



Antarctic Sciences Section
Committee of Visitors Review
April 28-30, 2020

Recommendations and OPP/ANT response

The ANT Committee of Visitors (COV) review covered programs in the Office of Polar Programs (OPP) Antarctic Sciences Section (ANT) for proposals processed in fiscal years 2016 to 2019. The COV Committee met virtually from April 28-30, 2020 and reviewed programs in the Antarctic Organisms & Ecosystems (AOE), Antarctic Earth Sciences (AES), Antarctic Ocean & Atmospheric Sciences (AOAS), Antarctic Astrophysics & Geospace Science (AAGS), Antarctic Glaciology (AG), Antarctic Integrated System Science (AISS), Antarctic Instrumentation & Facilities (AIRF), Polar Cyberinfrastructure (CI), Polar Special Initiative Program (Education and Outreach), Antarctic Coord. & Info. (Media)/Artists and Writers (AAW) Programs.

Introduction

The Antarctic Sciences Section (ANT) appreciates the effort expended by the COV members in conducting a thorough and thoughtful review of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions in the Section. In particular, we would like to thank Dr. Lee Kump for his leadership of this effort.

The COV commended ANT's work in a number of areas. In particular, the COV noted that the Program Directors (PDs) are doing an excellent job of presenting summary evaluations of both review criteria in their reviews and they are doing an excellent job of communicating their decisions to investigators. The COV was very supportive of ANT's move to virtual panels, and they felt that ANT has effectively managed the elimination of deadlines. The Committee also saw tremendous value in ANT's reorganization under a more general solicitation removing restrictions on PIs to submit to a specific program. They felt that this approach fostered greater interdisciplinary science in the Antarctic research community. The COV also noted that the self-study report was "incredibly helpful" in completing the work of the Committee. ANT responses to the COV recommendations are shown in blue font and are categorized according to their appearance in the COV Report.

Recommendations

- I. Questions about the quality and effectiveness of the program's use of merit review process
 1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?

- a. Recommendation: The abandonment of panel review (self-study Fig. 7) by a fair proportion of the programs (21% in 2019) raises some concerns. The COV feels that panel review is important to helping the PDs manage portfolio balance, given their broader exposure to the variety of submissions that the individual ad hoc reviewer doesn't have. We recommend all programs to strive to incorporate panel review into their merit review process in addition to maintaining ad hoc reviews. The committee recognizes the extent to which the PDs require flexibility in how they solicit reviews, but the committee sees that there could be significant benefit to holding more virtual panels including increased opportunities for broader participation (e.g., by single parents, faculty with heavy teaching loads) and, when well moderated by the PD or delegate, more balanced participation by panelists (less likely to be dominated by strong personalities). On the other hand, the loss of opportunities for networking and chance scientific encounters is reduced. Savings from shifts to virtual panels might be redirected to creative, alternative in-person activities that provide these otherwise lost benefits. [Response: ANT is committed to the use of both panels and ad hoc reviews when assessing proposals submitted to the section. With the decline in proposal numbers after the removal of the annual ANT deadline, it has increasingly become a challenge to hold disciplinary panels in some areas. However, in instances where insufficient proposals have been submitted in a given research area, ANT Program Directors \(PDs\) are encouraged to hold joint panels with the Arctic Section and programs in other GEO and NSF Divisions.](#)

2. Are both merit review criteria, 1) intellectual merit and 2) broader impacts, addressed?

- a. Recommendation: NSF should clearly indicate that PIs should budget for BI activities that are not covered in standard budget categories such as student support. [Response: Official guidance for budget elements included in a proposal can be found in the Proposal and Award Policies and Procedures Guide \(PAPPG\).](#) In addition, when NSF program personnel are speaking at meetings such as early career PI forums or more recently during ANT Office Hours, we always stress that Broader Impacts (BI) must come with sufficient budget to accomplish the proposed scope.
- b. Recommendation: NSF should clearly indicate that PIs should assess the impact of BI activities in annual and final reports and in the Results from Prior section of subsequent proposals. Reviewers, panel and PDs should assess the success of past BI activities reflected in the Results from Prior section. [Response: We agree completely and are looking for a comprehensive, across ANT plan for how to ensure BI impacts are reported as part of the annual and final reporting process. As part of our panel briefing process, we indicate that the Results from Prior should be taken into account when evaluating proposals. Program Directors make their recommendation on the entirety of the package which includes information](#)

contained in the Results from Prior sections and the proposal broader impacts. Currently all reviewers are provided resources on the Broader Impacts merit review criterion when requested to provide an ad hoc review or to serve on panel. Ad hoc review requests are linked with the explicit Foundation expectation for the BI merit review criterion outlined in the PAPPG. Panelists are required to participate in a panel orientation that also explicitly outlines expectations on the BI merit review criterion with the opportunity to ask specific questions of program officers after the presentation is complete.

