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NOS GRANT

The Gulf of Alaska Ecosystem Monitoring and Research Program

Establishing a very long-term monitoring program for detecting and understanding change in marine ecosystems to sustain a healthy and biologically diverse marine ecosystem in the northern Gulf of Alaska (GOA) and the human use of the marine resources in that ecosystem

REVISED PROPOSAL SUBMITTED ON JUNE 18, 2003 TO:

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Introduction

GEM is a nationally recognized program for collecting observations on coastal marine ecosystems in Alaska that is now ready for implementation. GEM's goal to produce long-term biological and physical information on coastal ecosystems was evaluated by the National Research Council (NRC 2002), and regionally vetted by a three-year process of public and scientific review. GEM is just now starting the long process of designing and deploying the monitoring system, so administrative efforts during the first three years of planning and development are critically important to its long-term success.

The Trustee Council adopted the GEM program after an extensive public review and positive recommendations from the National Research Council in July 2002. The Trustee Council staff has been engaged in planning for the implementation of the GEM program since August 1999, and approximately $1 million dollars has been invested in planning since that time, including support for the NRC review, GEM Science Management, GEM Data Management, preparation of the scientific synthesis (Chapter 7) and other parts of the GEM Program Document, and public outreach including workshops, meetings, and public presentations. The institutional commitment to the GEM program has been very strong, and is expected to continue in the future.

Funding is requested to defray scientific administrative costs during the start-up of the GEM program October 2003 – September 2006 so that an equivalent amount of Council funds can be devoted to implementation of the observing system. Due to the nature of the Trustee Council's procedures for designing and deploying observing system elements, defraying administrative costs is the most efficient means for NOAA to assist GEM in implementing its program of long-term observations on coastal marine ecosystems.

Funding from NOAA for the enhanced scientific input and oversight that is essential to this developing program will allow an equivalent amount of funds to be allocated to research and development of monitoring functions identified in the Science Plan (Attachment 6). The funding from NOAA will make it possible to implement GEM faster, because funds that would otherwise be spent on essential administrative activities will be allocated to developing the monitoring program. NOAA would be receiving good value for its expenditures by making it possible for the Trustee Council to realize its objectives for monitoring of the coastal marine ecosystems damaged by the 1989 oil spill. The specific monitoring activities that NOAA would be making possible are identified and discussed in the section below entitled, Science Plan, and are presented in full detail in Attachment 6.

The need for the administrative procedures and activities identified below was established in a lengthy public and scientific peer review process initiated in August 1999 which culminated in the adoption of the GEM Program Document, in July 2002

(EVOSTC 2002). As detailed in Chapter 5 of the GEM Program Document (EVOSTC 2002) The Trustee Council operates in a public process that is supported by established groups of public and scientific advisors that communicate with the Council through a small staff (See Figure 5.1 in this document), or directly with the Council as members of the public. Work products are produced for the Council by contractors, who are located and engaged by a grant and contract process operated by the staff with support from the public and scientific advisory groups and volunteer peer reviewers (See Figure 5.2 in this document). The Trustee council staff annually follows a series of procedures established by the Trustee Council to update and release to the public the three key elements of GEM Program implementation; the Science Plan, Invitation for Proposals, and the Work Plan.

Once adopted by the Trustee Council, the procedures can only be changed by the Council, which in the case of GEM would require the Council to revisit a lengthy public process. Therefore the administrative functions that NOAA is being asked to fund are not discretionary, and the staff must regard the cost of these functions as fixed annual costs of implementing the program. Of the total annual amount allocated to GEM by the Council, funds that are not spent on administrative activities are spent on program implementation.

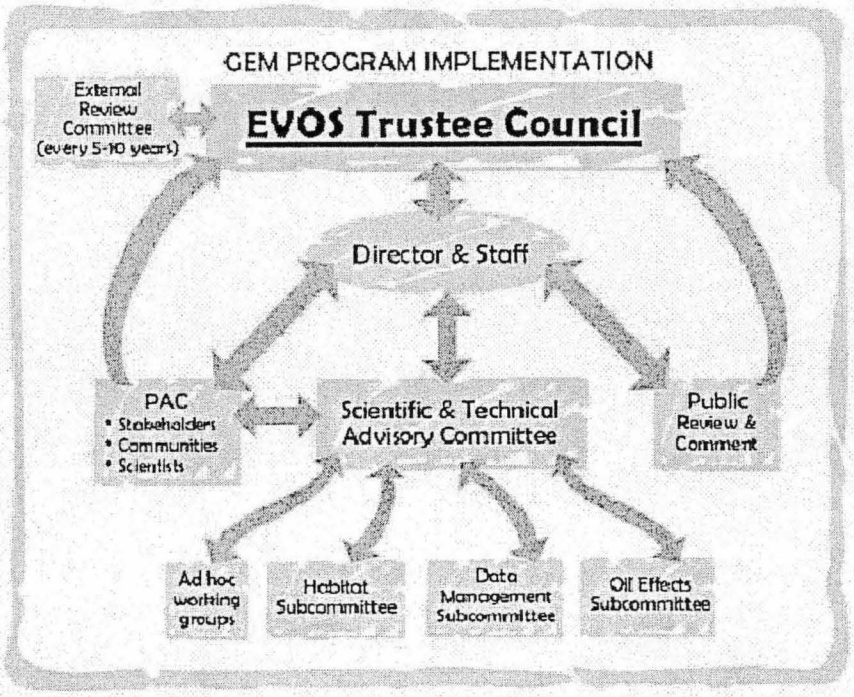

Figure 5.1 The organizational elements involved in GEM implementation. Modified

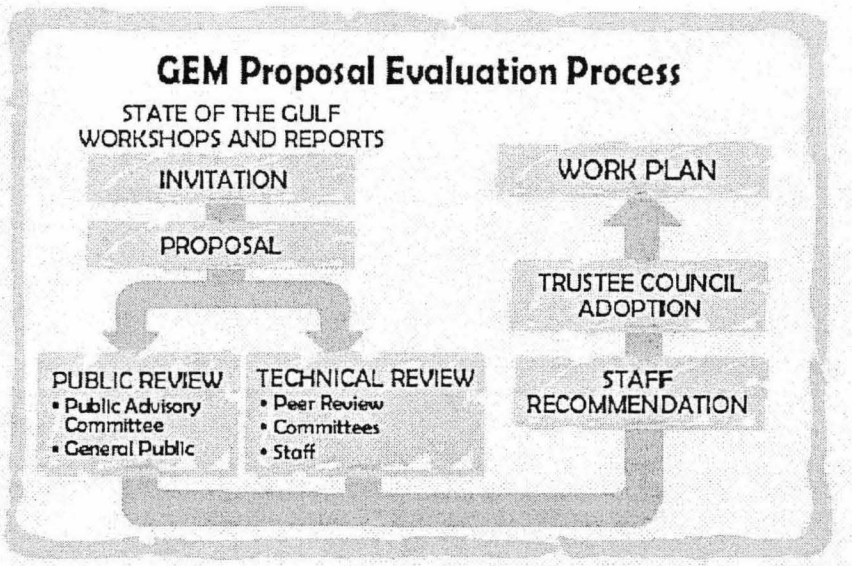

Figure 5.2 GEM Proposal Evaluation Process

The GEM Program

In order to maintain brevity, the proposal relies on the GEM Program Document, available on line, http://www.oilspill.state.ak.us/gem/documents.html. The GEM Program Document portrays the Trustee Council's vision and scientific conceptual foundation (Chapters 1-2), outlines the tools available and the initial opportunities for monitoring (Chapters 3-4), gives the approach to program management in terms of science and public involvement (Chapter 5) gives the leading scientific hypotheses and an authoritative synthesis of the scientific literature (Chapters 6-7), and discusses the roles of modeling (Chapter 8) and data management (Chapter 9). Extensive appendices provide background information on relevant monitoring and research activities of others and additional supporting information. Information available in the GEM Program Document is briefly summarized throughout the proposal for the convenience of the reader.

To summarize the relevance of GEM to the region and the nation, the coastal communities of Alaska are tightly linked to the marine ecosystem through their dependence on the environment to provide employment, food and recreation. Though less tightly linked than coastal communities, other parts of the state derive substantial economic, recreational and cultural benefits from these same coastal ecosystems. Consequently, careful long-term management and stewardship of coastal resources are important to the future of all of Alaska; however, the pathways to careful management and stewardship often are limited by lack of the kinds of data and information provided by long-term monitoring programs.

Management and stewardship of coastal resources in Alaska require a long term commitment to monitoring critical biological and physical variables. During the 1970s sharp changes, known collectively as the "regime shift," occurred in marine ecosystems all over Alaska. The regime shift was followed over a period of years by the disappearance of highly lucrative crab and shrimp fisheries in the Gulf of Alaska, even as salmon populations in some parts of the state soared to historical highs. In addition populations of some marine mammals, such as fur seals and Steller sea lions declined during the 1980s and 1990s. The decline of the sea lions ultimately led to the involvement of the federal courts in one of the nation's largest remaining commercial fisheries, pollock. The case of the Alaska pollock fisheries is a classic example of federal courts and other government institutions struggling with little information in the attempt to strike a balance between conservation of natural resources and supporting the economies of coastal communities and the nation.

Crafting responses from government to situations created by a changing environment that both protect the environment and foster economic development requires more and different kinds of information than are presently available. The kinds of information lacking are long-term datasets of physical and biological observations that allow us to detect and understand ecosystem change over time. Such long-term observations are essential to understand how ocean currents move food and energy into the trophic webs

of seabirds, marine mammals and fish of coastal ecosystems. Platforms collecting these observations would include moorings, vessel transects and surveys that are relevant to specific aspects of the marine ecosystems of the northern Gulf of Alaska.

