

**FY 2013 REPORT TEMPLATE FOR  
NSF COMMITTEES OF VISITORS (COVs)**

<b>Date of COV:</b> 18-20 March 2013
<b>Program/Cluster/Section:</b> Antarctic Sciences Section/Antarctic Infrastructure and Logistics Section
<b>Division:</b> Polar Programs
<b>Directorate:</b> Geosciences
<b>Number of actions reviewed:</b> 171  <b>Awards:</b> 108  <b>Declinations:</b> 63  <b>Other:</b> 0
<b>Total number of actions within Program/Cluster/Division during period under review:</b> 842  <b>Awards:</b> 350  <b>Declinations:</b> 472  <b>Other:</b> 20
<b>Manner in which reviewed actions were selected:</b> Actions were selected to reflect awards and declines over the range of disciplines represented in each of the ANT programs as well as to highlight low rated awards and highly rated declines. Proposals were also selected to represent those with fieldwork and those without.  Proposals in the "Other" category were proposals that were withdrawn or "returned without review" for administrative reasons. Hence these were not reviewed.

### COV Membership

	<b>Name</b>	<b>Affiliation</b>
<b>COV Chair or Co-Chairs:</b>	John J. Cassano	University of Colorado
<b>COV Members:</b>	Kelly Brunt	NASA / GSFC
	Nelia Dunbar	New Mexico Tech
	Richard Hale	University of Kansas
	Robert McPherron	UCLA
	Meredith Nettles	LDEO / Columbia University
	Silke Severmann	Rutgers University
	Jordan Powers (Office Advisory Committee Liason)	NCAR

## Executive Summary

Overall the committee of visitors (COV) was very impressed with the quality, effectiveness, and management of the Antarctic Sciences (ANT) and Antarctic Infrastructure and Logistics (AIL) programs.

The COV was very impressed with the effectiveness of the merit review process. The COV felt that the strength of the review process lies in the combination of ad hoc and panel review with detailed analysis of these reviews by the Program Officers. Detailed and specific feedback from the Program Officers is a critical tool for PIs to be able to evaluate the quality of their grant proposals. Therefore it is important that Program Officers communicate as much of their review analysis to the PIs as possible.

In all but two of 96 cases reviewed the COV felt that the Antarctic program did a good job at recognizing and quickly resolving conflicts of interest in the merit review process. In two cases the conflicts were identified relatively late in the review process and discussions with ANT personnel served to highlight both (1) that these cases were outliers; and (2) the need for continued vigilance regarding potential or perceived conflicts.

The COV was impressed with the overall management of the program. The COV was supportive of the program's broad and inclusive "bottom-up" approach to defining program research objectives, which helps to promote innovation, and allows for a wide range of proposal sizes, from single-PI proposals to major, large-scale, collaborative initiatives. One area of concern involved the overall workload for the Program Officers. Due to the unique nature of the Antarctic section the Program Officers in this section have significant project management demands on their time, contributing to the large workload.

The COV felt that appropriate attention is being paid by ANT and AIL to ensure that the USAP infrastructure is sufficient to meet the scientific requirements of the program going forward. The recent change to proposal deadlines and implementation of a short, narrative "Logistical Requirements and Field Plan" in proposals are likely to improve the timeliness and effectiveness of logistics support provided for USAP research activities.

The COV identified several NSF-wide issues that should be addressed including matters related to sharing and long-term archiving of data and derived data products, the negative impacts of NSF staff travel restrictions, and improved methods to identify willing reviewers and conflicts of interest as early in the review process as possible.

