2011 COMMITTEE OF VISITORS REPORT FOR THE NSF OCEAN SCIENCES DIVISION

Date of COV: 28-30 June 2011

Program: Integrative Programs Section: Oceanographic Centers, Facilities, and Equipment

Division: Ocean Sciences

Directorate: Geosciences

2011 COMMITTEE OF VISITORS REPORT FOR THE NSF OCEANS SCIENCES DIVISION

Committee of Visitors Review Process

The Committee of Visitors (COV) met June 28-30, 2011 at the National Science Foundation to review the Oceanographic Centers, Facilities, and Equipment Section of the Integrative Programs Section (IPS) in the Ocean Sciences Division (OCE), Geosciences Directorate. The particular programs reviewed include: Ship Operations; Submersible Support; Oceanographic Instrumentation; Oceanographic Technical Services; Shipboard Scientific Support Equipment; and Ship Acquisition and Upgrade. The charge to the COV is to 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) the degree to which the outputs and outcomes generated by awardees have contributed to the attainment of the NSF's mission, strategic goals, and annual performance goals.

The COV session began with opening remarks about the state of the directorate and division by Timothy Killeen, Assistant Director, Geosciences Directorate; Margaret Cavanaugh, Deputy Assistant Director, Geosciences Directorate; and David Conover, Ocean Sciences Division Director. We heard presentations about the Ocean Observatory Initiative by Jean McGovern (an MREFC project, not under review here); about the *R/V Sikuliaq* construction project by Matt Hawkins (construction an MREFC project, not under review here); about Ship Operations, including ship utilization by Linda Goad and environmental compliance by Holly Smith; and about an overview of IPS activities by Brian Midson.

Small groups of panel members focused on each of the particular programs under review, using summary materials provided to the COV, discussions with the program officers, and by reviewing e-jackets. Findings for the particular programs were integrated into this report, which is divided into two sections: a narrative report focused on Findings, Recommendations, and Review of Responses to the 2008 COV Report; and the FY 2011 Report Template for Committees of Visitors. The Report Template, tailored to more traditional proposal-driven research programs, was not always a direct fit for this review of facilities programs, and we note this when necessary on the form.

We thank Brian Midson (IPS), Bauke Houtman (IPS Section Head), and other program officers for providing materials in advance and during the meeting and for their prompt and cooperative help in facilitating our review. We especially appreciated their willingness to meet with us on an ad hoc basis during our meeting.

Context for Findings and Recommendations

Access to oceanographic measurement, data, and samples from sea going vessels and submersibles is an essential need now and for the future in addressing fundamental NSF-funded research. In addition, the Ocean Observatories Initiative[1] (OOI) brings evolving platform needs for specific components (e.g., fixed arrays, gliders, cables) as well as access to the seagoing fleet of vessels. The importance of the academic research fleet[2] and its future is highlighted in two recent national reports—*The UNOLS Academic Research Fleet: Continued Access to the Sea*[3] and *Critical Infrastructure for Ocean Research and Societal Needs in 2030*[4]. Both reports highlight the fundamental and applied scientific research that requires access to the oceans and define concerns about the aging, potentially inadequate fleet capacity to meet high priority scientific needs.

Oceanographic Centers, Facilities, and Equipment programs of the Integrative Programs Section support the facilities necessary for NSF-funded research and training of oceanographers. Facility examples include ships, submersibles, shipboard infrastructure, shared-use instruments, and seagoing technical support. Many of these facilities receive partial, complementary support from other federal agencies, state and local governments, and private sources. The University-National Oceanographic Laboratory System (http://www.unols.org/) (UNOLS) schedules these facilities and expeditionary programs funded by NSF. NSF also participates in the Interagency Working Group on Facilities and Infrastructure[5] (IWG-FI), which advises on policies, procedures, and plans relating to oceanographic facility use, upgrades, and investments and other matters relative to national oceanographic assets. These collaborations are effective in maximizing the capabilities and use of the academic research fleet.

