Sustainable Regional Systems Research Networks (SRS RNs)

PROGRAM SOLICITATION
NSF 20-611

National Science Foundation

Directorate for Engineering

Directorate for Social, Behavioral and Economic Sciences

Directorate for Biological Sciences

Directorate for Computer and Information Science and Engineering

Directorate for Education and Human Resources

Directorate for Geosciences

Directorate for Mathematical and Physical Sciences

Office of Integrative Activities

Office of International Science and Engineering

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

January 11, 2021

IMPORTANT INFORMATION AND REVISION NOTES

IMPORTANT WEBINAR: NSF will hold an informational webinar on October 27, 2020, from 2:30-3:30 pm EST to discuss the SRS RNs solicitation and answer questions. To register for this webinar, please visit https://nsf.zoomgov.com/webinar/register/WN_nh16JLVfQ3qzYtRqLlxA7g.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 20-1), which is effective for proposals submitted, or due, on or after June 1, 2020.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Sustainable Regional Systems Research Networks (SRS RNs)

Synopsis of Program:

The United States is made up of regional systems comprising interdependent urban and rural systems and every community category between urban and rural. Urban systems are dependent on rural systems for the provisioning of food, energy, water, and other materials and natural resources, while rural systems are dependent on urban systems for markets, manufactured goods, and medical resources. These systems are also connected by ecological processes that both influence and are influenced by human behavior. The vital interconnection of urban-rural systems underscores the critical need for the advancement of sustainable regional systems (SRS). The goal of this solicitation is to fund convergent research and education that will advance sustainable regional systems science, engineering, and education to facilitate the transformation of current regional systems to enhance sustainability. To further the advancement of SRS science, engineering, and education, NSF will support Full Scale proposals and Planning Grant proposals for Sustainable Regional Systems Research Networks (SRS RNs).

Sustainable regional systems are connected urban and rural systems that are transforming their structures and processes collaboratively with the goal of measurably and equitably advancing the well-being of people and the planet. The purpose of the SRS RNs competition is to develop and support interdisciplinary, multi-organizational teams of investigators and stakeholders working collaboratively to produce cutting-edge convergent research, education, and outreach that addresses grand challenges in sustainable regional systems. SRS RNs will study multiscale regional systems to further SRS science, engineering, and education. Key elements will include new data, methods, and models to understand interactions between natural, human-built, and social systems; improved understanding of interdependencies, mutual benefits, and trade-offs of different wellbeing outcomes for humans and the environment; new and generalizable theories of change relevant to SRS; the co-production of knowledge; and exploration of concepts of social equity in sustainable regional systems across spatial and temporal scales. SRS RN outcomes will have the potential to inform societal actions for sustainability across urban systems and the connected rural communities

that make up regional systems.

Subject to availability of funds and quality of proposals, this SRS RN solicitation will support projects in the following categories:

- **SRS RNs Full Scale Awards (Track 1).** These awards will support fundamental convergent research, education, and outreach that addresses engineering, environmental (biology, chemistry - including sensing, chemical analytics, and recyclable plastics, atmospheric sciences, hydrology, geology), computer and data sciences, and social and behavioral sciences of sustainable regional systems in partnerships that may embrace universities, colleges, practitioners, non-profit organizations, local governments, industry, and community groups. The award size is up to $15 million total with a duration of 5 years.
- **SRS RNs Planning Grants (Track 2).** These awards are for capacity building to prepare project teams to propose future well-developed SRS RN Full Scale (Track 1) proposals. Each of these Track 2 awards will provide support for a period of one year and may be requested at a level not to exceed $150,000 for the total budget.

SRS RNs will conduct innovative and pioneering fundamental research and education that is of a scale and complexity that would not be possible within a single organization, center, or through the normal collaborative modes of NSF research support in core programs.

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.

- Bruce K. Hamilton, Division of Chemical, Bioengineering, Environmental, and Transport Systems, telephone: (703) 292-7066, email: SRS@nsf.gov
- Brandi Schottel, Office of Integrative Activities, telephone: (703) 292-4798, email: SRS@nsf.gov
- David Corman, Division of Computer and Network Systems, telephone: (703) 292-8754, email: SRS@nsf.gov
- Laura Lautz, Division of Earth Sciences, telephone: (703) 292-7775, email: SRS@nsf.gov
- Elizabeth R. Blood, Division of Environmental Biology, telephone: (703) 292-4349, email: SRS@nsf.gov
- Sharmistha Bagchi-Sen, Division of Behavioral and Cognitive Sciences, telephone: (703) 292-8740, email: SRS@nsf.gov
- Anne-Marie Schmoltner, Division of Chemistry, telephone: (703) 292-4716, email: SRS@nsf.gov
- Pushpa Ramakrishna, Division of Undergraduate Education, telephone: (703) 292-2943, email: SRS@nsf.gov
- Keith Chanon, Office of International Science and Engineering, telephone: (703) 292-7305, email: SRS@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.079 --- Office of International Science and Engineering
- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant or Cooperative Agreement

Estimated Number of Awards: 15 to 23

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals, NSF merit review criteria, and solicitation-specific review criteria, as well as availability of funds.

Anticipated Funding Amount: $31,000,000

31 million (up to three Full Scale awards (Track 1) as cooperative agreements, and 12-20 Planning Grants (Track 2) as standard grants)

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals, NSF merit review criteria, and solicitation-specific review criteria, as well as 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.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

Who May Serve as PI:

There are no restrictions for the allowable organizations listed above.

In addition to the organizations above, individuals from the following types of organizations can be listed on the Cover Sheet as co-PIs or Senior Personnel (but not the lead PI) as subawardees or unpaid collaborators:

- **FFRDCs**: Researchers or participants from federal agencies or federally funded research and development centers (FFRDCs) cannot serve as a lead PI but may be supported by subawards or participate as unpaid collaborators. Non-NSF sponsored FFRDCs are required to provide a letter of support from their agency.
- **State and Local Governments**: Individuals from state educational offices or organizations and local school districts cannot serve as a lead PI but may be supported by subawards or participate as unpaid collaborators. A letter of collaboration from their organization is required.
- **Unaffiliated Individuals:** Scientists, engineers or educators in the U.S. who are U.S. citizens cannot serve as a lead PI, but may be supported by subawards or participate as unpaid collaborators.
- **Foreign organizations:** For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion. Researchers from a foreign organization cannot be PIs OR co-PIs, and must be listed as "non-funded Senior Personnel". A letter of collaboration from their organization is required.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 2

No more than one for Track 1 and one for Track 2 (two total, but those two must be in separate tracks and cannot have the same project idea).