## Summary of Recommendations

- **The COV recommends continued reliance on the combination of ad hoc and panel reviews, which provides for a strong and effective merit-review process.** Overall, ad hoc reviewers provide expert, thorough reviews, and panels provide value-added, carefully argued critical evaluations of the proposal, incorporating input from ad-hoc reviews.
- **The COV recommends strengthening several aspects of the ad-hoc review process.**
  - **ANT should work to ensure that all proposals evaluated by ad-hoc review receive an adequate number of high-quality ad-hoc reviews.** This is especially important for large-budget, complex, and/or interdisciplinary proposals. Most proposals are thoroughly and adequately reviewed; a few have only the minimum allowable number of reviews. The COV believes that a system to allow improved tracking of reviewer responses to requests to review proposals would facilitate Program Officer tracking of review requests and allow for improvement in the number of reviews received for the proposals that are currently most lightly reviewed. A system similar to the editorial system used by journal editors is felt by the COV to be a good model, allowing for quick reviewer responses, automated reminders, and improved early identification of potential conflicts of interest early in the review process.
  - **ANT should work to ensure that conflicts of interest are identified early in the review process.** Most conflicts of interest are identified properly and early; in a small number of cases, conflicts of interest were identified late. The addition of several “checkboxes” prior to review submission that ask the reviewer about specific areas of potential conflict would help identify cases of conflict of interest earlier in the review process and would serve to remind the reviewers of the various sources of potential conflict.
- **The COV recommends that ANT work to strengthen the overall quality of panel summaries.** Most panel summaries are appropriately thorough and add significant value in the review process; in some cases, the summaries are cursory, particularly with respect to broader impacts. The use of a template or Program Officer-provided list of questions to be addressed in the panel summary would likely create more uniformity in the quality and content of the panel summaries and would ensure that the panels address both the intellectual merit and broader impacts review criteria.
- **The COV recommends ANT work towards more uniform documentation of the review process.**
  - **ANT should ensure documentation of important “offline” communication with PIs.** Overall, key communications with PIs are well documented in the jackets; in some cases, offline discussions with PIs relevant to award scope or award/decline decisions were noted only briefly in the jackets. The COV encourages Program Officers to follow up important offline discussions with proposers with an e-mail that summarizes the content of the conversation. This would ensure that the content of these conversations is well documented.
  - **Continue ANT’s thorough Review Analysis approach.** It was noted that some Program Officers state explicitly in their review analysis the rationale for choosing reviewers, or how the reviewers align with different aspects of the proposal. The COV felt that this was a very useful tool to assess whether all aspects of the proposal were adequately addressed, especially for multidisciplinary proposals.
  - **Maintain and strengthen high level of detailed feedback to PIs at time of proposal decision.** The Program Officers generally provide useful and detailed

feedback to the PIs at the time of proposal recommendation or declination; less feedback is sometimes provided about the broader impacts criterion than about the intellectual merit criterion. More detailed comments from the Program Officers regarding the broader impacts criteria, would serve to better convey to the research community NSF's expectations for broader impacts, and help educate the PI community about this merit review criterion.

- **Continue to evaluate Program Officer workloads, develop appropriate metrics for assessing these workloads, and pursue strategies for reducing workloads.**
  - **ANT should develop metrics for workload that include the significant project-management activities undertaken by Program Officers.** The number of proposals handled appears to be an insufficient metric for Program Officer workload in the ANT section. The COV felt that post-award workload related to project management is especially important to track following the recent merger of the Antarctic program into the Geoscience Directorate (GEO).
  - **ANT should consider adding Science Assistants or associate program managers to assist in reducing Program Officer workload.** This would also provide mentoring and career development opportunities for career Program Officers.
  - **ANT should work to ensure appropriate proposal-supported project management for large and complex projects.** The COV recommends that project management plans be considered as an important element of the review by Program Officers, and that this expectation be stated in future proposal solicitations and broadly communicated to the research community.
  
- **Pursue long-term strategic planning and investment in support of logistics for Antarctic Sciences.**
  - **Actively address Blue Ribbon Panel recommendations.** The COV fully supports the Blue Ribbon Panel recommendations regarding increased capital budget commitment to the USAP and development of a capital plan for U.S. activities in Antarctica and recommends that these suggestions be implemented.
  - **Develop a plan to address logistics requests for support items where demand may exceed supply.** The COV recommends that ANT and AIL develop a plan for dealing with logistics requests for support items that are in high demand, such as aircraft resources that allows the USAP to respond to target of opportunity research opportunities as they arise.
  
- **The COV recommends focused attention on communication with the scientific community.** Currently, items such as changes in proposal-submission dates and requirements are not well communicated to the broader scientific community. Similarly, there is a need for better communication of general news items relevant to proposal planning, including rotations of program officers and plans for logistics support platforms. The COV suggests the development of a newsletter, such as that provided quarterly by NSF EAR ('EAR to the Ground'). We also suggest information be provided on the NSF ANT website, as appropriate.

## **INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT**

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program(s) under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

**I. Questions about the quality and effectiveness of the program's use of merit review process.** Please answer the following questions about the effectiveness of the merit review process and provide comments or concerns in the space below the question.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE
<p>1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?</p> <p>Comments:</p> <p>Overall the COV was very impressed with the effectiveness of the merit review process. For nearly all jackets reviewed by the COV, proposals were reviewed with both ad hoc and panel reviews, although in a few cases no panel review was completed. The COV felt that the strength of the review process lies in the combination of ad hoc and panel review. This combination provides a broad range of expertise, and allows for commentary from in-field experts and a group with broad knowledge of Antarctic science. The COV did identify several instances where a single expert review was able to swing a decision of the panel, or where outlier reviews were appropriately dismissed by the panel for bias or lack of focus.</p> <p>While the average number of independent ad-hoc reviews was ~5, there were a few cases where the COV noted a potential mismatch between the number or quality of reviews and the size of the proposal budget, with some large proposals reviewed by as few as three ad-hoc reviewers and no panel review. The COV felt that these proposals would have benefitted from more thorough review, especially where the proposals were highly interdisciplinary. Discussion with the Program Officers identified that the main source of difference in number of reviews for each proposal was related to the review request response rate.</p> <p><b>Recommendation:</b> The COV recommends that the program and NSF work to streamline tracking of ad-hoc review requests and responses, to facilitate efforts by program officers to obtain additional reviews in a timely fashion. One suggestion is to implement a system that allows requested reviewers to easily indicate their willingness to complete a review when first contacted by a Program Officer. If the person contacted wishes to decline the review, the system could also contain a mechanism for suggesting other reviewers. The system should also send automatic reminders to reviewers as the deadline for the review approaches. This would be similar to the system used for peer review requests in many journals, wherein the standard response allows the potential reviewer to identify accepting the review task, rejecting the review task, providing a recommendation for an alternate reviewer, and identifying potential conflicts of interest at time of request. The COV notes that this approach is very effective for the journals the COV works with.</p>	<p>Yes</p>

