NAVIGATING THE NEW ARCTIC (NNA)

NNA Funding
(Dollars in Millions)

	FY 2018 Actual	FY 2019 (TBD)	FY 2020 Request
Stewardship Activities (GEO)	-	-	**$30.00**
Foundational Activities	**$23.67**	**-**	**$13.00**
BIO	1.50	-	1.50
EHR	-	-	1.25
ENG	2.84	-	2.00
GEO	0.50	-	1.75
SBE	0.38	-	0.50
OISE	1.00	-	1.00
OPP	17.45	-	5.00
Total	**$23.67**	**-**	**$43.00**

Overview

Arctic temperatures are warming faster than nearly everywhere else on Earth, with some models predicting that continued warming could produce an ice-free Arctic Ocean by mid-century. The rapid and wide-scale changes occurring in response to this warming portend new opportunities and unprecedented risks to natural systems; social and cultural systems; economic, political and legal systems; and built environments of the Arctic and across the globe. The lack of scientific observations and the prevalence of interdependent social, natural, and built systems in the Arctic make it challenging to predict the region's future. Understanding and adapting to a changing Arctic will require creative new directions for Arctic-specific research, education, workforce development, and leveraging of science, engineering, and technology advances from outside the Arctic.

NNA, one of NSF's 10 Big Ideas, embodies the Foundation's forward-looking response to these profound challenges. NNA seeks innovations in Arctic observational networks and fundamental convergence research across the social, natural, environmental, computing and information sciences and engineering that address the intersection of natural, social, and built systems. By drawing upon expertise from across the agency, NNA investments will accelerate research needed to inform decisions regarding the economy, security, and resilience of the U.S. as an Arctic Nation. On the observing front, NNA will advance and address key gaps in the existing array of observational networks, leveraging resources with the Mid-scale RI Big Idea as appropriate. NNA will also support knowledge co-production with indigenous and local people to enhance observations in key areas. Interagency, state government, and international partnerships will be further developed in order to achieve pan-Arctic and Arctic-global perspectives.

NNA will provide support for research activities that advance understanding of the social changes underway, including shifting demographics, changing ways of life, and traditional ecological and other knowledge in danger of being lost. Researchers will also examine economic, cultural, and social impacts on groups and communities living in regions impacted by Arctic changes in order to better understand how the social, economic, and governance systems interact with infrastructure such as the delivery of services and access to resources. Findings from this research can help to anticipate social changes that are likely to emerge from increased economic activity.

NNA-supported data efforts will enable major advances in modeling and prediction of Arctic systems and their global interactions. Strong coupling of observations, computation, and theory will be supported to

ensure progress. NNA will leverage investments through the HDR Big Idea by federating data systems supported by NSF and interagency and international partners so that data can be readily discovered, accessed, and interoperated to facilitate more rapid theory and idea development and testing.

NNA will build on NSF's STEM investments and the NSF INCLUDES Big Idea to encourage innovative and appropriately evaluated education and public engagement efforts that leverage exciting NNA science and inspire diverse participation in STEM. NSF plans to invest in NNA through FY 2023.

Goals

1. 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.
2. New enhanced research communities that are diverse, integrative, and well-positioned to carry out productive research at the intersections of Arctic natural and built environments and social systems.
3. Research outcomes that inform U.S. national security and economic development needs in the Arctic and enable resilient, sustainable Arctic communities.

In FY 2017, NSF issued a Dear Colleague Letter (DCL) on the GCR Big Idea (NSF17-065) to explore Convergence approaches within four of the research-focused NSF Big Ideas including NNA. This DCL requested proposals for Research Coordination Networks (RCNs), workshops, and activities to enhance Arctic observational systems. In FY 2018, NSF issued a DCL on Stimulating Research Related to NNA (NSF18-048), requesting proposals for workshops, RCNs, and proposals be submitted to the Arctic Sciences program in OPP. NSF awarded 25 new projects under these two DCLs and related opportunities. In FY 2019, NSF issued a solicitation for NNA (NSF19-511) and plans to make approximately 25 awards to support research grants, and planning grants that develop convergence research teams.

FY 2020 Investments

NSF's NNA activities in FY 2020 will focus on enabling advances in priority areas, which will be developed by building on outcomes from FY 2017 – FY 2019 activities. In 2019, NNA focused on advances in observing technologies and convergent social/built/natural environment systems science. FY 2020 support for this investment will continue, and NSF expects to issue another solicitation in FY 2020.

NSF will also continue coordination and leveraging of NNA-related activities with external stakeholders, including other federal agencies through the Interagency Arctic Research Policy Committee chaired by the NSF Director, local residents and indigenous peoples through state and local governance structures of Alaska, as well as with international partners through fora such as the biannual International Arctic Science Ministerial. All of the identified FY 2020 NNA activities will support goals 1, 2, and 3.