

**NSF Committee of Visitors Report  
Deep Earth Processes Section  
Division of Earth Sciences  
Directorate for Geosciences  
November 7-9, 2011**

**RESPONSE TO SPECIFIC COMMENTS IN THE  
COMMITTEE OF VISITORS REPORT**

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On November 7-9, 2011, a Committee of Visitors (COV) met at NSF to review five Programs in the Deep Earth Processes Section (DEP) of the Division of Earth Sciences (EAR). These Programs included: *Tectonics, Petrology and Geochemistry, Geophysics, Continental Dynamics,* and *EarthScope*. The review covered proposal and award actions for the Fiscal Years of 2008, 2009, and 2010. We are very pleased with the overall results of the COV as outlined in their report:

“In the majority of individual proposal cases reviewed, the proposal evaluation process is sound, and carefully and meticulously administered by the Program Officers. *Ad hoc* mail reviews are solicited from scientists with appropriate expertise, and there is ~60% review return rate in all of the programs, slightly higher or slightly lower depending on the cycle and program. All of the programs use a merit review process involving three parts – ad hoc mail reviews, panel review, discussions and ranking, and program officer discretion and resourcefulness in dealing with proposals that fall near the “water line.” This COV, in agreement with the previous COV, is strongly supportive of this three-part review process and unanimously recommends that it be retained. The committee notes that the panel process alone would be less effective without *ad hoc* reviews, and that the panel process serves multiple purposes, not the least of which is to provide to a steady stream of members of the research community an opportunity to see first hand how the merit review and decision making process works in the Foundation. The panel process provides a valuable form of transparency and education that benefits the Foundation and the community.

All of the DEP program officers have an unusually thorough knowledge of their research community and can provide valuable and necessary guidance to their panels, as well as make good independent decisions where necessary. There is abundant evidence that each PO expends serious effort and is adept at finding opportunities for co-funding of proposals from allied programs within and external to the Division that can extend the ability of their program to fund important and worthy research, and hence provide a great benefit to their research community. This part of the DEP programs is exceptionally well managed.”

While positive and complimentary of NSF's management of the DEP Section, the COV report contains some specific recommendations or concerns on areas that could be improved by the Section.

## GENERAL FINDINGS

1. As an example, given the evolution of the general topic of tectonics and its overlap with Geophysics, Petrology and Geochemistry, EarthScope, earth surface dynamics, and Continental Dynamics, it might be beneficial for all the programs to further define what the objectives of each program are, and how investigators might best find a home for their research. The current program solicitations are useful from an individual program standpoint because they are fairly general and do not serve to unnecessarily restrict the scope of the program, but they are less useful in helping an investigator to understand the differences between programs.

Response: Program descriptions have been intentionally developed to be general within each program's purview to ensure that a potential PI is not discouraged from submitting because of an overly prescriptive program description. However, we agree that, because of dynamically evolving science in the programs and the recently completed New Research Opportunities in Earth Sciences by the National Research Council, a review and revision of the individual program solicitations is warranted, and we shall do this.

2. This COV would therefore echo the recommendation of the previous COV that the POs continue to communicate to their communities the means by which proposers can satisfy the BI criteria for their program or for the DEP section overall.

Response: We agree and will continue to explain NSF's BI criteria in individual PI interactions and special sessions at appropriate meetings. Despite the fact that the Broader Impact criteria were set up over 10 years ago, several CoVs have expressed that there is still confusion among PIs, reviewers, and NSF on how to use them effectively. As a matter of fact, the NSB has tasked NSF with revising the merit review criteria once more and we expect that these will be included in the next GPG, perhaps even this year. This would be the ideal time to make a concerted effort to educate the stakeholders on any revised merit review criteria (intellectual merit and broader impacts) that are to be used in the future assessment of NSF proposals.

3. The COV appreciated the considerable effort expended by NSF in producing an agenda that allowed it to complete the entire review on site. However, many of us felt that the process could be strengthened if more time were available for interactions with POs, and for COV discussion of the template questions to achieve consensus for draft parts of the report on each program. This might be accomplished by enabling committee review of some subset of eJackets ahead of time.

