

**CORE QUESTIONS and REPORT TEMPLATE
for
FY 2009 NSF COMMITTEE OF VISITOR (COV) REVIEWS**

Guidance to NSF Staff: This document includes the FY 2009 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2009. Specific guidance for NSF staff describing the COV review process is described in Subchapter 300-Committee of Visitors Reviews (NSF Manual 1, Section VIII) that can be obtained at <www.inside.nsf.gov/od/oia/cov>.

NSF relies on the judgment of external experts to maintain high standards of program management, to provide advice for continuous improvement of NSF performance, and to ensure openness to the research and education community served by the Foundation. Committee of Visitor (COV) reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions; and (2) comments on how the results generated by awardees have contributed to the attainment of NSF's mission and strategic outcome goals.

Many of the Core Questions are derived from NSF performance goals and apply to the portfolio of activities represented in the program(s) under review. The program(s) under review may include several subactivities as well as NSF-wide activities. The directorate or division may instruct the COV to provide answers addressing a cluster or group of programs – a portfolio of activities integrated as a whole – or to provide answers specific to the subactivities of the program, with the latter requiring more time but providing more detailed information.

The Division or Directorate may choose to add questions relevant to the activities under review. NSF staff should work with the COV members in advance of the meeting to provide them with the report template, organized background materials, and to identify questions/goals that apply to the program(s) under review.

Suggested sources of information for COVs to consider are provided for each item. As indicated, a resource for NSF staff preparing data for COVs is the Enterprise Information System (EIS) –Web COV module, which can be accessed by NSF staff only at <http://budg-eis-01/eisportal/default.aspx>. In addition, NSF staff preparing for the COV should consider other sources of information, as appropriate for the programs under review.

Guidance to the COV: The COV report should provide a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the **processes** related to proposal review; and (B) the quality of the **results** of NSF's investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. Discussions leading to answers for Part A of the Core Questions will require study of confidential material such as declined proposals and reviewer comments. *COV reports should not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Core Questions will involve study of non-confidential material such as results of NSF-funded projects. The reports generated by COVs are used in assessing agency progress in order to meet government-wide performance reporting requirements, and are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

We encourage COV members to provide comments to NSF on how to improve in all areas, as well as suggestions for the COV process, format, and questions. For past COV reports, please see <http://www.nsf.gov/od/oia/activities/cov/covs.jsp>.

**FY 2009 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)**

The table below should be completed by program staff.

Date of COV: June 4-5, 2009
Program/Cluster/Section: MGG; ODP; OTIC; Ocean Education; Chemical Oceanography; Physical Oceanography; Biological Oceanography
Division: Ocean Sciences
Directorate: Geosciences
Number of actions reviewed: 130 Projects (225 Proposals) Awards: 39 projects (67 proposals) Declinations: 91 projects (158 proposals) Other:
Total number of actions within Program/Cluster/Division during period under review: 2603 projects (3,886 proposals) Awards: 364 projects (1104 proposals) Declinations: 918 projects (2782 proposals) Other:
Manner in which reviewed actions were selected: Budget, Finance, and Awards division provided OCE with a spreadsheet with Program Element, Proposal ID, mail reviewer average score and panel average score, and overall average of the proposals for FY 06-08. The number of proposals per program to be reviewed was prorated based on the total number submitted per program. Proposals were randomly selected from the following categories: award-low rating, decline-high rating, award high rating, decline low rating, and some in the middle. Any of the proposals that involved one of the COV members was removed and replaced with another proposal with similar ratings.

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

A.1 Questions about the quality and effectiveness of the program's use of merit review process. Provide comments in the space below the question. Discuss areas of concern in the space provided.

<p>QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS</p>	<p>YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE¹</p>
<p>1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?</p> <p>Yes, based on our analysis of a sample of 130 projects provided by the OCE Program Officers for our evaluations, as well as discussions with OCE Program Officers and the Division Director. The number of projects (130) was less than the number of proposals (225) reviewed because for collaborative projects with more than one PI, proposals submitted by each PI were identical. Proposals chosen were those that were ranked low- yet funded, and those that were ranked high- yet declined. Our review was not of the scientific content of proposals, rather it was of the Program Officer's decisions based on information contained in proposal jackets. Jackets consist of the mail reviews, panel summaries, Program Officer notes (Review Analysis), and notes on their communications with PIs. Mail reviews, panel summaries, and Review Analysis are made available to PIs.</p> <p>The National Science Foundation, Ocean Sciences Division, Committee of Visitors finds that the research programs in Ocean Section, Marine Geosciences, Ocean Technology and Interdisciplinary Coordination, and the Education Programs are well managed and support innovative, high quality science and education. The OCE management team consists of dedicated, and highly capable individuals doing an exceptional job in facilitating and managing oceanographic research and education.</p> <p>Comments: We are impressed at the extent of work and conscientiousness of the Program Officers to document their decisions. There is a logical train of thought from mail reviews to decision, which is well documented in Review Analysis. OCE</p>	<p>Yes</p>

¹ If "Not Applicable" please explain why in the "Comments" section.

<p>processes approximately 1300 new proposals each year, obtains at least three mail reviews for each proposal, and conducts panel reviews for ~90% of the proposals submitted to the science sections (see Graph Percentage of Proposals to Panel by program).</p> <p>OCE occasionally makes use of site visits; however, the COV did not review their procedures for site visits. Site visits apparently are not practical for most projects. Instead PIs are invited to come to NSF to meet with Program Officers, and meet with them at professional meetings. Given the work load of the Program Officers and staff, the review methods are appropriate.</p> <p>We discussed the possibility of allowing a PI the opportunity to respond to or rebut mail reviews. However, our review of jackets showed that panel members often were able to arbitrate discrepancies between mail reviewers, and the mail review is only a part of the entire review process. We were also concerned that the rebuttal process may raise the rating of all proposals that had the opportunity for rebuttal- thus not making the decision process any easier.</p>	
<p>2. Are both merit review criteria addressed</p> <p>a) In individual reviews? Yes, for the most part. The broader impact criterion is occasionally omitted from the mail reviews, and when present, can be cursory.</p> <p>b) In panel summaries? Yes</p> <p>c) In Program Officer Review Analyses? Yes, these are exceptionally well developed and written and presented.</p> <p>Comments:</p> <p>In general, the whole review process does an excellent job in assessing Criterion I, Intellectual Merit (IM). It is appropriate that IM should be the most weighted criterion on which to base the funding decision. Program Officers do an admirable job of explaining technical faults that kept proposals from being selected.</p> <p><i>Before the panel meeting it will be beneficial for panelists to have in hand a clear and cogent policy statement involving IM and Broader Impacts (BI) criteria. After reviewing the jackets, it was clear to us how IM fits into the decision process. However, the COV found no instances in the sample of 130 projects wherein the BI criterion appeared to be the decisive factor affecting the decision to fund. We agree that IM should continue to receive the most weight in the decision to fund. Program Officers weight the BI in different proposals to greater or lesser extent, and they need the flexibility to continue to do so. Nevertheless, considering the perceived worth of the BI criteria, we ask that the impact of BIs on the decision process be well documented and explicitly included in panel summary and Review Analysis for feedback to PIs.</i></p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>

