

OPP comment on Mid-Term Assessment of Progress on the 2015 Strategic Vision for Antarctic and Southern Ocean Research

March 1, 2022

NSF's Antarctic Sciences Section (ANT) appreciates the dedication of the committee members who developed the "Mid-Term Assessment of Progress on the 2015 Strategic Vision", and the broad participation of stakeholders that contributed to the committee's deliberations. The report's recommendations include *improving communication* with the research community; *fostering community development* in strategic priority areas; and *broadening the diversity and inclusion* of the polar research community.

Communication: The United States Antarctic Program (USAP) appreciates the need for continued dialogue with the scientific community, and greater transparency regarding the availability of logistical resources to support science.

Actions to increase communication: With the onset of the pandemic, ANT initiated quarterly virtual office hours to provide programmatic updates, and answer community questions concerning the current state of field support for ongoing and new projects. In recognition of greater need for transparency in the availability of logistics, ANT and Antarctic Infrastructure and Logistics (AIL) are developing communication tools to provide researchers with more information on available capabilities. In addition, ANT and AIL are creating a Prospective Participant Guide that provides a single location for essential information and timelines needed to develop an Antarctic field-based proposal. Finally, the USAP Capital Investment Planning process includes routine refreshing of Campus Master Plans, with broad community input. These Master Plans form the basis for future infrastructure work, and their development offers the research community an important voice in the future of each Station.

Community Development: The report discusses funding trends relative to priority areas, and points to deficiencies in the support of research in certain fields (e.g., ice sheet behavior, genomics of adaptation). It suggests that ANT should foster research expertise and community development in areas where progress is needed.

Actions to support community development: ANT has a strong record of supporting innovative research in the priority areas, through the success of proposals that have been submitted through the annual solicitation, and through special announcements. ANT agrees with the imperative for progress in priority areas, and the need to stimulate the scientific community toward innovation in underexplored fields. To this end, over the time frame covered by the report, ANT has supported the following workshops pertinent to the science priority areas:

- Rapid Access Ice Drill (RAID) Science Workshop (OPP-1719246)
- Antarctic Surface Hydrology and Future Ice Shelf Stability (OPP-1743326)
- Workshop: Best Practices for using Next Generation Sequencing Datasets to determine Robust Evidence of Positive Selection and Convergent Evolution of Polar Organisms (OPP-1744877).
- RAPID: Antarctic ECOSystem Research following Ice Shelf Collapse (AECORISC): Scoping Workshop (OPP – 1750903, 1750888, 1750630)

- Interrogating Molecular and Physiological Adaptations in Antarctic Marine Animals (Specific Aim 3) (OPP-1935635, 1935672)
- A Workshop for Evaluating the Value and Scope of a Biological Repository of Antarctic Specimens (OPP-2015878)
- Ice Drilling Program Office Early Career Workshop (OPP-2144886)

In addition to updating the Antarctic Research solicitation, ANT released two additional solicitations and a Dear Colleague Letter, all intended to highlight and advance research in the priority areas:

- NSF-NERC Future of Thwaites Glacier and its Contribution to Sea-level Rise (solicitation NSF 17-505)
- Dear Colleague Letter: Genetic Underpinnings for Life in Antarctica (LIA) (DCL NSF 19-045; expected revision 2022)
- Biodiversity in a Changing Planet (BoCP) solicitation (NSF 22-508).

ANT will further consider funding workshops and developing special solicitations in targeted areas to underscore its commitment to research in all three priority areas. Additional areas of interest include advancing technology development and innovation in polar research. Recent and future workshops aligned with this growing area include:

- Antarctica Subsea Cable Workshop: High-speed Connectivity Needs to Advance U.S. Antarctic Science (OPP-2130663)
- Polar Radar Science and Technology Conference 2021 (OPP-2113032)
- Technology Developments to Advance Antarctic Research: A Workshop (OPP-2132040)
- Generation of High-Resolution Surface Melting Maps over Antarctica using Regional Climate Models, Remote Sensing and Machine Learning (workshop is part of funded award OPP-2136938).