- c. Recommendation: NSF should consider adding BI experts to panels, especially when large, expensive proposals are being evaluated. Response: The National Science Board (NSB) is actively engaged in re-examining BIs including pilot projects that recommend adding a BI professional on every COV. ANT agrees that the BIs are an essential part of the Merit Review process and that the number of BI goals as listed in the PAPPG (Section II.C.2.d.) should scale with the size of the award. When populating a panel, Program Directors will often choose panelists that have extensive experience with BIs. For future panels we will consider what types of thresholds might trigger the addition of a BI expert and what might define the appropriate level of BI expertise.
- ci. Recommendation: Reviewers and panelists should be instructed to have higher expectations for more expansive and innovative BI activities in large, expensive proposals. Response: Answered in c. above
- cii. Recommendation: ANT should consider showcasing especially impactful BI activities and provide a handbook/website with exemplars of BI activities. Response: Defining BIs has been a long-standing topic of discussion at NSF and the Foundation has conducted extensive work and generated several reference materials to aid the Principal Investigator (PI) community in understanding what qualifies as BI activities. The Office of Integrative Activities (OIA) hosts a website to serve as a gateway for these materials that includes a workshop report from the Broader Impacts Infrastructure Summit, a video outlining merit review criteria for assessing Broader Impacts, and a link to a website for the recently funded Impact in Society (ARIS). ARIS was funded to “advance the rigor, relevance, and practice of BI by (a) cultivating and strengthening the existent and emerging BI expert community; (b) building capacity of researchers and educators to enhance and articulate the broader impacts of their work; and (c) creating socio-technical infrastructure able to adapt to stakeholder needs as BI continues to grow and evolve”. The center was co-funded by all the major research directorates and is meant to be a resource to researchers, collaborators, and the public. We will look into adding some examples of Antarctic BI “shining stars” on the OIA webpage and advertise these resource in our Early Career workshops, office hours and other events. In addition to this, a

number of organizations funded by NSF and OPP-ANT provide guidance, mentoring and examples of broader impacts for their communities.

3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals?

- a. Recommendation: NSF should revamp its reviewer solicitation and tracking system to one similar to that of many journals that allows for automatic confirmation or declination of the request. Such a system would allow PDs to solicit additional reviews if needed and maintain the expertise and gender/ethnic/racial diversity of the reviewer pool and would allow those declining the invitation to suggest alternate reviewers. Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes. We have conveyed this idea to NSF Division of Information Systems (DIS). The underlying functions described in this recommendation are currently fulfilled in a more ad hoc manner, but we agree that a tighter framework could be helpful.

4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?

- a. Recommendation: ANT PDs should encourage their panels to provide more thorough rationales for proposals that are unlikely to be recommended for funding. Response: Program Directors will include language in the ANT pre-panel webinar informing panelists of the importance of proving strong rationales when they recommend that proposals are not competitive. Program Directors also must approve panel summaries and those summaries should be sufficiently justified to help make a proposal recommendation. The ANT Section believes it is especially important to provide constructive feedback to early career investigators and PIs that are new to the Antarctic program.

5. Does the documentation in the jacket provide the rationale for the award/decline decision?

- a. Recommendation: ANT should find a way to convey to their investigator community the outstanding job their PDs are doing with their attention to detail and professionalism. Response: We appreciate the positive feedback on ANT PD performance.
- b. Recommendation: New PIs should be encouraged to build professional relationships with these outstanding individuals. Response: All Antarctic PDs are encouraged to build strong professional networks across their community base. In particular ANT PDs participate in a wide selection of professional mentoring activities targeted at early career investigators. These opportunities include participating in NSF, GEO and OPP new PI sessions and mentoring activities and everyone is encouraged to participate at early career forums at professional meetings.