Response: In order to provide COV members access to eJackets prior to the COV meeting, NSF requires that a full conflict-of-interest/confidentiality briefing be given to the COV panel members prior to access. It can be done by webinar, but it cannot be just written materials. The difficulty of scheduling this briefing for a large group of busy panel members, along with concerns about unexpected conflicts without a program officer present to provide guidance prevent us from making the eJackets available ahead of time.

4. ...a subsidiary concern of the COV was the issue of program scope and evolution, how this is determined, how it is reflected in the program solicitations, and how it is communicated to the scientific community. Although we provide some suggestions about how these issues might be addressed, we also make the general recommendation

that NSF/EAR consider holding periodic reviews of the overall DEP (or EAR) organization and program structure. Something like a decadal timescale would likely be an appropriate frequency for such a review.

Response: We agree. Organizational structure of the DEP section is a division and directorate responsibility and is continually being reviewed by management. Actual organizational and program scope changes within EAR have taken place more frequently than the suggested decadal timescale.

### **Geophysics Program**

5. The POs are very responsive to agency-wide initiatives such as FESD (Frontiers in Earth System Dynamics), CMG (Collaboration in the Mathematical Geosciences), CDI (Cyber-enabled Discovery and Innovation) and other cyber-infrastructure initiatives. Although this has probably contributed significantly to the increase in funding rate and is highly applauded, the COV expresses some concern that these initiatives represent essentially unfunded mandates to the staff and may in the long run hurt the successful management of the core programs, which have already seen their proposal volume doubled in the last decade.

Response: We too are concerned about the program officer work load represented by the increase in cross-directorate and cross-foundation programs, not only in the Geophysics Program but across the division. While we have received some relief in the form of additional positions and help from the GEO front office, the EAR work load is still the highest in the directorate and discussions about solutions to this problem are ongoing.

### **Tectonics Program**

6. The COV recommends that the POs go a step further and work with the tectonics community to identify important new research trends and methods; this might be done by encouraging workshops and increasing communication with the community.

Response: We agree. Although the Tectonics Program Officers have been active in encouraging and funding or co-funding workshops on new research trends and methods (Extending a Continent: Architecture, Rheological Coupling and Heat Budget, 2007; Rock Deformation Gordon Research Conference, 2008; Integrated Solid Earth Sciences (ISES) Summer School, "Dates, Rates, and States", 2008; Workshop for Advancing Numerical Modeling of Mantle Convection and Lithospheric Dynamics, 2008; Rock Deformation Gordon Research Conference, 2010; Integrated Solid Earth Sciences (ISES) Structural Geology and Tectonics Forum, 2010; GLADE Workshop, 2010), they plan to increase their efforts in this area if funding levels permit.

### **Petrology and Geochemistry Program**

7. ...we recommend that division and section administrators engage directly with the program officers to strategize about funding levels and the future of the (CH) program.

Response: We agree. For all programs in the division, the budget is developed by the Division Director who consults with directorate management as well as program officers. The division also holds retreats and workshops at least yearly to discuss new science directions and their support strategies. For example, the CH program supports periodic workshops and/or meetings to bring potential PIs together to strategize on future research directions – e.g., most recently, a 2012 Gordon Conference on Mineral Deposit Geochemistry, and a 2011 Chapman Conference on the Galapagos as a site for collaborative Earth Science and Biological research.

8. (We recommend that) program officers and administrators develop a succession plan that will allow at least one new full time program officer to be mentored for a significant period of time to gain knowledge of the community. While this shorter-term knowledge transfer is imperative, it is also critical that an operational style in which program officers keep fully involved with the community be maintained in the future.

Response: We agree. Directorate and division policy is to make every effort to have some overlap with outgoing and incoming program officers in order to allow the new person to gain knowledge of the community and program procedures. The timing of departures, and delays in the process of finding and processing replacements, make this goal sometimes difficult, but we always strive to accomplish this important overlap. All program officers are encouraged to keep fully involved with their community through site visits and scientific meetings as time and travel funds allow.

