

## **Research Program Manager's Report, by W. Scott Pegau, Ph.D.**

We are continuing to fund projects in accordance with the Science Plan and the Work Plan.

### **Understand**

#### *Observational Oceanography*

The observational oceanography program experienced a large transition in the fall of 2007 as Claude Belanger left and Jennifer Ewald started. During this transition it was decided not to deploy the moorings in the fall of 2007. This decision allows Jennifer a chance to evaluate the mooring design to reduce the risk of loss of equipment in the future, and to evaluate the performance of the instruments to date. The moorings are expected to be installed again in the spring of 2008. We expect that an additional mooring will be deployed in the "Black Hole". This mooring will have a bottom mounted conductivity-temperature sensor to determine when new waters are advected in from the Gulf of Alaska. A real-time mooring was installed in Chenega Bay in 2007 and will be serviced in 2008. This mooring measures temperature, salinity, chlorophyll-a, and turbidity and transmits the data with the SnoTel station. The data will be made available on the AOOS website.

The hydrographic surveys conducted in collaboration with Dr. Steve Okkonen were completed with a survey in January 2008. The data is presently being analyzed to examine the seasonal variability in physical oceanographic properties within Prince William Sound. The PWSSC will continue seasonal surveys to develop a better climatology of Prince William Sound.

OSRI has provided most of the funding for the observational oceanography program; however, important financial contributions have also come from the Alaska Ocean Observing System (AOOS), Prince William Sound Regional Citizens' Advisory Council, and the National Aeronautics and Space Administration.

The PWSSC is also preparing nine drifters for deployment as part of a model validation exercise planned for 2009. More details on the model validation program will be provided later.

#### *Meteorological Stations*

One additional SnoTel meteorological station was installed near Valdez in 2007. The permits for two more of the high-altitude stations were received in January 2008. Deployment of those stations is planned for 2008. These stations will require helicopters to install and service. OSRI has been funding the maintenance of the SnoTel stations in Prince William Sound with 7 of the 10 stations currently installed. Since some stations had not been installed the maintenance costs have been below the amount budgeted. With the additional stations coming on line and the higher logistics costs associated with those stations we expect to fully expend the amount budgeted for the next two years.

#### *Modeling Status*

The funding to UCLA for the Regional Ocean Model (ROMS) development ended at the end of 2007. We are currently waiting on the final report from Jim McWilliams. Results from this modeling effort were presented at the Alaska Marine Science Symposium in January 2008. Model development work is continuing with funding through the Prince William Sound Science Center. Funding for the Weather Research and Forecasting (WRF) model will end in July 2008. Dr. Peter Olsson will provide an update of that effort later in this meeting. Funding for modeling in the OSRI Science Plan ended in fiscal year 2007. A three-year proposal AOOS recently

submitted to NOAA includes funds to continue the modeling efforts but initial indications are that AOOS' request will be funded at a lower level.

#### *Model Validation Exercise*

The culmination of the modeling work is to be a model validation exercise that was originally scheduled for 2007. AOOS is committed to conducting this exercise in 2009. A day-long meeting was held in January 2008 to review the status of efforts and begin the planning process for the exercise. One result of that meeting is to be a list of critical components and their cost. The list will allow us to identify gaps in the presently funded projects and prioritize the funding of projects that will allow a successful test of the models to be conducted. I expect that OSRI will need to provide additional funds, or redirect existing efforts, in order to conduct the model validation exercise. The responsibility for planning this exercise is shifting from Dr. Carl Schoch to Jennifer Ewald.

### **Respond**

#### *Joint Industry Program*

OSRI contributed to the successful Joint Industry Program (JIP) Steering Committee meeting in Anchorage in October, 2007. The JIP has increased the number of exercises planned for the spring of 2008 to be better prepared for the 2009 experimental spill. Reports are being generated on the capabilities of different response strategies and equipment. These reports are extremely useful when trying to determine what types programs we might want to fund in the future.

OSRI's Work Plan includes funding for a joint request for proposals (RFP) with the Coastal Response Research Center (CRRC) for a biological program as part of the JIP exercise. The CRRC developed a RFP that highlights the potential for biodegradation of oil in ice. This program has not received strong support from OSRI's Scientific and Technical Committee. A white paper on our present understanding of the effects of oil-in-ice on arctic biology was requested by the STC. A draft of that report was completed in the summer and revised in the fall of 2007 after comments were received from Jeep Rice. A copy of that report is included in this packet. If the STC does not support the CRRC project we may want to examine other means to use the budgeted funding to support the JIP and arctic response research. Possibilities include covering shipping costs of equipment that Alaska Clean Seas has offered to supply, and conducting a feasibility study for measuring oil fluorescence through snow and ice.

**I recommend that we budget an additional \$50K to the JIP program to allow us to pay the shipping cost of boom that is being contributed to the JIP program. The shipping of the donated boom was not contained in the original JIP planning so shipping must come from an outside source or a reduction in budgets. The JIP steering committee will have to approve our offer to cover the cost of shipping the boom. The request for additional funding allows us the opportunity to continue to work with the CRRC with the STC's approval. It also represents funds identified for the JIP program in FY07 that were not spent.**

#### *Joint Partnership Opportunities*

So far two opportunities have come up. The first is to work with Shell to update the NOAA oil spill calculator tools. This opportunity has strong support and strong opposition from the technical members of the STC. I have not pursued this opportunity because of the split support. The second opportunity is to work with Prince William Sound Regional Citizens'

Advisory Council to update their dispersant bibliography. This project has received support from the STC because of its value when developing RFPs in the future.

