# Coastlines and People (CoPe)

## PROGRAM SOLICITATION
## NSF 21-613

## REPLACES DOCUMENT(S):
## NSF 20-567

**National Science Foundation**

Directorate for Geosciences

Office of Integrative Activities

Directorate for Social, Behavioral and Economic Sciences

Directorate for Engineering

Directorate for Biological Sciences

Directorate for Education and Human Resources

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

December 06, 2021

For both Focused Hubs and Large-Scale Hubs

## IMPORTANT INFORMATION AND REVISION NOTES

Several changes have been made including

1. LOIs are no longer required
2. the deadline date is now the same for both focused and large-scale hubs
3. project description page limits have been increased
4. project management plans and results from prior NSF support are no longer supplemental documents
5. budget requests for geo-supported facilities must be included in total budgets and not exceed budget limits
6. revised wording in the data management plan, postdoc mentoring plan and additional review criteria

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

## SUMMARY OF PROGRAM REQUIREMENTS

### General Information

**Program Title:**

Coastlines and People Hubs for Research and Broadening Participation (CoPe)

**Synopsis of Program:**

Scientific research into complex coastal systems and the interplay with coastal hazards is vital for predicting, responding to, and mitigating threats in these regions. Understanding the risks associated with coastal hazards requires a holistic Earth Systems approach that integrates improved understanding of and, where possible, predictions about natural, social, and technological processes with efforts to increase the resilience of coastal systems. The Coastlines and People program supports diverse, innovative, multi-institution awards that are focused on critically important coastlines and people research that is integrated with broadening participation goals. The objective of this solicitation is to support Coastal Research Hubs, structured using a convergent science approach, at the nexus between coastal sustainability, human dimensions, and coastal processes to transform understanding of interactions among natural, human-built, and social systems in coastal, populated environments.

**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.*

- CoPe Working Group, telephone: (703) 292-4708, email: nsfcope@nsf.gov

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

- 47.041 --- Engineering
- 47.050 --- Geosciences
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.083 --- Office of Integrative Activities (OIA)

## Award Information

**Anticipated Type of Award:**

Standard Grant or Continuing Grant or Cooperative Agreement

**Estimated Number of Awards:** 5 to 8

Due to the potential scope and complexity of CoPe Hubs, the awards may be continuing grants or cooperative agreements.

**Anticipated Funding Amount:** $28,000,000

**Focused Hubs**: Projects with total budgets up to $1 million per year, for 3 to 5 years.

**Large-scale Hubs**: Projects with total budgets ranging from $2 to 4 million per year (not to exceed 4 million in any one year), with an average award of $3 million per year, for up to 5 years.

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

## Eligibility Information

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

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

**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:**

An individual may be listed as a PI or co-PI on no more than one Hub proposal submitted in response to this solicitation. Proposals exceeding the limit for any person will be returned without review in the reverse order received. There is no limit on the number of proposals on which an investigator may be listed as Lead of a Subaward or as Other Senior Personnel.

## 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):

  December 06, 2021

  For both Focused Hubs and Large-Scale Hubs

## 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:**

Standard NSF award conditions apply.

**Reporting Requirements:**

Standard NSF reporting requirements apply.

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## I. INTRODUCTION

Coasts are paramount to our nation's economic prosperity, sustainability and national security. U.S. coastal ports handle more than $700 billion in merchandise annually. Coastal shoreline counties produced 40 percent of the nation's total jobs and contributed 46 percent of its gross domestic product in 2014 (https://coast.noaa.gov/data/digitalcoast/pdf/socioeconomic-data-summary.pdf). Critically, 1,774 military sites across the globe depend on the stability of 153,646 kilometers (95,471 miles) of coastline (Center for Climate and Security, 2016).

Coastal counties in the lower 48 states have a population density that is six times greater than corresponding inland counties and is growing rapidly (National Ocean Service, 2017). According to the U.S. 4th National Climate Assessment, as of 2013, 257.9 million people or 81.5% of the U.S. population live in Coastal States. The population of coastline counties along the Pacific, Atlantic, and Gulf coasts are much more diverse, with populations that are composed more than 50% of racial/ethnic groups other than non-Hispanic White compared to 34% in non-coastline counties (U.S. Census, 2019). The Great Lakes hold environmental, cultural, and economic value for both the region and the nation. Often referred to as the "Third Coast," the five Great Lakes possess 95 percent of the country's surface fresh water supply. The Great Lakes Basin includes 158 counties and 13 major urban areas; about 27.3 million Americans call the region home.

