

Thwaites: The Future of Thwaites Glacier and its Contribution to Sea-level Rise

PROGRAM SOLICITATION

NSF 17-505



National Science Foundation

Directorate for Geosciences
Division of Polar Programs



Natural Environment Research Council

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

March 01, 2017

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 17-1). NSF anticipates release of the PAPPG in the Fall of 2016 and it will be effective for proposals submitted, or due, on or after January 30, 2017. Please be advised that proposers who opt to submit prior to January 30, 2017, must also follow the guidelines contained in NSF 17-1.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Thwaites: The Future of Thwaites Glacier and its Contribution to Sea-level Rise

Synopsis of Program:

Considerable uncertainty remains in projections of future ice loss from West Antarctica. Reducing this uncertainty is an international priority that was recently underscored by the Scientific Committee on Antarctic Research in its "Horizon Scan 2020" (SCAR, 2015). The recent U.S. National Academy of Sciences, Engineering, and Medicine report (*A Strategic Vision for NSF Investments in Antarctic and Southern Ocean Research*, 2015) places prediction of ice mass loss from the West Antarctic Ice Sheet (WAIS) as the top priority for Antarctic research, and singles out Thwaites Glacier as a "region of particular concern".

Building on this community priority, and recognizing that such research is becoming an increasingly global endeavor with demands that exceed the capacities of any one nation, NSF and the UK Natural Environment Research Council (NERC) have developed this joint program with the objective to substantially improve both decadal and longer-term (century-to-multi-century) projections of ice loss and sea-level rise originating from Thwaites Glacier.

Since the 1990s, satellites have shown accelerating ice loss driven by ocean change in five neighboring glacier catchments, including Thwaites Glacier, that drain more than one third of the WAIS. The rate of ice loss there doubled in six years and now accounts for about 10 percent of global sea-level rise. The most rapid ice loss is currently from Pine Island Glacier, which has been the focus of the NERC iSTAR Programme and NSF-funded science. Recent studies indicate the greatest risk for future rapid sea-level rise now arises from Thwaites Glacier due to the large changes already underway, the potential contribution to sea-level rise, and the societally relevant timescales of decades to centuries over which major, irreversible changes are possible in the system.

The program will have a direct and significant impact on understanding the stability of marine ice sheets and specifically the West Antarctic Ice Sheet in the vicinity of Thwaites Glacier, and will contribute to the ice-sheet modeling community capability to simulate ice sheets and to reduce the uncertainties in sea-level projections. In addition, the program will contribute to improving risk assessments that coastal communities need for decisions about adaptation and long-range planning.

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.

- Paul Cutler, telephone: (703) 292-4961, email: pcutler@nsf.gov
- Jessica Surma, telephone: +44(0)1793411600, email: jetc@nerc.ac.uk

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 5 to 8

Total (combined US and UK) project research budgets may be up to a maximum of \$4,000,000 for up to five years.

Anticipated Funding Amount: \$20,000,000 to \$25,000,000

Awards are anticipated to begin after October 1, 2017, pending availability of funds. The total anticipated funding amount is the combined total of NSF and NERC research funds. If a project is recommended for funding, NSF will support the US component of the project and NERC will separately support the UK component of the project.

Eligibility Information

Who May Submit Proposals:

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

Who May Serve as PI:

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

Normal NERC eligibility rules apply for UK-based team members. These can be found in Section C of the NERC Research Grant and Fellowships Handbook. UK Independent Research Organizations (IROs) must be eligible for NERC Managed (Strategic Research) Mode.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Each proposal must have a US and UK Principal Investigator (PI). An individual may appear as PI on no more than one proposal and appear on no more than two proposals in total, whether as co-PI, Senior Personnel, or consultant (or any similar designation).

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, 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.
 - 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: http://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 01, 2017

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

TABLE OF CONTENTS

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

Considerable uncertainty remains in projections of future ice loss from West Antarctica. Reducing this uncertainty is an international priority that was recently underscored by the Scientific Committee on Antarctic Research in its "Horizon Scan 2020" (SCAR, 2015). The U.S. National Academy of Sciences, Engineering, and Medicine report (*A Strategic Vision for NSF Investments in Antarctic and Southern Ocean Research*, 2015) places prediction of ice mass loss from the West Antarctic Ice Sheet (WAIS) as the top priority for Antarctic research, and singles out Thwaites Glacier as a "region of particular concern".

