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Frequently Asked Questions (FAQs) for Navigating the New Arctic, FY 2020

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GENERAL

1. **What are the goals for the Navigating the New Arctic (NNA) initiative?**

   Major goals of NSF's NNA Big Idea include:

   - *Improved understanding of Arctic change and its local and global effects that capitalize on innovative and optimized observation infrastructure, advances in understanding of fundamental processes, and new approaches to modeling interactions among the natural environment, built environment, and social systems.*
   - *New and enhanced research communities that are diverse, integrative, and well-positioned to carry out productive research on the interactions or connections between natural and built environments and social systems and how these connections inform our understanding of Arctic change and its local and global effects.*
   - *Research outcomes that inform national security, economic development, and societal well-being, and enable resilient and sustainable Arctic communities.*
   - *Enhanced efforts in formal and informal education that focus on the social, built, and natural impacts of Arctic change on multiple scales and broadly disseminate research outcomes.*

2. **What do you mean by "Arctic-related" research and how are "global effects" to be considered in Arctic-related research?**

   By Arctic-related, we mean research largely or partially conducted outside the Arctic that is significantly related to (and at least partially stimulated by) changes in the Arctic region. Of course, NNA will consider traditional place-based studies conducted in the Arctic, but NNA also supports research that focuses on engineering, environmental, economic, and socio-political responses to a changing Arctic in places outside the Arctic. The research may involve locations near or far from the Arctic in light of the multi-

scalar processes and feedbacks of the systems studied. Environmental change in the Arctic might lead to local, regional or global change outside of the Arctic. Similarly, environmental and/or societal "teleconnections" may link diverse social and/or environmental processes, dynamics, and change to distant locations elsewhere. NSF recognizes the inherently international and interconnected nature of the Arctic region to places outside the Arctic, and that impacts of changes span geographic and political boundaries. "Global effects" may include the entire globe as well as particular regions.

3. **How does NSF define "co-production of knowledge" for the purposes of NNA?**

   NSF identifies co-production of knowledge as the integration of different knowledge systems and methodologies to systematically understand the phenomena, systems, and processes being studied in a research project. In the Arctic, this often takes the form of Indigenous Knowledge holders and scientists working closely together to address shared research questions, pursue shared methodologies, and agree upon appropriate outreach and data sharing activities. A co-produced approach includes research in which local and Indigenous peoples and organizations fully engage in the complete research process from the development of research questions, to the collection, use and stewardship of data, and interpretation and application of results. Given the diversity of peoples, worldviews, ideas, approaches, and methodologies in the Arctic, the co-production of knowledge in NNA projects may take various forms, and the proposed plan of a co-produced approach should be well-justified in the Management and Integration Plan. If intending to pursue knowledge co-production, community engagement must begin well in advance of proposal submission, and Principal Investigators (PIs) are recommended to follow the Interagency Arctic Research Policy Committee (IARPC) Principles for Conducting Research in the Arctic.

4. **Is co-production of knowledge a required component of NNA proposals?**

   No. Co-production of knowledge with Arctic Indigenous communities (or other potential collaborators, including industry and educational organizations) is encouraged when it is appropriate and when relationships have been established to ensure a genuine co-produced approach.

5. **We are incorporating the co-production of knowledge into our proposal. Does this mean that I have met the requirement of the 'social system' aspect of the NNA Venn Diagram?**

   No. The 'social system' aspect of the NNA Venn diagram reflects social science theories and methodologies as outlined in the solicitation. Co-production of knowledge is a different and holistic way of understanding and analyzing the world but is not considered a social science approach for the purposes of NNA.

6. **What do you mean by "research capacity building"?**

   Research capacity-building refers to activities that further develop the interdisciplinary teams and team members that can contribute to research and training for NNA-focused communities, whether by developing plans for future research efforts and directions or in the activation of collaborations or networks to link efforts in novel ways. The goal of research capacity-building is to attract and develop research talent to address NNA research challenges through training, collaborations, networks, seminars, or other approaches. Such activities should be organized around strongly multidisciplinary, integrative theme(s) such as those described above, and with close community engagement.