<p>2. Are both merit review criteria addressed</p> <p>a) In individual reviews?</p> <p>b) In panel summaries?</p> <p>c) In Program Officer review analyses?</p> <p>Comments:</p> <p>The COV felt that individual reviews often provided more detailed comments than the panel summaries. This in part reflects the greater time available for an individual review than for reviews completed as part of a review panel (highlighting the importance of using both methods of review), as well as that the panelists have access to the ad hoc reviews, and do not necessarily need to repeat comments made therein. We encourage panels to take the same care in providing substantive feedback to the PIs as do the most conscientious reviewers, and we encourage Program Officers to provide structure to ensure the panel dialogue is captured in the summary, including any dissenting comments.</p> <p>The broader impacts criteria were often discussed very briefly in individual reviews and panel summaries, and were occasionally skipped in some panel summaries. The COV suspects that the reason for this omission may be due to a prevailing uncertainty among reviewers (and PIs) as to what constitutes appropriate Broader Impacts. The addition of some targeted questions on a panel summary questionnaire may help. For example: “Does the proposal address any or all of these aspects of Broader Impacts: Scientific merit beyond discipline, training and education within discipline, training and education beyond discipline, support for underrepresented groups, other outreach activities?” Nevertheless, the COV did note that both proposals and reviews are increasingly becoming better focused on broader impacts.</p> <p>Some Program Officers provide review panels with a list of items to be addressed in the panel summary and these generally resulted in more thorough and useful panel summaries.</p> <p><b>Recommendation:</b> The use of a template or Program Officer provided list of questions to be addressed in the panel summary would likely create more uniformity in the quality of the panel summaries and would ensure that the panels address both the intellectual merit and broader impacts review criteria. This would also make the panel summaries more directly comparable to the individual reviews.</p>	<p>Yes for individual reviews and Program Officer review analyses.</p> <p>Almost always for panel summaries, but no in a few cases.</p>
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<p>3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals?</p> <p>Comments:</p> <p>The individual reviews are usually very detailed, although a few were cursory. The Program Officers appear to be doing a good job of identifying the most useful individual reviews.</p> <p>Although the rankings (excellent, very good, etc.) are not always consistently applied from reviewer to reviewer, it appears that the Program Officers do not rely solely (or even mainly) on these rankings and focus instead on the text of the individual reviews.</p> <p>The COV also noted that some reviewers seem to feel compelled to comment on aspects of the proposal that are beyond their area of expertise. Some members of the COV felt that this was especially problematic in cross-disciplinary programs such as Antarctic Integrated System Science (AISS), where the COV frequently noted a wide range in rankings for single proposals. Reminding reviewers to focus their comments on aspects of the proposal that they are most qualified to comment on may alleviate this potential problem, although some members of the COV did not feel that this was problematic and did not need to be addressed.</p>	<p>Yes</p>
<p>4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?</p> <p>Comments:</p> <p>The panel summaries reviewed by the COV almost never discuss the issue of consensus among the panel members. There was discussion among the COV about whether this was because consensus was typically reached within the panel, or whether dissenting views were just not expressed. When questioned about this the Program Officers advised the COV that each panel is typically instructed that consensus is not required, but that lack of consensus should be noted in the summary. Therefore the COV assumed that consensus was reached in all panel summaries reviewed. For proposals with a wide range in ranking, the panel summaries usually do a good job in explaining which reviews or reviewer comments were given the highest weight. The summaries do consistently provide clear justification for the comments included in the summary, although some summaries are quite brief.</p> <p><b>Recommendation:</b> It may be useful to add an explicit question to be addressed in the panel summary regarding consensus (or dissenting opinions) in the panel discussion.</p>	<p>See comments</p>

