Operator Selection for a Regional Class Research Vessel (RCRV #3)

PROGRAM SOLICITATION
NSF 19-573

National Science Foundation

Directorate for Geosciences
Division of Ocean Sciences

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

July 01, 2019

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. Additionally, proposals and cost estimates should be submitted in accordance with the Large Facilities Manual (LFM), NSF 17-066, dated March 2017.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Operator Selection for a Regional Class Research Vessel (RCRV #3)

Synopsis of Program:

The Division of Ocean Sciences (OCE) Integrative Programs Section (IPS) is soliciting proposals from eligible organizations to serve as the Operating Institution (OI) for the third ship in the Regional Class Research Vessels (RCRV #3). Planning for construction of new RCRVs for the U.S. Academic Research Fleet (ARF) has been ongoing at the National Science Foundation for more than a decade. In early 2012 a Solicitation (NSF-12-558) was issued for the design and construction of up to three RCRVs. The solicitation provided that the Awardee would serve as Lead Institution (LI) for the Design and Construction of all vessels in the Class with the option to serve as Operator of the Lead Ship. The solicitation further indicated that selection of OIs for any additional vessels would be conducted by means of a separate competition that would be completed prior to delivery of the first RCRV.

In early 2013, a resulting Cooperative Agreement was awarded to Oregon State University (OSU). As the LI, OSU is responsible for managing each phase of the design, construction and trials of each vessel in the Class. OSU will also serve as Operator of the Lead Ship. The Design Phase was completed and NSF's 2017 budget included a provision that supported construction of three (3) ships. A construction contract for up to three Regional Class Research Vessels was awarded to Gulf Island Shipyards, LLC.

In 2018, the solicitation "Operator Selection for Two Regional Class Research Vessels (RCRV 2 and RCRV 3)" NSF 18-534 was released. However, the competition resulted in the selection of an operator for RCRV 2 only, the East Coast Oceanographic Consortium, led by the University of Rhode Island.

This solicitation seeks to select a qualified Operating Institution for the third vessel in the Class (RCRV#3). The institution shall either be a current University-National Oceanographic Laboratory System (UNOLS) Vessel Operator or be capable of becoming one prior to taking over responsibility for full vessel operations. The prospective Awardee will be required to perform the following, separately-funded activities:

- Provide Operating Institution representation on-site at the shipyard during the Design Verification and Transfer (DVT) Phase for RCRV #3 (see estimated dates below).
- Provide one representative to a Transition Core Team formed at the start of the Transition to Operations Phase of RCRV #1 (estimated to be July 2020).
- Provide appropriate levels of personnel resources in support of the two-year Transition to Operations Phase for RCRV #3, which starts one year prior to vessel delivery and ends one year following vessel delivery.

The staggered schedule for the RCRV program is based on approximately one-year Construction Stage Start intervals between RCRVs #1, #2 and #3. Start of Transition to Operations for RCRV#3 is staggered by about six months from RCRV #2 and one year from RCRV #1 due to the shorter Construction Stages between vessels.

The requirement to provide one Full Year of Operations under the Operations Stage after completing the Construction Stage will be funded directly under this solicitation.

Accordingly, a tentative schedule of associated milestones requires Awardee participation as follows:

RCRV #3 Construction Stage (Major Research Equipment and Facilities Construction Account (MREFC) Funded) Includes Construction Phase and Transition to Operations Phase

Construction Phase

- Start of Design Verification and Transfer (DVT) - June 2019 *(or soon after Award)*

Transition to Operations Phase

- Start of Transition to Operations for RCRV #1 - July 2020
- Start of Transition to Operations for RCRV #3 - July 2021
- Vessel Delivery - July 2022
- End of Transition to Operations - July 2023

RCRV #3 Operations Stage (Research and Related Account (R&RA) Funded)

- Start of First Full Year of Operations - July 2023
- First Full Year of Operations Complete - July 2024

The award resulting from this solicitation will encompass Operating Institution activities over an estimated 5-year period for RCRV #3. Activities for the Construction Stage will be MREFC-funded by way of a required contract instrument executed between the OI with the RCRV Lead Institution (OSU).