<p>3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?</p> <p>The majority of the proposals read had concrete specific reviews. There were, however, instances of cursory reviews. We were pleased to see that the reviewers making thorough and substantive comments were the ones that most influenced panel and Program Officers' decisions.</p> <p>Comments:</p> <p>There can be a problem when Program Officers get a small number of mail reviews, some of which are cursory. Since decisions are based on content rather than on scores, using the guideline of a minimum of 3 reviews is not adequate when reviews are cursory. However, we found that this is a rare occurrence (see Graph Mail Review Return Rate by Program). In some programs, Program Officers ask the lead panelist to write a review before reading the mail reviews prior to the panel; this ensures one additional substantive independent review that the panel and Program Officer will have to consider. In other programs, the lead panelist may be asked to write a review at the panel meeting to ensure the guideline of a minimum of 3 (substantive) reviews. Another issue is that, there is the perception that if many reviews (7-10) were returned of varying opinions, then that resulted in a project being declined. <i>In the future, a helpful statistic for the COV to use would be the number of mail reviews per proposal versus the success of proposal, and broken down by program.</i> This will address the perception (or perhaps misconception) that the more reviews a proposal has, the lower its chance of funding success.</p> <p>The COV will write an article for EOS on their analysis of the review process and results. In this article, the COV will convey to the community the importance of substantive comments.</p>	<p>Yes</p>
<p>4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?</p> <p>Panel summaries go directly to PIs as feedback. In the majority of cases reviewed by the COV, panel summaries were adequate. However, in a small fraction of cases the summaries did not communicate the decision making process. When a panel summary does not adequately convey factors going into the decision, mechanisms need to be put in place to ensure that adequate feedback is given to PIs. For example, Program Officers could (and often do) communicate additional information to PIs. Uniform expectations for panel summaries across programs may enable better documentation of panel discussions and communication to PIs, and reduce the apparent variability in the thoroughness of panel summaries across programs.</p> <p><i>To aid future COV analyses of panel summaries, we ask Program Officers to identify the expertise of the panel members in the jacket.</i> For example, on a small number of interdisciplinary proposals, it was not always possible to identify the backgrounds of the panelists to decide if there were adequate</p>	<p>Yes</p>

<p>representatives from relevant disciplines on the panel.</p> <p>Comments:</p> <p><i>We strongly request that panel summaries be comprehensive and adhere to standard format for all OCE programs.</i></p>	
<p>5. Does the documentation in the jacket provide the rationale for the award/decline decision?</p> <p>(Note: Documentation in jacket usually includes context statement, individual mail reviews, panel summary (if applicable), site visit reports (if applicable), Program Officer Review Analysis, and staff diary notes.)</p> <p>Yes</p> <p>Comments:</p> <p>The Review Analyses were exceptionally well developed, written, presented and appear to accurately reflect the thinking leading to the award/decline decision. E-Jacket system is impressive and appears to be an outstanding method for tracking the decision process.</p>	<p>Yes</p>

<p>6. Does the documentation to PI provide the rationale for the award/decline decision?</p> <p>Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, a Review Analysis from the Program Officer (written or telephoned with diary note in jacket) with the basis for a declination.</p> <p>Yes</p>	<p>Yes</p>
<p>Comments:</p> <p>Program Officers are doing an excellent job of transmitting the rationale for the decision via the Review Analyses that go to PIs, along with the mail reviews and panel summaries. In some cases there is evidence that the PI's previous efforts to strengthen a proposal were appreciated by the panel, and used effectively to counter more recent modest peer review scores. This is an example of the system working. <i>However, we have a concern relating to resubmissions-encouragement or otherwise. How many is too many (resubmissions)? How is this best conveyed to the PI?</i></p>	

<p>7. Is the time to decision appropriate?</p> <p>Note: Time to Decision --NSF Annual Performance Goal: For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later. The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals.</p> <p>Yes. OCE exceeds the NSF annual performance goal based on the graphs provided by OCE. During 2006-08, OCE informed 78-86% of applicants about a funding decision within six months of the agency's proposal receipt (see Graph OCE Percentage of Proposals Processed Within 6 Months of Receipt.</p> <p>Comments:</p> <p>In addition, on COV-reviewed proposals that were declined, a decision was reached and the PI informed sooner than proposals selected for funding by about two weeks on average. Based on 225 proposals, 197 (88%) reviewed decisions took less than 6 months (average number of days = 156, declines took 150 days, awards took 170 days).</p>	<p>Yes</p>
<p>8. Additional comments on the quality and effectiveness of the program's use of merit review process:</p> <p><i>Program Officers need to make it clear to the community and mail and panel reviewers that Broader Impacts does make a difference when all other factors in the review produce two proposals that are equally meritorious. Furthermore, BIs other than education and diversity are underutilized. For example, enhancing the conservation of a fishery is an appropriate BI, even though it could not serve as the primary Intellectual Merit.</i></p> <p>We are impressed that presently nearly 30% (based on statistics supplied to COV by program) of all proposals submitted to OCE are reviewed by two or more programs. However, the success rate for these proposals is on the low end of the OCE rates ~20%. <i>We are concerned by the perception that key research on the edge of two disciplines (e.g., potentially addressing multidisciplinary topics) may be falling through the cracks.</i> In discussion, OCE personnel recognized that interdisciplinary teams may provide new insights and approaches, but that sometimes proposals that claim to be interdisciplinary do not have clear connections between all proposed data collection activities and the integrated objectives of the project. As in other NSF divisions, future funding for interdisciplinary projects is expected to rise.</p> <p>Based on proposals reviewed, it appears that the majority of biogeochemistry proposals were reviewed by CO program. It was not clear why or how this was decided. Again, there was no way for the COV to know whether there was a BO person on the CO panel and vice versa (see comment under A2.1, 2.4).</p> <p>We understand that OCE Program Officers are giving more weight to substantive comments</p>	

than to reviewer’s scores, and we agree with this decision, see A1.3. As a consequence, there does not appear to be a correlation between proposal scores and funding actions. In as far as scores play some part in the decision process, an effort should be made to improve the correlation between scores and awards. The numerical scoring system can be improved – as an example, scoring as “competitive”, “potentially competitive”, “not competitive”, or developing an improved scoring system that is more consistent with the funding actions. *We recommend that future COVs revisit the correlation between proposal scores and funding actions, and the numerical scoring system for proposals.*

A.2 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE ²
<p>1. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>Yes.</p> <p>Comments:</p> <p>However, in some cases where there was interdisciplinary work proposed, COV was not able to determine the background of the mail reviewers and panelists. <i>It will help future COVs to have major program alliance coded for mail and panel reviewers.</i> We found clear evidence of diversity of expert backgrounds in certain programmatic areas. For example, technical proposals (new technologies for unique science/application) will often have reviews from individuals in other fields where applications may be very different, but operational criteria the same. Thus, PO scientists were asked to comment on proposals by MGG scientists when technical issues demanded it. This type of balance should be maintained as appropriate.</p> <p>Understandably, we have the impression that the breadth of mail reviewer’s expertise is wider than panelists. In recent years OCE has been cognizant of the fact that panel size and programmatic expertise needs to be tailored based on the number and disciplinary focus of the proposals received for a given panel. This is a good trend, and obtaining a fair panel composition is especially challenging for interdisciplinary initiatives.</p>	<p>Yes</p>
<p>2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?</p> <p>Comments:</p>	<p>We did not</p>

² If “Not Applicable” please explain why in the “Comments” section.