How can a long-term monitoring program be implemented that will anticipate government's future needs for information, especially for problems that arise years from now? Fortunately, deciding what kinds of observations to collect, and where and when to collect them, has been made easier by advances in scientific understanding of oceanography of the Pacific Ocean during the past twenty years. This knowledge now offers the prospect of a set of common currencies in which natural resource management problems may be denominated. The common currencies are the food, nutrients and energy that flow from the oceanic regions offshore to fuel the production of birds, fish and mammals in coastal ecosystems, including watersheds. The scientific case for this working concept has been thoroughly documented and reviewed in the scientific synthesis of the GEM Program Document, as vetted by the published review of the National Research Council (NRC 2002). The GEM Science Plan (February 3, 2003 working draft, Attachment 6) provides a brief overview of the scientific literature and linkages to the GEM Program Document.

The GEM program is designed to directly address critical regional needs for long-term information in support of the following activities:

- Fisheries management
- Protected species assessments
- Coastal zone management and permitting
- Environmental impact assessments
- Detection of contaminants in biological resources and sediments

Examples of specific activities within GEM that address each of these needs are presented and discussed in the GEM Science Plan (Attachment 6).

Objectives

Management of the GEM program revolves around developing and maintaining three critical documents:

- Objective 1. GEM Science Plan
- Objective 2. GEM Invitation for Proposals
- Objective 3. GEM Work Plan

Objective 1: GEM Science Plan

The GEM Science Plan (Attachment 6) is a working reference document derived directly from the scientific syntheses and gap analyses of GEM Program Document that is updated annually with the latest scientific information, progress from GEM projects, and input from related projects operated by other entities. The Science Plan serves as the

origin of the Invitation for Proposals and the Work Plan. As the origin of the Invitation, the Science Plan serves as the focal point for discussions at the annual State of the Gulf Workshops (See Figure 5.2 above) where public (including scientific) comments are collected on what GEM needs to do next. Specific actions from the Science Plan are selected to appear in the annual Invitation for Proposals (Attachment 7). The Science Plan serves as a reference on current scientific knowledge as garnered from the literature and project reports of the preceding year (Fig. 5.2), and it serves as a menu from which the Invitation can be crafted by presenting the following;

- Geographic scope and scale within which data acquisition occurs;
- Latest relevant scientific information on habitat types and the processes that connect them;
- Hypotheses across and within habitat types that organize the information into coherent explanations of what controls change in the region's populations of birds, shellfish and mammals;
- Gaps in knowledge of population control mechanisms that need to be filled in order to detect, understand and predict changes in the region's animal populations;
- Summaries and details of the existing data collection programs and how GEM efforts are designed to complement them;
- GEM work in progress;
- GEM work that needs to be done as soon as possible;
- Current expectations for work in the future; and
- Current and prospective status of the two GEM implementation strategies: community involvement and management applications and products.

As an example of specifics consider the following excerpt from the Table of Contents for the Science Plan (Attachment 6), which outlines the situation in the Alaska Coastal Current.

The Science Plan provides the full suite of current scientific thinking on what controls production of birds, fish and mammals in the Alaska Coastal Current (ACC), states the most likely explanation, discusses information needed to evaluate the explanation, and then states what needs to be done to acquire this information. For example, the ACC working concept is that changes in advective processes brought about by changes in weather patterns and other physical forcing control the movement of nutrients and carbon from deep waters across the continental shelf through the ACC and into the watersheds.

Changes in the rate of input of nutrients and carbon on decadal scales control the production of birds, fish and mammals in the ACC. Measurements of advective processes such as temperature and salinity, and of nutrients and of the origin and fate of carbon sources within the ACC are needed. The Science Plan also identifies ships of opportunity as the most cost effective means of getting these data in the ACC. Accordingly, the Invitation for Proposals (explanation below) calls for ideas on how to place instruments on the Alaska Marine Highway System Ferries and other vessels regularly transiting areas of interest.

As an example of how NOAA funds for GEM administration would accelerate deployment of the observing system, consider the process of developing the part of the GEM program that will monitor temperature, salinity and fluorescence from vessels of opportunity. If administrative costs were to be defrayed by NOAA funds, collection of measurements would begin in FY 04, and not in FY 05, as is now planned. Measurements of these variables have never before been collected at this frequency with this geographic coverage in shelf break areas of critical importance to understanding marine productivity. This is good value for NOAA's investment.

Another example of how NOAA funds to defray the costs of administration would contribute to the development of the observing system is found in the Science Plan under watersheds. Marine influences in watersheds are recommended by the Science Plan for long-term study. Stable isotopes of carbon, nitrogen, and sulfur, as well as amino acid signatures, are to be developed as proxies for measuring the extent of marine influences in coastal watersheds. For developing statistically appropriate sampling programs, getting as much geographic and hydrographic contrast among localities where proxies are sampled is essential. As a result of the NOAA funding, proxy measures from more different sites would be collected sooner, thereby accelerating substantially the implementation of the watershed component of the program.

Other areas of interest to GEM are addressed in the Invitation.

There are two elements to Objective 1:

Objective 1.1: Science Plan Production
Objective 1.2: Science Plan Maintenance

Objective 2: GEM Invitation for Proposals

The GEM Invitation for Proposals (Attachment 7) is a clear statement of what the Trustee Council needs in a given fiscal year from scientists and others in the public and private sectors. The annual Invitation is derived directly from the GEM Science Plan and is intended to guide the proposers in crafting proposals, the peer reviewers in evaluations of proposals, and the Scientific and Technical Advisory Committee (STAC) during the review process, and to serve as an informative tool for the public. The Invitation is critically important to the success of the program, since it is responsible for communicating to potential implementers of the GEM program.

The FY 04 Invitation for Proposals defines the areas in which proposals may be made, and the aspects of the Science Plan that must be addressed for a proposal to be successful. The contents of the Invitation are as follows;

... the parts of the GEM program under development at this time
- A. Synthesis
- B. Data Management and Information Transfer
- C. Modeling
- D. Community Involvement
- E. Lingering Oil Effects

... opportunities in the GEM habitat types targeted for new projects in FY 04
- F. Alaska Coastal Current
- G. Nearshore
- H. Watersheds

... projects funded through GEM in FY 03
- I. Continuing Projects

The synthesis work called for in the Invitation seeks manuscripts discussing the most recent scientific literature and other relevant information, as a coherent statement of the state of the Gulf of Alaska (see Figure 5.2 above) for a particular habitat type (Watersheds, Nearshore, Alaska Coastal Current, and Offshore). The synthesis contributes to the Science Plan as the introduction of each habitat section, as a presentation to a regional scientific meeting, and as a peer reviewed scientific publication.

Data management and information transfer in FY 04 calls for increased access to regional marine science data through activities such as establishing an OBIS pilot project, and developing a metadata directory for the region that complements state and federal efforts that have wider geographer scopes.

The modeling portion of the Invitation seeks to establish a team of biological and biophysical modelers to initiate the biophysical modeling effort for GEM. A model of fisheries production utilizing coupled biological and physical models for the northern Gulf of Alaska was recommended by the National Research Council and vetted through the scientific peer review and public involvement processes.

Community involvement meets a requirement established by the federal court and the Trustee Council for meaningful community involvement in the expenditure of funds. Projects targeting information transfer and development of scientific information of particular interest to coastal communities in the oil spill area are invited.

Lingering oil effects projects are invited to ensure that the GEM monitoring program is responsive to the continuing needs for restoration activities. A number of species, such as harlequin ducks and sea otters are identified by the Trustee Council as not having fully recovered from the effects of the 1989 oil spill. GEM sampling programs are to address

transfer of hydrocarbons through the food chain, as well as the origin and fate of hydrocarbons.

Work in the habitat types seeks to identify elements of the observing system that can be considered for adoption as elements of the GEM monitoring program. The focus in the Alaska Coastal Current is on basic physical measurements (T, S) from vessels of opportunity, and in the watersheds on learning how to sample for proxies of marine influences in watersheds. In the nearshore area projects that ensure the GEM monitoring program is relevant to environmental decision-makers are invited.

There are two elements to Objective 2:

Objective 2.1: Invitation Production
Objective 2.2: Invitation Maintenance

Objective 3: GEM Work Plan

To develop the GEM Work Plan, projects are selected by an open competitive proposal process through responses to the Invitation for Proposals. The evaluation of proposals uses independent volunteer peer reviewers selected globally for specific expertise relevant to the proposal, and members of the Scientific and Technical Advisory Committee (STAC), a committee of nationally recognized senior scientists who develop programmatic recommendations for funding from among the peer reviewed proposals. The STAC is supported by a standing subcommittee of volunteer regional scientific and technical experts, and temporary work groups as needed.

The GEM Work Plan, http://www.oilspill.state.ak.us/admin/DPD2003/index.html contains not only the narrative and budgets of current projects, but links to project web sites where data and progress reports may be found for some projects. Summaries of the rationales for funding each project (or rejecting others) are also part of the Work Plan.

There are two elements to Objective 3:

Objective 3.1: Work Plan Scientific Advice
Objective 3.2: Work Plan Scientific Review

Approach

Introduction

The overall direction of the GEM program comes from the GEM Program Document, as adopted by the *Exxon Valdez* Oil Spill Trustee Council (Trustee Council). The GEM program will be planned and implemented through the collective efforts of staff employed by the Trustee Council, volunteers from the public and private sectors as part of a community involvement effort, and public and private sector contractors selected by an open competitive proposal invitation process. The process engages all sectors of the

marine sciences community, including private, academic and government, and non-government.