Infrastructure needs (IPS-supported facilities, IODP operations and management, and other infrastructure) account for 40-45% of total funding in the OCE budget for the past three years. For the six programs constituting Oceanographic Centers, Facilities, and Equipment under review here, which constitute a major fraction of OCE infrastructure, 60-70% of the funding is for ship operations. This indicates the central and sustained importance of facilities support in accomplishing scientific expeditions across the entire OCE directorate. We note that Oceanographic Centers, Facilities, and Equipment were able to successfully compete for ARRA funding to address critical needs.

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[1] See http://www.oceanobservatories.org/

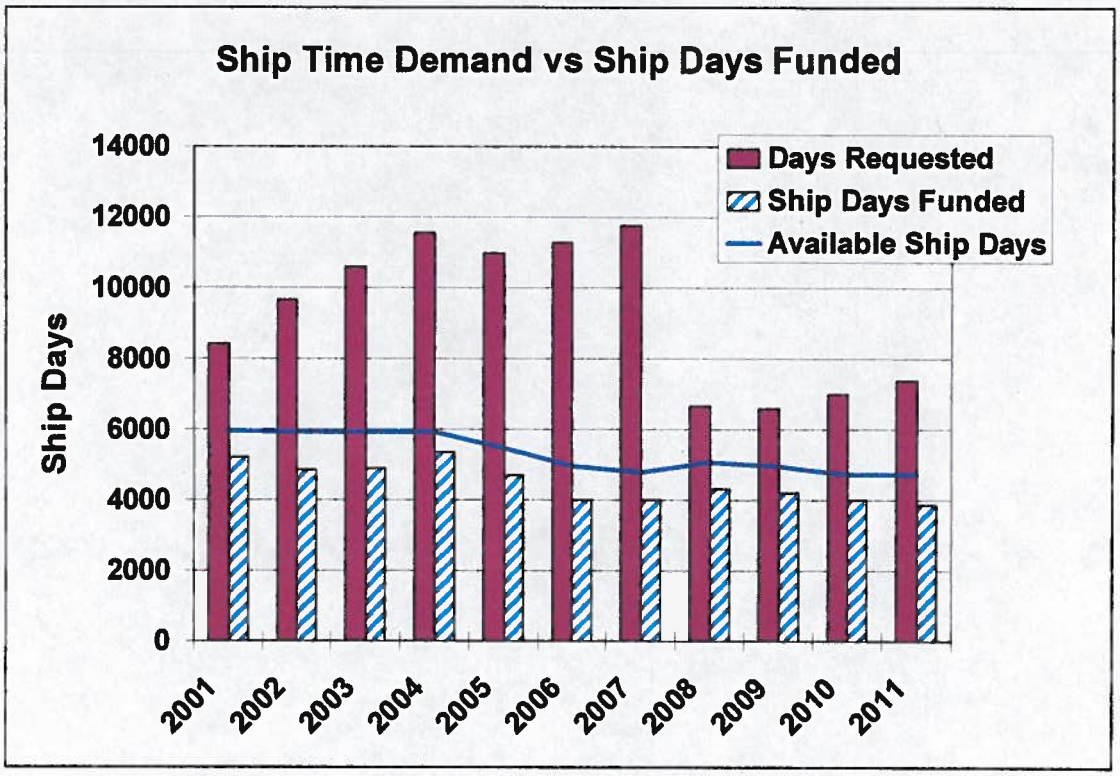
[2] The U.S. needs for a scientific ocean drilling platform are addressed separately from these reports on the academic fleet and separately from the Oceanographic Centers, Facilities, and Equipment programs under review here. An NSF MREFC-funded project renovated and remodeled the *JOIDES Resolution*, a riserless drilling vessel, for use in the Integrated Ocean Drilling Program (through 2013), and the *Resolution* is anticipated to be used in the successor program (2013-), the International Ocean Discovery Program.