An individual may appear as PI, co-PI, or Senior Personnel on no more than one Track 1 and one Track 2 proposal submitted in response to this solicitation. **Please note that these two separate proposals (Track 1 and Track 2) cannot be on the same topic.**

If an individual exceeds the two-proposal limit, the first proposals received within the limit will be accepted based on earliest date and time of proposal submission, and the remainder will be returned without review. This limitation includes proposals submitted by a lead organization and any subawards involving multiple organizations. **No exceptions will be made.**

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):

  January 11, 2021

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.

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I. INTRODUCTION

Sustainable Regional Systems (SRS) are connected urban and rural systems, including all systems in between, designed with the goal of measurably advancing the equitable well-being of people and the planet. More than half the world's population lives in urban centers, a trend that is expected to add 100 million new inhabitants to U.S. cities by 2050 [1]. The increase of urban inhabitants is likely to change and potentially strain the networks of connected communities that exist across the U.S. and the world. As urban systems and their connections to rural areas grow, it is imperative that current and future social, engineered, and natural systems and infrastructure are maintained, planned, and implemented to adapt to this increase in population.

NSF's Advisory Committee for Environmental Research and Education (ACERE) completed the report entitled "Sustainable Urban Systems: Articulating a Long-Term Convergence Research Agenda" in January 2018 (see https://www.nsf.gov/ere/ereweb/ac-ere/sustainable-urban-systems.pdf), in recognition of the increasing population trend in urban systems. The ACERE report defined **urban systems** as geographical areas with a high concentration of human activity and interactions, embedded within multiscale interdependent social, engineered, and natural systems. These systems affect human and planetary well-being across spatial (local to global) and temporal scales. As population growth continues, the dependence of urban systems on connected rural systems also continues to increase along with interdependencies of regional systems on other systems across the globe. **Rural systems**, in contrast to urban systems, are any settlements with population, housing, economic activity, or areas NOT in an urban geographical area. Urban systems are embedded in and interdependent on surrounding rural systems. Likewise, rural communities are dependent upon connected urban centers. Networks of urban, rural, and all systems in between, make up a dynamic, symbiotic system with complex social and physical interactions. In order to support a prosperous, sustainable, economically competitive, and resilient regional system, the complex variables and smaller systems that are operating within and across these communities need to be considered.

In response to the ACERE report (2018), NSF issued a call for conference proposals that resulted in 27 conference awards. The conference award abstracts and reports can be found at: https://www.nsf.gov/ere/ereweb/urbansystems/awards.jsp. These reports state that the study of multiscale regional systems in the context of multiple sustainability goals is essential to developing the science of sustainable regional systems. To further develop SRS science, NSF is calling for Full Scale proposals and Planning Grant proposals for Sustainable Regional Systems Research Networks (SRS RN).

The purpose of the SRS RN competition is to develop and support interdisciplinary, multi-organizational teams of investigators and stakeholders. Teams will work collaboratively to produce cutting-edge convergent research and education that will inform societal actions for future environmental, economic, and social sustainability, addressing grand challenges in sustainable regional systems.

[1] Cutter, S. L., W. Solecki, N. Bragado, J. Carmin, M. Fragkias, M. Ruth, and T. J. Wilbanks, 2014: Ch. 11: Urban Systems, Infrastructure, and Vulnerability. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 282-296. doi:10.7930/J0F769GR.

II. PROGRAM DESCRIPTION

The goal of this solicitation is to fund convergent research [2] and education that will advance sustainable regional systems science, engineering, and education to facilitate the transformation of current regional systems to enhance sustainability. Advancing SRS science, engineering, and education requires intentional integration across three perspectives from regional to global scale:

i. The study of single urban systems/metropolitan regions and their connected rural systems where multiple sustainability outcomes are addressed from a multiscale systems perspective that connects homes, businesses, and communities at regional and global scales.
ii. The study of multiple urban systems and their connected rural systems, exploring inter-relationships among networks of urban and rural systems, and identifying urban-rural typologies for the study of cohort groups and comparison groups.
iii. The study of supra-aggregations of connected urban-rural systems, e.g., of all urban-rural systems in an electrical grid region, a nation, a world region, or the world, to assess the collective impact of urban-rural transformation on people and the planet.

While all 3 of these perspectives (i-iii) include both urban and rural systems, it is important to note that a research project does not have to have an equal emphasis on the urban and rural systems of study, but rather, a consideration of both that is relevant to the research questions. A successful research network does not necessarily have to span all three (i-iii) perspectives. Within each of these perspectives (i-iii), integration of the following seven key elements (A-G) could significantly advance SRS science:

A. **Data and Methods:** New data and methods are needed to understand the current drivers and interactions among natural, engineered, and social and behavioral systems in urban-rural areas as they impact multiple sustainability outcomes across scales.
B. **Outcomes:** New science is needed to understand the co-benefits and trade-offs among multiple outcomes for human and planetary wellbeing across spatial and temporal scales.
C. **Theories of Change:** New science is needed to understand the drivers of and levers for change in diverse urban-rural systems, with a focus on integrative design, technology innovation, sociotechnical transitions, education, and/or multi-level actors and governance.
D. **Generalizable Theories:** Comparative, typology, and scalability studies are needed to develop generalizable theories across diverse urban-rural region types.
E. **Modeling:** The science to model the future of SRS across scales needs to be advanced.
F. **Stakeholder Participation:** Effective participation by communities, industry groups, practitioner groups, and governments at multiple levels should be established to leverage real-world experimentation that may be ongoing in many communities.
G. **Equity:** Expertise and data on best practices in terms of implementing strategies that equitably maximize human well-being within a regional system, when taken in consideration of a historical context, are vital for creating sustainable regional systems.

