

# **Prince William Sound Oil Spill Recovery Institute**



## **Annual Plan**

### **Fiscal Year 2000**

**(FY00)**

**October 1999 - September 2000**

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## 1.0 Introduction

This Annual Plan describes the oil pollution research and development (R&D) program for the Oil Spill Recovery Institute (OSRI) during Fiscal Year 2000 (FY00: 10/1999-9/2000).

The R&D Grant Program was established to solicit and administer oil pollution R&D projects in three areas.

- Applied Technology
- Predictive Ecology
- Public Education and Outreach

R&D grants within these program areas will be awarded and administered in accordance with the guidelines contained in the OSRI Grant Policy Manual. This manual is available through the OSRI web site.

## 2.0 Program Background

### 2.1 Oil Pollution Research and Development Plans

In 1995, OSRI published an Oil Pollution Research and Technology Plan for the Arctic and Subarctic (Thomas et al. 1995) that serves as the foundation for implementation and management of the OSRI R&D program. This plan used existing oil pollution R&D programs as a guide, particularly the National Oil Pollution Research and Technology Plan, published by the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR 1992). The OSRI plan describes the scope of oil pollution prevention and response R&D, and OSRI's geographic focus on Alaska's oil transport system.

In 1997, OSRI held a workshop to update Arctic and subarctic oil pollution issues for the Advisory Board. At this workshop R&D conducted after the Exxon Valdez Oil Spill (EVOS) was reviewed and the revised national plan for oil pollution research and technology was presented (ICCOPR 1997). Based on this workshop, the OSRI Board endorsed three programs:

- Applied Technology - to conduct research and development on new technologies for preventing and responding to oil spills in the Arctic and Subarctic;
- Predictive Ecology - to develop new capability to predict changes in animal populations at risk to spills; and
- Public Education and Outreach - to make the research process interactive with the public so that goals are clearly defined that have public benefit.

### 2.2 Grant Program Authority

The Oil Pollution Act of 1990 (OPA90) established the Prince William Sound Oil Spill Recovery Institute (OSRI) to conduct R&D programs to develop the best available technologies for dealing with oil pollution in Arctic and Sub-Arctic regions. OPA 90 also mandated that OSRI implement long-term environmental monitoring in conjunction with federal and state agencies in the Greater Prince William Sound region (Title V, Section 5001). Under Title V, Section 5006 of OPA90, Congress authorized OSRI \$23 million over 10

years from the TAPS Fund but only after outstanding claims were resolved. In FY97, after the outstanding TAPS claims were settled, Congress appropriated \$22.4 million of the remaining funds to be held by the U.S. Treasury with the annual interest awarded to OSRI for implementation of the R&D program for the Arctic and Sub-Arctic (Coast Guard Reauthorization Act of 1996).

### **2.3 R&D Grant Policies and Procedures**

OSRI has adopted an R&D grant program based upon policies and procedures that are used by the National Science Foundation (NSF), NOAA's National Undersea Research Program and the EVOS Trustee Council. The basic document that governs the OSRI program is the Grant Policy Manual (GPM). The GPM provides guidance on the various provisions of program management. All OSRI staff, committee members, and board members will follow the guidelines contained in the GPM when processing and managing OSRI grants and projects. The OSRI GPM and other OSRI documents and forms, including Broad Area Announcements (BAAs) for specific projects and application packages, are available on the OSRI web site at [www.pws-osri.org](http://www.pws-osri.org). These documents can also be requested by mail or in person at the OSRI offices in Cordova.

### **Approach**

OSRI encourages team science for both technology and ecology projects by rating the proposals on the basis of vertical integration of the research team with regulators, managers and user groups. Also, where it is appropriate, the proposals will be rated on the basis of horizontal integration of the research teams with respect to discipline and organization. Proposals that use bioregional, public decision-making processes to establish research goals are encouraged.

### **Roles and Responsibilities**

OSRI will assist in forming R&D teams, and when necessary, take an active part in convening workshops to address important issues, participate in assessments of research issues and planning, and disseminate results. The following roles and responsibilities are assigned:

- Advisory Board – Review and approve the bylaws, policies and procedures, resolve grievances, review annual, business and strategic plans and amend budgets, hire and fire the Director.
- Director – Prepare the annual plan, the revised business and strategic plan, hire and fire staff, direct the activities of the OSRI staff, work with the Science and Technology Committee to review large proposals, assist researchers to build R&D teams and act as the final award authority for small grants.
- Science and Technology Committee – Review all large grant proposals forwarded by the OSRI staff and make recommendations to the Advisory board for grant awards.
- OSRI Staff – Provide administrative support to the Director for executing the R&D Grant Program.

