

Oil Spill Recovery Institute FY04 Work Plan Spreadsheet

Program Area	FY04 Funding	Totals	Percentage
Goal 1 - Understand			
Nowcast Forecast Biological Modeling	100,000		7.23%
PWS Tide Height Data Collection	15,000		1.08%
PWS Meteorological Data Collection	15,000		1.08%
PWS Nowcast Forecast Physical Atmospheric Modeling Project	125,000		9.04%
PWS Nowcast Forecast Physical Ocean Modeling Project	150,000		10.85%
PWS Nowcast Forecast Observational Oceanography Program	150,000		10.85%
Intertidal Resources at Risk to Oil	100,000		7.23%
Zooplankton Monitoring	75,000		5.42%
Herring and Pollock Monitoring	75,000		5.42%
Three Deimnsional Oil Dispersal Simulation (OSCAR)	20,000		1.45%
PWSNF Field Experiments for Oil Spill Modeling	15,000		1.08%
		840,000	60.74%
Goal 2 - Respond			
Oil and Ice "Think Tank"	20,000		1.45%
Geographic Information System for Living Resoruces at Risk to Oil	60,000		4.34%
Dispersion Impact Analysis project	50,000		3.62%
		130,000	9.40%
Goal 3 - Inform			
K-12 Environmental Science Education Programs	60,000		4.34%
Graduate Level Fellowships	125,000		9.04%
Student Internships	5,000		0.36%
OSRI website	15,000		1.08%
Communication and Extension Services	3,000		0.22%
Annual Report	10,000		0.72%
		218,000	15.76%
Projects of Opportunity	75,000		5.42%
Science Director	120,000		8.68%
		195,000	14.10%
TOTAL FY04 Work Plan Program		\$1,383,000	100.00%
FY04 Administrative Costs		146,684	
Total - Program + Administrative		\$1,529,684	

Fiscal Year 2004 Work Plan

Oil Spill Recovery Institute

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As Approved September 12, 2003

Program Total \$ 1,383,000
Administrative Costs \$ 146,684
TOTAL FY04 Budget \$1,529,684

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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 2004 covering the period from October first of the year 2003 to the thirtieth of September 2004.

The OSRI R&D Grant Program was established in 1998 to solicit and administer oil pollution research and development projects. Initially, the programs were categorized into three program areas (technology, ecology and public outreach and education). In 2002-2003, a series of strategic planning sessions of the OSRI Advisory Board resulted in a revision of the program areas and adoption of four program goals which are detailed in Section 2.1 of this document. R&D grants will be awarded and administered in accordance with the guidelines contained in the OSRI Grant Policy Manual.

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 Sub-Arctic (Thomas et al. 1995) that provides a review and the guidance for developing and managing 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). This 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 Sub-Arctic oil pollution issues for the Advisory Board. At this workshop R&D efforts conducted after the Exxon Valdez Oil Spill (EVOS) were 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 program areas of applied technology, predictive ecology and public education and outreach.

In 2002, the OSRI Board solicited a program assessment by the National Academies' Polar Research Board (PRB). In response to the PRB report, published in early 2003, the OSRI Advisory Board deleted the three program areas, revised its Strategic Plan and adopted four goals for OSRI programs:

- Understand – Attain a four-dimensional* interdisciplinary understanding of Prince William Sound to enable detection and prediction of spill-related impacts and subsequent recovery. (* Time and 3-dimensional space – x, y, z coordinates)
 - Design Nowcast/Forecast observation and modeling system, demonstrates its utility, and seek long-term operation funding.
 - Conduct environmental research.
 - Profile potential impacts on the economy, life-style and well-being of communities and resource users in Prince William Sound.