<p>The jackets reviewed indicate that reviewers are drawn from a diversity of institutions from throughout the country. The numbers of women in our community has increased, and in the reviewer pool and panels they have increased over the years. We can assess gender based on names. However, we did not have the data to determine if reviewers were from underrepresented groups. Note that demographic data is self reported, with only about 25% of reviewers reporting this information. See attached Graphs on Reviewer Percentage by State, Reviewer Gender Percentage, Reviewer Minority Status, Overall Success Rate by PI as compared with Number of Proposals Submitted by PI Characteristic, and Success Rate by Institution Type.</p> <p>The larger issue of underrepresentation in ocean science remains. The Geosciences Directorate has studied the problem of underrepresentation and proposed steps to enhance diversity in the Geoscience workforce by assisting education and research training (see Strategy for Developing a Program for Opportunities for Enhancing Diversity in the Geosciences (NSF 01-53)). Furthermore, "GEO will increase its efforts to address the underrepresentation of women and minorities in the Geosciences by encouraging their active participation in its programs" (<i>NSF Geosciences Beyond 2000</i> - NSF 00-27). In support of this aim, <i>the COV recommends that women and scientists from underrepresented groups be consistently well represented as reviewers and on panels.</i> According to data in Graph OCE Success Rate by PI Characteristic and Graph OCE Proposals Submitted by PI Characteristic (see attached), the number of minority submissions have gone up somewhat over the years, but their proportion of the total is still quite low, and their success rate is much less than established majority investigators. The OCE Program Officers are well aware of the need for broader participation in the reviewer pool. Under A3.11, we discuss this further.</p>	<p>have the data to evaluate minority participation</p>
<p>3. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p>Yes, and they are well documented in the Program Officers' Review Analyses.</p> <p>Comments:</p>	<p>Yes</p>

4. Additional comments on reviewer selection:

Coding of reviewers and panelists as to their primary discipline, would make it easier for a future COV to judge appropriateness of panelists for the review process.

New PIs have a lower success rate than other PIs (see Graph OCE Success Rate), see data in Graph OCE Success Rate by PI Characteristic (attached). And there is a perception that it is difficult for new investigators to gain access into existing integrated or interdisciplinary programs without having some inside connections. For working to dispel the perception, we applaud OCE for bringing early career scientists into the panel experience, and thus supporting a healthy mixture of junior, mid-career, and senior panelists.

A.3 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE ³ , OR DATA NOT AVAILABLE
<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p>The overall quality of the research and education programs supported by OCE is extremely high. Research sponsored by OCE clearly enables the U.S. to be a world leader in ocean science and technology. The advances in our understanding of the oceans support fundamental societal needs for information to make sound decisions in a changing climate.</p> <p>Comments:</p> <p>See attached: OS Highlights for 2009 COV.pdf</p>	Appropriate
<p>2. Does the program portfolio promote the integration of research and education?</p> <p>Yes</p> <p>Comments:</p> <p>OCE is to be commended for the many ways in which awards promote the integration of research and education, and these can be seen in statistics provided. Some of these integrations of research and education include: COSEE, REUs, graduate students, post docs, K-12 educational activities.</p> <p>See attached spread sheet: OCE Personnel data_OCE-COV.xls</p>	Appropriate
<p>3. Are awards appropriate in size and duration for the scope of the projects?</p> <p>Yes. In some cases, awards involving field work could be longer.</p> <p>Comments:</p> <p><i>We are concerned that the mean award size by OCE as a Division and for</i></p>	Appropriate

³ If “Not Appropriate” please explain why in the “Comments” section.

<p><i>the individual programs has remained constant over the past 6 years. Considering inflation, in reality this represents a decrease in award size.</i></p> <p>The OCE Division mean award duration has increased slightly from 2.85 to 2.95 years over the period 2006-08. It increased in some parts of OCE, and it has decreased in others. While the OCE trend is in the right direction, the increase is small. This is a concern because in some cases it takes 3-5 years to make progress with field programs. The issue is that PIs tend to submit 2- or 3-year proposals, apparently because they are afraid that longer projects will be downgraded by reviewers. Program Officers stressed that they recommend to PIs that they submit proposals for the duration needed to conduct the research. <i>We recommend that Program Officers continue to be alert for inadequate proposal durations, and work toward raising awareness in the community about this issue.</i> Another problem with short duration proposals is that they do not allow graduate students sufficient time to complete dissertation research. Though we do not have the statistics, we have the impression that a significant portion of awards involving field and maybe laboratory work eventually request no-cost extensions or supplements. In the proposed EOS article, the COV will let the community know that the best strategy is to ask for the amount of funding needed to do the job adequately.</p> <p>See attached graphs: Mean Annual Award Size, Annual Award Size by Program, Mean Award Duration, Mean Award Duration by Program.</p>	
<p>4. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Innovative/potentially transformative projects? <p>It is clear that OCE is funding innovative and potentially transformative projects. Furthermore, across the OCE Division, the success rate for proposals identified as high risk/high reward is about double that for other proposals. Examination of OCE Highlights gives examples of work funded by the Division that has been published in such high profile journals as <i>Science</i> and <i>Nature</i>.</p> <p>Comments:</p> <p>“Transformative” science is difficult to identify in real time. OCE is doing a good job to foster acquisition of data and development of new techniques and approaches wherever possible that may result in breakthrough discoveries. The OCE portfolio provides good evidence of science that is being funded that goes well beyond incremental knowledge.</p> <p>What is an appropriate balance - how should innovative/potentially transformative projects be identified? The present practice is for Program Officers to ask panelists to identify these proposals. It is clear from the jackets that Program Officers are aware of the need to identify these categories. <i>We recommend that the GEO Advisory Committee provide further guidance to OCE on identifying innovative/potentially transformative projects.</i></p>	<p>Appropriate</p>

<p>See attached OS Highlights for 2009 COV.pdf. Graphs of: Number of SGER Awards, SGER Award Amounts in Current Dollars, SGER Awards as a Percentage of the Total Budget, OCE Identified High Risk/High Reward Proposals for FY 2008, OCE Success Rate for High Risk/High Reward Proposals – FY 2008.</p>	
<p>6. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program?</p> <p>Yes, as far as we can tell (see Graph OCE Success Rate by Program). Most of this was already answered in other questions, see above.</p> <p>Comments: What is the definition of appropriate? NSF/OCE funds mostly unsolicited, bottom up, i.e., what the community thinks are important proposals.</p>	<p>Appropriate</p>
<p>7. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Awards to new investigators? <p>NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant.</p> <p>Yes, as far as we can tell.</p> <p>Comments:</p> <p>OCE appears to be doing an admirable job of including new investigators, with new PIs comprising 15-20% of awards though their success rate is lower than the mean (see A2.4). <i>We recommend that OCE continue to make a concerted effort to invite new investigators to serve as panelists so that they can “learn the system.”</i> We also note that OCE sponsors Dissertation Symposia, which are bi-annual meetings of recent doctorate recipients for each of the disciplines:</p> <p>Chemical Oceanography: DISCO: 2006, 25 participant; 2008, 25 participants.</p> <p>Biological Oceanography: DIALOG: 2006, 43 participants. Eco-DAS, 2008 38 participants.</p> <p>Physical Oceanography: PODS, 2006, 25 participants; 2008, 24 participants. Patullo Conferences under MPOWIR program (see A3.11), 2008, 26 participants.</p> <p>MGG: MGLI: 2009 (first ever), 25 participants.</p> <p>See attached Graphs: Percentage of Awards to New PIs, OCE Success Rate</p>	<p>Appropriate</p>

