

Facilitator of Marine Seismic Capabilities for the U. S. Research Community

PROGRAM SOLICITATION NSF 20-533



National Science Foundation

Directorate for Geosciences
Division of Ocean Sciences

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

April 10, 2020

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 19-1](#)), which is effective for proposals submitted, or due, on or after February 25, 2019.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Facilitator of Marine Seismic Capabilities for the U. S. Research Community

Synopsis of Program:

Proposals are solicited to support needs of the marine seismic research community for access to acquisition of long-offset and deep-imaging 3D seismic data using a large tuned source. These needs are currently provided by the specialized, seismic research vessel *R/V Marcus G. Langseth (Langseth)*. The *R/V Langseth* is owned by the National Science Foundation and operated by the Lamont Doherty Earth Observatory (LDEO) of Columbia University. NSF has determined that it cannot adequately invest in the *R/V Langseth* or replace the vessel at the end of service life. Therefore, alternative approaches are necessary for providing the marine seismic research capability to support high priority research proposals. *R/V Langseth* will continue operations through September 2021, or no later than the Fall 2021 regulatory dry-docking, and will be divested.

This NSF solicitation seeks proposals for a Facilitator of Marine Seismic Capabilities, herein referred to as a "Facilitator" or Facilitator Support Office" to work with researchers in identifying suitable vessels (commercial, foreign academic, or other) to support NSF-funded seismic research projects. The Facilitator will also be responsible for arranging and negotiating competitive lease agreements for marine seismic research activities that have been determined by NSF to be high priority projects following the merit review process. The Facilitator may also be asked to help support access to additional subsurface imaging techniques.

The successful proposal for the Facilitator of Marine Seismic Capabilities will be administered as a Cooperative Agreement (CA) over a five-year period of performance.

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.

- Bob Houtman, Head, Integrative Programs Section, telephone: 703-292-7704, email: bhoutman@nsf.gov
- Candace Major, Head, Marine Geosciences Section, telephone: 703-292-7597, email: cmajor@nsf.gov
- James Holik, Oceanographic Instrumentation and Technical Service Programs, telephone: 703-292-7711, email: jholik@nsf.gov
- Deborah Smith, Lead Program Director, Marine Geosciences Section, telephone: 703-292-7978, email: dksmith@nsf.gov

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1

Anticipated Funding Amount: \$35,000,000

\$1,000,000/year for five years of Facilitator Support Office activities.

Average of \$10,000,000/year for three years (2022-2024) of marine seismic research vessel operations.

Amounts are subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

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

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

Not Applicable
- **Other Budgetary Limitations:**

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

April 10, 2020

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:

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

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I. INTRODUCTION

The Division of Ocean Sciences (OCE) of the National Science Foundation (NSF) supports a broad portfolio of marine seismic research using a wide range of seismic tools. A key component of this portfolio includes ship-based seismic surveys to image over the full crustal scale, which is critical for connecting deeper and shallower geological and oceanographic processes.

OCE will not continue to support the operation of the R/V *Marcus G. Langseth* in the long-term, and over the past several years, OCE has worked with the research community, University-National Oceanographic Laboratory System (UNOLS), and other stakeholders, as documented herein, to make progress on developing a new seismic data acquisition strategy in anticipation of *Langseth* divestment by Fall of 2021 and/or the next regulatory dry-docking deadline.

This solicitation seeks the services of a qualified Facilitator, through a Cooperative Agreement, to support access to long-offset, large tuned source, and 3-D marine seismic research capability in support of the U.S. research community.

The initial period of the award is intended to cover five years beginning in 2020 or as soon as a new Cooperative Agreement is in place. Annual Reviews will be conducted in addition to a comprehensive Management Review after the first three years of Awardee performance. Results of the latter review, in combination with demonstration of continuing community need, will guide a decision to re-compete or renew the Cooperative Agreement for a second five-year period, with renewal also contingent on submission of a meritorious proposal.

II. PROGRAM DESCRIPTION

Facilitator of Marine Seismic Capabilities for the U.S. Research Community

General

Many important scientific research topics require specialized seismic infrastructure capable of operating throughout the global ocean. These topics include assessing geohazards such as subduction megathrusts and landslides, defining magma supply systems underlying volcanoes in various tectonic settings, constraining processes involved in the construction and evolution of the oceanic lithosphere, and understanding sea level change at multiple timescales. Since 2008, a principal means of providing these capabilities has been on R/V *Marcus G. Langseth* and the science requirements for these capabilities will continue beyond the planned *Langseth* divestment in 2021.