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Since the 1990s, satellites have shown accelerating ice loss driven by ocean change in five neighboring glacier catchments, including Thwaites Glacier, that drain more than one third of the WAIS. The rate of ice loss there doubled in six years and now accounts for about 10 percent of global sea-level rise. The most rapid ice loss is currently from Pine Island Glacier, which has been the focus of the NERC iSTAR Programme and NSF-funded science. Recent studies indicate the greatest risk for future rapid sea-level rise now arises from Thwaites Glacier due to the large changes already underway, the potential contribution to sea-level rise, and the societally relevant timescales of decades to centuries over which major, irreversible changes are possible in the system.

The program will have a direct and significant impact on understanding the stability of marine ice sheets and specifically the West Antarctic Ice Sheet in the vicinity of Thwaites Glacier, and will contribute to the ice-sheet modeling community capability to simulate ice sheets and to reduce the uncertainties in sea-level projections. In addition, the program will contribute to improving risk assessments that coastal communities need for decisions about adaptation and long-range planning.

II. PROGRAM DESCRIPTION

The Thwaites Glacier (TG) research program will support an observational and modeling campaign in the TG and neighboring Amundsen Sea region to understand the changes taking place and the processes driving these changes. Modeling activities should proceed hand-in-hand with data collection to help optimize measurement strategies, decipher external drivers, and, ultimately, deliver improved projections of sea-level rise. Improved decadal projections will be supported by coupled models that incorporate observations from the zone where TG comes into contact with the ocean, as well as contextual data on TG and its catchment. Longer-term projections will be constrained by answering the critical question “did TG survive the last interglacial?” Observational evidence would constrain the extent and timing of past deglaciation of TG. This would provide a key opportunity to test hypotheses regarding the instability of marine ice sheets.

To reduce uncertainty in future contributions of the WAIS to sea-level requires an integrated program of research with a balanced portfolio of projects on TG. A key element of this joint NSF-NERC program is that each project must have substantive and integrated US-UK collaboration at its core. Projects are invited on one or more of the following themes:

1. **Boundary Conditions:** characterize boundary conditions and current state of TG and its surroundings through observations on or near the ice surface, in the ocean, and at the ice-sheet bed and margins. These observations will inform coupled models of ice-bed-ocean-atmosphere interactions that will be used to project future change.
2. **External drivers of change:** identify and characterize the past, recent, and potential future drivers of change at TG and address the question of why TG is changing now. Activities may include oceanographic measurements from ships, autonomous vehicles, and moorings; atmospheric measurements; shallow ice cores; land-surface, airborne, and satellite remote sensing; and high-resolution modeling to understand key processes determining forcing on TG.
3. **Processes leading to collapse:** examine key poorly understood processes that influence the dynamics and collapse of marine ice sheets (e.g., processes leading to shelf disintegration, grounding line retreat, enhanced sliding). Activities should be conducted at TG or have strong relevance to TG-related questions. These activities will inform treatment of collapse processes in models.
4. **Past change:** identify past changes that inform understanding of TG history. Activities may include drilling for sediment or bedrock samples, and results should inform modeling efforts.
5. **Forecasts of future change:** simulate the potential evolution of TG and its effect on sea-level. Activities may include the continued development of ice-sheet models capable of coupling with ocean/climate models in order to fully exploit the improved understanding of the WAIS developed in the other dimensions of this program.

Field Seasons

Three field seasons are anticipated under this call. Pending availability of resources, these would be 2018/19, 2019/20, and 2020/21. The first of these seasons would be primarily for logistics staging, but may also include deployment of long-duration sensors. The later seasons would be the focus of the field program.

Related Observational Campaigns in Support of the Program

The British Antarctic Survey, beyond its planned logistics support of NERC/NSF co-supported projects that arise from this solicitation, anticipates observational and modeling activities in support of the overall initiative. These include an airborne geophysical survey of the Amundsen Sea ice margin, maintaining moorings in the Amundsen Sea, and conducting an overland radar traverse from Fletcher Promontory to WAIS Divide camp to tie together dated layers across the TG catchment. In addition, work is anticipated to couple the NEMO ocean model with the BISICLES ice-sheet model. The Centre for Polar Observation and Modelling (CPOM) anticipates developing and making available a contemporary ice velocity map of the region. Details of these support efforts from UK National Capability funds are available through the Thwaites program page on the NERC website.