<p>5. Does the documentation in the jacket provide the rationale for the award/decline decision?</p> <p>[Note: Documentation in the jacket usually includes a context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), Program Officer review analysis, and staff diary notes.]</p> <p>Comments:</p> <p>In nearly all cases the COV was impressed with the Program Officers' careful assessment of the utility of the individual reviews. In some cases, the Program Officers showed less care in analyzing the comments from panel summaries than from individual reviews.</p> <p>In all cases the jackets provide adequate rationale for the award / decline decision and in most cases the jackets provide very thorough documentation of this decision. In some cases the Program Officer's award / decline decision went against the consensus of the individual reviews and / or panel but these cases were also well supported in the jacket documentation.</p> <p>In some jackets it is clear that the Program Officer had offline discussions (either by phone or in-person conversations) with the PIs and the level to which these conversations is documented is occasionally insufficient to provide a thorough record of the rationale for all actions taken leading to an award.</p> <p><b>Recommendations:</b> The panel felt that it would be useful to encourage Program Officers to follow up important offline discussions with proposers with an e-mail that summarizes the content of the conversation. This would ensure that the content of these conversations is well documented.</p> <p>The panel encourages that Program Officers apply a similar level of analysis to panel summaries as to individual reviews.</p>	<p>Yes</p>
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<p>6. Does the documentation to the PI provide the rationale for the award/decline decision?</p> <p>[Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the Program Officer (written in the PO Comments field or emailed with a copy in the jacket, or telephoned with a diary note in the jacket) of the basis for a declination.]</p> <p>Comments:</p> <p>In general the documentation provided by the Program Officer to the PI clearly states the rationale for the award / decline decision. The level of detail in this documentation did vary across the jackets reviewed but in all cases the COV felt that the documentation was adequate. Detailed and specific feedback from the Program Officers is the most important tool for PIs to evaluate their performance. Therefore it is important that Program Officers communicate as much of the review analysis as is possible.</p> <p><b>Recommendation:</b> The COV felt that Program Officer comments to PIs (for both awarded and declined proposals) should include more detailed comments regarding the broader impacts criteria. This would serve to better educate the research community regarding NSF expectations for broader impacts.</p>	<p>Yes</p>
<p>7. Additional comments on the quality and effectiveness of the program's use of merit review process:</p> <p>Overall the COV was very impressed with the thoroughness of the review process. Individual reviews consistently provided very thorough analysis of the proposals. The panel summaries were sometimes too brief to add much additional value to the review process but the COV felt that overall this aspect of the review process also added value. The Program Officers consistently impressed the COV with their thorough evaluation of all of the review materials and in their summarizing of this information in the jacket and for the PIs.</p> <p><b>Recommendation:</b> The COV recommends continued strong reliance on both individual and panel reviews as an essential part of the review process.</p>	

**II. Questions concerning the selection of reviewers.** Please answer the following questions about the selection of reviewers and provide comments or concerns in the space below the question.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE
<p>1. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>Comments:</p> <p>The reviewers chosen to review the proposals were nearly uniformly well qualified to evaluate the proposals. In instances where reviewers lacked expertise in some aspect of the proposal, this was typically noted in their reviews or in the program officer’s analysis of the review.</p>	<p>Yes</p>
<p>2. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p>Comments:</p> <p>In all but two (of 96) cases reviewed the COV felt that the program did a good job of recognizing and resolving conflicts of interest. In two cases the conflicts were identified relatively late in the review process. In one of these cases there was an apparent conflict due to offline conversations between a Program Officer and a reviewer that had a “non-standard” conflict of interest. The COV discussed this case at length with the section head of the Antarctic Section. Based on this discussion the COV feels that this was an isolated incident and the discussion served to highlight the need for continued vigilance regarding potential or perceived conflicts.</p> <p><b>Recommendation:</b> The addition of several “checkboxes” that asks the reviewer about specific areas of potential conflict would help identify cases of conflict of interest earlier in the review process and would serve to remind the reviewers of the various defined sources of potential conflict. This could be done as part of an online process to accept the request to review a proposal or at the start of the review process on FastLane</p>	<p>Yes (with some caveats)</p>

Additional comments on reviewer selection:

**Recommendation:** It was noted that some Program Officers state explicitly in their review analysis the rational for choosing reviewers or how the reviewers align with different aspects of the proposal. The COV felt that this was a very useful tool to assess whether all aspects of the proposal were adequately addressed, especially for multidisciplinary proposals. Such information is beneficial for panel members in evaluating the reviews, and also for the COV, and we suggest that this approach be adopted more widely by Program Officers, where appropriate.