The senior management team for the GEM Program is fully supported by the Trustee Council. The Team consists of the principal investigator (GEM Science Director), the GEM Data Systems Manager, and support from the Executive Director. Funding is requested to support key administrative staff (Science Coordinator, Data Programmer and Administrative Assistant), contractual support, and travel for the early years of implementing the GEM Program.

Schedule

The GEM program will be implemented during an annual cycle that coincides with the federal fiscal year, October 1 – September 30. Activities contributing to meeting each of the objectives will be conducted once a year in the following sequence:

- November – February: Invitation for Proposals
- February – June: Work Plan
- July – October: Science Plan

Approach, Products and Due Dates by Objective

Objective 1.1: GEM Science Plan Production
The senior management team is tasked with ensuring that the Science Plan is responsive to the overall direction of the Trustee Council, the GEM Program Document, and the public process (including the Public Advisory Committee) which is an essential component of the program. GEM staff are responsible for ongoing development of the Science Plan. Specific activities include briefings, workshops and work groups, writing, editing, oversight of review, and distribution.
Product and due date: 1) Draft Science Plan, updated October each year.

Objective 1.2: GEM Science Plan Maintenance
GEM staff are responsible for maintaining products that are essential to ongoing development of the Science Plan. This will allow the Science Plan to be used: 1) as a scientific reference on specific monitoring issues; 2) a reference on similar activities for collaboration and to avoid duplication; 3) a record of GEM activities in progress; 4) a tool for identifying prospects for future GEM activities. Maintenance activities include consultation and coordination with other marine research efforts to develop a network of partnerships to complement core GEM monitoring efforts.
Products and due dates: 1) GEM ProCite electronic bibliography of North Pacific marine scientific literature continuously available; and 2) GEM database of regional marine science activities as part of larger North Pacific database, continuously available.

Objective 2.1: GEM Invitation Production
GEM staff are responsible for developing a scientifically sound draft Invitation for review by the Trustee Council and its public process. Specific activities include writing, editing and distribution.
Product and due date: 1) Invitation for Proposals, February each year.

Objective 2.2: GEM Invitation Maintenance
GEM staff are responsible for maintaining the scientific content of the Invitation and for insuring that the format and procedures are appropriate to a scientific audience. The Invitation is to be maintained in a manner that supports at a minimum the following uses by all concerned: 1) instruction on what kinds of proposals are needed to address specific monitoring and research issues; 2) references on opportunities for collaboration and how to avoid duplicating efforts of existing activities; and 3) links to relevant GEM activities in progress. Maintenance activities include consultation and coordination with other marine research efforts to ensure GEM invites proposals that add to core GEM monitoring efforts.
Product and due date: 1) Standard Instructions for Proposals, updated February of each year.

Objective 3.1: Work Plan Scientific Advice
GEM staff are responsible for producing the scientific content of the draft annual Work Plan from the peer review-STAC process. Specific activities include collecting and editing content.
Products and due dates: 1) Draft Work Plan, June each year; and 2) Final Work Plan, December each year.

Objective 3.2: Work Plan Scientific Review
GEM staff assigns proposals to reviewers, and have the results of each review sent to the STAC. The Science Director participates in programmatic proposal review as a member of the STAC. The Science Director edits the conclusions of the STAC with respect to each proposal.
Products and due dates: 1) GEM Database of peer reviewers, June each year; 2) Draft Work Plan, June each year; and 3) Final Work Plan, December each year.

Project Management

Project management is provided by the principal investigator who is the Science Director, as assisted by the Data Systems Manager and Executive Director.

The principal investigator is the Science Director, Dr. Phillip R. Mundy. Dr. Mundy is fully qualified to lead the science management of the GEM program by virtue of his extensive experience in scientific research in Alaska, his background in fisheries and oceanography, his broad experience with governmental and non-governmental institutions that have marine science and other environmental missions, and his extensive network of contacts in scientific circles in the North Pacific and the nation. In addition to his scientific experience and credentials, Dr. Mundy has administrative experience

appropriate to the nature and geographic scope of GEM. As Chief Fisheries Scientist, Alaska Department of Fish and Game, Dr. Mundy supervised an immediate staff of five scientists and one clerical staffer, was responsible for statewide research issues, and was part of the process of building statewide budgets for research operations. As Manager of the Fisheries Science Department, Columbia River Inter-Tribal Fish Commission, Dr. Mundy supervised a staff of nine scientists and one clerical staff and was responsible for pursuing research issues throughout the Columbia River Basin in Washington, Oregon, and Idaho in cooperation with agencies of state, tribal and federal governments.

Information Technology support is provided by the Data Systems Manager, Robert Bochenek. Mr. Bochenek is a recent addition to the GEM project team, currently serving as the Data System Manager for the program. Mr. Bochenek has spent most of his professional life creating computer based systems to archive, analyze and disseminate scientific data and information products. While working at the Alaska Department of Fish and Game he was successful in re-engineering their informational data systems to make them web accessible and subsequently increase their usability and worth. He is currently working as the primary technical lead for architecting the GEM data system and helping GEM affiliates develop a regional distributed data system which has come to be known as the Coastal Alaska Observation System (CAOS). Mr. Bochenek's efforts will ensure the efficiency and effectiveness of the scientific administrative processes through automation. Mr. Bochenek is also responsible for access of the staff and the public to all documents associated with the project, as well as for the validity of all essential documents, such as peer reviews and reports.

Policy support and guidance is provided by the Executive Director. The current Executive Director is Molly McCammon. Ms. McCammon has served as executive director of the *Exxon Valdez* Oil Spill Trustee Council for more than eight years. The Trustee Council is the joint federal-state entity entrusted with managing the restoration program funded by a $900 million trust created through a court-approved settlement following the 1989 *Exxon Valdez* oil spill. The Trustee Council's programs are viewed as a model internationally because of their emphasis on long-term monitoring from the initial damage assessment of oil spill injury, to restoration and recovery, and now to an endowed ecosystem monitoring program. The GEM Program is viewed as the Trustee Council's lasting legacy for the original spill-impacted region of the northern Gulf of Alaska. Ms. McCammon's expertise is managing the coordination and collaboration between governmental and non-governmental entities and the public essential to the overall success of such a multi-faceted program.

Partnerships

As the creature of a state-federal trustee council, the GEM program has been developed under policies that call for leveraging of funds and interagency coordination and partnerships. Institutions currently making financial contributions to GEM by donating the services of scientists for GEM subcommittees include the Alaska Department of Fish and Game, Biological Research Division U.S. Geological Survey, Cook Inlet Regional

Citizens Advisory Council, National Marine Fisheries Service, U.S. Fish and Wildlife Service, University of Alaska, and the Chugach Regional Resources Commission. GEM projects in planning or currently underway are to be conducted with the Prince William Sound Citizens Advisory Council, the Alaska Department of Fish and Game, Kachemak Bay National Estuarine Research Reserve (NOAA-NOS), the Institute of Marine Sciences, University of Alaska Fairbanks, and the Prince William Sound Science Center. In the course of designing the GEM program, 1999-2002, virtually every governmental and non-governmental marine science and environmental organization active in the Gulf of Alaska contributed labor (GEM Program Document-Acknowledgements). In addition, the GEM program is designed and implemented to ensure that there will not be duplication of effort in monitoring and research, through its reliance on a database of North Pacific marine science activities, and through the emphasis on strategic partnerships with regional marine laboratories, government agencies, and other institutions.

Application of Results

In the absence of good data and information, human activities and uses of marine resources often are blamed for any changes to those resources and the overall marine environment. Long-term monitoring of marine resources and ecosystems is essential to adequately document those changes, assess whether they are due to natural forces or anthropogenic factors, and provide the necessary backup for resource management and permitting. Thus, the data and information products generated by the GEM Program should be of immediate use to resource managers, planners and permitters.

More specifically, the GEM Program has been instrumental in developing a prototype operational fisheries oceanography project (involving a physical oceanographer and a fishery biologist) to improve the regulatory structure of the Cook Inlet salmon commercial fishery. In addition, one of the first GEM projects adopted by the Trustee Council in 2002 is developing measures of the impact of subsistence harvests on an important intertidal resource, the black gumboot (a chiton). This is a critical subsistence resource that is poorly understood and is not routinely monitored by federal and state agencies.

The GEM data management and information transfer component (GEM Program Document, Chapter 9) is specifically designed to support user outreach and education via web-based services. Data management and information transfer was identified as an essential component of GEM early in the National Research Council Review of GEM (NRC 2002). All GEM projects are required to develop a data management plan which includes a schedule for delivering the data and information products to the public in a timely manner. The current GEM web site http://www.oilspill.state.ak.us/gem/index.html presently contains a wealth of information on the marine sciences in the northern Gulf of Alaska, as well as links to hundreds of web sites for other marine science organizations.

Cost Efficiency

Cost efficiency is attained in the GEM program through two strategies: the use of volunteer scientists and other volunteer expertise from private and public sectors in the attainment of the Science Plan and the Invitation for Proposals (Objectives 1 and 2), and the automation of administrative tasks surrounding the peer review process essential to development of the Work Plan (Objective 3). In the preparation of the first GEM Science Plan, 125 scientists and knowledgeable members of the public donated an average of eight hours each. As part of maintaining the GEM Science Plan and producing the Invitation, the eleven members of the habitat subcommittee who serve without compensation from the GEM program are expected to contribute the equivalent of two weeks a year to the program. During the first peer review of GEM proposals in the fall of 2002, ninety-one peer reviews were received from volunteer scientists.

