

**Office of Biological and Environmental Research (BER) Response to the
Report of BERAC Committee of Visitors Review of the Climate and
Environmental Science Division (SC-23.1)**

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Introduction

The Climate and Environmental Science Division (CESD) thanks the members of the 2010 Committee of Visitors (COV) for a thorough review of its programs and user facilities. The COV met for two days in July at DOE Headquarters in Germantown, MD and reviewed the four research program areas and two national user facilities comprising the major science elements managed within CESD. A thorough report was generated by the COV with specific recommendations for each element. CESD appreciates the thoughtfulness and dedication of COV members in performing their review functions. The recommendations are helpful to CESD and BER in ensuring that its processes, procedures and science are of the highest caliber.

This document serves as the official response by BER to specific recommendations offered by the 2010 CESD COV. Only those recommendations requiring a response are listed in this document. Additionally, for each recommendation an action plan or action(s) already taken are listed in more detail directly addressing the recommendation. In some instances, further clarification on the need for implementing recommendations is provided.

Responses to Comments and Recommendations

COV Recommendation	Program Response	Action Plan
General CESD (and BER) Issues		
The COV recommends that more support staff be made available for, for example, workshop and review planning and reviewer database maintenance. Additional PMs are needed as well as increased assistance for financial guidance document preparation for successful	BER is actively recruiting/hiring new program staff.	Since the COV review in July, CESD has hired two permanent PMs for Climate Modeling and has recently selected a person to fill the Ecologist position. Furthermore, an additional Physical Scientist hire is expected in the near term to address some of the programmatic tasks identified

proposals.		by the COV.
The COV recommends that more informative statements be included in declination letters.	BER agrees that more detail could be provided on declination letters to PIs.	BER will encourage PMs to provide more detail in declination letters to PIs. In addition, BER will articulate more clearly in declination letters that program managers will be available to further discuss questions or issues raised by PI's.
Experience of other agencies, in particular NSF, suggests that the productivity of PMs and support staff can be enhanced by a well designed and maintained electronic grants information system. There appears to be room for improvement in the system in place at DOE.	BER appreciates the finding of the COV.	A comprehensive electronic grants information system could be very useful and an improvement over current, largely hardcopy systems. A new Office of Science (SC)-wide electronic grants system is being developed that will directly address this COV finding.
Because the SFA is a large program of research, its size may inhibit a nimble response of the National Lab to current and changing needs for information. Accountability of all scientists associated with an SFA must be carefully monitored. Because this structure is in its infancy, discrete deadlines and mechanisms for reapplication will prevent complacency. The COV recommends a plan for recompeting SFAs be put in place as soon as conveniently possible.	BER agrees that vigilant oversight of the SFA programs at the Labs is required to ensure accountability and prevent complacency. A key element of and rationale for the SFA program is to provide a mechanism that encourages laboratories (in coordination with Program Managers) to respond rapidly to changes and needs in science and technology by redirecting resources to address new and forward looking challenges and opportunities.	Re-competition of National Laboratory programs is not the main intent of the SFA process. Rather, BER is challenging the National Laboratories to stand up and maintain long-term, team-oriented, mission-focused science within these programs that is distinct from financial assistance awarded to academic and/or private research institutions. That said BER conducts rigorous on-site reviews of SFA programs every three years as described in the document entitled "Managing BER Scientific Focus Area (SFA) Programs At the DOE National Laboratories" (http://www.science.doe.gov/ober/sfareview.pdf). These