[3] *The UNOLS Academic Research Fleet: Continued Access to the Sea* (2009) UNOLS Fleet Improvement Plan 2009, Prepared by the UNOLS Fleet Improvement Committee, 99 pp.

[4] *Critical Infrastructure Needs for Ocean Research and Societal Needs* in 2030 (2011) Committee on an Ocean Infrastructure Strategy for U.S. Ocean Research in 2030, National Research Council, National Research Council, National Academies Press, 98 pp.

[5] See http://www.nopp.org/committees/iwg-fi/

One area of concern is fleet utilization and the yearly necessity of matching funded science requiring ship time to appropriate platforms in geographically workable sequences. Funded ship time days have dropped significantly since 2004 (see figure below), and this concern was noted in the last COV report. Several factors contributed to this drop: the expense of fleet operations, especially, fuel costs, decreased availability, and more careful management by the agencies of when funded expeditions could be scheduled were used to deal with time lags. Of particular concern is the coming year's underutilization of available ship time, with a drop in funded ship days relative to available ones. Options that seem to provide cost savings—like cold lay-ups—really do not save costs in the long run and are often counterproductive to the ship's condition and the continuity of technical support.



Ship time Demand vs. Ship Days Funded (UNOLS Fleet Improvement Plan, Figure 30; updated: June 30, 2011). Ship time requests appear to have a significant drop starting in 2008 to the time interval under review by this COV (2008-); see discussion in text about reliability of these data. More significantly, ship days funded since 2006 have a significant drop from earlier years, as do ship days available. This lack of availability and inconsistent utilization is inconsistent with the projections of need in long-term, scientifically based projections.

We spent considerable time discussing these patterns, including the large apparent drop in ship days requested (see figure). Part of the large drop from 2007 to 2008 may have been the result of a change to a new database system for 2008 that reduced duplication of requests that may have inflated earlier year counts. The fraction of the drop resulting from this change is not known, but most likely does not account for the major fraction of the drop. UNOLS is carrying out a community survey to better understand these trends. We discussed several possible

factors, including the negative influence of well-meant cautions from NSF to the community about ship time having long-lasting effects. For example, in 2005, a strong message from NSF was conveyed to the community (AGU Town Hall, written communication) that proposals with ship time requests were far less likely to be funded. We also discussed the need for newer investigators to become skilled at getting ship time proposals funded and at carrying out expeditions.

This is clearly an issue that crosses from Oceanographic Centers, Facilities, and Equipment as the programs that fund the ship operators and the core OCE science programs. For example, in the same time interval, the number of science proposals (regardless of whether they requested ship time) submitted per year to core OCE programs dropped from >900 in 2005 and earlier to lows around 700 by 2008 (with a temporary bump from ARRA funds in 2009). Because of funding difficulties, during this time, we have anecdotal evidence that program officers were encouraging proponents to submit as seldom as possible. We do not think the drop in proposal pressure and ship utilization represents a drop in science needs, and the national reports sponsored by two different agencies—UNOLS[6] and the National Academy of Sciences[7]—demonstrate the need for a healthy, multi-vessel academic research fleet. Ocean sciences—and seagoing expeditions—remain essential to addressing high priority science needs. This mismatch and community behavior patterns deserve broader exploration by the relevant parts of NSF.

Findings

Overall Findings

(1) Assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions

This NSF section deals with seagoing assets of national priority and use. We were consistently impressed by program operations and management in Oceanographic Centers, Facilities, and Equipment and with the leadership in its overarching organization IPS. The value placed on collaboration, communication, and strategic thinking by program officers and their supervisors is clearly reflected in program processes and outcomes. Proactive management is evident in ship inspection outcomes being translated into planned and projected investments for needed ship maintenance. These plans are reached by engagement with stakeholders from all levels. The role of communication is exemplified by this section's interactions with the Office of Polar Programs, with other federal agencies using seagoing assets, and with ship operators themselves.