6. Does the documentation to the PI provide the rationale for the award/decline decision? No Recommendations.

7. Additional comments on the quality and effectiveness of the program's use of merit review process:

- a. Recommendation: ANT should conduct a study of the causes of these long dwell times and strive to reduce them to the NSF norm, especially for less complex, non-field-based studies. Response: ANT agrees that dwell times could be improved. A study, such as that recommended by the COV is being initiated. In addition, working with the Antarctic Infrastructure and Logistics (AIL) Section, ANT will explore efficiencies that could be gained in the more rapid assessment of logistics support for proposals that involve Antarctic fieldwork. The logistics planning for field work awards is complicated due to limited logistics resources. This means that PDs may have to hold good proposals for a season or more. The length of time between receiving and funding field-based proposals is an understood but lengthy part of our recommendation process. Program Directors are encouraged to move forward quickly with declines and non-field work awards to improve dwell time. COVID is only exacerbating the need to hold some strong field-oriented proposals, but this should be a temporary additional challenge.
- b. Recommendation: ANT should prioritize increasing bandwidth at McMurdo to allow PDs to continue their review and award responsibilities while staged in Antarctica. Response: We agree that improving connectivity would allow ANT PDs to continue with the review process while deployed. As noted in another response below, we are continuing to work on solutions that would increase bandwidth at McMurdo and the South Pole station. In addition, as part of our preseason planning we plan to instruct new PDs on how to download a majority of the materials needed to work on jackets while deployed. Under current bandwidth constraints we may not be able to send out ad hoc reviews or conduct remote panels, but work can be accomplished on review analysis. All that said, the different and intensive demands on PD time when deployed should not be underemphasized, and the pace of work on the review process will always be reduced during that time.

II. Questions concerning the selection of reviewers.

1. Did the program make use of reviewers having appropriate expertise and/or qualifications?
 - a. Recommendation: NSF should find a mechanism for COV to more objectively determine the answer to this question. Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes that ANT has relayed to the OIA that oversees the Agency wide COV implications.
2. Did the program recognize and resolve conflicts of interest when appropriate. No Recommendations.
3. Additional comments on reviewer selection. No Recommendations.

III. Questions concerning the management of the program under review.

1. Management of the program.

- a. Recommendation: ANT should continue to maintain a balance between rotators and permanent federal employees. **Response: We agree and will continue to seek out highly qualified and diverse individuals to fill vacant rotator and permanent positions.**
- b. Recommendation: Other areas of NSF, for example EAR, might consider following the lead of ANT in accepting submissions to a "meta program" or to a section as a whole (rather than having PIs submit to smaller "stove-piped" programs). In the case of ANT, this transition to a section-wide proposal allocation was facilitated by the elimination of proposal deadlines. PDs noted that this approach might also work in programs with deadlines and might be ill-suited for some programs. **Response: We agree that this process has been effective and is in the best interests of the ANT PDs and the Antarctic PI community. Other divisions within GEO are aware of the ANT process and we will continue to provide information to other groups in GEO on how to implement our process.**

2. Responsiveness of the program to emerging research and education opportunities.

- a. Recommendation: The reorganization of the program should be more favorable for interdisciplinary science and the committee recommends that the program explore ways to support workshops that facilitate different disciplinary groups within ANT to work together. A US institution hosting the SCAR meeting could facilitate this, or co-funding workshops that bring disciplines together (e.g., ice-ocean-nutrient cycling in Antarctica). While we commend the program for its nimbleness to respond to community needs, the TGI initiative was not publicly accessible early enough for a number of scientists to participate in the solicitation. Significant lead time is needed to plan logistics in this region of Antarctica and the international partnership that was required for this solicitation necessitated that partners were secured prior to the release of the solicitation since most partners were already partnered. We recommend providing more lead time for PIs and broadcasting the solicitation via listservs in addition to providing wider community access to the solicitation framing process as it occurs. Further, the committee noted that the new bio investment from ANT could benefit from clarity to PIs that the program is willing to support either of the two aims and does not require that both be addressed. Details could be ironed out in an RCN to help advance this area of research. The committee noted that there was a lack of discussion in the ANT Self-Study about education opportunities and the community remains unaware of where research in this area is going. This could be emphasized. Finally, the committee sees the value of ANT PDs deploying to Antarctica to see the logistical and other challenges facing their awardees, but these trips are time consuming (contributing to high dwell times) and the connectivity is significantly limited (in McMurdo and South Pole) such that it is difficult for PDs to