- Respond – Enhance the ability of oil spill responders to mitigate impacts of spills in Arctic and sub-Arctic marine environments.
 - Fill knowledge gaps on behavior of spilled oil.
 - Fill knowledge gaps on use and effectiveness of specific mitigation techniques.
 - Identify and evaluate new prevention and response technologies.
- Inform – Disseminate information and educate the public on the issues of oil spill prevention, response and impacts.
 - Publish scientific and technical results in the open literature.
 - Brief oil spill responders on OSRI products and assist to include them in operational activities.
 - Facilitate the exchange of information and ideas.
 - Provide graduate and undergraduate fellowships and internships.
- Partner – Partner with other organizations to take advantage of pooled funding, facilities, knowledge and experience.
 - Collaborate with other partners in achieving a long-term coastal and ocean observing system for Alaska.
 - Coordinate with the efforts of other related programs, such as the Gulf Ecosystem Monitoring (GEM) program and programs of the North Pacific Research Board (NPRB).

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 technology for dealing with oil pollution in Arctic and Sub-Arctic regions and 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). In FY02, Congress extended OSRI through the year 2012.

2.3 R&D Grant Policies and Procedures

OSRI adopted an R&D grant program based on policies and procedures 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 application packages, are available on the OSRI web site at www.pws-osri.org, or by request.

2.4 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 a bioregional, public decision-making processes to establish research goals are encouraged.

2.5 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 – Set strategic direction, review program toward accomplishing strategic goals, define duties of OSRI director and other staff, appoint and evaluate director and other OSRI staff, establish subcommittees, approve bylaws, set broad annual scientific priorities, approve annual program plan and large grant awards, seek operational coordination with the Prince William Sound Science Center and its Board of Directors, resolve complaints and financial award issues, act to fill vacancies on the Board, ensure fiduciary responsibilities are met, and assist OSRI Director and Science Director with partnerships.

OSRI Director – Assists the OSRI Science Director in preparing the annual work plan, the revised business and strategic plans and communicates with the OSRI Board on a regular basis concerning administrative and fiduciary issues. Hires and fires staff, and ensures that administrative support is available to implement OSRI R&D programs.

Science Director – Provides leadership in planning research programs, prepares annual work plans in consultation with the Work Plan Committee, works with OSRI Director on budget planning, and implements the work plan as approved. Determines and/or recommends contract awards, works with the Scientific and Technical Committee on proposal RFPs and reviews, and ensures compliance with all policies and procedures of the Grant Policy Manual.

Scientific and Technical Committee – Provides advice to the Board including recommendations regarding the conduct and support of research, projects and studies related to Arctic or sub-Arctic oil spills or the effects of such spills. Reviews proposal solicitations and assists the Science Director in peer reviews of proposals. Reviews the Science Director's recommendations for medium size grant awards and recommends large grant awards to the Advisory Board.

OSRI Staff - provide administrative support to the Director to carry out the R&D Grant Program.

2.6 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. Medium (\$25,000-100,000) and Small Awards (under \$25,000)

1. R & D projects.
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 \$25,000 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 Sub-Arctic.
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 Sub-Arctic.
3. Preference will be given to those proposals that fall within one of OSRI's four strategic goals.

2.7 Application and Award Process

OSRI staff, committee members, and board members will follow the guidelines and procedures detailed in the Grants Policy Manual (GPM). The OSRI GPM and other OSRI documents and forms, including application packages, are available on the OSRI web site at www.pws-osri.org, or by request.

3.0 Programs – Goal 1 - Understand

New Programs – New programs with initial funding in FY04

Nowcast Forecast Biological Modeling

The Prince William Sound Nowcast Forecast (PWSNF) system is an ongoing marine research program funded primarily through the OSRI and housed within the Prince William Sound Science Center. PWSNF is developing an ecosystem level understanding of the PWS and Copper River Delta regions. Consisting of numerical models of the regions' oceanic and atmospheric conditions as well as physical and biological monitoring programs, PWSNF is intended to provide information for evaluating oil spill response strategies, managing the region's coastal resources, and providing environmental information to local residents and industry. In June of 2003 OSRI convened a biological modeling workshop in Anchorage, Alaska. This workshop brought together a distinguished slate of experts to scope methods for incorporating biological modeling within the PWSNF. A solicitation for pre-proposal letters, developed within the workshop, was issued in July of 2003 for herring modeling in Prince William Sound and pre-proposals are due Sept. 22, 2003. FY04 is the initial year of the three-year proposed effort for development of a biological model.

