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NSF 25-504: Organismal Response to Climate Change (ORCC)

Expanding Understanding and Improving Predictions of Life on a Warming Planet

Program Solicitation

Document Information

Document History

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U.S. National Science Foundation
Directorate for Biological Sciences
Division of Integrative Organismal Systems
Division of Environmental Biology
Directorate for Geosciences
Division of Ocean Sciences

Paul G. Allen Family Foundation

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

January 23, 2025

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Important Information And Revision Notes

This solicitation continues to accept full proposals that propose mechanistic studies of **organismal response to climate change (ORCC)** as a **foundation** that, when integrated with research at other levels of organization, will lead to a deeper understanding and **better predictions** of the integrity, the resilience, and the adaptation of biological systems to climate change.

REVISION NOTES

This revision contains an additional track for submission of proposals during FY2025, the Microorganism-mediated Organismal Resilience to Climate Change track **(MMORCC track)**, to address significant knowledge gaps in our understanding of the molecular drivers and dynamics of microbial resilience to environmental change through a partnership between U.S. National Science Foundation (NSF) Directorate for Biological Sciences (BIO), and The Paul G. Allen Frontiers Group and The Paul G. Allen Family Foundation. The Paul G. Allen Frontiers Group, a division of the Allen Institute, is dedicated to exploring the landscape of bioscience to identify and foster ideas that will change the world. The Frontiers Group recommends funding to the Paul G. Allen Family Foundation, which then invests through award mechanisms.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

Summary Of Program Requirements

General Information

Program Title:

Organismal Response to Climate Change (ORCC)
Expanding Understanding and Improving Predictions of Life on a Warming Planet

Synopsis of Program:

The world is currently undergoing unprecedented changes in global climates across all biomes, with effects on nearly every life-form. How organisms respond to these rapidly changing conditions will have large consequences for the growth, reproduction and fitness of individual organisms, the distribution of species over space and time, the integrity and the composition of natural communities, the yield of domesticated crops and animals, and the incidence and severity of pathogen outbreaks. Consequences such as these are already having major impacts on the US bio-economy, the world's food security, and the ecosystem services provided by living systems to humans. Developing a comprehensive understanding of the **mechanistic underpinnings of organismal response to climate change** will improve our ability to understand adaptive and plastic capacity of species and to predict and to mitigate maladaptive biological responses to rapidly changing environments, thus facilitating the maintenance of species on a changing planet.

Most climate change studies to date have lacked integration between investigations of **organismal mechanisms of response** and eco-evolutionary approaches. This solicitation calls for proposals that integrate the study of organismal mechanisms of response to climate change (ORCC) with eco-evolutionary approaches to better predict and mitigate the effects of a rapidly changing climate on earth's living systems. Specific areas of emphasis include but **are not limited to** integrating physiology and genomics into the next generation of species distribution models; understanding the mechanistic bases of plastic responses to climate change; functional genomics of organismal response to climate change; how biological interactions are affected by climate change; how biological interactions in turn affect organismal responses to climate change; and improving our ability to predict the limits of biological and global resilience as organisms face changing and novel climate conditions.

Proposals to the ORCC Solicitation are encouraged that build on NSF's investment in growing convergence research by developing integrative, cross-disciplinary approaches that examine the organismal **mechanisms** that underlie adaptive and maladaptive responses to environmental factors associated with climate change, how these responses affect fitness in changing and/or novel climates and the genetic and evolutionary processes (**eco-evolutionary**) through which these traits originate, persist, and are transmitted across generations. Further, this solicitation encourages creative approaches to use the results of these foundational research investigations to develop use-inspired ways to address societal challenges in anticipating and managing effects of climate change on organisms across spatial and temporal scales and biological hierarchies.

Proposals that do not bridge disciplinary components, that lack a specific focus on mechanisms of organismal response to climate change, that do not integrate organismal mechanistic insights with eco-evolutionary consequences above the level of the individual, or that do not describe a plan for use-inspired applications of foundational research, should be submitted to the "core" or special programs in IOS, OCE, or DEB are not appropriate for submission to this solicitation. Please contact a cognizant program officer if you have questions about where your planned proposal fits.