**III. Questions concerning the management of the program under review.** Please comment on the following:

MANAGEMENT OF THE PROGRAM UNDER REVIEW
<p>1. Management of the program.</p> <p>Comments:</p> <p>The COV was impressed with the overall management of the program. One area of concern involved the overall workload for the Program Officers.</p> <p>As stated in the two previous COV reports the workload for Program Officers in the Antarctic section is large. Previous COV reports focused on an increasing number of proposals evaluated by each Program Officer over time, but in discussing workload issues with NSF staff it appears that this is not an adequate measure of workload. Due to the unique nature of the Antarctic section the Program Officers have many additional demands on their time. These include on-going project management related to the field-intensive nature of many proposals, oversight of other activities (such as ice drilling), increased demands related to logistics planning in pre- and post-award phases, significant demands related to international collaboration, and addressing environmental concerns for proposed activities related to the Antarctic treaty. Increasing cross-directorate activity is also serving to increase Program Officer workload. Program Officers observe that large, complex projects that have effective project management plans reduce post-award workload for Program Officers.</p> <p><b>Recommendations:</b> The COV stresses the need for continued evaluation of Program Officer workloads, and metrics by which workload is evaluated. Project-management activities are not reflected in counts of proposals processed, and developing metrics that reflect this aspect of the workload is recommended.</p> <p>Based on improved metrics of Program Officer workload the COV recommends adding staff as justified. Increased use of science assistants or associate program directors would help reduce the workload on the Program Officers, as well as help train younger scientists and provide mentoring opportunities for Program Officers, supporting their career development.</p> <p>The COV suggests that the ANT program ensures proposal-supported project management for large and complex projects is adequate, in order to reduce the workload on program officers in the post-award phase. This expectation should be stated in future proposal solicitations and broadly communicated to the research community.</p>

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

Comments:

The approach taken by the Antarctic program to emerging research has largely been to respond to new directions proposed by researchers, rather than trying actively to steer research directions. For example, the direction of some Antarctic programs has evolved over the past 15 years, as new technologies, such as remote sensing, remotely operated vehicles, high-precision GPS receivers, and genomics, among others, have become important research tools. Although that longer time frame is outside the scope of this COV, this “bottom-up” process of program evolution takes place on the shorter, as well as longer, time scales. The COV found this style of response to emerging research opportunities appropriate for ANT, and that allowing the researchers to steer the direction of the program, rather than vice-versa, allows for a greater degree of creativity and innovation in the research community.

The responsiveness of the program to educational opportunities is more difficult to assess. The COV does note that in the portfolio of funded proposals almost all involve graduate student education, and several are CAREER, RUI, or REU awards. The COV noted that current travel restrictions on Program Officers may have a detrimental effect on the program’s response to educational opportunities. A significant aspect of Program Officer’s presence at meetings and workshops as well as site visits, is to interface with and educate the next generation of scientists about opportunities at NSF. This face-to-face interaction and communication between NSF Program Officers and students can provide a personal contact within an organization that can otherwise be intimidating to approach. We see the reduction of this interaction as highly problematic.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments:

The Antarctic Sciences Section describes the work supported by the Section in the following manner in the program solicitation:

"The National Science Foundation's Antarctic Sciences Section fosters research on globally and regionally important scientific problems. In particular, the Antarctic Sciences Section supports research that expands fundamental knowledge of the region as well as research that relies on the unique characteristics of the Antarctic continent as a platform from which to support research."

Within each program, the solicitation defines fairly broadly the scope of appropriate proposals for consideration under the program, and Program Officers emphasized in their presentations that these descriptions are meant as guidance, and are not intended to be interpreted in an overly restrictive manner. Section Head Scott Borg described a deliberate decision to use this relatively open approach in order to allow the PI community to propose the best work possible in Antarctic Science, and to allow for the emergence of new and nontraditional approaches to research as well as new subfields of research relevant to Antarctic Science. This deliberately broad approach is sometimes described as a "bottom up" approach to scientific prioritization.

The program funds workshops partly as a means for assessing community direction and identifying new directions for the science. The program is also using input from the recent Blue Ribbon Panel to set priorities, including possibly greater support for the development of instrumentation. For funded projects, the program is increasingly working to define science priorities for the focusing of logistics resources.

The COV is supportive of the program's broad and inclusive approach, which helps to promote innovation and allows for a wide range of proposal sizes, from single-PI proposals to major, large-scale, collaborative initiatives. The COV notes both that it is impressive that few proposals are declined for reasons of logistics infeasibility, and that this results in part from PIs recognizing logistics limitations of the USAP prior to submission. The COV encourages Antarctic Sciences to continue its dialogue with the scientific community to identify those areas in which proposed work is constrained by logistics capabilities, and, when new support capabilities are developed (e.g., deep field camps) to communicate plans for these capabilities as broadly as possible to the community. The COV also notes that Program Officer engagement with the scientific community is significantly limited by current travel restrictions for the Program Officers, reducing their ability to communicate ANT priorities to PIs effectively and reducing the efficiency with which they can gain knowledge of emerging research directions.



4. Responsiveness of program to previous COV comments and recommendations.

Comments:

The program responded thoughtfully and clearly to the comments and recommendations of the previous COV. The updated (2013) responses to the 2009 COV recommendations demonstrate continuing efforts by the program over the past three years to address these recommendations.