FY04 funding of this project is \$100,000

Continuing Programs – Previously supported & new FY04 funds budgeted

PWS Tide Height Data Collection

The PWS Tide Height Data Collection project provides for the operation and maintenance of automated tide gauges at Pigot Point, Chenega Bay, and Tatitlek. These telemetered autonomous instruments will contribute to the understanding of the physical dynamics of PWS and serve as a historical record.

FY04 funding for this project is \$15,000

PWS Meteorological Data Collection

This project provides for the operation and maintenance of automated meteorological stations (wind speed, wind direction, temperature, relative humidity, & barometric pressure) at various points within Prince William Sound. Due to the strong geographic influence on meteorological conditions, lack of a systematic reporting system and sparse population these autonomous stations represent the most cost effective method of obtaining the necessary data for determining the movement and weathering of oil spills within PWS. Stations are sited at Nuchek, Pt. Pigot, Applegate Rocks, Chenega Bay, Tatitlek, Cordova and Kokinhenik Bar.

FY04 funding for this project is \$15,000

PWS Nowcast Forecast (PWSNF) Physical Atmospheric Modeling Project

The PWSNF project is the primary initiative of the current OSRI research and development programs (see further description above "Nowcast Forecast Biological Modeling"). The PWSNF Atmospheric Modeling project began in FY02 to integrate a Regional Atmospheric Modeling System (RAMS) within the numerical modeling suite that OSRI has assembled for use as a planning and research tool within the major transportation corridor of Prince William Sound. Coupling of these models was implemented in FY03 and continues. This project will also be a key participant in the PWS field experiments for oil spill modeling (see description of this below). The RAMS project is led by Dr. Peter Olsson, Alaska Experimental Forecast Facility, University of Alaska Anchorage.

FY04 funding of this project is \$125,000

PWS Nowcast Forecast Physical Ocean Modeling Project

The PWSNF project is the primary initiative of the current OSRI research and development programs (see further description above “Nowcast Forecast Biological Modeling”). This specific project has implemented a Princeton Ocean Model (POM) for Prince William Sound. The POM serves as the central component of PWSNF. It is implemented on a ~1.1 km grid utilizing 15 vertical sigma (terrain-following) layers with boundaries at Hichinbrook Entrance and Montague Straits. A non-uniform freshwater runoff model (Simmons) provides freshwater input along the coastline. Tidal forcing is provided from a Northeast Pacific tidal model (Foreman). Surface winds are derived from the PWS RAMS atmospheric model (see above). Goals for the ocean modeling project in FY04 are primarily to extend the boundaries of the POM and continue verification work. This project will also be a key participant in the PWS field experiments for oil spill modeling (see description of this below). The Ocean Modeling effort is led by Dr. Christopher Mooers, Rosenstiel School of Marine and Atmospheric Science, University of Miami.

FY04 funding of this project is \$150,000.

PWS Nowcast Forecast Observational Oceanography Program

This project’s primary goal is to collect oceanographic observations through seasonal hydrographic cruises; these observations are used in the continued validation of the POM for PWS. The cruises consist primarily of acoustic Doppler current profiler (ADCP) surveys for measuring ocean currents in the mid-Sound and Hinchinbrook Entrance, as well as expendable conductivity, temperature, and depth profiler measurements at various stations within the Sound. During the spring and summer of 2004 the Operational Oceanography program will participate extensively in a series of field experiments proposed for Prince William Sound (see description of this below). These experiments will involve the release of multiple drifter buoys to simulate both surface slicks and subsurface plumes for analysis and modeling by the PWSNF system. In the fall of 2003, leadership of the observational oceanography program is transitioning from Dr. Shari Vaughan to Dr. Steve Okkonen; Shelton Gay, oceanographic program staff, continues to support the program.

FY04 funding of this project is \$150,000.