<p>by PI Characteristic.</p>	
<p>8. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? <p>Yes, as far as we can tell.</p> <p>Comments:</p> <p>Again, what is appropriate? A reasonable number of PIs are funded at non-coastal institutions.</p>	<p>Appropriate</p>
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>Yes, as far as we can tell.</p> <p>Comments:</p> <p>Again, what is the definition of appropriate? Success rate by institution type shows 100% success for 2-year institutions, and almost equal success rates for all other institutions during 2006-08.</p> <p>See attached Graphs: Award Percentage by Institution Type, Success Rate by Institution Type,</p>	<p>Appropriate</p>
<p>10. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and sub disciplines of the activity? <p>Yes, very much so as evidenced by data in attached graphs.</p> <p>Comments:</p> <p>See attached Graphs: Ocean Research Program Budgets in Current Dollars, OCE Annual Award Size by Program</p>	<p>Appropriate</p>
<p>11. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>While progress has been made, issues of underrepresentation persist, see A2.2. Developing a complete understanding of the problem and how to remedy it was hampered by a lack of detailed data. Nevertheless, it was clear from the information provided that Ocean Sciences receives relatively few proposals from minority investigators and that their success rate is relatively low.</p> <p>Comments:</p> <p>Persons from underrepresented groups do not always self identify. Minorities</p>	<p>Insufficient data</p>

<p>and women are underrepresented in science and ocean science as a whole. The OCE success rate for women increased from 23% in 2006 to 27% in 2008 while overall OCE success rate also increased. In particular, we applaud the Physical Ocean Program for its funding of MPOWIR (Mentoring Physical Oceanography Women to Increase Retention, www.mpowir.org). In recognition of the leaky pipeline in Physical Oceanography, the community organized to take responsibility and try to plug the leak. The MPOWIR programs are multifaceted involving a Patullo Conference for early career PhDs, Mentoring Groups, Seminars at national meetings, and statistics are being collected to track the success of MPOWIR.</p> <p>Recent GEO strategy (NSF 01-53) outlines a series of proposed actions aimed at enhancing diversity in the Geosciences. <i>Supporting research and training partnerships between minority serving institutions and major oceanographic institutions, increased fellowship support for outstanding underrepresented students, and greater representation on review panels are both appropriate and effective actions.</i> We appreciate that OCE is working on a set of program changes to specifically address this problem and implement recommendations set forth in NSF 01-53, and strongly encourage them in this regard.</p> <p>See attached Graph: OCE Success Rate by PI Characteristic</p>	
<p>12. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports.</p> <p>Yes, Yes, Yes.</p> <p>Comments: Work by OCE supported PIs form the center of many of the arguments presented in the IPCC fifth assessment published in 2007. Work supported by the program is included in the Ocean Research Priorities Plan, numerous NRC Ocean Studies Board reports, Pew Oceans Commission (2003), and US Commission on Ocean Policy (2004), President's Ocean Action Plan (2005). Specific reports include:</p> <p>America's Living Oceans: Charting a Course for Sea Change, A Report to the Nation Recommendations for a New Ocean Policy. 2003. Pew Oceans Commission</p> <p>An Ocean Blueprint for the 21st Century. 2004. Final Report of the U.S. Commission on Ocean Policy</p> <p>U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Commission on Ocean Policy. 2004. Submitted to Congress.</p> <p>A review of the Ocean Research Priorities Plan and implementation strategy. 2007. Committee to Review the Joint Subcommittee on Ocean Science and Technology's Research Priorities Plan, National Research Council</p>	<p>Appropriate</p>

Charting the Course for Ocean Science in the United States: Research Priorities for the Next Decade. An Ocean Research Priorities Plan and Implementation Strategy 2007. National Science and Technology Council, Joint Subcommittee On Ocean Science And Technology

Climate Change 2007: Synthesis Report: Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Core Writing Team, Pachauri, R.K. and Reisinger, A. (Eds.), IPCC, Geneva, Switzerland. pp 104

Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.

Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds. Cambridge University Press, Cambridge, UK, 976 pp

Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 851 pp.

OCE funded science in general is highly relevant to the overarching objectives of the NSF. As noted previously, proposals, both declined and awarded, deal with topics of fundamental importance to national priorities. Knowledge, for example, on the effects of ocean acidification is being used to document anthropogenic effects of climate change on ocean chemistry and the health of coexisting marine fauna. Research supported in MGG touches on the chemical and physical linkages involving heat and mass transfer between the ocean crust and the overlying ocean. These are fundamental processes that can affect the entire Earth system. Moreover, development of new instrumentation is central to the progress of science, and for example, to the eventual reality of ocean observatories, a new NSF initiative. See attached OS Highlights for 2009 COV.pdf.

13. Additional comments on the quality of the projects or the balance of the portfolio:

The COV applauds the Program Officers in OCE for funding projects of top quality, which are well balanced across a broad spectrum. The projects are very heterogeneous covering science objectives ranging from the Great Lakes and near-shore environments to the open ocean. From our knowledge of the program and review of jackets, the science is state-of-the-art AND highly relevant to society. The societal benefits are clear as regards the contributions to climate, human and ecosystem health and the economy - and PIs are good at anticipating future information needs of society.

A.4 Management of the program under review. Please comment on:

1. Management of the program.

Comments:

Program Officers do an excellent job managing the proposal process, making decisions, and communicating priorities. There is transparency in the reasons for their decisions and in the process. We thank the Program Officers for their efforts in making themselves available to the community.

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

OCE has continued to be supportive and responsive to emerging research areas, examples include the SGER awards. During last 3 years of declining budgets, Program Officers in OCE planned wisely to continue funding emerging research that is high risk/high reward and education projects, while at the same time they balanced the needs to upgrade facilities infrastructure.

See attached Graphs: Number of SGER Awards, SGER Award Amounts in Current Dollars, SGER Awards as a Percentage of the Total Budget.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments:

NSF OCE has a healthy balance between funding core science/basic research and big/mission oriented programs. *We encourage OCE to continue to keep core science healthy.* This is particularly important as approximately 70% of the money for ocean science research received by academic and research institutions comes from NSF/OCE.

OCE has been responsive to federal and other plans. The recent success of OCE to secure funding for the Ocean Observatory Initiative, as well as funds for a new Arctic research vessel provide some evidence of the programs response to new funding opportunities in difficult economic times (see Graph OCE Annual Budget and OCE Research Budget in Current Dollars). Support for research infrastructure is significant, and essential to meet program goals and priorities easily articulated to broad constituencies in public and private agencies.