### **Types of Funding**

OSRI awards will be divided into three main categories:

#### **A. Large Awards** (\$100,000 or greater):

1. Applied technology grants that include proof of concept (alpha testing) of new technologies and pilot implementation projects for new applications of proven technology (beta testing).
2. Applied predictive ecology grants that develop nowcast/forecasting capability. These usually consist of numerical models and their monitoring programs for animal populations at risk.

**B. Small Awards** (under \$100,000)

1. R & D projects in the area of technology, ecology and education
2. Workshops that have fact-finding or fact-demonstration goals related to technology, ecology and education.
3. Publications of various types that promote the OSRI R&D program to the scientific community and the general public.

**C. Fellowships & Internships** (under \$100,000 per year)

1. Fellowship Grants to support post-doctoral and graduate students in research related to oil pollution prevention and response in the Arctic and Subarctic.
2. Internships to support high school and undergraduate college students to work with qualified researchers on OSRI projects or those relating to oil pollution prevention and response in the Arctic and Subarctic.
3. Preference will be given to those proposals that fall within one of OSRI's three program areas.

**Application and Award Process**

OSRI staff, committee members, and board members will follow the guidelines and procedures detailed in the Grants Policy Manual (GPM).

### 3.0 Applied Technology program

The OSRI 10-year business plan targets 40% of program funds for grants, contracts and workshops in the area of applied technology. The applied technology program is the development component of the OSRI R&D program. As such, it is focused on the engineering and application of new products and technologies. OSRI technology products are anticipated to range from new tools for the prevention and remediation of oil pollution to the implementation of systems that provide new information for decision-makers on natural resources at risk to oil spills. By design, applied technology projects will often match funding with predictive ecology and education projects owing to the need for collaborative research and educational efforts for the technology applications to realize their full potential.

*For information about individual grants, visit the BAA section of our web site. All costs are approximate and are subject to change. The Applied Technology budget for FY00 is \$610K (38% of FY00 program spending). Additionally, the OSRI Board of Directors specified \$200K in unallocated funds for the Applied Technology program in FY00. These funds are discretionary and available for funding programs arising between fiscal year budgetary cycles. As discretionary, uncommitted funds these monies are not included in the Applied Technology program dollar amount listed above or in the overall percentages listed within this document.*

#### 3.1 Technology – Continuing Programs

##### Nowcast/Forecast Ocean Circulation Program (FY99 continuation into year 2)

The Nowcast/Forecast (N/F) project is the primary initiative of the current OSRI research and development programs. For this reason, the funding for N/F development is split 50/50 between the Predictive Ecology and Applied Technology programs. The goal of this project is to assemble a host of new predictive and measurement tools into a N/F system for specific physical and biological conditions and features of Prince William Sound. By working with the public, government organizations and private industry in the region, we hope to select key features that provide valuable information services to the region long into the future. Also, as the N/F system develops it should provide structure for many of the smaller grants funded through OSRI.

FY99 was a transition year for OSRI, which focused on finishing projects from the Sound Ecosystem Assessment (SEA) and other research programs as well as initiating the development of the N/F system for PWS (PWSNF). Several changes in the structure of the N/F program are being made in FY00 based on first year project results and to unify project leadership under the new Technology Coordinator. This program includes continued funding for one of the previous principle investigators, Dr. Shari Vaughan, and two post-doctoral positions in physical ocean modeling and atmospheric modeling as outlined below. The OSRI postdoctoral researchers will be located in Cordova at the Prince William Sound Science Center.

In FY98, OSRI obligated \$300K per year for five years with a 50/50 split of program costs between Applied Technology and Predictive Ecology for N/F system development. Spending is targeted for \$300K a year on an annualized basis.

##### **BAA: Two-year, Post-Doctoral Position in Physical Ocean Modeling**

A two-year post-doctoral position will be nationally advertised that seeks an individual with the ability to implement operations of the Princeton Ocean Model (POM) in near real-time data acquisition systems. This postdoctoral oceanographer will work with Dr. Shari Vaughan on research questions that involve observation and with the postdoctoral meteorologist to couple the POM with an MM5 or similar atmospheric model that provides surface wind forcing. Cooperation between Dr. Vaughan and the postdoctoral meteorologist is a primary objective. This will be a full-time position at the OSRI offices in Cordova.

