

Provision of Marine Seismic Capabilities to the U. S. Research Community

PROGRAM SOLICITATION NSF 17-563



National Science Foundation
Directorate for Geosciences
Division of Ocean Sciences

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

August 21, 2017

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 17-1](#)), which is effective for proposals submitted, or due, on or after January 30, 2017.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Provision of Marine Seismic Capabilities to the U. S. Research Community

Synopsis of Program:

Proposals are solicited to support needs of the marine seismic research community that are currently provided by the specialized seismic research vessel *R/V Marcus G. Langseth*. The vessel is owned by the National Science Foundation and operated by the Lamont Doherty Earth Observatory of Columbia University (LDEO). NSF has determined that the current operational model is unsustainable and, with this solicitation, seeks proposals that provide comparable access to marine seismic capability through innovative approaches to *R/V Marcus G. Langseth* use or by other means.

The successful proposal will be administered as a Cooperative Agreement over the 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, telephone: (703) 292-8583, email: bhoutman@nsf.gov
- Candace Major, Program Director, Marine Geosciences Section, telephone: (703) 292-7597, email: cmajor@nsf.gov
- Richard Murray, Division Director, Ocean Sciences Division, telephone: (703) 292-7240, email: rwmurray@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: \$50,000,000

\$50 million total for five years at \$10 million per year. Amount is subject to the availability of funds

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

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:**

Not Applicable

C. Due Dates

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

August 21, 2017

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

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 is imaging over the full crustal scale, which is critical for connecting deeper and shallower geological and oceanographic processes. This capability is currently provided by *R/V Marcus G. Langseth*, a 235-foot specialized seismic research vessel owned by the NSF and operated by the Lamont Doherty Earth Observatory of Columbia University (LDEO). Access to the vessel is coordinated by the University-National Oceanographic Laboratory System (UNOLS).

As part of OCE's reply in May, 2015, to the National Research Council's report "[Sea Change: Decadal Survey of Ocean Sciences, 2015-2025](#)", and via multiple outreach opportunities over the past several years, NSF has made clear that the current business, financial, and resultant operational model for *R/V Marcus G. Langseth* is unsustainable. OCE has worked with the research community, UNOLS, and other stakeholders to make progress on developing a new seismic data acquisition strategy, including holding a [workshop](#) to address the scientific and technological drivers of the marine seismic community, establishing a [Regional Framework Plan](#), surveying the community for feedback regarding [seismic research needs](#), and issuing a Dear Colleague Letter ([NSF 16-120](#)) seeking written expressions of interest regarding the provision of marine seismic capabilities. These and other community engagement activities have provided essential guidance to OCE.

This solicitation seeks the services of a qualified institution, organization, or consortium, through a Cooperative Agreement, to provide the capabilities to support seismic infrastructure that are currently met by the *R/V Marcus G. Langseth* in support of the U.S. research community. Any solution would include the ability to obtain high-resolution images of full crustal and upper mantle structures, provide for seafloor-mapping capability, and deploy large arrays of ocean-bottom seismometers. Other OCE-supported seismic acquisition capabilities (e.g., portable 2-Dimensional multichannel seismic [MCS], ocean-bottom seismometers, CHIRP systems, etc) are not affected by this solicitation. OCE will continue its programmatic support of these capabilities, and is further exploring how to expand opportunities for researchers to use these and other techniques (e.g., P-cable).

The Awardee will work closely with NSF and the scientific community to ensure that the seismic capabilities provided will support, sustain, and advance frontier science within available resources. Also, the Awardee will plan and execute a viable, coherent, and inclusive program to support research and education, consistent with guidance and independent oversight provided by the scientific community via UNOLS.

The initial period of the award is intended to cover five years beginning in mid-2018 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 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

A. Marine Seismic Capability Alternatives

Many important scientific research topics require specialized seismic infrastructure capable of operating throughout the global ocean. These 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. These and other scientific challenges are an important part of NSF's Geosciences programs, and addressing these and other topics also are an important component of the scientific priorities identified in *Sea Change*.

NSF/OCE emphasizes that the objective of this action is to support seismic infrastructure that is currently met by the capabilities provided by R/V *Marcus G. Langseth*. Responses to this solicitation and future infrastructure and operations need not involve this vessel.

