CORE QUESTIONS and REPORT TEMPLATE
for
FY 2020 NSF COMMITTEE OF VISITOR (COV) REVIEWS

FY 2020 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

Date of COV: May 12-13, 2021	

Program/Cluster/Section: Improving Undergraduate STEM Education: Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences **(IUSE: GEOPAths)** GEO Opportunities for Leadership in Diversity – Expanding the Network **(GOLD-EN)** Global Learning and Observations to Benefit the Environment (**GLOBE**)

Division: **OAD**/ICER

Directorate:	GEO

Number of actions reviewed: 90 **Awards:** 62 **Declinations:** 28 **Other:**

Total number of actions within Program/Cluster/Division during period under review: 497 **Awards:** 196 **Declinations:** 301 **Other:**

Manner in which reviewed actions were selected: The committee chair selected ~ 10 jackets per COV member for review and encouraged the members to review additional jackets, if possible. Each COV member reviewed jackets that represented the various programs, the diversity of institutions, and PIs. For each jacket, any previously declined submissions or awards being supplemented were also reviewed (if available to the COV). Particular attention was given to proposals with multiple declines to identify if the process failed to provide helpful feedback or institutions with limited resources had a greater number of declines.

COV Membership

	Name	Affiliation
COV Chair:	Luis A. González	University of Kansas Geology (Retired)
COV Members:	Crystal Tulley-Cordova	Navajo Nation Department of Water Resources
	Gisèle Muller-Parker	Former NSF EHR/DGE (Retired)
	Dave Padgett	Tennessee State University
	Leonard Pace	Schmidt Ocean Institute

MERIT REVIEW CRITERIA

An understanding of NSF's merit review criteria is important in order to answer some of the questions on the template. Reproduced below is the information provided to proposers in the Grant Proposal Guide about the merit review criteria and the principles associated with them.   Also included is a description of some examples of broader impacts, provided by the National Science Board

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.

- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These broader impacts may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.

- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.   These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (PAPPG Chapter II.C.2.d.(i) contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including PAPPG Chapter II.C.2.d.(i), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit**: The Intellectual Merit criterion encompasses the potential to advance knowledge; and

- **Broader Impacts**: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to:
   a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?
6. Is there a mechanism to <u>reward</u> best practices in implementing broader impacts strategies?

3. Examples of Broader Impacts

The National Science Board described some examples of broader impacts of research, beyond the intrinsic importance of advancing knowledge.[1] "These outcomes include (but are not limited to) increased participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education at all levels; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a globally competitive STEM workforce; increased partnerships between academia, industry, and others; increased national security; increased economic competitiveness of the United States; increased collaborations with Historically Black Colleges and Universities (HBCUs) and other Minority Serving Institutions (MSIs), and enhanced infrastructure for research and education. These examples of societally relevant outcomes should not be considered either comprehensive or prescriptive. Investigators may include appropriate outcomes not covered by these examples."

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[1] NSB-MR-11-22

INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

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
1. Are the review methods (for example, panel, ad hoc, site visits) appropriate? Comments: ● The review process for most seems to be appropriate. ● GOLD-EN: Is using the EAGER process (review by the program director) appropriate for most of the GOLD-EN proposals/grants? The panel noted the diversity of disciplines in the GOLD-EN proposals and whether PD is seeking input from other disciplines/PDs within NSF. We encourage the embedding of a process that ensures input is sought when needed. **Data Source: EIS/Type of Review Module**	YES

2. Are both merit review criteria addressed
 	
   a) In individual reviews?
 	
● In most cases, they are. However, in many, the broader impact analysis is limited or too brief.
 	
   b) In panel summaries?
 	
● In most cases, they are. However, in many, the broader impact analysis is limited or too brief.
 	
   c) In Program Officer review analyses?
 	
● Yes, program officer review analyses are balanced.
 	
Comments:
 	
● The program manager is commended for reaching out to "Competitive" proposal PIs lacking some of the elements required to facilitate award.
 	
● GEO Ed is encouraged to work with NSF leadership to better define broader impact and provide guidance.
 	
Data Source: Jackets
	YES

3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals? Comments: ● Most of the reviewers do support their rating with appropriate comments. ● Some are very brief, and feedback is limited or not too helpful. Brief comments and lack of valuable feedback are chronic in the evaluation of broader impacts. ● Reviewers should be encouraged to provide more significant details on areas needing improvement to empower corrections/modifications in resubmissions. **Data Source: Jackets**	YES
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? ● Yes Comments: **Data Source: Jackets**	YES
5. Does the documentation in the jacket provide the rationale for the award/decline decision? ● Yes, the information is there, however the form and/or location of the rationale varies. ● [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.] Comments: **Data Source: Jackets**	YES

6. Does the documentation to the PI provide the rationale for the award/decline decision?
 	
● Yes.
 	
  [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 Jackets) of the basis for a declination.]
 	