The three perspectives (i-iii) noted above are envisioned to enable a holistic study of regional to global SRS at different scales where appropriate for a project, while the seven key elements (A-G) could fill critical research gaps and work to provide a strategic pathway to advance SRS, starting from understanding the system, to designing change from a social-ecological-infrastructural perspective, and finally, to informing action to positively change forecasts.

SRS RNs will conduct innovative and pioneering fundamental research in sustainable regional systems science, engineering, and education that may be conceptual, empirical, synthetic, and/or computational in nature, and of a scale and complexity that would not be possible within a single organization, center, or even through the normal collaborative modes of NSF research support. The SRS RNs solicitation offers an avenue for collaborations within the academic research and education institutions in concert with non-profit, community, industry, municipal, and international partners. Collaborations through SRS RNs will cross traditional disciplinary boundaries of engineering, environmental, data, social sciences, mathematics, statistics, computation, and education. SRS RNs may link existing programs and create others to advance fundamental understanding that could make possible outcomes such as improving predictions, technologies, policies, and practices related to sustainability. Examples include harnessing renewable energy resources, addressing water quality and supply, improving sensing and chemical analytics, developing recyclable/upcyclable plastics, reducing vulnerabilities of chemical and material supply chains supporting healthy environments, and conserving biodiversity, while enhancing human well-being and economic vigor in regional settings. Regions should be defined by the proposer with an explanation for why the defined region is appropriate for the study of regional sustainability. Significant anticipated outcomes should also be included in the proposal.

Proposers may frame their networks around issues or topics important to the sustainability of regional systems, e.g. coastal urbanization, urban heat islands, food systems, energy, biodiversity, essential ecosystem services, public health, transportation, or governance. Research must focus on identified urban and rural systems that include closely coupled regions beyond their boundaries. For example, issues of urban water quality might also include an examination of the hydrology, land use change, and ecosystem services associated with a watershed. The goals of an SRS RN could include, but are not limited to the following ideas from the workshops held in 2019 (see for workshop awards https://www.nsf.gov/ere/ereweb/urbansystems/awards.jsp):

- Deeper development of linked social, ecological, and technological systems (SETS) [3] theory for sustainable regional systems.
- Development of new ways to use natural environment linkages with the built environment to promote and maintain sustainable regional systems.
- Development of new theories about sustainable regional systems that encompass the urban-rural connection, for example, theories about the circular economy or social justice in such systems.
- Ideas for removing infrastructure barriers to social equity in sustainable rural and urban systems.
- Development of people-centric research and implementation practices to promote sustainable regional systems.
- Development of new theoretical and mechanistic understandings of biological systems and their interactions within regional system environments and how these interactions can impart sustainability.
- Development of generalizable empirical insights from research that spans large temporal and geographic regions and generates fundamental knowledge about how regional systems function and how this functioning can be positively and sustainably altered.
- Implementation of a nation-wide data system for regional sustainability research.
- Formation of a national network focused on development of regional sustainability curricula that necessarily incorporates the effects on people in those systems, including the social equity and consideration of groups that have been historically disadvantaged.
- Development of adaptation strategies that, if implemented, could help ensure continuous operation of services, protection of human and environmental health, and economic robustness in times of national emergencies/crises that disrupt the regular flow of people, goods, and services as well as disruptions in physical, technological, and social systems.

Proposals must present compelling plans for implementing (Track 1) or developing (Track 2) strong collaborations to advance use-inspired convergent research that has high potential for significant societal and sustainability impacts. Proposals must also describe plans for developing a deeper understanding of regional systems as integrated social-environmental-technological systems and to improve education related to SRS themes.

Proposals must be interdisciplinary and multi-organizational but must be submitted by a lead organization. **SRS does NOT accept project proposals that consist of a set of linked collaborative proposals** (see proposal preparation instructions). Proposals must identify partnerships drawn from multiple disciplines and organizations, including practitioners and other stakeholders. Proposers are encouraged to consider geographical diversity when appropriate for the topic when listing partners. To promote broadening participation in SRS science, engineering, and education, proposals that explore innovative approaches to broadening participation and the incorporation of concepts and aspects of NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science initiative (INCLUDES) are desired. Information on NSF INCLUDES and the objectives of this initiative are accessible at the following link: https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp.

Subject to the availability of funds and quality of proposals, this SRS RN solicitation will support projects in the following categories:

TRACK 1: SRS RN Full Scale Awards. These awards will support convergent research and education that advances fundamental understanding of sustainable regional systems. Importantly, projects should consider the impact of research outcomes beyond the life of the project, including the scalability and transferability of the proposed science, dissemination of research outcomes to decision makers, and/or consideration of how research will be transitioned to full-scale implementation, if successful. Budget requests must not be greater than $15,000,000 total and five years in duration and must include funds for team members to attend an annual awardees conference.

TRACK 2: SRS RN Planning Grants. Awards funded in this category will provide support for one year and may be requested at a level not to exceed $150,000 for the total budget. **Planning grant awards should prepare project teams to submit well-developed SRS RN proposals near or after the conclusion of the planning grant.** These awards will support a range of planning activities intended to, for example, foster the research to effectively integrate multiple disciplinary perspectives; explore the community context and build collaborations with relevant stakeholders; and hone education and research gaps, questions, and hypotheses. Activities within scope include, but are not limited to, travel, multidisciplinary workshops, stakeholder meetings, data collection, preliminary experiments, and pilots. Additionally, SRS Planning Grant awardees will be expected to participate in an awardees conference as a required activity during their award period.

SRS proposals must clearly define the regional system(s) of study, the various components that make up the regional system(s) to be studied, the major topics that will frame the networks (Track 1) or the intended networks (Track 2), and the goals of the project that will lead to a more sustainable regional system or systems.