Intertidal Resources at Risk to Oil Spill

Beginning in the spring of 2000, OSRI funded this study on the intertidal resources on the Copper River Delta at risk to oil spills. The primary objective of this study is to quantify through field sampling the benthic invertebrate prey, demersal (bottom feeding) fish and crab, and avian communities and to develop the mechanistic understanding of the biological community necessary to predict how the system would respond to a major disturbance, such as an oil spill. The project has four objectives for FY04-06, summarized as: 1) characterize the spatial abundance of macrobenthic species within the CRD and Orca Inlet regions, 2) determine and quantify factors that best serve as predictors for primary production, 3) quantify the spatial and temporal abundance of demersal and avian predators and assess the role of epibenthic predation on recruitment of intertidal macroinvertebrates, and 4) develop a cost-effective strategy and sampling design for long-term monitoring of the intertidal sedimentary habitats. This study is led by Dr. Mary Anne Bishop of PWSSC, Dr. Sean Powers of the University of South Alabama, and Dr. Pete Peterson of University of North Carolina.

FY04 funding of this project is \$100,000.

Zooplankton Monitoring

Neocalanus copepods and pteropods represent the bulk of forage for planktivorous fishes (herring, walleye pollock, salmon fry, etc.) during the annual spring bloom in Prince William Sound. Given the importance of zooplankton as forage for dominant fishes and their risk due to oil spills, OSRI has provided funds for long-term monitoring of their population. FY04 includes continued funding for Dr. Richard Thorne's acoustical monitoring program through the PWS Science Center. Cooperators in this project include the Prince William Sound Aquaculture Corporation, Alaska Dept. of Fish & Game, and the PWS Fisheries Research and Applications Planning project (funded by the GEM program, EVOS Trustee Council).

FY04 funding of this project is \$75,000.

Herring and Pollock Monitoring

Pacific herring and walleye pollock represent the bulk of the forage for piscivorous wildlife in Prince William 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 has provided funds for long-term monitoring of their biomass. Monitoring is conducted using the advanced acoustic technologies developed during the Sound Ecosystem Assessment (SEA) program (1994-99, supported by the EVOS Trustee Council). Dr. Richard Thorne is principal investigator for the acoustical monitoring program conducted through the PWS Science Center. The Alaska Department of Fish & Game is a cooperator in this project.

FY04 funding of this project is \$75,000.

Three Dimensional Oil Dispersal Simulation (OSCAR)

SINTEF, a Norwegian non-profit research corporation, was awarded funds in FY99 and FY00 to adapt their Oil Spill Contingency and Response (OSCAR) model for Prince William Sound. OSCAR utilizes a Princeton Ocean Model (POM) for ocean current modeling. The OSCAR system provides oil spill trajectory, chemical fates and effects, and biological exposure modeling capacity to the PWSNF system. The three components - oil weathering model, a fates and effects model and a tactical response model - interact within the same GUI (graphical user interface) based on a Windows NT platform. Processes calculated by OSCAR include surface spreading, emulsification, dispersion (both natural and chemically enhanced), dissolution, evaporation, sedimentation, resurfacing, degradation, and stranding. Trajectories are derived from PWS-POM current predictions and surface winds. Chemical processes are calculated based on 27 components and pseudo-components. Spatially explicit biological models ported to interact with OSCAR, such as may be proposed for the OSRI-sponsored herring (biological) modeling effort, should be able to provide exposure estimates through interactions with OSCAR. OSCAR will be utilized in the PWSNF field experiments during FY04.