Accordingly, NSF/OCE is seeking proposals for a qualified Facilitator that will support access to marine seismic capabilities to meet the expected needs of U.S. academic research scientists following R/V *Langseth*'s divestment. Close interaction with NSF, the research community and owners/operators of marine seismic vessels will be required of the prospective Awardee, and the proposed approach must have the capacity for year-to-year flexibility. OCE anticipates contributing a base total of up to \$35,000,000 during the five-year performance period. This will include Facilitator Support Office costs of up to \$1,000,000 each year and an average of \$10,000,000/year for marine seismic vessel operations for the final three years of the five-year performance period.

Specific Tasks

The Facilitator will serve as the principal intermediary between researchers and marine seismic vessel operators. In this capacity, the Facilitator will:

1. Survey the market to identify availability of vessels that have the capability to support the needs of proposals to NSF that require long-offset, large-tuned source, and/or 3-D seismic capability. This task is expected to include site visits to candidate vessels, as appropriate.
2. Provide general advice to marine seismic research proponents concerning the most promising approaches and vessel alternatives for projects in the planning stage. This should be accomplished through regularly scheduled webinars, town halls and other suitable means, and should include a preliminary assessment of legal, regulatory and environmental issues, as well as personnel, equipment, scheduling and cost considerations. The Facilitator's advice will serve to inform marine seismic research proposals to NSF.
3. Establish a standardized process for obtaining the information from highly ranked NSF proposals that will enable implementation by means of the most suitable vessel facility. Geographic location, schedule and length of cruise, science party accommodation requirements, specialized equipment, technical support and other specific needs for accomplishing the science described in the award should be addressed.
4. Facilitate efforts required to obtain authorizations, permits and clearances for marine seismic research with (1) science proponents during the preparation and scoping phase of proposals and (2) NSF, science proponents, vessel operators and other government agencies during the pre-cruise phase of the activity. Coordinate preparation and submittal of documentation required to obtain clearance to conduct marine seismic research in foreign jurisdictions. Coordinate timely preparation and submittals of appropriate environmental compliance documentation, such as Environmental Assessments, Incidental Harassment Authorizations, Biological Assessments, and Protected Species Observer (PSO) Reports. Coordinate with vessel operators to ensure compliance with terms and conditions of authorizations/permits, including obtaining equipment (e.g., "big eyes"), personnel (e.g., PSOs), and mitigation, monitoring, and pre/post cruise reporting requirements.
5. Develop work statements for marine seismic vessel operation that incorporate requirements defined by the Principal Investigator of the research project and requirements for vessel operators to ensure compliance with all international and U. S. federal, state and local environmental laws, regulations and safety standards. NSF and the Principal Investigator of the research project will review and approve final work statements.
6. Issue competitive requests to lease marine seismic vessels in accordance with the approved work statement to implement awarded science projects.
7. Evaluate vessel lease proposals in terms of technical and operational suitability, schedule availability and project cost in collaboration with the NSF program office and the Principal Investigator of the research project. Provide recommendations to NSF concerning the best value proposal.
8. Negotiate and execute formal vessel leasing agreements with operators that are most advantageous to the scientific effort, considering cost and other factors (such as safety).
9. Manage vessel leasing agreements to achieve optimal scientific results in accordance with agreement terms and conditions.
10. Arrange for and support an on-board representative, if deemed necessary, for each cruise to facilitate interaction between the participating science party and the vessel operator while at sea.
11. Develop Annual Work Plans (AWPs) that detail specific activities and estimated costs for each year of Awardee performance. Provide Quarterly and Annual Reports that describe progress and associated cost in achieving efforts identified in the respective AWP. Include metrics that can be used to identify, measure and improve performance of scientific, budgetary and scheduling objectives. Provide additional reporting as described in Section VII.c. below.

III. AWARD INFORMATION

Estimated award up to \$35,000,000 over the five-year period of performance of the Cooperative Agreement, subject to the availability of funds. This consists of up to \$1,000,000/year for five years of Facilitator Office activities and an average of \$10,000,000/year for three years (2022-2024) of marine seismic research vessel operations. Years 1 and 2 of this award will not include vessel operations.

Additional, experiment-specific costs (e.g., environmental compliance assessment, marine mammal observers, etc.) for the final three years of CA performance period will be considered based on essential, supplemental efforts identified in approved Annual Work Plans.

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

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses

of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

Additional Eligibility Info:

U. S. IHEs or U.S. non-profit, non-academic organizations must serve as the Lead Organization. Collaborative proposals from multiple organizations may not be submitted.

Consortia may include subawards/partnerships with U. S. commercial and/or international organizations. Consortia members may not submit separate proposals.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via 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.

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

The Full Proposal shall conform to the guidelines specified in the NSF PAPPG or the NSF Grants.gov Application Guide, except where detailed below.