Science Coordination

In addition to the expected coordination within each project, it will be necessary to coordinate among all grantees to maximize the value and impact of the overall program. Separate proposals are sought to fulfill this cross-project science coordination role.

Functions performed in this role would include:

- enhancing integration among projects
- facilitating planning, data sharing, and synthesis.
- serving as a hub of outreach and education activities
- representing the program at meetings
- organizing conference sessions
- organizing program meetings
- facilitating data management and discovery

As with all proposals in this competition, the US and UK PIs of coordination proposals may not be lead PI on another proposal. See the Supplemental Instructions for specific guidance on preparing science coordination proposals and contact the cognizant Program Directors should questions arise.

PROGRAM NOTES

Facilities, Logistics, and Support

This program will have at its core a coordinated US-UK logistics effort. It is anticipated that research teams will use a mix of US and UK assets, and that initial plans for these will be documented in the proposal. Because of the remote setting and challenging nature of operating in the target region, proposers must pay particular attention to their logistics footprint and the practicality of field plans.

NERC will contribute to the logistics requirement of the project through the British Antarctic Survey (BAS). Anticipated assets include the RRS James Clark Ross to support marine science and onshore logistics. Land-based science and logistics will be supported using the scientific tractor traverse developed for the iSTAR project. This will be complemented with the usual BAS stations, aircraft, field camps and lightweight travelling parties. For sites and facilities, see <https://www.bas.ac.uk/polar-operations/sites-and-facilities/>. For fieldwork planning see <https://www.bas.ac.uk/polar-operations/life-in-the-polar-regions/camping-and-deep-field-working/>. For information on the tractor train see <https://www.bas.ac.uk/polar-operations/sites-and-facilities/facility/rothera/tractor-train-traverse-system/>. Please contact the BAS Operations Manager Mike Dinn, (Email medi@bas.ac.uk, Telephone +44 1223 221637) for more detail about available support.

The U.S. Antarctic Program (USAP) maintains a web portal (<http://www.usap.gov/>) with research, logistics, and operational information about U.S. activities in the Antarctic. In addition to information regarding USAP stations, ships, and related field support, the website provides descriptions of research support provided by other organizations. The "Information for Proposers" page

(<http://www.usap.gov/proposalInformation/>) provides links to resources that will be useful during proposal preparation, as well as information detailing the science support process and associated timeline. For information on logistical support, investigators may contact the Antarctic Research Facilities and Special Projects Program Director (Michael E. Jackson, mejacks@nsf.gov) or the Research Support Manager (Jessie Crain, jlcrain@nsf.gov) or the Ocean Projects Manager (Tim McGovern, tmcgover@nsf.gov) in the Antarctic Infrastructure and Logistics Section. In addition, NSF's prime Antarctic logistics contractor, Leidos Antarctic Support Contractor (ASC) coordinates research support and field operations in Antarctica and has a planning group that can assist investigators with questions about field or logistical support.

International Collaboration and Cooperation (Non-U.S./U.K. facilities)

This solicitation requires substantive and integrated US-UK collaboration at the core of all proposals. This does not preclude further international collaboration on a project-by-project basis.

USAP and NERC welcome proposals that involve collaboration and cooperation with scientists from other nations. Such proposals are usually the result of scientist-to-scientist discussions of potential collaborations. When discussing such projects with foreign colleagues, remember that individuals cannot commit USAP or NERC resources. Your acceptance of a generous offer from another nation's Antarctic program could inadvertently be construed as commitment of U.S. or NERC resources for some later project. Scientists wishing to do research with other nations' Antarctic programs are asked to contact the Program Directors for this solicitation before submitting a formal proposal.

ENVIRONMENTAL STEWARDSHIP

The Antarctic Treaty System and its Protocol on Environmental Protection (1991), prescribes comprehensive environmental protection measures.

The UK implements this through the Antarctic Act 1994, Antarctic Act 2013, and associated regulations. The U.S. implements these environmental protection agreements through the Antarctic Conservation Act of 1978 (Public Law 95-541), as amended by the Antarctic Science, Tourism, and Conservation Act of 1996 (Public Law 104-227).

The Protocol on Environmental Protection to the Antarctic Treaty (1991), the UK Antarctic Act (1994, 2013), and the US Antarctic Conservation Act (ACA) require all Antarctic activities including scientific research, science support, construction, operations, logistics, and facilities maintenance, to be subject to an Environmental Impact Assessment (EIA). In the US, the Division of Polar Programs conducts these assessments and in the UK BAS does so. No activity may go forward until the EIA process is complete.