7. **Please explain what is meant by "new and enhanced research community"?**

   The development of the NNA Big Idea is based on the recognition that profound changes in the Arctic present unprecedented opportunities and risks to natural, social, and built systems both within and outside of the Arctic. Meeting these challenges requires a large and diverse research community empowered to work across disciplinary boundaries and to bring to bear new perspectives on local, regional, and global causes and consequences of Arctic change. For these reasons, one of NNA's major objectives is the development of an expanded community of researchers, including participants new to Arctic research and teams that incorporate novel combinations of scientists, stakeholders, community members, and students from a range of disciplines, backgrounds, and social and cultural contexts.

8. **Is there a preference for any particular methodology or suite of methodologies?**

   No. The NNA competition does not privilege any particular research methodology or approach. Given the transdisciplinary and/or convergent nature of the research, multi- or mixed methodologies are expected.

9. **Do you have additional guidance for conducting education research? What are some examples of development, implementation, or evaluation of educational activities?**

   In general, education project activities associated with knowledge generation should be informed by the Common Guidelines for Education Research and Development. Such activities may include, but are not limited to:

   - Research experiences and other activities that capitalize on disciplinary and interdisciplinary scientific training or indigenous experience and knowledge to advance Arctic science;
   - Development of courses that will advance training related to the scientific focus of

the proposal;
- Development, implementation or evaluation of curricular changes to existing educational programs to reflect the emerging scientific focus of the proposal;
- Development of certificate programs that enable students to master a narrow subject or topic or offer professional training in an area of Arctic science;
- Implementation of evidence-based practices that increase the number, diversity, and expertise of Arctic researchers;
- Opportunities for students to partner with industry, government, community, and non-profit stakeholders that work within the Arctic nexus; and/or
- Involvement of local educational institutions, including Tribal College and Universities Program (TCUP) eligible institutions, Historically Black Colleges and Universities (HBCUs) and Hispanic Serving Institutions (HSIs).

10. **Can NNA projects involve international collaborations?**

    Yes. NSF encourages NNA proposals that include significant international components. Note, however, NSF rarely provides direct funding support to foreign organizations. Refer to the NSF Proposal and Award Policies and Procedures Guide (PAPPG), Part I, Chapter I.E.6, for guidance on required information and justification in cases where the funding of a foreign organization is considered to be essential by the proposer.

11. **Can NNA proposal budgets include funds to support activities by individuals employed by Federal agencies or Federally Funded Research and Development Centers (FFRDCs)?**

    As described in PAPPG, Part I, Chapter I.E.7, NSF does not normally support research activities by employees of other Federal agencies and/or FFRDCs. NNA will consider requests for an exception only when the other Federal agency or FFRDC can make unique contributions to the needs of researchers elsewhere. A request for an exception must provide specific detail about what unique contributions the other Federal agency or FFRDC can provide. Please note that employees of other Federal agencies and/or FFRDCs may participate as unfunded collaborators.

12. **Can an individual be simultaneously involved as a PI, co-PI or Senior Personnel in Track 1 and Track 2 proposals?**

    Yes. However, an individual may not participate as PI, co-PI, and/or Senior Personnel on more than three proposals in response to this solicitation. NNA is intended to promote initiatives that empower new research communities and diversify the next generation of Arctic researchers. NSF believes that limiting the participation of any one individual in the role of PI, co-PI, or Senior Personnel will help ensure that a wide, diverse group of new discoverers will play leading roles in NNA projects. Therefore, an individual may participate as PI, co-PI, or Senior Personnel on at most three proposals

in response to the NNA solicitation.

13. **My project may require Institutional Review Board (IRB) approval. Do I need to submit IRB approval paperwork with my proposal?**

    IRB approval is not needed at the time of proposal submission but must be provided before NSF can make the award. The box for "Human Subjects" must be checked on the Cover Sheet if use of human subjects is envisioned. The requirements contained in the PAPPG Part I, Chapter II.D.5 must be followed. NSF provides additional guidance on IRB requirements on the NSF Human Subjects Web page. Additional approvals or permits may be needed for projects with international, tribal, or collaborative dimensions.