		reviews are both retrospective and prospective in nature and are informed by renewal proposals.
The COV would encourage more effort to showcase the contributions of DOE to the public.	BER agrees with the COV and is in the process of developing more effective communications and public relations materials.	A communications team led by the BER Chief Scientist and composed of PMs across BER programs has been assembled and is developing new methods and communication products to showcase BER science. Highlights of BER science are collected weekly within BER for transmittal within SC, DOE and to the public.
Atmospheric Systems Research (ASR)		
To assess the quality and standing of the research supported through the solicitation process in the Atmospheric System Research (ASR) program, it is suggested that quantitative metrics of the output publications be considered. These metrics could also contribute to the identification of future research areas in the program.	BER appreciates the COV's suggestion. The ASR website does provide a list of all publications with options to search for a particular topic of science; and these lists are used to track program productivity. BER strives to use other mechanisms to identify and guide future scientific priorities and portfolios.	We agree that a well-designed set of metrics would potentially be useful in identifying science areas that need to be promoted. BER also uses broad input from the scientific community via dedicated workshops on challenges, opportunities, and discovery, to help guide CESD's programmatic priorities in addition to Advisory Committee review and input.
A requirement to include accomplishments from prior support from the Program (including ARM and ASP) as part of the proposal process should be formalized and these accomplishments should be considered in the scientific review.	The ASP and ARM programs did request that all renewal applicants include details of outcomes from prior support as a part of a full proposal, and this will continue in the future. Reviewers are verbally asked to consider this input in evaluating and rating each application.	ASR will continue to require applicants to provide a summary of prior progress in resubmissions to the program. This requirement will continue to be an explicit part future FOAs and reviewer instructions.
For proposals that rated good scientific reviews but were not funded for	BER agrees that more detail could be provided on documenting funding	BER will more fully document the process used to make funding decisions. In

<p>programmatic considerations, the programmatic issues used in funding decisions should be fully documented and suitably articulated.</p>	<p>decisions.</p>	<p>addition, BER provides all applicants with reviewer comments and abbreviated discussion in the formal decision letter regarding the status of their proposal. PMs do commonly communicate with declined PIs via telephone. Feedback on declined proposals is helpful to the PIs and the ASR program.</p>
<p>Increasing attention to PI diversity and balance across career development is strongly encouraged.</p>	<p>While diversity is an objective of the ASR, implementation of policies on diversity and selection is directed by the Office of Science rather than individual programs.</p>	<p>Career development is a strong secondary objective in ASR funding activities. ASR has four Post-Doctoral Fellows (PDF) at national and international modeling centers with a fifth PDF under consideration. Also, BER and ASR participate in the Early Career Research Program managed by the Office of Science.</p>
<p>The definitions of conflict of interest should be more formally defined.</p>	<p>DOE policies and rules on COI are set at the Office of Science level.</p>	<p>ASR will continue to articulate and implement these rules as clearly as possible with reviewers and panelists in the review process.</p>

Terrestrial Ecosystem Science/ Terrestrial Carbon Sequestration Research

<p>The COV lauds the enthusiasm of the PM for the newly consolidated program for terrestrial systems research. To strengthen the new program, the COV would encourage the PM to reduce the number of non-reviewed renewals so that awards would be guided by competitive processes that are transparent, rigorous and well documented.</p>	<p>It should be clarified that project renewals are not made without peer review. The committee may be referring to one-year extensions (adding a fourth year of funding to a previously reviewed and awarded three year project). One-year extensions have been used in the past when an additional year of funding is judged by the PM to be justified. This approach is used judiciously</p>	<p>Project renewals are not made without peer review and this practice will continue.</p>
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	and is not a routine funding mechanism.	
The COV recommends that the Terrestrial Ecosystem Science (TES) program consider bringing the state-of-the-art ecosystem models and climate modelers together to determine how ecosystem models can be better interfaced with climate models.	BER agrees with the recommendation.	The program will develop plans to conduct such a meeting, potentially in conjunction with the next PI meeting.
We recommend that the program rapidly transition to a system of solicitations for non-National Laboratory science that includes (1) an annual solicitation, (2) for the proposals that clearly have a term longer than three years, there should be fewer renewal proposals and more longer-term awards, and (3) funding for synthesis activities. We believe that such a system would better engage a broader research community in the program and improve the quality of the science. Additionally, funding synthesis activities is extremely worthwhile, especially in ecosystem science, and is very cost-effective research.	BER agrees with these recommendations.	The program follows general BER practice of making three-year awards for university-based research. It is generally expected that the majority of university projects should be able to be completed within this time frame. Procedures for making longer term awards for unique university projects requiring more than three years of funding will be explored. BER agrees with the COV that synthesis activities are extremely worthwhile and will work to promote such activities within the TES portfolio.
We recommend the program consider a solicitation to fund collaborative work with the Spruce and Peatland Responses Under Climatic and Environmental Change (SPRUCE) and NGEE.	BER agrees.	Both the Next Generation Ecosystem Experiment (NGEE) and Spruce and Peatland Responses Under Climatic and Environmental Change (SPRUCE) projects are intended to support external collaborators in addition to the core