Other Considerations: NSF promotes international cooperation that links scientists and engineers from a range of disciplines and organizations to solve the significant global challenges of Sustainable Regional Systems. Proposals including international collaboration are encouraged when those efforts enhance the merit of the proposed work. Such proposals should address how the proposed international collaboration enhances intellectual merit and broader impacts. Proposals including international collaboration are encouraged when those efforts enhance the merit of the proposed work in the following ways:

- Mutual benefit of the collaboration for all partners
- True intellectual collaboration with the international partner(s)
- Benefits to be realized from the expertise and specialized skills, facilities, sites, and/or resources of the international counterpart
- Active research engagement of U.S. students and early-career researchers
- Explanation of how the research will benefit the United States

Research may involve any country/countries, but the U.S. team's international counterparts should have support or obtain funding through non-NSF sources. Proposals that involve international collaboration should clearly describe the work that will be accomplished by the entire team, including the international partners, and how the international partners' efforts will be or are already supported. Additionally, for projects that will study SRS in international settings, a case must be made for why this research benefits the United States, even if there are no international collaborators. For information on foreign research opportunities and funding see: Counterpart Science Funding Agencies. More information on international collaborations is provided below under "**Proposal Preparation Instructions".**

[2] Convergent Research is defined as research that is a) driven by a specific and compelling problem and b) requires deep integration across disciplines.

[3] Markolf, S.A.; Chester, M. V.; Eisenberg, D.A.; Iwaniec, D.M.; Davidson, C.I.; Zimmerman, R.; Miller, T.R.; Ruddell, B.L.; Chang, H.; "Interdependent Infrastructure as Linked Social, Ecological, and Technological Systems (SETSs) to Address Lock-in and Enhance Resilience", *Earth's Future*, **2018**, 6, 1638-1659. https://doi.org/10.1029/2018EF000926.

III. AWARD INFORMATION

Anticipated Type of Award: Cooperative Agreement or Standard Grant

Estimated Number of Awards: 15 to 23

(up to three for Track 1 as cooperative agreements, and 12-20 for Track 2 as standard grants)

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals, NSF merit review criteria, and solicitation-specific review criteria, as well as availability of funds.

Anticipated Funding Amount: $31,000,000

$31 million (up to three Full Scale awards (Track 1) as cooperative agreements, and 12-20 Planning Grants (Track 2) as standard grants)

The number of awards is dependent upon the proposals received and the degree to which proposals meet the solicitation goals, NSF merit review criteria, and solicitation-specific review criteria, as well as 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.
- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.

Who May Serve as PI:

There are no restrictions for the allowable organizations listed above.

In addition to the organizations above, individuals from the following types of organizations can be listed on the Cover Sheet as co-PIs or Senior Personnel (but not the lead PI) as subawardees or unpaid collaborators:

- **FFRDCs**: Researchers or participants from federal agencies or federally funded research and development centers (FFRDCs) cannot serve as a lead PI but may be supported by subawards or participate as unpaid collaborators. Non-NSF sponsored FFRDCs are required to provide a letter of support from their agency.
- **State and Local Governments**: Individuals from state educational offices or organizations and local school districts cannot serve as a lead PI but may be supported by subawards or participate as unpaid collaborators. A letter of collaboration from their organization is required.
- **Unaffiliated Individuals:** Scientists, engineers or educators in the U.S. who are U.S. citizens cannot serve as a lead PI, but may be supported by subawards or participate as unpaid collaborators.
- **Foreign organizations:** For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion. Researchers from a foreign organization cannot be PIs OR co-PIs, and must be listed as "non-funded Senior Personnel". A letter of collaboration from their organization is required.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 2

No more than one for Track 1 and one for Track 2 (two total, but those two must be in separate tracks and cannot have the same project idea).

An individual may appear as PI, co-PI, or Senior Personnel on no more than one Track 1 and one Track 2 proposal submitted in response to this solicitation. **Please note that these two separate proposals (Track 1 and Track 2) cannot be on the same topic.**

If an individual exceeds the two-proposal limit, the first proposals received within the limit will be accepted based on earliest date and time of proposal submission, and the remainder will be returned without review. This limitation includes proposals submitted by a lead organization and any subawards involving multiple organizations. **No exceptions will be made.**

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.

- **Proposal Categories**

Proposals for research, education, and outreach in the following two categories will be considered:

- **SRS RN Full Scale Awards (Track 1).** Budget requests must not be greater than $15,000,000 total and must be five years in duration. These awards will support **convergent research and education that addresses fundamental engineering, environmental, data, chemical, and social and behavioral scientific aspects of sustainable regional systems** in partnerships with communities, non-profit organizations, municipalities, and/or industry. Projects that consider the **impact of research outcomes beyond the life of the project, including the scalability and transferability of proposed solutions** are especially encouraged. These include, for example, projects that pursue collaborations that link research outcomes to planned efforts within communities or by local or regional governments, identify joint investment models for implementing innovative research solutions, or consider how research will be transitioned to full-scale implementation, if successful.
- **SRS RN Planning Grants (Track 2).** Awards funded in this category will provide support for a period of one year and may be requested at a level not to exceed $150,000 for the total budget. **Planning grant awards should prepare project teams to submit well-developed SRS RN proposals near or after the conclusion of the planning grant.** These awards will support a range of planning activities intended to, for example, foster the research to effectively integrate multiple disciplinary perspectives; explore the community context and build collaborations with relevant stakeholders; and hone education and research gaps, questions, and hypotheses. Activities within scope include, but are not limited to, travel, multidisciplinary workshops, stakeholder meetings, data collection, preliminary experiments, and pilots.

For all proposals, in addition to the required PAPPG sections, there are specific supplemental instructions regarding the Cover Sheet, Project Description, Results from Prior NSF Support, Biographical Sketches, the Budget, Postdoctoral Mentoring Plan, and Supplementary Documents.

A. Cover Sheet (both Track 1 and Track 2):

- All proposal titles should start with “SRS RN:…”
- Separately submitted (linked) collaborative proposals are NOT allowed.
- Any international considerations must be listed, including collaborators and/or research in an international setting.
- Use of human and/or animal subjects must be addressed as specified in the PAPPG

B. Project Description

For Track 1 (Full Scale Proposals)

In addition to the required components in the PAPPG, including the Intellectual Merits and Broader Impact narrative that will comprise the bulk of the proposal:

- The Project Description is ***not to exceed 25 pages*** (a deviation from the 15-page PAPPG limit) including tables and figures.
- The "Results from Prior NSF Support" section is to be provided as a labeled document in the "Additional Supplementary Documents" Section, not to exceed five pages in length.
- **The intellectual merit (IM) and broader impacts (BI) for the proposed project must be addressed and described as an integral part of the narrative**. A separate heading for BI is not required in the Project Description for SRS RN proposals submitted in response to this solicitation. Instead, the broader impacts of each portion of the project (see required sections below) should be woven into the intellectual merit of each of these sections where appropriate.

