

Committee of Visitors September 5-7, 2007
Lower Atmospheric Research Section
Division of Atmospheric Sciences
National Science Foundation

RESPONSES TO COV RECOMMENDATIONS

FY 09 Updates

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We thank the Committee of Visitors for their time and thorough evaluation of the merit review practices and research outcomes in the Lower Atmosphere Research Section (LARS). We are pleased that the Committee found our practices to be appropriate and the outcomes of LARS-supported research to meet the NSF's goals of Discovery, Learning, and Research Infrastructure. However, the Committee also made some recommendations, and we wish to take this opportunity to provide some responses.

[A.1.1.] LARS employs a mix of mail reviews and panels. [...] The COV finds that the mix of approaches is appropriate, but is concerned that the rationale for choosing when to use panels for proposals associated with field campaigns isn't well understood by the community.

Recommendation: *Program officers should have the flexibility to choose to utilize panels when needed and/or appropriate, but in the case of proposals associated with large field campaigns they should strive to communicate to the community the reasons for their choice.*

LARS Response: LARS Program Officers do attempt to communicate the reasons for such choices, and will make additional efforts to do so more effectively.

FY 08 Update: Two panels were held by LARS in FY 08, both for major field projects (VORTEX II and VOCALS). There was ample communication with the proposing community prior to those panels, and only positive feedback was received. The VOCALS project is an international collaboration involving several U.S. funding agencies who were involved in the planning. The NSF panel process was viewed as a fair and thorough way of evaluating the community's requests for support.

FY 09 Update: LARS, with the exception of the Paleoclimate Program and the P2C2 solicitation, did not hold any panels in FY09. However, program officers did participate in panels that were cross-cutting in nature, such as Collaboration in Mathematical Geosciences (CMG).

[A.2.4.] Currently reviewers are told of the two criteria and referred to a web site for further details. The review template, of course, asks for comments on both. The COV doubts that all reviewers will take the trouble to follow-up on the instruction. In particular, it would be difficult for them to get a sense of the balance

expected, on how their opinions on broader impacts will be used in reaching a decision, and on how much they should try to document their review of the secondary criterion.

Recommendation: *Program officers should detail these aspects prominently in their instructions and emphasize it in their communications with reviewers.*

LARS Response: LARS Program Officers will continue to advise reviewers on the importance of both review criteria. Our review request letters do include guidance on their use. We will look for ways to provide better information our communications with reviewers and panelists. General information provided to reviewers via the NSF website and FastLane is uniform NSF-wide and is regularly updated.

FY 08 Update: LARS Program Officers take great care to ensure that both review criteria are prominently mentioned in the review request letters.

FY 09 Update: Statistics indicate that the reviewers are continuing to respond to both criteria at a high rate. An additional criterion was added this FY with the mentoring program for post-docs. LARS made an effort to alert the community to this change, and we are just starting to see proposals and reviews that address this. By the FY10 COV, LARS will have a good idea how well the reviewers are responding to this new criterion.

[A.3.1.] In general, the stated target of four reviews per proposal was exceeded, with an average of five reviews per proposal throughout. There was some concern that multidisciplinary proposals and proposals that cut across programs and/or sub-programs are not well served by this target. If a proposal is truly multidisciplinary, a target of four reviews translates, at best, to two reviews per discipline.

Recommendation: *For multidisciplinary proposals and proposals that cut across programs and/or sub-programs, a target greater than four reviews per proposal should be set to ensure an adequate breadth of coverage needed for a full evaluation.*

LARS Response: We agree with the recommendation that generally a larger number of reviewers is needed to cover all major scientific subtopics of inter- and multidisciplinary proposals, and will strive to include more reviewers in future multidisciplinary proposals. We note that in the case of jointly reviewed proposals, generally all Program Officers involved contribute reviewer names to cover their respective disciplines.

FY 08 Update: LARS Program Officers strive to select reviewers with sufficient breadth in expertise, particularly for interdisciplinary or co-reviewed proposals.

FY 09 Update: LARS Program Officers continue to make efforts towards selecting the most appropriate reviewer pool for an individual proposal, with an eye towards inclusion of viewpoints from all of the relevant disciplines for each proposal.

[A.5.1.] An important aspect of the management of the section and programs is the allocation of budget. The Paleoclimate budget is conspicuously low when

compared to the budgets of the other programs. This was also noted in the NRC report "Strategic Guidance for the National Science Foundation's Support of the Atmospheric Sciences" (2007, page 66). This smaller budget faces proposal pressure (defined here as "dollars awarded per submitted proposal") greater than that faced by other programs within LARS.