Some activities will also require a specialist UK Antarctic Act or US ACA Permit before the activity can proceed. These activities include the sampling of or harmful interference with flora and fauna, taking geological samples (including soils and sediments), waste disposal, use of designated pollutants, introduction of non-native species, and entry into protected areas. In certain cases, the EIA will cover some of these activities, rather than the issuance of individual permits.

Information on EIA and UK Permitting is available at: <https://www.bas.ac.uk/for-staff/polar-predeployment-prep/intro-guidelines-and-forms/preliminary-environmental-assessment/> and at <https://www.bas.ac.uk/for-staff/polar-predeployment-prep/intro-guidelines-and-forms/permits/>.

U.S. Scientists may apply for an ACA permit, which is required for interaction with seabirds, mammals, and in certain cases, plants, and to enter protected areas for compelling scientific purposes. ACA permits may be required for over-flight of areas where wildlife congregates. The permit review process provides for public comment on each application. Information on the ACA and the permit application process can be found at the NSF website (<https://www.nsf.gov/geo/plr/antarct/aca/aca.jsp>).

Transshipment and importation of Antarctic samples is governed by regulations of the countries involved (e.g., New Zealand, Chile, United Kingdom, and the United States). Consult "Information for Proposers" on [USAP.gov](http://www.usap.gov/usapgov/proposalInformation/contentHandler.cfm?id=2799) for details on ACA permits and those required for transshipment and importation (<http://www.usap.gov/usapgov/proposalInformation/contentHandler.cfm?id=2799>). For questions as to whether a permit is required, contact the Program Director relevant to the proposed research or the Polar Programs Permit Officer (acapermits@nsf.gov).

Samples collected by UK researchers will be governed by FCO regulation and permitting. Further details about importing samples and permitting can be obtained from the BAS operations manager Mike Dinn (Email medi@bas.ac.uk, Telephone +44 1223 221637).

III. AWARD INFORMATION

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 5 to 8

Total (combined US and UK) project research budgets may be up to a maximum of \$4,000,000 for up to five years.

Anticipated Funding Amount: \$20,000,000 to \$25,000,000

Awards are anticipated to begin after October 1, 2017, pending availability of funds. The total anticipated funding amount is the combined total of NSF and NERC research funds. If a project is recommended for funding, NSF will support the US component of the project and NERC will separately support the UK component of the project.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

In addition, and separate from these awards to organizations, field and laboratory support will be available in Antarctica for those projects for which fieldwork has been proposed and approved.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

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

Who May Serve as PI:

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

Normal NERC eligibility rules apply for UK-based team members. These can be found in Section C of the NERC Research Grant and Fellowships Handbook. UK Independent Research Organizations (IROs) must be eligible for NERC Managed (Strategic Research) Mode.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Each proposal must have a US and UK Principal Investigator (PI). An individual may appear as PI on no more than one proposal and appear on no more than two proposals in total, whether as co-PI, Senior Personnel, or consultant (or any similar designation).

Additional Eligibility Info:

Normal NERC eligibility rules apply for UK-based team members. These can be found in Section C of the NERC Research Grant and Fellowships Handbook. UK Independent Research Organizations (IROs) must be eligible for NERC Managed (Strategic Research) mode. UK associated studentships are eligible under this program. The cost for the studentship should be included within the total requested funds. Each studentship should constitute a distinct project providing added value to the parent grant. The main grant research should still be viable without the studentship and should have distinct objectives that are not reliant on the requested studentship. See the Thwaites program page on the NERC website for additional information.

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 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. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (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.

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.

Antarctic research proposal preparation:

Supplemental instructions

1. Submission of Joint Proposals:

- a. All proposals must be submitted solely to NSF. Each proposal must involve substantive and integrated contributions from US and UK collaborators. At the beginning of the project description, a lead PI must be identified for both the US- and UK-based portions of the team. Biographical sketches and collaborators and other affiliations information for all senior personnel on the project must be included in NSF format.
- b. All proposals must be submitted by a single US institution (not as separately submitted "collaborative proposals"). When multiple US institutions are involved, budgets must be included for subawards to collaborating institutions and personnel.
- c. For research proposals, the UK portion of the budget must be presented in NERC format as a Supplementary Document. This can be found at <http://www.nerc.ac.uk/funding/available/researchgrants/international/uk-budget-form/>. The NERC funding

contribution will be at 80% Full Economic Cost (FEC) with the standard exceptions paid at 100% FEC, for example ship time and marine equipment, and associated studentships. Indexation at the prevailing rate will be applied at the time of award. Please see the Thwaites program page on the NERC website for further information. UK participants must include a budget justification with this Supplementary Document. After the review process, UK participants on successful projects will ultimately be required to submit their proposals through the JeS system. Further information will be provided to those for whom this becomes relevant.