Environmental phenomena of terrestrial, oceanic, and atmospheric origin are constantly changing coastal landscapes and affect human habitats and infrastructure. Sea-level rise will continue to cause serious economic, social, and environmental impacts to coastlines around the globe. Since 1900, global mean sea level has risen by 7-8 inches, with about 3 inches occurring since 1993 (Folger, 2016) (USGCRP, 2017). Research has shown that all coastal cities will see some impacts of global sea level rise (Larour, 2017).

Climate change is leading to warming seas, causing about half the eustatic sea level rise, and impacting precipitation patterns which alter coastal hydrology and ecosystems. In 2017, Hurricanes Harvey, Maria and Irma set damage records totaling $265 billion (Smith, 2018).

Devastating earthquakes, tsunamis, and landslides occur at subduction zones, five of which exist along coastlines in the U.S. and its territories. In 1964, the most powerful earthquake in U.S. history occurred in Alaska, causing 129 deaths and $2.38 billion in property losses, mostly resulting from tsunamis caused by local undersea landslides (USGS, 2017).

A great deal of public critical infrastructure, such as housing, transportation, water supply, and electricity generation and distribution, is vulnerable to extreme weather events, sea-level rise, coastal flooding, algal blooms, and tectonic hazards. Scientific research into complex coastal systems and the interplay with coastal hazards is vital for predicting, responding to, and mitigating threats in these regions. Understanding the risks associated with coastal hazards requires a holistic Earth Systems approach that integrates improved understanding of and, where possible, predictions about natural, social, and technological processes with efforts to increase the resilience of coastal systems.

Significant population growth in coastal regions increases risk exposure to these coastal hazards. This motivates an investment in interdisciplinary, convergent research across many disciplines including biology, engineering, geoscience, and the social and behavioral science. Convergent research is driven by a specific challenge or opportunity. It entails integrating knowledge, methods, and expertise from different disciplines to form novel frameworks to catalyze scientific discovery and innovation.

Therefore, a successful research framework responsive to this solicitation brings together researchers from multiple disciplines, cutting across natural and/or engineering and/or social and behavioral sciences, to study dynamic Earth Systems processes and vulnerabilities across varying spatial and temporal scales. The complex interface between coastal processes/hazards and people requires strong partnerships between the research team and relevant stakeholders. Therefore, critical sectors of the global coastal economy, e.g., tourism, construction, fisheries, and national security, must be proactively engaged in the development of novel research approaches to advance coastal zone science that informs sound management and conservation efforts for long-term resiliency. Through these partnerships, coastal vulnerabilities can be identified and addressed through research that informs a variety of practical actions including planning and adaptation promoting resilience; active mitigation of impacts prior to, and after, events; and by accounting for predictable slowly occurring processes at longer temporal and larger spatial scales.

## II. PROGRAM DESCRIPTION

Investigating the complex interactions between *coastal processes, human dynamics, and the built environment* requires a focused investment in novel, multidisciplinary science that engages a diverse group of local stakeholders. The goal of this program is to support Coastal Research Hubs, structured using a convergent science approach, at the nexus of coastal sustainability, human dimensions, and coastal processes to transform understanding of interactions among natural, human-built, and social systems in populated coastal environments. Research Hubs will address issues operating at multiple scales and link science, stakeholder engagement, and education into developing pathways to sustainability in changing coastal environments.

Many of the communities that are most vulnerable to natural hazards and environmental change in coastal areas include significant populations of groups that have historically not been included in STEM (Science, Technology, Engineering, and Mathematics) fields or in the development of STEM research. Thus, CoPe Hubs present an opportunity to broaden participation and engage stakeholders in a meaningful way that will benefit individuals, communities, society, and STEM. Successful CoPe hubs will embrace both broadening participation and stakeholder engagement as key values that are integrated into the design of the hub and the choice of science priorities to explore. Broadening participation, in the context of CoPe, includes rethinking how we identify, approach, and prioritize scientific questions to get a diversity of individuals involved in the scientific enterprise. Diversifying the STEM workforce is an important component of broadening participation that should be coupled with activities that ensure inclusion of the diverse workforce in the workplace. The CoPe program is also interested in stakeholder engagement through citizen science, stakeholder partnerships, community engagement and many more types of activities that help drive research priorities and have the potential to broaden participation in STEM. The Committee on Equal Opportunity in Science and Engineering (CEOSE), in October 2019, called for a more integrative vision for inclusiveness in STEM and thus recommended that NSF give increased attention to including diverse community voices across its research and education portfolios through community driven projects. CoPe Hubs provide an opportunity to implement that CEOSE recommendation (See **C**EOSE Biennial Report to Congress: Investing in Diverse Community Voices, Arlington, VA, (2019)).

