

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

**Update to the Response to the 2013 Committee of Visitors Report:
Geosciences Education and Diversity (GEO E&D) Programs**

Date of the COV: May 30 – 31, 2013

Date of Update: October 12, 2016

The Directorate for Geosciences (GEO) appreciates the 2013 Committee of Visitors (COV) for their time and efforts to review the Fiscal Year 2010 to 2012 activities of the following programs in the Geosciences Education and Diversity (GEO E&D) portfolio: Geoscience Education (GeoEd), Opportunities for Enhancing Diversity in the Geosciences (OEDG), Global Learning and Observations to Benefit the Environment (GLOBE), Geoscience Teacher Training (GEO Teach), and the Division of Earth Sciences Education and Human Resources (EAR E&HR) program (which includes the Research Experiences for Undergraduates (REU) and Postdoctoral Fellowship (EAR-PF) programs).

This Update provides the current status of programs and related activities mentioned in the COV Report, gathered under the following main headings, as defined in the COV template: (3) management of the program under review; (4) resulting portfolio of awards; and, (5) other topics.

Section 3: Management of the Program under Review

COV Report: The COV found the planning, prioritization, and management of the programs under review to be highly effective. The committee commended the EAR REU program, noting the novel recruitment strategies for engaging community college students and the careful post-award monitoring ensure that stated goals regarding recruitment and diversity are being achieved. The committee expressed concerns about a decline in the number of REU applications and what might be done to reverse this trend. The committee viewed the flexibility of the GeoEd program to be an important asset, but would have liked to see a bit more justification for some of the decisions being made. The committee recommended that GEO formalize the GeoEd planning grant opportunities and advertise these opportunities more widely, especially among minority serving institutions. The committee further recommended that EAR consider a new solicitation aimed at involving two-year college faculty as PI's and providing their students with place-based research opportunities.

GEO's response: GEO appreciates the thoughtful comments provided by the committee regarding management of the programs under review and the suggestions regarding specific concerns that GEO should address. GEO will keep in mind the committee's recommendations regarding the GeoEd planning grants and the need for further documentation regarding specific decisions if the GeoEd program is continued past FY 2013. GEO will consult with the REU PI community to investigate possible reasons for a decline in the number of proposals submitted to that program. The Advisory Committee for GEO will be considering revisions to the GEO E&D strategic plan at its next meeting in Fall 2013, particularly in light of the proposed budget changes for the related programs; the suggestion that GEO add a new solicitation for two-year college faculty and students will be considered in conjunction with that renewed strategic planning effort.

GEO Update:

- GEO held an REU PI meeting in late September 2016 in which submission levels were an agenda item. At the time of this update a full debriefing from the REU meeting had not occurred, therefore discussion points and/or recommendations from the community were not available.
- GEO is currently finalizing the process to begin a retro analysis of the GEO Ed and Diversity program suite with NSF's Evaluation and Assessment Center (EAC). The goal is that the retro analysis will more adequately inform the strategic planning process for GEO Ed and Diversity efforts as a whole.
- In 2015 GEO collaborated with the Education and Human Resources (EHR) Directorate to create the new GEOPATHS program which supports the foundation wide IUSE (improving Undergraduate STEM Education) initiative. The two tracks in this program (in its second year) are the EXTRA track, which focuses on students experiences in geoscience related disciplines. R1 institutions are ineligible to be the lead institutions on GEOPATHS:EXTRA proposals. Leaving room for less research intensive institutions like 2yr colleges and minority serving institutions. The IMPACT track focuses on institutional collaboration to support students at critical transition points along the geoscience academic pathway. The 2yr to 4yr transition point is one of the areas emphasized in the solicitation examples for GEOPATHS:IMPACT.