Under difficult financial times, OCE made hard decisions to keep the balance between infrastructure and research roughly 40% to 60%, and we applaud them for this. Of the 67 proposals examined by the COV that were awarded, 49 (73%) had no equipment in budgets. The remaining 18 had equipment requests ranging from 5K (<1% of budget) to \$475,346 (33%) and \$150,000 (68% of budget). All 18 proposals with equipment requests were in either Biological Oceanography (10) or

Physical Oceanography (8).

We did not have the information on the list of targeted program solicitations. *We ask GEO Advisory Committee to look into the balance as regards targeted solicitations and Intermediate size programs.*

4. Responsiveness of program to previous COV comments and recommendations.

Comments:

The management of OCE and Program Officers have done a very good job in addressing the concerns of the 2006 COV. There are some issues cited by the 2006 COV that still need work. Many of these are issues broader than OCE and will require more time- in particular those related to underrepresented groups.

A1.2, A1.4 (in 2006 COV Report it was A1.4) Variable quality of panel summaries is still an issue that needs work. Our review suggests that the more recent eJackets improved in both panel summary and PI feedback. A suggestion for panels is that at the end of discussion of a proposal, and before moving on to the next proposal, those involved might briefly recap with the panel's scribe the main points of response.

A1.6 (was A1.5) We noticed an improved standardization across OCE disciplines in the quality and completeness of feedback to PIs. In particular the MGG program, after being singled out in 2006, is complimented for improving their panel summaries. In general, variable quality of feedback to PIs continues to be an issue that needs work.

A1.2 (was A2.2) We recognize that Broader Impacts is a work in progress, and that new policies and procedures continue to be institutionalized. We also suggest that the panel summary should include explicit mention of the Broader Impacts and explanation of the approximate weight given to them in their overall proposal evaluation.

A1.3 (was A3.1) The adequacy of 3 mail reviews remains difficult to quantify. And we raise the question of the effect on success rate of having a large (7-10) number of reviews. As did the 2006 COV, we are requesting for future COVs statistics related to number of mail reviews versus success rate.

A2.2 (was A3.3) There is still insufficient data available to assess diversity. The 2006 COV requested additional data- and we request the same. We understand that an NSF-wide report regarding better utilization of reviewer information may have been released or is forth-coming. We hope the recommendations of that report will help to address this on going question

A 3.3 (was A4.2) Award size has remained constant for 6 years. When considering inflation then

award size has decreased. Award size is still an issue that needs work.

A3.4 (was A4.3) Judging what will be considered innovative/high risk research is still an issue that needs work. As noted in 2006 SGER are opportunistic not necessarily high risk, we did not review any EAGER projects.

A3.11 (was A4.11) Progress on participation of under represented groups is still something we cannot assess. We recognize that this is a very difficult issue to make progress on, and some part of the problem is due to the pipe-line. NSF should continue its efforts in using existing funding mechanisms, and encourage mentorship, fellowship and other grants that target underrepresented groups.

We commend the program for raising the success rate for proposals with UNOLS ship time to the level for proposals without ship time requests. See attached graphs: Proposal Success Rate with UNOLS Ship Time Requests by Program, Proposal Success Rate without UNOLS Ship Time Requests by Program.

5. Additional comments on program management:

We commend OCE for enforcing a very strong data release policy. This policy is described in detail in Report NSF 04-004. As outlined in the report, the General Data Policy is:

A. Principal Investigators are required to submit all environmental data collected to the designated National Data Centers as soon as possible, but no later than two (2) years after the data are collected. Inventories (metadata) of all marine environmental data collected should be submitted to the designated National Data Centers within sixty (60) days after the observational period/cruise. For continuing observations, data inventories should be submitted periodically if there is a significant change in location, type or frequency of such observations.

B. Principal Investigators and their institutions, and ship-operating institutions are also responsible for meeting all legal requirements for submission of data and research results that are imposed by foreign governments as a condition of that government's granting research clearances. Each principal investigator and institution must determine their legal obligations in this respect, with the assistance of the Department of State and NSF, as necessary.

C. Where no data or sample repository exists for the collected data or samples, metadata must be prepared and made available. The Principal Investigator (PI) is required to address alternative strategies for complying with the general philosophy of sharing research products and data as described above. This must be included in the proposal Project Description. Samples should be curated in a manner that preserves the quality of the samples. The PI is invited to discuss this issue with NSF Program Officers in advance of submitting proposals.

In addition, there can be no question that NSF Program Officers have actively advanced timely release of data by attending numerous recent workshops and meetings. The policy requirements are strongly and repeatedly articulated at these meetings and the community is becoming aware of them. There are examples of programs that follow immediate or less than 6 month release policies: for hydrography, tracers and CO₂ - the CLIVAR and Carbon Data Office (CCHDO) at Scripps Institution of Oceanography. All data from the CLIVAR/Carbon repeat hydrographic cruises, except for some tracer data that require degassing, are made available publicly directly after each cruise. Each large CLIVAR process study (KESS, CLIMODE, DIMES) has been tasked to assemble all the data in a coherent data set to be made available after the usual 2 year period. The data collected as part of the RAPID collaboration (line W and Abaco moorings) are shared with our UK partner as soon as they have been calibrated (usually 6 months).

We commend OCE for the improvement in staffing as regards a balance of IPAs and permanent

staff, and putting in place mechanisms for leadership transitions. We encourage OCE to continue to maintain a healthy balance of rotators and permanent staff. Visiting scientists help to bring new thinking and challenge NSF's ways of doing things, and the new energy makes them a true asset. We as a community need to be much more active in recruiting rotators.

It will be helpful to the next COV if PIs include in their Annual Reports specific information on outcomes and goals for research infrastructure to feed directly into part B below. This will be made easier if PIs paste their text into the form provided rather than upload both text and figures as attachments. We will recommend this in our proposed article in EOS.

PART B. RESULTS OF NSF INVESTMENTS

The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio as it relates to the three outcome goals of Discovery, Learning, and Research Infrastructure. The COV is not asked to review accomplishments under Stewardship, as that goal is represented by several annual performance goals and measures that are monitored by internal working groups that report to NSF senior management.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: "Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."

Comments:

NSF OCE Program Officers have done an outstanding job of funding “research that will advance the frontier... and establish the nation as a global leader in fundamental and transformative science and engineering.” And in fact the U.S. is the leading nation in the field of ocean sciences. Some of the forefronts of science that OCE are investing in include: climate change research, water cycle, energy, ocean acidification, carbon cycle, genomics, biodiversity, health. For examples see attached OS Highlights for 2009 COV.pdf, which includes publications in *Nature*, *Science*, *Geophysical Research Letters*, *JGR Oceans* for the period June 2006-June 2009. Publication in these high profile journals provide some community certification for the science funded. Consider the decade long funding of World Ocean Circulation, Joint Global Ocean Flux Studies and Climate Variability Repeat Hydrography and Carbon Programs, which made accurate measurements of hydrography, carbon, and tracers around the globe. These data formed the backbone of the discovery and quantification that increasing anthropogenic CO₂ dissolving in the oceans has caused the ocean’s pH to decrease and the ocean to become more acidic. These data also have been used to document a change in the global hydrological cycle, which has the signature of greenhouse warming.

