program may also support requests to visit communities on an *ad hoc* basis to support communication with local communities. These visits are anticipated to be limited to a few days and do not include additional funds for fieldwork or salaries. Please contact the RSL program managers for information about these opportunities.

Investigators are responsible for acquiring any permits necessary for their work. For work in Greenland, the Government of Greenland has instituted a new process (<http://naalakkersuisut.gl/en/About-government-of-greenland/Travel-activities-in-remote-parts-of-Greenland>). In response to the requirement that researchers in remote parts of Greenland carry DKK 1,000,000 in Search and Rescue insurance payable to the Danish State (<http://naalakkersuisut.gl/en/About-government-of-greenland/Travel-activities-in-remote-parts-of-Greenland/Procedure-and-forms>), NSF made an agreement to cover Search and Rescue costs as a self-insured government agency. NSF provides the names of each traveler to Greenland under the auspices of NSF to the Government of Greenland. NSF would take an active role in searching for and arranging medevac of personnel under the auspices of NSF in coordination with the procedures of the Government of Greenland. NSF reserves the right to seek reimbursement for costs incurred.

NSF is not responsible for medical costs, medevac charter costs, or evacuation of injured parties back to the U.S.. Investigators should include costs of evacuation insurance for each individual in the proposal budget if not covered by their institution. This is an allowable cost.

More information about the logistics program, logistics providers and facilities and other opportunities for field work is available on the RSL program web site ([http://www.nsf.gov/od/opp/arctic/res\\_log\\_sup.jsp](http://www.nsf.gov/od/opp/arctic/res_log_sup.jsp)). For support from CPS in planning field support, please contact Naomi Whitty at [naomi@polarfield.com](mailto:naomi@polarfield.com) and/or see the CPS website (<http://www.polar.ch2m.com/>).

### **Environmental Policy Considerations of Field Work**

Federal agencies must comply with the National Environmental Policy Act (NEPA) and other applicable laws and policies. Each recommendation for award will be assessed for environmental impacts prior to award and additional consultations or mitigation efforts may be required. PIs should expect to be involved in the assessment and environmental compliance process for their projects. Most NSF awards support individual scientific research projects and are not considered 'major Federal actions significantly affecting the quality of the human environment' but must nevertheless be documented. All federal agencies are regulated under acts such as the Endangered Species Act, the Marine Mammal Protection Act, and the National Historic Preservation Act. Researchers proposing work that may affect cultural or historic properties, or whose work involves tribal lands must cooperate with NSF in complying with the consultation requirements of section 106 of the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act (NAGPRA). For additional information on cultural or historic preservation issues, see the Advisory Council on Historic Preservation's web site at <http://www.achp.gov/work106.html>; for information concerning NAGPRA see <http://www.nps.gov/nagpra/>. Contact the Environmental Officer of the Division of Polar Programs, Dr. Polly Penhale ([ppenhale@nsf.gov](mailto:ppenhale@nsf.gov)) for guidance on environmental consultations, permitting, and NSF's obligations under existing environmental laws.

### **Data Management**

Proposals must include a data and information management plan that describes how free and rapid access to quality-controlled and fully-documented data and information by all researchers, and others, will be achieved during the course of the award, e.g., via a project web site and/or an appropriate data repository. Proposers should be aware that posting graphs on a web site is not sufficient. The plan must include transfer of all data to an established (i.e., long-lived) publically accessible data repository by the conclusion of the award. Please note that the Arctic Social Sciences Program has requirements relevant to the social sciences (Section IIB). Please see Policy for Sharing Scientific Data in Section VII.B. of this solicitation for other data reporting requirements.

**Identify this Solicitation Number on the Proposal Cover Sheet.**

## B. Budgetary Information

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### Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

## C. Due Dates

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

October 21, 2014

October 19, 2015

October 18, Annually Thereafter

## D. FastLane/Grants.gov Requirements

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### 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](mailto: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](mailto: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

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

A comprehensive description of the Foundation's merit review process is available on the NSF website at: [http://www.nsf.gov/bfa/dias/policy/merit\\_review/](http://www.nsf.gov/bfa/dias/policy/merit_review/).

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

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by

investing in building the knowledge that informs improvements in STEM teaching and learning.

