

**Directorate for Geosciences (GEO)
Office of the Assistant Director (OAD)**

**Response to the 2017 Committee of Visitors Report:
Geosciences Education & Diversity (GEO E&D) and Polar
Education Programs**

Date of the COV: May 16 – 17, 2017

The Directorate for Geosciences (GEO) thanks the 2017 Committee of Visitors (COV) for their time and efforts to review the Fiscal Year 2013 to 2016 activities of the following programs in the Geosciences Education & Diversity (GEO E&D) and Polar Special Initiatives portfolio: *IUSE:GEOPATHS*, *Global Learning and Observations to Benefit the Environment (GLOBE)*, *Geoscience Opportunities for Leadership Development (GOLD)*, and *Polar Education Programs*. GEO commends the COV for the excellent guidance provided in the report resulting from the May 16-17, 2017 meeting, and acknowledges and appreciates the substantial amount of work the committee undertook while evaluating the complex portfolio of separate programs which comprises the GEO E&D and Polar Education efforts.

In particular the committee provided complimentary assessments of:

- The integrity and efficiency of the merit review process for the GEO E&D and Polar Ed programs.
- How well and fairly the review process has been administered.
- The diversity of the individuals serving as reviewers.

This Response addresses the specific comments expressed in the COV Report, gathered under five main headings, as defined in the COV template: (1) quality and effectiveness of the merit review process; (2) selection of reviewers; (3) management of the program under review; (4) resulting portfolio of awards; and, (5) other topics. Responses to comments regarding individual programs are included, as necessary.

Section 1: Quality and Effectiveness of Merit Review Process

COV Recommendation & Comment:

Recommendation: Programs should establish a more standardized way to negotiate with PIs when requesting missing information that doesn't state that they are being recommended for funding. Example: 'Your proposal has been reviewed (favorably), but the panelists have some questions. This correspondence does not convey a funding decision, but is instead a request for more information for further review.'

GEO's Response: GEO greatly appreciates the committee's positive findings regarding the quality and effectiveness of the review processes utilized and the specific recommendation to

further improve post-review communication to PIs. GEO agrees that it is desirable to clarify the requests for information before a decision is made to recommend a proposal. GEO will request additional information using similar language.

Comment: The variations in the review processes between programs, e.g., GLOBE, GEOPATHS, Polar, were not transparent, but the COV assumes there was rationale for building out programs as they did. The program officers have a suite of review options available and appear to use them based on minimum requirements for review, immediacy of implementation/results, and other internal rationale.

GEO's Response: Program will attempt to explain rationale for review process in future Review Analyses, and will explain the variation in review processes to future COVs prior to the COV meeting.

Section 2: Selection of Reviewers

COV Suggestion: While institution and department demographics were provided for reviewers, research discipline or expertise relevant to the program were not. In order to comprehensively evaluate reviewers the COV would like to have access to comprehensive demographics and sub-discipline/expertise information.

GEO's Response: GEO is pleased that the COV recognizes the ongoing efforts being undertaken to recruit a diverse, knowledgeable, and representative community of reviewers for the programs in the GEO E&D portfolio. Expanding the reviewer pool – to include representatives from all categories of institutions, all of the sub-disciplines served by the GEO Directorate, and all of the educational audiences being supported through these programs – will continue to be a high priority for GEO. GEO will explore strategies for providing additional information about the expertise and credentials of the ad-hoc reviewers being used within these programs, but notes the difficulty in obtaining some demographic information because NSF is only allowed to use self-reported data and many reviewers prefer to not disclose this information. In addition, the NSF system does not request information about disciplinary expertise, only individual demographics and institutional affiliation.

COV Recommendation: Program officers should continue to carefully examine a panelist's experience and background for conflicts. The GLOBE program is an example of an initiative where conflicts of interest should be carefully scrutinized due to the nature of the participation and involvement of several organizations such as NOAA and NASA.

