

NSF Response to:

FY 2012 Committee of Visitors (COV) for the Ocean Sciences Division (Marine Geology and Geophysics, Ocean Drilling Program, Oceanographic Technology and Interdisciplinary Coordination, Ocean Education, Chemical Oceanography, Physical Oceanography, and Biological Oceanography)

The Geosciences Directorate (GEO) wants to express sincere appreciation to the Committee of Visitors for their time and effort in conducting a comprehensive review of several programs in the Ocean Sciences Division (OCE). Members of this COV spent significant time in advance of the meetings at NSF to review program documents and to iterate with OCE staff and other COV members on data and questions. The two days of meetings onsite at NSF were full of active engagement among the COV members themselves, as well as with many NSF program staff. The COV members' commitment to the task was obvious, and working with them was a sincere pleasure for NSF staff.

The Committee of Visitors triennial review of OCE programs is one important process by which GEO and OCE learn about our successes in fulfilling NSF's responsibilities to advancing research and education, and by which we come to better understand areas for improvement. The COV report and follow-up documents also serve as an important communication to the ocean sciences community. We appreciate the strong support the Committee voiced on OCE program management and the work of program staff, and we welcome the recommendations for improvement.

Below we provide responses to specific recommendations.

Recommendation 1 (p 4): The COV recommends that all panels be provided with consistent instructions with regard to two specific issues: 1) identifying and evaluating transformative and high risk proposals at the onset of the panel process, and 2) effectively evaluating multi-disciplinary proposals both in the context of the discipline and the division.

NSF Response 1: We will review our procedures to ensure all OCE panelists are given consistent instructions on how to identify and evaluate potentially transformative and high risk/high reward proposals, and how to evaluate multi-disciplinary proposals. Currently, members of each disciplinary panel are asked ahead of time by their parent program to identify proposals they found to be the most creative, innovative, potentially transformative or high risk/high reward and articulate why during the panel discussions. With regard to the review of multi-disciplinary proposals, at the beginning of each panel, panelists are briefed about the process of assembling a customized panel for each of the multi-disciplinary proposals made up of panelists from the appropriate disciplinary panels. Panelists are also reminded that they are asked to give NSF scientific advice on the quality of these proposals as a whole and that co-funding decisions will be made by the programs involved in the review. To ensure greater consistency across the Division's various panels, we will develop standard materials to share

with panelists on these topics. We can also clarify the processes to panelists ahead of the panel meetings, maybe through the use of webinars.

Recommendation 2 (p 5): The COV recommends that the importance of addressing BI should continue to be explained to reviewers and PIs. More focused guidance on how to assess projects under BI should be given to all reviewers/panelists.

NSF Response 2: This is a continuing topic of education for PIs and reviewers. We have seen marked improvement in the past 5 years in how Broader Impacts (BI) are treated in proposals and it is clear that more meaningful descriptions of BI in proposals translate into better evaluations by the reviewers and panels. Panelists are specifically asked to provide an evaluation of the BI of the proposed activities in the panel summary, rather than simply restating what they are. We will review our procedures once NSF has finalized its implementation plan in response to the recent National Science Board (NSB) report on NSF's merit review criteria. The NSB did not recommend changing the two criteria of Intellectual Merit (IM) and BI. Rather, the report recommended that NSF better define the two criteria and provided principles to govern NSF's approach to utilizing the criteria.

Recommendation 3 (p 6): The COV recommends that when there is a spread in scores on the mail and panel reviews, it would be helpful if the Panel Summary detailed the key points that went into determining the final score, so as to provide more thorough feedback to the PI.

NSF Response 3: We specifically ask panelists to address divergent opinions in the mail reviews when they exist and to articulate in the panel summary which points in the reviews they considered the most important and which ones the PIs should ignore. With many different writers of panel summaries working under tight time constraints, it is not always possible to capture this in great detail. When panel summaries are lacking in details, the program officer assigned to that proposal will usually make a note in the review analysis and try to write more detailed program officer comments for the PI.

Recommendation 4 (p 21): The COV recommends that, while reviewer expertise seems to be sufficient to comment on how proposals address IM, NSF should seek to expand the range of reviewer expertise (where it makes sense) to add perspective to how proposals address BI. Additionally, the use of reviewers from sibling Agencies may also increase the perspective on BI since agencies continually respond to inquiries regarding programmatic outputs, outcomes and return on investment of research dollars.