Accordingly, NSF/OCE is seeking proposals that will present a new financial and/or managerial model to provide access to the marine seismic capabilities to meet the expected needs of academic research scientists. Such models must include procedures to ensure compliance with all international, federal, state, and local environmental laws and regulations and safety standards. Additionally, new financial and/or managerial models must have the capacity for year-to-year flexibility. Over a period of five years, OCE anticipates supporting 75-150 science mission days per year, funding permitting. For purposes of this solicitation, science mission days are considered to include both (1) days the vessel is away from the port of departure, including transit, in an operating status in support of scientific missions, and (2) days in port of departure needed to prepare for and complete each specific mission. Maintenance days, days out of service for layup or other reasons, and days to transfer between one region of operations to another are not considered science mission days.

NSF/OCE anticipates that proposals are likely to fall into one or more of the three categories listed below, with each category subject to operating within the specified annual budgetary constraints and in the context of providing the required seismic capabilities necessary to meet the scientific needs described above.

1. A qualified institution, organization, or consortium provides access to alternative technologies to replace the existing approaches used by R/V *Marcus G. Langseth*. NSF encourages creative strategies for meeting NSF's seismic research needs. In this approach, NSF would follow established U.S. governmental procedures for divestment of R/V *Marcus G. Langseth*, as described in Section III.B. below, and the vessel would no longer be available to researchers.
2. A qualified institution, organization, or consortium assumes ownership of R/V *Marcus G. Langseth*, following the NSF procedures for divestment, described in Section III.B. below, and commits to supporting NSF-funded research at the usage levels described above. Such support of NSF-funded research need not involve R/V *Marcus G. Langseth* if, for example, such an organization or consortium has other assets that could also, or instead, be used. If NSF no longer owns the vessel, any remaining ship-time after annual NSF seismic needs are met would be available to support the business model of the new owner(s).
3. NSF retains ownership of the vessel and a new financial and operational structure is established for management of R/V *Marcus G. Langseth*. In this model, the institution, organization, or consortium would guarantee access to the vessel via UNOLS for 75-150 days, subject to annual budgetary constraints. Due to the overall age of the vessel and the potential for vessel replacement in the future, however, NSF will not commit to a service life extension via a mid-life refit for R/V *Marcus G. Langseth*.

Proposals based on any of the three identified categories, or on any other model, may take advantage of the fact that the provision of marine seismic capabilities may potentially be assisted by alternative scheduling plans, regardless of platform, in which large and complex marine seismic programs funded by NSF would be conducted only on a periodic basis, for example every 2-3 years, rather than annually. Such a schedule could align well with the community's parallel need for multi-year planning for complex research projects, and could also allow large uninterrupted blocks of time for non-NSF projects to be conducted by the provider.

If no acceptable proposals are received, NSF will divest from R/V *Marcus G. Langseth* and will work with academic, international, and/or commercial partners for ad hoc access to third-party seismic capabilities within budgetary and logistical constraints and responsive to science proposals.

B. Potential Divestment of R/V *Langseth*

Should divestment of R/V *Marcus G. Langseth* proceed, the process to be followed would include the following steps:

1. LDEO would complete a Marine Survey of Ship and Science Equipment to determine the market value.
2. To maximize cost savings, NSF/OCE and LDEO will collaboratively determine if any equipment is suitable for transfer to other U.S. Academic Research Fleet (ARF) ships or to add to the equipment pools supported by NSF/OCE.
3. NSF would transfer the Title to LDEO, who would then advertise the ship for sale for a set period of time.
4. LDEO would inform NSF of any offers to purchase the ship and (a) recommend which offer to accept (if more than one), or (b) recommend other divestment alternatives if there are no purchase offers.
5. NSF would review and make a decision on the recommendation(s) from LDEO.

When divesting of other vessels, NSF historically has agreed to allow the ship operator to hold the funds from the sale in an escrow account which, in consultation with NSF and at NSF's sole discretion, could be used to help outfit but not purchase a new ship or to buy ship-time on other ARF vessels to support NSF-funded science awards.

III. AWARD INFORMATION

Estimated award amount up to \$50,000,000 over the five-year period of performance of the Cooperative Agreement, subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

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:

US universities, colleges or non-profit, non-academic organizations must serve as the Lead Organization. Consortia may include subawards/partnerships with US commercial and/or international organizations.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

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

See PAPPG Chapter II.C.2 for guidance on the required sections of a full research proposal submitted to NSF. Please note that the

proposal preparation instructions provided in this program solicitation may deviate from the PAPPG instructions.