All peer review correspondence is automated through the use of computer programs and the Internet. Peer reviewers are solicited by an e-mail program that draws names from a database of willing peer reviewers developed by the science management program. Persons responding positively to the request for peer review services are sent forms and proposals via e-mail, and are encouraged to respond by e-mail. Over time, the automated processes will become more efficient through improvements in software made possible by our experience and by faster hardware.

The large pool of willing peer reviewers necessary to make the GEM peer review process possible (more than 800) is made possible by the extensive networking undertaken by GEM staff through travel to regional, national and international scientific meetings. Promotion of the GEM program in these venues has also opened up many opportunities for cost savings through sharing research platforms with other, larger programs. The GEM program will be continuing to improve and expand its network of marine science contacts.

Budget Narrative

The request is for $745,125 over three years ($248,375). Year 1 will be October 1, 2003-September 30, 2004. Year 2 will be October 1, 2004-September 30, 2005. Year 3 will be October 1, 2005-September 30, 2006.

Personnel: Funds requested for personnel costs total $477,900. Two currently unfilled positions will be funded primarily (9 months per year of their time) with CSC grant funds. The Science Coordinator and the Data Programmer will assist the senior management team for the GEM program in the objectives related to establishing a coastal observing and monitoring system--the GEM Science Plan, Invitation, and Scientific Advice and Review. The Science Coordinator will provide the primary staff support to the STAC (Scientific and Technical Advisory Committee), assume primary responsibility for managing the scientific review process, edit and oversee production of the annual update of the GEM Science Plan and GEM Invitation, work with tribes and other stakeholder and community groups to ensure community involvement in the GEM

program, and provide general assistance to the Science Director, Executive Director, and Program Director. The Data Programmer will support continued development and maintenance of the GEM database of peer reviewers, the GEM database of North Pacific marine scientific literature, and the GEM database of regional marine science activities, as well as provide general assistance to the Data Systems Manager. Nine months of an Administrative Assistant will also be funded with CSC funds to provide general administrative support to implementation of the GEM program.

Science Coordinator at a monthly salary cost of $4,371.00 for the 1st year, $4,512.00 a month for the 2nd year, and $4,653.00 a month for the 3rd year, for a 3 year total salary of $121,824.00. Fringe benefits at $1,829.00 a month for the 1st year, $1,888.00 a month for the 2nd year, and $1,947.00 a month for the 3rd year, for a 3 year total fringe benefit/employer cost of $50,976.00.

Data Programmer at a monthly salary cost of $3,948.00 for the 1st year, $4089.00 a month for the 2nd year, and $4,230.00 a month for the 3rd year, for a 3 year total salary of $110,403.00. Fringe benefits at $1,652.00 a month for the 1st year, $1,711.00 a month for the 2nd year, and $1,770.00 a month for the 3rd year, for a 3 year total fringe benefit/employer cost of $46,197.00.

Administrative Assistant at a monthly salary cost of $3,736.50 for the 1st year, $3,877.50 a month for the 2nd year, and $4,018.50 a month for the 3rd year, for a 3 year total salary of $104,692.50. Fringe benefits at $1,563.50 a month for the 1st year, $1,622.50 a month for the 2nd year, and $1,681.50 a month for the 3rd year, for a 3 year total fringe benefit/employer cost of $43,807.50.

Travel: Funds requested for travel costs total $85,725.00. Travel is a high cost of doing research in Alaska. It is essential that staff participate in regional and national monitoring efforts, as well as work with local Alaska communities in developing the GEM Program.

- STAC travel assumes two 2-day meetings in Anchorage. Includes airfare from Washington, D.C. for O'Dor ($1,300), from Virginia for Royer ($1,300), from Oregon for Miller ($700), and from Fairbanks for Norcross ($300). Includes 22 days expenses (hotel, meals, taxi/car rental) at $200/day (includes a travel day in addition to meeting days for O'Dor, Royer and Miller).

- PICES travel is for 2 staff to attend meeting (assume international travel). Includes airfare (estimate $2,000/ticket) and 10 days expenses (hotel, meals, taxi/car rental) at $260/day.

- GLOBEC travel is for 2 staff to attend meeting (assume national travel). Includes airfare (estimate $1,000/ticket) and 6 days expenses (hotel, meals, taxi/car rental) at $220/day.

▪ AOOS travel is for 2 staff to attend meeting (assume regional travel). Includes airfare (estimate $500/ticket) and 4 days expenses (hotels, meals, taxi/car rental) at $200/day.

▪ Other travel is to support staff participation in other meetings, both within and outside of Alaska, that are part of regional and national efforts to establish coastal observing and monitoring systems. For example, in the past year staff has attended a remote sensing workshop in Homer, Alaska, a traditional ecological knowledge/Native observations workshop in Tatitlek, Alaska, and the GOOS and IOOS planning sessions in Washington, D.C. Trips to Washington, D.C. are budgeted at $1,000/air ticket and $300/day expenses (hotels, meals, taxi/car rental). Trips within Alaska are budgeted at $500/air ticket and $200/day expenses (hotels, meals, taxi/car rental).

Contractual: Funds requested for contractual costs total $120,000.00. Four of the STAC (Scientific and Technical Advisory Committee) members (those who are not federal or state employees) are compensated for their services through contracts with the Trustee Council. Payment is $500/day; 20 days of service are estimated for each member.

Supplies: Parts and supplies for general office maintenance.

Indirect Charges: Funds requested for administrative costs total $42,177.00. This fee (6% of project costs) covers the costs of payroll and personnel functions, accounting functions, and administrative contract monitoring.

	YEAR 1	YEAR 2	YEAR 3
PERSONNEL	$153.9	$159.3	$164.7
TRAVEL	$33.9	$28.5	$23.3
CONTRACTUAL	$40.0	$40.0	$40.0
SUPPLIES	$6.4	$6.5	$6.4
INDIRECT COSTS	$14.1	$14.1	$14.0
TOTAL COSTS	$248.3	$248.4	$248.4

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Budget Category:	Authorized FY 04	Proposed FY 05	PROPOSED FY 03 TRUSTEE AGENCIES TOTALS ADEC	ADF&G	ADNR	USFS	DOI	NOAA
Personnel	$153.9	$159.3						
Travel	$33.9	$28.5						
Contractual	$40.0	$40.0						
Commodities	$6.4	$6.5						
Equipment	$0.0	$0.0	LONG RANGE FUNDING REQUIREMENTS					
Subtotal	$234.2	$234.3	Estimated					
General Administration	$14.1	$14.10	FY 2006					
Project Total	$248.3	$248.4	$248.4					
Full-time Equivalents (FTE)								
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

PREPARED 08/10/04

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Lead Agency: ADFG/Trustee Council Office

FORM 2A
MULTI-TRUSTEE AGENCY SUMMARY

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Budget Category:	Authorized FY 04	Proposed FY 05	LONG RANGE FUNDING REQUIREMENTS					
Personnel	$153.9	$159.3						
Travel	$33.9	$28.5						
Contractual	$40.0	$40.0						
Commodities	$0.0	$6.5						
Equipment	$0.0	$0.0						
Subtotal	$227.8	$234.3						
General Administration	$14.1	$14.10						
Project Total	$241.9	$248.4						
Full-time Equivalents (FTE)								
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADFG/Trustee Council Office

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 04
						0.0
Dworsky	Science Coordinator		9.0	6.4		57.6
Womac	Administrative Asst		9.0	5.5		49.5
Schlei	Data Analyst		9.0	5.8		52.2
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		27.0	17.7	0.0	
					Personnel Total	$159.3

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 04
Travel for Trustee Council Office science staff as needed					10.3
Travel for STAC					11.6
Travel for PICES and MONITOR meetings					6.6
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$28.5

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADFG/Trustee Council Office

FORM 3B
Personnel
& Travel
DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Contractual Costs:	Proposed FY 04
Description	
STAC compensation - Honararium for non-governmetnal members @ $500 day.	40.0
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$40.0

Commodities Costs:	Proposed FY 04
Description	
Office Supplies	6.5
Commodities Total	$6.5

FY05

Project Number:050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADFG/Trustee Council Office

FORM 3B
Contractual & Commodities DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 04
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.		**New Equipment Total**	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADFG/Trustee Council Office

FORM 3B
Equipment
DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Budget Category:	Authorized FY 03	Proposed FY 04	LONG RANGE FUNDING REQUIREMENTS					
Personnel	$0.0	0						
Travel	$0.0	0						
Contractual	$0.0	0						
Commodities	$0.0	0						
Equipment	$0.0	0						
Subtotal	$0.0	0						
General Administration	$0.0	0						
Project Total	$0.0	0						
Full-time Equivalents (FTE)								
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADNR

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 04
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		0.0	0.0	0.0	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 04
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$0.0

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADNR

FORM 3B
Personnel
& Travel
DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Contractual Costs:	Proposed
Description	FY 04
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$0.0

Commodities Costs:	Proposed
Description	FY 04
Commodities Total	$0.0

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADNR

FORM 3B
Contractual & Commodities DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FY 04
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.		**New Equipment Total**	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: ADNR

FORM 3B
Equipment
DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Budget Category:	Authorized FY 03	Proposed FY 04	LONG RANGE FUNDING REQUIREMENTS					
Personnel	$0.0	$0.0						
Travel	$0.0	$0.0						
Contractual	$0.0	$0.0						
Commodities	$0.0	$0.0						
Equipment	$0.0	$0.0						
Subtotal	$0.0	$0.0						
General Administration	$0.0	$0.0						
Project Total	$0.0	$0.0						
Full-time Equivalents (FTE)								
	Dollar amounts are shown in thousands of dollars.							
Other Resources								