In particular, the current COV notes that although workload concerns have not disappeared, all open positions in ANT have been filled, and hiring processes are underway within AIL, partly in response to Blue Ribbon Panel recommendations.

While the program has also taken steps to ensure that PIs make their data available according to established NSF and Antarctic Sciences policies the COV notes that this is an ongoing challenge, and encourages continued efforts in this area.

Although no specific recommendation was made regarding gender diversity in awarded proposals, the 2009 COV noted a disproportionately low success rate for female PIs. The current COV is pleased to see that this gender discrepancy is no longer evident during the past three years.

**IV. Questions about Portfolio.** Please answer the following about the portfolio of awards made by the program under review.

**ANT SPECIFIC**

1. Does the program portfolio have an appropriate balance of awards across disciplines and sub-disciplines of the activity?

The budgets presented were spread fairly evenly throughout the disciplines, ranging from \$4M in AISS to \$12M in AOE, with an average of ~\$8.5M. Each sub-discipline also presented a balance within their program for the FY2011 awards. Furthermore, AAGS and Glaciology presented material indicating a slight year-to-year (for FY2009 – FY2011) variability in the awards across their respective sub-disciplines, suggesting that while “balance” is desired it does not drive the award selection. There is, however, clear evidence of strategic investment discussions within panel reviews regarding appropriate balance for proposals ranked highly in ad hoc reviews. The panel feels that this is an award-justification element that is being appropriately considered.

2. Are awards appropriate in size and duration for the scope of the projects?

These were some of the most consistent metrics across sub-discipline, with an average duration of ~3 years and an average budget of \$215K per year. The only noticeable outlier for either of these metrics is the average annual budget of AAGS at \$531K. A number of the jackets reviewed were re-scoped, suggesting that the Program Officers are providing further guidance to PIs on budget and/or duration concerns.

3. Does the program portfolio include awards for projects that are innovative or potentially transformative?

The program portfolio includes awards for projects that are innovative and/or potentially transformative. Guidance from the Section Head to Program Officers and review panels provides a reminder of the goal of supporting transformative research. Ad hoc reviewers, review panels, and Program Officers generally view positively proposals that include new and innovative approaches to science and/or technology, even when these approaches involve higher risk than proposals without these elements. Reviews at all levels give substantial benefit of the doubt to such proposals. The COV emphasizes that rigorous review of the transformative nature of the proposed work is critical, particularly in instances where the potentially transformative character of the work is a deciding factor in the award / decline decision. Program Officers appropriately recognize that chances of successful outcomes for such work can be increased by solid planning and project management. For large or complex projects, several Program Officers encourage the development of management plans. The COV perceives the Antarctic Sciences Section to be supportive of innovative and potentially transformative proposals.

4. Does the program portfolio have an appropriate balance of awards to new investigators and early career researchers?

Across the program, 15% of the proposals submitted had “New PI” involvement and 12% of the proposals awarded had New PI involvement, with a New PI proposal success rate of 33%. The New PI proposal success rates varied within the sub-disciplines (16% to 54%), but is overall similar to the success rate for all PIs. For some jackets, the “New PI” distinction had an influence on the award decision; proposals that did not rank as well in ad hoc or panel reviews, but that were associated with a New PI, were often viewed favorably by the Program Officers. Therefore, the panel feels that

the Program Officers are making a concerted effort to support new investigators in the division. As a caveat, the COV group did not have a good idea about what a truly appropriate and sustainable level of “New PI” involvement in the program should be.

One area of concern related to new investigators is NSF staff travel restrictions, due both to limited travel budgets as well as newly imposed rules regarding government travel, that will limit young investigator access to their respective Program Officers. For example, the WAIS Workshop, which is small and limited in scope, is well attended by students, post-docs, and early career glaciologists. Due to its size, the workshop has traditionally been a good venue for young researchers to interact with their Program Officers, which has arguably contributed to a high retention rate of graduate students, many of whom are now faculty members that are sending their students and post-docs to the meeting. However, NSF travel limitations have made it difficult for the Program Officers to attend this meeting for the past few years, thereby limiting crucial Program Officer/young-investigator interaction.

**5. Does the program portfolio include projects that integrate research and education?**

The integration of research and education is evident in the broader impacts of the research proposed and funded, and the serious consideration of each is apparent in the ad hoc, panel and Program Officer reviews. As one would expect, integrated education activities proposed by individual PIs vary considerably both in scope and sophistication. The program portfolio comprises integrated research and education activities that include but are not limited to interactive science exhibits, web-based tutorials and applications, informative news releases, research experience for teachers, science nights, immersive science experiences for K-12 students, research experiences for undergraduates, development of curricular content for K-12 and higher education, experiential field programs, graduate education and training, and post-doctoral mentoring. There is evidence of substantive feedback to individual PIs for opportunities to improve or expand integrated research and education activities. As such, the panel feels the integration of research and education is an appropriate priority in the program portfolio.