Salary is \$40K plus PWSSC benefits package and computer resource expenses. Projected spending is \$70K

in FY00 with an additional \$70K planned for FY01.

Total FY00 funding for this item is \$70K.

**BAA: Two Year Post-Doctoral Fellowship in Atmospheric Modeling**

A two-year post-doctoral position will be nationally advertised that seeks an individual with the ability to implement operations of the MM5 or similar atmospheric model in PWS to provide surface winds data to drive the PWSPOM. The coupling of the MM5 and POM models will be the core of the N/F system. Cooperation with the postdoctoral oceanographer is a primary objective. This will be a full-time position at the OSRI offices in Cordova.

Salary is \$40K plus PWSSC benefits package and computer resource expenses. Projected spending is \$70K in FY00 with an additional \$70K planned for FY01. Total FY00 funding for this item is \$70K.

**MORICE (FY99 continuation into year 2)**

This project is a cooperative effort by an international group of private and public organizations that are dedicated to the development of a new technology for cleaning spilled oil in broken ice. OSRI was one of six partners (U.S. Minerals Management Service, SINTEF Applied Chemistry, Alaska Clean Seas, Saga Petroleum (Norway), Norsk Hydro and the Canadian Coast Guard) in FY99 that contributed equal amounts to a field demonstration on the North Slope.

FY99 funding was \$64K and funding for FY00 is \$60K.

**Technology Coordinator (FY99 continuation into year 2)**

Funding of this position was established in FY99 to continue through FY06 to provide a Technology Coordinator position that takes responsibility for the conversion of the OSRI research and development effort into products and applications that provide tangible services.

FY99 was approximately \$20K. Funding for FY00 is anticipated at approximately \$110K.

**BAA: Scoping Initiative for Cook Inlet Risk Assessment (FY00 new project)**

OSRI is committed to serving those Arctic and sub-Arctic regions at risk to oil spills. In an effort to serve the geographically diverse area of OSRI's concerns, a BAA will seek proposals to perform the initial scoping necessary for executing a Risk Assessment of Cook Inlet.

*Funding for this project in FY00 is \$25K.*

**3.2 Technology – Carryover Programs**

**Remote Sensing Technology Development (FY99 continuation)**

This project is a continuation of the FY99 work plan. Funding will support one to four projects relating to new remote sensing technologies that will improve current tracking, spill dispersion and aggregation, and spill risk minimization and response. Proposals are being evaluated.

*The BAA for this program was issued in the fourth quarter of FY99. The Board of Directors specified \$100K of funding in this area for FY00.*

#### **Three Dimensional Oil Dispersal Simulation (FY99 continuation)**

This project is a continuation of the FY99 work plan. Funding will support one to four projects relating to the fate and effects of air and/or water dispersed vs. non-dispersed oil. The BAA for this program was issued in the fourth quarter of FY99. Proposals are being evaluated.

*The BAA for this program was issued in the fourth quarter of FY99. The Board of Directors specified \$100K of funding in this area for FY00.*

#### **Small Spill Technology (FY99 continuation)**

This project is a continuation of the FY99 work plan and no additional FY00 funding is anticipated. It involves the implementation of the small spill workshop findings to improve spill prevention in small boat harbors.

The BAA for this program was issued in the fourth quarter of FY99. This project commits \$50K of FY00 funds.

#### **Oil & Broken Ice Workshop (FY98 continuation)**

This has been an FY98 pending project for OSRI to sponsor a workshop on remediation techniques for oil and broken ice.

*Alaska Clean Seas is the grant recipient for this collaborative multi-sponsored workshop. FY00 funding is \$25K.*

## **4.0 Predictive Ecology Program**

The 10-year OSRI business plan targets 40% of the program funds for grants, contracts and workshops in the area of predictive ecology. Predictive Ecology is the research component of the OSRI R&D program. As such, it focuses on the acquisition of knowledge and the identification of gaps in scientific knowledge that may be limiting the development of practical applications of technology. OSRI research efforts range widely from the collection of missing scientific information that yields new understanding, to new predictive or measurement tools that improve the quality and quantity of information on environmental conditions and living resources.