The first Full Year of Operations following the End of Transition to Operations for RCRV #3 will be R&RA funded through the Cooperative Agreement resulting from this solicitation. Thereafter, separate Cooperative Agreements will be negotiated between NSF Ship Operations and the successful Awardee for subsequent operational periods.

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.

- Rose Dufour, W8118, telephone: (703) 292-8811, email: rdufour@nsf.gov
- Brian Midson, W8156, telephone: (703) 292-8145, email: bmidson@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: $4,300,000

$4.3M for RCRV #3 in FY2023 for one year of Operations Stage activities.

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

Funding for required activities through the end of the Construction Stage for RCRV #3 will be provided by the Major Research and Facilities Construction (MREFC) account under the separate contracting mechanism with Oregon State University required by this solicitation.

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:**

  Not Applicable

C. Due Dates

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

  July 01, 2019

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:

Standard NSF award conditions apply.

Reporting Requirements:

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

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I. INTRODUCTION

A. Background

The National Science Foundation provides the majority of funds in support of operations of the U.S. Academic Research Fleet (ARF), a subset of the Federal Oceanographic Fleet. The ARF functions as a key component of the research platforms available for Ocean Sciences. UNOLS, an organization of 59 academic institutions and national laboratories involved in oceanographic research, serves as the coordinating body for the Fleet. The vessels in the ARF range in size, endurance and capabilities that provide NSF and other U.S. Federally-funded scientists with access to diverse platforms capable of conducting ocean science research in coastal and open ocean waters as well as the Great Lakes.

As part of interagency and UNOLS planning, the ARF has been reduced from 27 vessels in 2005 to 18 vessels in 2019. This reduction is due to age and obsolescence of the retired vessels, some of which were built more than 40 years ago. As part of the ongoing Fleet planning and "right-sizing" effort, NSF, through its Cooperative Agreement with OSU, is supporting construction of three modern, appropriately designed RCRVs. The right-sizing effort looks at ways to sustain utilization across the Fleet, therefore work that falls outside the ARF may be viewed as competitive if OCE ship funding is required. These vessels are intended to replace other vessels within the ARF that are scheduled to retire in the next 3-5 years and will serve to sustain the Nation's ability to conduct state-of-the-art research in the coastal zone and continental shelf within current and projected future budgets.

B. Science Priorities

The coastal ocean encompasses a range of oceanic phenomena and human-environment interactions. Coastal regions are sensitive to human alteration from water and air pollution, resource extraction, transportation, and recreational activities. Wind- and freshwater-driven coastal ocean flows directly affect regional climate. As conveyors for heat and salt and regions of strong vertical mixing, boundary currents play an important role in the large-scale ocean circulation. Vigorous interactions between the coastal ocean and the atmosphere control many biogeochemical processes (e.g., the exchange of nutrients between the land, ocean, and continental margin sediments).

The coastal oceans are extremely productive, accounting for a large percentage of the world's wild seafood and most of the aquaculture. They are the dominant sites for burial of organic matter, important in net marine uptake of atmospheric CO_2, and are locations of major hydrocarbon resources, including oil, gas, and methane gas hydrate. The coastal oceans can be sites of wind and wave energy extraction and play host to the deposition of river sediments as well as dredge spoils. They are sites of tectonic activity, including hazardous earthquakes and tsunamis. To better understand such coastal phenomena and their importance in the Earth system, ocean scientists and educators must sustain regional observations of marine physical, chemical, biological, and geological processes.