**AIL SPECIFIC**

**1. As science projects are being recommended for award, are logistical plans developed in a timely manner? Are the results of the logistics reviews documented adequately in the proposal jackets?**

The proposal jackets successfully capture the timeline of events from proposal submission through the award / decline decision, and illustrate a continuing dialogue between Program Officers and PIs. Logistics reviews and PI acceptance generally occur within two months of the recommendation for award, which is generally two months before the actual award start date. There are instances of the initial logistics review occurring simultaneously with award, but these are not common. It is apparent that timely logistics reviews are a program priority.

Two recent changes have been implemented that focus on improved timeliness and accurate assessment of logistics needs. The COV noted that the proposal submission date has recently been adjusted, in part to accommodate the need for logistics reviews in advance of award, and the COV felt that this was a positive change. The COV also felt that replacing the Operational Requirements Worksheet (ORW) as part of the proposal process with the Logistical Requirements and Field Plan may better capture logistics support requirements at an early stage in the proposal process. The COV felt that it was important for the program to communicate changes such as these broadly within the research community.

The recent Blue Ribbon panel tasked with evaluating the logistical effectiveness of the USAP identifies a long-term plan that includes an increased capital budget commitment. As the open positions in AIL are filled, the more manageable workload distribution should result in additional improvements to logistics planning and projection. As such, the panel feels the logistical plans are being developed in a timely manner within currently available resources.

2. Does post-award logistics documentation accurately reflect support needed to successfully implement the project?

Yes, this appears to be the case. The accuracy of post-award logistics projections and their effect on program success are difficult to quantify without a longitudinal assessment of initial logistics projections at time of award, revised logistics projections during award, and a post-award review of actual logistics expenses. Each of these would need to be reviewed in the context of final project reports, end-of-season field reports and publications to see if logistics affected the successful implementation of the project. However, based on the field experiences of those on the panel, the initial logistics reviews appear to be thorough and sufficient in breadth to capture the bulk of logistics concerns and expenses. PI concurrence with logistics documentation is always sought, and generally occurs within one week of the initial document. There is evidence of continued dialogue in some instances as plans adapt or more information is made available.

### **ANT and AIL**

1. Are processes in place to ensure alignment of USAP support infrastructure to emerging scientific community requirements within a reasonable timeframe?

The COV feel that appropriate attention is being paid by ANT and AIL to moving infrastructure development forward to meet the requirements of the scientific community. There is obvious close collaboration between ANT and AIL, which is an important foundation for the USAP infrastructure to keep up with scientific requirements. An indication that this topic is being taken seriously is that a Blue Ribbon panel was recently tasked with evaluating the logistical effectiveness of the USAP, and a report produced in July 2012 presents a long-range plan to improve the logistics of the USAP with the goal of allowing the most science to be accomplished within a given ANT/AIL budget. The Blue Ribbon Panel noted a deficiency in capital budget as a root cause of inefficiencies within the Antarctic program. The Blue Ribbon Panel recommended an increased capital budget commitment to the USAP and development of a capital plan for U.S. activities in Antarctica as a basis for subsequent annual budgeting. The COV recommends that all efforts are made to see that these suggestions are implemented.

We observe that development of other resources for emerging science have been developed in the past 3 years, such as the science traverse equipment, formerly associated with WISSARD. This type of innovation is a model of infrastructure development that can be made available to a range of researchers in a reasonable timeframe. We would like to encourage the program to move forward with other such innovations.

On a more detailed level, the "Allocated Resource Summaries" provided to the COV indicate planned commitments for a range of resources, several years into the future. Of possible concern is that air support of any kind is in high demand and therefore has extremely limited unallocated availability. If a research target of opportunity were to arise that required air support (collapse of an ice shelf, for instance), supporting the effort could be challenging. We recommend that a response to this type of scenario be considered.

Based on our conversations with AIL managers, there appears to be a general sense of high workload that could result in gaps between infrastructure availability and science requirements. AIL managers indicated that there are several vacant positions within that group, and the COV hopes that in filling those positions with well-qualified applicants, the resultant lower workload will allow AIL managers to have more time to devote to planning infrastructure development to match scientific needs.

The presence of an ANT instrumentation program provides another avenue for moving research-related infrastructure forward. The purpose of this program is to provide funding for Antarctic-focused, cross-disciplinary instrumentation. Although the section reports that this program has gotten off to a slow start, the COV would encourage ANT to dedicate funding to this effort and to publicize and grow the program.

**Recommendations:** The COV fully supports the Blue Ribbon Panel recommendations regarding increased capital budget commitment to the USAP and development of a capital plan for U.S. activities in Antarctica and recommends that these suggestions are implemented.