B.2 OUTCOME GOAL for Learning: “Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.”

Comments:

See A2.2 above, see discussion of DISCO A3.7 and MPOWIR A3.11 above.

OCE funds over 200 postdoctoral scholars per year, between 700-900 graduate students, and approximately 400 undergraduate students. The Early Career Development Program was evaluated by another COV in 2006, it covered 1700 proposals foundation-wide. Since then in OCE there have been: 2006, 20 proposals, 5 awards; 2007, 20 proposals, 4 awards; 2008, 20 proposals, 4 awards.

While progress is being made in the under representation of women and minorities, there is more work to be done. Sections A1.1, A2.2, and A3.11 of this report provide specific comments and recommendations of the COV.

Many OCE funded scientists have received prestigious awards during 2006-08 made possible through their exemplary scientific work funded through OCE. Their names and OCE grant numbers are listed below.

Mark Abbott (OSU) is a member of the **National Science Board**.

National Academy of Sciences Members

Ed DeLong (MIT): 0001619, 9529804, 9218523

Paul Falkowski (Rutgers): 0851982, 0631367, 0505927, 0301184, 0241023, 0220955, 0103827, 0084032, 0000363, 9911948, 9906635, 9101704, 8515886

David Karl (U of Hawaii): 0926766, 0849159, 0838123, 0652430, 0334792, 0326616, 0314657, 0216164, 0215817, 0133021, 9981313, 9906820, 9840139, 9617409, 9642935, 9543920, 9440152, 9301368, 9249662, 9243284, 9240117, 9147315, 9102642, 9016090, 9046123, 8946593, 8946075, 8940267, 8847891, 8843186, 8800329, 8747483, 8741046, 8740893, 8645079, 8641780, 8600462, 8545038, 8541985, 8541716, 8442090, 8351751, 8311219, 8340945, 8216673, 8242941, 8109256, 8024255, 8005180, 7825446, 7820721, 7818926

John Kutzbach (U of Wisconsin-Madison): 0352362

NAS Award Medals

James Ledwell (WHOI): 0937492, 0751653, 0651848, 0622825, 0425197, 0424953, 0350743, 0244256, 0241310, 0227679, 0081502, 9906685, 9806498, 9415598, 9340644, 9242082, 9148401, 9143306, 9020492, 9013299, 8918821, 8944421, 8944029, 8941511, 8940922, 8845385, 8842147, 8722497, 8711184, 8620078, 8614635, 8641597, 8543942, 8401648

Edward Boyle (MIT): 0904249, 0751409, 0733494, 0647446, 0350672, 0326736, 0326689, 0117195, 0003021, 0002273, 9911416, 9981442, 9711814, 9709500, 9419210, 9402198, 9316207, 9341498, 9217791, 9247878, 9146905, 9146560, 9145333, 9102329, 9018565, 9018490, 9041789, 8921979, 8945445, 8847358, 8846623, 8717305, 8710328, 8710168, 8614017, 8545378, 8545365, 8542440, 8541717, 8416382, 8442747, 8411141, 8440521, 8342542, 8218583, 8244699, 8209362, 8240443, 8117929, 8018665, 7916755, 7808485

American Society for Limnology and Oceanography Awardees

Kelly Dorgan (U Maine)-Lindeman Award: graduate student on Peter Jumar's award

Jed Fuhrman (USC)-Hutchinson Award 2006: 0735128, 0649300, 0648581, 0623575, 0551167, 0527034, 0439608, 0405279, 0327034, 0241723, 9981371, 9906989, 9634028, 9218324, 9123889, 8996136, 8996117, 8716988, 8711132, 8410074, 8406712, 8316903, 8214498, 8207523

John Hobbie (MBL)-Redfield Lifetime Achievement 2008: 0423507, 0341790, 0336730, 0331943, 0235468, 0225791, 0217997, 0114985, 0043764, 0041646, 9941433, 9843389, 9726921, 9643230, 9419078, 9416294, 9346469, 9218220, 9214461, 8841656, 8615406, 8615055, 8545371, 8415687, 8342711, 8214641, 7808247

The Oceanography Society Awardees

Peter Worcester (SIO)-Munk Award: 0550218, 0405766, 9819525, 8746611, 8744080, 8645312, 8544700, 8444748, 8414978, 8441122, 8340005, 8214918, 8240425, 8017575

American Meteorological Society Awardees (Fellows not included)

Thomas Rossby (URI)-Verner E. Suomi Award 2006 "For innovative and influential contributions to the technology of oceanographic instruments and methods that have profoundly improved the understanding of ocean circulation and processes.": 0922081, 0850609, 0825845, 0752125, 0727689, 0623210, 0452970, 0425782, 0411804, 0326907, 0241654, 0221073, 0137037, 0118536, 0117660, 0093647, 9906775, 9819724, 9811289, 9617986, 9617869, 9531878, 9314480, 9218219, 9202794, 8912016, 8901602, 8716929, 8712348, 8600512, 8504148, 8310833, 8310831, 8111498, 8110914, 8010839, 7926187, 7818662, 7611726, 7518930

Michael Gregg (UW)-Henry Stommel Research Award 2006 "For outstanding and comprehensive measurements of turbulence and mixing in many oceanic environments, and particularly for establishing a quantitative relationship between pelagic mixing rates and the energy of internal waves.": 0751420, 0734197, 0726523, 0549948, 0549892, 0424792, 0424779, 0326280, 0220686, 0117166, 0095382, 0002903, 9819535, 9818693, 9843370, 9730009, 9729288, 9633067, 9316004, 9202773, 9240599, 9103629, 9140775, 9140379, 9042074, 8940424, 8815961, 8815900, 8840895, 8646575, 8611899, 8641131, 8519330, 8541779, 8410741, 8441464, 8214780, 7929477, 7825441, 7520573

John A. Whitehead (WHOI)-Henry Stommel Research Award 2007 "For his fundamental contributions to Geophysical Fluid Dynamics and Physical Oceanography, for which his laboratory and observational studies of rotating hydraulic flows have been particularly illuminating.": 0834048, 0551999, 0325296, 0325102, 0095427, 0081756, 0081179, 9943112, 9810647, 9810607, 9810065, 9724825, 9633063, 9542998, 9407000, 9314013, 9343612, 9342417, 9201464, 9242004, 9240731, 9105834, 9141982, 9141471, 8916857, 8915408, 8941824, 8847278, 8842728, 8708033, 8614842, 8546244, 8416100, 8018322, 7918656, 7820772, 7809725, 7809448, 7707507, 7618956, 7520079, P3A1370, 7201562

Raffaele Ferrari (MIT)- Nicholas P. Fofonoff Award 2007 "For profound insights and important discoveries on eddy and mixing processes in the ocean.": 0849233, 0827187, 0825376, 0612143, 0425150, 0336839, 0241528

Dean H. Roemmich, (SIO)-2008 Sverdrup Gold Medal Award "For major contributions to the measurement and understanding of the ocean's role in climate, and for leading the development and implementation of the Argo profiling float array.": 0095248, 9632983, 9401439, 9343389, 9340729, 9242270, 9242260, 9017965, 9004230, 9004228, 9044212, 8947085, 8844969, 8843382, 8716314, 8742720, 8710084, 8742124, 8640475,