remain actively working while deployed. We recommend improving connectivity in the main science labs at both bases. This would have multiple benefits beyond enabling PD work to continue, including allowing PIs to continue to work through delays and permitting real-time education and outreach opportunities. Alternatively, PDs could deploy every other year. Response: ANT is committed to encouraging interdisciplinary research. This was a significant driver for altering the ANT solicitation to focus on integrated research priorities rather than isolated disciplinary programs. Proposals are solicited without deadlines and submitted to a general "Antarctic Research" theme rather than disciplinary programs. ANT has also long supported workshops, such as the West Antarctic Ice Sheet(WAIS) workshop, as well as workshops to determine priority locations for interdisciplinary deep-field camps. ANT commits to continuing these investments in the future. In addition, the ANT Section participates in a number of joint review panels with OPP-Arctic, EAR Sections and BIO and MPS Directorates. The Section funds interdisciplinary workshops (i.e., Thwaites, WAIS, Polenet, Long Term Ecological Research (LTER)) and utilizes joint funding programs like Antarctic Instrumentation and Science Facilities and Antarctic Integrated System Science programs to fund opportunities across disciplinary boundaries.

Regarding the question of education opportunities, OPP co-reviews and co-funds education research proposals that are submitted to the Improving STEM Education (IUSE), Advancing Informal STEM Learning (AISL) and Discovery K-12 Research (DRK-12) programs in the Directorate for Education and Human Resources if the proposals are relevant to polar sciences. Co-funding of the proposals is especially important when the award involves logistics in polar regions. The projects usually involve undergraduates, K-12 teachers and students or the general public, and research results from the awards are generally reported in peer-reviewed education journals. We will make stronger efforts to ensure that the results of education research that is supported within OPP are communicated more often to the community via social media and are discussed at a variety of meetings, including the COVs.

Regarding our nimbleness to respond to community needs, ANT recognizes that significant lead times are required for groups to organize and respond to opportunities for large, complex, Antarctic field campaigns. In the future, we will ensure that the community has additional time to prepare proposals for large interdisciplinary solicitations. The Thwaites Glacier Initiative was preceded by community discussions at U.S. and international workshops and the critical need to investigate Thwaites Glacier was also highlighted in the 2015 National Academies of Science Engineering and Medicine decadal priorities report "A Strategic Vision for NSF Investments in Antarctic and

Southern Ocean Research". The Thwaites solicitation was released in October 2016 and was advertised widely. The due date of March 1 of the following year was 6 weeks beyond the normal 90 days.

Regarding the recommendation on the new bio investment above, the Genetic Underpinning and Rules for Living in Antarctica area of research continues to be a priority for ANT. We agree that greater clarity on what ANT is willing to support could increase community response to this opportunity. We will also continue to explore the option of supporting an Research Coordination Network (RCN) to build community and advance research in this critical area.

Regarding the issue of internet connectivity, we agree that improving connectivity at the main science labs would be beneficial. We are continuing to work on solutions that would increase bandwidth at McMurdo and the South Pole station. The Antarctic Science Section is sponsoring a National Academies Antarctic Technology Workshop focusing on how new and improved technology, including communications technology, can advance, expand, and transform in situ work in and around the polar regions. We will also be funding a community workshop to look at the science and broader impacts that could be accomplished by implementing a subsea fiber optic telecommunications cable between New Zealand and McMurdo Station. ANT would like to clarify that deployment to Antarctica for Science Rep duties is part of the job description. Although the Science Rep tasks may not advance the merit review process, they advance the progress of the field season and ensure science-informed decision-making in Antarctica when things don't go according to plan. Overall, deployments are arranged to have minimal effect on dwell times.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
 - a. Recommendation: The COV is impressed with the ANT project portfolio and to a great extent recommends that the program continue to conduct 'business as usual' in this regard. However, the success of our virtual COV meeting (using the platform Zoom) led us to speculate whether future iterations of many of the workshops, Town Hall meetings, etc. described above might also be held via Zoom or a similar virtual means. If so, this could provide myriad benefits, in that it would, for example, eliminate (or at least greatly reduce) potential financial and geographic barriers to participation, thereby facilitating the inclusion of students, postdoctoral fellows and other early-career researchers, and (ideally) underrepresented groups. This, in turn, could raise awareness of ANT and the funding opportunities therein within the scientific community, potentially leading to an even more diverse suite of projects and PIs in the program's portfolio.
Response: We agree that a mix of in-person (when safe) and virtual