Comments:

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: USGS/DOI

FORM 3A
TRUSTEE
AGENCY
SUMMARY

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 04
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		0.0	0.0	0.0	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Proposed
Description	Price	Trips	Days	Per Diem	FY 04
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$0.0

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: USGS/DOI

FORM 3B
Personnel
& Travel
DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

Contractual Costs:	Proposed
Description	FY 04
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	$0.0

Commodities Costs:	Proposed
Description	FY 04
Commodities Total	$0.0

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: USGS/DOI

FORM 3B
Contractual & Commodities DETAIL

FY 04 *EXXON VALDEZ* TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2003 - September 30, 2004

New Equipment Purchases: Description	Number of Units	Unit Price	Proposed FY 04
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.		**New Equipment Total**	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY05

Project Number: 050630A
Project Title: Scientific Management for GEM and Lingering Oil Programs
Agency: USGS/DOI

FORM 3B
Equipment
DETAIL

Exxon Valdez Oil Spill Trustee Council

DRAFT WORK PLAN

FY 2005 – FY 2007

AUGUST 12, 2004

Exxon Valdez Oil Spill Trustee Council
441 West 5th Avenue, Suite 500
Anchorage, AK 99501
907-278-8012
www.evostc.state.ak.us

Notice

The abstracts were written by the authors of the proposals to describe their projects. To the extent that the abstracts express opinions about the status of injured resources or priorities for GEM or other parts of the Restoration program they do not represent the views of the Executive Director, the Science Director or other staff of the *Exxon Valdez* Oil Spill Trustee Council, nor do they reflect policies or positions of the Trustee Council.

Full scientific references for the literature cited may be found in the GEM Program document on the Trustee Council's web site, as they are not included here for the sake of brevity.

Publication produced by staff at no additional cost. Release authorized by the *Exxon Valdez* Oil Spill Trustee Council.

Table of Contents

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Gail Phillips, Executive Director

Phillip R. Mundy, Science Director

Executive Summary

The Draft Work Plan consists of projects already approved by the Trustee Council and proposals recommended for funding by the Executive Director. The function of the Executive Summary is to enable the Council to see exactly what is newly proposed for FY 2005 – FY 2007 and how much it would cost to implement the proposed work. In the body of the Draft Work Plan the recommended proposals and the already funded projects are merged so that the Council may see its Restoration Program in its entirety, as it would be should the Council adopt all of the Executive Director's recommendations. The third part of the Draft Work Plan is the Appendix that contains the basic information concerning each proposal and its complete record of funding recommendations during the review process.

The next two federal fiscal years, FY 2005 and FY 2006, are critically important pivot points in the transition from the conclusion of the court settlement process started in 1991 toward the long-term monitoring phase of the Restoration Program. The actions proposed in the Draft FY 2005 Work Plan now before the Council are intended to do two tasks to enable this transition; 1) Inform the Council and the public on the status of injured resources and oil in the environment, and 2) complete laying the foundation on which a long-term monitoring program, Gulf of Alaska Ecosystem Monitoring and Research, GEM, may be built starting in FY 2007. The FY 2005 Draft Work Plan envisions bringing closure to the injured species list, developing recommendations on oil impacts studies for summer 2005, and developing measures of fate and effects of oil on the injured intertidal communities and other nearshore resources. As a consequence of adoption of the Draft Work Plan, funding for new GEM projects in FY 2006 would not be necessary, as the implementation phase would be fully funded as of FY 2005, completing the foundation for transition to long-term monitoring. Details of the two transition tasks follow.

The Conclusion of the Court Settlement Process

Adoption of the Draft Work Plan takes an essential step toward bringing the court settlement phase of the Restoration process to a successful conclusion. A successful conclusion allows the Council to assure the governments and the public that 1) impacts on injured species and resources are known and are being addressed to the extent possible, 2) that the long-term direct impacts of oiling are being measured, and 3) that the information collected is being used, or will be used by government resource managers. As explained in detail in the body of the Draft Work Plan, the proposed work would extend knowledge of injured birds, fish, mammals, intertidal resources, and other injured resources. In addition, identifying and understanding long-term direct impacts of oiling and measuring the fate of oil in the environment would be furthered by the proposed work. Finally, implementation of the recommendations would accelerate development of management applications, and start the long-term process of institutionalizing the utility and access of all Council data to managers through implementing a modeling program.

The out-year funding proposed would limit the FY 2006 Invitation to small modifications to existing projects (perhaps no more than ca. $20 – 40K maximum). The limited activity on the FY 2006 Invitation is planned to give the Council staff time to focus on the Injured Species List, revising the Science Plan, as well as finishing the automation of our grant and contract process that is needed in FY 2007. The FY 2007 Invitation needs to be designed with care, as this is the launch point for long-term monitoring (GEM). The results from long-term planning and research in the Watersheds and Nearshore will be available to guide development of the FY 2007 Invitation to be issued in February 2006. A good deal of consultation from the STAC, Habitat Subcommittee, Lingering Oil subcommittee, the Trustee Council agencies and other parts of the scientific community will be needed.

The Injured Species List contains eight individual species still listed as injured, and eight more resources encompassing many species listed as recovering, and five more resources listed as recovery unknown. The Council staff will serve as the focal point for bringing together the legal, policy, and biology interests of the Trustee Council to chart a path to bringing closure to the issue of injured resources. As an initial goal, it is suggested that the Injured Species List be resolved into "recovered" and "recovery unknown." The species and resources listed as "recovery unknown" would be referred to the GEM program for long term study. The scientific criteria will be developed through workshops during FY 2005 and 2006. The relation of the status of injured species and resources to the needs for "lingering oil" work is taken into account, as this area will require increasing staff attention, as contractors start producing results from projects initiated in this fiscal year (FY 2004).

The Science Plan is the point of origin for the Invitation for Proposals and ultimately the Work Plan, so it is a critically important document. Due to staffing vacancy (Science Coordinator) and the lack of availability of synthesis proposals in response to past Invitations, the Science Plan is past due for an update. The goal is to work with Trustee Council agency scientists, the STAC and Subcommittees, our contractors, and other interested parties to revise the Science Plan to the point where it can be released as a "color glossy" booklet. The booklet would allow a wide audience to become familiar with what the Council plans to do and why, and the process of producing the booklet would provide the Trustees a chance to participate.

The Long-term Monitoring Phase of the Restoration Program (GEM)

Adoption of the Draft Work Plan would complete the funding for the transition phase of GEM. The work proposed in the Draft Work Plan would 1) complete the implementation for the GEM program areas of Modeling, Synthesis, Nearshore and Lingering Oil, as called for in the Council's Science Plan, 2) accelerate development of Management Applications, as requested by the Council during last year's funding cycle, 3) complete the package of Watershed proposals funded by the Council last year by addition of its community-based water quality component, and 4) provide for activities to complement the Council's existing Community Involvement projects. Information from projects completed during FY 2003 – FY 2005, and from ongoing projects in FY 2006, would be used to design an FY 2007 Invitation for Proposals that would start the long-term monitoring phase of the Restoration Program.

Recommendations for New Funding FY 2005 – 2007

The Trustee Council is being asked to approve an expenditure of $6.6 million in this FY 2005 – FY 2007 Draft Work Plan. The Executive Director recommends 21 external projects for funding in the amount of $ 2.1 million for FY 2005, $1.7 million for FY 2006, and $1 million for FY 2007, for a total of **$4.8 million in external projects for FY 2005 – 2007** (Executive Summary Table 1). Funding for the internal projects is requested for FY 2005 in the amount of $1.8 M, for a **total FY 2005 – 2007 funding request for new external and internal projects of $6.6M**. Projections of annual costs for out-year internal projects are shown in Table 1 for planning purposes, however the Council is not being asked to authorize these expenditures at this time. Internal projects (conducted by Trustee Council staff) are authorized annually and cover basic operational activities such as administration, science management and peer review. For reference, a listing of all proposals is given in Executive summary Table 4.

The out-year implications of adopting the Work Plan: The total annual amounts recommended for funding combined with current obligations are $6.155 million, $3.170 million, and $980 thousand in FY 2005 – 2007 respectively (Table 2). Some adjustments are necessary to interpret these figures in terms of the Trustee Council's estimated guideline funding cap of $5M. The FY 2005 annual total includes $465 thousand in funding from the Trustee Council action of May 14, 2004 that was excluded from the Council's $5 million funding cap. The FY 2005 total excluding the May 14 funding is $5.690M (Table 1).

Taken over the four-year time period FY 2003 – FY 2006, total expenditures and encumbrances are estimated to be $19.878 million on adoption of this Draft Work Plan (Table 3). EVOSTC funding for the Restoration Program, including implementation of the GEM program, would be slightly under $5M per year as an average of the four fiscal years, FY 2003 – FY 2006. **On adoption of the FY 2005 - 2007 Work Plan the Trustee Council is projected to have spent or obligated less than the estimated annual guideline cap of $5 million, for the period FY 2003 – FY 2006, and the estimated FY 2007 obligation would be less than one-fifth of the guideline.**

On adoption of the Draft Work Plan, there would be a total of 53 projects operational in FY 2005, 48 external and 5 internal (Table 5).