- d. For Science Coordination proposals, the UK budget must be submitted in NSF subaward format.
- e. Participant Support and other travel costs for program-related meetings must not be included in proposal budgets as these will be separately supported.

2. Project title: Proposal titles must begin with "NSFPLR-NERC:".

3. Where to Submit: all proposals must be submitted to this solicitation. It is recognized that proposal topics will be relevant to one or more Antarctic core programs. Proposals may identify on the cover page Antarctic Sciences core programs as secondary recipients of the proposal (e.g., Antarctic Glaciology, Antarctic Earth Sciences, Antarctic Ocean and Atmospheric Sciences, Antarctic Integrated System Science) as appropriate.

4. Broadening Participation: The Antarctic Sciences Section strongly encourages proposals from persons under-represented in science (e.g., women, minorities, those with disabilities) and from investigators new to Antarctic research with the goal of broadening participation of both individuals and institutions. Antarctic Sciences also strongly encourages international collaborations and research-related education and outreach as part of broader impacts of proposals.

5. Page limit: Proposals must not exceed 15 pages in the project description section (see NSF GPG or NSF Grants.gov Application Guide for details). The normal 15-page limit for the Project Description will be enforced, according to the NSF GPG, Chapter II, C., 2.d.ii.

6. Data and sample disposition: NSF and NERC policy requires that investigators make samples and data available to other researchers at no more than incremental cost and within a reasonable time (See NSF AAG Chapter VI.D.4b and the NERC Data Policy). In the Data Management Plan, all proposals must describe how data and metadata will be managed, shared, and archived. This plan must be included as a Supplementary Document (See NSF's GPG Chapter II.C.2.j) and must address requirements of Polar Programs. These are available in "Data Management and Data Reporting Requirements for Research Awards Supported by the Division of Polar Programs" (<https://www.nsf.gov/pubs/2016/nsf16055/nsf16055.jsp>).

7. Project Management Plan: Proposals must articulate how the various activities will be managed toward a successful conclusion to the project. Complex projects may require dedicated project management expertise. Proposers should carefully consider the needs of the research activities and include an appropriate description of the management plan and appropriate resources in the budget. The Project Management Plan must be submitted as a Supplementary Document and must not exceed three pages. While it will not be possible to be specific about how the project would interface with other projects covering different dimensions of the overall program, the proposal and the Management Plan should be written with the expectation that the project would be part of a larger, coordinated body of effort as described in the Program Description. Note that costs related to program-level meetings organized by the Coordination Office must not be included in research project budgets.

8. Proposals Involving No Fieldwork: Proposals must be clear about whether or not fieldwork in Antarctica is needed. If no fieldwork is required, the statement "This proposal does not require fieldwork in the Antarctic" must be included as the last line of the Project Summary.

9. Proposals Involving Fieldwork:

If fieldwork is required, the statement "This proposal requires fieldwork in the Antarctic" must be included as the last line of the Project Summary.

Project Descriptions must contain sufficient information for reviewers and program staff to judge the scientific need for fieldwork, field readiness, and whether the resource levels requested are appropriate. NSF's goal for supporting fieldwork within the USAP is to support activities that can only be done, or are best done, in Antarctica. Consequently, proposals must convince reviewers and NSF that the proposed fieldwork meets this goal. Investigators must justify the need to conduct laboratory analyses in Antarctica rather than analyzing samples in their home laboratory. All instrumentation used in Antarctic fieldwork must be tested and considered operational prior to deployment.

Project descriptions must justify the number of field team members and their roles. Field team members must have a well-justified role in the team that makes it clear the research cannot be reasonably accomplished without the position. Foreign collaborators must be identified. If a proposer contemplates having a family member participate in fieldwork that person must have appropriate qualifications. NSF reserves the right to seek institutional concurrence for situations in which family members are proposed as field team members.

Proposers must submit a Logistical Requirements and Field Plan, which will be subject to peer review, outlining the PI's logistical requests associated with the proposed fieldwork. This statement must be included as a Supplementary Document. Proposals with fieldwork that lack this Plan are subject to return without review.