The RCRVs are designed to support these critical science needs. The 2015 National Academies of Sciences report, *Sea Change, Decadal Survey of Ocean Sciences,* (*Sea Change),* lists the following eight science questions that encompass scientific research priorities extending from the ocean surface, through the water column, to the sea floor and subsea floor environment:

1. What are the rates, mechanisms, impacts, and geographic variability of sea level change?
2. How are the coastal and estuarine ocean and their ecosystems influenced by the global hydrologic cycle, land use, and upwelling from the deep ocean?
3. How have ocean biogeochemical and physical processes contributed to today's climate and its variability, and how will this system change over the next century?
4. What is the role of biodiversity in the resilience of marine ecosystems and how will it be affected by natural and anthropogenic changes?
5. How different will marine food webs be at mid-century? In the next 100 years?
6. What are the processes that control the formation and evolution of ocean basins?
7. How can risk be better characterized and the ability to forecast geohazards like mega earthquakes, tsunamis, undersea landslides, and volcanic eruptions be improved?
8. What is the geophysical, chemical, and biological character of the sub-seafloor environment and how does it affect global elemental cycles and understanding of the origin and evolution of life?

The RCRVs will contribute to research applicable to all eight science questions and will provide significantly enhanced capabilities in comparison with the ships in the ARF scheduled for retirement. They are essential to advance science-based understanding of ocean processes and will support oceanographic research along the U.S. Atlantic East Coast, the Pacific West Coast and the Gulf of Mexico and Caribbean region. The latter region is expected to serve as the primary emphasis for RCRV #3 operations.

C. **Vessel Characteristics and Capabilities**

The RCRVs will be modern mono-hull research vessels capable of general purpose interdisciplinary oceanographic research in areas from shallow coastal bays and estuaries to and beyond the continental shelf. The common design of each vessel of the Class emphasizes support of science mission requirements with integrated diesel-electric propulsion, flexible laboratory spaces, large aft working deck space, modern accommodations for scientists, technicians, crew and/or students, and an outfit of capable scientific equipment. The Operating Institution is encouraged to use the vessel to enhance early career training, graduate work or other oceanographic use. The ships will principally operate in coastal regions worldwide and have the capability to make open ocean transits. Over the life of the RCRVs, there may be circumstances involving work in regions that may have light ice conditions and the ships have been designed and constructed accordingly. Areas of study enabled by the multipurpose RCRVs relate to the atmosphere, the water column and the seafloor below from coastal shores and river mouths to the continental slope and adjacent abyssal plain.

RCRV Principal Characteristics include a 199'-6"-Overall Length, a 41'-Beam and a 12'-6" design draft vessel capable of 12 knots sustained speed with a range of 5,400 nautical miles. Endurance for a total ship's complement of 30 is approximately 25 days. The ship will be equipped with a suite of over-the-side handling equipment including an articulated A-frame aft, a main crane capable of reaching the entire aft deck, conductivity, temperature, depth (CTD) instrumentation and accompanying launch and recovery system (LARS), a below deck oceanographic traction winch and a hydrographic winch located on the 01 Deck. The RCRVs will also be equipped with a portable crane, portable winch and portable side A-frame. A suite of sonars will include multi-beam sonars, acoustic doppler current profilers and fisheries sonars. To support acoustically sensitive instruments and improve habitability, the vessel has been designed to minimize underwater and airborne noise.

Dynamic positioning capability will be incorporated to facilitate tasks required of the RCRV including precise station-keeping and track line maneuvering, water column sampling and data collection, sediment coring and deployment and recovery of scientific packages. A significant number of "Green Ship" features for hull, propulsion, electrical, auxiliary and pollution control systems have been integrated into the RCRV design to minimize its environmental footprint. State-of-the-art communications will enable a telepresence capability with shore-side scientists, educators and students.

The resulting design will provide highly capable platforms for conducting regional oceanographic science. Full details of the RCRV design are available in the contract drawings and specifications in NSF's RCRV Resource Library.

II. PROGRAM DESCRIPTION

Operating Institution Requirements

NSF is seeking a proposal from eligible U.S. entities or consortia (as set forth in this Section and Section IV below) to serve as the operator of the third Regional Class Research Vessel. Proposers must demonstrate the existence of, and potential for, a strong research agenda that supports the program goals and fully utilizes the vessel.