GEO's Response: GEO agrees with the COV that the quality of the review process would be negatively impacted if conflicts of interest are not continued to be handled with diligence. However, GEO only supports the GLOBE program through funding for the annual meeting and supplements to existing awards for researchers to interact with the broader GLOBE community. These two support mechanisms would only require internal review at most. GEO will take special note of conflicts for GLOBE supplements that are submitted that meet the threshold for external review.

Section 3: Management of the Program under Review

COV Comments: Polar Special Initiatives has supported a diverse portfolio of programs which covers both formal and information education across age groups, providing learning opportunities for students, teachers and research professionals. The specific inclusion of international collaboration, Alaska Natives and minorities in the program is commendable and hopefully will increase the participation of these groups in polar research, which has historically been a struggle.

There appears to be a struggle to increase minority participation in one long-running project, so whatever NSF can do to encourage this is important. New ideas are key.

GEO's Response: GEO appreciates the thoughtful comments provided by the committee regarding management of the programs under review. Pertaining to the specific issue identified by the COV for the Polar Special Initiatives, the Program will continue to encourage minority participation in all programs and will put additional weight on attention to minority participation in future proposal reviews for long-running Polar Special Initiative programs.

Section 4: Resulting Portfolio of Awards

COV Comment: NSF labels PIs or Co-PIs who are underrepresented minorities (URM) as "PICOMIN" in their database. Using those data, the COV determined that the Polar program has great representation of women (50%), but still very low URM (10%) among those PIs/Co-PIs who volunteered demographic information.

GEO's Response: The Polar Special Initiatives Program encourages minority participation in all programs and will encourage the submission of proposals from minority PIs by attending conferences such as SACNAS, NABG and AISES in the future.

Section 5: Other Topics

COV Comments:

Comment 1: The programs have the perennial task of attracting strong proposals from Minority Serving Institutions (MSIs) and 2-year schools. One conclusion of the recent GEO-NEEDS meeting (funded by GOLD, <http://serc.carleton.edu/geoneeds/index.html>), where multiple stakeholders (faculty, administrators, resource agencies and geoscience researchers) were gathered to discuss the barriers and opportunities for enhancing geoscience instruction at 2-year colleges and MSIs was to continue and increase communication and dissemination. This would be in the form of increased workshops, support and development of regional networks of geoscientists, and geoscience career information. These kinds of activities could help generate the level and diversity of proposals to bridge this gap.

GEO's Response (1): GEO agrees with the COV that increased communication, dissemination and interaction with communities that have not traditionally been represented in high numbers in the geosciences should be a priority. Since the 2017 COV, GEO has taken a series of steps towards this effort 1) GEO participated in an HBCU workshop at the 2017 Earth Educator's

Rendezvous to encourage the connection of geoscientists and social scientists who work at HBCUs to begin to think more broadly about how to interact with NSF and, in particular, the Geosciences Directorate. As a result, a team of faculty from five HBCUs submitted a collaborative Letter of Intent to the GEOPATHS program. 2) GEO attended the 2017 NABG meeting to interact with participants and share information regarding REU programs. 3) GEO visited Coppin State University (HBCU) to share information about NSF's funding sources outside of the traditional directorate specific solicitations. 4) GEO supported a workshop at the 2017 National Technical Association's annual meeting to explore how HBCUs could better network with each other and how the geosciences could serve to connect professional societies (e.g., NTA) and HBCUs on an inter-disciplinary level. 5) GEO awarded an RCN to the Geoscience Alliance to broaden the participation of Native Americans in the geosciences. 6) GEO is supporting an upcoming workshop to seek how to incorporate indigenous knowledge into research projects that are focusing on hydrology issues that impact Native communities.

Comment 2: One of the outcomes of these programs is that they generate transferable approaches. Innovative programs such as GEOPATHS and GOLD involving geoscientists and social scientists will hopefully make a difference by providing research supported pedagogies to help geoscientists become better educators. This is important because these programs provide the reason that these pedagogies are important, rather than description of successful techniques. Continued funding and commitment is important to continue to expand the effectiveness of geoscience education to continue the GEO pipeline from undergraduate to career. As this occurs, resources and outcomes are leveraged across prior funded activities, increasing efficiency and effectiveness through transferable approaches.