The Logistical Requirements and Field Plan must include the following elements and is limited to two pages of text and one page of figures (if needed):

- o Brief statement of research objectives
- o List of field sites and the geographic region(s) in which they are located. For remote sites, investigators should consider providing a map of proposed field sites with coordinates included.
- o Description of proposed field activities including major logistical resources required (e.g., fixed-wing aircraft, overland vehicles, vessels, helicopter support, laboratory, and aquarium facilities).
- o Description and justification of the desired deployment schedule. Projected numbers of deploying personnel.
- o Description of any needs for facility construction, alteration, or instrument installation. Investigators should consider providing a design and/or instrument plan as part of this description or referencing the proposal.
- o Provide references to any proposal text that describes aircraft instrumentation, unmanned aerial vehicle or drone use, scientific instruments or equipment with special support requirements, and field sampling or diving plans.

Investigators who require US vessel support must fill out a UNOLS ship request form (https://strs.unols.org/Public/diu_login.aspx) and submit the completed form as a Supplementary Document. Investigators who require UK ship or equipment support must fill out a Ship Time and Marine Equipment (SME) form (<http://www.nerc.ac.uk/research/sites/facilities/marine/using/>) and submit the completed form as a Supplementary Document. UK investigators should consult Section F point 230 of the NERC Research Grants and Fellowships Handbook for further information. All SMEs must be submitted by January 9, 2017 so costs can be calculated for inclusion in proposal budgets. All costs must be included within proposals and be counted toward the budget cap. Early discussions with Marine Planning are encouraged. See the Thwaites program page on the NERC website for more information.

Proposals involving international collaborations in addition to US-UK collaborations must include letters from the foreign investigator acknowledging their role in the proposed collaboration (as described in the proposal) and providing the name and contact details, as applicable, for the foreign Antarctic program or foreign funding agency that will support the foreign investigator. These letters must be uploaded as Supplementary Documents.

Projects requiring support from PASSCAL, UNAVCO, PGC, or IDDO must include a letter of support from the facility outlining supportability and any additional costs that will be incurred by the proposed work. Such costs must be counted toward the budget cap.

Applicants may apply for access to any Research Councils UK (RCUK) services and facilities. Prior to submitting a proposal, applicants wishing to use a NERC service or facility must contact the facility to seek agreement that they could provide the service required and a technical assessment must be obtained from the facility and included with the proposal submission in a letter of support. The costs for the service or facility must be included within the proposal budget and be counted toward the budget cap. Further information on NERC services and facilities can be found on the NERC website.

The Logistical Requirements and Field Plan will assist reviewers in assessing the readiness of the project and alert the USAP and BAS logistics teams to the support requirements of the possible upcoming project. Additional information and descriptions of logistical support capabilities at all three US Antarctic stations and on the two USAP research vessels can be found on the USAP web portal on the Information for Proposers web site at <http://www.usap.gov/proposalInformation/contentHandler.cfm?id=2796>.

US-based Investigators unsure of the logistics requirements necessary to accomplish their research goals should contact their cognizant NSF Program Director in Antarctic Integrated System Sciences (Paul Cutler, pcutler@nsf.gov), Antarctic Glaciology (Julie Palais, jpalais@nsf.gov), Antarctic Earth Sciences (Thom Wilch, twilch@nsf.gov), Antarctic Ocean and Atmospheric Sciences (Peter Milne, pmilne@nsf.gov), Antarctic Research Facilities and Special Projects Program Director (Michael E. Jackson, mejacks@nsf.gov), the Research Support Manager (Jessie Crain, jlcra@nsf.gov), or the Ocean Projects Manager (Tim McGovern, tmcgover@nsf.gov) in the Antarctic Infrastructure and Logistics Section as ideas for research proposals are being developed.

Additional information and descriptions of BAS logistical support capabilities are available on the web site <https://www.bas.ac.uk/polar-operations/sites-and-facilities/>.

UK-based investigators should contact the BAS Operations Manager Mike Dinn, (Email medi@bas.ac.uk, Telephone +44 1223 221637) when developing their proposals.