8545837, 8543444, 8511013, 8442008, 8317389, 8244723, 8214532, 8209340, 8121262,

Jonathan D. Nash (OSU)-Nicholas P. Fofonoff Award 2009 "For innovative and insightful contributions to the measurement and understanding of small-scale oceanic processes, leading to broader appreciation of their role in oceanic circulation.": 0920872, 0825287, 0824928, 0751930, 0728375, 0648655, 0424133, 0350543, 0238727, 0136116

American Geophysical Union Awardees (Fellows not included)

Michael Purdy (LDEO)-Ewing Medal 2008: 0924111, 0921736, 0849686, 0849023, 0848459, 0827872, 0825670, 0751761, 0737848, 0726710, 0614900, 0614645, 0613366, 0443868, 0342067, 0327363, 0326107, 0237198, 0205909, 0205898, 0121034, 0099461, 9442099, 9403697, 9403409, 9401374, 9314360, 9314374, 9345401, 9342985, 9300562, 9217673, 9149134, 9101280, 9142479, 9142348, 9142278, 9048579, 9019918, 9019683, 9000458, 8917750, 8917660, 8917628, 8917599, 8944887, 8941829, 8940223, 8846000, 8746932, 8746929, 8709615, 8700806, 8740020, 8615797, 8517137, 8509193, 8407798, 8408055, 8401659, 8315590, 8244728, 8218927, 8218357, 8243108, 8240507, 8140503, 8025206, 8018805, 8040604, 7924174, 7909464, 7825644, 7819801, 7602254

Marcia McNutt (MIT)-Ewing Medal 2007: 0840753, 0629362, 0526608, 0451153, 0434042, 0222650, 0096358, 9740726, 9706338, 9614302, 9629484, 9529981, 9415930, 9442329, 9304621, 9302192, 9342987, 9341055, 9221169, 9242736, 9019717, 9012949, 8919140, 8846797, 8817764, 8843380, 8717826, 8710222, 8642887, 8609526, 8512409, 8507816, 8409157, 8306731, 8218615

John Kutzbach (U of Wisconsin-Madison)-Revelle Medal 2006: 0352362

Michael Bender (Princeton) -Revelle Medal 2008: 0082324, 9310574, 9342272, 9022311, 9042033, 8941767, 8847887, 8817514, 8746920, 8719487, 8743287, 8711221, 8645331, 8609923, 8545394, 8541756, 8541725, 8506207, 8503848, 8501917, 8501916, 8410815, 8410810, 8315464, 8219671, 8218892, 8244572, 8207787, 8240521, 8240371, 8118343, 8101830, 8140491, 8025203, 8040607, 7921137, 7914594, 7908953, 7820343, 7713050, 7705184, 7683366, 7602318, 7809511, 7413161

WHOI Summer GFD Program-Excellence in GEO Education 2008

Estuarine SA Awardees

Alan Hastings (UC-Davis)-Robert MacArthur Award 2006: 0815293, 0535398, 0417594, 0003254, 9711448, 9340867, 9242469, 9016721

The Coastal and Estuarine Research Federation Awards: See page 9 of the 2007 conference program book for list of awardees including the Odum Award for Life Time Achievement to Grace Brush who worked on an LTER, and the Cronin Award for Early Career Achievement to Elizabeth North who has awards from NSF: <http://www.erf.org/erf2007/ERF07Program.pdf>.

B.3 OUTCOME GOAL for Research Infrastructure: *"Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyber infrastructure and experimental tools."*

Comments:

Cutting edge advanced instrumentation and facilities supported by OCE 2006-08 include:

Proposal	Proposal Title	Institution	PI Name
0647971	The HOT Profiler: A Battery-Powered/Inductively-Charged, Satellite-Linked Moored Profiling System for Long Time Series of Rapid Vertical Profiles of Density and Velocity	University of Washington	Alford, Matthew H.
0838099	Long-term in situ chemical sensors for monitoring nutrients: phosphate sensor commercialization and ammonium sensor development	Western Environmental Technology Laboratories, Inc.	Barnard, Andrew H.
0758446	Further Development of the Eddy Correlation Technique	University of Virginia Main Campus	Berg, Peter

0752707	Collaborative Research: Oceanic Applications of Laser Induced Breakdown Spectroscopy: Laboratory Validation	Woods Hole Oceanographic Institution	Chave, Alan D.
0752664		University South Carolina Research Foundation	Angel, Stanley M.
0724561	Collaborative Research: Advanced Laser Fluorometer (ALF) for in vivo Characterization of Phytoplankton Pigments, Physiology and Community Structure	Columbia University	Chekalyuk, Alexander M.
0724413		University of California-San Diego Scripps Inst of Oceanography	Mitchell, B. Gregory
0727587	Collaborative Research: Phase Two Development of a Self-Contained Underwater Velocimetry Apparatus	Providence College	Costello, John H.
0727825		California Institute of Technology	Dabiri, John O.
0727544		Roger Williams University	Colin, Sean P.
0648708	In Situ Ichthyoplankton Imaging System (ISIIS) - Development and Testing of Operational System	University of Miami Rosenstiel School of Marine&Atmospheric Sci	Cowen, Robert K.
0624092	ROV-based System for Sampling Planktonic Thin Layers	Oregon State University	Cowles, Timothy J.
0621525	Submersible Autonomous Sensors for Oceanic Inorganic Carbon Characterization	University of Montana	DeGrandpre, Michael
0836807	Collaborative Research: An autonomous indicator-based pH sensor for oceanographic research and monitoring	University of Montana	DeGrandpre, Michael
0836592		University of California-San Diego Scripps Inst of Oceanography	Dickson, Andrew G.
0836817		Sunburst Sensors, LLC	Beck, James C.
0753637	SGER: Development of New Method for Black Carbon Nano-Particles in Seawater	University of Nevada Desert Research Institute	Edwards, P. Ross
0737958	Development and Validation of an Underwater Optical Modem	Woods Hole Oceanographic Institution	Farr, Norman E.
0838107	Development And Deployment Of A Modular, Autonomous In Situ Underwater Stable Isotope Analyzer	Harvard University	Girguis, Peter
0749472	SENSORS: Collaborative Research: ALOHA Mooring Sensor Network and Adaptive Sampling	University of Washington	Howe, Bruce M.
0728305	Advanced Technology for In-situ Acoustic Sensing of Zooplankton	University of California-San Diego Scripps Inst of Oceanography	Jaffe, Jules S.
0629362	Monterey Accelerated Research System	Monterey Bay Aquarium Research Institute	McNutt, Marcia K.
0726984	Instrumentation for Determining Benthic Oxygen Exchange Rates by Eddy-Correlation with Coordinated Studies of the Oregon Shelf	Oregon State University	Reimers, Clare E.
0750058	Collaborative Research: The Environmental Sample Processor (ESP): A Device for Detecting Microorganisms In Situ Using Molecular Probe Technology	Monterey Bay Aquarium Research Institute	Scholin, Christopher A.
0623400	In-Situ Classification of Bloom-Forming Phytoplankton by Imaging Multivariate Optical Computing (IMOC)	University South Carolina Research Foundation	Shaw, Timothy J.
0726956	SGER: Inexpensive nitrate nutrient sensor arrays	University of California-San Diego Scripps Inst of Oceanography	Stokes, Malcolm D.
0726867	The Development of a Next Generation Subseabed Pore Pressure Instrument for Marine Hydrogeology: The PUPPI-II	University of California-San Diego Scripps Inst of Oceanography	Tryon, Michael D.
0649672	A micro-plankton detector for deployment in the marine environment	University of Washington	van den Engh, Gerrit J.
0826098	Collaborative Research: A Nanostructure Sensor for Measuring Dissolved Iron and Copper Concentrations in Coastal and Offshore Seawater	University of Maine	Wells, Mark L.
0825762		Colby College	King, D. Whitney
0612332	Development of 'Eye-in-the-Sea' (EITS), an Unobtrusive Camera System using Far-Red Illumination for Remote in-Situ	Bigelow Laboratory for Ocean Sciences	Widder, Edith A.