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[6] *The UNOLS Academic Research Fleet: Continued Access to the Sea* (2009) UNOLS Fleet Improvement Plan 2009, Prepared by the UNOLS Fleet Improvement Committee, 99 pp.

[7] *Critical Infrastructure Needs for Ocean Research and Societal Needs* in 2030 (2011) Committee on an Ocean Infrastructure Strategy for U.S. Ocean Research in 2030, National Research Council, National Research Council, National Academies Press, 98 pp.

There has been significant personnel turnover since the last COV report. Although there was concern at the time of the last report, we are happy to report that these transitions have gone smoothly. The loss of long-term expertise and corporate memory was mitigated by effective use of e-jackets to document necessary history. The carefully considered matching of personnel to tasks has brought new insights and energy to critical tasks. Overall, there is a strong team effort in managing a large array (large in both scope and cost) of platforms for sea-going exploration with not very many people!

(2) The degree to which the outputs and outcomes generated by awardees have contributed to the attainment of the NSF's mission, strategic goals, and annual performance goals

The first element in the primary mission of NSF is to promote the progress of sciences. NSF's recently published Strategic Goals[8] include (1) Transform the Frontiers, (2) Innovate for Society, and (3) Perform as a Model Organization. The seagoing ships, equipment, technical support, and facilities dealt with by Oceanographic Centers, Facilities, and Equipment are of national and critical importance to fundamental understanding of processes in ocean system. These are facilitating infrastructure for transformative, interdisciplinary science. Attention to the nuts and bolts of operating, maintaining, and renewing the academic research fleet is important, with NSF cooperating with other relevant agencies on an ongoing basis. Oceanographic Centers, Facilities, and Equipment pays attention to innovation and emerging areas of science, for example, with promoting satellite communications across the academic fleet to improve science outcomes and to create and enhance opportunities for real-time outreach programs that can capture students' and teachers' interest in a most compelling fashion.

Specific Findings

Ship Operations

Finding: Ship operations and maintenance proposals for a majority of vessels were last reviewed by an external panel in December 2004, in conjunction with the renewal of cooperative agreements.

E-jackets contain a wealth of information related to the operation, maintenance, inspection, and performance of vessels and crew occurring since the renewal of cooperative agreement for ship operations. Additional information regarding the performance of operations and material condition and capabilities of vessels is available within the section.

Finding: Ship operations have been effectively and efficiently managed within the IPS for ten years. The Program Director has significant oversight of a major function of the section: i.e. sponsoring major national research facilities operated by a diverse group of academic institutions, and administering the budget to support annual operations and maintenance of these facilities. The Program Director is departing federal service within the next few months.

[8] *Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years 2011-2016.*

Finding: Bringing the R/V MARCUS LANGSETH into a state of material and administrative readiness for support of science in the UNOLS fleet has consumed a significant amount of section personnel time and effort and financial resources. The current section team is successfully dealing with a myriad of issues with both the material condition of the ship and the management of ship operations, while sponsoring a modest operating schedule in support of seismic operations. While the e-jacket for the vessel contains a wealth of information, reports and correspondence occurring since the negotiation of the cooperative agreement in 2008, there is no consolidated and definitive analysis of causes and actions to serve future section teams.

Finding: Division of responsibly within IPS (Hawkins: SSSE, Ship Inspection, Ship Construction, Holik: Tech. Support, Oceanographic Instrumentation, etc.) is appropriate and contributes significantly to the success of the Section.

Finding: Coordination of SSSE Group Purchases and Development of Appendix A and B to the RVSS has contributed significantly to the safe and efficient operation of the UNOLS fleet.

Finding: Program managers often went beyond standard operating procedures to guarantee the success of science programs i.e. preapproval of award in order to correct existing problems w/ seismic compressor on LANGSETH, 2010 SSSE. Univ. of Miami 2010 SSSE proposal requested funds for a new tugger winch. During the panel discussion it was discovered that an analysis of the bolt plan and deck structure in way of the winch installation was not provided. Instead of funding the winch, the program manager recommended funding of a winch bolt down analysis that could be used by the entire fleet. The program manager recommended that Miami request a new winch in the next SSSE solicitation.