Broadening Participation In STEM

NSF recognizes the unique lived experiences of individuals from communities that are underrepresented and/or under-served in science, technology, engineering, and mathematics (STEM) and the barriers to inclusion and access to STEM education and careers. NSF highly encourages the leadership, partnership, and contributions in all NSF opportunities of individuals who are members of such communities supported by NSF. This includes leading and designing STEM research and education proposals for funding; serving as peer reviewers, advisory committee members, and/or committee of visitor members; and serving as NSF leadership, program, and/or administrative staff. NSF also highly encourages demographically diverse institutions of higher education (IHEs) to lead, partner, and contribute to NSF opportunities on behalf of their research and education communities. NSF expects that all individuals, including those who are members of

groups that are underrepresented and/or under-served in STEM, are treated equitably and inclusively in the Foundation's proposal and award process.

NSF encourages IHEs that enroll, educate, graduate, and employ individuals who are members of groups underrepresented and/or under-served in STEM education programs and careers to lead, partner, and contribute to NSF opportunities, including leading and designing STEM research and education proposals for funding. Such IHEs include, but may not be limited to, community colleges and two-year institutions, mission-based institutions such as Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), women's colleges, and institutions that primarily serve persons with disabilities, as well as institutions defined by enrollment such as Predominantly Undergraduate Institutions (PUIs), Minority-Serving Institutions (MSIs), and Hispanic Serving Institutions (HSIs).

"Broadening participation in STEM" is the comprehensive phrase used by NSF to refer to the Foundation's goal of increasing the representation and diversity of individuals, organizations, and geographic regions that contribute to STEM teaching, research, and innovation. To broaden participation in STEM, it is necessary to address issues of equity, inclusion, and access in STEM education, training, and careers. Whereas all NSF programs might support broadening participation components, some programs primarily focus on supporting broadening participation research and projects. Examples can be found on the NSF Broadening Participation in STEM website.

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.

- Patrick Abbot, telephone: (703) 292-4740, email: bio-orcc@nsf.gov
- Miriam A. Ashley-Ross, telephone: (703) 292-4997, email: bio-orcc@nsf.gov
- Sara M. Branco, telephone: (703) 292-8491, email: bio-orcc@nsf.gov
- Jeremiah W. Busch, telephone: (703) 292-5168, email: bio-orcc@nsf.gov
- Carol A. Fassbinder-Orth, telephone: (703) 292-8064, email: bio-orcc@nsf.gov
- Jayne Gardiner, telephone: (703) 292-4828, email: bio-orcc@nsf.gov
- Aardra Kachroo, telephone: (703) 292-7826, email: bio-orcc@nsf.gov

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

- 47.050 --- Geosciences
- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 20

Pending availability of funds, 15-20 awards are anticipated.

Anticipated Funding Amount: $15,000,000

Pending availability of funds, a minimum of $10,000,000 of NSF funds is anticipated to be available for awards in FY2025 plus an additional $5,000,000 from the Paul G. Allen Family Foundation solely for the MMORCC track.

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 sub-awards 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 laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:**

  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. submitting organization's local time):

  January 23, 2025

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

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

Reporting Requirements:

Standard NSF reporting requirements apply.

I. Introduction

Nearly every life-form across earth's terrestrial, aquatic, and marine biomes is experiencing rapid and dramatic changes in their biotic and abiotic environments. These dynamic conditions have resulted in many organisms experiencing conditions outside of their climatic tolerances, with effects on their growth, reproduction, survival, and species distribution. Studies over the last several decades have documented changes in the distribution, phenology, abundance, and rates of extinction of natural populations and species in response to changing climate, as well as changes in agricultural yields and ecosystem services supplied to human populations. Other studies have identified physiological and genetic mechanisms underlying organismal response to environmental stressors, but not always in the context of climate change. The goal of this solicitation is to integrate organismal mechanisms with eco-evolutionary approaches and models to improve our ability to predict organismal responses to changing climates. Projects that innovatively apply approaches that combine experimentation, computation, and modeling, that lead to new conceptual and theoretical insights and testable predictions about integrated organismal responses to climate change are encouraged. Research that integrates data across spatial/temporal/biological scales, leads to transformative methods, tools, and resources, and/or seeks breakthroughs in the understanding of complex traits and emergent properties of organisms (e.g., robustness, resilience) is also emphasized. This solicitation also seeks to support projects that use the foundational research results generated for use-inspired, translational outcomes that address societal challenges due to current and/or future climate changes.

