

**OFFICE OF POLAR PROGRAMS (OPP)****\$419,780,000**  
**-\$68,900,000 / -14.1%****OPP Funding**  
(Dollars in Millions)

	FY 2019 Actual	FY 2020 (TBD)	FY 2021 Request	Change over FY 2019 Actual	
				Amount	Percent
<b>Research</b>	<b>\$123.09</b>	-	<b>\$101.32</b>	<b>-\$21.77</b>	<b>-17.7%</b>
Long Term Ecological Research (LTER)	3.41	-	3.38	-0.03	-0.9%
<b>Education</b>	<b>2.14</b>	-	<b>0.72</b>	<b>-1.42</b>	<b>-66.4%</b>
<b>Infrastructure</b>	<b>363.45</b>	-	<b>317.74</b>	<b>-45.71</b>	<b>-12.6%</b>
Arctic Research Support and Logistics	50.15	-	40.50	-9.65	-19.2%
IceCube Neutrino Observatory (ICNO)	3.51	-	3.50	-0.01	-0.3%
U.S. Antarctic Facilities and Operations <sup>1</sup>	210.94	-	190.14	-20.80	-9.9%
U.S. Antarctic Logistical Support	81.30	-	71.00	-10.30	-12.7%
Geodetic Facility for the Advancement of Geoscience (GAGE)	1.10	-	0.70	-0.40	-36.5%
Seismological Facility for the Advancement of Geoscience (SAGE)	1.61	-	1.00	-0.61	-38.0%
Research Resources	7.95	-	4.04	-3.91	-49.2%
Polar Environment, Safety, and Health (PESH)	6.88	-	6.86	-0.02	-0.2%
<b>Total</b>	<b>\$488.68</b>	-	<b>\$419.78</b>	<b>-\$68.90</b>	<b>-14.1%</b>

<sup>1</sup> FY 2019 Actual includes additional funding to replace the aging pier at Palmer Station and to replace or refurbish other equipment and facilities.

**About OPP**

OPP invests in polar scientific research and education as well as provides research support and logistics including infrastructure, such as permanent stations and temporary field camps, in the Antarctic and the Arctic. OPP's FY 2021 Request is influenced by three key priorities: (1) maintaining strong disciplinary programs that provide the basis for investments in cross-disciplinary system science programs; (2) supporting critical facilities that enable research in the Earth's polar regions; and (3) supporting the construction phase of the Antarctic Infrastructure Modernization for Science (AIMS) project which was awarded to Leidos Corporation in May 2019. These priorities reflect opportunities for fundamental scientific discovery uniquely accessible in polar regions, as well as studies to investigate the causes and future trajectory of environmental, biological, and human system changes now being observed in the polar regions that have possible global implications.

OPP is the primary U.S. supporter of fundamental research in the polar regions. In the Arctic, NSF helps coordinate research planning as directed by the Arctic Research Policy Act of 1984, and the NSF Director chairs the Interagency Arctic Research Policy Committee (IARPC) created for this purpose. In the Antarctic, per Presidential Memorandum 6646, NSF manages all U.S. activities as a single, integrated program, making Antarctic research possible for scientists supported by NSF and by other U.S. agencies. The latter include the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), the Smithsonian Institution, the Department of Energy, and the National Institute of Standards and Technology (NIST). The U.S. Antarctic Program (USAP) research activity supported by NSF also supports leadership by the U.S. Department of State in the governance of the continent and Southern Ocean under the aegis of the Antarctic Treaty System.

In addition to shared cross-directorate basic research objectives, OPP investments will be guided by recent sponsored studies to identify priority areas and ensure effective polar research programs:

- For the Arctic, IARPC's Arctic Research Plan: FY 2017-2021,<sup>1</sup> and the World Meteorological Organization's Year of Polar Prediction Implementation Plan<sup>2</sup> inform science investment priorities. Efforts to build an integrated research capacity to address the potential opportunities and challenges of Arctic change for the Nation's security and economics and well-being of Arctic residents will continue.
- For the Antarctic, the 2015 National Research Council report *A Strategic Vision for NSF Investments in Antarctic and Southern Ocean Research*<sup>3</sup> informs science investment priorities. Specifically, in 2018, OPP initiated support of a five-year deep-field program to study the Thwaites Glacier region that was the highest priority in that study. The Thwaites program is jointly supported, including shared logistics, with the National Environment Research Council of the U.K. The first field work will be accomplished in the 2019-20 austral summer season.