The 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.

The following information is required for the Full Proposal:

1. **Single Copy Documents: Collaborators & Other Affiliations (COA) Information** specified in the PAPPG should be submitted using the instructions and spreadsheet template found at <https://www.nsf.gov/bfa/dias/policy/coa.jsp>.
2. **Cover Sheet:** A cover sheet must be submitted and electronically signed by an Authorized Organizational Representative for all full proposals. Proposers should select "Center/Research Infrastructure" for the Type of Proposal.
3. **Project Summary:** This section should provide a summary of the key points of the proposal and should be understandable to a scientifically or technically literate lay reader. This section must follow the standard PAPPG or NSF Grants.gov Application Guide guidelines. Proposals that do not include an overview and separate statements on intellectual merit and broader impacts within the Project Summary will not be accepted by FastLane or will be returned without review.
4. **Program Description (up to 40 pages):** The Program Description should describe the proposed approach for providing a marine seismic research capability as an alternative to the current operating model for the *R/V Marcus G. Langseth*. Proposed approaches may include continued use of the *Langseth* under Awardee or NSF ownership as described in Section II or strategies that replace use of the *Langseth* altogether if NSF's seismic research needs can be met. The proposal shall:
 - a. Describe the proposed approach to providing access to seismic infrastructure capable of operating throughout the global ocean that will address important research topics in marine geosciences such as geohazards, magma supply systems, oceanic lithosphere evolution and sea level change. Include a discussion of the capability to obtain high resolution images of full crustal and upper mantle structures.
 - b. Describe in detail how the proposed new financial/managerial model for marine seismic capability will help advance frontier science within the available budget.
 - c. Discuss how environmental compliance and safety standards related to marine seismic research will be addressed and implemented.
 - d. Clearly present the management structure, capability, experience, and qualifications of the Organization(s) necessary to carry out the program. Include an aggregated description of the internal and external resources (both physical and personnel) that the organization and its collaborators will provide to the program.
 - e. Describe the proposed approach to working with NSF, the scientific community and the UNOLS Marine Seismic Oversight Committee to ensure the advancement of frontier science. Discuss how knowledge and discoveries of the marine seismic capabilities program will be applied to strengthen associated education, diversity, public outreach and community development objectives.
 - f. Discuss how the proposing organization will assure success relative to measures of performance applicable to Marine Seismic Capability for the U.S. Research Community. Include a discussion of how performance metrics and user statistics will be used to assess how well the Awardee is achieving scientific, budgetary and scheduling objectives.

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.

5. **References Cited:** This section should follow the standard PAPPG or NSF Grants.gov Application Guide guidelines.
6. **Biographical Sketches:** A resume, limited to 2 pages, must be provided for the PI, each co-PI, all Key Personnel, and any other senior personnel as required in PAPPG Chapter II.C.2.f
7. **Budget:** Standard PAPPG instructions apply.
8. **Current and Pending Support:** This section should follow the standard PAPPG or NSF Grants.gov Application Guide guidelines.
9. **Facilities, Equipment and Other Resources:** **This section is NOT required** - all relevant information must be provided in Project Description and Appendices. Proposers should insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your proposal.
10. **Supplementary Documentation:** Except as specified in this item or in the NSF PAPPG (see Chapter II.C.2.j), special information relevant to determining the quality of the proposed work must be included either as part of the Project Description or as part of the budget justification
 - a. **Documentation of collaborative arrangements of significance to the proposal:** Proposers should document with formal memoranda/letters of collaboration any collaborative arrangements of significance in performing the proposed work. Letters of support are not permitted under this solicitation, and proposals containing such letters may be returned without review. Please see the NSF PAPPG Chapter II.C.2.d (iv) for further details.
 - b. **Transition Plan:** Proposing organizations, other than the incumbent, may be funded for an additional transition period of up to six (6) months preceding the transfer of operating authority. If a new Awardee is selected to provide marine seismic capabilities to the U.S. Research Community, the incumbent will cooperate with the successor to the extent necessary during the transition period, and will provide transfer of legal rights to relevant property and equipment. NSF will support appropriate transition costs incurred by the successor Awardee in an amount up to \$1 Million if different from the current Awardee.
 - c. Organizations other than the incumbent must provide, as a Supplementary Document not to exceed 10 pages, a

detailed transition plan and budget for a transition period of up to 6 months following the new award. The transition plan must include at a minimum:

- A proposed duration and schedule for the transition period.
- Estimated resource needs for the transition period.
- Plans for personnel recruiting, orientation, and training.
- Plans for changes to staffing, facilities, or operational modes.
- A plan to acquire office infrastructure and manage the transfer of assets, inventory, commitments, plans, and documents.
- Identification of assumptions that underlie the transition plan.
- A detailed budget for the transition period, presented in accordance with instructions given in Section V.B.

General Information

Site visits to the R/V *Marcus G. Langseth* or related facilities at LDEO will be considered for potential proposers. If they occur, these site visits will be guided and managed by NSF staff.

It is essential that all proposed vessels are compliant with regulatory body requirements. Further discussion will be held concerning proposed vessel compliance with the UNOLS Research Vessel Safety Standards (RVSS).

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 the Cognizant Program Officers, Candace Major (cmajor@nsf.gov) or Bob Houtman (bhoutman@nsf.gov). The following publically available documents will be informative:

- Sea Change: <http://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: <http://www.ldeo.columbia.edu/research/office-of-marine-operations/langseth>
- NSF Strategic Plan: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf14043
- GEO Visions document: https://www.nsf.gov/geo/acgeo/geovision/nsf_ac-geo_vision_10_2009.pdf
- UNOLS Marine Seismics User Survey: https://www.unols.org/sites/default/files/Marine_Seismic_Survey_All_Responses_160705.pdf
- PREEVENTS: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504804
- Regional Framework Plan for Marine Seismics: <https://www.unols.org/committee/marcus-langseth-oversight-committee-mlsoc>
- 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
- 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 a 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).

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

August 21, 2017

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

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

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage:

<http://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgment 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 *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.

Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

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

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

2. Merit Review Criteria

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

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (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 considered:

- The extent to which the proposed marine seismic infrastructure provides the capability to address important research topics in marine geosciences.
- The degree to which the proposed new financial/managerial model for marine seismic capability can facilitate advancement of frontier science within the budgetary constraints outlined in the solicitation.
- The extent to which the proposal demonstrates an understanding of environmental and safety constraints related to marine seismic research and the capability to implement activities for effective compliance.
- The capability and qualifications of the proposed organization to manage and execute program requirements.
- The suitability of the proposed approach to working with NSF, the research community and the UNOLS Marine Seismic Research Oversight Committee to advance knowledge of marine geoscience. The extent to which the proposal articulates meaningful education, diversity, public outreach and community development activities planned for the program.
- The sufficiency of the proposed methodology for measuring, assessing and improving performance related to scientific, budgetary and scheduling objectives.
- The adequacy of the proposed Transition Plan, if applicable, to enable the proposer to assume full responsibility for providing the required marine seismic capability to the U.S. 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 Acquisition and Cooperative Support 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 and Agreements Officer in the Division of Acquisition and Cooperative Support. 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 Cooperative Agreement Supplemental Financial Terms and Conditions - Large Facilities (CA-SFATC-LF) 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) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *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 Program Plans. 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, Program Plans, and Performance Metrics.
- Site visits, annually or as necessary.
- 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=pappp.

Additional Reporting Requirements

1. The Awardee will submit Annual Program Plans to NSF with budgets for support of the management 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 Officer.
4. In compliance with the NSF/OCE data policy, data collected as a result of this CA 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 provide the data to principal investigators in a format suitable for submission to the data center, and shall monitor compliance with this requirement.

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.

The Awardee will acknowledge the support of the NSF on any signs identifying Marine Seismic Capability operations at its various locations. An acknowledgment of NSF support and disclaimer must appear in any publication of any material based upon or developed under this contract 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, telephone: (703) 292-8583, email: bhoutman@nsf.gov
- Candace Major, Program Director, Marine Geosciences Section, telephone: (703) 292-7597, email: cmajor@nsf.gov
- Richard Murray, Division Director, Ocean Sciences Division, telephone: (703) 292-7240, email: rwmurray@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an

information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF [Grants Conferences](#). Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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


PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select

potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and [NSF-51](#), "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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

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

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