Proposers are reminded to review procedures under "Proprietary or Privileged Information" in Chapter II.D.1 of the PAPPG and to mark only such information, including patentable ideas, trade secrets, privileged or confidential commercial or financial information, disclosure of which might harm the proposer, with the appropriate legend such as, "The following is (proprietary or confidential) information that (name of proposing organization) requests not be released to persons outside the Government, except for purposes of review and evaluation." Please also see the section entitled "Privacy Act and Public Burden Statements" below.

In addition to the requirements for Sections of the Proposal described in PPAPG Chapter II.C.2, the **Project Description** shall include the following specific information:

- Describe the overall approach for providing a cost-effective marine seismic research capability and for facilitating access to suitable vessels in support of successful Marine Geology and Geophysics proposals awarded by NSF.
- Thoroughly address the experience and capability of the proposer to perform the specific tasks listed in Section II of this solicitation.
- Emphasize proposer understanding of marine seismic scientific research, familiarity with the associated community, knowledge of world-wide seismic research vessel assets, regulatory and environmental considerations, and the capability to successfully negotiate vessel leasing agreements.
- Provide an outline of the process for obtaining relevant information from Awardees as described in Specific Task 3 listed under Section II above.
- Provide a preliminary format to be used for leasing proposal requests described in Specific Task 6 of Section II. Identify significant issues likely to arise in leasing agreement negotiations.
- Describe the approach that will be followed to obtain clearance from foreign governments to conduct marine seismic research in areas under their respective jurisdictions. Discuss experience in securing vessel clearances and in coordinating the preparation of relevant environmental

- compliance documentation necessary for conducting this type of research.
- Discuss the approach for developing realistic, achievable Annual Work Plans to Facilitate Marine Seismic Capability for the U. S. Research Community. Include a discussion of how performance metrics and user statistics will be used to verify consistent completion of activities defined by Annual Work Plans within budget and schedule.

The Project Description shall be limited to no more than **40 pages**, not including the Budget and other Appendices which shall be submitted under Supplementary Documentation described below.

Please note that all information relevant to determining the quality of the proposed work must be included as part of the Project Description, unless otherwise directed in this solicitation.

General Information

Site visits to the R/V *Langseth* or related facilities at LDEO may be proposed for the first two years. All site visits will be guided and managed by NSF staff.

It is essential that all proposed vessels are compliant with regulatory body requirements.

For additional information on this competition, NSF practices and policies, and/or access to the Resource Library that provides further detail, proposing organizations should contact Bob Houtman (bhoutman@nsf.gov), Candace Major (cmajor@nsf.gov), James Holik (jholik@nsf.gov), or Deborah Smith (dksmith@nsf.gov). The following publicly available documents will be informative:

- Sea Change: <https://www.nap.edu/catalog/21655/sea-change-2015-2025-decadal-survey-of-ocean-sciences>
- Sea Change reply: <https://www.nsf.gov/geo/oce/pubs/nsf-oce-sea-change-reply-may-11-2015.pdf>
- Seismic workshop report: https://www.nsf.gov/geo/oce/pubs/Seismic_Workshop%20Report_final_2016.pdf
- Langseth* www site at LDEO: <https://www.ldeo.columbia.edu/research/office-of-marine-operations/langseth>
- NSF Strategic Plan: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf18045
- GEO Visions document: https://www.nsf.gov/geo/acgeo/geovision/nsf_ac-geo_vision_10_2009.pdf
- Marine Seismic Community Survey Results (July 2016): <https://www.unols.org/document/marine-seismic-community-survey-results-july-2016>
- Regional Framework Plan for Marine Seismics: https://www.unols.org/sites/default/files/SeismicRegionalPlan_MSROC_April_2018_map.pdf
- Dear Colleague Letter 16-120: Dear Colleague Letter: Provision of Marine Seismic Capabilities to the U.S. Research Community: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf16120
- Solicitation NSF 17-563: Provision of Marine Seismic Capabilities to the U. S. Research Community: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17563
- Report to NSF: Future of Marine Seismics Workshop: https://www.unols.org/sites/default/files/Report_to_NSF_May2019.pdf
- Dear Colleague Letter 19-083: Dear Colleague Letter: An Update to the Approach for the Provision of Marine Seismic Capabilities for the U. S. Research Community: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf19083
- University-National Oceanographic Laboratory System Research Vessel Safety Standards, 10th Edition, July 2015: https://www.unols.org/sites/default/files/RVSS_Edition_10_July2015.pdf

In addition to the above, proposing organizations should review documentation that is being made available through an NSF-maintained Resource Library. The documents are grouped in categories that include:

- Information Related to Environmental Compliance.
- Memoranda of Understanding and Similar Agreements.
- NSF and OCE Data Policies.
- Frequently Asked Questions (FAQs).