14. **I have never worked in the Arctic before, but I think my research could be appropriate for NNA. Should I submit a proposal?**

    Yes. NSF welcomes proposals from investigators new to the Arctic, provided all requirements of the solicitation are met.

15. **What if my organization has knowledge of issues relevant to, or works in, the Arctic but doesn't normally submit proposals to NSF? Is my organization eligible to submit a proposal to this competition?**

    Yes. NSF is interested in engaging new investigative teams and organizations in Arctic-related research through the NNA solicitation. The NSF PAPPG and the NNA solicitation list a wide range of eligible organization types, with examples provided in the PAPPG. Please note that US-based organizations that primarily represent, research, and/or lead Indigenous and non-Indigenous residents of the Arctic and beyond, including but not limited to tribal colleges and councils, local Indigenous organizations, and non-profit organizations may meet the PAPPG definitions. NSF does require financial review of awardee organizations that have never received an NSF award, but that review does not take place unless the proposal is going to be recommended for funding. You can find additional information for prospective new proposers in the NSF Prospective New Awardee Guide.

16. **Do the logistics costs for fieldwork in the Arctic count towards the total budget of the proposal when it comes to the upper limits on the total proposal budget?**

    As is stated in the Solicitation, "Proposals involving fieldwork in the Arctic must describe the field activities in the body of the proposal and include a schedule of proposed work. Logistics costs may be included directly in the proposal budget if the proposer plans to make the logistics arrangements. Alternatively, investigators may utilize third-party logistics providers paid for directly by the Arctic Research Support and Logistics

program (RSL)." Thus, if the proposer plans to make the logistics arrangements, the logistics costs would count toward the total budget of the proposal. If the proposer utilizes third-party logistics providers paid for directly by the RSL, the logistics costs would not count toward the total budget of the proposal. See "Proposals Involving Arctic Fieldwork or Ship Time" in Section V.A of the Solicitation for more details

17. **For multi-organization projects, must investigators from each collaborating organization attend the annual NNA Principal Investigator (PI) Meetings?**

    Fundamentally, the PI meetings are intended to foster community development. All NNA project budgets must include funding for at least one representative of the project to attend each PI meeting during the proposed lifetime of the award. For multi-organization projects, investigators from each participating organization are expected to attend. There may be anticipated circumstances for a given project that mean not every participating organization can be represented, which should be clearly articulated in the budget justification.

18. **Must proposals submitted to the Navigating the New Arctic solicitation include a component addressing the actual navigation of the Arctic region?**

    No. "Navigating" is meant as a metaphor, and not as a constraint or requirement for proposals submitted to this competition.

19. **How will NNA proposals be reviewed?**

    The review process is described in the solicitation, Section VI.B. Please note that the convergent nature of NNA projects will require a multidisciplinary group of reviewers.

20. **Can I obtain a waiver of the page limitation for the project description if my project is large and complex, or if my project is a large collaboration among multiple organizations?**

    No. All proposals must adhere to the page limit given in the solicitation.

21. **Do all proposals require a Data Management Plan?**

    Yes, all proposals submitted under this solicitation are required to include a Data Management Plan. Special requirements for the Data Management Plan are described in the solicitation, Section V.A

22. **Do all proposals require a Management and Integration Plan?**

    Yes. Please note that the quality and appropriateness of the Management and Integration Plan are important review criteria for NNA proposals. The convergence statement is an important part of the Management and Integration Plan.

23. **Is the submission deadline flexible?**

    No. Proposals will not be accepted after 5:00 PM submitter's local time on the deadline date.

24. **The solicitation lists maximum durations and budgets for NNA proposals. Can we propose a project with a shorter duration or smaller budget?**

    Yes. NSF does not consider any particular project duration or budget to be optimal, provided that neither exceeds the limits given in the solicitation, and that project durations and budgets are commensurate with the scope of the work proposed. NSF anticipates funding awards with a range of project durations and budgets. The solicitation limits Track 1 awards to 5 years in maximum duration and Track 2 awards to 2 years in maximum duration.

25. **I submitted a proposal to the FY19 NNA competition, and the proposal was declined. Am I eligible to resubmit?**

    Yes, you can resubmit a revision of your FY19 submission to the FY20 competition, subject to the guidance on resubmissions provided in PAPPG, Part I, Chapter IV.E.