meetings are key to maximizing participation of all participants in the US Antarctic Program (USAP). A recent poll of the community indicated that they liked hearing from the Antarctic Sciences Section through virtual office hours about every two months. We plan on continuing office hours as a mechanism to inform the community of new opportunities, share critical logistics information, and answer questions that the community might have.

4. Responsiveness of program to previous COV comments and recommendations
 - a. Recommendation: Future COVs should also have the benefit of a self-study report. Although producing it took a great deal of time and effort this first time, future iterations should be less time intensive. Response: We agree and will ensure that a Self Study will be completed for the next COV.

IV. Questions about Portfolio

1. Does the program portfolio have an appropriate balance of awards across disciplines and subdisciplines of the activity?
 - a. Recommendation: The COV recommends that PDs consider whether disparity in award amounts (not rates) across sections may discourage multi-disciplinarity or system-oriented thinking in proposal preparation. Response: ANT will collect additional data to determine whether the observed disparity was an artifact of short-term, four-year data collection encompassed by the COV, or whether the observed disparity is more systematic.
2. Are awards appropriate in size and duration for the scope of the projects?
 - a. Recommendation: We encourage consideration of whether there are inherited programmatic preconceptions about what the typical size of an award should be based on prior funding experience. The COV wonders whether there is a programmatic mechanism in place to make accommodations for atypical award sizes in particularly meritorious cases, and if not, whether development of such a mechanism should be encouraged to promote moving the boundaries for what is considered a typical award for a section. Response: There are no preconceived ideas on the size of a typical award and Program Directors are encouraged to fund the most meritorious science possible. A number of mechanisms exist so Program Directors can financially balance funding larger awards, the most obvious of which is the continuing grant mechanism. The ANT program has funded numerous large scale and integrated awards such as Southern Ocean Carbon and Climate Observations and Modeling project (SOCCOM), Thwaites project, and the Rapid Access Ice Drill (RAID) drill development program by splitting costs between programs and extending those costs over the time duration of the award. Program Directors look for portfolio balance across award amount, demographics, and science topic. They also engage actively in relevant opportunities that arise elsewhere in the agency and efforts to communicate those to the Antarctic research community.

3. Does the program portfolio include awards for projects that are innovative or potentially transformative?
 - a. Recommendation: We recommend this question to be removed as it might not provide valuable information. [Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes that we have relayed to the OIA at NSF.](#)
4. Does the program portfolio include inter- and multi-disciplinary projects?
 - a. Recommendation: We encourage the program to continue increasing the interaction with programs outside GEO, such as CISE, Engineering. Filling positions such as the PD in Polar CI could facilitate this. [Response: A Polar-wide Cyberinfrastructure Program Director was hired and is working closely with NSF's Computer and Information Science and Engineering \(CISE\) Directorate, including by supporting and encouraging Polar contributions to Cyberinfrastructure for Sustained Scientific Innovation, EarthCube, Cybertraining, and other open solicitations, also including community activities and workshops. OPP personnel have benefited from cross directorate initiatives such as Midscale 1 and 2, Convergence Accelerator, and GEO-CI as ways of integrating more closely with The CISE and Engineering Directorates.](#)
5. Does the program portfolio have an appropriate geographical distribution of Principal Investigators?
 - a. Recommendation: The committee noted that predictable, long-term NSF investment in research activity centers is important. However, there need to be clearly identified pathways for increasing research productivity in states or institutions that do not have a strong history of work with the ANT Section. Suggested mechanisms include encouraging and supporting workshops, town halls, and proposal development presentations that are held in states or at institutions that are under-represented in the portfolio. [Response: This is an excellent idea, and we will look for ways to prioritize and implement this. For one avenue, virtual platforms offer a tool with broad accessibility, and ANT is building a track record of experience in reaching people through this medium.](#)
6. Does the program portfolio have an appropriate balance of awards to different types of institutions?
 - a. Recommendation: The committee suggested two pathways for increasing awards to Public MS, HBCU, and Other institutions: (1) NSF creation and marketing of public-facing documents that highlight funded researchers from these institutions doing Antarctic research, and (2) supplements to core grants that fund opportunities for faculty and students from these institutions to partner with ongoing research grants and thus increase opportunity for discovery and future collaboration. [Response: These are both good suggestions that we will pursue. Currently, OPP's main public communication method is via our web pages, Dear Colleagues Letters \(DCL\),](#)