  Comments:
 	
● For GEOPATHS declinations, more program guidance may be necessary for some PIs who resubmit and are declined multiple times and for PIs from MSIs and community colleges who only submit once and are declined
 	
Data Source: Jackets
	For the most part, YES

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

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
1. Did the program make use of reviewers having appropriate expertise and/or qualifications? ● YES Comments: ● We are pleased that the program has made a concerted effort to diversify the institutions and other organizations of reviewers and panelists. ● We encourage the cross-sharing of reviewers (if not done) between GEO and EHR programs. ● GEO Ed is encouraged to ensure that review panels are representative of the demographics of the U.S.A. **Data Source: Jackets**	YES
2. Did the program recognize and resolve conflicts of interest when appropriate? ● We did not see any obvious conflicts of interest. Comments: ● We encourage the inclusion of data on conflicts of interest in the Review Analyses. If present in the materials provided, it was not obvious or easy to find. **Data Source: Jackets**	Data not available
3. Additional comments on reviewer selection: ● Invite PIs to review who have not been successful in their proposals as a way for them to broaden their knowledge/understanding of the processes. ● Reviewer training regarding how to improve feedback to ensure constructive feedback is provided should be encouraged/pursued.	

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

MANAGEMENT OF THE PROGRAM UNDER REVIEW
1. Management of the program. Comments: ● We commend the program manager for his handling of the program, the program's positive action (reaction) in response to prior COV reports, and the effort to diversify institution types and proposal submissions. The support staff is also doing an outstanding job.
2. Responsiveness of the program to emerging research and education opportunities. ● The program seems to be responsive, although much of the actions are tied to other programs, Divisions, or Directorates. Comments: ● GEOPATHS could be seen as a "model" program of late in terms of equity with MSIs. Review panel members should be recruited from past MSI institution awardees. ● INTERN program could benefit from better dissemination of information to increase awareness of the program and "expand" the range/type of institutions and PIs taking advantage of the program. Given that employment opportunities are primarily in the private sector, PIs should be encouraged to avail themselves of the opportunity the program provides for experiences with small businesses or industry to benefit the student. ● NSF should encourage recipients of INTERN funds to share their experience and research at interdepartmental presentation opportunities. Perhaps the program could encourage professional organizations to provide a forum (virtual) to share such experiences. It is crucial for the students to gain experience presenting and important for non-major students to gain exposure to geoscience. In terms of professional organizations, AMS and AGU are bringing equity issues to the forefront.
3. Program planning and prioritization process (internal and external) that guided the development of the portfolio. ● We were provided the external evaluation, and, upon request, a draft outline of the action plan was presented. Comments: ● Substantive feedback would have been possible if the action plan draft was shared with the COV. The presented high-level draft outline appears to contain impactful actions. Some which we understand are being implemented. ● The panel was informed that the evaluation plan was an internal document that required that it would be kept confidential to NSF. However, the panel encourages NSF to present and share as much of the material as possible with the community.

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

● The program has been responsive to previous COV comments and recommendations and has made substantial and noticeable improvements that have a positive impact on the process, diversifying institutions both in terms of proposal submission as well as the reviewer pool.

Comments:

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

Programs should provide materials to the COV regarding portfolio goals and can insert specific targeted questions about their portfolios. *(Some dimensions of portfolio balance to consider include: balance across disciplines and sub-disciplines, award size and duration, awards to new and early-career investigators, geographical distribution of awards, awards to different types of institutions, innovative/potentially transformative projects, projects with elements of risk, inter- and multi-disciplinary projects, projects that integrate research and education, participation of groups that are under-represented in science and engineering, and projects that are relevant to agency mission or national priorities).*

V. OTHER TOPICS

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

- The program has made substantial progress (positive) in advancing its mission. It appears that the Budget is a limiting factor.

- At present we perceive the program to be a 3-person operation (Program manager, and 2-staff members), we can only imagine the impact of having additional staff coupled to a budget increase.

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.

- We encourage the program to be more proactive in partnering within and outside NSF. Perhaps using professional societies as a resource to disseminate information and in assisting in the forging of partnerships.

- We see tremendous opportunity in partnering with the Office of International Science and Engineering, not only with respect to the untapped potential of the GLOBE program, but also to provide geosciences students with international experiences.

3. Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.
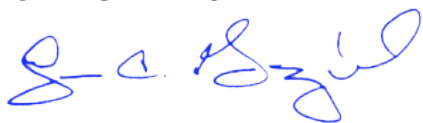
- NSF should strive to provide resources either through programs or working with professional societies to act as clearing houses to help MSIs that lack adequate infrastructure.

- NSF should provide guidance to reviewers on how to consider the discrepancies in resources between small or budget limited institutions and those with large and well-established infrastructure and budgets.

- NSF should support more efforts to expand GLOBE to HBCUs and MSIs. GLOBE's mission is to train K-12 teachers to teach STEM. The HBCUs produce 50 percent of Black teachers. HBCUs + GLOBE = closing the racial achievement gap in STEM. Though we lack data on TCUs and HSIs teacher training, we believe that a concerted effort with all MSIs can help increase teacher training and help close the STEM gap.

- NSF and GEO should use GLOBE program to encourage the introduction or expansion of geosciences/earth-sciences into the early stages of K-12, the formative years.

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

●   GEO Ed programs fulfill a vital role and should be expanded via partnerships within NSF, with other federal agencies, and with industry, growth of program budgets, and the addition of personnel.

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

●   NSF through this COV report is encouraged to, be a JEDI, and fully reflect the demographics of the United States and have the COVs across all its programs reflect professional, educational, racial, gender, organizational, etc. diversity.

The Committee of Visitors is part of a Federal advisory committee. The function of Federal advisory committees is advisory only. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the Advisory Committee, and do not necessarily reflect the views of the National Science Foundation.

SIGNATURE BLOCK:

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For the GEO Education & Diversity (GEO ED) programs

Luis A. González

COV Chair