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

## A. Merit Review Principles and Criteria

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

### 1. Merit Review Principles

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

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

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

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

### 2. Merit Review Criteria

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

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

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

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

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

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

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

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

### Additional Solicitation Specific Review Criteria

1. Priority will be given to proposals that contribute to our understanding of the Arctic.
2. Proposals submitted in response to this program solicitation will be reviewed by Ad Hoc Review and/or Panel Review. If another federal agency is considering funding proposals in this area, NSF may share proposals and review content with and/or may invite employees from the federal agency(ies) to sit in on review panels as observers for the purpose of determining whether the agency may provide funding.

## B. Review and Selection Process

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

Ad hoc Review and/or Panel Review.

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

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

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

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

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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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

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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 [http://www.nsf.gov/awards/managing/award\\_conditions.jsp?org=NSF](http://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](mailto:nsfpubs@nsf.gov).

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

#### Special Award Conditions:

#### Principles for the Conduct of Research in the Arctic

Principal Investigators are expected to follow the *Principles for the Conduct of Research in the Arctic*, prepared by the Social Science Task Force of the U.S. Interagency Arctic Research Policy Committee (IARPC) and approved by IARPC in 1990. These principles are listed at <http://www.nsf.gov/geo/plr/arctic/conduct.jsp>. Investigators may find useful the Guidelines for Improved Cooperation between Arctic Researchers and Northern Communities (<http://www.arcus.org/guidelines>).

#### Policy for Sharing Scientific Data

The Arctic Sciences Section (ARC) of the Division of Polar Programs (PLR) at the National Science Foundation (NSF) has adopted a policy for data sharing that will be applied to all grantees. This policy establishes the requirements criteria for the timely archiving of data in long-lived and publicly accessible archives and sets out special conditions applicable to ARC grants. The purpose of this policy is to facilitate full and open access to data, metadata and materials for polar research from projects supported by ARC.

The Division of Polar Programs, in conformance with NSF policy (see Grant Proposal Guide, <http://www.nsf.gov/pubsys/ods/getpub.cfm?gpgg>), expects investigators to share with other researchers, at no more than incremental cost and within a reasonable time, the data and associated metadata, derived data products, samples, physical collections and other supported materials gathered or created in the course of the research project. Data sets from ARC-supported scientific research should be deposited in long-lived and publically-available archives appropriate for the specific type of data collected (such as the NSF supported data center and discovery activity ACADIS at <http://www.aoncadis.org/home.htm>). Metadata for projects, regardless of where they are archived, should be submitted to ACADIS for improved access and discoverability.

Data archives of ARC-supported projects should include easily accessible information about the data holdings (metadata), including quality assessments, supporting ancillary information, and guidance for locating and obtaining the data. National and international data and metadata standards should be used for the collection, processing and communication of ARC-sponsored data sets. The use of graphics to present data or results does not qualify as sharing of scientific data or submission to an archive.

NSF realizes that on occasion there are data gathered of a particularly sensitive nature, such as the locations of archaeological sites or nest locations of endangered species. It is not the intention of this policy to reveal such information publicly. Discipline standards, indigenous community cultural rules, and state and federal regulations and laws should be followed for these types of data.

### **General Data Sharing Policy**

For all ARC supported projects:

- Complete metadata must be submitted to a national data center or another long-lived publicly accessible archive within two years of collection or before the end of the award, whichever comes first.
- All data and derived data products that are appropriate for submission to a national data center or another long-lived publicly accessible archive, must be submitted within two years of collection or before the end of the award, whichever comes first.

For all ARC supported Arctic Observing Network projects:

- Real-time data must be made publicly available immediately. If there is any question about what constitutes real-time data, please contact the appropriate program officer.
- All data must be submitted to a national data center or another long-lived publicly accessible archive within 6 months of collection, and be fully quality controlled.
- All data sets and derived data products must be accompanied by a metadata profile and full documentation.

