

ACTIONS NEEDED

Although OSRI is a small program within the larger scientific context and it has had some problems that need to be addressed, OSRI is doing some good work and it is a big influence in Cordova, Alaska. Some of its educational programs deserve special credit for building a strong community partnership.

What follows are the committee's main findings and recommendations, drawn from each chapter. The focus is on the overall OSRI portfolio and procedures, and not specific projects, with the exception of a more detailed exploration of the modeling efforts because these are such a large component of the OSRI program. The items vary in their specificity; however, all are intended to help the Advisory Board and OSRI staff strengthen the program as it evolves, especially if it is decided that the program should continue past its currently scheduled sunset in 2006.

ORGANIZATION AND ADMINISTRATION

Finding 1: Overall, the organization and administrative structure of the Oil Spill Recovery Institute are appropriate for the mission. As with any new program, there were start-up problems, and some problems remain (addressed in the following findings and recommendations). But in general the Advisory Board has discussed problems frankly and implemented procedures to address them (e.g., the Grants Policy Manual).

Recommendation: The committee recommends continued strong oversight from the Advisory Board and the Scientific and Technical Committee. These perspectives and added expertise are important to ensuring that OSRI fulfills its mission and generates high quality research that is useful over time in improving our understanding of, and ability to respond to, oil spills in cold marine environments.

GRANT AWARD POLICIES AND PROCEDURES

Finding 2: Solicitations for proposals, especially some of the Broad Area Announcements (BAAs), do not always accurately and adequately describe the scope of the research being requested. Confusion in this area in the past may have led to some of the frustration expressed by investigators who felt unfairly treated in the OSRI grant review process.

Recommendation: The success of the OSRI research program requires careful attention to the writing and administration of the proposal process. BAAs are appropriate for some objectives of OSRI (e.g., education programs, fellowships and internships, and in cases where novel solutions are being solicited). However, RFPs that are specific in objective are likely to be more effective for many of the projects funded by the OSRI. Well-written RFPs would provide potential bidders with adequate information to respond to long-term strategic goals.

Finding 3: The solicitation process has not been effective in reaching a broad audience, which is critical to ensure high-quality science and technology. BAAs and RFPs were not well advertised or released in a regular cycle. Whether true or not, there is a perception in the scientific community that some people have advance knowledge of upcoming solicitations.

Recommendation: Improvements in the process used to solicit research and technology development proposals are needed.

- Solicitations for proposals should be released on a standard schedule and should be open for a reasonable amount of time (e.g., three months). Additional effort is needed to ensure BAAs and RFPs are independently developed and in concert with the mission and objectives of OSRI.

- Solicitations should be advertised nationally, which will help garner wider responses and increase awareness of OSRI goals and objectives.
- Implementation of existing procedures should be strict, to assure potential bidders that the procurements are not “wired.”
- OSRI should increase its use of the RFP rather than BAA process when specific research is desired.
- A schedule for review and decision making should be established so that investigators who have expended considerable time and money will get a timely response to their submittal. Unsuccessful bidders should be notified of the final selection and provided some feedback regarding the reason for their unsuccessful bid.
- OSRI should define a minimum distribution list of organizations, publications, and individuals for the dissemination of BAAs and RFPs. These should include written and electronic media, both within Alaska and across the United States. The Arctic Research Consortium of the United States (ARCUS), based in Fairbanks, Alaska, manages a listserv that reaches more than 3,000 people and is one example of a mechanism that can be used. Consideration should be given to include distribution to other countries where expertise resides.

Finding 4: As of August 2002, the list of OSRI publications includes about 44 items, either published or in press, of various types including journal articles, conference proceedings, abstracts, videos, and assorted maps and guides. The number of articles in refereed journals appears to be increasing. Thus OSRI research is starting to make its way into the refereed literature.

Recommendation: OSRI leadership should continue to place high emphasis on funding research likely to be published in peer-reviewed publications that have broad distribution. The nature and number of publications should be monitored into the future, using publication rates as one measure of the quality of the program.

Finding 5: The 20 percent limit on overhead discourages some potential researchers from applying for funds. For example, many applicants at academic institutions would be restricted from applying given that constraint.

Recommendation: The Advisory Board has discussed this potential problem and agreed that additional overhead may be paid at the discretion of the OSRI director. This policy should be made clear in future advertising of BAAs and RFPs. For example, a statement could be added that government-audited indirect cost rates at academic institutions will be honored if a proposal is selected and funds are available.

PROGRAM PLANNING

Finding 6: OSRI’s most recent strategic planning document was issued in 1995. Since the 1995 document, there has been an evolution in interpretation of the OSRI mission and associated goals and the 1995 strategic planning document no longer directs OSRI’s future. Annual plans and the Technical Coordinator Report comprise an important part of the organization’s planning process, but serve more as records of past and current activities rather than to help set a course for the future.