The COV recommends that ANT and AIL develop a plan for dealing with logistics requests for support items that are in high demand, such as aircraft resources that allows the USAP to respond to target of opportunity research opportunities as they arise.

2. The Antarctic Treaty and the National Environmental Protection Act require that USAP establish a process to evaluate projects intended for support in the Antarctic. These reviews occur in the pre-award phase (Record of Environmental Review) and more comprehensively in the post-award phase, when necessary. Does the environmental documentation found in the jackets demonstrate that a robust process has been established?

The current Record of Environmental Review (ROER) form appears to be simple and effective, and it appears to be the document of record for most of the field-based projects. This form is a very good starting point that allows projects with possible significant environmental impacts to be identified and documented more comprehensively. The ROER form is present for all relevant projects and appears to be filled out consistently, suggesting that the process is robust.

3. Have issues raised by the last COV been adequately addressed?

This question is addressed in section III, question 4.

## OTHER TOPICS

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

This COV was pleased to see that the Program has addressed the data-sharing concerns raised in the last COV and that this has been incorporated into a) the proposal process (Data Management Plan) and b) the rewording in the Biographical Sketches (listing of “5 most closely related products”). The COV feels that there needs to be an assessment of compliance with the proposed data management plans, perhaps in the annual reviews.

The COV recognizes that some disciplines have well established long-term data sharing solutions in place and that these solutions are currently evolving with the changing needs of the community. However, the COV feels that the Program, and NSF as a whole, needs to be proactive about thinking broadly with respect to data archiving needs and maintaining long-term support of these archives. Our concerns are not limited to the collection of raw data in Antarctica, but also include issues associated with the archiving of derived data products.

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 questions.

Communication between the Program and the broad science community needs improvement. Programmatic changes or announcements should be communicated promptly to the broad research community.

**Recommendation:** The COV recommends focused attention on communication with the scientific community. One suggestion is the development of a newsletter, such as that provided quarterly by NSF EAR ('EAR to the Ground'). We also suggest information be provided on the NSF ANT website.

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

The COV identified a few NSF-wide issues that needed addressing:

The data management issues mentioned above (Q1) are both a divisional and agency-wide issue. NSF needs to be proactive in addressing the long-term archiving of data and derived data products. The agency should also evaluate approaches to assessing PI compliance with data sharing requirements.

The COV voiced concerns throughout this document about the negative impact of NSF staff travel limitations. While the nature of required deployment to the Antarctic is unique to this division, the COV feels that the travel issue is an agency-wide concern.

The COV felt that tracking of project outcomes was currently limited, with some project impacts occurring years after the end date of an award. Project success metrics could include number of resultant publications and the retention of graduate students in the STEM fields. The COV recognizes multiple challenges inherent in tracking such metrics, but encourages NSF to be proactive.

In discussions with Program Officers it became apparent that ad hoc reviews are not as widely used across NSF as they are in ANT. The COV feels that the ad hoc reviews are a critical element of the ANT merit review process and encourages continued support for the ad-hoc review process by NSF, including within FastLane or successor software.

The addition of several “checkboxes” that asks the reviewer about specific areas of potential conflict would help identify cases of conflict of interest earlier in the review process and would serve to remind the reviewers of the various sources of potential conflict. This could be done as part of an online process to accept the request to review a proposal or at the start of the review process on FastLane.

4. Please provide comments on any other issues the COV feels are relevant.

Bringing in new-to-ANT investigators continues to be a challenge for ANT. The COV notes that the retirement of the ORW forms is a positive move to improve accessibility for program outsiders. On the other hand, the decision to impose stricter travel limits for Program Officers was seen as negative. Workshops and meetings, especially large international meetings provide important opportunities for Program Officers to meet investigators from other disciplines, and also meet with international partners. Facilitating such travel with minimal restrictions seems a very worthwhile investment both in terms of time and funds.

The COV felt that the occasional use of Program Officers detailed from other divisions provided benefit to ANT and encourages the continuation of this practice as appropriate.

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

The COV suggests modifying the template to include targeted questions that specifically address the Program Officer workload related to award management, as well as those currently included on proposal review and evaluation. From our discussions with the Program Officers it became clear that award management is an important ‘behind the scenes’ aspect of their workload that is unique to the logistics involved with Antarctic fieldwork and significantly larger than for other NSF programs. This aspect of their workload was not very apparent from the presentations or the documentation in the e-jackets, and including it in the template would increase the visibility of these efforts.

The COV greatly appreciates the well-organized and comprehensive presentation of documents and ejackets provided by the Program for this review. Accessibility of many of the documents prior to the COV meeting facilitated an efficient review process.

**SIGNATURE BLOCK:**

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For the Antarctic Sciences Section/Antarctic Infrastructure and Logistics Section  
Committee of Visitors  
John J. Cassano  
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