NSF Response 4: We agree with the need to use reviewers with a broad range of expertise and experience who can provide substantive evaluation of both IM and BI aspects of proposals. As noted in the response to Recommendation 2 above, the NSB recently issued a report on NSF's review criteria, and NSF is finalizing its plans to implement the NSB recommendations. We will carefully consider how to expand the OCE reviewer pool within that context. The COV brings up an interesting point about using reviewers from other funding agencies. We agree that government and industry scientists, both nationally and internationally, can provide valuable perspective on IM and BI, and currently engage them in reviews of proposals with significant non-educational BI activities. We note that the selection of reviewers is done on a proposal by

proposal basis, such that the full extent that OCE already incorporates government and industry scientists in the review process might not have been captured accurately in the small sample of proposals examined by the COV.

Recommendation 5 (p 22): The COV recommends that the Program review the wording on the letters requesting reviews, to clarify that reviews from those with conflicts of interest will not be used, and to request that in cases of suspected conflicts of interest, the reviewer contact the Program Officer in a timely manner for clarification, to avoid wasting reviewer effort.

NSF Response 5: We agree with the COV that the current language in the review request letters should be changed as suggested to avoid wasting reviewers' time and effort.

Recommendation 6 (p 22): The COV recommends that OCE should make a concerted effort to tap other, underrepresented, reviewer pools.

NSF Response 6: We are consistently looking to expand our reviewer pool, but need to develop better strategies for tapping underused pools. We plan to tap participants in two new OCE programs (Research Initiation Grants: Broadening Participation and Postdoctoral Research Fellowships: Broadening Participation) as future reviewers, as appropriate. Moreover, there may be opportunities for better coordination with the GEO Education and Diversity Program, and with programs in the Education and Human Resources Directorate such as Alliances for Graduate Education and the Professoriate (AGEP).

Recommendation 7 (p 22): The COV recommends that NSF look into the feasibility of submitting an Information Collection Request to OMB (Office of Management and Budget) to begin to collect additional appropriate reviewer information to better identify areas of improvement in panel and reviewer makeup.

NSF Response 7: We suggest that the COV raise this idea with the Geosciences Advisory Committee (AC-GEO) so they may bring it to NSF's upper management's attention if appropriate.

Recommendation 8 (p 26): The COV considered especially the REU program, and the COV recommends that, while research and education are naturally integrated in OCE REU programs, all REU proposals be held to the same standard of educational and societal relevance. In addition and specific to REU efforts, the COV recommends programs encourage greater emphasis on projects focusing on training students to be more than academic researchers and include options better suited to non-academic geoscience careers.

NSF response 8: The primary goal of the Research Experiences for Undergraduates (REU) program (sites and individual supplements) is to introduce undergraduate students to the research process and encourage them to pursue higher education. Each REU site project includes seminars and workshops. Through the review process, we can ensure that seminars and workshops on non-academic careers are included. We could also look into ways to encourage the mentors of REU students to articulate better why the research they are doing matters to others.

Recommendation 9 (p 28): The COV recommends ensuring that the reporting procedures are standardized and that all symbols used are clearly defined.

NSF Response 9: The symbols that the COV is referring to are part of the central NSF database and cannot be changed. Most are for internal purposes and are not seen by the external community (PIs and reviewers). For future COVs, we can clarify what these mean. With regards to review ratings, our new review analysis template identifies the individual scores, including split ratings (e.g., V/G).

Recommendation 10 (p 31): The COV recommends that the Program make the process of convening a special panel for multi-disciplinary proposals more generally known to the community.

NSF response 10: In the past year, OCE has reestablished the OCE newsletter on a quarterly basis and we plan to use this as a vehicle to clarify different aspects of the proposal review (including the review of multi-disciplinary proposals) and grant management process. We are also developing a set of FAQs on these topics to be posted on the OCE web site. OCE program officers will also continue to discuss proposal review and grant management topics during visits to institutions and when attending meetings.

Recommendation 11 (p 34): The COV recommends that the Program track this information on women on panels and continue to encourage participation by women and minorities in the review process.

NSF response 11: We continually strive to have balanced representation on our review panels without overburdening individuals from under-represented groups. In that context, to improve the representation of under-represented groups, we are inviting more junior scientists, which are a more diverse group than senior scientists, to participate in review panels.

Recommendation 12 (p 51): The COV recommends that more clear HR-HR criteria be developed at the programmatic level. Sets of criteria can then be used to identify programmatic overlaps in an effort to generate some consistency in HR-HR definition across OCE. A future COV can then assess this issue with accurate and coherent data.

NSF response 12: COV deliberations made it clear that answering the question "Does the Program portfolio include awards for projects that are innovative or potentially transformative" is difficult using existing data. A few years ago, OCE started an experiment of coding proposals as "high risk" (and implicitly high reward) (HR-HR), and asked program officers to provide an explanation in the review analysis. OCE could establish an additional code to track "potentially transformative" proposals since "high risk" does not necessarily equal "potentially transformative" and both can be very subjective. OCE will work to develop consistent criteria in line with NSF policies to help future COVs answer this set of questions in a quantitative manner.