Eligibility

To be considered for selection, a proposing organization must meet the following minimum requirements:

1. Function as an established United States entity or consortium currently conducting graduate level research programs in the ocean sciences;
2. Demonstrate the ability to provide suitable docking, staging, and maintenance and storage facilities for the RCRV;
3. Maintain current status as a UNOLS vessel operator or demonstrate the ability to meet the requirements and apply for full membership if their proposal is successful.

A proposal from a formal consortium of U.S. institutions (rather than a single institution) must include a preliminary consortium agreement among the parties which identifies the lead institution, and which outlines their understanding of the requirements stated in this solicitation and expresses their intent to jointly support RCRV operations and maintenance throughout the performance period of this award.

Budget Considerations

The RCRV budget for the Lead Institution includes MREFC funds to support OI requirements during the Construction Phase for the vessel. **Once selected, the OI shall work with the RCRV Lead Institution to enter into a contractual relationship to coordinate efforts and cover funding for the OI during the Construction Stage.** NSF will separately fund the first Full Year of Operations under the Operations Stage from the R&RA account through an award under this Solicitation.

Construction Stage

Design, Verification and Transfer Phase (DVT)

The Awardee shall provide on-site representation at the construction shipyard from the start of DVT of RCRV #3 or soon after award. As described in the RCRV Contract Specifications, principal duties during DVT include:

- Participating in efforts to verify that contract drawings and specifications: are functional, producible and current; satisfy requirements of the Awardee's designated on-site representative, in collaboration with the LI; and, are suitable for the Contractor to proceed with detailed engineering and production.
- Participating in drawing and specification changes that surface as a result of DVT.
- Participating in the transfer of design responsibility to the Contractor with assurance that any required, substantial contract changes have been resolved prior to advancement of detailed engineering and production.

Following DVT, on-site OI representatives shall assist the Lead Institution in monitoring construction progress through the delivery and post-delivery shipyard period of RCRV #3.

Transition to Operations Phase

A Transition to Operations Coordinator (from the LI) and Transition Core Team (including OI representatives) will be established by the Lead Institution early in the Transition to Operations Phase for the Lead Vessel (estimated to start in July 2020). The selected Operating Institution for RCRV #3 will provide a Core Team member beginning with Start of Transition to Operations for RCRV #1. RCRV #3 Start of Transition to Operations will follow RCRV #1 Start of Transition to Operations by approximately one year.

The Transition to Operations Phase for RCRV #3 will last for approximately two years, beginning one year prior to vessel delivery through the one-year post-delivery warranty period. As such, Transition to Operations activities can be separated into two periods, Pre-delivery Transition to Operations and Post-delivery Transition to Operations, with each expected to last roughly one year.

Activities required of the OI, in support of and under direction of the LI, during the **Pre-delivery Transition to Operations** period include:

- Providing a full-time member of the Transition Core Team (TCT) beginning with the start of Transition to Operations for the RCRV #1 Lead Vessel (estimated July 2020) through the end of Transition to Operations of RCRV #3. The TCT member must be on-site from Transition to Operations start until delivery of RCRV #3.
- Supplying on-site personnel, including the vessel crew and marine technicians, approximately two months prior to vessel delivery for shipyard-provided Vessel Familiarization Training, Factory Training and preparation for post-delivery outfitting.
- Working closely with the LI to formulate and execute the following:
    - Vessel-specific crewing plans and the timing required for institution personnel involvement for the science outfitting period
    - Required training for existing or new crew members to achieve regulatory compliance for training for a vessel of RCRV's size, horsepower, and Class
    - Detailed work plans for the outfitting period
    - Application of the Science Trials Plan and stages of Science Trials.
- Carrying out institution-specific procedures and protocols for the various stages of Transition to Operations of RCRV #3 under overall direction of the LI Transition to Operations Coordinator. These include such items as:
    - Vessel Fire Plan
    - Safety Management Manual
    - Standard Operating Procedures
    - Cruise Planning Manual(s)
    - Institution-Specific Operations Manual(s)
    - Training Plan(s)
    - Institutional Management System.