9. The program officers engage the community in various ways to provide input on future directions and goals of the program, including the name and boundaries of the program (i.e., "branding").

Response: We agree. We try to accomplish this through the funding of special workshops and studies. The most important recent example is the New Research Opportunities in Earth Sciences study by the National Research Council that was commissioned by EAR. Program names, which deal with division organization, and boundaries, which deal with revision of the program solicitations, are addressed above.

### **Continental Dynamics Program**

10. A geosciences community workshop to review and re-assess the priorities of the CD program is long overdue, given changes in the organization of the NSF (including the addition of new programs) and advances in science. The overlap in types of projects funded by EarthScope and Continental Dynamics in North America has led to confusion in the community about where to best submit proposals. Moreover, many techniques relied upon by the tectonics and lithosphere geodynamics communities simply did not exist 25 years ago. A community workshop should be a priority even if a transition to a new "Integrative Earth Systems" program is under discussion - perhaps the workshop could aid in this transition by helping to define the goals and scope of the new program.

Response: As the recommendation indicates, the suggested CD workshop has not been done because division structural changes, which are based on community input from various workshops and the new NROES study, are underway for CD. EAR hopes to have a community workshop based on the revised program when the transition occurs.

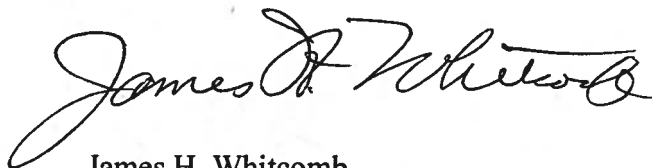
11. One concern is that there was no overlap among the mail reviewers from one annual review cycle to the next for some proposals that were initially rejected and resubmitted. Most CD proposals are not funded on the first try, and having some reviewers see the same proposal in successive years is important (so they can note whether concerns from the prior submission were addressed adequately). The PO informed the COV committee that he strives to achieve some degree of reviewer continuity through multiple decision cycles.

Response: We agree and future CD proposal resubmissions will have at least some mail reviewer overlap when possible.

12. A more significant concern was an apparent inconsistency between panel and mail reviewers' ratings and funding outcomes for a significant fraction of the proposals we examined. We evaluated seven jackets, choosing proposals with a range of outcomes: some were funded on the first try, some were rejected one or more times before being funded, and others were not funded during the three-year period we considered. Of the seven proposals we evaluated, in three cases the proposal was either (1) highly rated by the reviewers and the panel and not funded; or (2) not strongly supported by the reviewers or the panel, yet funded. Somewhat troubling was the fact (related to us by the PO) that post-panel conversations with principal investigators, sometimes by happenstance, had entered into the decision in all three of the cases noted. The PO emphasized that the final decision was his responsibility, and involves factors not covered by the reviews. We don't question the PO's prerogative to make decisions of this sort, but it is our understanding that in cases where there could appear to be inconsistencies in the review process, and especially when there are substantive interactions with PIs outside of the normal review process, a record should be entered via the "Diary Notes" feature in eJacket (as resolved by NSF following the June 2008 COV). The PO acknowledged that he did not deposit a formal note of these conversations into the jackets.

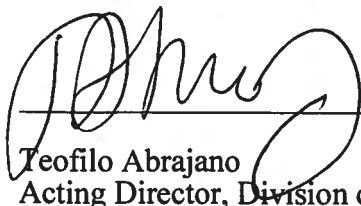
Response: We agree; this is standing NSF policy for the documentation of proposal review. In the future, all factors used in making CD decisions and all discussions with PIs concerning their pending CD proposals will be documented and entered into the appropriate eJacket sections.

We would like to thank Dr. DePaolo and the members of the COV for their time and efforts in making these excellent recommendations that will improve the Programs of the Deep Earth Processes Section.



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Concurrence by:



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