For Track 2 (Planning Grant Proposals)

- The Project Description ***should not exceed 6 pages***, including charts and figures (this is a deviation from the 15-page PAPPG limitation).
- The "Results from Prior NSF Support" section is to be provided as a labeled document in the "Additional Supplementary Documents" Section, not to exceed five pages in length.
- The Project Description also must contain, as a separate section within the narrative, a section labeled “Broader Impacts”.

Required components of SRS RNs proposals in the Project Description:

A successful SRS proposal will clearly define the regional system(s) of study, the various components that make up the regional system(s) to be studied, the major topics that will frame the networks (Track 1) or the intended networks (Track 2), and the goals of the project that will lead to more sustainable regional system or systems.

In addition to these definitions and the descriptions of the abovementioned topics, each of the following topics is to be covered in a section labeled with the indicated component title.

1. **Scope and Scale (Required for Track 1 only)**

   SRS RNs will conduct innovative and pioneering fundamental research in sustainable regional system science, engineering, and education that is of a considerable scale and complexity that would not be possible within a single organization, center, or through the normal collaborative modes of NSF research support. This section should present a compelling case for why an award as large as $15 million with a duration of 5 years is required to successfully achieve the objectives stated in the proposal.

   Track 2 Proposals do NOT require a "Scope and Scale" component.

2. **Convergent Research (Required for Track 1 and 2)**

   The NSF identifies convergent research as research that is a) driven by a specific and compelling problem and b) requires deep integration across disciplines. The ACERE report already cited discusses extensively SRS convergent research gaps and needs. Together, an SRS convergent research network team will foster new knowledge and tools that significantly advance network integration, coordination, innovation, and the convergent science of SRS. Collaborations through SRS RNs should cross traditional disciplinary boundaries to foster new knowledge, data, and tools. The SRS RNs solicitation also offers an avenue for collaboration within the academic research and education institutions in concert with non-profit, community, industry, municipal, and international partners. SRS RNs may also link existing programs and create others to advance fundamental understanding and enable actionable outcomes such as improving predictions, technologies, policies, and practices related to sustainability.

   Under the labeled heading “Convergent Research,” a plan for convergent research must be presented. Planning Grant proposals (Track 2) do not

require specific research objectives, testable hypotheses, and overview of research methods, or the anticipated outcomes and impact of research. Generating this level of specificity would be among the objectives of a planning grant.

For more information on convergent research approaches, see “Convergence Research at NSF" - https://www.nsf.gov/od/oia/convergence/index.jsp and the Dear Colleague Letter: Growing Convergence Research at NSF March 2018 - https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf18058.

3. **Partnerships and Stakeholder Engagement for Impact (Required for Track 1 and 2)**

   This section should make a compelling case for how the proposed activities in the research network will result in generation of new knowledge that would advance sustainable regional systems through potential implementation.

   The inclusion of non-academic stakeholders in the project (industry, government, non-governmental organizations, community partners, etc.), including early engagement in the conception of SRS RN proposals, can enhance the chances for the knowledge produced by SRS RNs to inform the sustainability of regional systems. Proposals should clearly identify and define these non-academic partners, and also describe activities that reflect meaningful engagement of these partners. This engagement should consider these partners as integral to the research. Investigators and these partners are encouraged to work closely to develop, pilot, and evaluate creative approaches to accomplish the goals of the proposed research. Non-academic partners may also have leadership roles within the proposing team, including as a PI, co-PI (see limitations on "Who may serve as PI or co-PI"), or Senior Personnel if appropriate for the project, and are encouraged to be active participants in the project and proposal formulation. *An SRS RN proposal is expected to present a compelling case on how what is proposed can be anticipated to result in this new knowledge*.

   Many of the 27 workshops funded by NSF in summer 2019 https://www.nsf.gov/ere/ereweb/urbansystems/awards.jsp) emphasized the importance of stakeholder participation, including early engagement of stakeholders in the conception of SRS RN proposals. These workshops made the case that stakeholder participation is an approach that enhances the chances for an SRS RN to impact significantly and beneficially sustainable regional communities. Stakeholder participation can take several forms, such as co-production, advisory councils and boards, citizen science, etc., and inclusion of organization or community member leaders that are part of the regional system of study on the project and proposal formation is encouraged where appropriate for the research topic(s).

4. **Diversity and Culture of Inclusion (Required for Track 1 and 2)**

   Describe the vision and plan for nurturing a culture of inclusion to support diverse participation in the SRS RN. A culture of inclusion has many important aspects that are essential for deep collaboration, including the participation of members from a diversity of scientific and engineering backgrounds and training, participation of members of groups traditionally underrepresented in STEM, and a diversity of partner organizations (including practitioner and other co-production partners) that will bring different perspectives to bear on the goals of the SRS RN.

   In addition to this vision and plan(s), Full Scale proposals (Track 1), must include either/or:

   - The lead or at least one of the core partner universities must be a university that serves populations of traditionally underrepresented students interested in STEM (defined as minority serving institutions, women's colleges, or institutions where the majority of the students are students with disabilities). To qualify as a core partner organization, there must be a minimum of three faculty members participating in the SRS RN along with a minimum of three students.
   - A core partner, such as a community group, a non-profit, or other group/organization that supports an underrepresented community within the scope of the proposed research project. Such a core partner must be allocated a minimum of 10% of the total budget request for the entire SRS RN.

   These partners must be fully integrated into the SRS RN. The vision for diversity and inclusion should go well beyond numbers and include a description of the integration and roles of diverse participants in the SRS RN**.**

   For Full Scale proposals (Track 1), suitable metrics to assess the SRS RN’s inclusion and diversity goals should be described, and feedback loops should be in place for independent assessment and improvement of diversity and inclusion at all levels of the SRS RN, including participating faculty members, leadership, practitioners and other stakeholders, and students. The Diversity and Culture of Inclusion Plan should include a timetable and methods for assessment.