		experiment. As these projects become operational over the next few years the TES annual solicitation will provide funding opportunities for university scientists to engage in and contribute to these projects.
The program should consider an emphasis on model needs or deficiencies as a selection criterion for proposals. This emphasis is an excellent tool for discrimination among proposals and for steering the program.	BER agrees.	Such an emphasis was highlighted in this program's most recent (FY 2010) solicitation and was an important criterion for making funding decisions from that solicitation. Such an emphasis will be continued in future solicitations.
The program should consider soliciting shorter, lower cost proposals for high risk-high reward ideas for proof of concept.	BER agrees.	Exploratory Proposals (\$150k total and 24 months of funding) were a component of this program's most recent (FY 2010) solicitation. Exploratory projects will be continued in future solicitations.
Progress (publication and particularly syntheses) often occurs after final progress reports have been submitted. To keep the program informed on publications, a system such as electronic search capacity (Web of Science) or providing some incentive for funded scientists to contribute information should be considered.	BER recognizes this challenge and agrees with the committee's recommendation.	We note several recent examples (e.g., FACE projects) where terminal funding was dependent on an analysis and publication plan to garner the maximum value from these long-term investments. The challenge is different for three-year university awards where it becomes the program's responsibility to identify and document publications following the end of the project. With the additional PM in place, BER will allocate more effort to tracking and cataloging post-project publications and accomplishments.

<p>The development of web pages that document the program and continue to update its impact should be considered a high priority while balanced with resource allocation needs.</p>	<p>BER agrees with this recommendation.</p>	<p>Web-based information about the program and its scientific impact will be a priority as the new PM and Physical Scientist come on-board.</p>
<p>The program is growing in stature and impact. That trajectory will be encouraged by continuing the transition from projects that are renewed with little review, to funding based on periodic solicitations for proposals and rigorous transparent reviews that are carefully organized to minimize bias and conflicts. The TES has made tremendous progress in this regard and should be encouraged to continue strides in this direction.</p>	<p>BER agrees.</p>	<p>BER intends for project renewals to be the exception in the future. Yearly solicitations and new awards will be the norm for university funding. As noted above, all renewals are made following peer review.</p>
<p>We recommend the program continue to solicit research on important topics in ecosystem response to global change that cannot be accomplished outside of the program.</p>	<p>BER agrees.</p>	<p>BER works closely with other Federal agencies through the U.S. Global Change Research Program to ensure that its programs are appropriately integrated with and distinct from those of other agencies. BER appreciates this guidance and will continue efforts to maintain a unique and impactful climate science program.</p>
<p>We recommend that a greater effort be made to recruit more highly qualified reviewers from outside the U.S., perhaps 20%.</p>	<p>BER will continue to encourage PMs to recruit reviewers of the highest quality regardless of national origin.</p>	<p>Recruiting qualified, unconflicted reviewers is an ongoing and recognized challenge. BER seeks to achieve balance in its panels, including gender, age, and institutional affiliation. PM's will be encouraged to continue to seek international representation as a form of</p>

		diversity on review panels.
Subsurface Biogeochemistry Research (SBR)		
The language dealing with the linkage between existing DOE field sites and DOE collaborators could be strengthened to emphasize the importance of this connection in the decision process.	BER agrees that while many funded projects do not have a direct connection to a field project, all projects must provide an explanation of the environmental relevance of the proposed research.	The language will be clarified in future FOAs.
The COV requests more consistent format and content of the annual SBR SFA progress reports to ensure that the reports are useful to all stakeholders. The COV encourages use of videoconferencing for progress reporting where possible.	BER agrees.	While guidance on the content of the report is part of the SFA plans and procedures, a review of the reports' format and utility is appropriate and will inform next year's annual report submissions. SBR will consider the merits and logistical realities of videoconferencing in its program review processes. In-house videoconferencing facilities are available.
The new SBR strategic plan has the potential to broaden the scope of the portfolio and link to the climate change and carbon-cycling efforts in CESD. This would allow SBR to contribute to additional DOE goals and critical societal needs.	BER appreciates the finding.	Broadening the scope of SBR research is intended to allow for more effective integration within CESD, enabling BER to develop new initiatives across programs. The broadened SBR scope will be part of a new CESD strategic planning process.
There is a need for development of a comprehensive data management plan for all IFRCs. Apparently, a workshop is scheduled where this issue will be discussed. Any plan should include arrangements for data-sharing outside the IFRC-funded team within a reasonable time.	BER agrees.	Preliminary plans for a workshop on data-management/data-sharing systems within SBR are being developed in FY11. This effort will be coordinated with similar activities ongoing with the climate science programs and genomic science programs within BER.