11. Unmanned Aircraft Systems (UAS), Unmanned Aerial Vehicles (UAV) and Remotely Piloted Aircraft (RPA), regardless of size, weight or form, are all subject to approval by NSF and BAS prior to use. These systems can substantially benefit scientific observations and so contribute to advancing knowledge of the Antarctic and to outreach activities. However, use of these systems in challenging Antarctic conditions can lead to unanticipated loss of equipment to the environment. In addition, careful consideration and appropriate controls must be exercised with regard to safety of equipment and personnel in the context of the USAP/BAS's sometimes high tempo of fixed wing, helicopter, ship, and vehicle operations. Accordingly, use of these devices in association with USAP- and BAS-approved activities (including research and outreach) must be well justified in the project description of proposals. In addition, the use of such systems requires explicit approval by NSF and BAS of a Concept of Operations (CONOPS) document submitted by the PI that includes consideration of factors such as safety of planned operations, environmental hazards including treaty obligations and known or foreseeable impacts, and risk mitigation strategies associated with their use. Such considerations apply to all aspects of unmanned aircraft operations as well as potential activities to recover or repair these systems once deployed. The CONOPS document will be developed and evaluated as part of the USAP and BAS joint planning process following a preliminary decision to support a project. Contact your program officer if you have questions.

UAV use by UK researchers will be governed by the BAS UAV regulations and approval process. More detail can be obtained from BAS operations manager Mike Dinn (email medi@bas.ac.uk, Telephone +44 1223 221637) or Head of Airborne Survey Technology Carl Robinson (email carob@bas.ac.uk, Telephone +44 1223 221338)

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

Budget provisions for field services in Antarctica:

For UK participants, NERC eligible costs for an Antarctic logistics funding proposals can be found at: <https://www.bas.ac.uk/science/opportunities-for-polar-fieldwork/preparing-a-funding-proposal-to-nerc/antarctic-logistics-funding-proposal-costs/>. Participants should contact the listed UK program manager with any UK-specific budget questions.

For US participants, costs for the following items must be included in your funding request. Questions related to this list should be directed to your cognizant Program Director or Research Support Managers in the Antarctic Infrastructure and Logistics Section.

- o Physical and dental examinations including blood work, for all persons deploying to Antarctica. NSF funding cannot be used to support medical or dental treatment that may be required to meet physical qualification requirements established for the U.S Antarctic Program or in support of a request for a waiver of the physical qualification requirements.
- o Per diem for travel to the departure point to Antarctica (itemized under "Foreign Travel"). Do not include airfare costs to this departure point. If non-UK-based foreign scientists are to be part of the field team, NSF expects that these individuals will provide their own airfare and travel expenses unless a compelling rationale exists for an exception. Consequently, these funds should not be requested in the proposal. They should buy their own tickets from their home location to their point of departure to Antarctica (Christchurch, NZ, Punta Arenas, Chile or elsewhere).
- o Laboratory consumables and supplies above those normally stocked in reasonable quantities by the U.S. contractor, project-specific equipment, field supplies that the contractor does not have in inventory, batteries to operate remote equipment, and equipment and supplies required at home organizations. A list of available lab materials, supplies, and chemicals can be found at: <http://www.usap.gov/usapgov/proposalInformation/>.
- o Non-recoverable and potentially non-recoverable equipment, such as moorings (except for the anchor mass), drifters, XCTDs, and satellite tracking tags.
- o Mountaineer/field safety support for research teams that will be working in technical terrain requiring enhanced field skills to ensure the safety of the field party and who can, if needed, serve as the responsible field team leader.
- o Technical support for the measurement of nutrients on research cruises.
- o Certified explosives blaster support required for detonation of explosives.

- Equipment dedicated to a project for multiple years including UNAVCO and IRIS/PASSCAL equipment that cannot be supplied from the core equipment pool.
- o Cargo and sample shipping within the continental United States to/from the U.S. Antarctic Program cargo center in Pt. Hueneme CA. Funds for shipment of temperature-sensitive samples from Antarctica should not be requested in the proposal.
 - o Accompanied excess baggage costs required for transport of research-related equipment.
 - o Specialized packaging or preparation of equipment needed for transport of project-specific equipment to and/or from Antarctica.
 - o Private medical evacuation insurance if a tour ship or other private transportation will be part of the field plan.

The USAP issues, at no charge to the award, limited amounts of basic polar clothing as described in the USAP Participant Guide (<http://www.usap.gov/travelAndDeployment/contentHandler.cfm?id=541>).

