

Ship-based Science Technical Support in the Arctic (STARC)

Augmenting Science Support on the USCGC Healy

PROGRAM SOLICITATION

NSF 22-528

REPLACES DOCUMENT(S):

NSF 10-594



National Science Foundation

Directorate for Geosciences
Office of Polar Programs

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

March 01, 2022

IMPORTANT INFORMATION AND REVISION NOTES

Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in [Important Notice No. 147](#). In support of these efforts, research proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov or via Grants.gov, and may not be prepared or submitted via FastLane.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 22-1](#)), which is effective for proposals submitted, or due, on or after October 4, 2021.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Ship-based Technical Support in the Arctic
Augmenting Science Support on the USCGC Healy

Synopsis of Program:

This solicitation is for proposals to enhance marine science and technical services provided to NSF-supported research cruises on U.S. Coast Guard cutter (USCGC) Healy. U.S. Coast Guard (USCG) provides basic services that will be augmented by the awardee to the level provided by the University-National Oceanographic Laboratory System (UNOLS) for supporting academic research. This solicitation is for an awardee to perform two primary functions: 1) to plan, coordinate, and deliver science technical support onboard the USCGC Healy, augmenting the role of the USCG marine science technicians and 2) to coordinate with NSF, USCG, and the academic community to provide for the operation, maintenance and upgrade of science equipment installed or used on the USCGC Healy. The awardee is expected to coordinate support among qualified providers as appropriate for specific cruises, utilizing the capabilities and equipment available through the UNOLS system. Ship-based science support will be planned and provided in close coordination with the research teams and USCG personnel with input and approval from NSF.

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.

- Frank R. Rack, Arctic Research Support and Logistics Manager, W7189, telephone: (703) 292-2684, email: frack@nsf.gov

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Continuing Grant or Cooperative Agreement

Estimated Number of Awards: 1

One award for 5 years as a continuing grant or cooperative agreement to a lead institution submitting a proposal that may include subawards to multiple institutions.

Anticipated Funding Amount: \$500,000 to \$1,500,000

per year, subject to availability of funds. The funding amount is given as a range because the annual funding amount will be based on support requirements of funded research projects for each annual period of performance and availability of funds. After the first year, the funding request will be proposed by the awardee and agreed to by NSF through an annual program plan.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
 - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide (PAPPG)* guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
 - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Cost Sharing is not required under this solicitation.
- **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, 2022

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Section for Arctic Sciences supports ship-based research in the Arctic in all aspects of oceanography and marine science as individual projects or organized research efforts. The USCGC *Healy* was commissioned for active service in 2000 and was designed to support research in the Arctic. It has supported approximately 2-4 projects per year during the arctic summer season, May - November, funded by NSF, Office of Naval Research (ONR), National Oceanic and Atmospheric Administration (NOAA), United States Geological Survey (USGS), The National Aeronautics and Space Administration (NASA) and other agencies or organizations. Its capabilities are described in greater detail on the USCG website <https://www.pacificarea.uscg.mil/Our-Organization/Cutters/cgcHealy/> and a science support website for the USCG <http://icefloe.net/>.

Requests for ship time on the USCGC *Healy* are made through the University-National Oceanographic Laboratory System (UNOLS; <http://www.unols.org>.) Marine Facilities Planning (MFP) system (<https://mfp.us>). The Section for Arctic Sciences collaborates with USCG to schedule and manage the icebreakers in collaboration with other federal agencies and involving the research community through the Arctic Icebreaker Coordinating Committee (AICC; <https://www.unols.org/committee/arctic-icebreaker-coordinating-committee-aicc>), a subcommittee of UNOLS. In conjunction with USCG and the AICC, NSF has supported the development of the scientific capabilities of the USCGC *Healy*. The awardee will work with USCG, NSF, other agencies and the AICC to identify and implement improvements to the technical systems that support science in addition to providing science technical support during cruises.

II. PROGRAM DESCRIPTION

The Arctic Sciences Section seeks proposals to provide two main functions: 1) to plan, coordinate and deliver science technical support onboard the USCGC *Healy*, augmenting the role of the USCG marine science technicians and 2) to coordinate with NSF, USCG, and the academic community to provide for the operation, maintenance and upgrade of science equipment installed or used on the USCGC *Healy*.

The number of cruises supported by the Arctic Sciences Section varies each year based on funded proposals. Because other agencies like ONR, NOAA, USGS and NASA fund cruises on the USCG icebreakers, NSF expects that these agencies will request services provided by the awardee on a cost-reimbursable basis to NSF. To provide a scope of work for proposers to respond to, the awardee may anticipate supporting up to 4 cruises per year for a total of 115 days conducting oceanographic and marine science research on the USCGC *Healy*.