   For both Full Scale proposals (Track 1) and Planning Grant proposals (Track 2), in the component labeled “Diversity and Inclusion,” describe how the leadership team will effectively create an inclusive culture for the SRS RN in which all members feel valued and welcomed, creatively contribute, and gain mutual benefit from participating.

   To promote broadening participation in SRS science, engineering, and education, proposals that explore innovative approaches to broadening participation and the incorporation of concepts and aspects of NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science initiative (INCLUDES) are desired. Information on NSF INCLUDES and the objectives of this initiative are accessible at the following link: https://www.nsf.gov/news/special_reports/nsfincludes/index.jsp

5. **Education and Education Evaluation (Required for Track 1 only)**

   Based on the ACERE and SUS conference reports, there is an urgent need as well as a historic time sensitivity to develop a new educational paradigm in SRS. An education and education evaluation plan is required in the Project Description for Full Scale proposals (Track 1) with the label “Education and Education Evaluation.” *This plan should encompass convergence science and engineering in which a complex compelling problem drives the deep integration of diverse disciplines that transcend traditional disciplinary siloes.* The education and education evaluation plan should describe how the proposed SRS RN will integrate education, research, and practice as a fully integrated model of environmental, social, and economic sustainability. The education and education evaluation plan should focus on the interdependence of SRS with local, regional, and/or global communities.

   The plan should articulate clear goals and objectives. SRS RNs must:

   - Incorporate systems thinking and develop convergent educational practices that balance the trade-off between depth of knowledge versus the breadth of knowledge
   - Implement innovative pedagogy that emphasizes active, experiential, inquiry-based learning and real-world problem solving
   - Add to the body of knowledge about what works in SRS education and the conditions that lead to improved SRS teaching, learning, and research
   - And measure progress and achievement of SRS RN education goals

All SRS RNs are expected to increase knowledge about effective SRS education. The education and education evaluation plan presented should draw on research literature about evidence-based practices. Knowledge generation should be based on well-formulated research questions that guide convergence education, and state how the questions will be answered or should have an evaluation plan that is aligned with the stated goals and objectives.

The evaluation plan should state specific strategies for summative and formative assessment. The evaluation plan should describe how different disciplines are coming together to solve complex problems in convergence education. The evaluation plan should address both SRS education implementation and outcomes; the specific data sources, data collection instruments, and methods that will be employed to address evaluation questions or criteria, and how data will be analyzed and interpreted to answer evaluation questions and reach conclusions about the quality of SRS education implementation and outcomes. The evaluation plan is expected to address both the impacts of individual learning as well as the actual implementation and activities of the project including outreach, communication, and dissemination. A timeline for the evaluation should be provided that identifies when data will be collected, when reports will be submitted, and the frequency of communication between an external evaluator (see below) and SRS RN personnel.

Funds to support an evaluator independent of the SRS RN must be requested. The requested funds must match the scope of the proposed evaluative activities. The evaluator may be employed by an SRS RN's member organization, as long as this individual works in a separate organizational unit (e.g., a different department) that has a different reporting line than that of the SRS RN member. An SRS RN should engage staff, participants, or an internal evaluator to work with the external evaluator to improve the quality of data collected and feasibility of conducting the education evaluation.

It is recommended that the evaluator be named in the proposal and a biographical sketch included with the proposal's supplementary documents. If the proposer's organization requires evaluation consultants to be selected through a competitive bid process after an award is made, the proposer should note the organizational policy that prohibits noncompetitive selection and describe the procedures that will be used to select an evaluator after the award is made.

Additionally, graduate education can be greatly enhanced by internships in industry, national laboratories, government offices, non-profits, and NGOs. Submissions that include these opportunities are encouraged.

Proposals that include a strong workforce development component, including undergraduates, K12 STEM teachers, and/or community college faculty are encouraged. Additionally, proposals could include Research Experiences for Undergraduates (REU) or Research Experiences for Teachers (RET) supplement mechanisms **when appropriate**. Information on NSF REU is accessible at the following link:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517.

Information on NSF RET is accessible at the following link:

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505170

Track 2 Proposals do NOT require an "Education and Education Evaluation Plan". Track 2 proposals with an education focus are encouraged to apply.

Additional Considerations and Cross Cutting Themes

SRS-RNs are expected to provide pathways for translating research into practice. An SRS-RN will link scientists, engineers, and educators in multiple organizations and be geographically dispersed. Humanities researchers may be included in the team if appropriate to the project scope. The SRS RN may build upon, but not duplicate, existing activities. Funding and other resources will be shared among the network partners. The network could promote collaboration, when appropriate, with resource managers, policymakers, end-users and other stakeholders in the private and public sectors through the direct involvement - from the outset - of participants from federal, state and local agencies, tribal communities, non-governmental and international bodies, and industry. The RN should be designed to adapt and grow as new opportunities arise. Both Track 1 and Track 2 proposals should address how to foster these networks.

Note that Proposals must be interdisciplinary and multi-organizational but must be submitted by a lead organization with support for partner organizations provided via subawards. **SRS RN will NOT accept project proposals that consist of a set of linked, collaborative proposals.**

Proposals that address topics of NSF's 10 Big Ideas are encouraged, particularly Understanding the Rules of Life, Navigating the New Arctic, and Harnessing the Data Revolution, The Future of Work at the Human -Technology Frontier, and NSF INCLUDES.

Proposers are encouraged to consider geographical diversity as appropriate for the proposed research when identifying partners.

In addition, NSF promotes international cooperation that links scientists and engineers from a range of disciplines and organizations to solve the significant global challenges of SRS. Proposals including international collaboration are encouraged when those efforts enhance the merit of the proposed work. Such proposals should address how the proposed international collaboration enhances intellectual merit and broader impacts in the following ways:

- Mutual benefit of the collaboration for all partners
- True intellectual collaboration with the international partner(s)
- Benefits to be realized from the expertise and specialized skills, facilities, sites and/or resources of the international counterpart
- Active research engagement of U.S. students and early-career researchers

Research may involve any country/countries, but the U.S. team's international counterparts generally should have support or obtain funding through non-NSF sources. Proposals that choose to involve international collaboration should clearly describe the work that will be accomplished by the entire team, including the international partners, and how the international partners' efforts will be or are already supported. For information on foreign research opportunities and funding see: Counterpart Science Funding Agencies.