Finally, ANT and AIL continue to advance capability to support research in Priority Areas I and II. For example, the proposed Antarctic Research Vessel, now in the Preliminary Design Phase, will be a cutting-edge research vessel supporting biological, oceanographic, and earth system sciences. With respect to Priority Area III, CMB-S4 was identified by the ASTRO 2020 Decadal Survey as a priority research facility. Decisions on the future of CMB-S4 at South Pole Station will involve collaboration among the Directorate of Mathematical and Physical Sciences, the Directorate of Geosciences, and the Office of Polar Programs.

Diversity and Inclusion: Diversity and inclusion are important priorities for all of NSF. Diversifying the geosciences has special challenges, given the lack of access to, and low familiarity with, extreme or remote environments.

Actions to advance diversity and inclusion: ANT is committed to increasing the diversity of scientists within polar research, through ongoing and completed efforts such as: the development of a comprehensive Sexual Assault, Harassment Prevention and Response Program; the support of significant diversity and inclusion efforts within large field programs such as Thwaites Glacier Initiative and the newly funded Science and Technology Center

“COLDEX” (NSF Award 20-19719); and the reinstatement of the OPP Postdoctoral Research Fellowship that emphasizes new pathways into Polar Research (NSF 22-516).

In 2020, the Office of Polar Programs charged a subcommittee of the Advisory Committee to develop evidence-based recommendations for enhancing Diversity and Inclusion in Polar Science, and awaits the subcommittee’s findings and recommendations. ANT is focused on developing a pipeline of researchers from underrepresented groups and is considering targeted opportunities for researchers from Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs) and Tribal Colleges and Universities. ANT actively participates in the OPP Broader Impacts Working group, which shares information on best practices in all aspects of program and proposal management which make diversity and inclusion a priority.

Additional Considerations:

The report’s call for increases in support of scientific priority areas; maintenance of core research programs, and enhanced logistics to support these efforts, is understandable. However, in the absence of significant increases in science budgets, it is not realistic to advance each of these recommendations simultaneously. ANT and AIL work collaboratively, in an ongoing partnership, to evaluate capability, opportunity, and tradeoffs in their continued effort to support groundbreaking science. The quality of science is always the highest priority.

COVID Impacts: The report acknowledges that the pandemic will severely impact the ability of the USAP to support science. However, the report does not reconcile its research aspirations with the realities of COVID impacts, and the budgetary constraints under which NSF must execute its mission, over the next five years. As a result of the pandemic, there is a significant, multi-year backlog of funded Antarctic science projects that await placement in the field. This backlog impacts the ability of USAP to respond to ambitious science projects that are envisioned or proposed.

The near-term response of USAP to the report will, by necessity, be constrained by the need to support currently funded projects; and by the ongoing response to, and shifting dynamics of, the pandemic. While this circumstance does not preclude moving forward with the efforts to broaden the pipeline; increase transparency concerning the availability of logistical support for field science; and foster innovative science through community development, it will preclude implementation of certain ambitious projects until the COVID backlog has cleared.

Logistical capabilities: A conclusion in the summary states, “Overall, logistical capacity was a major impediment to the pace and scope of progress in all of the strategic priorities and the broad Antarctic Sciences research program”. The Antarctic Sciences Section did not task the committee to analyze logistical capability, and accordingly, the committee lacked the information and expertise to assess it. Logistics is one of many considerations that impact how Antarctic science is supported, and prior to the pandemic, it rarely has been the determinant of a funding decision. Successful support of remote science requires optimization and balance among science operations and logistics, facility maintenance and recapitalization.

Antarctic Infrastructure and Logistics continues to innovate by expanding capabilities (e.g., science traverses) where limitations (e.g., LC-130 hours) arise, and Antarctic Science welcomes proposals for innovative technologies (e.g., autonomous vehicles, remote sensing applications, geophysical instrumentation pools) to advance polar research. OPP continually seeks to maximize science support given the logistics in place, and welcomes suggestions to enhance performance. These suggestions are best formulated from detailed knowledge concerning logistical capability, and a deep understanding of all areas of science requiring support, once the competitive grants process has concluded.