Broader Impacts: This solicitation requires a **plan or a predictive framework** for how the foundational research results provide **use-inspired insights that address societal challenges** caused by climate change. See solicitation specific criterion 3 in this solicitation. In addition, this solicitation supports projects that provide unique educational and training opportunities for the next generation of researchers, scientific educators and scientifically literate citizens. To address the Broader Impacts review criterion, proposals can contain the development of innovative educational, broadening participation, and outreach activities or substantive participation in existing institutional infrastructure for education, training and outreach with additional budget requested to support those activities. Successful proposals often demonstrate close integration of the scientific and educational goals.

NSF encourages input and participation from the full spectrum of diverse talent that society has to offer which includes underrepresented and under-served communities. Proposals from EPSCoR jurisdictions are especially encouraged.

Budget and Scope: This solicitation encourages submission of projects across the full range of conceptual scales, and duration (1-5 years ORCC track; 1-3 years MMORCC track) with associated budget requests commensurate with the scope,

scale, and duration of the work. There are no budget minimums, and support will continue for both small-scale projects and larger requests as appropriate for the work proposed.

Proposals are encouraged that leverage NSF-supported scientific infrastructure, including but not limited to cyberinfrastructure (e.g., Cyverse, Environmental Data Initiative), and infrastructure for monitoring the natural environment (e.g., the Long-term Ecological Research Network, the National Ecological Observatory Network (NEON), and Ocean Observatories Initiative).

II. Program Description

This solicitation accepts proposals through two tracks:

Track 1: The Organismal Response to Climate Change (ORCC) Track

The goal of this solicitation is to invite mechanistic studies of organismal response to climate change (ORCC) as a foundation that, when integrated with research at other levels of organization, will lead to a deeper understanding and better predictions of the integrity, the resilience, and the adaptation of organismal systems to climate change. Proposals are encouraged to include collaborative teams with an overarching goal of using convergence approaches across biological sub-disciplines to improve our ability to anticipate adaptive and maladaptive organismal responses to future and novel environmental conditions brought upon by climate change. All aspects of organismal response associated with global climate change are open for consideration, but proposals should integrate organismal mechanisms with eco-evolutionary approaches to be generalizable across temporal, geographic, and/or biological scales. Competitive proposals will describe how the incorporation of mechanistic insights at the organismal level can increase understanding of persistence, dynamics, resilience and/or resistance of organisms to climate change. Proposals submitted to this solicitation must translate the foundational research results in use-inspired outcomes that address societal challenges arising from climate change, including but not limited to assisted migration, resource and agricultural systems management, food security, management of disease and pest outbreaks, conservation, and maintenance of ecosystem services and global resiliency. Proposals that lack a specific focus on mechanistic responses to climate change, do not bridge disciplinary components, and could normally be submitted to the "core" or special programs of IOS, OCE, or DEB are not appropriate for submission to this solicitation. Please contact a cognizant program officer if you have questions about where your planned proposal fits. Competitive projects are expected to develop causal frameworks and to employ experimental, theoretical, and/or computational approaches to increase understanding of organismal responses to climate change. Competitive proposals are anticipated to have strong plans for assessing success and impact of proposed activities. Additionally, competitive proposals should lead to generalizable concepts that can be applied to systems beyond the organism(s) under study.

The ORCC track accepts three types of proposals:

Research proposals focused on incorporating mechanistic insights at the organismal level to increase understanding and the ability to accurately predict persistence, dynamics, resilience, and resistance of organisms to climate change. Competitive proposals should include explanations for how the findings obtained with any study system are generalizable to other systems and relevant to societal concerns generated by climate change, such as conservation, biodiversity, resource management, food security, disease and pest outbreaks, maintenance of ecosystem services, or planetary resilience. Competitive proposals also address all 3 of the solicitation's special review criteria found in section VI.2.