Responsibility for care of the vessel will transfer from the shipyard to the Lead Institution upon vessel delivery. In support of and under direction of the LI, OI activities during the **Post-delivery Transition to Operations** period include:

- Training and outfitting at the shipyard
- Completing shakedown and transit to the Operating Institution home port
- Conducting local outfitting and testing as needed at home port
- Performing Operator and Science Trials / Verifications
- Completing a shipyard availability to correct warranty deficiencies
- Undergoing a NSF inspection
- Attaining UNOLS vessel designation
- Integrating RCRV #3 into the UNOLS Ship Scheduling System.

Operations Stage

Upon completion of the Transition to Operations Phase, approximately one year following vessel delivery, full operational control of the vessel will transfer from the Lead Institution to the Operating Institution. Title to the vessel will then transfer from the Lead Institution to NSF.

Subsequent to the transfer of full operational control of the vessel from the LI to the OI, funding for one year of operations will be provided under the Cooperative Agreement resulting from this Solicitation. A separately negotiated funding agreement between the

Awardee and NSF will govern future operations following the conclusion of this Cooperative Agreement.

III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of: (1) construction funds for RCRV #3; and (2) R&RA funds for RCRV #3.

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:

Please refer to Eligibility Considerations under the Program Description section of this Solicitation. Note that eligible organizations may include a consortium of two or more academic or non-profit organizations. Consortia may also include partnerships with commercial and/or international organizations, but NSF requires that an academic or non-profit U.S. organization serve as the lead organization. The Awardee must have current status as a UNOLS vessel operator or demonstrate the ability to meet the associated requirements if their proposal is successful.

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) 292-7827 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 following information is required for the Full Proposal:

1. **PI/Co-PI Information:** This should follow the standard PAPPG or NSF Grants.gov Application Guide guidelines.
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. **Project Description (up to 75 pages):** The Project Description section of the proposal should address the qualifications and capabilities of the proposing organization to perform the responsibilities required of the Awardee. The Project Description must address the following factors that are considered key to successful selection as an RCRV Operating Institution:
    a. **Ocean Science Research Programs**

    Discuss institutional commitment with respect to the following topics:

    i. Extent and quality of ocean science research experience of the proposer. Describe the institution's or consortium's ocean science research program over the past five years, including identification of key staff scientists or research groups, sources and amounts of funding, past use of ships and publications and other evidence of research accomplishments. The same data may also be provided for other users of the institution's oceanographic assets, such as programs of other academic, government or private users, which may further strengthen the proposal.
    ii. Future research directions as coupled to NSF and other Federal Agency research interests. Provide a detailed description and notional schedule for optimal utilization of the vessel, including the scientific activities envisioned for the first two years of ship operations following vessel delivery. Include a thorough description of the anticipated role of individuals or groups with the institution or consortium, and identification of probable sources of research support based on past and present initiatives. The same data should also be provided for other anticipated users. Provide a clear and convincing discussion of the longer term (5-10 year) outlook for sustained RCRV utilization for research initiatives of interest to the proposing institution/organization, the ocean research community, NSF and other Federal agencies in ocean science research should also be included. Discuss how the research will relate to *Sea Change* ocean science priorities.
    iii. Match of the proposer's current and future research program requirements to the ship's expected capabilities. Provide a clear statement of the institution's or consortium's reasons for desiring to be designated as the operator of the new vessel. Briefly discuss how the RCRV would benefit current ocean sciences research capabilities within the institution or consortium. Discuss in detail how the new RCRV capabilities will serve to accelerate and advance scientific discovery in the expected regions of operations including potential research areas of the Gulf of Mexico, Caribbean Sea and southeastern Atlantic Ocean. Describe how future science contributions enabled by the RCRV will serve to promulgate societal benefits. In addition, include a discussion of the institution's or consortium's philosophy concerning scheduling and operating the ship as a unit of the U.S. Academic Research Fleet.