C. Biographical Sketches

Both Track 1 and Track 2

All members of the project leadership team should be listed as lead PI, a co-PI, or as Senior Personnel. All members of the leadership team should have a biographical sketch in the appropriate section. If a member of the leadership team will not receive funding from this proposal, please list them as "non-funded" Senior Personnel. This will allow their Biographical Sketch to be loaded in the appropriate section.

D. Budget

Track 1 Full Scale Proposals (up to $15,000,000, with an expected project length of 5 years)

In addition to standard budget requirements in the PAPPG, each Track 1 proposal must contain:

- **Funds to Support Broader Impacts Activities:** Funds for activities described that are intended to enhance the broader impacts of the project must be included where appropriate.
- **Funds for attendance at an annual SRS RN Awardee Conference:** In order to (a) accelerate the rate of dissemination of ideas among researchers and stakeholders; (b) build an intellectual research core to address the challenges of SRS, and (c) enable enhanced research collaborations, the SRS RNs program plans to host awardee conferences every year with participation from all funded projects and other representatives from academia, industry, government, and community organizations. PIs or their designees must participate in the entirety of each awardee conference throughout the duration of their awards. Lead investigators from each subaward organization are expected to participate. A substitute project representative may be designated to attend a PI meeting, but only with prior approval from a cognizant NSF Program Officer. As noted in Section V.B, Budget Preparation Instructions, budgets for all projects must include funding for one or more designated SRS RN project representatives (PI/co-PI/Senior Personnel or NSF-approved replacement) to attend each SRS RNs awardee conference during the proposed lifetime of the award. It is also strongly encouraged for at least one community stakeholder to attend the awardee conference and for the budget to include funding to support the participation of the attending stakeholder(s).
- **For the education plan:** Funds to support an evaluator independent of the SRS RN must be requested. The requested funds must match the scope of the proposed evaluative activities. The evaluator may be employed by an SRS RN's member organization, as long as he or she works in a separate organizational unit (e.g., a different department) that has a different reporting line than that of the SRS RN member. An SRS RN should engage staff, participants, or an internal evaluator to work with the external evaluator to improve the quality of data collected and feasibility of conducting the education evaluation.
- **International Collaborations:** As NSF funding predominantly supports U.S. participants, network participants from organizations outside the U.S. are encouraged to seek support from their respective funding organizations, notably participants from developed countries. NSF funds may not be used to support the expenses of the international scientists and students at their home organization. Please see the PAPPG guidance on how NSF funds can be used for SRS RN-related international expenses.

Track 2 Planning Proposals (not to exceed $150,000 total)

- **Funds for attendance at an annual SRS RN Awardee Conference**: In order to (a) accelerate the rate of dissemination of ideas among researchers and stakeholders; (b) build an intellectual research core to address the challenges of SRS, and (c) enable enhanced research collaborations, the SRS RNs program plans to host awardee conferences every year with participation from all funded projects and other representatives from academia, industry, government, and community organizations. PIs or their designees must participate in the entirety of one awardee conference throughout the duration of their awards. As noted in Section V.B, Budget Preparation Instructions, budgets for all projects must include funding for one or more designated SRS RN project representatives (PI/co-PI/Senior Personnel or NSF-approved replacement) to attend one SRS RNs awardee conference during the proposed lifetime of the award.

E. Postdoctoral Mentoring Plan (Both Track 1 and 2, if funding is requested for a postdoctoral researcher), 1 page:

Proposals involving postdoctoral researchers must offer an innovative and forward-thinking plan for postdoctoral training that extends beyond the mentoring that would normally occur as part of a research project at a single site or in a single lab. The SRS program wants to see activities that prepare the post-doc for conducting interdisciplinary and convergent science; leading and managing interdisciplinary science teams; and provide exposure across the environmental, engineering, and human sciences represented in the project. Training opportunities could include short courses, workshops, collaborations, lab exchanges, or other related activities (national or international). Sample topics might include leadership, large project management, team science, application of statistical methods for integrating data across disciplines, analytical methods useful for sustainable urban studies, or computational techniques for dealing with large, complex, or interdisciplinary datasets.

F. Other Supplementary Documents

Track 1 Other Supplementary Documents (preferably in this order):

1. **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 RN.
    a. List all project personnel who have a role in the management, research, education, broadening participation, and knowledge transfer components of the Center. Use the following format: last name, first name, institution/organization.
    b. 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. **Project Management Plan** (up to 5 pages in the "Other Supplementary Documents"): All SRS RNs proposals must provide, as a supplementary document, a description of the management plan for coordinating activities. This supplementary document must be labeled "**Project Management Plan**". This description should include an organization chart, plans for internal communication, coordination of data and information management, evaluation and assessment of progress, allocation of funds and personnel (specifically for each major task), and other specific issues relevant to the proposed activities.

    A table summarizing the roles and responsibilities of each investigator is required including PI, co-PIs, other senior personnel, and paid consultants at all organizations involved.

    The plan should describe governance of the project, any advisory bodies, and lines of authority. Coordination and how the project will be managed within and across organizations and disciplines should be clearly defined, including identification of the specific coordination mechanisms that will enable cross-organization and/or cross-discipline scientific integration (e.g., regular meetings or teleconferencing, yearly workshops, graduate student exchange, project meetings at conferences, video conferences, etc.).

    A timetable with yearly goals should be provided that includes benchmarks for the major anticipated project milestones and deliverables and expected dates for their release.

3. **Results from Prior NSF Support (5-page limit):** This section is moved from the project description and should be submitted as a Supplementary Document. The other requirements for the content of the Results from Prior NSF Support Section are the same as found in the PAPPG.
4. **Letters of Collaboration:** This section should include any letters of collaboration from individuals or organizations that are integral parts of the proposed network, such as collaborating organizations, organizations granting permission to access sites, materials, or data for research. The purpose of letters of collaboration is solely to affirm the willingness of the individual or organization to collaborate in the network as specified in the project

description of the proposal. It is not to provide an endorsement of the merits of the proposal, to seek to influence reviewers, or to provide information that should properly have been included within the 25 page limit of the project description.