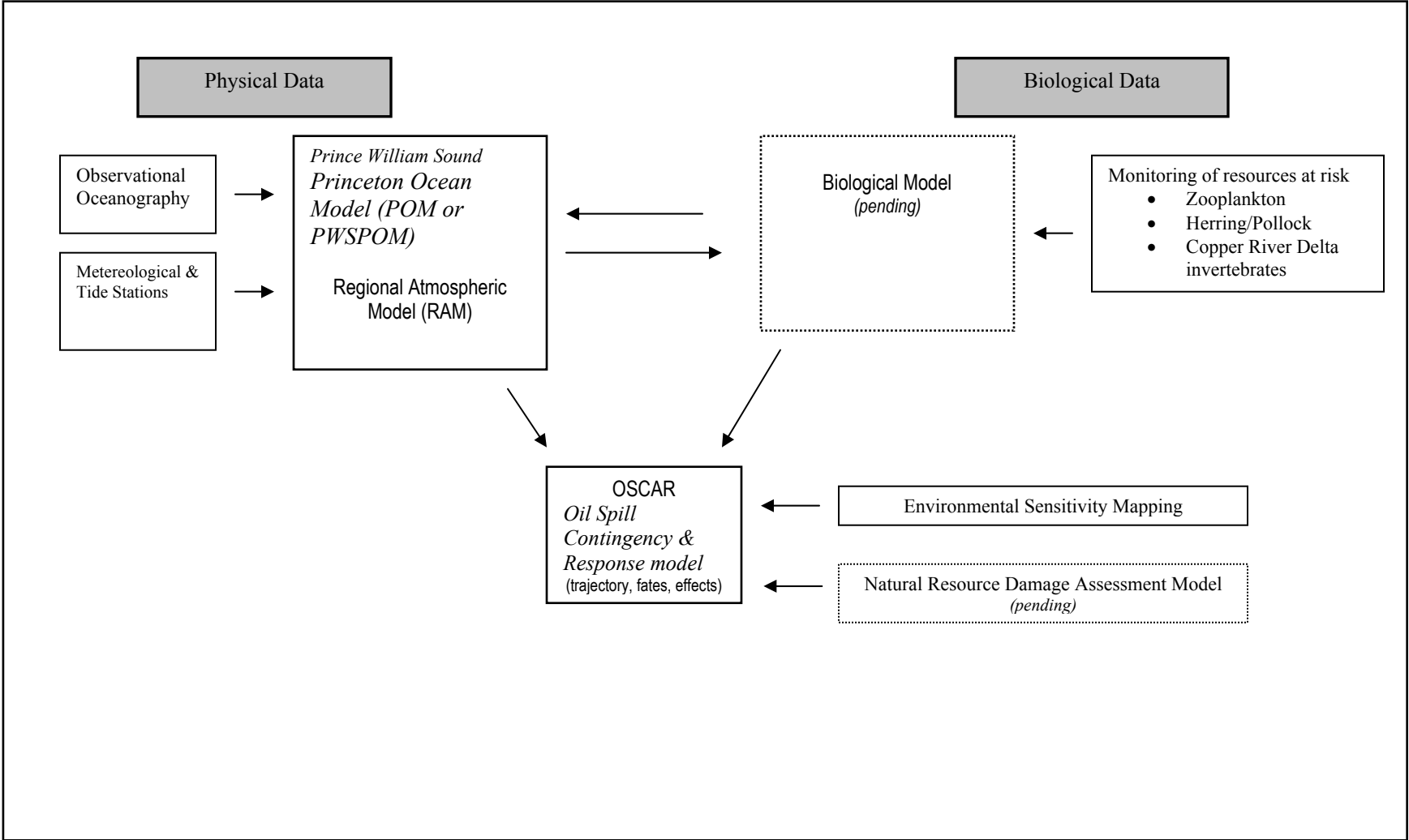
FY04 funding for this project is \$20,000.

PWSNF field experiments for oil spill modeling

The PWSNF system has progressed to the point of readiness suitable for initial field trials over the next three years. The purpose of these field experiments is to identify areas for improvement in the application of physical and oil spill modeling to the Prince William Sound region and to further collaboration and communication among the oil spill research and response communities active in the region (detailed explanation of these experiments is available on request to the OSRI staff). OSRI will conduct two field experiments in the spring and summer of 2004. Most of the costs associated with these field experiments will be built into the budgets of the PWSNF

projects. A Congressional appropriation awarded to the PWSSC in FY03 will provide some support for the experiments, through vessel charters, travel and/or logistical organization support. Additional funds may become necessary to purchase drifter buoys.
FY04 funding for this project is \$15,000.