Recommendation: *The COV is not in a position to comment on the appropriateness of the size of the budgets with the LARS programs. However, the committee does feel that in the same way that LARS prides itself in the transparency of the process associated with proposals it should also pride itself in the transparency of the process associated with the distribution of funds amongst programs. LARS should put in place an ordered process for deciding how it distributes funds amongst the programs. This process should be transparent and justified.*

LARS Response: Prior to the reorganization of the Section in 2004, LARS had six research programs of varying sizes. The reorganization resulted in three programs of roughly equivalent size, while the Paleoclimate Program remained smaller. However, equalizing program size was not a goal of the reorganization per se. Setting program budgets is fundamentally an internal management decision, and proposal pressure is only one possible decision criterion. We will attempt to provide future COVs with additional information about the various decision factors.

[A.5.1.] Another important aspect of the management of the section is decisions associated with large field campaigns. The COV found the processes employed and decisions made by the program officers to be excellent, but the COV is concerned that the community views many of these decisions to be arbitrary.

Recommendation: *There is a need for transparency and improved communication to the community regarding funding decisions for large field campaigns.*

LARS Response: As the Committee noted, very careful consideration is given to all proposals for large field programs. This involves review of the scientific and experimental plans, extensive discussions among LARS Program Officers and the Program Director for Lower Atmosphere Facilities (in the UCAR and Lower Atmosphere Facilities Section (ULAFOS)), as well as with facility managers in NCAR's Earth Observing Laboratory (EOL) and other facility providers. The apparent perception in the research community that these decisions are "arbitrary" is unfortunate and we will explore possible additional venues to improve communication with the community about NSF's rationale for decisions regarding large field programs.

FY 08 Update: LARS personnel continually communicate with members of the community about our process for choosing field projects – at meetings, workshops, and other formal and informal gatherings. For instance, the NCAR Facilities Users Workshop (September, 2007) provided an excellent opportunity to engage with the community.

FY 09 Update: FY09 brought another opportunity to address the community through the NCAR Facility Users Workshop. Ultimately, NSF can only explain the process of the decisions, as the actual recommendations can be shared only with the PIs of the projects.

[C.3.] The committee is satisfied that LARS program officers strive to include underrepresented groups in their portfolio of reviewers and PIs. However, a significant barrier to increasing participation of these groups is the small pool from which to draw.

Recommendation: *NSF must continue its efforts to increase the participation of underrepresented groups in science and engineering across all education levels.*

LARS Response: We certainly agree, and LARS will continue to participate in appropriate GEO and NSF-wide efforts aimed at increasing the participation of underrepresented groups. In addition, we will continue to encourage members of underrepresented groups in our investigator communities, as well as support efforts to engage students at all levels who are members of underrepresented groups in NSF-supported research. This is a very high priority for NSF as well as the section, division and directorate.

FY 08 Update: This remains an important goal. Additional efforts made include outreach by NSF Program Officers at NSF days and at professional meetings to identify potential new reviewers, especially from underrepresented groups. The PDM Program recently made an award for an REU site to a Minority-Serving Institution, with the goal of providing a large number of students from underrepresented groups the opportunity to experience research in atmospheric sciences.

FY 09 Update: LARS staff was engaged again in FY 09 in a variety of NSF outreach efforts. In the summer of 2009, LARS hosted a HACU (Hispanic Association of Colleges and Universities) student who compiled information about atmospheric science departments and potential reviewers. This tool can help Program Officers expand their reviewer pool and increase the number of reviewers representing diversity.

[C.3.] It was found that many PIs and reviewers pay little attention to the broader impact section of proposals and reviews. The COV feels that this is likely because the NSF has done an inadequate job communicating the importance and meaning of the broader impacts criterion to the community.

Recommendation: *The NSF should make clear the relative importance of Intellectual Merit and Broader Impacts to the community and encourage program officers to make and communicate funding decisions in accordance with that relative importance.*

LARS Response: See response above [A.2.4.].

Both recommendations under [C.3.] are directed at NSF rather than LARS; we will therefore communicate these recommendations to senior management.

[C.4.] The merger of the Large-Scale Dynamical Meteorology program with the Climate Dynamics program and the merger of the Physical Meteorology program with the Mesoscale Dynamic Meteorology program effectively removed an

artificial barrier and provided program officers with greater flexibility in their ability to make awards. The COV was impressed by the benefits afforded by this increased funding flexibility.

Recommendation: *While significant co-funding already exists amongst LARS programs, and the Section already has a small amount of discretionary funds, we ask the section to explore mechanisms for adding additional funding flexibility.*

LARS Response: There is indeed some degree of funding flexibility at all levels of NSF, and there are often opportunities for support from other parts of NSF or special competitions that the community or program officers can use to advantage, although these were not discussed in the material presented to the Committee of Visitors by LARS. Depending on management decisions, this flexibility can change from year to year. In times of sub-inflationary increases or declines in program funding levels, ATM and LARS practice has been to protect the core program budgets from cuts as much as possible. Any increase in other funds, such as division-level opportunity funds or reserves, would be at the expense of program core funds. In times of healthier budget increases, better opportunities exist for growing particular scientific priority areas and providing additional flexibility.