	Observation		
0752105	Immunosensors for water column and 2-D sediment distributions of vitamin B-12 and target organic solutes	SUNY at Stony Brook	Zhu, Qingzhi
0851540	Construction and Deployment of a Seafloor Drift-Corrected Pressure Gauge for Deformation Observation at Axial Volcano	University of California-San Diego Scripps Inst of Oceanography	Zumberge, Mark A.

Based on the COV's inspection of a small subset of proposals, *in situ* instrumentation appears to be funded as needed when part of a field program. Funding for laboratory instrumentation and capability development appears to be more difficult to get in some disciplines. Although there are special opportunities MRI, the number of such proposals is limited for any given institution. *For a future COV to assess the funding appropriateness of laboratory instrumentation needs, the success rates for proposals requesting laboratory equipment will be needed and broken down by program discipline.*

PART C. OTHER TOPICS

C.1. Please comment on any program areas in need of improvement or gaps (if any) within program areas.

Overall the COV was impressed with the excellent caliber, collegiality, and dedication of the OCE management team, Program Officers and staff.

C.2. Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

We encourage OCE to continue to keep core science healthy. This is particularly important as OCE plays a critical role in support of basic research and education, as OCE funds approximately 70% of the ocean science research at academic and research institutions. See above answer to A3.13.

The COV did not have the data or time to discuss the issue of success rate versus proposal resubmission times. We are concerned about PIs spending considerable time resubmitting proposals when the process can drag out for years. It would also be useful to have data on the percentage of reviewers re-used from previous reviews of a proposal and correlation with success rates.

C.3. Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

We have no way to evaluate the amount of funding spent by OCE on operational activities as compared with research and development activities. And we are aware that funding of operational activities can be complex and involve tradeoffs with other agencies. *We suggest that the GEO Advisory Committee look into the balance.* In addition, we have other suggestions for the GEO Advisory Committee. In A1.8: *We recommend that future COVs revisit the correlation between proposal scores and funding actions, and the numerical scoring system for proposals.* In A3.4: *We recommend that the GEO Advisory Committee provide further guidance on identifying innovative/potentially transformative projects.* In A 4.3: *We ask GEO Advisory Committee to look into the balance as regards targeted solicitations and Intermediate size programs.*

C.4. Please provide comments on any other issues the COV feels are relevant.

The COV was provided information that described a process undertaken by the NSF Directorate of Engineering in which the engineering *community is asked to suggest emerging priorities for funding*. We were intrigued with this idea as a means of identifying high risk research areas, and ask that OCE consider how this might work in practice (who would review these ideas, how often solicitations would be requested, what portion of core funds might be allocated, etc.).

We have a concern relating to proposal resubmissions- encouragement or otherwise. How many is too many resubmissions? How is this best conveyed to the PI? There were no data available to assess resubmissions.

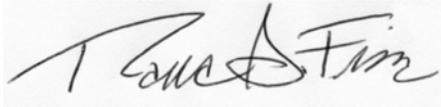
C.5. NSF would appreciate your comments on how to improve the COV review process, format and report template.

The 2009 OCE COV thanks and are sincerely indebted to the OCE staff for their input and for providing the data and analyses needed for this report. In particular, the following staff members provided IT and data support: Brian Midson, Michele Arsenault, Cheryl Fossani, and Michael Welin.

This COV finds questions in the Report Template redundant. We would appreciate a template with fewer questions. In addition, we have some procedural suggestions for the next COV:

- Establish the COV password-protected web page 2 months before meeting
- Post guide to reviewers, past COV reports and NSF responses, and all material that panelists receive before serving on a panel for each program on this webpage when it is established.
- Invite COV members to participate in or observe a panel before the COV meeting
- During the COV meeting, COV members should be able to use the panelist electronic function so they can work together on the text of the report,
- A description of the panel review process for each program, research highlights of OCE programs, and an explanation of the ejacket system should be presented to COV at the start of meeting,
- There should be some overlap of persons reading jackets (i.e., one jacket should be read by 2 COV members),
- For the report, each question should be assigned to two COV members (a 'primary' and 'secondary' member) who would be responsible for reviewing the information provided by NSF, reporting on it to the COV, and drafting the text for the report after COV members discussed the question),
- 1.5 days is inadequate for meeting - lengthen to 2 days to allow some in depth conversation and discussion of answers,
- Either committee members should be able to read the jackets before meeting, or the length of the meeting should be increased to 3 days having one as a reading day
- If COV members review the jackets before the meeting, then web-x conferencing could be used to explain the details of the ejackets.

SIGNATURE BLOCK:



For the National Science Foundation Ocean Sciences Division Committee of Visitors
Rana A. Fine
Chair

Attachments:

OCE_COV_Highlights_2009.pdf
OCE_COV_PersonnelData_2009.xls
OCE_COV_Graphs_2009.ppt includes:
OCE Annual Budget
OCE Research Program Budgets in Current Dollars
OCE Mean Annual Award Size
OCE Annual Award Size by Program
OCE Mean Award Duration
OCE Mean Award Duration by Program
OCE Percentage of Proposals Processed Within 6 Months of Receipt
Annual Number of New Proposals
Mail Review Return Rate by Program
Percentage of Proposals to Panel by program
Number of Proposals Handled per Program Manager
OCE Success Rate
OCE Success Rate by Program
Annual Number of New Awards
OCE Percentage of Awards to New PIs
OCE Success Rate by PI Characteristic
Proposal Success Rate with UNOLS Ship Time Requests by Program
Proposal Success Rate without UNOLS Ship Time Requests by Program
Number of SGER Awards
SGER Award Amounts in Current Dollars
SGER Awards as a Percentage of the Total Budget
Award Percentage by Institution Type
Success Rate by Institution Type
Percentage Collaborative Proposals by program
OCE Identified High Risk/High Reward Proposals for FY 2008
OCE Success Rate for High Risk/High Reward Proposals – FY 2008
OCE Proposals Submitted by PI Characteristic
OCE Proposals Awarded by PI Characteristic
Total Number of Projects versus Projects Reviewed by Two or More Programs
Percentage of Projects Reviewed by two or More Programs
Success Rate of Projects Reviewed by Two or More Programs