Four technicians are typical to operate all underway systems, plus an additional person may be needed onshore for data management for all cruises. The awardee should plan to have technical staff available for shakedown and transit cruises to the Arctic prior to the field season for a total of 25 days, depending on the area of research focus. Key personnel should also plan to attend pre-cruise planning meetings with the ship, routine telephone calls with USCG, NSF or UNOLS organizations, and post-cruise debrief teleconferences. These parameters are intended to simplify the proposal budget development and to outline an expected scope of work. Services provided on board will include operation of all "standard" equipment and systems described below. Those support services

described as "other" will vary depending on the nature of the cruise and are not necessary to include in the proposal budget.

The awardee will work closely with NSF, the chief scientist and other participating researchers to provide an appropriate level of cruise support. Types of support will vary from cruise to cruise, aspects of which are noted below. NSF anticipates that no single institution will provide all ship-based technical support, but rather that the awardee will work with the academic research community to coordinate services from established providers. The awardee should provide pre-cruise planning, deliver support during cruises, provide underway data to approved data archives, and provide information for the chief scientist's post-cruise report. The awardee will participate in cruise debriefs conducted by the AICC to address concerns of the research team or ship. Because Arctic cruises may be supported by vessels other than those affiliated with USCG, the awardee may be requested to coordinate with other vessel operators and the chief scientist to share or transfer equipment.

The awardee will work with NSF, AICC, USCG, and the academic community to define program needs and priorities for maintenance and upgrades to ship-based science support capabilities, including participation in scheduled dry dock activities, which would be considered as "other" support services. To accomplish these responsibilities, the awardee is expected to participate in meetings of the AICC and other UNOLS committees such as Research Vessel Operators Committee (RVOC) and Research Vessel Technical Enhancement Committee (RVTEC) and to work with the engineering and operations staff of the USCGC *Healy* and with NSF.

More information about UNOLS institutions, pooled equipment, research vessels and UNOLS committees is available on the UNOLS website at <http://www.unols.org/>. Additional information about science support on the USCG icebreakers is available from the USCGC *Healy's* Marine Science Officer (D13-DG-CGHealy-MSO@uscg.mil).

Planning, Coordination and Reporting

Ship time requests for use of the U.S. Coast Guard icebreakers are submitted by researchers through the UNOLS Marine Facilities Planning (MFP) system and are copied to the awardee. NSF will notify the awardee when projects are funded to initiate their detailed planning process. When funding decisions are made, USCG develops the icebreaker schedules in collaboration with NSF and other agencies. The awardee will work with NSF during this planning phase of each arctic field season.

An Annual Program Plan (APP) will typically be due on **March 15** of each year, detailing the planned technical support for scheduled cruises and related science technical support activities for review and approval by NSF. This APP will form the basis for each year's activities with adjustments negotiated as needed between NSF and the awardee. Each year after the first year, an annual report should accompany the APP. The annual report should summarize major activities and accomplishments and include a government-recognized performance metric of the number of days of service lost due to the organization's performance. Other performance metrics may be included as well.

Science support on *Healy* includes, but is not limited to:

Acoustic Equipment

Proposals should address operational support of the ADCP, multibeam sonar, and sub-bottom profiler onboard the USCGC *Healy*. The awardee will operate these instruments while underway. The successful proposer should present a staffing plan and approach for collecting and distributing data from these and other underway measurements and for providing spatial data services such as real-time bottom mapping and georeferencing satellite imagery of ice conditions.

Hydrographic Systems

A mainstay of arctic research includes collecting essential oceanographic data. The awardee will provide support to operate and manage onboard hydrographic systems. These systems include CTD rosettes, flow-through system with associated measurements, salinometer, bathythermograph data acquisition system and other devices that may be required for oceanographic studies. The flow-through system also includes a pCO₂ instrument. The awardee will coordinate with NOAA personnel to maintain the system before and after each field season and will document STARC time and effort associated with this support for reimbursement to NSF.

Meteorological Systems

The awardee will operate the science meteorological systems available on the USCGC *Healy* and provide a plan to maintain and configure meteorological sensors in support of research. The USCGC *Healy's* systems include air temperature, ultrasonic wind, barometric pressure, photosynthetically active radiation (PAR), long and shortwave radiation, and relative humidity.

Other Science Instrumentation

The USCGC *Healy* is also equipped with a gravimeter, Mili-Q system, hydrophone, a hull-mounted mooring release transducer, and an Edgetech mooring release deck box.

Navigation Systems

The awardee is expected to maintain a Trimble ABX Two and Trimble SPS 356 and provide science GPS feeds and inertial navigation systems.

Information Technology and Data

The USCG operates and maintains an onboard science network and science data logging. The awardee will also maintain a number of software systems currently in use to analyze real-time underway navigation, multibeam data streams, and the 3D visualization and exploration of geophysical data.