### **Special Note for Arctic Social Sciences Awards**

The Arctic Social Sciences Program supports the full range of social science disciplines and adheres to the ARC Data Management statement that "Proposals must include a data and information management plan that describes how free and rapid access to quality-controlled and fully-documented data and information by all researchers, and others, will be achieved during the course of the award, e.g., via a project web site and/or a recognized data repository." However, the program recognizes that the nature of social science data, the way they are collected, analyzed, and stored, and the pace at which this occurs, vary widely. Different storage facilities and access requirements exist for different types of social science data, e.g., archaeological data, specimens from physical anthropology, large-scale survey data, oral histories, taped interviews, and other narrative materials elicited from individuals or groups, and field records. Therefore, "rapid access" is defined in the Arctic Social Sciences Program as 3-5 years and "recognized data repository" can be discipline-specific. However, increasing efforts are being made by the social science community to provide disciplinary relevant guidelines (in the form of best practices), set data and ethical standards, create open source software for social science data, and create new data repositories. In recognition of these efforts, all proposals to the Arctic Social Sciences program must include a data and information management plan. Providing access to data collected in projects supported by the Arctic Social Sciences Program necessarily engages a broad range of potential complexities. Investigators should identify those that can be anticipated and explain fully when and why a modified application of the ARC Data Management policies might be appropriate.

### **Responsibilities of Principal Investigators of Awards Funded by the Arctic Sciences Section**

Coordinated programs (multi-investigator and/or multi-agency programs) may (in consultation with the ARC program managers and other funding agencies involved) establish data submission procedures that are more rigorous than those for typical single-investigator projects, as necessary to meet the coordinated mission objectives. Principal Investigators with ARC-funded awards should comply with data policies established for these coordinated programs and submit their data as required to the appropriate repository stipulated by the coordinated program office.

Compliance with the data guidelines will be considered in the program managers' overall evaluation of a Principal Investigator's prior support record. Annual and final reports may not be approved if program managers determine that data sharing requirements have not been met. This will prevent future funding increments, awards and most other NSF actions for the PI and his or her co-PIs until the requirement is satisfied and the report is approved.

Any questions concerning this policy should be directed to the cognizant program officer in the Arctic Sciences Section.

## **C. Reporting Requirements**

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

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

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of

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

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

Please see the instructions, Section VII. B. Award Conditions in this program solicitation for information about award conditions for data.

## VIII. AGENCY CONTACTS

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*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:

- William Ambrose, telephone: (703) 292-8029, email: [wambrose@nsf.gov](mailto:wambrose@nsf.gov)
- Renee D. Crain, Arctic Research Support and Logistics Program Director, 755 S, telephone: (703) 292-4482, email: [rcrain@nsf.gov](mailto:rcrain@nsf.gov)
- Patrick R. Haggerty, Arctic Research Support and Logistics Program Director, 755 S, telephone: (703) 292-8577, fax: (703) 292-9082, email: [phaggert@nsf.gov](mailto:phaggert@nsf.gov)
- Anna M. Kerttula de Echave, Arctic Social Sciences Program Director, 755 S, telephone: (703) 292-7432, fax: (703)292-9082, email: [akerttul@nsf.gov](mailto:akerttul@nsf.gov)
- Diane McKnight, telephone: (703) 292-4897, email: [dmcknigh@nsf.gov](mailto:dmcknigh@nsf.gov)
- Neil R. Swanberg, Arctic System Science Program Director, 740 S, telephone: (703) 292-8029, email: [nswanber@nsf.gov](mailto:nswanber@nsf.gov)
- William J. Wiseman, Arctic Natural Sciences Program Director, 755 S, telephone: (703) 292-4750, fax: (703) 292-9082, email: [wwiseman@nsf.gov](mailto:wwiseman@nsf.gov)
- Marc Stieglitz, telephone: (703) 292-2461, email: [mstiegli@nsf.gov](mailto:mstiegli@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).
- Linda Izzard, Program Coordination Specialist, 755, telephone: (703) 292-7430, fax: (703) 292-9082, email: [lizzard@nsf.gov](mailto:lizzard@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](mailto:support@grants.gov).

Note: The Arctic Social Sciences Program will not have a deadline in 2015 and will resume in 2016. Please consult the [NSF Dear Colleague Letter regarding the Arctic Social Sciences Program \(NSF 15-109\) \(August 18, 2015\)](#).

## IX. OTHER INFORMATION

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

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information**  
(NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**  
Send an e-mail to: [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov)  
or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton  
Reports Clearance Officer  
Office of the General Counsel  
National Science Foundation  
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