**A. Objectives of the CoPe program are to:**

- Conduct basic research focused on understanding the origins and/or processes that impact coastal environmental variability and hazards on populated coastal regions.
- Support research and activities in a hub-based environment, where the whole is greater than the sum of the parts.
- Support potentially ground-breaking investigations on both coastlines and people that cross disciplines, involve stakeholders and local communities, and integrate broadening participation into the values of all activities and research the hub undertakes.
- Foster fundamental coastal science and engineering that is societally relevant.
- Provide a framework where multiple institutions and constituencies can easily work together on scientific questions relevant to all.
- Serve as an exemplary program for integrated Earth-system processes.

**B. Characteristics of Coastlines and People Hubs**

While the exact structure of a hub may take many different forms, successful hubs will achieve the following:

- Fit within the NSF mission of basic research that has strong intellectual merit and broader impacts related to coastal hazards. While a natural hazard is often thought of as a single event with a timescale of seconds to days, CoPe will consider environmental changes that occur on long time scales and impacts coastal populations to also be hazards (e.g., sea level rise, erosion). Each hub should have a clearly defined science theme, with articulation of why an interdisciplinary effort is necessary to advance the science chosen. While the research should be fundamental, it should also have the potential to inform the actions by stakeholders and include a clear motivation for the science proposed by the hub.
- Integrate broadening participation activities fully into hub science, recognizing that when new voices are considered as science is developing, new and better ideas can emerge. Hubs that fully integrate broadening participation activities have the potential to not only help diversify STEM, but fundamentally impact how the science is conducted and who is involved and included in the development of scientific ideas.
- Involves multiple constituencies and institutions. Proposers should be tackling scientific challenges that are larger in scale than can be accomplished by a single institution or a single discipline.
- Defines a structure that will enable interaction between the various institutions, stakeholders, and communities. The hub may be completely virtual, or it may have a physical central location. Regardless the chosen structure of the hub must have plans in place for enabling research across disciplines, institutions, and constituencies.
- Over the life span of a hub, it is anticipated that the science pursued and the activities the hub engages in may evolve. Thus, it is important that a CoPe hub can evolve its leadership and structure to best serve the entirety of the hub and the evolving scientific focus.
- Engage stakeholders in a manner that would help drive the basic science research priorities. Each hub should identify who the relevant stakeholders are for the hub research theme. Stakeholders may be local communities, government (local, state and/or federal) agencies, nonprofit organizations, private sector businesses, and other scientists.
- A hub may be focused on a geographic region but should explore science that is transferable to other locations.

**Funding Tracks:**

**Track 1: Focused CoPe hubs**

The CoPe Program welcomes proposals for Focused hubs via this solicitation. These awards are intended to support full-fledged research hubs that require smaller budgets ($1 million or less per year). Therefore, the scope of the Focused hubs may focus on a specific geographic region, a narrow set of research questions, or have other aspects of the chosen theme that keeps the scope of the hub appropriate for the budget.

**Track 2: Large-scale CoPe hubs**

The CoPe Program welcomes proposals for Large-scale hubs via this solicitation. These awards are intended to support hubs that require larger budgets because of the scope of the science or geographical area involved ($2-$4 million per year). Due to the potential scope and complexity of the Large-scale hubs, the awards may be continuing grants or cooperative agreements.

Post-award oversight for both Focused and Large-scale Hubs will entail a midterm review by NSF to assess progress toward the Hub's stated goals and objectives.

## III. AWARD INFORMATION

**Anticipated Type of Award:** Standard Grant or Continuing Grant or Cooperative Agreement

**Estimated Number of Awards:** 5 to 8

**Anticipated Funding Amount:** $28,000,000

The program budget for FY 2022 is $28 million, subject to the availability of funds.

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

## IV. ELIGIBILITY INFORMATION

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

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

**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:**

An individual may be listed as a PI or co-PI on no more than one Hub proposal submitted in response to this solicitation. Proposals exceeding the limit for any person will be returned without review in the reverse order received. There is no limit on the number of proposals on which an investigator may be listed as Lead of a Subaward or as Other Senior Personnel.