As requested by the Trustee Council, priorities for individual proposals were established by the Executive Director (Table 6) and the Scientific and Technical Advisory Committee (Table 7). Overall, the priorities for the program areas represented by the proposals under consideration for funding by the Trustee Council are: Priority 1 - Modeling and Synthesis; Priority 2 - Nearshore and Lingering Oil, Priority 3 - Management Applications; Priority 4 - Watersheds; and Priority 5 - Community Involvement. Modeling and Synthesis are closely related top-priority "navigational" areas that use existing data and publications to inform all other

aspects of the Council's programs. The Nearshore and Lingering Oil areas are grouped together as very close seconds in priority because they are different aspects of the same effort to implement a long-term accounting of the status of oil-injured resources of the intertidal and near-subtidal areas. Management Applications are ranked somewhat below the first four program areas, as this area is intended to supplement and complement ongoing projects in all program areas by providing tools for resource managers in relatively short amounts of time. Watershed activities are a fourth place priority because the Trustee Council made a substantial investment in Watersheds last year, FY 2004 – FY 2006. Community Involvement gets a fifth place in prioritization of proposal program areas because the Council made an investment in this area in FY 2004, and because the Council has yet to agree upon criteria for identifying and evaluating this type of project beyond those specified in the GEM Program Document, as adopted by the Council in July 2002. Consistent with the GEM Program Document, Community Involvement is addressed within all other proposals recommended for funding to the extent appropriate and feasible.

In addition to the preceding considerations, priorities were based on the needs identified in the Science Plan, and on the information needs for the conclusion of the court settlement period explained above. Cost was also a factor, in that funding a single project with a very large (multiple hundred thousand dollar) price tag can prohibit moving forward in a variety of program areas with a variety of less costly projects. An expensive project would need leveraging by funding from partners to reduce the overall costs in order to achieve a higher priority.

Executive Summary Table 1.

Thousands of dollars

Category	FY03*	FY04**	FY05**	FY06	FY07
External projects Proposed			$2,068	$1,699	$980
External projects Obligated	$4,400	$3,303	$1,812	$1,471	
Internal projects		$1,787	$1,810	$1,778***	$2,026***
Grand Total	*$4,400*	*$5,090*	*$5,690***	*$4,948*	*$3,006*

Amounts in shaded cells are from prior fiscal years for reference purposes

***Estimated expenditure**

****Project cost approved May 14, 2004 are excluded as they are outside the $5 million dollar spending cap**

***** Projections only: internal projects are authorized annually**

***Executive Summary Table 2**. Proposed amounts and obligations including amount authorized on May 14, 2004.*

		Thousands of dollars	
All External projects for FY 2005**	**FY 2005**	**$**	**3,880**
May 14, 2005		**$**	**465**
Internal projects for FY 2005	**FY 2005**	**$**	**1,810**
	FY 2005 Total		**$ 6,155**
All External projects for FY 2006	**FY 2006**	**$**	**3,170**
Internal projects for FY 2006	**FY 2006**	**$**	**1,778**
	FY 2006 Total		**$4,948**
External projects for FY 2007	**FY 2007**	**$**	**980**
Internal projects for FY 2007	**FY 2007**	**$**	**2,026**
FY 2007 Total $3,006			
TOTAL FY 2005 – 2007 estimated (internal + external)		**$**	**14,109**

Executive Summary Table 3. *Summary of GEM implementation funding and projections FY 2003 – FY 2006.*

	Thousands of dollars		
External & Internal projects for FY 2003	**FY 2003**	**$**	**4,400**
External projects for FY 2004**	**FY 2004**	**$**	**3,303**
Internal projects for FY 2004	**FY 2004**	**$**	**1,537**
External projects for FY 2005**	**FY 2005**	**$**	**3,880**
Internal projects for FY 2005	**FY 2005**	**$**	**1,810**
External projects for FY 2006	**FY 2006**	**$**	**3,170**
Internal projects for FY 2006	**FY 2006**	**$**	**1,778**
TOTAL FY 2003 – 2006 expenditures & authorized (internal + external)		**$**	**19,878**

Note: **FY 04 figures exclude an estimated $250K in lapse in internal projects and also excludes $1,213K in projects funded on May 14, 2004. The FY 05 figures exclude $465K in external projects funded on May 14, 2004.

Executive Summary Table 4. A summary of all proposals and one project modification, followed by a summary of proposed internal projects, the proposed amounts authorized for funding in each fiscal year FY 2005 – 2007. STAC priorities refer to Program Areas, as projects are not prioritized within program areas in this table (see Table 7 for STAC priorities for individual projects). Grand totals include costs only for recommended proposals. Information includes the Executive Director's recommendation, STAC priorities by Program Area, the fiscal year dates for project funding, and additional project information. Internal projects (EVOSTC) are conducted by Trustee Council employees.

	Funding Priorities		Funding Requested			Additional Project Info	
External proposals	ED	STAC Program Priorities	FY 2005	FY 2006	FY 2007	Late Report	Existing EVOS funding
Adams	Y	1 - Modeling	$93,700	$0	$0	N	Y
Baird	Y	1 - Community Inv	$28,900	$20,300	$11,900	N	N
Bodkin	Y	1 – Nearshore	$227,300	$104,400	$0	N	Y
Brodie	N	DNF - Community Inv	$79,600	$108,800	$1,255,700	N	N
Cooper	Y	1 – Watershed	$102,500	$86,000	$96,900	N	N

	Funding Priorities		Funding Requested			Additional Project Info	
External proposals	ED	STAC Program Priorities	FY 2005	FY 2006	FY 2007	Late Report	Existing EVOS funding
Edmundson	Y	1 - Synthesis	$84,000	$85,800	$67,200	N	N
Etnier-FY05	N	DNF – ACC	$72,500	$90,400	$69,800	N	N
Hoover-Miller	Y	4 – Nearshore	$92,700	$130,300	$82,300	N	N
Irons	Y	2 - Lingering Oil	$163,600	$32,700	$0	N	Y
Kline	N	DNF - ACC	$139,800	$193,900	$206,200	N	N
Konar	Y	5 - Nearshore	$136,100	$106,600	$120,800	N	Y
Lees	N	DNF - Nearshore	$197,800	$230,000	$0	N	Y
Logerwell	Y	3 - Management	$32,700	$112,800	$66,900	N	Y
Matkin	Y	DNF - ACC	$20,500	$22,300	$23,800	N	Y
Mazumder	N	DNF - Watersheds	$179,500	$168,200	$165,700	N	N
McNutt	Y	1 - Modeling	$92,700	$95,300	$99,000	N	N
Merritt	N	DNF - Synthesis	$82,300	$71,900	$67,500	N	N
Moffitt	Y	1 - Modeling	$18,900	$0	$0	N	N
Otis	N	DNF - Management	$67,700	$89,400	$25,100	N	N
Rosenberg	Y	1 - Lingering Oil	$39,900	$0	$0	N	Y
Saupe	Y	2 - Nearshore	$201,300	$201,900	$0	N	Y
Schoch	Y	6 - Nearshore	$312,300	$291,400	$0	N	N
Schumacher	Y	1 - Modeling	$22,600	$24,700	$22,600	N	N
Short	Y	1 - Lingering Oil	$58,900	$58,900	$58,900	N	Y
Szarzi	Y	2 - Management	$62,800	$59,200	$59,200	N	N
Vick	N	DNF - Nearshore	$223,300	$0	$0	N	N
Weingartner-ACC	Y	1 - Synthesis	$95,300	$99,700	$98,900	N	Y
Weingartner - Offshore	Y	1 - Synthesis	$105,900	$111,700	$105,000	N	Y

	Funding Priorities		Funding Requested			Additional Project Info	
External proposals	**ED**	**STAC Program Priorities**	**FY 2005**	**FY 2006**	**FY 2007**	**Late Report**	**Existing EVOS funding**
Willette - ACC	Y	1 - Management	$68,800	$65,900	$67,000	N	Y
		Total	$2,061,400	$1,709,900	$980,400		
Weingartner	Y		$6,200	-$10,500		N	Y
Notes * Weingartner-FY04-Alaska Coastal Current has requested an increment of $6.2 K for 2005 and a decrement of 10.5 K for 2006.							
External Total Recommended for Funding in FY 05			**$2,067,600**	**$1,699,400**	**$980,400**		
FY05 Internal proposals ++			***FY 2005***	***FY 2006***	***FY 2007***		
Administration			$853,700	$853,700	$853,700		
Science Management			$415,800	$415,800	$664,200		
Data management			$154,600	$154,600	$154,600		
Project Management			$255,500	$255,500	$255,500		
ARLIS			$130,800	$98,100	$98,100		
		Total	**$1,810,400**	**$1,777,700**	**$2,026,100**		
Grand Total (External+ Internal)			**$3,878,000**	**$3,477,1000**	**$3,000,600**		

Notes:

- **Weingartner-FY 04 – Alaska Coastal Current is a project change**
- **Irvine project has been delayed to FY 2005 and 2006; no cost extension**
- **DOI and NOAA share the Irvine project $60.6:$11.1 respectively**
- **ADF&G and NOAA share the Cokelet project $15.3:$156.2 respectively**
- **ADF&G and DOI share the EVOSTC 040100 project $682.5:$160.8 respectively**
- **ADF&G, NOAA, DNR, and DOI share the EVOSTC 040250 project $57.2:$49.8:$9.9:$27.9 respectively**
- **ADF&G, DNR, and DOI share the EVOSTC 040630 project $274.1:$103.6:$13.9 respectively**
- **++ Internal proposals are funded on a fiscal year basis, FY 06 and FY 07 bare approximations for informational purposes.**

Executive Summary Table 5. Identifies all ongoing projects that the EVOS Trustee Council funded together with the proposed internal and external projects that are being recommended which are identified in "BOLD/ITALICS" text.