Additional Solicitation Specific Review Criteria. Leveraging publicly available data generated by continental-scale environmental monitoring platforms such as, but not limited to, the National Ecological Observatory Network (NEON) and the Ocean Observatories Initiative (OOI) is encouraged.

Research Coordination Network (RCN) proposals to build collaborative networks of scientists in diverse disciplines to coordinate, expand, and synthesize research on the causal bases of genetic, developmental, neural, physiological, behavioral, or ecological responses to climate change. Highest priority will be given to RCNs that bring together researchers bridging experimental, ecological, oceanographic, computational, and/or '-omic' expertise from diverse experimental systems. Competitive proposals would include experts in applied fields, such as agriculture, forestry,

fisheries, conservation, and natural resource management. Please note that RCN proposals must be submitted by the deadline specified in this solicitation. Proposers should contact a program officer prior to submission to discuss their ideas. For general guidance about preparing RCN proposals, please consult the RCN program page.

Workshop and Conference proposals that bring together teams of scientists bridging experimental, ecological, oceanographic, computational, and/or '-omic' expertise to address research bottlenecks in climate change studies. For example, conference topics might include: What types of resources, including computational expertise and cyber-infrastructure, will the research community need to best incorporate organismal mechanisms into predictive models of the response of living systems to climate change? What metrics should be used to determine the most critical species/habitats/ecosystems for research? How will future research efforts in this area ensure that all individuals and groups, to include those who are under-represented in the biological sciences are included? In what ways will recruitment, training, and mentoring of early-career individuals aid in the development of integrative approaches to climate change research in the future? Conference activities and any resulting outcomes reports should be designed to advance integrative, synthetic research that incorporates mechanistic studies of organismal response to climate change and aims to improve the ability to foresee and prepare for adaptive and maladaptive responses of biological systems to climate change. Please note that conference proposals may be submitted anytime during the year and reviewed accordingly. Proposers should contact a program officer prior to submission to discuss their ideas. For general guidance about conferences, follow the current PAPPG guidance for preparing Conference Proposals.

Track 2: The Microorganism-mediated Organismal Resilience to Climate Change (MMORCC) track

For the MMORCC track, the U.S. National Science Foundation (NSF) Directorate for Biological Sciences (BIO), and The Paul G. Allen Frontiers Group and The Paul G. Allen Family Foundation have partnered to promote research in areas of shared priority focusing on microorganisms and their role in climate change. This partnership seeks to catalyze science that leverages systems-level approaches to query microorganism resilience and the dynamic dialogue across the host-microorganism continuum, which ultimately regulates microorganism-mediated resilience to environmental change across temporal (e.g., lifespan) and/or spatial (e.g., landscape) scales. The overarching goal is to leverage the power of microorganisms to develop practical solutions for mitigation and adaptation to climate change and build a resilient planet.

The MMORCC track ONLY accepts Research proposals designed to address significant knowledge gaps in our understanding of the molecular drivers and dynamics of microbial resilience to environmental change. Researchers embracing the call will integrate the interdisciplinary expertise needed to identify the physiological and molecular mechanisms underlying phenomenological observations as well as improve our ability to predict the limits of biological and global resilience as organisms (non-human) face changing and novel climate conditions.