Recommendation 13 (p 52): The COV recommends that NSF provide guidance (perhaps in the OCE newsletter or town hall meetings) to the community, reviewers and panelists regarding strategies to properly assess the risks inherent in HR-HR projects relative to programmatic objectives during the review process.

NSF response 13: With Recommendation/Response 12 as context, OCE agrees with the need to communicate with the community, reviewers and panelists about this topic, and will use the OCE newsletter, meetings, program officer comments back to PIs about their proposals, and other opportunities to do so.

Recommendation 14 (p 53): The COV recommends that there should be an effort to encourage more proposals from 2-year colleges, community colleges, and tribal colleges.

NSF response 14: As noted in the response to Recommendation 6, coordination with the GEO Education and Diversity Program, and with programs in the Education and Human Resources Directorate such as Alliances for Graduate Education and the Professoriate (AGEP) may provide opportunities for targeted outreach to a broader pool of institutions.

Recommendation 15 (p 58): The COV recommends that OCE take a leadership role to address these issues in its own programs and in NSF as a whole.

NSF response 15: OCE is taking a leadership role in this area through several on-going (e.g., Mentoring Physical Oceanography Women to Increase Retention - MPOWIR) and new programs (Postdoctoral Research Fellowships and Research Initiation Grants for broadening participation). As noted previously, OCE is also seeking opportunities for greater synergy with broadening participation efforts in GEO and across NSF.

Recommendation 16 (p 64): The COV recommends that OCE should consider expanding the size of the REU program with the goal of reaching more students and to continue progress at increasing the diversity of the OCE community given the past effectiveness of the REU program.

NSF response 16: We will consider several options to increase the number of students who benefit from research experiences. We can consider increasing the number of students at each funded REU site, increasing the number of sites, or increasing the number of individual REU supplements with the possibility of follow-on research activities during the academic year. We are also planning a new program to bring ocean research experiences to more students in a cost-effective and sustainable manner.

Recommendation 17 (p 64): The COV recommends that OCE and NSF seek to showcase the impact that both IM and BI are having on the research conducted by NSF PIs.

NSF response 17: We completely agree with this recommendation and will make efforts to highlight both IM and BI aspects in the OCE newsletter and in OCE-related NSF Highlights, and will continue to work with the Office of Legislative and Public Affairs to tune messages to a breadth of audiences.

Recommendation 18 (p 65): The COV recommends that NSF begin the process of collecting data necessary to evaluate the effectiveness of these new requirements.

NSF response 18: This refers to the new NSF requirements for proposals to have a data management and postdoctoral mentoring plans. This issue is NSF-wide and should go to AC-GEO for further discussion and action.

Recommendation 19 (p 66): The COV recommends that for future COVs these graphs be linked to the data used to generate them in a way that would allow statistical analysis by the committee.

NSF response 19: OCE is happy to provide more specific data, when possible, but it is easier for us to provide the statistical analyses. The NSF databases are not publicly available (they include confidential information on individual proposals and PIs) and there is no way to block or filter out conflicts of interest associated with COV members when using them. There are also a number of nuances about the data that individuals from outside of NSF would not know, so the data produced would likely not match the "official" NSF data. If the COV panel can provide a list of data products they feel would be useful, we can make sure that data are available to future COV panels.

Recommendation 20 (p 66): The COV recommends that individual members of the next COV read jackets from more than one program.

NSF Response 20: This was the first COV for which we had the opportunity to use the new on-line conflict-of-interest module and to give COV members access to electronic jackets ahead of the in-person meeting at NSF. Having had a successful experience with remote electronic access to jackets, we can now offer the option of members reading jackets from more than one program. Future COV's will be able to self-organize in this regard.

Recommendation 21 (p 66): The COV recommends that NSF staff wear nametags and OCE program identification during the COV review to help COV members get to know them better.

NSF response 21: We will be happy to implement this COV recommendation in the future.

Recommendation 22 (p 66): The COV recommends that the Program check through documentation provided to ensure:

- a) the charge to the COV is consistent;
- b) the questions in the template are consistent with the charge,
- c) sufficient data are provided to address the charge.
- d) all graphs and tables provided to the COV include detailed descriptive captions or footnotes.

NSF response 22: We will ensure that the charge to future COVs in the invitation letter is in sync with the revised COV report template. With regards to the questions in the report template, these are used NSF-wide and are not always well matched to the data collected by individual units, meaning that some of the questions can only be answered qualitatively based on

discussion with the programs. We will strive to include more detailed captions and footnotes for graphs and tables provided to future COVs.