

NSF Response to:

FY2013 Committee of Visitors (COV) report for the Atmosphere Section (AS),  
Division of Atmospheric and Geospace Sciences (AGS), Geosciences Directorate (GEO)

The Geosciences Directorate (GEO) extends its appreciation to the Committee of Visitors (COV) team for conducting a thorough and thoughtful evaluation of the programmatic management of the Atmosphere Section (AS) within the Division of Atmospheric and Geospace Sciences (AGS).

The Atmosphere Section is the largest of the three sections in AGS and it interacts extensively with other NSF Sections, Divisions, and Directorates, as well as several federal agencies and the wider external science community. As such, it is critical to the NSF to have an independent and objective assessment of how the Section functions autonomously and collaboratively in its mission of service to the public.

The COV's efforts in reviewing the Section were extensive. All 1,152 program jackets were available for COV review, as needed. A subset of 390 representative jackets (34% of total actions) was highlighted by AS Program Directors and the Section Head to the COV Members for evaluation based on the relevance of the information within the jacket to the questions posed to the COV Members in the COV Template. Additional jackets, beyond those highlighted by AS Program Directors and the Section Head, were made available to the COV Members in response to specific requests by the COV Members for information.

The Section took advantage of NSF's e-business systems for COVs to create a web based version of the COV meeting materials. This allowed participants to access the COV data at a distance wherever they were and at their convenience for a period of three weeks.

The Section held one ninety minute-long group telecom for COV members and NSF staff on March 25, 2013 to: 1) explain the role of the COV; 2) clarify the NSF ethics requirements; 3) familiarize the COV Members with the NSF electronic system; 4) provide overviews of the science programs under review; and 5) review the data that was assembled for their evaluation of the Section activities.

This group telecom was followed, in one week's time, with individual virtual breakout group discussions between relevant Section Program Directors and their COV program counterparts to discuss specific programmatic data and issues.

A two-day period for in-person interactions was reserved for April 9-10, 2013. The meeting began at 9:00 AM on April 9, 2013 and ended by 5:00 PM on April 10, 2013.

Several Section-specific and Agency-wide programmatic themes emerged in the COV's final report that we address, in the order in which they arose, in each section of the report instead of working through the report point-by-point.

## **Section I. Quality and Effectiveness of the Merit Review Process**

Overall, the COV found the current practices of the Section as contributing to promoting a merit review process of high quality and effectiveness. The Committee raised several issues for discussion that are addressed in turn below.

### **01.1. Virtual Panels**

*COV: “The COV questions whether the proposed use of “virtual panels” (video conferencing, for example) are as effective as “face-to-face meetings” and, to this end, suggests further assessment of virtual meetings and their potential impacts. The COV thinks that this approach is less effective than traditional “face-to-face” meetings. The COV thinks that interactions and relationship-building between panelists and the program manager are much better facilitated by “face-to-face” interactions than virtually so. The COV recognizes the greater financial cost of “face-to-face” meetings, but several members of the COV consider it good value.”*

*NSF:* With respect to the use of virtual panels in evaluating proposals, the Section acknowledges that there are challenges to making effective use of virtual panels and meetings. Face-to-face meetings provide a great opportunity for networking with peers and NSF staff and we understand that many have come to value this as a collateral benefit of panel service.

We note, however, that several programs both within AS and across GEO have used virtual panels with great success, as judged by the feedback from participants and the substance of the panel discussions and summary comments. An NSF-wide working group evaluating the merit review process also noted that virtual panels have the potential to broaden participation in the review process, shorten the overall time commitment to panel participation, lower environmental impacts associated with panelist travel, and help contain administrative costs.

In recent years NSF has worked hard to develop best practices for using virtual panels. This includes providing guidance on the types of panel best suited to virtual panel review (not every panel is suited to virtual convening), training in virtual panel technologies (specifically video conferencing), training in effectively moderating virtual discussions, tests of various new and existing platforms, and infrastructure investments to improve the user and convener experience. An NSF-wide Virtual Panel Task Force was convened last year to oversee these activities. The Task Force is committed to ongoing evaluation of the effectiveness of virtual panels, and to piloting innovative new modes of virtual participation.