Submersible Support

Finding: The ALVIN RHOV program is complicated, with a prime contractor (WHOI), a prime subcontractor (SwRI), a subcontracted classification authority (ABS), and a third party certification authority (NAVSEA). In spite of the complications, the program is well-managed. The program has done a good job of adapting the MREFC process to this R&RA project. However, this complexity makes the program difficult to evaluate during a short review. In particular, the various budgetary items and overall budget are not well-described.

Finding: The interagency agreement with NAVSEA for the RHOV is scoped, defined, and funded. The effort on the part of WHOI and the subcontractor SwRI in support of NAVSEA certification is exceeding its initial level-of-effort estimate, and is therefore likely to require use of contingency funds.

Finding: The relationship between NSF and NAVY for operations and maintenance of ALVIN has been very successful, and should be continued.

Finding: SENTRY was added to NDSF as a replacement for ABE. It has been a valuable tool for site surveys during ALVIN downtime, and as an exploratory tool.

Finding: NEREUS and its unique capabilities and special flotation represent advances in the field. Although NEREUS is considered a prototype, and not suitable for inclusion in NDSF at this time, it is still a transformative tool available to the community.

Finding: NDSF is hoping to answer new questions in science using submersibles such as conducting mid-water work with Alvin by providing advanced training to pilots.

Finding: Outreach efforts at the Fall 2009 AGU meeting were very successful in generating interest in NDSF assets and introducing the facility to new user groups.

Finding: A Memorandum of Understanding (MOU) between NSF, NOAA, and the US Navy was established in 1993 (and has been renewed every 2-5 years since that time) to provide base funding for the operation of NDSF through a 60/20/20 (NSF/Navy/NOAA) cost share. The MOU was most recently extended through July 1, 2011. As science objectives have shifted for both NOAA and the Navy, and as Federal budgets have been impacted, NSF has absorbed much of the base operating costs. For example, NSF is paying for 174 of 178 days in FY 2011. As all fixed costs are amortized into day rates, the decrease in base support has had some negative impacts on the facility overall such as limitations on improvements and upgrades. This was offset somewhat by 2009 stimulus funds, but it is important to note that efficiency is lost with decreased overall utilization.

Oceanographic Instrumentation (OI) and Shipboard Scientific Support Equipment (SSSE)

The OI and SSSE programs are central for making transformative and interdisciplinary research programs possible by continually upgrading and improving the scientific and operational capabilities of the academic research fleet. Since 2008 the OI and SSSE programs have held joint proposal review panels given their many shared issues. External experts and panelists provide rigorous and thoughtful reviews of annual proposals submitted to IPS requesting funding for instrumentation and shipboard equipment. Proposal reviewers and panelists include ship operators, technical managers, technicians and scientists and are carefully selected to provide broad expertise and knowledge.

Finding: Based on reviews and panel recommendations, program managers have made informed funding decisions, and have identified opportunities for cost-saving measures such as the establishment of equipment pools and shared-used instrumentation that have improved fleet assets and the efficiency of maintenance and use of these assets.

Finding: The OI and SSSE programs are being excellently managed. The program managers are cognizant of the needs of the fleet, and wisely budget capital improvements, maintenance and education to maximize effective use of NSF investments.

Finding: The SSSE program budget for equipment support is less flexible than the OI budget due to the ability to move funds between OI and the technical services budgets. This does not appear to be a major issue now, but could be problematic in the future.

Finding: Progress has been made in improving utilization of the NSF Ship Inspection program to more effectively use this tool to evaluate ship operational status and, in consultation with ship operators, to plan for future capital expenditures.