The awardee will work with USCG on IT solutions for research teams. Proposals may include new approaches to provide better connectivity for science teams on board the USCGC *Healy* while addressing USCG information security requirements. Proposals should include an approach for disseminating underway data to science teams immediately following cruises. Underway measurement data should be quality assured, quality controlled and submitted to relevant NSF-recognized data archives following each cruise.

Other Ship-based Support includes, but is not limited to: Coring

Upon request, the awardee will coordinate sediment coring support for research cruises as required. Coring equipment purchased for the USCGC *Healy* is managed by Oregon State University's Marine Sediment Sampling (MARSSAM) Group for storage and maintenance and is typically operated by OSU technicians (<http://marssam.ceoas.oregonstate.edu/>). In addition, the awardee may need to plan for other coring in support of research.

MARSSAM supplies and maintains equipment specific to Healy include:

- A gravity corer
- A jumbo piston corer
- MC-800 Multicorer
- A climate-controlled van to send to the Arctic
- Variety of sediment grabs

Other Requirements

The awardee will gather requirements from funded research projects and plan to meet those requirements. In addition to operating the above equipment onboard the USCGC *Healy*, the awardee may be required to provide or arrange support that includes but is not limited to the following:

- assisting with mooring deployment or recovery
- arranging and coordinating the use of general or special purpose vans, ensuring proper handling and disposal of hazardous or radioactive material
- assisting with deployment and recovery of autonomous vehicles
- arranging scientific diving
- designing and implementing active seismic systems
- conducting environmental assessments, consultations, and permitting activities, and engineering on-deck flow-through seawater systems
- assisting with requirements gathering for helicopter services in support of research
- recommendations on best practices from the UNOLS fleet
- interface with UNOLS Winch and Wire Pool
- maintaining spares inventory and consumables.
- other tasks as needed

The awardee should provide key personnel who will work with USCG, NSF and the chief scientist to determine the cruise requirements. To meet these requirements, services may be provided directly by the awardee or coordinated by the awardee utilizing other institutions equipped and experienced at providing aspects of cruise support required. The Arctic Sciences Section is interested in using existing infrastructure and institutions and technicians with expertise in relevant aspects of cruise support.

The proposal should describe an approach to gathering researcher requirements and planning to support the requests. The proposal may include a work breakdown structure, describe the approach to providing cruise support, describe the roles and responsibilities of personnel or entities involved, and should include metrics for how the service provider will assess their performance. The proposal should also address aspects of planning and overseeing maintenance and upgrades to science equipment on the USCGC *Healy* in collaboration with USCG, NSF, and the research community. Reports to the UNOLS AICC indicate that a mid-life dry dock and maintenance period for Healy is being planned for 2025 or 2026, with an earlier limited dry dock period in 2023 and annual dockside maintenance activities as required.

III. AWARD INFORMATION

Anticipated Type of Award: Continuing Grant or Cooperative Agreement

Estimated Number of Awards: One award for 5 years as a continuing grant or cooperative agreement to a lead institution submitting a proposal that may include subawards to multiple institutions.

Anticipated Funding Amount: \$500,000 to \$1,500,000 per year, subject to availability of funds. The funding amount is given as a range because the annual funding amount will be based on support requirements of funded research projects for each annual period of performance and availability of funds. After the first year, the funding request will be proposed by the awardee and agreed to by NSF through an annual program plan.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

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 Research.gov or Grants.gov.

- Full Proposals submitted via Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. The Prepare New Proposal setup will prompt you for the program solicitation number.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

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

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

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

B. Budgetary Information

Cost Sharing:

Cost sharing is not required under this solicitation.

C. Due Dates

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

March 01, 2022

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For Research.gov user support, call the Research.gov Help Desk at 1-800-673-6188 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov 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: <https://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

A comprehensive description of the Foundation's merit review process is available on the NSF website at: https://www.nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and other underrepresented groups 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

Proposals responding to this solicitation are to provide science technical support to funded research projects on the USCG icebreaker *Healy*. Accordingly, the intellectual merit of the proposal may be somewhat different than that in most research proposals. Intellectual merit will be reflected in proposing an organized approach to gathering requirements for maintenance and upgrades to shipboard science equipment, providing science support and documentation, and coordinating service providers to meet the requirements of funded research projects. Broader impacts of this support proposal will focus on services provided to a community of researchers but may also include education, training and outreach in fields relevant to marine sciences.

Meritorious proposals will:

- Describe an approach to gathering detailed science support requirements, planning, scheduling, budgeting and providing ship-based science technical support.
- Describe what aspects of science support will be provided directly and which aspects will be coordinated with other institutions and how this coordination will be managed successfully.
- Include metrics for measuring their success at providing research support and improving their performance. Include approaches to participate in ship scheduling meetings, AICC meetings and other relevant meetings.
- Leverage the investment NSF has made in developing the UNOLS pool of equipment, services and expertise as appropriate.
- Include an approach for managing the maintenance and upgrade of science equipment in collaboration with USCG, NSF and the research community.