	Author-FY-Short Title & Project number	FY05	FY06	FY 07	Agency
1	***Adams-FY05-Pink Salmon Survival Models 050757***	***$93,700***	***$0***	***$0***	***NOAA***
2	***Baird-FY05-Connecting with Coastwalk 050743***	***$28,900***	***$20,300***	***$11,900***	***ADFG***
3	Ballachey-FY04-Oil Exposure in Nearshore Vertebrate Predators 040774	$150,500	$0		DOI
4	Ballachey-FY04-Oil Exposure in Sea Otters 040775	$126,900	$0		DOI
5	Batten-FY04-CPR data 040624	$135,200	$135,200		NOAA
6	Bechtol-FY04-Parameters in the N. Gulf of AK 040693	$56,100	$56,000		ADFG
7	Bishop-FY04-Top-down and Bottom-up Processes 040635	$164,030	$151,390		NOAA
8	Bodkin-FY04-Lingering Oil and Sea Otters 040620-2	$26,200	$6,500		DOI
9	***Bodkin-FY05-GEM Nearshore Monitoring Plan 050750***	***$227,300***	***$104,400***	***$0***	***DOI***
10	Cokelet-FY04-AK Marine Highway System Ferries 040699	$185,900	$145,900		Multiple*
11	***Cooper-FY05-Community-based Sampling 050746***	***$102,500***	***$86,000***	***$96,900***	***NOAA***
12	Day-FY04-Sediment Quality Survey 040772	$57,200	$0		DOL
13	DeLorenzo-FY04-Youth Area Watch 040210	$126,400	$133,200		ADFG
14	Eckert-FY04-Natural Variability in the Nearshore 040702	$17,500	$0		ADFG
15	***Edmundson-FY05-Synthesis of Watershed Linkages 050748***	***$84,000***	***$85,800***	***$67,200***	***ADFG***
16	***EVOS TC-FY05-ARLIS 050550***	***$130,800***	***$98,100***	***$98,100***	***ADFG***
17	***EVOS TC-FY05-Data System (INTERNAL) 050455***	***$154,600***	***$154,600***	***$154,600***	***ADFG***
18	***EVOS TC-FY05-Project Management (INTERNAL) 050250***	***$255,500***	***$255,500***	***$255,500***	***Multiple****
19	***EVOS TC-FY5-Public Information and Administration (INTERNAL) 050100***	***$853,700***	***$853,700***	***$853,700***	***Multiple****
20	***EVOS TC-FY5-Scientific Management (INTERNAL) 050630***	***$415,800***	***$415,800***	***$664,200***	***Multiple****
21	Fall-FY04-Status of Subsistence Uses 040471	$25,600	$0		ADFG
22	Finney-FY04-Marine-terrestrial Linkages 040703	$80,154	$81,117		ADFG
23	Heintz-FY04-Energy Allocation 040706	$42,300	$14,000		NOAA
24	Honnold-FY04-Marine-derived Nutrients on Sockeye Salmon 040703-A	$82,400	$86,800		ADFG
25	***Hoover-Miller-FY05-Harbor Seal Monitoring 050749***	***$92,700***	***$130,300***	***$82,300***	***ADFG***
26	***Irons-FY05-Marine Bird Abundance 050751***	***$163,600***	***$32,700***	***$0***	***DOI***
27	Irvine-FY04-Lingering Oil on Boulder-Armored Beaches 040708	$17,200	0*		Multiple*
28	Jacobs-FY04-Synthesis on injured resources 040776	$0	$0		DOL
29	***Konar-FY05-SOP for Long-term Monitoring 050761***	***$136,100***	***$106,600***	***$120,800***	***ADFG***
30	***Logerwell-FY05-Productivity of capelin and Pollock 050755***	***$32,700***	***$112,800***	***$66,900***	***NOAA***

	Author-FY-Short Title & Project number	FY05	FY06	FY 07	Agency
31	Mann-FY04-Reconstructing Sockeye Populations 040723	$90,400	$0		ADFG
32	***Matkin-FY05-Monitoring Killer Whales 2005-2007 050742***	***$20,500***	***$22,300***	***$23,800***	***NOAA***
33	***McNutt-FY05-Infrastructure for GEM 050766***	***$92,700***	***$95,300***	***$99,000***	***ADFG***
34	***Moffitt-FY05-SEA Pink Salmon Survival Model 050758***	***$18,900***	***$0***	***$0***	***ADFG***
35	Nelson-FY04-Hydrocarbon Database 040290	$22,200	$22,200		NOAA
36	Okkonen-FY04-Monitoring Program in the NE Pacific Ocean 040614	$30,366	$31,455		ADFG
37	Rice-FY04-Contaminant Inputs and CYPIA Induction 040740	$130,100	$0		NOAA
38	Rice-FY04-Lingering Population Status 040620-1	$61,000	$29,100		NOAA
39	***Rosenberg-FY05-Harlequin Duck Populations Dynamics 050759***	***$39,900***	***$0***	***$0***	***ADFG***
40	***Saupe-FY05-ShoreZone Mapping – Kodiak 050764***	***$201,300***	***$201,900***	***$0***	***NOAA***
41	Schneider-FY04-Kodiak Archipelago 040610	$63,000	$63,000		ADFG
42	***Schoch-FY05-ShoreZone Mapping for PWS 050768***	***$312,300***	***$291,400***	***$0***	***NOAA***
43	***Schumacher-FY05-Infrastructure for GEM 050745***	***$22,600***	***$24,700***	***$22,600***	***NOAA***
44	***Short-FY05-Monitoring of Anthropogenic Hydrocarbons 050763***	***$58,900***	***$58,900***	***$58,900***	***NOAA***
45	***Szarzi-FY05-Salmon Smolt Abundance 050747***	***$62,800***	***$59,200***	***$59,200***	***ADFG***
46	Thorne-FY04-Seafood Waste Discharge 040725	$111,692	$108,943		NOAA
47	Walker-FY04-Marine Derived Nutrients 040726	$153,400	$149,700		ADFG
48	Weingartner-FY04-Alaska Coastal Current 040340	$75,482	$75,482		ADFG
49	***Weingartner-FY04-Alaska Coastal Current* 050770***	***$6,200***	***-$10,500***		***ADFG***
52	***Weingartner-FY05-EVOS Synthesis Offshore 050762***	***$95,300***	***$99,700***	***$98,900***	***ADFG***
51	***Weingartner-FY05-GEM Synthesis: ACC Habitat 050770***	***$105,900***	***$111,700***	***$105,000***	***ADFG***
52	Willette-FY04-Monitoring ACC Dynamics 040670	$68,000	$27,900		ADFG
53	***Willette-FY05-Salmon Smolt Monitoring 050765***	***$68,800***	***$65,900***	***$67,000***	***ADFG***
54	Woody-FY04-Nutrient-Based Resource Management 040712 (Knudsen)	$177,002	$152,632		DOI
	Grand Total	***$6,154,226***	***$4,947,619****	***$3,000,600****	

Notes:

- ***Includes $1.8M internal projects authorized by the Trustee Council on an annual basis**
- **Weingartner-FY 04 – Alaska Coastal Current is a project change**
- **Irvine project has been delayed to FY 2005 and 2006; no cost extension**
- **DOI and NOAA share the Irvine project $60.6:$11.1 respectively**
- **ADF&G and NOAA share the Cokelet project $15.3:$156.2 respectively**

- **ADF&G and DOI share the EVOSTC 040100 project $682.5:$160.8 respectively**
- **ADF&G, NOAA, DNR, and DOI share the EVOSTC 040250 project $57.2:$49.8:$9.9:$27.9 respectively**
- **ADF&G, DNR, and DOI share the EVOSTC 040630 project $274.1:$103.6:$13.9 respectively**

Executive Summary Table 6. Executive Director's priorities for recommended projects with cumulative funding levels in order of decreasing priority. Overall, the priorities for the program areas represented by the proposals under consideration for funding by the Trustee Council are: **Priority 1 -** Modeling and Synthesis; **Priority 2 -** Nearshore and Lingering Oil, **Priority 3 -** Management Applications; **Priority 4 -** Watersheds; and **Priority 5 -** Community Involvement.

Executive Summary Table 6.		FY 2005		FY 2006		FY 2007	
Priorities	Title	Project	Cumulative	Project	Cumulative	Project	Cumulative
1 - Modeling	Adams-FY05-Pink Salmon Survival Models	$93,700	$93,700	$0	$0	$0	$0
1 - Modeling	McNutt-FY05-Infrastructure for GEM	$92,700	$186,400	$95,300	$95,300	$99,000	$99,000
1 - Modeling	Moffitt-FY05-SEA Pink Salmon Survival Model	$18,900	$205,300	$0	$95,300	$0	$99,000
1 - Modeling	Schumacher-FY05-Infrastructure for GEM	$22,600	$227,900	$24,700	$120,000	$22,600	$121,600
1 - Synthesis	Edmundson-FY05-Synthesis of Watershed Linkages	$84,000	$311,900	$85,800	$205,800	$67,200	$188,800
1 - Synthesis	Weingartner-FY05-EVOS Synthesis Offshore	$95,300	$407,200	$99,700	$305,500	$98,900	$287,700
1 - Synthesis	Weingartner-FY05-GEM Synthesis: ACC Habitat	$105,900	$513,100	$111,700	$417,200	$105,000	$392,700
1 Nearshore	Bodkin-FY05-GEM Nearshore Monitoring Plan	$227,300	$740,400	$104,400	$521,600	$0	$392,700
1 Lingering Oil	Rosenberg-FY05-Harlequin Duck Populations Dynamics	$39,900	$780,300	$0	$521,600	$0	$392,700
1 Lingering Oil	Short-FY05-Monitoring of Anthropogenic Hydrocarbons	$58,900	$839,200	$58,900	$580,500	$58,900	$451,600
1 Management	Willette-FY05-Salmon Smolt Monitoring	$68,800	$908,000	$65,900	$646,400	$67,000	$518,600
1 Watershed	Cooper-FY05-Community-based Sampling	$102,500	$1,010,500	$86,000	$732,400	$96,900	$615,500
1 Community Involvement	Baird-FY05-Connecting with Coastwalk	$28,900	$1,039,400	$20,300	$752,700	$11,900	$627,400
2 - Lingering Oil	Irons-FY05-Marine Bird Abundance	$163,600	$1,203,000	$32,700	$785,400	$0	$627,400
2 - Management	Szarzi-FY05-Salmon Smolt Abundance	$62,800	$1,265,800	$59,200	$844,600	$59,200	$686,600
2 - Nearshore	Saupe-FY05-ShoreZone Mapping - Kodiak	$201,300	$1,467,100	$201,900	$1,046,500	$0	$686,600
3 - Management	Logerwell-FY05-Productivity of Capelin and Pollock	$32,700	$1,499,800	$112,800	$1,159,300	$66,900	$753,500
3 -Nearshore	Hoover-Miller-FY05-Harbor Seal Monitoring	$92,700	$1,592,500	$130,300	$1,289,600	$82,300	$835,800