Plans for recompeting IFRCs should be developed soon.	BER agrees.	The IFRC projects have been extended for one year to complete ongoing activities. The SBR program will request proposals for new research in FY2012.
Climate Modeling Programs		
Given the high importance and national and international prominence of the activities of the Climate Modeling Program and the extensive responsibilities of its PMs, a program of mentoring for new PMs would be appropriate.	BER agrees with this recommendation.	Mentoring of relatively new program management staff for this program is ongoing. Similar mentoring efforts will be made with future new hires.
The allocation of high-performance computing resources is decoupled from Climate Modeling projects. This procedure has been successful to date because of the expansion of available resources and the good will of the participants. However, as demands increase, it would be prudent to install a more systematic method for the allocation of high-performance computer resources coupled to the funding of the project.	BER agrees.	BER understands the intent of this recommendation and is working with the Office of Advanced Scientific Computing Research to explore ways to more closely align the allocation of resources from these two Office of Science programs.
The COV recommends an increase in the number of Program managers for Climate Modeling to accommodate the size and complexity of the program element. With addition of a third PM, the number of PMs will possibly be sufficient, but we suggest	BER appreciates the comments.	BER has addressed these issues through the recent hire of two permanent PM's (a net increase of one staff). In addition, there are two other PMs who have responsibility for pieces of the climate modeling portfolios. This is enabling the PM's to attend

<p>that one-to-two additional (4-5 total) managers would allow for PMs to have more time to interact with PIs, stay up to date in the science, allow engagement in long-range planning activities, and participate in interagency activities.</p>		<p>more scientific meetings. BER is continuously evaluating its staffing needs and share these needs with Office of Science leadership.</p>
<p>Long-term support for vital high-profile activities is needed but lacking.</p> <ul style="list-style-type: none"> ○ PCMDI: Serving of climate model results and the maintenance and development of associated software are crucial activities, vital for national and international climate research. Support for this project is moving from SciDAC to the Climate Modeling Program, which reduces funds available for other program activities and has the potential to reduce the stability of PCMDI support. International partners are seeking a decadal commitment to support for the availability of climate model output. ○ Computing for IPCC and Coupled Model Intercomparison Project (CMIP): The development and integration of climate 	<p>BER agrees.</p>	<ul style="list-style-type: none"> ○ The comment about PCMDI is related to support for the Earth System Grid (ESG) program, of which PCMDI is a major partner. BER agrees with the concern expressed and is working with the Office of Advanced Scientific Computing Research, to identify mechanisms to maintain ESG without negatively impacting the CESD modeling programs. ○ BER also agrees with the need for advanced planning to support future national and international modeling needs. BER is currently working with the Office of Advanced Scientific Computing, and National Laboratories to identify planning mechanisms for these future needs. It is anticipated that BER will work together with other Federal and international agencies to insure that effective planning for future modeling needs is in place.