While we do expect that continued technological improvements, along with growing familiarity with and adoption of best practices, will support increased successful use of virtual panels at NSF in the future, we want to clearly state also that we are *not* moving towards abandoning face-to-face panels and meetings. Judicious but not exclusive use of virtual panels and meeting is our goal because we recognize that nothing substitutes for people coming together and meeting face-to-face.

Our use of virtual meetings for the COV is a case in point. Historically, COV members collectively convened at the NSF in a conference room for several days in a face-to-face setting

to individually pour over program materials. We have replaced the traditional face-to-face time spent looking through program jackets with virtual time to do so at the leisure of the COV Members and in advance of a face-to-face meeting at the NSF when we can discuss your assessment of our program management. In essence, we have used remote access and virtual meetings to allow the COV more time to look over “our books” so that when we do meet face-to-face, we can have a more substantive dialogue.

### **01.1. Large and Enduring Awards**

*COV: “The COV spent considerable time discussing the methodology NSF/AGS/AS uses to evaluate high cost initiatives and projects that may also endure for long time spans out of the AS core funding. By “high cost” we mean ~10% or more of a program’s budget, and by “long” we mean over 5 years or more (through repeated awards). In short, the COV questioned whether current practices are adequate for awards that fall, in size and duration, between “traditional” awards (curiosity driven research by individual PIs or small teams at amounts less than about \$500K) and the larger science and technology centers (e.g., a center of excellence).”*

*NSF:* The COV wrestled with the issue of the size and duration of certain projects, specifically those that cost 10% or more of the core program budget and last for more than five year through repeated awards.

The COV’s comments are especially applicable to funding provided by the Climate and Large Scale Dynamics program (CLD). The CLD program has an award to an entity which meets the COV’s criteria regarding size and duration (i.e., more than 10% of core budget and more than five year duration) and is funded through an interagency agreement between NSF and its federal partners who provide varying levels of financial support to the award.

The current award expires soon and a renewal proposal is currently undergoing merit review. Thus, it would be difficult to apply all of the COV’s guidance to the current proposal, as the review process is currently underway. Furthermore, the review process for the proposal was negotiated with NSF’s partner agencies pledging to fund (or not fund) the award on the basis of the reviews solicited by NSF.

Regarding the specific guidance provided by the COV regarding management oversight, the Section Head and Division Director are currently involved in discussions regarding the review process for, and management of, such projects.

The AS programs could add language to the review analysis for such proposals to explain why NSF did not consider it necessary to have an open solicitation for such a large award. That language could include a discussion of the history of the award and the arrangements made with other agencies to support this inter-agency effort.

Specifically, while the CLD program believes it should retain the ability and flexibility to make large awards on specific thematic science on the basis of standard program review procedures (i.e. under the standard program solicitation and using mail review), it will specifically reassess its use of this practice over multiple rounds of renewal awards to the same entity.

Should the current proposal to CLD review well, the Program will consult with its federal partners and consider the option of funding the project for a shorter period of time followed by an open solicitation and re-competition using a form of panel review.

The Section will also consider seeking community input as to whether it is necessary to fund certain activities through “block funding” as opposed to a collection of smaller awards to individual researchers. Thus, the Program will exert discretionary judgment in this matter based on the best interests of the science community and scientific progress.

### **QI.2. Addressing Both Merit Review Criteria**

*COV: “The COV found that individual reviews, panel reviews, and especially PO review analyses effectively addressed both criteria. The COV notes that some reviewers concentrated more of their efforts on the “intellectual merit” criterion compared to the “broader impacts” criterion. This may reflect ongoing and long-standing confusion as to what is meant by “broader impacts” and how they are to be evaluated. COV recognizes efforts by NSF to clarify this, and encourages NSF to continue to provide information to PIs about the broader impacts criterion.”*

*NSF: The COV cites some disparity in reviewer efforts between the Intellectual Merit and Broader Impacts assessment of proposals. This is an ongoing issue for all of NSF which, in our experience, reflects lingering confusion about the Broader Impacts criteria, the relatively small amount of space used in a proposal describing the Broader Impacts, and the personal opinion of individual reviewers that the Broader Impacts are of lesser importance than the Intellectual Merit. We strive to strike a balance between being informative and proscriptive with reviewers who graciously and generously donate their time and expertise to the NSF merit review enterprise.*

Recently, the NSF Director and the National Science Board have taken steps to highlight and clarify the merit review criteria. As a result, we have seen a positive impact, in terms of clarity, in the reviews we have received since the new criteria and review instructions were adopted in January 2013.