Finding: Of special note was the prudent allocation of funds to improve and expand the capabilities and science versatility of the *R/V Marcus Langseth*. The investment will benefit the geophysical and oceanographic research communities. There has been careful analysis of the technical feasibility and of the pros/cons of transitioning the long corer to the Langseth.

Finding: Both programs facilitate effective operation and maintenance of assets and provide adequate support for technical training and workshops on use of new equipment and instrumentation.

Finding: ARRA money was used in 2009 to capitalize the east and west coast winch pools to be maintained by the Woods Hole Oceanographic Institution and the Scripps Institute of Oceanography. It is noted that ARRA funds were carefully allocated between capital equipment and support facility needs appropriate to maintain these assets.

Finding: The establishment of various pooled equipment centers (e.g., wire, winch, van, gravimeter, etc.) provides the fleet with equal access to specialized equipment when needed and ensures its proper maintenance, calibration and operational readiness.

Finding: Web-based inventories that describe the various pooled equipment and shared-use instruments available to the community are presently being developed. When completed, these databases will allow for more efficient scheduling of these assets and increase their availability to scientific users.

Finding: Both programs have employed cost-saving measures such as group purchases to maximize use of limited NSF funds. The programs have actively solicited and incorporated reviewer, panel, operator and technician recommendations in funding group purchases. Group purchases of equipment and instruments benefit the academic research fleet in numerous ways, and the sharing of technical expertise across the fleet is of particular benefit to single ship operator institutions. There has been careful technical evaluation in the selection of instruments purchased to best meet current and emergent science needs. Secondly, group purchases have promoted standardization and uniformity of complex instrumentation across the fleet. This benefits science users and facilitates training and flexibility of the technician pool.

Finding: Requests for upgrades of multibeam systems by a number of operators have led program managers to plan for a multibeam oversight committee, instrument spares pool,

maintenance agreement, data quality evaluation process, and a best practices operations manual.

Finding: The program has maintained flexibility in funding equipment and instruments to meet cruise requirements, unanticipated losses, urgent safety and operational issues and environmental disasters, such as the Deep Horizon oil spill in the Gulf of Mexico.

Finding: The program has provided adequate support for equipment upgrades to meet regulatory requirements and for technical training as needed.

Finding: The program recognizes problems in lack of specificity in proposal guidelines have led to some confusion in the proposal requests. Program has initiated a revision of OI and SSSE proposal guidelines to clarify which types of equipment items should be requested through SSSE and OI and which types of equipment are more appropriately funded through ship operations (e.g. MOSA) or technical services awards.

Oceanographic Technical Services

Finding: One of the biggest challenges for the Oceanographic Technical Services is recruiting and retaining technicians in an environment of declining ship utilization and budgets. The program considers the traditional UNOLS model to be too lean for the sophisticated equipment in use on ships. Recruiting new people into the field is a concern. The program officer is to be commended for his efforts toward maintaining a robust and vital pool of technical talent in the academic fleet in the face of these challenges.

Finding: The MATE long-term internship program, although in its early stages, looks like a very promising program for recruitment of new technicians into the UNOLS fleet.

Finding: The program has been proactive in providing training funds and opportunities for technician groups. The program publicizes these opportunities widely to the technician community. These efforts have been successful and welcomed, although some groups do not take full advantage of these opportunities.

Finding: Ad hoc technician "swaps" between institutions to cover short-term personnel needs have been successful. Recent addition of a technical coordinator in the UNOLS office has improved and streamlined the process. Sharing of technicians between platforms builds additional capacity and may ultimately assist with retention.

Finding: Several fleet-wide efforts may prove to be transformative including development of a field-pool for magnetics and gravity; development of a multi-beam user group to establish a standard set of best practices, establishment of a hot spares depot and administration of a maintenance program with the manufacturer (Kongsberg); development of a web-based documentation depot; and establishment of a web-based shared-use equipment inventory.

CORE QUESTIONS and REPORT TEMPLATE
for
FY 2011 NSF COMMITTEE OF VISITOR (COV) REVIEWS

Guidance to NSF Staff: This document includes the FY 2011 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2011. 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 (2) managerial matters pertaining to proposal decisions.