26. **Can I submit a proposal for a center pursuant to this solicitation?**

    No. The current solicitation does not allow for center or center-like proposals. NSF anticipates that future NNA solicitations may include opportunities for projects up to the scale of centers and/or consortia. See the description of Track 2 proposals in the solicitation for more information regarding future NNA goals.

27. **Can I submit a proposal for a conference pursuant to this solicitation?**

    Yes. NNA Track 2 proposals "may include support to conduct organizational planning meetings"; therefore, small conferences may be proposed as an integral component of a Track 2 proposal. However, proposals for conferences whose primary purpose is not aligned with the goals of NNA Track 2 should not be submitted to this solicitation. Other programs at NSF may be more appropriate for such a conference proposal.

TRACK 1 - RESEARCH GRANTS

28. **How do I know if my project is more appropriate for NNA Research Grant (Track1) or for another program at NSF?**

    As stated in the NNA solicitation, Track 1 proposals must address a question or questions at the intersection between at least two of the following: the natural environment, the built environment, and social systems. All Track 1 proposals also must

address at least one of the six focus areas listed in the solicitation. In addition, proposals must have a strong connection to real-world needs of the changing Arctic or its global impact, with clear evidence of domain expertise within the investigative team. Proposals are expected to be convergent in nature as defined by NSF. Projects not meeting these requirements would not be appropriate for NNA Research Grants but could be appropriate for other programs at NSF.

29. **The solicitation lists six focus areas for Track 1 proposals. Can you provide examples of activities that might fit under each focus area?**

    ***Arctic Residents**. Convergence research approaches to help researchers to understand the complex relationship between Arctic residents and their natural and cultural landscape. Studies are needed to better understand how social, economic, and governance systems interact with infrastructure and how environmental and biophysical changes in the Arctic impact these interactions.*

    This could include a focus on multi-scalar governance systems, how Arctic communities adapt to rapid Arctic transformations, shifting demographics and cultural systems, or resilience and vulnerability of coastal and inland settlements to rapid environmental changes, including sea level rise and increasing wildland fires. In addition, studies could focus on changes in biodiversity and ways of life and their effects on food security and subsistence harvests, efforts made to maintain and share Indigenous knowledge and languages in the face of rapid loss, and wider social, ecological, institutional and cultural efforts being made by Arctic residents to adapt to these changes.

    ***Data and Observation**. Innovations in interoperable national and international Arctic observational networks, instruments, sensing and sensor-network technologies; shared and open data collections; and/or intelligent data management, analysis, and/or modeling efforts that address impacts and new opportunities on the interactions or connections between at least two of the natural and built environments and social systems. Engaging local and global communities in the design and deployment of these new technologies and observational networks is strongly encouraged*

    For example, anticipating, understanding, and predicting changes in the Arctic social, natural, and built environments may be enabled by the introduction of customized sensor platforms whose observational data and analysis may inform research models in anticipating, predicting, and mitigating extreme events. Underwater robots could map the sea floor as never before; characterize biogeochemical, geophysical, and ecological sea conditions; and provide ground-truthing for satellite estimation of ice thickness. Novel and robust observation techniques by Arctic residents could also provide a valuable source of information that can deepen our understanding of Arctic systems at multiple scales. New sensors, sensing, and sensor-networking/Internet of Things (IoT)

technologies to solve problems relevant for NNA may also be appropriate as elements of NNA proposals.

***Education**. Research on the effectiveness of formal and informal education activities; methods and impact of dissemination of Science, Technology, Engineering, and Mathematics (STEM) research results; and formation of collaborations for convergence research in the new Arctic. Studies are also needed on diverse methods to create an informed public, which is critical to the development of national policies and priorities.*

For example, research on successful models to develop graduate students as the next generation of scientists who are well-trained to address the scientific challenges in Arctic science; research on the development of effective methods for developing strong partnerships between Arctic researchers and Arctic residents to collaborate on the co-production of knowledge in NNA projects; studies of the efficacy of existing learning environments and development of new learning environments in northern regions; basic research on improved student learning using new education materials developed by NNA projects; or research on the effectiveness and impact of methods of dissemination of NNA project results to diverse stakeholders.