Research foci include but are not limited to areas such as the mechanistic understanding of the resilience of microorganisms and symbiotic relationships involving microorganisms (including amongst microorganisms themselves) in changing environments; the role of multiple environmental stressors in shaping the functional dynamics of microorganisms and microorganismal symbioses; development of technologies in the field of microorganismal resilience and microorganism-mediated organismal resilience and sensitivity; and benefits and costs imparted by microorganismal resilience to the host organism across time and spatial scales. Research could include manipulations of target microorganisms or microbiomes for increased resilience or less vulnerability to climate change scenarios. Proposals with predictive models that incorporate mechanistic and dynamic perspectives on the resilience of microorganisms, microorganismal cohorts, or their symbionts are especially encouraged. In addition to mechanistic underpinnings, project outputs should have the capacity to integrate mechanistic insights at the organismal level with eco-evolutionary approaches to produce synergistic research outcomes that may lead to novel, unexpected, or major advances in understanding and/or prediction of biological responses to climate. Creative approaches that leverage the outcomes of foundational research to inform use-inspired applications that address societal challenges caused by climate change for predicting, anticipating, and/or managing adverse effects of climate change are especially encouraged.

Proposals that do not bridge interdisciplinary components, that lack a specific focus on mechanisms of response to climate change, do not integrate knowledge across scales, do not synergize experimental research with a predictive framework or computational or mathematical modeling, or do not describe a plan for use-inspired applications of

foundational research, are not appropriate for this program. Additionally, ***research whose primary goal is to establish a new model microorganism will not be considered***.

Despite its special focus on microorganisms, researchers working on microorganisms may submit through either track, but only those submitting through the MMORCC track be considered for funding through the NSF/BIO - Paul G. Allen Frontiers Group/Paul G. Allen Family Foundation partnership.

III. Award Information

Anticipated Type of Award: Continuing Grant or Standard Grant

Estimated Number of Awards: 15 to 20

Pending availability of funds, 15 to 20 awards are anticipated.

Anticipated Funding Amount: $15,000,000

Pending availability of funds, a minimum of $10,000,000 of NSF funds is anticipated to be available for awards in FY2025 plus an additional $5,000,000 from the Paul G. Allen Family Foundation solely for the MMORCC track.

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

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of sub-awards 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 laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- Tribal Nations: An American Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges as a federally recognized tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. §§ 5130-5131.

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:

Paul G. Allen Family Foundation Eligibility: Organizations eligible to receive a MMORCC award from the Paul G. Allen Family Foundation include: Nonprofit, tax-exempt 501(c)(3), U.S. organizations; Units of state or local government; State colleges or universities; or federally recognized tribal communities or tribes. All supported organizations must review and agree to the Paul G. Allen Family Foundation grant terms and Grantee Code of Conduct found here: https://pgafamilyfoundation.org/_ui/img/pgafoundation/Grantee_Code_of_Conduct.pdf. Eligible institutions do not include foreign 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 Research.gov or Grants.gov.

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

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

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

See PAPPG Chapter II.D.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.

Additional Proposal Preparation Instructions beyond those that must be followed in the PAPPG:

Preparation of proposals should follow the guidance in the PAPPG. Below we provide additional information and resources to aid preparation:

For the ORCC track: Proposal titles should be prefaced by "ORCC:" for ease of identification. Proposals for RCNs should be prepared and submitted consistent with the guidelines in the RCN solicitation, with the proposal title prefaced with "RCN: ORCC:".

For the MMORCC track: Proposal titles should start with "MMORCC:".

NSF will manage the review of MMORCC proposals in consultation with The Paul G. Allen Frontiers Group. The MMORCC track proposals will be reviewed along with other proposals received for the ORCC track, using NSF's merit review process and solicitation-specific review criteria described below.

If a MMORCC proposal is recommended for funding, the Principal Investigator (PI) will be asked to submit a revised budget to NSF and to submit a budget to The Paul G. Allen Family Foundation according to each organization's total funding contribution to the project. All funds awarded by The Paul G. Allen Family Foundation must be budgeted as direct costs, and indirect costs are not allowed on this part of the budget. The Paul G. Allen Family Foundation and NSF anticipate a 50:50 split of each total award budget.

Additionally, The Paul G. Allen Frontiers Group will host at least one convening in Seattle open to MMORCC award recipients during the award period. Recipients will be responsible for travel and accommodation costs associated with attendance of this convening. Proposals should include travel and accommodation costs for all PIs and one trainee in their budgets. This event will be open to attendance by representatives of NSF and may include attendance by individuals affiliated with the Allen Institute or the Paul G. Allen Family Foundation and its network of award recipients, or other strategic attendees that could facilitate opportunities for the advancement of the field.