This Resource Library will be updated from time to time. For example, additional information will be added to the FAQs as needed.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

- Amounts for Facilitator Support Office limited to \$1,000,000/year for each year of 5-year performance period.
- Amounts for Marine Seismic Vessel operations limited to an average of \$10,000,000/year for final three years of the performance period. (Vessel operations in Years 1 and 2 excluded from this action.)
- Additional, experiment-specific costs (e.g., environmental compliance documentation, Protected Species Observers, etc.) for the final three years of the performance period will be considered based on essential, supplemental efforts identified in approved Annual Work Plans.

C. Due Dates

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

April 10, 2020

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

principles apply:

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

For this solicitation, the following additional specific review criteria will be applicable.

The capability and qualifications of the proposed organization to manage and execute program requirements in consideration of:

- The extent to which the proposal demonstrates familiarity with the world-wide fleet of seismic research vessels.
- The effectiveness of the approach for providing the required interface with researchers intending to develop proposals that will require use of marine seismic research vessels.
- The extent to which the proposal reflects understanding of the information required from scientific researchers to enable scoping and planning for access to suitable seismic research vessels.
- The degree to which the proposal demonstrates a working knowledge and capability of compliance with international and U. S. federal, state and local environmental laws and regulations and safety standards related to seismic vessel operations.
- The extent to which the proposal provides assurance of the capability to develop and execute vessel leasing agreements from the formulation of requirements through the solicitation, evaluation, award and administration phases of this activity.
- The sufficiency of the proposal in demonstrating the ability to develop achievable Annual Work Plans and associated performance metrics.

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:

The award associated with this solicitation will be a Cooperative Agreement, not a standard grant or a contract, that will fund the Provision of Marine Seismic Capability for U. S. Researchers in accordance with approved Annual Work Plans. Annual Work Plans must be provided within 120 days of the new award period. Any special requirements not stated herein will be negotiated at the time of award. Cooperative Agreements include substantial involvement of the Government, particularly in oversight of award performance. The following are some of the measures NSF uses to conduct oversight:

- Review of Annual Reports, Annual Work Plans, and Performance Metrics.
- Site visits, annually or as necessary.
- Review/approval of subawards including ship lease arrangements.
- Review of management performance and operation activities approximately midway through the initial five-year award.

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.

Additional Reporting Requirements

1. The Awardee will submit Annual Work Plans to NSF with budgets for support of the Facility Support Office and baseline operations.
2. The Awardee will provide Quarterly Reports to NSF in addition to the Annual Reports noted previously.
3. The Awardee will provide regular informal reporting including communications with the NSF Program Officers, as appropriate.
4. In compliance with the NSF/OCE data policy, data collected as a result of this Cooperative Agreement will be submitted to a data center within two years of collection. Submission of data will be the responsibility of the grantee institution of the principal investigator of the science project. The Awardee will ensure that data are provided to principal investigators in a format suitable for submission to the data center and shall monitor compliance with this requirement. Ancillary underway data, if applicable, will be provided to the Rolling Deck to Repository (R2R) program.
5. News releases and other similar items prepared by the Awardee and/or its subcontractors/employees that describe activities or research results will be submitted for NSF review at least two days prior to proposed publication and will acknowledge the sponsorship of the NSF. Public information brochures, and other related material prepared by the Awardee, will be sent to the NSF before being made available to the public. The text of any planned Congressional testimony related to the Provision of Marine Seismic Capability will be submitted to NSF for approval prior to its presentation.
6. The Awardee will acknowledge the support of the NSF on any signs identifying Marine Seismic Capability operations at its various locations. An acknowledgement of NSF support and disclaimer must appear in any publication of any material based upon or developed under this award in substantially the following terms:

"The Provision of Marine Seismic Capability for U.S. Researchers is sponsored by the National Science Foundation. Any opinions, findings and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the National Science Foundation." (The preceding sentence may be omitted from scientific articles or papers published in scientific journals.) Also, support of other agencies or international contributors shall be acknowledged as appropriate.

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:

- Bob Houtman, Head, Integrative Programs Section, telephone: 703-292-7704, email: bhoutman@nsf.gov
- Candace Major, Head, Marine Geosciences Section, telephone: 703-292-7597, email: cmajor@nsf.gov
- James Holik, Oceanographic Instrumentation and Technical Service Programs, telephone: 703-292-7711, email: jholik@nsf.gov
- Deborah Smith, Lead Program Director, Marine Geosciences Section, telephone: 703-292-7978, email: dksmith@nsf.gov

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

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

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

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) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of

Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Alexandria, VA 22314

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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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