*For information about individual grants, visit the BAA section of our web site. All costs are approximate and are subject to change. The Predictive Ecology budget for FY00 is \$685K (42% of FY00 program spending).*

#### **Nowcast/Forecast Ocean Circulation Program (FY99 continuation)**

The development of the N/F capability for Prince William Sound is ongoing in FY00. N/F system development is a combined effort encompassing both the Applied Technology and Predictive Ecology programs of OSRI. Recognizing that the numerical models that were developed and/or implemented by the SEA program are relatively new applications, there will be a long-term effort to evaluate and improve their predictions through a variety of observations and field tests. This effort is lead by Dr. Shari Vaughan, P.I. of the physical oceanography observational program at the Science Center.

In FY98, OSRI obligated \$300K per year for five years with a 50/50 split of program costs between Applied Technology and Predictive Ecology for N/F system development. Observational oceanography is the research component of this project assigned to the Predictive Ecology Program. The FY00 budget for this program is approximately \$150K.

**BAA: Coupling of the SEA Phytoplankton Model with the PWSPOM (FY99 continuation)**

This project is a continuation of support for Dr. J. Wang at the University of Alaska at Fairbanks International Arctic Research Center (UAFIARC) for efforts in coupling the Sound Ecosystem Assessment (SEA) phytoplankton model with the Prince William Sound Princeton Ocean Model (PWSPOM). The funding supports Dr. Meibing Jin, a Research Assistant Professor who was initially an OSRI funded postdoctoral research associate. The objective is to couple the PWSPOM and the SEA phytoplankton model developed by Dr. David Eslinger. Cooperation between the OSRI postdoctoral physical oceanographer, Dr. Wang and Dr. Jin is a primary objective.

Funding for this item in FY00 is \$60K.

**BAA: Intertidal Resources at Risk to Oil Spill (FY00 new project)**

OSRI will support research investing intertidal resources at risk to oil spill in the Copper River Delta and PWS region. This effort is in response to concerns expressed by local citizens, scientists and the OSRI Board of Directors that there is insufficient data concerning this vulnerable natural resource. Anticipated issuance of the BAA is first half of FY00.

Funding for this item in FY00 is \$100K.

**BAA: Zooplankton Monitoring and Modeling (FY00 new project)**

The SEA program found that *Neocalanus* copepods and pteropods represent the bulk of forage for planktivorous fishes (herring, walleye pollock, salmon fry, etc.) during the PWS spring bloom. Given the importance of zooplankton as forage for dominant fishes and their risk due to oil spills, OSRI will commit funds to initiate long-term monitoring of their population. Monitoring methodologies will include the use of advanced optical and acoustic technologies similar to those developed in the GLOBEC and SEA programs. This effort will look for partners in management with overlapping interests. For FY00, OSRI will provide a grant in support of a postdoctoral research associate in this area. The associate will monitor zooplankton species and age structure for empirical testing and modification of the SEA zooplankton model developed by Dr. David Eslinger. OSRI's long-range goal is to couple this model with the phytoplankton model, which will require cooperative efforts with Dr. Jia Wang and Dr. Meibing Jin.

Funding for this item in FY00 is \$75K.

**BAA: Herring and Pollock Monitoring in PWS (FY00 new project)**

The SEA program found Pacific herring and walleye pollock to represent the bulk of the forage for piscivorous wildlife in the Sound in addition to supporting independent commercial fisheries. Given their importance as a commercial resource, their position as the dominant fish in the ecosystem and their trophic position as forage fishes for piscivorous wildlife, all of which are at risk to oil spills, OSRI will commit funds to the initiation of long-term monitoring of their biomass. Monitoring will be conducted using the advanced acoustic technologies developed during the SEA program. This effort will look for partners in management and research with overlapping interests in sustainable harvesting and the development of new numerical models, respectively. A long-term goal is the development and testing of advanced numerical models for these primarily planktivorous fishes that can be coupled with the phyto-zooplankton model under development for N/F.



FY00 budget for this area is \$60K.

#### **BAA for Bird and Marine Mammal Workshops (FY00 new project)**

SEA discovered that the bulk of the forage for piscivorous wildlife in the Sound is the walleye pollock and herring biomass. Since this knowledge is not incorporated into present research and management of species at risk, there is a need to convene workshops to discuss the ramifications of this finding and how it might effect determination of a species vulnerability to oil spills. Because food limitation is the most commonly accepted hypothesis for recent declines in the marine birds and mammals of the North Pacific Ocean, impact assessment for oil pollution is dependent upon understanding the dynamics of forage fish. With the development of the zooplankton model and monitoring of forage fish underway, this monitoring effort represents an initial step by OSRI to include seabirds and marine mammals in the Nowcast/Forecast system.