The program(s) under review may include several sub-activities 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 sub-activities 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.

For section IV addressing portfolio balance the program should provide the COV with a statement of the program's portfolio goals and ask specific questions about the program under review. Some suggestions regarding portfolio dimensions are given on the template. These suggestions will not be appropriate for all programs.

Guidance to the COV: The COV report should provide a balanced assessment of NSF's performance in the integrity and efficiency of the ***processes*** related to proposal review. 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.*** The reports generated by COVs are made available to the public.

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 2011 REPORT TEMPLATE FOR NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: June 28, 2011 – June 30, 2011	
Program/Cluster/Section: Integrative Programs Ship operations (5411) Submersible Support (5412) Oceanographic Instrumentation (5413) Oceanographic Technical Service (5415) Shipboard Scientific Support Equipment (5416) Ship Acquisition and Upgrade (5417)	
Division:	**Ocean Sciences**
Directorate:	**Geosciences**
Number of actions reviewed:	**139**
Awards:	**134**
Declinations:	**5**
Other:	
Total number of actions within Program/Cluster/Division during period under review:	**139**
Awards:	**134**
Declinations:	**5**
Other:	
Manner in which reviewed actions were selected: The committee was provided access to all actions taken within the coverage period by the programs under review. Some actions were initiated before the start of the review period, but had significant activities to be reviewed. These include several cooperative agreements managed by the Ship Operations Program, as well as the Cooperative Agreement for the Alvin Upgrade Project.	

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.

I. Questions about the quality and effectiveness of the program's use of merit review process. Please answer the following questions about the effectiveness of the merit review process and provide comments or concerns in the space below the question.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE
1. Are the review methods (for example, panel, ad hoc, site visits) appropriate? Comments: Panels were used effectively, and mail reviews where used where appropriate. Some components are exempt from external review (e.g., ship operations) because of the nature of the program. Program officer vigilance, in consultation with experts in the community as needed, serves the review role.	Yes
2. Are both merit review criteria addressed a) In individual reviews? Yes b) In panel summaries? Yes c) In Program Officer review analyses? Yes Comments:	Yes

3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals? Comments:	Yes
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? Comments: These provide a clear rationale in the written record for the panel recommendation.	Yes
5. Does the documentation in the jacket provide the rationale for the award/decline decision? (Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.) Comments: Because of the nature of facilities funding, these programs have few outright declines for an entire proposal. The jacket documents the sometimes extensive correspondence of the program officers with the awardees, in declining specific parts of proposals, in negotiating revisions in different aspects of proposals, and in best achieving the goals of the program.	Yes

6. Does the documentation to PI provide the rationale for the award/decline decision? (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, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.) Comments: See answer to #5.	Yes
7. Additional comments on the quality and effectiveness of the program's use of merit review process: Program officers used panel advice effectively in identifying priorities best addressed by group purchases and by integrating knowledge across the academic fleet to identify optimal products for meeting science needs in multiple platforms. Given the specific nature of the funding for facilities, program officers have been effective in using the "intellectual merit" and "broader impacts" criteria and documenting this use.	

II. Questions concerning the selection of reviewers. Please answer the following questions about the selection of reviewers and provide comments or concerns in the space below the question.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE
1. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: Reviewer and panel expertise included diverse expertise. The selection of reviewers and panels was thoughtful and appropriate, given the complexities of the issues under review and the potential conflicts of interest.	Yes
2. Did the program recognize and resolve conflicts of interest when appropriate? Comments: Template for written review analysis includes an opportunity to discuss conflicts of interest in reviewer selection and during panels. This is routinely tracked as part of an OCE-wide process.	Yes
Additional comments on reviewer selection: We were impressed by the use of science community members with hands-on expertise and with industry experience in the review process. This provided a valuable perspective on technical issues for instrumentation reviews, giving important, but subtle, details for making decisions. This included the seagoing scientist (the end user), the operators, the seagoing technicians, international representation, and inter-agency representatives as appropriate.	