Those MMORCC proposals selected for funding by NSF will be handled and awarded in accordance with standard NSF procedures. The Paul G. Allen Family Foundation component of the recommended funding will be awarded in accordance with its policies and terms and conditions. Recipients must comply with the award conditions and reporting requirements of the organizations from which they receive funding. Recipients are required to acknowledge NSF, The Paul G. Allen Frontiers Group and The Paul G. Allen Family Foundation in any reports or publications resulting from the award.

For Both Tracks:

Both tracks must address the solicitation specific review criteria found in section VI. 2. Below.

Data Management and Sharing Plan. In addition to the guidance in the PAPPG, the Directorate for Biological Sciences provides additional context and guidance to PIs on the preparation of Data Management and Sharing Plans. All projects must ensure that data and biological materials are collected, archived, digitized, and made available using methods that allow current and future investigators to address new questions as they arise. Funded projects must disseminate project data broadly, using widely accepted electronic data standards. Investigators are strongly encouraged to make use of appropriate community infrastructure for data management. For proposals that involve collecting or generating specimens (e.g., organisms, parts of organisms, fossils - including trace fossils, microbial isolates, etc.), the Data Management and Sharing Plan must include a description of how the specimens and associated data will be accessioned into and maintained in an established biological collection.

Projects focused on marine organisms: Data Management and Sharing Plans must be compliant with guidelines specified in the Division of Ocean Sciences Data and Sample Policy described in NSF 24-124.

For planned Research Experiences for Undergraduates (REU), Research Opportunity Awards (ROA), Research Experience for Post-Baccalaureate Students (REPS), Research Experiences for Teachers (RET) or Research Assistantships for High School Students (RAHSS) activities, a Supplementary Document (as described in the REU solicitation) should be included that describes those activities. Funds for these proposed activities should be included in the budget. Additional guidance for REU activities can be found on the REU program page. Additional guidance for ROA, RET or RAHSS activities can be found in the Facilitating Research at Primarily Undergraduate Institutions: Research in Undergraduate Institutions (RUI) and Research Opportunity Awards (ROA) solicitation and the RAHSS DCL.

Safe and Inclusive Fieldwork (SAIF) Plan:

All proposals submitted to this solicitation that include research that will be conducted off-campus or off-site must submit a plan for safe and inclusive fieldwork as a supplemental document that will be considered under the broader impacts review criterion. This supplemental document is in lieu of the required plan associated with the certification called for in Chapter II.E.9 of the PAPPG. More information regarding review of the plan is provided under Solicitation Specific Review Criteria.

It is NSF policy to foster safe and harassment-free environments wherever science is conducted. Work conducted off-campus or off-site should be an enriching experience for everyone and help draw researchers to biological and geological

sciences research. By requiring advanced planning and attention to maintaining an inclusive environment, NSF is working to ensure that off-campus or off-site research is safe and inclusive for all participants.

Off-campus or off-site research is defined as data/information/samples being collected off-campus or off-site, such as fieldwork and research activities on vessels and aircraft. The **SAIF** plan **must be no more than two pages and include**:

- a brief description of the field setting and unique challenges for the team;
- the steps the proposing organization will take to nurture an inclusive off-campus or off-site working environment, including processes to establish shared team definitions of roles, responsibilities, and culture, e.g., codes of conduct, trainings, mentor/mentee mechanisms and field support that might include regular check-ins, and/or developmental events;
- communication processes within the off-site team and to the organization(s) that minimize singular points within the communication pathway (e.g., there should not be a single person overseeing access to a single satellite phone); and
- the organizational mechanisms that will be used for reporting, responding to, and resolving issues of harassment if they arise.

Polar and/or Marine Fieldwork Logistics, Assignable Assets.

Projects including facilities, logistics, or assignable asset costs (e.g., NEON, Arctic Research Support and Logistics, Ship-time and Marine Equipment [SME] for use of Academic Research Fleet) must provide evidence showing that requests have been submitted for appropriate support and use.