Recommendation: A revised five-year strategic plan should be developed, led by the Advisory Board, and perhaps for efficiency assigned to a subgroup such as the work plan committee, with strong input from OSRI staff and the Scientific and Technical Committee. The planning process should explicitly consider the issue of “top-down” and “bottom-up” approaches and provide clear guidance on how the Advisory Board wishes the administration to proceed. Annual plans should be continued and expanded to provide an update on progress toward long-term strategic goals as well as a summary of projects. Together, these documents will not only guide the program but will be very useful to Congress when it decides on the future of the program.

The strategic plan should

- contain the history and evolution of the OSRI mission and objectives including the rationale for these changes in course.
- evaluate the 1995 recommendations/priorities versus progress to date or explicitly declare them no longer applicable.
- provide a clear overarching vision for OSRI for the rest of its legislative life, including an explanation of how funded activities fit into this vision, and describe future challenges that OSRI might address should it continue.
- explicitly identify mission-related goals and the activities to be pursued to reach these goals.
- provide a detailed time line and milestones by which progress toward the goals can be assessed on regular basis.

PREDICTIVE ECOLOGY

Finding 7: OSRI predictive ecology projects are generally responsive to the OSRI mission. There needs to be more synergism and connectedness between the field studies and the predictive ecology modeling.

Recommendation: The predictive ecology portfolio should be continued with improvements in design and in scope as detailed elsewhere in this report. Outputs from observational field studies should be closely aligned with the modeling efforts to ensure that relevant parameters are being measured and that data is collected on spatial and temporal scales consistent with integration into the models. OSRI should develop a niche for its studies in larger regional ecosystem studies, where it can provide leverage and synergy.

Finding 8: The Copper River Delta study, Prince William Sound resource monitoring, and the sensitivity mapping have produced quality results that increase our understanding of ecosystems in the area. The work is well designed and is providing valuable information about the ecology of forage species of invertebrates that are preyed upon by migratory birds.

Recommendation: All ecosystem monitoring should strive to develop a better understanding of ecosystem functioning and structure. Such studies require rigorous study design. Inventories are of limited value as a first order assessment of resources present, since the biological patterns vary over time and space. To enhance the usefulness of the Copper River study, chemical analyses (hydrocarbons, metals, and nutrients) should be done to allow comparison if there is a spill upriver or in the Gulf of Alaska.

Finding 9: OSRI's biological monitoring generally covers the four dominant biomasses in Prince William Sound and the Copper River Delta (Pacific herring, pollock, *Neocalanus copepod*, and *Macoma balthica*). While this approach provides insights about financially important species, it does not provide a comprehensive picture of the ecosystem. Many research programs consider monitoring to be within their missions, so coordination with monitoring efforts by other organizations is particularly important.

Recommendation: When OSRI supports biological monitoring programs in Prince William Sound, it should cover a broader spectrum of the ecosystem. For example, zooplankton data need to be integrated with synoptic nutrients and phytoplankton data. Herring and pollock studies should evaluate predator and prey distributions and abundances, so that the distribution and ecological data for the two species can be integrated into the ecological and food chain models for the sound. Results should be integrated with other fisheries and ecological studies in the sound, including the *Exxon Valdez* Trustee Council's GEM program, projects of the newly evolving North Pacific Research Board, and other ecosystem-oriented research programs. Where possible, monitoring should be expanded to include a wider geographic area of the sound and seasonal observations.

APPLIED TECHNOLOGY

Finding 10: The projects funded within the Applied Technology program are generally responsive to the OSRI mission. OSRI purchases of existing software packages have limited impact and only marginally contribute to the OSRI mission.

Recommendation: OSRI Applied Technology projects should concentrate on the development or improvement of techniques, materials and equipment that affect the efficacy of the oil spill prevention and clean up response. A component of the overall OSRI portfolio should support natural resource damage assessment, such as efforts to improve assessment tools. Purchases of existing software or other off-the-shelf items should be carefully considered to be certain they are relevant to the OSRI mission and add value to the program.

Finding 11: OSRI is not structured, funded, or mandated to be a real-time oil spill response organization.

Recommendation: OSRI should not fund activities, projects, or purchases that have a primary real-time response justification. OSRI should be encouraged to develop a close relationship with oil spill response organizations to clearly define an appropriate and realistic role in the case of an actual spill.

Finding 12: The education and outreach activities supported by OSRI are generally well designed and effective. There are real opportunities available to create educational activities with an applied technology orientation.

Recommendation: The impact of the Applied Technology program could be enhanced by creating additional education and outreach activities, such as short courses, and by designing new activities with a technology focus.

PROGRAM BALANCE

Finding 13: Although creation of the 40/40/20 split among predictive ecology, applied technology, and education/outreach was an appropriate initial attempt to build balance into the overall OSRI program, it is not accomplishing its intended effect. In some cases, project classification based on the 40/40/20 criteria appears to be arbitrary and the requirement is actually undermining the goal of project balance.