***Forecasting**. Studies to understand and forecast interdependent changes in the biogeochemical, geophysical, biological, ecological, institutional, and social processes occurring in the new Arctic, including, when appropriate, global feedbacks. The dramatic expansion of information and emergence of novel simulation techniques provide an exciting opportunity for the science community to understand present conditions and model possible futures to which we must respond.*

For example, the evolutionary, physiological, and ecological responses of flora and fauna; changes in Arctic landscapes, driven by permafrost thaw and fire, that fundamentally alter ecosystems; dynamic interactions between changing Arctic landscapes and the atmosphere as well as the Arctic ocean; changes in Arctic Sea temperatures and salinity that impact marine ecology; or a wide range of human activities, such as governance and decision-making structures, examinations of the influence of environmental change in the Arctic on global security and political phenomena, and/or the impact of responses of state governmental institutions and international organizations to rapid Arctic change. Novel simulation techniques, including for multi-domain simulations, may enable all these examples and other NNA-relevant research questions. Keep in mind that, as stated above, proposals must address how research activities will lead to understanding of questions at the intersection between the natural environment, the built environment, and social systems.

***Global Impact**. Understanding and forecasting global influences, consequences, and*

opportunities arising from a changing Arctic. Studies are needed to help researchers understand how biophysical and other changes in the Arctic link to environmental, social, geopolitical, and economic realities in the rest of the world.

Projects focused on understanding the impacts of Arctic change on environmental, climatic and biophysical processes across the globe may be appropriate for NNA, if the link to Arctic processes is made clear. In addition, understanding the consequences and opportunities for international trade, the global economy, natural resource extraction industries, national security, and other geopolitical factors from the expanding ability to navigate the new Arctic could be appropriate for NNA.

***Resilient Infrastructure**. Innovations and studies enabling fundamental science and engineering research in forward-looking, sustainable, adaptable, and resilient infrastructure to meet current and future challenges of a changing Arctic. Infrastructure must be capable of withstanding extreme and variable temperatures in Arctic marine, freshwater, soil, and sediment environments, as well as adapt to ongoing changes in the atmospheric, cryospheric, marine, terrestrial, and institutional systems*

For example, projects (1) to understand and mitigate the negative effects of thawing permafrost, changes in the frequency and nature of natural disasters; and changing demands for, and stresses on, current and future built infrastructure; (2) to explore approaches to vastly improved communications and transportation systems that can endure Arctic conditions, including ground-based and marine transportation systems (manned or autonomous), satellite-based communications, and/or supply chain logistics under dynamic and uncertain conditions; and/or (3) to research new technologies that are needed to enable sustainable, green Arctic infrastructure capable of withstanding extreme and variable conditions.

30. **Can I submit a Track 1 proposal for a project that does not involve research in the Arctic?**

    Yes, provided the project meets the requirements given in the solicitation and summarized in FAQ #28 above. As one example, a project that examines the implications of the changing Arctic on two or more of the natural environment, built environment, and social systems could be appropriate under the *Global Impact* focus area, even if those environments and/or systems are not located in the Arctic itself.

TRACK 2 - PLANNING GRANTS

31. **Is it necessary to submit a planning grant proposal, or receive a planning grant award, to submit proposals to future NNA competitions?**

    No. One is not required to submit a planning grant proposal to participate in future NNA

competitions.

32. **Must the original team for a successful planning grant proposal be retained for future NNA proposals?**

    No. Participation in the planning grants program should not be construed as a proposal for future NNA competitions, and the information presented in a submitted planning grant will not limit in any way a future NNA proposal submission.

33. **The solicitation states "NSF particularly encourages Track 2 proposals that reflect integrative, multidisciplinary research; tangible research capacity-building; meaningful community engagement; and efforts to advance education." Is it required that all four elements be present in the proposal?**

    No. The proposals are not required to include all four of the listed elements, however, note that planning grant proposals that aim to strengthen as many of these elements as possible are expected to make stronger contributions towards the major goals of the NNA program.