*One to two proposals are anticipated in FY00 for a total of \$60K.*

#### **Sentinel Fish Monitoring (FY99 continuation into year 2)**

This program is an effort to develop new technology for taking advantage of the sedentary nature of Pacific rockfish to identify the potential for their use as long term sentinels for oil pollution. In 1999, four fish were tagged and three were monitored a month later at the same location. One fish was visually observed. Since Dr. Kline has two other fish tagged and six more tags to implant we recommend one additional year of support at \$60K and encourage Dr. Kline to tag and attempt to recapture information on all twelve tags.

The FY00 budget for this project totals \$60K.

#### **BAA: Geographic Information System for Living Resources at Risk to Oil (FY99 continuation and FY00 new project)**

The idea for this program came from OSRI's international partnership with the Arctic Countries via the EPPR and by a national partnership between NOAA-HAZMAT and OSRI. This national partnership was initiated with a grant for incorporating GIS data acquired after the EVOS event into a PWSGIS. OSRI plans to continue this program into FY00 through the acquisition of the GIS data for the region and dissemination to the public via out web page and newsletters. The international partnership was initiated by an agreement at the EPPR meetings in Norway (FY99) that all participating countries would put together a 1/1,000,000 map of oil transportation routes and resources at risk.

*A BAA for the national and international projects will be issued in FY00 using \$60K in FY99 obligations and \$60K in FY00 new funding for a total of \$120K in FY00 expenditures. Two projects are anticipated.*

### **5.0 Public Education and Outreach Program**

The 10-year OSRI business plan authorizes 20% of the program funds for grants, contracts and workshops in the area of public education and outreach. In many cases, the direction of research and development is constrained due to a lack of public and professional awareness. The objective of the OSRI education and outreach program is to minimize this impediment.

*For specific information about individual grants, visit the BAA section of our web site. All costs are approximate and are subject to change. The Public Education and Outreach budget for FY00 totals \$320K (20% of FY00 program spending).*

#### **BAA: K-12 Environmental Science Education Programs. (FY99 continuation and FY00 new projects)**

Ongoing support and expansion of programs such as the award winning "Science of the Sound" project at the

Science Center will be solicited. This multi-faceted education program includes hands-on teaching in classroom settings, outreach trips to regional villages and communities and a summer camp. OSRI would like to establish working partnerships with other regional organizations to extend this type of program to the greater community affected by the EVOS event.

*This program will require \$75K of FY00 funds. \$25K of these funds are set aside for the second year of support for the Science of the Sound program. An unspecified amount is also dedicated for a pending award to PWSRCAC.*

**BAA: Science Planning Workshops (FY99 continuation and FY00 new projects)**

OSRI has maintained an open BAA for proposals to hold science planning workshops that tackle difficult issues in the region by bringing together international groups of scholars, researchers, managers, developers and the public to review, discuss and plan the direction of research and management in the region.

*Funding of two to three workshops is anticipated from the FY00 funding of \$75K.*

**BAA: Graduate Level Fellowships (FY00 new projects)**

This is an open BAA for grants supporting one to three graduate fellows working on projects related to the OSRI mission. The fellowships will be available on a yearly basis.

The total FY00 budget for this program is \$80K.

**BAA: Student Internships (FY00 new project)**

This is an open BAA for grants supporting high school and college undergraduate students for assisting in research related to pollution in the marine environment. Internships are available on a quarterly basis.

The total FY00 budget for this program is \$50K.

**BAA: OSRI Web Site (FY00 new project)**

Support for the OSRI web site maintenance and continuing development of inter-net and intra-net capabilities.

The FY00 budget for this program area is \$15K.

**BAA: Communication and Extension Services (FY00 new project)**

Funding for public dissemination and projection of OSRI's scientific and educational information.

The FY00 budget for this area is \$15K.

**BAA: Annual Report (FY00 new project)**

The OSRI will contract for an Annual Report to be produced that details each of the programs developed by the OSRI in FY00.

**This report will require \$10K of FY00 funds**

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