Proposals centered on Polar habitats need to be discussed prior to submission with a Cognizant ORCC program officer for additional guidance and logistics requirements. Polar projects should explore logistics available for Arctic (https://www.nsf.gov/geo/opp/arctic/res_log_sup.jsp) and Antarctic (https://www.nsf.gov/geo/opp/ail/) fieldwork. Proposals requesting support for polar fieldwork should expect to go to the field no sooner than 12 months after proposal submission to allow time to plan, budget, and complete environmental compliance documentation.

Proposals centered on Marine and Great Lakes habitats with requests for ship time on a vessel in the U.S. Academic Research Fleet (ARF; https://www.unols.org/ships-facilities/unols-vessels/unols-designated-vessels/) need to be discussed prior to submission with a Cognizant ORCC program officer for additional guidance and logistics requirements. Requests for ship time on a ARF vessel must be submitted via the UNOLS Marine Facility Planning (MFP) website at: https://mfp.us/ with the SME form included in the proposal as a supplementary document. Proposals requesting ship time should expect to go to the field no sooner than 12 months (Intermediate, Regional, and Local-class vessels) or 18 months (Global or Ocean class vessels) after proposal submission (https://www.nsf.gov/news/news_summ.jsp?cntn_id=309730&org=OCE) to allow time to plan, budget, and complete environmental compliance documentation (https://www.unols.org/marine-facilities-planning-scientist-how-guide). PIs are responsible for filing the appropriate requests for major research platforms; a copy of the request must be submitted as a Supplementary Document. Any science support provided by third-party organizations must be described in a 1 – 2-page Supplementary Document that outlines the scope of support and a cost estimate. Please allow service providers 4 – 6 weeks to prepare Supplementary Documents to include in proposals and initiate the request far in advance of proposal submission. For any instrument or infrastructure deployed to the field, investigators should include the scope and cost for the demobilization or other disposal of the property.

Per the NSF PAPPG, recipients are responsible for acquiring and complying with all permits necessary for their work and are responsible for all activities conducted under the award. NSF is not responsible for costs associated with medical evacuations or other interruptions to scheduled fieldwork and reserves the right to seek reimbursement for costs incurred for search, rescue, or medical evacuation. Proposers should ensure all members of the field team are covered by institutional medical evacuation insurance or request funds to purchase medical evacuation insurance, which is an allowable grant cost. All investigators should have a risk management plan for their fieldwork including a plan for emergencies.

International Collaboration:

The Organismal Responses to Climate Change Program broadly welcomes, but does not require, that projects include international collaborators. PIs considering ORCC research in non-U.S. locations need to be sure to partner with local scientists as full collaborators in the design and conduct of the research project and the nature of this collaborative partnership should be fully described in the project proposal. All international collaborators are expected to seek support from their respective funding organizations.

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. submitting organization's local time):

  January 23, 2025

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationa For Research.gov user support, call the Research.gov Help Desk at 1-800-381-1532 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

The NSF Grants.gov Proposal Processing in Research.gov informational page provides submission guidance to applicants and links to helpful resources including the NSF Grants.gov Application Guide, Grants.gov Proposal Processing in Research.gov how-to guide, and Grants.gov Submitted Proposals Frequently Asked Questions. Grants.gov proposals must pass all NSF pre-check and post-check validations in order to be accepted by Research.gov at NSF.

When submitting via Grants.gov, NSF strongly recommends applicants initiate proposal submission at least five business days in advance of a deadline to allow adequate time to address NSF compliance errors

and resubmissions by 5:00 p.m. submitting organization's local time on the deadline. Please note that some errors cannot be corrected in Grants.gov. Once a proposal passes pre-checks but fails any post-check, an applicant can only correct and submit the in-progress proposal in Research.gov.

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

VI. NSF Proposal Processing And Review Procedures

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

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

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Leading the World in Discovery and Innovation, STEM Talent Development and the Delivery of Benefits from Research - NSF Strategic Plan for Fiscal Years (FY) 2022 - 2026*. 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.D.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.D.2.d(i), prior to the review of a proposal.