## Major Investments

- In FY 2021, OPP research funding is \$101.32 million. To accommodate its core research priorities, OPP will continue to leverage interagency and international partnerships.
- Arctic programs will continue to focus on integrating sustained observations, process studies, theory, and modeling of the natural and social systems to understand and improve predictions of the changing Arctic and its role in the Earth system. This has, in prior years and will in FY 2021, include investments in polar cyberinfrastructure, data analytics, and software. A major FY 2019 investment was made in the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC),<sup>4</sup> an international study of the formation and melt of sea-ice in the central Arctic Ocean with a year-round field presence that extends into FY 2020. NSF will continue to invest in this effort as the project transitions from field work to analysis of the data generated by the observations. Arctic programs will continue to invest in the Navigating the New Arctic NSF-wide Big Idea that will support research needed to inform the economy, security, and resilience of the Nation, the larger region, and the globe in the face of a rapidly changing Arctic.
- Antarctic science will maintain funding in priority areas as outlined in the 2015 National Academies report and the NSF's WoU and URoL Big Ideas. In particular, Antarctic programs will begin upgrades to the IceCube Neutrino Observatory (ICNO) at the South Pole. OPP will continue to support three LTER projects: two in the Antarctic and one in the Arctic at \$3.38 million.
- Arctic research support and logistics are funded at \$40.50 million while U.S. Antarctic Logistical Support will be funded at \$71.0 million. This will support existing commitments for field work in the Arctic and the Antarctic.
- Education activities across OPP will be through Improving Undergraduate STEM Education (IUSE) and Research Experiences for Undergraduates (REU) Supplements.
- In FY 2021, Antarctic Facilities and Operations funding is \$190.14 million. This will accommodate the science supported by McMurdo Station for the third year of two major multiyear field science projects: the International Thwaites Glacier Collaboration<sup>5</sup> and the Subglacial Antarctic Lakes Scientific Access project (SALSA).<sup>6</sup>
- FY 2021 will be the third year of the AIMS project's construction phase, which addresses major recommendations of the 2012 Blue Ribbon Panel study, *More and Better Science in Antarctica through*

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<sup>1</sup> [www.iarpcollaborations.org/uploads/cms/documents/iarpc\\_arctic\\_research\\_plan\\_2017-2021.pdf](http://www.iarpcollaborations.org/uploads/cms/documents/iarpc_arctic_research_plan_2017-2021.pdf)

<sup>2</sup> [www.polarprediction.net/fileadmin/user\\_upload/www.polarprediction.net/Home/YOPP/YOPP\\_Documents/FINAL\\_WWRP\\_PP\\_P\\_YOPP\\_Plan\\_28\\_July\\_2016\\_web-1.pdf](http://www.polarprediction.net/fileadmin/user_upload/www.polarprediction.net/Home/YOPP/YOPP_Documents/FINAL_WWRP_PP_P_YOPP_Plan_28_July_2016_web-1.pdf)

<sup>3</sup> [www.nap.edu/catalog/21741/a-strategic-vision-for-nsf-investments-in-antarctic-and-southern-ocean-research](http://www.nap.edu/catalog/21741/a-strategic-vision-for-nsf-investments-in-antarctic-and-southern-ocean-research)

<sup>4</sup> [www.mosaic-expedition.org/](http://www.mosaic-expedition.org/)

<sup>5</sup> <https://thwaitesglacier.org/>

<sup>6</sup> <https://salsa-antarctica.org/>

*Increased Logistical Effectiveness.*<sup>7</sup> AIMS focuses on modernizing McMurdo Station, the major NSF Antarctic logistics hub, and thereby ensures continued cross-discipline access to the continent for the U.S. science community. OPP will support a major ramp-up in the construction tempo of the AIMS project. AIMS commenced in 2019 as a MREFC project to be completed within 10 years from its award.