We will, however, commit to being more proactive going forward. Broadly speaking, we will continue to monitor the incoming reviews and will take further measures if review comments on the Broader Impacts are deemed inadequate.

Specifically, however, the Section will improve our efforts, starting in FY14, to better articulate, in all of our communications with PIs especially those related to funding recommendations, what we think are appropriate examples of Broader Impacts.

### **QI.6. Documentation to the PI Regarding the Funding Recommendation**

*COV: “The COV recognizes and appreciates the value and significance of providing feedback to PIs on declined proposals. To the extent possible, the COV encourages sharing (in writing) appropriate elements of the review analysis with unsuccessful PIs (especially early career PIs), particularly on proposals that were viable, or “close to the line” in terms of being funded. It was noted that some PO already engage in this practice.”*

*NSF*: The Division has different practices in providing feedback to Principal Investigators (PI). Historically, the Division culture was to call the PI on the phone and discuss the proposal recommendation. The current practice in AS is to provide written details to all PIs when communicating the funding recommendation. Regardless of the mode of communication and in all instances, the programs strive to explain funding recommendations as clearly as possible. Apart from any sensitive or confidential information, the goal is to make the feedback process transparent and informative. The Section will continue to improve communicating funding decisions in writing with as many details as appropriate for the circumstance.

## **Section II. Selection of Reviewers**

Overall, the COV found the current practices of the Section with regard to the selection and management of reviewers to be appropriate and of high quality. The Committee raised several issues for discussion that are addressed in turn below.

### **OII.1. Use of International Reviewers**

*COV*: “While AS is already aware of this issue, the COV simply reiterates efforts to identify and use qualified non-US reviewers. NSF might remind PIs that when they suggest reviewers, they should also consider scientists that are not based in the US.”

*NSF*: We appreciate the suggestions for identifying new reviewers for AS proposals, especially international reviewers. The Program Directors have found that they are more likely to get a positive response to a request to review either from researchers that have been supported by NSF in the past or by the international collaborators of those researchers. We recognize that many in the science community are overburdened with requests to review proposal and journal submissions. Our experience shows that researchers supported by NSF funds are quite generous with their time and are willing to review multiple proposals per year as part of their contribution to the running of the merit review process.

The new effort launched by the NSF in the area of international science that the COV refers to call the Global Research Council offers us the possibility of engaging international scientists is not only research but research evaluation. We will explore how this body might help us reach a wider perspective on research proposed to the NSF.

## **Section III. Management of the Program Under Review**

Overall, the COV found the AS programs to be well managed. The Committee raised points for discussion that are addressed in turn below.

### **OIII.2. Responsiveness to Emerging Research and Education Opportunities**

*COV: “Importantly, the COV thinks that NSF Program Officer participation in workshops, conferences, and other scientific gatherings are essential ways in which POs keep abreast of new developments, novel ideas, and emerging issues. As such, the COV recommends greater financial support to enable participation by POs in such activities. In parallel, while generally operating in the background at such events, POs also have formal and informal opportunities to share information with the participating scientists and to interact with early career scientists, thus enriching the activity.”*

*NSF:* The COV expressed interest in having NSF staff maintain good contact with scientists, in general, and early-career scientists, in particular. The program staff in AS attend small expert scientific meetings and large scientific conferences, as travel funds allow. They use these meetings to learn of emerging science topics and to interact face-to-face with researchers.

The AS program staff also organizes and participates in several specific activities specifically focused on early career scientists such as the annual Early Career Geosciences NSF Visit, the meeting of graduate studies in Minorities Striving and Pursuing Higher Degrees of Success (MS PHD’S), and the AGS Post Doc Workshop. Those who cannot join the meeting physically do so virtually using available technology.