    b. **Operating Institution Capability**

    Discuss existing or planned capability to manage, operate and maintain the vessel efficiently and effectively as a unit of the U.S. Academic Research Fleet. Describe the organizational structure, including formal memoranda for collaborative arrangements, and the institution's or consortium's management plan to operate and properly maintain the vessel for scientific research at sea, addressing each of the following:

    i. Physical Facilities. The location, size, design and extent of docking and related shore support facilities available to the vessel after its delivery and the interface with other vessels currently operated by the institution. Provide information related to age and condition of the pier, depth of channel and area alongside, and the results of any recent facility inspections. Discuss the advantages of the proposed facilities to support RCRV operations. For any new/planned facilities or infrastructure, provide a timeline for completion and a detailed description of status in terms of design, construction and available funding resources. Discuss contingency plans for supporting the RCRV if the new infrastructure is not available when the vessel is delivered.
    ii. Personnel. The capabilities of the proposed management and operations staff, and a notional plan for assigning or hiring the vessel's crew and marine technician complement. If any of these do not already exist within the institution, a plan for recruitment must be submitted. Discuss how complexities of the RCRV, including new operational capability and regulatory body compliance issues, are likely to escalate the level of technical and required shoreside support.
    iii. Shipboard Personnel Capabilities and Training. The capabilities and training of the crew and marine technicians to be assigned to the vessel that will enable and foster successful scientific research at sea. Describe the qualifications and training of the crew that will be assigned upon delivery of the ship. Describe institution or consortium plans for maintaining a highly qualified and trained crew for scientific research at

sea.

c. **Construction and Operations Stages**

Describe the institution or consortium's management plan for support and outfitting during the Construction Stage and subsequent responsibility for full vessel operations, addressing each of the following:

i. Detailed Work Plan. Tasks, milestones and intended resources for the Construction and Operations Stages, including institution specific items. Emphasis should be placed on the interaction with the Lead Institution to establish and implement a necessary contracting mechanism that will enable coordination of efforts and cover funding for the OI during the Construction Stage (Construction and Transition to Operations Phases) for the vessel.

ii. Outfitting. The source, condition and characteristics of any equipment proposed to be installed by the Awardee following vessel delivery (including space, weight, power requirements, and proposed locations for major equipment.) Describe the institution's or consortium's system for inventory and maintenance of this equipment.

iii. Initial Operating Plan. The initial operating plan following the transfer of full operational control from the LI to OI, from a logistical and maintenance perspective. Describe the maintenance approach, including preventive maintenance, repairs, overhauls and required dry-docking. The maintenance and repair discussion should address the following:

Planned Maintenance. Describe experience in using predictive maintenance, preventive maintenance and condition monitoring techniques.

- Management of Repairs. Describe the approach used to mitigate the risks associated with planning crew capable repairs, voyage repairs, and shipyard availabilities.
- Lifecycle Management Program. Describe the planned lifecycle management program to perform adequate and timely maintenance and repair and adequate engineering oversight and spares to ensure vessel readiness.
- Property Management. Describe how the vessel operator will use or modify its property control system to manage installed machinery, equipment or materials that become property of the Government.

iv. Reporting. A notional plan for reporting on Awardee activities throughout the period of performance envisioned for a resulting Cooperative Agreement (CA) award, Construction Stage activities, as well as a one-year period of Full Vessel Operations during the Operations Stage.

v. Cost Estimates. The estimated cost for participation in the Construction Stage Activities, as well as for a subsequent one-year period of Vessel Operations Stage Activities, along with rationale for projections concerning vessel utilization rate. Provide a notional budget and fully explain the costs of the program as they relate to the following:

MREFC funded Construction Stage Activities from DVT through the End of Transition to Operations

- On-site representation at the construction shipyard from the start of the Design, Verification and Transfer process (or soon after award) through the end of the Transition to Operations Phase.
- Institutional participation in the OSU-led Transition to Operations Core Team beginning with the start of Transition to Operations of RCRV #1 through the end of Transition to Operations of RCRV #3.
- Crew, Technician and other support personnel for an estimated two-month period prior to vessel delivery through completion of the Transition to Operations, approximately one year following delivery. Activities include:
  - Support and attendance at pre-delivery activities such as builder's and acceptance trials
  - Support and attendance at post-shipyard delivery activities including outfitting, final contract trials, deferred work, and post-shakedown availability
- Estimated operating and maintenance costs through the end of the Transition to Operations Phase.