and Facebook posting and we are examining additional options. We will also consider support for awards that will create opportunities for Antarctic researchers to meet with faculty from Minority Serving Institutions (MSIs) who are interested in Antarctic research in order to consider collaborative projects. One currently funded effort to introduce faculty from MSI to polar researchers is the “School of Ice”. The PolarTREC program could support faculty from MSIs to participate in ANT research projects. ANT recognizes that more focused effort is needed to increase diversity in polar sciences and Geosciences as a whole. The Advisory Committee for the Office of Polar Programs instituted a sub-committee on Diversity and Inclusion in 2019 that is examining existing efforts and creating recommendations to significantly enhance diversity and inclusion in the polar sciences.

7. Does the program portfolio have an appropriate balance of awards to new and early-career investigators?
 - a. Recommendation: The COV notes that entry into the ANT scientific community has substantial barriers, especially related to the complex logistics and to the demands of field investigations. The COV recommends that ANT take particular steps to facilitate engagement by new investigators including sponsoring or directly providing workshops (virtual and in-person), webinars, FAQs, and other informal ways of connecting early career scientists to more experienced mentors. The COV also mentioned the role of representation in encouraging both new and underrepresented investigators to propose to ANT, suggesting that public-facing materials should showcase young and nontraditional investigators as much as practical. Response: This is not the first time we have heard that there is an impression that barriers of entry to the program exist for those who do not have previous experience or a strong ANT mentor. ANT PDs try to break down these barriers by participating in the NSF early career workshops at the American Geophysical Union (AGU), Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) and other national meetings, discussing these issues in ANT office hours, and highlighting in our solicitation that “When making investments, ANT seeks broad representation of PIs and institutions in its award portfolio, including a geographically diverse set of institutions (including those in EPSCoR jurisdictions) and PIs who are women, early-career researchers, members of underrepresented minorities, veterans, and persons with disabilities”. We are engaged in considering further possibilities and look forward to reporting back on this over the coming year.
8. Does the program portfolio include projects that integrate research and education?
 - a. Recommendation: The COV recommends that ANT personnel take particular care not to use education and outreach proposals to balance ANT-wide award demographics. Members of the COV noted that female and underrepresented PIs appear to be disproportionately awarded in the Polar Education program, but we could not separate this effect from the

fact that females were PIs of Polar Education proposals at higher rates than of proposals in other programs. We recommend considering demographic balance both within and across programs in ANT. **Response:** We take note of the COV's recommendation. ANT Program Directors are asked to balance their portfolios such that they recommend for funding a diverse, rich mix of bold, state-of-the-art projects that advance the frontier of science and contribute to the attainment of NSF's strategic goals. As part of this they balance across career stage, underrepresented groups, institution type, geographic distribution and other factors to the extent this is feasible among the submitted proposals. ANT will be working closely with the Subcommittee on Diversity and Inclusion so we ensure demographic balance both within and across programs and we look forward to reporting on this in the coming year.

9. Does the program portfolio have appropriate participation of underrepresented groups

- a. Recommendation: Using supplements to funded and experienced projects should be considered as a way to both diversify and enlarge the proposal base. **Response:** ANT encourages the judicious use of supplemental funding within the original scope of the award for up to six months of additional support to assure adequate completion of the proposal goals. The program does have the ability to add MSI and Research Experiences for Undergraduates (REU) supplements as tools for broadening participation in existing projects and we will commit to advertising this broadly through the ANT solicitation and more informal means like office hours. Under existing policy, supplemental funding is generally only considered only after a PI has extinguished other options for completing the grant (e.g., no-cost extensions and budget reallocation) and the award reflects a small remaining balance.

10. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports.