III. Questions concerning the management of the program under review. Please comment on the following:

MANAGEMENT OF THE PROGRAM UNDER REVIEW
1. Management of the program. Comments: We were impressed by the emphasis on strategy and big picture emphasis throughout IPS and in this component; this clearly starts with the leadership. The various groups communicate easily and well, with cooperation between program managers. Personnel are assigned appropriately to tasks that fit their background, interests, capacity, and potential for professional growth, and this serves to accomplish the overall goals of Oceanographic Centers, Facilities, and Equipment. Coordination is key here and carried out effectively, because of the need to integrate from construction to operation. Program officers have authority and responsibility, with management at all levels setting the framework that allows this to take place. Many big programs, a long time in the making, have come to fruition in this time interval (including the MREFC-funded construction of the Ocean Observatories Initiative), and these priorities have been effectively addressed. The number of personnel is relatively small, and the collaborative, cooperative tone is evident.
2. Responsiveness of the program to emerging research and education opportunities. Comments: The issues surrounding the operation, maintenance, and renewal of the academic fleet are forefront in their work; these are of national priority and require long lead times and sustained attention. Oceanographic Centers, Facilities, and Equipment personnel cooperate within NSF and with other agencies in this regard, including contributing to national reports. They embrace new technologies, new ship infrastructure, new equipment, and new assets (e.g., gliders, autonomously operated vehicles [AUVs], shipboard communications system, load handling systems). We note the transformative potential of R2R, Rolling Deck to Repository, for bringing shipboard data to broad community availability. Communication advances have contributed to emerging educational efforts, like ship-to-shore educational contacts (e.g., video conferences, real-time blogs, K-12 teacher training).
3. Program planning and prioritization process (internal and external) that guided the development of the portfolio. Comments: See response to #4.
4. Responsiveness of program to previous COV comments and recommendations. Comments: There was an initial response to the 2008 COV Report and brief annual written reports documenting actions taken in response. Several items were appropriately considered closed before this COV.

IV. Portfolio Review. Please provide comments on whether the program's portfolio goals are appropriate and whether the program has achieved its goals for portfolio balance.

Not applicable; please see narrative report.

Programs should provide materials to the COV regarding portfolio goals and can insert specific targeted questions about their portfolios. *(Some dimensions of portfolio balance to consider include: balance across disciplines and sub-disciplines, award size and duration, awards to new investigators, geographical distribution of awards, awards to different types of institutions, innovative/potentially transformative projects, projects with elements of risk, inter- and multi-disciplinary projects, projects that integrate research and education, and projects that are relevant to agency mission or national priorities).*

OTHER TOPICS

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

The advent of new technologies and seagoing assets (like gliders) will result in the need for management structures dedicated to these, with questions about how to manage these pooled assets and about where the management should reside (in IPS or in a science program elsewhere in OCE). There are excellent precedents established within the IPS-funded programs with program manager guidance, like the existing Winch and Wire Pools and the relatively new and evolving web inventories of seagoing equipment. These assure broad community access and availability for these shared use assets.

We suggest that criteria like the need for standardized and high quality instrumentation and facilities; the relative expense of these valuable community assets; and the advantages of coordinated cost-effective management be considered in creating these structures.

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.

See answer to #1 and the narrative report.

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

Operation, management, and planning for academic fleet renewal are essential components of meeting NSF's strategic goals of transforming the frontiers and innovating for society. The use of Business Processes Review (BPR) with awardees for ship operations is an excellent example of operation as a model example.

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

NA

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

NA

SIGNATURE BLOCK:

Peggy Delaney

For the 2011 COV, Integrative Programs Section: Oceanographic Centers, Facilities, and Instrumentation (Ocean Sciences, Geosciences)
Margaret L. Delaney, Chair