#### **Section IV. Questions About the Portfolio**

Overall, the COV found the AS programs to be appropriately linked to the Mission of AGS and the NSF and well balanced in terms of the scope of research and its support. The Committee raised several points for discussion that are addressed in turn below.

##### **OIV.4. Inter- and Multi-Disciplinary Projects**

*COV: “[T]he COV notes that the number of interdisciplinary awards has increased, and hopes that this trend does not negatively impact smaller awards to individual investigators.”*

*NSF:* The COV noted concern that the increasing number of interdisciplinary projects over the years in the AS portfolio could threaten funding to single investigators. As a point of clarification, we believe that this concern by the COV refers to the number of collaborative projects since these, by NSF definition, involve single projects shared across multiple institutions. Interdisciplinary projects may involve a single researcher or, alternately, a group of researchers at the same institution. To the larger point, however, NSF encourages both single and multi-investigator projects and the AS programs seek to fund meritorious science within a diverse cadre of awardees.

##### **OIV.9. Rural Underserved Populations**

*COV: “The COV suggests greater acknowledgement of the neglected group of “rural underserved populations.” This would apply much wider than just this AGS section... (i.e., entire NSF). The COV suggests that there be a box to check on the proposal form, for this specific criterion.”*

NSF: The COV suggested that the NSF provide “greater acknowledgment of the neglected group of rural underserved populations.” As noted by the COV, having such a designation was beyond the purview of the AS.

While perhaps not addressing the COV’s concerns about rural populations directly, the NSF Experimental Program to Stimulate Competitive Research (EPSCoR) Program is designed to promote scientific progress in jurisdictions that have historically received lesser amounts of NSF Research and Development. These jurisdictions include rural areas. The AS programs make awards every year through this program.

## **Other Topics**

### **Q1. Stability of Paleoclimate Funding**

The COV noted that long-term stability for paleoclimatology, as a highly interdisciplinary research field, should be established. While singling out paleoclimatology specifically, this comment speaks to the larger challenge of making space in budgets and planning for research that crosses disciplinary lines. This is an area of active discussion within AS and beyond.

To the specific concerns of the COV for paleoclimatology, the Paleo Perspectives on Climate Change (P2C2) solicitation is currently being renewed, for multiple years, as a collaborative effort among all four divisions of the Geosciences Directorate. This speaks to the value of the science but also serves as one example of a collaborative management strategy that have been implemented when faced with research spanning multiple disciplinary boundaries.

### **Q3.a. Advanced Software for Reviewing Proposals**

The COV expressed concern that the merit review software used by the NSF was once state-of-the-art but is now lagging behind other professional software packages, such as those for journal reviewers and editors. Several members of the COV urged the NSF to update its reviewer management software package to the level of the professional scientific journals.

The NSF electronic business systems have evolved quickly over time but this comment suggests that more could be done. This comment is relevant to the whole of the NSF and will be discussed at that level.

### **Q3.b. Efficacy of the CAREER and AGS Post-Doc Programs**

The COV raised questions about the efficacy about the CAREER program and the Post-Doc program, and suggested that the NSF reevaluate its implementation.

The number of CAREER proposal submitted to AS has grown as has the success rate for CAREER proposals. The Section has been increasing the number of awards in CAREER in response to official and specific guidance from the NSF to do so. The discussion among the

COV members that questioned the wisdom of such investments was surprising since AS believes it is acting in response to a need from the community.

The AS Program Directors engage in active mentoring of early career researchers, especially regarding the suitability of CAREER projects to their professional goals or whether it would be better to pursue a different type of support.

As for the AGS Post-Doc Program, the program has only just completed its initial three-year solicitation duration. The AGS Division plans to assess the effectiveness of the program this year.

#### **0.5. COV process**

The COV expressed satisfaction with the COV process and offered some ideas to improve the process that included maintaining both virtual and face-to-face aspects and providing better coordination among COV members in sharing their assessments prior to arriving at the NSF. We will incorporate this good advice in future COV meetings and for other meetings as well.