GEO's Response (2): GEO agrees with the COV that continued support is important to "expand the effectiveness of geoscience education to continue the GEO pipeline from undergraduate to career". Since the 2017 COV, GEO has provided a supplement to SERC to support an HBCU working group that will work to provide culturally appropriate content to HBCU faculty who are working in the field of geoscience. GEO also provided supplemental support to the GOLD awardees to a) develop a centralized web portal that will ease virtual connections and b) provide access to increased professional development services for GOLD teams as they move forward in their projects.

Comment 5: The introductory presentations that were given by the program officers on the first day of the COV meeting were very helpful because they gave the funding history of the programs and the background on how different initiatives were formed and implemented. This would have been helpful to have at the time of the introductory webinar so that the COV could read the source documents with an understanding of each program's goals and history, as well as with an understanding of how each program was run. Some of the information that was initially provided was in excerpted form in the solicitations, but the level of the detail given during the presentation provided essential background and context that was otherwise not available.

It would be helpful for the COV to have the nuanced information that went into the final proposal decisions, especially if final decisions went against panel recommendations or were regarding proposals in the 'marginal' or 'competitive' rankings. This information is often in the program officer comments, but inconsistent, and the 'big picture' nature of these decisions is not transparent to the COV.

Section IV requires data on Minority PIs, Women PIs, New PIs, New Institutions, Institution type, Co-funding, project size, award amount and award duration. The COV could save much time in session if these data were made available in one pdf query in advance. If these materials were placed in the eJacket at the same time proposal assignments were made, committee members could complete more work in advance and possibility reduce the in-person meeting time by one day.

Having all documents available electronically via the eJacket was appreciated. Given that the COV attempts to be thorough with reviewing the process, it would have been helpful to have the ability to download all documents for an eJacket with a single click, as a pdf packet or in some other secure form. It may help to add the option to click boxes to merge all files within categories, e.g., all documents in the “Review” section, all documents in the “Communications” section etc., rather than leaving the COV with a series of links that subsequently connect to additional text files and single pdfs. It was helpful that the reviews could be downloaded as one document, and a process similar to the way that one can “View Entire Proposal” would be appreciated.

There was some confusion regarding the level of understanding of both the PI and the reviewer panel regarding the difference between the GEOPATHS “EXTRA” and “IMPACT” tracks. If a PI submits a proposal that has content that is deemed inappropriate for the designated track, or where the activities don’t match the requirements of the track per the RFP, the reviewers’ individual comments, and the panel’s collective summary should clearly identify the disconnect. The COV was concerned when a mismatch of proposal content for the track was listed in the PO’s Review Analysis as the primary reason to deny funding, however the panelists rated the proposal favorably, and neither the individual reviews nor the panel summary explicitly raised any issues with the chosen track. Further, the proposal was reviewed favorably, according to the solicitation’s guidelines for the PI’s stated track. The recommendation is that when disconnects between proposal content and a track are clear to the PO, those disconnects should be made apparent to the panel for group discussion and mentioned in the panel summary, unless other NSF rules apply.

GEO’s Response (5):

- GEO will work to provide introductory/background materials (perhaps through a webinar) prior to the in-person meeting for the next COV.
- GEO will work to provide appropriate information in the Review Analyses and/or PO Comments that highlight the nuances (e.g., application of portfolio factors) in the decision-making process.
- GEO will make an effort to provide materials in a more user-friendly format if possible for the next COV.
- During the panel, GEO will work to clarify delineation points for GEOPATH proposals that straddle the two program tracks (IMPACT and EXTRA) so that reviewers are clear on the POs thoughts concerning specific proposals. GEO will encourage panelists to include the discussion thread in the panel summary so that PIs have a more thorough understanding of the entire discussion.