Section 4: Resulting Portfolio of Awards

COV Report: The committee found the distribution of projects, in terms of their disciplinary focus, size and duration, potential for innovation or transformative impacts, and demographic diversity (both PIs and institutions), to be appropriately balanced. The committee was pleased by the multi-disciplinary breadth of the REU and EAR-PF projects, GEO's efforts to leverage other resources (e.g., LSAMP), and successful recruitment and funding of new investigators for the OEDG program. The committee noted that it was difficult to gauge whether some of the smaller GeoEd and OEDG projects were of appropriate size and impact, in the absence of longer term information, but did agree that the larger Track 2 OEDG projects had demonstrated important impacts. The committee recognized that Earth system science and Geology dominated the disciplinary focus in the portfolio of projects funded through these programs, and commented that the atmospheric sciences may be underrepresented in the portfolio. The committee recommended that the GeoEd and OEDG programs consider how to encourage proposal submissions from currently underrepresented geographic regions in the portfolio. They further suggested that information on collaborating institutions be broken out more explicitly so that future COV's can better examine the institutional diversity of the portfolio. Efforts to improve the success rate of minority-serving institution proposals in the OEDG program and to increase the number of proposals being submitted to the REU program by two-year colleges were strongly encouraged. Although the committee noted the low participation of underrepresented groups in the portfolio, they also noted that the participation rate was higher in the E&D programs than in GEO's science programs and commended GEO for its ongoing efforts to encourage proposals from minority-serving institutions and minority PIs.

GEO's response: GEO agrees that a three-year snapshot of the portfolio of projects funded by the GeoEd and OEDG programs – which are only competed on a bi-annual schedule – does not provide an adequate basis for determining the full impact of the projects being supported. As such, GEO will continue to monitor the annual reports and outcomes of currently funded projects in order to evaluate which types of projects have had the most significant impacts. GEO agrees that it must be very proactive and sustained in its efforts to engage underrepresented regions of the country and minority-serving institutions in these programs and will continue to explore additional mechanisms (e.g., partnerships with other NSF programs) that might help us achieve these goals. It is not possible to be more specific at

this time because of uncertainties about the status of the GeoEd and OEDG programs after FY 2013. As noted previously, GEO will explore approaches that may be effective in getting two-year colleges more engaged in the REU program.

GEO Update:

- As mentioned, the proposed retro analysis of past GEO Ed programs should provide useful. Because of the recent realignment of many STEM assets across the Federal government, now is an appropriate time to gather information about the impact of recently sunset programs and how the paths created by those programs could inform the formation of future Geo Ed and Diversity initiatives.
- GEO has ramped up its activities as they relate to under-represented groups in STEM and in particular GEO. The recent Geoscience Opportunities for Leadership in Diversity (GOLD) program is an effort that focuses on creating diversity champions on campuses and in departments with geo programs. GOLD aligns with and supports the goals of NSF's INCLUDES program to promote broader participation across STEM. GEO has also begun coordinated discussions with HBCU faculty about how best to be intellectually engaged in geoscience education and research. Preliminary discussion ideas that could be actionable include specified DCLs for HBCU faculty, HBCU focused supplements, EAGER awards and a potential HBCU PI meeting hosted by NSF in 2017.
- GEO continues to support tribal students and faculty by collaborating with EHR's Tribal College Undergraduate Program (TCUP) through the Pathways to Geoscience (PAGE) track of TCUP.

Section 5: Other Topics

COV Report: The committee offered few comments in this section of the report, but suggested that GEO consider new collaborations between the geosciences and computer sciences that help to develop the workforce needed for an era of "big data". The committee also emphasized again the desire to find creative approaches to improve the involvement of two-year colleges, minority serving institutions, and minority PIs, and reiterated their desire to have more information about the individual reviewers used in the merit review process for these programs.

GEO's response: GEO agrees that the emerging priority of "big data" and new initiatives such as EarthCube, which lie at the intersection of the geosciences and computer sciences, is an important area to explore, both in terms of educational opportunities and workforce development. In March 2013, GEO sponsored an EarthCube end-user workshop focused on education that began to identify some of the grand challenges in both preparing the technologically savvy geoscience workforce of tomorrow and using the complex data and visualization resources offered through EarthCube for broader STEM education and engagement. GEO expects that programmatic planning related to this topic will continue to mature in the coming months.

GEO Update:

- The GEOPATHS:EXTRA track provides model activities for the community to consider, one of which emphasizes partnerships with large research facilities, to provide students with hands-on training and experience using sophisticated geoscience instrumentation, large data sets, and/or models. The first round of GEOPATHS awards were made last Fall (2015) and therefore the scheduled retro analysis would be timely to capture first year results from that cohort, including any projects that included the use of big data in student experiences.