**OPP Funding for Facilities**

**OPP Funding for Major Multi-User Facilities**

(Dollars in Millions)

	FY 2019 Actual	FY 2020 (TBD)	FY 2021 Request	Change over FY 2019 Actual	
				Amount	Percent
<b>Total</b>	<b>\$217.17</b>	<b>-</b>	<b>\$195.34</b>	<b>-\$21.83</b>	<b>-10.1%</b>
IceCube Neutrino Observatory (ICNO)	3.51	-	3.50	-0.01	-0.3%
U.S. Antarctic Facilities and Operations <sup>1</sup>	210.94	-	190.14	-20.80	-9.9%
Geodetic Facility for the Advancement of Geoscience (GAGE)	1.10	-	0.70	-0.40	-36.5%
Seismological Facility for the Advancement of Geoscience (SAGE)	1.61	-	1.00	-0.61	-38.0%

<sup>1</sup> FY 2019 Actual includes additional funding to replace the aging pier at Palmer Station and to replace or refurbish other equipment and facilities.

For detailed information on individual facilities, please see the Facilities and the Major Research Equipment and Facilities Construction chapters.

**Funding Profile**

**OPP Funding Profile**

	FY 2019 Actual Estimate	FY 2020 (TBD)	FY 2021 Estimate
<b>Statistics for Competitive Awards:</b>			
Number of Proposals	459	-	500
Number of New Awards	171	-	150
Funding Rate	37%	N/A	30%
<b>Statistics for Research Grants:</b>			
Number of Research Grant Proposals	448	-	450
Number of Research Grants	162	-	130
Funding Rate	36%	N/A	29%
Median Annualized Award Size	\$187,785	-	\$187,800
Average Annualized Award Size	\$292,827	-	\$292,800
Average Award Duration, in years	2.7	-	2.6

In general, about 20 percent of the OPP portfolio is available for new research grants. In FY 2021, the number of research grant proposals is not expected to change significantly compared to the FY 2019 Actual and OPP expects to award about 130 research grants.

<sup>7</sup> [www.nsf.gov/geo/opp/usap\\_special\\_review/usap\\_brp/rpt/index.jsp](http://www.nsf.gov/geo/opp/usap_special_review/usap_brp/rpt/index.jsp)

## Program Monitoring and Evaluation

### Science and Technology Policy Institute (STPI) Reports

- STPI performed its annual Survey Analysis of the United States Antarctic Program Logistical Support Services for the 2018–19 Field Season report.

### Committees of Visitors (COV) and Advisory Committee (AC)

- In 2020, COVs will review both the Antarctic and Arctic programs.
- The OPP AC meets twice annually, in the fall and spring. It recently published: *An Overview of Advisory Studies for the Office of Polar Programs, 2019*.<sup>8</sup>

The Performance and Management chapter provides details regarding the periodic reviews of programs and portfolios of programs by external Committees of Visitors and directorate Advisory Committees. Please see this chapter for additional information.

## People Involved in OPP Activities

<b>Number of People Involved in OPP Activities</b>			
	FY 2019		
	Actual	FY 2020	FY 2021
	Estimate	(TBD)	Estimate
Senior Researchers	786	-	600
Other Professionals	418	-	300
Postdoctoral Associates	120	-	100
Graduate Students	302	-	200
Undergraduate Students	271	-	200
<b>Total Number of People</b>	<b>1,897</b>	<b>-</b>	<b>1,400</b>

<sup>8</sup> [www.nsf.gov/geo/opp/opp\\_advisory/OPP\\_AC\\_Report2019.pdf](http://www.nsf.gov/geo/opp/opp_advisory/OPP_AC_Report2019.pdf)