**Additional Eligibility Info:**

Support for non-lead collaborating organizations should be requested as subawards. Separately submitted collaborative proposals are not allowed.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

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

**Project Description:** The project description should provide a clear statement of the work to be undertaken and must include the objectives for the period of the proposed work and the expected significance. Note that the project management plan and results from prior NSF support should be included in the project description. Additional details for inclusion of this information is explained under the following sections: Focused Hubs and Large-scale Hubs. ***The page limit for Focused Hubs is 22 pages and the page limit for Large-scale hubs is 27 pages.***

**Focused Hubs**: Projects with total budgets of $1 million or less per year, for 3 to 5 years, should be identified as such with the designation "**Focused CoPe:**" *as a prefix to the project title in the full proposal*. The project description page limit is 22 pages for Focused Hub proposals, and must include a description of the project, the project management plan, and the results from prior NSF support. *The project management plan and results from prior NSF support must be identified with clear section headings.*

**Large-scale Hubs**: Projects with total budgets of $2-4 million per year, with an average award of $3 million per year, for up to 5 years, should be identified as such with the designation "**Large-scale CoPe:**" *as a prefix to the project title in the full proposal*. The project description page limit is 27 pages for Large-scale Hub proposals, and must include a description of the project, the project management plan, and the results from prior NSF support. *The project management plan and results from prior NSF support must be identified with clear section headings.*

**Requests for Use of GEO Supported Facilities**: If a project requires the use of NSF's GEO facilities, the PI must contact the cognizant program officer to discuss budget implications before submitting a proposal.

**Project Management Plan (PMP):** The PMP should (1) explain the organizational relationships and reporting structure related to the specific goals and objectives of the hub, (2) describe the processes used to prioritize hub activities, and (3) articulate how the management and leadership of the hub will have mechanisms in place to allow the hub to evolve as the science evolves. The summary management plan should include a timeline that specifies milestones and expected completion dates with an anticipated mid-project review by NSF to assess progress toward the Hub's stated goals and objectives.

The most competitive CoPe hubs will consider the following suggestions in developing their proposals:

1. **Vision, Motivation and Impact:** What research relevant to Coastlines and People will be undertaken by the hub? How will understanding of the complex interface between coastal natural processes, geohazards, people and their natural and built environments be advanced by the proposed hub? How is this research well suited to integrate stakeholder engagement and broaden participation? What strategies will be used to broaden participation in STEM? How will integration of broadening participation shape the science undertaken by the CoPe hub? How will the hub be structured to enable the goals of the hub?

   Proposers should:

   - Identify a hub theme that will advance both understanding of Coastlines and People, engage stakeholders and broaden participation in coastal STEM research in an integrated fashion.
   - Connect the hub theme to overarching basic scientific questions at the interface between coastal natural processes, hazards, people and their natural and built environments.

- Present clear objectives and outcomes for the hub. These should be related to the basic science questions and be formulated so that progress and success can be assessed.
- Articulate a common agenda for the hub that reflects a collective understanding of research challenges, challenges to broadening participation, and challenges of integrating research and broadening participation.
- Develop an overall framework of the hub structure necessary to conduct the proposed research and activities, including technical infrastructure, which facilitates collaborative activities and the implementation and accomplishment of specified activities and targeted outcomes.
- Explain the unique opportunity that an interdisciplinary and integrated hub will provide, as well as describe what will be achieved in the hub mode that could not be achieved with group or individual support.
- Describe the potential legacy and national impact of the proposed hub.

2. **Integration and Partnerships:** Which organizations are proposed partners within the CoPe Hub? What unique expertise, perspective, and talent does each partner bring to the CoPe hub necessary to conduct the proposed science? What evidence is there that partnerships will be able to successfully work together towards the vision of the CoPe hub proposed? How will activities be integrated across the partners?

   Proposers should:

   - Describe the academic partners that will participate in the proposed hub, articulating the unique contribution they bring, as well as how the theme of the CoPe hub aligns with institutional priorities and strengths.
   - Describe the non-academic partners that will participate in the proposed hub. Articulate the extent of any existing relationships with non-academic partners. Provide a plan for how non-academic partnerships, especially with community groups and stakeholders, will be strengthened by hub research and activities. For partnerships with federal agencies, articulate how research conducted by the hub will be beneficial to the federal partners, but remain fundamental research in alignment with the NSF mission.
   - Describe any partnerships that build on existing NSF investments such as GEO facilities, NEON, Critical Zone Observatories (CZO), Long Term Environmental Research (LTER), Smart and Connected Communities (S&CC testbeds/living labs), NSF INCLUDES (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science), and GOLD (GEO Opportunities for Leadership Development or other Federal investments. Articulate how those previous/ongoing investments will be leveraged in new ways.
   - Describe partnerships that broaden participation. Articulate how any existing broadening participation efforts of partners will be leveraged and amplified by hub activities.
   - Articulate how the partnerships in the proposed hub will be nurtured to build long lasting relationships, whose impact and integrated activities continue well beyond the length of the hub performance period.