- a. Recommendation: Continue and enhance efforts to solicit input from the wider research community to develop research priorities and inform the research community of the overarching national priorities in which to frame their research proposals. **Response:** We wholeheartedly agree that communication with our communities through workshops, National Academies studies, annual updates to the Ice Drilling Program long-term priorities, as well as less formal mechanisms such as periodic Antarctic Science Office Hours are critical for informing the program on research priorities and emergent ideas.

11. Additional comments on the quality of the projects or the balance of the portfolio.
No Recommendations.

V. Other Topics

1. Please comment on any program areas in need of improvement or gaps (if any) within program areas.

a. Recommendation: The COV believes that, given the particular challenges of working in the Antarctic, the NSF should sponsor some combination of workshop and webinar materials to address best practices around sexual harassment and overall safety in field operations. ANT might consider taking a similar approach around other issues where best practices are not widely implemented, such as dealing with inclusion and equity for intersectional and underrepresented researchers or developing innovative BIs with appropriate assessment. Response: In 2018, NSF published new requirements in an effort to help ensure research environments are free from sexual harassment. As a result, awardee organizations must report to NSF when PIs and Co-PIs working on NSF funded research are placed on administrative leave, subjected to administrative actions and when there are findings and determinations by the organizations that PIs and Co-PIs engaged in sexual harassment. NSF established a secure online portal for awardee institutions to submit harassment notifications and a separate portal for individuals to file sexual harassment complaints. The Office of Polar Programs has taken additional steps in the form of the Polar Code of Conduct and the USAP Executive Management Board's Affirmation of Non-Harassment Policy and has increased communication on harassment issues and reporting mechanisms through briefings, training, and postings at our stations and on our vessels. In April of 2021 OPP is entering into an agreement with the Department of Interior's Federal Consulting Group (FCG) and their contracted team of experts to assist the NSF in the creation of a USAP wide Sexual Assault/Harassment Prevention and Response (SAHPR) program. Our ultimate goal is a sustainable SAHPR program that will support the entire deployed USAP regardless of program participant or affiliation.

2. Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above question. No Recommendations.

3. Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

a. Recommendation: Building in greater flexibility for cross-program and novel research directions by allowing PIs to propose to sections or divisions, rather than solely to programs. This strategy has been successfully implemented by ANT, so ANT staff could provide guidance on effective implementation and best practices. This would allow for glaciology (for example), traditionally lacking a disciplinary home within NSF, to have a mechanism for funding of ideas that do not traditionally fit within either of the polar programs. In addition, this would likely increase the ability for co-funding and interdisciplinary science across the Directorate. Response: We appreciate the ANT reorganization is seen as facilitating cross-programs and

novel research directions. This suggested improvement to NSF business processes that ANT will relay to the OIA who oversees the Agency wide COV process. The ANT Glaciology program is fostering such collaborations virtually through our joint panels with ARC and EAR-Geomorphology and Land Use Dynamics (GLD).

- b. Recommendation: Implementing a range of review mechanisms, including ad hoc reviews, virtual, hybrid, and face-to-face meetings to facilitate participation by researchers who have barriers to participation in traditional review. Response: ANT appreciates the support for virtual panels and their insightful comments regarding the benefits for broadening participation that virtual panels provide. ANT will continue to employ virtual panels in the merit review process.
- b. Recommendation: NSF should clearly indicate that PIs should assess the impact of BI activities in annual and final reports and in the Results from Prior section of subsequent proposals. Reviewers, panel and PDs should assess the success of past BI activities reflected in the Results from Prior section. Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes that ANT will relay to the OIA that oversees the Agency wide COV process. However, ANT recognizes the need to track proposed BIs against delivered BIs and their subsequent impact. We commit to investigating how to do this in a way that is compatible with existing NSF business processes and look forward to reporting back on this over the coming year.
- c. Recommendation: The demographic reporting in proposals and award reporting should be modified to reflect modern identities, including allowing researchers to identify non-binary genders and multiracial cultural identification. Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes that has been relayed to the OIA.
- d. Recommendation: Challenges in handling Conflicts of Interest, especially in smaller scientific communities such as Antarctic researchers, should be assessed for their impact on the review process. Some possible remedies might be provided by revisiting practices for institutional conflicts and by implementing more modern reviewer tracking and selection tools. Response: This 2020 ANT COV committee recommendation is a suggested improvement to NSF business processes that has been relayed to the OIA.
- e. Recommendation: The review process would benefit from the sort of automation modern journals use. Response: We agree that automating the review request process and especially the PD Review Analysis process would be beneficial. There are a number of tools already available and being piloted within NSF for streamlining reviewer selection, conflict checking, panel optimization and review analysis creation. As part of our onboarding of new PDs, we highlight these tools and periodically have

advanced trainings. We are also staying abreast of efforts across the Foundation to streamline the review and RA write up process.