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

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

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

1. What is the potential for the proposed activity to
    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and

b. Benefit society or advance desired societal outcomes (Broader Impacts)?

2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

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

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

Additional Solicitation Specific Review Criteria

In addition to the two NSB-approved merit review criteria, reviewers will be asked to evaluate the following solicitation-specific criteria for proposals in both tracks:

1. Does the proposal describe an overarching question that is addressed through hypothesis-driven research aimed at expanding knowledge and understanding of the **mechanisms of response of organisms to climate change**?
2. Does the proposal **integrate mechanistic insights at the organismal level with eco-evolutionary approaches** to produce **synergistic** research outcomes that may lead to novel, unexpected, or major advances in understanding and/or prediction of biological responses to climate change?
3. Do the broader impacts describe a **plan or a predictive framework** for how the foundational research can be **used for use-inspired insights that address societal challenges** caused by climate change?

Reviewers will be instructed to also evaluate the Safe and Inclusive Fieldwork (SAIF) Plan within the Broader Impacts review criterion, specifically:

- Is there a compelling plan (including the procedures, trainings, and communication processes) to establish, nurture, and maintain inclusive off-campus or off-site working environment(s)?
- Does the proposed plan identify and adequately address the unique challenges for the team and the specific off-campus or off-site setting(s)?
- Are the organizational mechanisms to be used for reporting, responding to, and resolving issues of harassment, should they occur, clearly outlined?

B. Review and Selection Process

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

NSF will manage the review of MMORCC proposals in consultation with The Paul G. Allen Frontiers Group. The MMORCC track proposals will be reviewed along with other proposals received for the ORCC track, using NSF's merit review process and solicitation-specific review criteria described above.

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 proposers whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new recipients may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements or 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 an NSF Grants and Agreements Officer. 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)*; and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

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

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

Administrative and National Policy Requirements

Build America, Buy America

As expressed in Executive Order 14005, Ensuring the Future is Made in All of America by All of America's Workers (86 FR 7475), it is the policy of the executive branch to use terms and conditions of Federal financial assistance awards to maximize, consistent with law, the use of goods, products, and materials produced in, and services offered in, the United States.

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for infrastructure projects under an award unless all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's Build America, Buy America web page.

Special Award Conditions:

Those MMORCC proposals selected for funding by NSF will be handled and awarded in accordance with standard NSF procedures. The Paul G. Allen Family Foundation component of the recommended funding will be awarded in accordance with its policies and terms and conditions. Recipients must comply with the award conditions and reporting requirements of the organizations from which they receive funding. Recipients are required to acknowledge NSF, The Paul G. Allen Frontiers Group and The Paul G. Allen Family Foundation in any reports or publications resulting from the 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 annual project report, and a project outcomes report for the general public.

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

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

VIII. Agency Contacts

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

General inquiries regarding this program should be made to:

- Patrick Abbot, telephone: (703) 292-4740, email: bio-orcc@nsf.gov
- Miriam A. Ashley-Ross, telephone: (703) 292-4997, email: bio-orcc@nsf.gov

- Sara M. Branco, telephone: (703) 292-8491, email: bio-orcc@nsf.gov
- Jeremiah W. Busch, telephone: (703) 292-5168, email: bio-orcc@nsf.gov
- Carol A. Fassbinder-Orth, telephone: (703) 292-8064, email: bio-orcc@nsf.gov
- Jayne Gardiner, telephone: (703) 292-4828, email: bio-orcc@nsf.gov
- Aardra Kachroo, telephone: (703) 292-7826, email: bio-orcc@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-381-1532
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. Other Information

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

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

About The National Science Foundation

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

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (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.F.7 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) 292-8134
- **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 proposers 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/recipients 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 proposers or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See System of Record Notices, NSF-50, "Principal Investigator/Proposal File and Associated Records," and NSF-51, "Reviewer/Proposal File and Associated Records." Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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

Suzanne H. Plimpton
Reports Clearance Officer
Policy Office, Division of Institution and Award Support

Office of Budget, Finance, and Award Management
National Science Foundation
Alexandria, VA 22314