3. **Metrics of Success and Evaluation:** What will constitute success for a hub? How will the multiple and integrative activities of a CoPe hub be evaluated? What type of data will be collected related to broadening participation activities and how will that data be used to assess progress? What components of hub have potential to continue beyond the lifetime of the hub?

   Proposers should:

   - Describe how progress will be measured and reported; include the designation of an external evaluator.
   - Detail an evaluation plan which may include benchmarks, indicators, logic models, road maps, or other evaluative methods to document progress towards objectives and outcomes.
   - Outline a process to develop appropriate ways to collect and analyze metrics data across the diverse and evolving activities of a hub.
   - Present current demographic data related to broadening participation. These data should be specific to the group(s) the hub will work with to broaden participation and in a format that can be used for benchmarking and measuring progress on broadening participation.
   - PIs should budget within travel for a minimum of 2 PI/Co-PIs to travel to NSF 3 times over the award period for a PI meeting and/or to report to NSF on hub progress.

**SUPPLEMENTARY DOCUMENTS**

**Data Management Plan:** In addition to PAPPG guidance on data management plans, the data management plan should explicitly address how data that are co-created or co-collected with local communities will be managed and shared with those communities. The DMP must include details on how co-produced data will be shared with communities. All projects must ensure that data and materials are collected, archived, digitized, and made available using methods that allow current and future investigators to access data and material. Funded projects must disseminate project data broadly, using widely accepted electronic data standards, and a named publicly accessible data site. Investigators are strongly encouraged to make use of appropriate community infrastructure for data management. The data management plan should address how any personally identifiable data will be protected before publicly sharing, though techniques such anonymization, aggregation, etc. The investigators must state a time period, after the end of the award, when the data will become publicly accessible that is consistent with NSF policy. After this time-period, there can be no restrictions or contingencies on data availability.

**Postdoc Mentoring Plan:** Follow PAPPG guidance. Note that there should be a single postdoc mentoring plan for the entire hub. The format of the postdoc mentoring plan should follow the PAPPG guidelines. The mentoring plan should articulate the intellectual contribution of Postdocs to the overall project.

**Other Supplementary Documents should be included in this order:**

1. **List of Project Personnel:** A list of Partner organizations and Project Personnel as described below is required. This information provides NSF and reviewers with a comprehensive list of personnel and organizations involved in the CoPe Hub.
   - List all project personnel who have a role in the management, research, education, broadening participation, and knowledge transfer components of the CoPe Hub. Use the following format: last name, first name, institution/organization.
   - List of all institutions and organizations with which project personnel are affiliated. Designate for each an appropriate category: Institution of Higher Education, National Laboratory, Federal Government, Industry, Non-Governmental Organization, State/Local Government, or International organization.
2. **Letters of Collaboration**

   **PIs are strongly encouraged to use the recommended template in the PAPPG. Please contact a cognizant program officer if you plan to deviate from this template.**

## B. Budgetary Information

**Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

## C. Due Dates

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

  December 06, 2021

  For both Focused Hubs and Large-Scale Hubs

## 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 NSF Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The NSF Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

**For Proposals Submitted Via Grants.gov:**

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

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

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

# VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

## A. Merit Review Principles and Criteria

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

every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

**1. Merit Review Principles**

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

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

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

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

**2. Merit Review Criteria**

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

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

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

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

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

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

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

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

**Additional Solicitation Specific Review Criteria**

1. The extent to which the proposed research aims to advance understanding of the origins and impacts of coastal environmental variability and hazards on populated coastal regions;
2. The degree to which the project meaningfully integrates research and broadening participation;
3. The strength and relevance of the proposed partnerships for advancing CoPe goals;
4. The feasibility of the evaluation plan; and
5. The efficacy of the proposed summary Project Management Plan (PMP).

## B. Review and Selection Process

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

Ad hoc, in person and virtual panels.

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

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

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

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

# VII. AWARD ADMINISTRATION INFORMATION

## A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

## B. Award Conditions

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

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

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

## C. Reporting Requirements

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

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

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

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

## VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- CoPe Working Group, telephone: (703) 292-4708, email: nsfcope@nsf.gov

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

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

For questions relating to Grants.gov contact:

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

## IX. OTHER INFORMATION

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

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

*Facilitation Awards for Scientists and Engineers with Disabilities* (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) 292-8134

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

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

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