<p>models takes several years. In order to plan effectively, climate modelers must know what computing resources will be available. For example, planning for CMIP6/IPCC AR6 should be underway now.</p>		
<p>Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF)</p>		
<p>ACRF is now managed separately from the science that uses data generated by the Facility. A reliable mechanism for frequent communication exchanges with the modeling scientists needs to be established.</p>	<p>BER disagrees with the premise that the relationship between ACRF and the supporting research programs (now known as ASR) has changed.</p>	<p>The ARM program managers attend the ASR Working Group and Science and Infrastructure Steering Committee (SISC) meetings and hold regular meetings with the ASR program managers. Mechanisms are in place for ARM to routinely solicit scientific input from ASR scientists, the ASR working groups and the SISC. These mechanisms are long-standing, time-tested and proven to be effective.</p>
<p>Consider convening a face-to-face meeting or telecon for the technical merit review panel to discuss disparate proposal evaluations. There are advantages and disadvantages to this approach.</p>	<p>BER agrees.</p>	<p>BER is currently implementing face to face meetings for its technical merit review panels for this program.</p>
<p>The COV recommends that “best estimate” data set development activity should</p>	<p>BER agrees.</p>	<p>Input will be solicited from the community to identify candidate data sets and</p>

<p>be continued and broadened to include measurements/data from other areas of earth science research.</p>		<p>establish priorities for their development.</p>
<p>Assess whether the ACRF measurement suites deliver sufficient chemical and biogeochemical data to support the “basic development of climate model components, with an emphasis on incorporating missing physical and biogeochemical processes in Earth System Models”.</p>	<p>BER agrees.</p>	<p>This will be accomplished through a workshop that will be scheduled during the upcoming year and through input from the ASR working groups. The design of the workshop will be developed jointly by ARM, modeling and ASR program managers.</p>
<p>We recommend that ARM implement an agreement (“terms of use”) on the data registration web page to include a standard one-sentence acknowledgment statement in all publications or presentations that make use of ARM/ACRF data. The statement should include “ARM/ACRF” and/or other unique keywords to facilitate citation searches and assessment of the stature and scientific impact of ACRF.</p>	<p>BER agrees.</p>	<p>The recommendation will be implemented as soon as possible.</p>
<p>Environmental And Molecular Sciences Laboratory (EMSL)</p>		
<p>The users of the Environmental Molecular Sciences Laboratory (EMSL) facilities write short proposals to obtain access to the sophisticated instrumentation and expert guidance of EMSL</p>	<p>BER agrees with this recommendation.</p>	<p>Guidance will be transmitted to EMSL to enforce the proposal guidelines on user access proposals for next round of user proposals.</p>

<p>personnel. The COV strongly recommends that proposal guidelines be firmly enforced to prevent the perception of, or actual, inequitable treatment.</p>		
<p>The program is effective with an appropriate external and internal review process which, if conducted in the future in a manner that enforces the proposal requirements, will make the appropriate allocation of facilities time.</p>	<p>BER agrees.</p>	<p>Guidance will be transmitted to EMSL to enforce the proposal guidelines on user access proposals.</p>
<p>The definition of “distinguished” user should clearly indicate recognition of the highest level of scholarship and research accomplishment.</p>	<p>BER agrees with the spirit of this recommendation – that the definition of “Distinguished User” should clearly identify users that are distinguished solely by scientific accomplishment or recognition.</p>	<p>BER will work with EMSL to evaluate a way to more clearly distinguish scientific from organizational recognition in this definition.</p>
<p>BER and EMSL are encouraged to attempt to attract more industrial users. The panel recommends that the facility work hard and encourage more “partner proposals” with individuals and groups of users.</p>	<p>BER agrees with this recommendation.</p>	<p>BER will ask EMSL to propose outreach mechanisms and/or incentives that would increase the potential for industrial users.</p>
<p>Continue to maintain support to allow continued acquisition of state-of-the-art equipment.</p>	<p>BER agrees with this recommendation and recognizes the need to maintain state of the art capabilities at EMSL.</p>	<p>BER will continue to develop capitalization plans for EMSL and strive to maintain support for acquisition of state-of-the-art equipment.</p>
<p>Include in the FY2011 science and operational review of EMSL a comprehensive assessment of ES&H.</p>	<p>BER agrees with this recommendation.</p>	<p>The next EMSL review will include an ES&H component.</p>

<p>The travel budget for the program manager should be increased by 50% to allow travel to scientific meetings as well as additional travel to EMSL.</p>	<p>BER recognizes the potential travel needs of PM's with responsibilities for facilities.</p>	<p>Each Division in BER holds a reserve for travel needs beyond the standard PM allocation. Facility PM's are given high priority in the allocation of these reserve funds. To date BER has been able to accommodate all necessary travel through this mechanism.</p>
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