Project linkages within PWS Nowcast Forecast System



4.0 Programs – Goal 2 - Respond

Continuing Programs – Previously supported & new FY04 funds budgeted Oil and Ice “Think Tank”

Oil spills in ice environments were the central focus of a workshop co-sponsored by the OSRI in April of 2000. The development of an Oil & Ice research plan for the Arctic and sub-Arctic is central to OSRI's legislated mandate. This project will fund a small working meeting of experts within this field for a “think tank” to develop a prioritized list of projects for prevention, planning and response to oil spills in ice prone regions. The final document derived from this effort is to be co-published with the U.S. Arctic Research commission. The FY04 funds will provide for the travel of some of the meeting participants and facilitator and other meeting related costs. FY03 project funds support the principal investigator on this project (DF Dickins Associates, Ltd.)
FY04 funding for this project is \$20,000.

Geographic Information System for Living Resources at Risk to Oil

OSRI is cooperating in a five-year agreement with NOAA-HAZMAT for completion of the Alaska coastal GIS effort. In previous years, environmental sensitivity index maps have been completed for the Prince William Sound, Southeast Alaska, and Northwest Alaska. Work is ongoing for the Yukon-Kuskokwin Delta region and future plans are to proceed to the Bristol Bay and Chukchi Sea regions. Additional funds to complete these regional mapping projects are contributed by non-profit associations, municipalities and private corporations.
FY04 funding for this project is \$60,000.

Dispersion Impact Analysis project

This project expands upon OSRI's efforts in oil spill fate and effects modeling and ecosystem resource monitoring and modeling. In January of 2003 OSRI conducted a workshop and formed a stakeholders' group that includes representatives of various organizations and members of the public concerned with spill response activities in Prince William Sound. Specific activities in 2004 will be determined after receipt of a report from the Alaska Regional Response Team's Science committee.

FY04 funding for this project is \$50,000.

5.0 Programs – Goal 3 - Inform

Continuing Programs – Previously supported & new FY04 funds allocated **K-12 Environmental Science Education Programs**

This program offers support to ongoing environmental and science education programs or specific projects within the communities impacted by the Exxon Valdez oil spill. The “Science of the Sound” is an example of the kind of programs supported; it includes hands-on classroom teaching, outreach trips to regional villages and other remote communities, and a series of summer camps for a variety of age groups. OSRI would like to establish additional working partnerships with other regional organizations to establish and extend similar programs to the greater community affected by the Exxon Valdez oil spill.

FY04 funding for this program is \$60,000.

Graduate Level Fellowships

OSRI graduate fellows are provided \$25,000 per year to work on projects related to the OSRI mission and relevant to Arctic and sub-Arctic oil spills. Fellowship applications are accepted throughout the year.

FY04 funding for this program is \$125,000.

Student Internships

This grant program provides support funds to high school and college undergraduate students for assisting in research related to pollution in the marine environment. Internships are available on a monthly basis.

FY04 funding for this program is \$5,000.

OSRI Website

Support for upgrading the OSRI web site and ongoing maintenance funds.

FY04 funding for this project is \$15,000.

Communication and Extension Services

This funding supports public dissemination of OSRI’s scientific and educational information. This may include publication of a newsletter or other brochures.

FY04 funding for this program is \$3,000.

Annual Report

The OSRI will contract for a FY04 Report that details the programmatic activities and provides a summary financial status report. This report serves as a document of recording and evaluating the process of the OSRI program.

FY04 funding for this program is \$10,000.

6.0 Programs - Projects of Opportunity

FY04 Projects of Opportunity

This line item makes funds available for valuable projects that may come up during the fiscal year. Examples of past projects this line item has provided supporting funds to include the Ice Detection project and various workshops. In FY04, an eligible project for these funds includes continuing development of a Viscous Oil Pumping system, in cooperation with the U.S. Coast Guard and Hyde Marine, Inc. Continuation of Projects of Opportunity enables OSRI to operate in an efficient and proactive manner in response to promising new proposals within a limited funding window.

FY04 funding of this program is \$75,000.

7.0 Science Director

Science Director

This position was established in FY03 for providing programmatic leadership and oversight of the OSRI R&D program. Funding of the Science director position is a programmatic expenditure.

FY04 funding of this project is \$120,000.