In addition, if one of the senior personnel is a foreign collaborator(s) who does (do) not already have funding, a letter of collaboration is required in which the foreign collaborator(s) must identify a point of contact in the foreign funding agency or agencies that is or are considering their proposal.

Track 2 Other Supplementary Documents

1. **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 RN.
    a. List all project personnel who have a role in the management, research, education, broadening participation, and knowledge transfer components of the Center. Use the following format: last name, first name, institution/organization.
    b. 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. **Results from Prior NSF Support (5-page limit):** This section is moved from the project description and should be submitted as a Supplementary Document. The other requirements for the content of the Results from Prior NSF Support Section are the same as found in the PAPPG.

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):

    January 11, 2021

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

For Proposals Submitted Via FastLane or Research.gov:

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

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in PAPPG Exhibit III-1.

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

In addition to the National Science Board merit review criteria, reviewers will be asked to apply the following program-specific criteria when reviewing SRS RN proposals.

For both Tracks 1 and 2:

- Comment on the clarity of the proposal's specification of the region(s) for study as well as the sustainability topic(s) to be researched.
- To what extent do the collaborations proposed for an SRS RN or SRS Planning Grant cross traditional disciplinary boundaries to foster new sustainability knowledge, systems thinking, data, tools, and a workforce skilled in the interdisciplinary scholarship needed to understand and address the complex issues of sustainability?
- How likely is it that the proposed SRS RN or SRS Planning Grant will successfully link scientists, engineers, and educators in multiple organizations, be geographically dispersed, and, from the outset, engage participants from a variety of different sectors and perspectives? Does the proposal explain clearly how each of the network partners will contribute to the goals and objectives of the network?
- Are the structure, roles and responsibilities, and management for the proposed SRS RN or SRS Planning Grant appropriate and clear?

For Track 1 only:

- Evaluate the quality of the plans for Convergent Research, Diversity and Inclusion, Education, and Education Evaluation.
- How likely is the proposed approach to succeed in building a foundation for translating research into practice through, for example, policy, management, and public outreach?
- Are the proposed mechanisms likely to allow the network to adapt and grow as new opportunities arise?
- How likely is it that the proposed SRS RN will advance fundamental scientific and engineering knowledge, as well as address the overarching goals of overcoming barriers to sustainable human well-being and forging reasoned pathways to a sustainable future?

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 Reverse Site Review.

Please note that SRS RN is an interdisciplinary solicitation, and thus, will require interdisciplinary review. There will NOT be separate review processes for different disciplines. The proposals, if paneled, will be placed on interdisciplinary panels. Submitters should prepare their proposals accordingly.

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 panel recommendations will be considered by NSF in selecting the most promising proposals for virtual reverse site visit review (RSV). This review will focus on the management and budget of the proposed SRN, and outstanding issues that were raised during the earlier parts of the review process. The PIs of the participating SRN teams will be informed in advance of the RSV format and requirements.

The Working Group will consider and discuss the input from the review process and will formulate a recommendation.

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Special Award Conditions:

For Track 1 Full Scale Awards:

- **Attendance at an annual SRS RN Awardee Conference:** In order to (a) accelerate the rate of dissemination of ideas among researchers and stakeholders; (b) build an intellectual research core to address the challenges of SRS, and (c) enable enhanced research collaborations, the SRS RNs program plans to host awardee conferences every year with participation from all funded projects and other representatives from academia, industry, government, and community organizations. PIs or their designees must participate in the entirety of each awardee conference throughout the duration of their awards. Lead investigators from each subaward organization are expected to participate. A substitute project representative may be designated to attend a PI meeting, but only with prior approval from a cognizant NSF Program Officer. As noted in Section V.D Budget Preparation Instructions, budgets for all projects must include funding for one or more designated SRS RN project representatives (PI/co-PI/Senior Personnel or NSF-approved replacement) to attend each SRS RNs awardee conference during the proposed lifetime of the award. It is also strongly encouraged for at least one community stakeholder to attend the awardee conference and for the budget to include funding to support the participation of the attending stakeholder(s).

For Track 2 Planning Grant Awards:

- **Attendance at an annual SRS RN Awardee Conference:** In order to (a) accelerate the rate of dissemination of ideas among researchers and stakeholders; (b) build an intellectual research core to address the challenges of SRS, and (c) enable enhanced research collaborations, the SRS RNs program plans to host awardee conferences every year with participation from all funded projects and other representatives from academia, industry, government, and community organizations. PIs or their designees must participate in the entirety of one awardee conference throughout the duration of their awards. As noted in Section V.D, Budget Preparation Instructions, budgets for all projects must include funding for one or more designated SRS RN project representatives (PI/co-PI/Senior Personnel or NSF-approved replacement) to attend one SRS RNs awardee conference during the proposed lifetime of 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 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:

- Bruce K. Hamilton, Division of Chemical, Bioengineering, Environmental, and Transport Systems, telephone: (703) 292-7066, email: SRS@nsf.gov
- Brandi Schottel, Office of Integrative Activities, telephone: (703) 292-4798, email: SRS@nsf.gov
- David Corman, Division of Computer and Network Systems, telephone: (703) 292-8754, email: SRS@nsf.gov
- Laura Lautz, Division of Earth Sciences, telephone: (703) 292-7775, email: SRS@nsf.gov
- Elizabeth R. Blood, Division of Environmental Biology, telephone: (703) 292-4349, email: SRS@nsf.gov
- Sharmistha Bagchi-Sen, Division of Behavioral and Cognitive Sciences, telephone: (703) 292-8740, email: SRS@nsf.gov
- Anne-Marie Schmoltner, Division of Chemistry, telephone: (703) 292-4716, email: SRS@nsf.gov
- Pushpa Ramakrishna, Division of Undergraduate Education, telephone: (703) 292-2943, email: SRS@nsf.gov
- Keith Chanon, Office of International Science and Engineering, telephone: (703) 292-7305, email: SRS@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) 292-8569
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

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