The notional budget is understood to be a preliminary cost estimate. Please note that the cost estimates for this time period should not be included on the NSF Budget for this solicitation. The selected OI will be required to negotiate a formal contract for the Construction Stage time period with the Lead Institution (OSU).

R&RA funded activities for the First Full Year of Operations Stage activities following the End of RCRV #3 Transition to Operations (this solicitation):

Proposers shall provide their estimates of the first Full Year of Vessel Operations following the Transition to Operations Phase. Estimate format should generally follow Section 6 of the Ship Operations Detailed Proposal Format & Tables at:

(https://www.nsf.gov/geo/oce/programs/ips/index.jsp)

Cost estimates must also follow the guidance provided in the Large Facilities Manual (LFM), NSF 17-066 dated March 2017. Specifically, section 4.2 of the LFM covers Cost Estimating and Analysis for both Construction and Operations Awards. As is further described in the LFM, the evaluation of cost estimates follows GAO Cost Estimating guidance (well documented, comprehensive, accurate, and credible) and an evaluation of whether the costs are allowable, allocable, and reasonable.

An award for the first Full Year of the Operations Stage will be made by NSF to the successful respondent to this Solicitation.

Financial support of the activities listed above will depend on the availability of NSF funding for construction, transition to operations, and operations of the vessel.

d. **Efficiencies**

Discuss the ability of the proposing organization to minimize vessel costs while assuring full utilization for future at-sea scientific research requirements.

i. Describe current or proposed practices to stabilize or reduce vessel operating costs. This may address initiatives such as improvements in efficiencies or cost reduction efforts including, but not limited to, cross-decking of equipment, multiple facility/institutional uses for the vessel, multi-use port facilities for UNOLS-wide access or forms of efficient fleet maintenance, scheduling and crew utilization. Discuss how selection as Operator for RCRV #3 will impact utilization/divestment of other institution/consortium marine assets. Creative approaches within the context of the overall ARF are encouraged.
ii. Discuss the institutional commitment (or if a consortium, a multi-institutional commitment) to advancing careers in seagoing oceanography and how the RCRV will be used to pursue that commitment.

e. **Past Performance**

Discuss past performance in operations and maintenance of oceanographic research vessels. Identify successful management and maintenance best practices that will transfer to RCRV #3 operations. Briefly describe the results of relevant research cruises and ship material evaluations conducted by external agencies over the past five years. Such descriptions may include summaries of UNOLS Post-Cruise Assessments, NSF, Navy, U.S. Coast Guard or American Bureau of Shipping inspections or evaluations.

5. **References Cited:** This section should follow the standard PAPPG or NSF Grants.gov Application Guide guidelines.
6. **Biographical Sketches:** A biographical sketch, 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:** The budget should be based on the preceding Detailed Work Plan and Cost Estimate subsections of the Project Description and is divided into three portions in this subsection (a, b, and c). The budget estimate should include (a) estimated cost breakout for the Construction Stage DVT Activities described in Section II and (b) estimated cost breakout for the Construction Stage Transition to Operations Activities described in Section II, each to be funded by MREFC funds under the OI contract with OSU. The current MREFC funding estimate for items (a) and (b) combined is $7.5M for RCRV #3.

   The proposed budget, and budget pages for this solicitation, shall only include (c) the estimated cost for the first Full Year of the Operations Stage to be funded under the award resulting from this solicitation.