Insurance: NSF does not provide insurance for grantee personnel in Antarctica, and NSF funding, as a direct cost, cannot be used for the acquisition of insurance such as for health care, property loss, workers compensation or survivor benefits. Persons who need hospital care beyond the limited capabilities in Antarctica will be transported to the nearest appropriate health care facilities in New Zealand, South America, or the United States, at which point they will be responsible for medical costs. Investigators are encouraged to ensure that their health and life insurance policies cover flights aboard scheduled military aircraft. Investigators are also encouraged to ensure that their medical insurance covers medical transportation cost for return to the U.S. from health care facilities in New Zealand, South America, or other Antarctic access points that may be utilized for medical evacuation, in the event that service is needed.

U.K participants should refer to BAS guidance at https://www.bas.ac.uk/wp-content/uploads/2015/04/insurance_summer_visitors.pdf

C. Due Dates

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

March 01, 2017

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

A comprehensive description of the Foundation's merit review process is available on the NSF website at: 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

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

All proposals will be assessed jointly by NSF and NERC. Program Officers from both agencies will be involved in selecting ad hoc reviewers and panelists, operating a joint panel, and, following joint discussion of overall feasibility, settling on recommendations to their respective leadership.

All proposals will be assessed for:

1. Substantive participation of both US and UK team members
2. Quality of the Project Management Plan and evidence of integration among all components of the project.

In addition, research proposals will be assessed for:

1. Potential to advance the program objective 'to substantially improve both decadal and longer-term (century-to-multi-century) projections of ice loss and sea-level rise originating from Thwaites Glacier in West Antarctica'. And, specifically, potential to advance one or more of the five program themes.
2. Relevance to processes in the Thwaites Glacier catchment.
3. Operational feasibility: Proposals involving Antarctic fieldwork will be evaluated for operational feasibility, including safety and environmental impact. This feasibility will be considered in decisions for award or declination.

In addition, science coordination proposals will be assessed for potential to enhance the overall impact and success of the program.

B. Review and Selection Process

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

All proposals will be assessed jointly by NSF and NERC. Program Officers from both agencies will be involved in selecting ad hoc reviewers and panelists, operating a joint panel, and, following joint discussion of overall feasibility, settling on recommendations to their respective leadership.

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 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.

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.

Special Award Conditions:

Projects must comply with the NSF PLR Data Management Policy ("Data Management and Data Reporting Requirements for Research Awards Supported by the Division of Polar Programs"). This policy has specific requirements for the submission of data, metadata, and derived products to data centers. For full details, see <https://www.nsf.gov/pubs/2016/nsf16055/nsf16055.jsp>.

Metadata. Principal Investigators are required to submit metadata files for all data sets and derived data products in the form of a Directory Interchange Format (DIF) entry, to the Antarctic Master Directory. This is done via the USAP Data Coordination Center (<http://www.usap-data.org/>). Further information on DIF generation can be found on the Global Change Master Directory website (<http://gcmd.gsfc.nasa.gov/>). This metadata submittal is a requirement of US Antarctic Program and NERC obligations under the Antarctic Treaty. Proof of the DIF metadata submission must be included in the Final Project Report to NSF in the form of a link to the metadata and data archive, in the section entitled: Products-Websites.

NERC Awards. NERC grantees will receive a NERC offer, which consists of a letter containing details of the funds being awarded, including a breakdown by fund heading, Service and Facility usage information, grant additional information, and general terms and conditions of award, which can be found in Section L of the *NERC Research Grants and Fellowships Handbook*. Additional grant and call specific terms and conditions of award may be included where necessary, which include specific conditions relating to Antarctic Logistic support, equipment, and facilities.

Acknowledgement of US Antarctic Program and UK NERC support. In addition to the acknowledgement of NSF and NERC support, projects receiving US Antarctic Program and/or BAS support for fieldwork in the Antarctic must include the following acknowledgement in publications resulting from the project:

Logistical support for this project in Antarctica was provided by the U.S. National Science Foundation through the U.S. Antarctic Program and by the U.K. Natural Environment Research Council through the British Antarctic Survey.

Further guidance on acknowledging support and providing disclaimers is given in the NSF Award and Administration Guide VI.E.4.

C. Reporting Requirements

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

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

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

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

VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Paul Cutler, telephone: (703) 292-4961, email: pcutler@nsf.gov
- Jessica Surma, telephone: +44(0)1793411600, email: jetc@nerc.ac.uk

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message

from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

This is a joint solicitation with the UK Natural Environment Research Council (NERC). UK-based researchers are encouraged to contact the NERC representative with questions on UK-specific details.

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <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
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress.

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

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

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

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