FY 08 Update: In FY 08, LARS successfully pursued a variety of leveraging opportunities to support our community, including Division and Directorate funds, collaboration with other agencies, and other Directorates. For instance, the ETBC (Emerging Topics in Biogeochemical Cycles) Program provided additional resources for several projects. Conversely, comparatively small investments by LARS programs enabled the support of some large awards made by other directorates via programs such as Peta-Apps and MRI (Major Research Infrastructure).

FY 09 Update: The LARS program budgets were significantly affected by ARRA funding. Many very good projects were funded, and importantly for the future, out-year “mortgages” have been significantly reduced. This will give LARS more flexibility in the next several years.

[C.5.]The committee’s only substantive concern about the COV review process involved Part B – Results of NSF Investments. The only information available to assess the quality of NSF investments comes in the form of annual and final project reports. The committee recognizes that the full impact of research cannot be fully appreciated after 1-3 years, but we feel that a sense of the quality of the work can potentially be gleaned from these reports provided PIs are conscientious about their content and level of completeness. The NSF does not keep relevant metrics to quantitatively evaluate performance from its granting activities (e.g., papers published, conference presentations made, etc.). The COV understands the reasons for this policy (i.e., manpower requirements to search out these records) and so has adopted a qualitative approach of highlighting relevant projects and grants that likely will produce significant advances in the science covered by LARS.

Recommendation: *LARS should explore mechanisms to quantitatively assess the results of the section’s investments at the time of submittal of annual and final*

project reports. The COV anticipates that much like the reviewer scores for proposals the “quality of investment” metric will sometimes be misleading. But like the reviewer scores for proposals the “quality of investment” metric will provide rough guidance for both program officers and future COVs.

LARS Response: We will continue to discuss better ways for providing input to COVs on the topic of “Results of NSF Investments.” We understand the need to summarize in some way the massive amount of material potentially available for this task, given the limited time available to the COV. On the other hand, the Committee needs to arrive at its own judgment of the quality of the research outcomes. We will explore potential ways of determining a “quality of investment” metric, although, as the Committee noted, such efforts are fraught with difficulties, both for ATM and NSF as a whole.

*[C.5.] The committee also **recommends** the following fine-tuning to the COV process, format and report template.*

1) It would be helpful to have information such as Months in ATM and Total Score made available in the eJackets.

[...]

3) It was noted that some of the review statistics provided to the COV only included reviewers who scored proposals. It was not uncommon for a reviewer to provide a text review but no score. These reviews should be enumerated in the summary statistics.

4) Questions A.5.1 and A.5.5 are identical. A.5.5 should be removed or changed.

[...]

7) The COV found the computer and software system inadequate. [...] We also recommend that software solutions be implemented that i) enable committee members to easily share documents created and edited on individual machines, ii) enable committee members to edit a common document (similar to the software currently used by panels), and iii) enable the contents of any monitor to be projected onto a screen and viewed by all.

LARS Response: The above recommendations address NSF-wide practices. We will therefore forward these recommendations to the NSF COV Coordinator. Item (3) touches on an issue that goes beyond the COV – mixed ratings are allowed by NSF, but are inconsistently displayed and utilized (for instance, in calculating an average review score) in the standard NSF software applications (reviews with mixed ratings tend to be displayed as “remarks only”). ATM FastLane representatives have pointed this out to the software developers, however, to this date there has been no fix. We will continue to recommend improvements.

FY 08 Update: These suggestions have been forwarded to the NSF COV Coordinator.

2) While all of the documents in the COV folder were made available in electronic form it would be helpful if information in tables were stored in spreadsheet form rather than PDFs. This would enable simple statistical information to be calculated and communicated quickly and easily.

LARS response: We agree and will provide such information in the future. We will add this to the list of recommended practices.

5) The information provided to the COV in binder form was very useful, but a lack of page numbers made it difficult to point committee members to common pages. Please provide page numbers for each section.

LARS response: We agree and will certainly correct this oversight in future COVs.

7) The COV found the computer and software system inadequate. We recommend that a solution be found that enables committee members to swivel their monitors so that program teams can more easily share information.

LARS response: We will pass these suggestions on to future COVs as recommended practices.

FY 09 update: The e-business rooms that the COV mentions have been de-commissioned. Future COVs will make primary use of updated laptops.

6) Ask program officers to provide lists of proposals that they feel are i) transformative/innovative, ii) high-risk, and iii) multidisciplinary/interdisciplinary.

LARS response: We agree and will provide such lists in the future. We note that the Program officers did identify proposals from all categories, including the ones mentioned above, as samples that were included in the initial selection of proposals provided to the Committee.