8. **Current and Pending Support:** This section should follow the standard PAPPG or NSF Grants.gov Application Guide guidelines.
9. **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.
10. **Single Copy Documents:** Information for the items below should be entered via the Single Copy Documents section in FastLane.
    a. **Collaborators and Other Affiliations Information:** Proposers should follow the guidance specified in Chapter II.C.1.e of the NSF PAPPG.
    b. **Additional Single Copy Document - Project Personnel:** Provide the full names, affiliations, educational background, and specific role for each person for whom support is sought, including all PIs, co-PIs, named senior personnel, and/or contractors (including subawardees).
11. **The following section is NOT required for the Full Proposal:**

    Facilities, Equipment and Other Resources (all relevant information must be provided in the 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.

General Information

- For additional information on this competition, NSF practices and policies, and/or access to the Resource Library described below that provides further detail, proposing organizations should contact the Cognizant Program Officers, Rose Dufour, (rdufour@nsf.gov) or Brian Midson, (bmidson@nsf.gov).

The following publicly 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
- 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
- Oregon State University College of Earth, Ocean and Atmospheric Sciences, Regional Class Research Vessel: http://ceoas.oregonstate.edu/ships/rcrv/
- Large Facilities Manual, NSF 17-066, March 2017

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 RCRV Design and Operation
- RCRV Project Information (Design & Construction Solicitation, OSU Planning Documentation (Integration and Commissioning Plan, Vessel Acceptance and Operational Readiness Plan, Transition to Operations Plan, etc.) OSU Planning Documentation, etc.)
- NSF and OCE Data Policies
- Frequently Asked Questions (FAQs)

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

Proposals should describe, if any, expected average annual amounts for institution-funded days of ship operations.

C. Due Dates

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

  July 01, 2019

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 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: 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 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

Proposals submitted in response to this program solicitation will be reviewed by a panel established specifically to review RCRV #3 Operator Selection proposals. Specific review criteria will include:

Ocean Science Research Programs. NSF will review the extent and quality of ocean science research experience of the proposer, the proposer's future research directions as coupled to NSF and other Federal Agency research interests, the projections for near term and sustained long-term utilization of the RCRV, and the match of the proposer's current and future research program requirements to the ship's expected capabilities.

Operating Institution Capability. NSF will review the degree of existing or planned capability to operate and maintain the ship efficiently and effectively as a unit of the U.S. Academic Research Fleet, including details of the proposer's organizational structure, physical facilities, shore-based management and operational staff, and shipboard personnel and training.

Construction and Operations Stages. NSF will review the proposer's approach to these activities, which shall address: existing infrastructure; the proposer's work plan for accomplishing required activities for the DVT Phase and Transition to Operations Phase, as well as the first Full Year of Operations, including execution of a contract with the Lead Institution for support of activities through the end of the Transition to Operations Phase; their outfitting plan; and their plan for reporting management activities. Cost estimates will be evaluated to assess the proposer's understanding of scope and effort along with rationale for projections concerning vessel utilization.

Efficiencies. NSF will review the proposer's institutional commitment to stabilizing or reducing vessel operating costs while assuring full utilization for research activities, and to advancing careers in seagoing oceanography, as well as how the RCRV will be used to pursue that commitment.

Past Performance**.** NSF will review the proposer's past performance in operations and maintenance of oceanographic research vessels.

B. Review and Selection Process

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

The Review Panel will be convened as soon as practicable following the deadline for proposal submission. 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), the Cooperative Agreement Modifications and Supplemental Financial and Administrative Terms and Conditions (CAFATC) for Major Multi-User Research Facility Projects and Federally Funded Research and Development Centers 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.

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

Content and schedule for additional required deliverables will be specifically defined in the Cooperative Agreement's terms and conditions.

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:

- Rose Dufour, W8118, telephone: (703) 292-8811, email: rdufour@nsf.gov
- Brian Midson, W8156, telephone: (703) 292-8145, email: bmidson@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 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 (FASED) 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 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
Alexandria, VA 22314