B. Review and Selection Process

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

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the

identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

Special Award Conditions:

Any cooperative agreement awarded in response to this solicitation will contain the following term and condition:

Ensuring Adequate COVID-19 Safety Protocols

- a. This clause implements Section 3(b) of Executive Order 14042, Ensuring Adequate COVID Safety Protocols for Federal Contractors, dated September 9, 2021 (published in the Federal Register on September 14, 2021, 86 FR 50985). Note that the Department of Labor has included "cooperative agreements" within the definition of "contract-like instrument" in its rule referenced at Section 2(e) of this Executive Order, which provides:

For purposes of this order, the term "contract or contract-like instrument" shall have the meaning set forth in the Department of Labor's proposed rule, "Increasing the Minimum Wage for Federal Contractors," 86 Fed. Reg. 38816, 38887 (July 22, 2021). If the Department of Labor issues a final rule relating to that proposed rule, that term shall have the meaning set forth in that final rule.

- b. The awardee must comply with all guidance, including guidance conveyed through Frequently Asked Questions, as amended during the performance of this award, for awardee workplace locations published by the Safer Federal Workforce Task Force (Task Force Guidance) at <https://www.saferfederalworkforce.gov/contractors/>
- c. *Subawards*. The awardee must include the substance of this clause, including this paragraph (c), in subawards at any tier that exceed the simplified acquisition threshold, as defined in Federal Acquisition Regulation 2.101 on the date of subaward, and are for services, including construction, performed in whole or in part within the United States or its outlying areas. That threshold is presently \$250,000.
- d. *Definition*. As used in this clause -

United States or its outlying areas means—

1. The fifty States;
2. The District of Columbia;
3. The commonwealths of Puerto Rico and the Northern Mariana Islands;
4. The territories of American Samoa, Guam, and the United States Virgin Islands; and
5. The minor outlying islands of Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Midway Islands, Navassa Island, Palmyra Atoll, and Wake Atoll.

Principles for Conducting Research in the Arctic

Proposers should observe the Principles for Conducting Research in the Arctic (<https://www.nsf.gov/geo/opp/arctic/conduct.jsp>). These Principles are directed at academic and federal researchers funded by The Interagency Arctic Research Policy Committee (IARPC) agencies but are equally relevant to other individuals and organizations pursuing or funding research in the Arctic. They are guidelines for conducting responsible and ethical research, and they encourage respect for all individuals, cultures, and the environment.

The Arctic Research Support and Logistics (RSL) program was created, in part, to enhance access, safety and interactions with arctic communities. Accordingly, investigators are encouraged to propose effective and efficient use of logistics resources to achieve research goals and to cooperate with communities near field research sites.

Policies Related to Arctic Fieldwork

Participants in NSF-sponsored Arctic fieldwork are required to comply with the following NSF policies: Code of Conduct, Field Safety Risk Management, Physical Qualifications for Arctic Fieldwork, IT Security Rules of Behavior, or similar USCG policies and regulations. Failure to comply can result in removal from the field or from NSF facilities, retraction of funding, debarment, and referral to law enforcement as appropriate. These policies are available on the Arctic Research Support and Logistics program website (https://www.nsf.gov/geo/opp/arctic/res_log_sup.jsp) and the NSF prime Arctic logistics contractor website (<https://battlearcticgateway.org/for-researchers>)

Relevant Organizations

The University-National Oceanographic Laboratory System (UNOLS) includes pooled, university-operated equipment to meet specific research needs. UNOLS equipment may be requested for science support onboard the USCGC *Healy*.

When private aircraft are required for science support, NSF works with the Aviation Management Directorate (AMD) at the Department of the Interior (DOI), which coordinates contracting for federal aviation support.

NSF's prime arctic logistics contractor is [Battelle Arctic Research Operations](#) (Battelle ARO or ARO). They may be involved in some aspects of marine research

projects but do not typically provide ship-based support services.

C. Reporting Requirements

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

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

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

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Frank R. Rack, Arctic Research Support and Logistics Manager, W7189, telephone: (703) 292-2684, email: frack@nsf.gov

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

- FastLane and Research.gov Help Desk: 1-800-673-6188
- FastLane Help Desk e-mail: fastlane@nsf.gov
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

Additional information about science support on the USCG icebreakers is available from the *Healy's* Marine Science Officer (D13-DG-CGChely-MSO@uscg.mil).

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: nsfpubs@nsf.gov
 - or telephone: (703) 292-8143
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

Suzanne H. Plimpton
 Reports Clearance Officer
 Policy Office, Division of Institution and Award Support
 Office of Budget, Finance, and Award Management
 National Science Foundation
 Alexandria, VA 22314

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 National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA
 Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (703) 292-5090 or (800) 281-8749
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