Recommendation: Changes should be made in the 40/40/20 classification requirement. Either projects should be classified objectively as to category or the targets for allocation rescinded. Award selection should be based on quality and relevance to mission. Balance should be assessed year to year but overall balance should be judged based on the entirety of the program's portfolio over the lifetime of the Institute.

MODELING

Finding 14: The OSRI-supported Nowcast/Forecast (NC/FC) model system is conceptualized primarily as a real-time oil spill response tool.

Recommendation: The mission of OSRI should be to fund research, and while OSRI may contribute needed information to responders, it should not compete in the response business. OSRI's modeling efforts should work to advance the state of the art, including validation and analysis using hindcasting. Modeling can be effectively used to synthesize existing information and as a hypothesis-testing tool to define questions and needed research. It is more appropriate that OSRI use modeling

in research, contingency planning, and ecological risk.

Finding 15: The NC/FC system is not a validated and accepted response tool.

Recommendation: If OSRI intends to continue with this role for the model system, it will need to be validated and the potential user community will need to be persuaded that it is a worthwhile tool.

Finding 16: Considerable OSRI funding has been committed to implementation of existing modeling technology and knowledge, such as model algorithms that have been incorporated in other modeling systems applied elsewhere as well as in Prince William Sound.

Recommendation: The incorporation of existing models is appropriate if it is clearly related to research goals. However, OSRI would make a greater contribution by funding research that advances the state of the art of modeling—for example, by improving algorithms for oil transport, fates, and effects—rather than funding development of code to implement (or reimplement) existing capabilities and knowledge. OSRI could play a role in basic research of modeling, which is typically not funded by industry.

Finding 17: Model validation efforts have been limited to date, in part because of the lack of data to input to the models. These limitations have been recognized by OSRI and attempts are being made to improve data inputs to the model system, such as the addition of the atmospheric modeling component to provide spatially varying wind fields to the hydrodynamic and oil spill models.

Recommendation: OSRI should make it a priority to validate the entire system together, as well as each model alone. In addition, the comparison of model predictions and observations should be described statistically, where goodness of fit is measured and uncertainty is presented quantitatively.

Finding 18: The present emphasis on real-time forecasts every six hours is inappropriate and unnecessary, as there is little understanding gained from each simulation. In addition, the model system as it stands is deterministic—that is, it produces single simulations with no measure of uncertainty.

Recommendation: OSRI's modeling efforts would be more productive and cost effective if they focused on intensive observational periods (of a month or so duration) to develop a better understanding of the system by comparing model results and observations. In addition, the model system needs to be applied in a probabilistic/stochastic mode, with quantitative uncertainty estimation. This is appropriate whether the application be spill response or ecological risk assessment.

Finding 19: There has been little effort devoted to incorporating biological effects into the modeling or in quantifying recovery aspects of Prince William Sound after the Exxon Valdez oil spill. Early OSRI studies did evaluate physical-biological coupling, but this work has not been continued.

Recommendation: OSRI should plan for and implement biological modeling into the program.

Finding 20: The current focus on the atmospheric model development is appropriate and needed for better understanding of hydrodynamics and oil transport, as well as the implications to biological communities.

Recommendation: As OSRI's modeling activities evolve, continued work will be needed to improve the atmospheric components and continued attention to freshwater runoff will be needed for the hydrodynamics to be understood and predicted.

Finding 21: There has been little coordination between models until a recent meeting of principle

investigators in April 2002. OSRI is writing a strategic plan for modeling based on the workshop.

Recommendation: There is a need for more and better planning of the model system, in writing, and with specific goals, deliverables, and a timeline. For example, the coupling of the hydrodynamics and oil transport needs to be tight, to be sure no redundancy of forcing (wind drift, Ekman flow) is included.

Finding 22: Coordination with other programs and organizations involved in modeling has been limited.

Recommendation: There should be increased coordination with the modeling components of the Gulf Ecosystem Monitoring (GEM) program, GLOBEC, SALMON and other research programs, especially regarding boundary conditions and coordination with larger scale atmospheric models, and better coordination with NOAA and Alyeska.

EDUCATION AND OUTREACH

Finding 23: Activities included under the Public Education and Outreach program of OSRI cover a broad range and they are a valuable contribution to the overall OSRI program.

Recommendation: Education and outreach activities should be continued, similar to current efforts. Staff must ensure that these activities support the OSRI mission, meaning that they must have clear links to oil spills, their prevention and response, and environmental impacts and protection. There may be special opportunities for more technology-focused activities and activities directed at teachers.

Finding 24: Although most of the projects included in the Education and Outreach program generally fall within the OSRI mission, some may be more appropriately considered administrative functions (e.g., annual report development, computer technology, and website maintenance).

Recommendation OSRI management, under the direction of the Advisory Board, should frankly discuss the limitations imposed by the 20 percent overhead cap and give explicit approval that certain overhead-type activities can or cannot be conducted under the auspices of the Education and Outreach program.