4. Please provide comments on any other issues the COV feels are relevant.
 - a. Recommendation: Logistics hurdle to performing field work in Antarctica is significant for PIs with young families. We recommend training, logistical issues, etc. that could be done from home ahead of travel that would reduce the time spent away in the field. Response: AIL, through the Antarctic Support Contractor, actively works to streamline training and the amount of time individuals spend in McMurdo handling logistics issues. One of the key reasons for the AIMS project was to provide a streamlined, single logistics hub to quickly and efficiently support researchers in training and field preparation and get them quickly into the field. Prior to the pandemic we were exploring what training could be accomplished during delays in Christchurch. During the pandemic we have better learned which training lends itself to virtual delivery, either at home or while waiting in Christchurch. We will continue to explore moving trainings online and evaluating the efficiency of moving researchers through Christchurch, McMurdo and into the field.
 - b. Recommendation: Improve connectivity in McMurdo and South Pole so that PDs and PIs can work effectively while away from the office. Response: We agree that improving connectivity at the main science labs would be beneficial. We are continuing to work on solutions that would increase bandwidth at McMurdo and the South Pole station including the completion of the new Ross Island Earth Station. The Antarctic Science Section is sponsoring a National Academies Antarctic Technology Workshop focusing on how new and improved technology, including communications technology, can advance, expand, and transform in situ work in and around the polar regions. We will also be funding a community workshop to look at the science and broader impacts that could be done by implementing a subsea fiber optic telecommunications cable between New Zealand and McMurdo Station.
 - c. Recommendation: There is great coordination with NERC/BAS as evidenced by Thwaites Glacier Project -- develop similar formal collaborations, joint solicitations, etc. with other Antarctic programs (e.g., Chilean, Argentine). These other programs bring resources to the table that are often lacking in USAP, and vice versa. Response: We agree that the coordination between NSF/Natural Environment Research Council (NERC) /British Antarctic Survey has been critical to the success of the International Thwaites Glacier Collaboration. This coordination and cooperation have been essential in getting critical activities accomplished during a restricted year of field activities due to COPVID-19. ANT has reached out to Korea Polar Research Institute (KOPRI) leadership and had an initial meeting to discuss areas of further cooperation. We will continue to seek coordination and collaboration with additional international partners.

d. Recommendation: Given reduced availability of resources (e.g., aircraft), might ANT/OPP consider revisiting its policies for accessing particular field sites? For instance, it is not currently permissible to traverse sea ice, but this often presents a barrier (the only barrier, in some cases) to accessing sites. Rather than going to the expense of procuring helicopters to fly over sea ice, or searching in vain for Zodiac-accessible leads through the ice, might ANT consider hiring experienced mountaineers to aid researchers in crossing this ice? Response: The sea ice at Palmer is very different from the ice around McMurdo. McMurdo tends to be relatively more stable and predictable while Palmer tends to be very dynamic and unpredictable. The program hires experienced field personnel to aid in field work, including traversing sea ice near Palmer (like the PIPERS sea ice cruise), but often the conditions simply are not conducive to venturing out on the ice (e.g., around James Ross, Seymour, Vega & Snow Hill Islands in the north eastern Antarctic Peninsula). In the latter cases, looking for leads or suitable small craft landing sites, or use of helicopters is required. The program continues to be open to providing a case-by-case technical assessment of feasibility depending on the field site.

5. NSF would appreciate your comments on how to improve the COV review process, format and report template.

a. Recommendation: We found the self-study and the jacket evaluation template and plots in Excel developed by one of us (Eric Post) to be extraordinarily helpful, and as such we suggest that they be made available to future COVs. ANT described the self-study as taking three weeks from a blank slate but would take considerably shorter time if it was a living document maintained yearly. ANT also described the self-study as being helpful as an on-boarding document for new staff, so it has BIs beyond the COV. Response: We agree that the graphs and templates were useful. We see that making this a living document would be helpful and will look into the feasibility of that for the future.