I am developing two RFPs to be released if partnership opportunities do not develop. One would be for a demonstration project showing how radar systems on smaller vessels may be used for detecting and mapping oil at night. There has been work on this subject, and there are new processing systems that are being developed that should allow shipboard radar to map oil. The second opportunity is for a feasibility study for measuring oil fluorescence through snow and ice. This is an area of research that I am very familiar with. I know the concept is on the border of being feasible and the people I have talked with have provided some ideas that may make it more feasible. Both of these RFPs are being developed to be similar to a Small Business Innovation Research (SBIR) RFP used by many federal agencies. The SBIR phase I proposals are for feasibility/demonstration project and are typically for \$70,000 or less.

### *InnoCentive Challenges*

We have completed a full cycle in the InnoCentive process. This has pointed out a few small differences between how I expected the process to work and the reality. Most of the differences have been that OSRI has had more control than I expected. We submitted three theoretical challenges to InnoCentive. The first to be completed was for means to break the viscous shear of oil at very low temperatures. We received 28 solutions, many of which used a common approach. There were three or four techniques that had potential. A prize was awarded for a solution that uses a concrete vibrator mounted on a pole to break up the oil, thus allowing it to flow to the pump.

The second challenge was to develop a technique for remediating lingering oil in Prince William Sound. We received 6 solutions to that challenge. No prize was awarded. This challenge demonstrated that most solvers are unaware of the cost of operating in Alaska.

The third challenge was for containment and recovery of submerged oil. This challenge generated the most creative solutions of the three challenges. There were no solutions that adequately addressed both aspects of the challenge, but the technology experts we consulted thought that one of the solutions for recovery had enough merit to award a prize. A prize was offered for that solution. The solution that we awarded the prize to outlined a recovery method that used a type of rop-mop skimmer designed for underwater use and mated to a remotely operated vehicle for maneuverability.

Some of the lessons we learned follow. Well defined challenges lead to more and better solutions. We learned that we could use our experts to determine if a solution met the criteria put forth in the challenge. The theoretical challenges just provide an idea and a follow up effort is required to gain benefit from these types of challenges. We only get contact information for the people we award prizes to, which makes it difficult to follow up on multiple good ideas.

We need to develop new challenges for release. It would be nice to release a demonstration project style of challenge, which is more expensive than a theoretical challenge. At this point we have not been able to get partners on this program, but should continue for at least one more year. Potential projects are demonstration of a means to prevent ice formation on recovery equipment, a theoretical project to identify an oil spill simulant for oil spill response training, a theoretical challenge for allowing night time response from small vessels. We should also consider holding another meeting for defining potential projects similar to that held last year.

## Education

### *Technology Scholarship*

One of the Fellowships has been converted to an undergraduate scholarship offered through the Kenai Peninsula College. No applications were received in the fall and the scholarship was revised and opened for the spring term. Three applications were received and a scholarship was awarded. The scholarship includes \$4,000 per term for three terms and a \$13,000 internship for the summer. Our intention is to offer the scholarship again next winter. Since the technology program is a two-year program we found that it makes sense to open the scholarship in the winter after students have started work on the program and are easier to notify of the scholarship opportunity.

### *Technology Education Demonstration*

A new program in the fiscal year 2008 budget is a technology education demonstration project. The desire of the program is to introduce technology into the K-12 education efforts. A RFP was issued in the fall and two proposals were received. Based on the reviews we awarded the project to the Alaska SeaLife Center. Their project is to develop five new oil spill curricula and provide teacher training. Technologies to be covered include means for cleaning oil from water, methods to clean wildlife, and the use of remotely operated vehicles for spill detection and mapping. This project will start in April with teacher training this summer and tracking of the training in the future. Their proposal is part of the packet.

### *Oil in Ice Conference*

The Oil in Ice conference was held in Anchorage in October 2007. Experts in a wide variety of fields related to oil development in the Arctic provided presentations. Their presentations are available on CD. This conference provided information about the current level of technology and where advances are being made. It was not designed to develop recommendations for future research needs. The OSRI sponsored document on Advancing Oil Spill Response In Ice-Covered Waters document remains an excellent guide to the needs for future research.

### *Detecting Hydrocarbons in the Marine Environment*

We are working with the Alliance for Coastal Technology to develop a workshop on detecting hydrocarbons in the marine environment. The workshop will be held in April 8-10 in Seward. The workshop brings together researchers, manufacturers, and resource managers to discuss the current sensor capabilities and future sensor needs. The desire is for OSRI to gain guidance for the types of sensor capabilities that it should fund in the future. This workshop has received a lot of interest so far. Because of the strong interest and many of the invitees are foreign we are finding that we under-budgeted.

**I recommend moving \$10K from the Graduate Fellowships to the Workshop budget to allow additional funding for this workshop. The transfer of funds is possible because the revised technology scholarship only requires \$12.5K in FY08 instead of the budgeted \$25K.**

*Science of the Sound and Forest to the Sea*

The K-12 education efforts continue to provide excellent education programs. The PWSSC partner in the Science of the Sound, the Forest Service, has received budget cuts which recently threatened to reduce their ability to participate. The program's importance to the community of Cordova was demonstrated through an immediate commitment by the telephone and electric cooperatives to cover the \$4,300 shortfall which would have meant the loss of programs for K-2 graders. In a unique arrangement, the Science Center is hiring the former Forest Service part-time employee in order to maintain the program through the end of this school year.

No science fair was held this year, so the \$500 was not needed for student scholarships. The funds were re-assigned to the Discovery Room project to allow funding a visit by the Imaginarium. This allowed all students to benefit from the funding.