Executive Summary Table 6.		FY 2005		FY 2006		FY 2007	
Priorities	Title	Project	Cumulative	Project	Cumulative	Project	Cumulative
4 -Nearshore	Konar-FY05-SOP for Long-term Monitoring	$136,100	$1,728,600	$106,600	$1,396,200	$120,800	$956,600
6 - ACC	Matkin-FY05-Monitoring Killer Whales 2005-2007	$20,500	$1,749,100	$22,300	$1,418,500	$23,800	$980,400
6 Nearshore	Schoch-FY05-ShoreZone Mapping for PWS	$312,300	$2,061,400	$291,400	$1,709,900	$0	$980,400
	Fiscal Year Totals	$2,061,400		$1,709,900		$980,400	
Not prioritized	Weingartner-FY04-Alaska Coastal Current*	$6,200	$2,067,600	-$10,500	$1,699,400	$0	$980,400
	Fiscal Year Grand Totals	$2,067,600		$1,699,400		$980,400	
Notes * Weingartner-FY04-Alaska Coastal Current has requested an increment of $6.2 K for 2005 and a decrement of $10.5 K for 2006.							

Executive Summary Table 7. STAC priorities for individual projects, as median scores, for recommended proposals with project costs by fiscal year and cumulative costs. Minimum, maximum and the difference between them (range). Three members declined the invitation to participate in project prioritization, and the remaining four provided these scores (N = 4). Note that the STAC did not assign a priority to the Matkin project, since the STAC did not recommend funding it (see Master Table in Appendix A).

Median			FY 2005		FY 2006		FY 2007		Statistics		
									Range limits		Range in scores
Priority	Program Area	Title	Project	Cumulative	Project	Cumulative	Project	Cumulative	Min	Max	
1	Modeling	McNutt	$92,700	$92,700	$95,300	$95,300	$99,000	$99,000	1	1	0
1.5	Modeling	Schumacher	$22,600	$115,300	$24,700	$120,000	$22,600	$121,600	1	2	1
3	Modeling	Adams	$93,700	$209,000	$0	$120,000	$0	$121,600	2	10	8
3	Nearshore	Bodkin-Planning	$227,300	$436,300	$104,400	$224,400	$0	$121,600	1	8	7
5	Modeling	Moffitt	$18,900	$455,200	$0	$224,400	$0	$121,600	4	10	6
5.5	Synthesis	Weingartner-ACC	$105,900	$561,100	$111,700	$336,100	$105,000	$226,600	4	7	3
6.5	Synthesis	Weingartner-Offshore	$95,300	$656,400	$99,700	$435,800	$98,900	$325,500	4	7	3
6.5	Lingering Oil	Short-LTEMP	$58,900	$715,300	$58,900	$494,700	$58,900	$384,400	3	9	6
6.5	Nearshore	Saupe	$201,300	$916,600	$201,900	$696,600	$0	$384,400	3	12	9

Median			FY 2005		FY 2006		FY 2007		Statistics: Range limits		Statistics: Range in scores
Priority	Program Area	Title	Project	Cumulative	Project	Cumulative	Project	Cumulative	Min	Max	
7	Lingering Oil	Rosenberg	$39,900	$956,500	$0	$696,600	$0	$384,400	3	10	7
8	Synthesis	Edmundson	$84,000	$1,040,500	$85,800	$782,400	$67,200	$451,600	6	13	7
11	Nearshore	Hoover-Miller	$92,700	$1,133,200	$130,300	$912,700	$82,300	$533,900	10	16	6
12	Management	Willette	$68,800	$1,202,000	$65,900	$978,600	$67,000	$600,900	8	13	5
12.5	Community Inv.	Baird	$28,900	$1,230,900	$20,300	$998,900	$11,900	$612,800	6	20	14
13	Watershed	Cooper	$102,500	$1,333,400	$86,000	$1,084,900	$96,900	$709,700	6	18	12
13.5	Lingering Oil	Irons	$163,600	$1,497,000	$32,700	$1,117,600	$0	$709,700	9	16	7
14.5	Nearshore	Konar	$136,100	$1,633,100	$106,600	$1,224,200	$120,800	$830,500	12	18	6
16	Nearshore	Schoch	$312,300	$1,945,400	$291,400	$1,515,600	$0	$830,500	13	19	6
16.5	Management	Szarzi	$62,800	$2,008,200	$59,200	$1,574,800	$59,200	$889,700	10	19	9
19.5	Management	Logerwell	$32,700	$2,040,900	$112,800	$1,687,600	$66,900	$956,600	12	20	8

Introduction

The Draft Work Plan consists of projects already approved by the Trustee Council and proposals recommended for funding by the Executive Director. The function of the Draft Work Plan is to present the recommended proposals and the already funded projects together so that the Council may see its Restoration Program in its entirety, as it would be should the Council adopt all of the Executive Director's recommendations.

The next two federal fiscal years, FY 2005 and FY 2006, are critically important pivot points in the transition from the conclusion of the court settlement process started in 1991 toward the long-term monitoring phase of the Restoration Program. The actions proposed in the Draft FY 2005 Work Plan now before the Council are intended to do two tasks to enable this transition; 1) Inform the Council and the public on the status of injured resources and oil in the environment, and 2) complete laying the foundation on which a long-term monitoring program, Gulf of Alaska Ecosystem Monitoring and Research, GEM, may be built starting in FY 2007. The FY 2005 Draft Work Plan envisions bringing closure to the injured species list, developing recommendations on oil impacts studies for summer 2005, and developing measures of fate and effects of oil on the injured intertidal communities and other nearshore resources. As a consequence of adoption of the Draft Work Plan, funding for new GEM projects in FY 2006 would not be necessary, as the implementation phase would be fully funded as of FY 2005, completing the foundation for transition to long-term monitoring. Details of the two transition tasks follow.

The Conclusion of the Court Settlement Process

Adoption of the Draft Work Plan takes an essential step toward bringing the court settlement phase of the Restoration process to a successful conclusion. A successful conclusion allows the Council to assure the governments and the public that 1) impacts on injured species and resources are known and are being addressed to the extent possible, 2) that the long-term direct impacts of oiling are being measured, and 3) that the information collected is being used, or will be used by government resource managers. As explained in detail in the body of the Draft Work Plan, the proposed work would extend knowledge of injured birds, fish, mammals, intertidal resources, and other injured resources. In addition, identifying and understanding long-term direct impacts of oiling and measuring the fate of oil in the environment would be furthered by the proposed work. Finally, implementation of the recommendations would accelerate development of management applications, and start the long-term process of institutionalizing the utility and access of all Council data to managers through implementing a modeling program.

The out-year funding proposed would limit the FY 2006 Invitation to small modifications to existing projects (perhaps no more than ca. $20 – 40K maximum). The limited activity on the FY 2006 is planned to give the Council staff time to focus on the Injured Species List, revising the Science Plan, as well as finishing the automation of our grant and contract process that is needed in FY 2007. The FY 2007 Invitation needs to be

designed with care, as this is the launch point for long-term monitoring (GEM). The results from long-term planning and research in the Watersheds and Nearshore will be available to guide development of the FY 2007 Invitation to be issued in February 2006. A good deal of consultation from the STAC, Habitat Subcommittee, Lingering Oil subcommittee, the Trustee Council agencies and other parts of the scientific community will be needed.

The Injured Species List contains eight individual species still listed as injured, and eight more resources encompassing many species listed as recovering, and five more resources listed as recovery unknown. The Council staff will serve as the focal point for bringing together the legal, policy, and biology interests of the Trustee Council to chart a path to bringing closure to the issue of injured resources. As an initial goal, it is suggested that the Injured Species List be resolved into "recovered" and "recovery unknown." The species and resources listed as "recovery unknown" would be referred to the GEM program for long term study. The scientific criteria will be developed through workshops during FY 2005 and 2006. The relation of the status of injured species and resources to the needs for "lingering oil" work is taken into account, as this area will require increasing staff attention, as contractors start producing results from projects initiated in this fiscal year (FY 2004).

The Science Plan is the point of origin for the Invitation for Proposals and ultimately the Work Plan, so it is a critically important document. Due to staffing vacancy (Science Coordinator) and the lack of availability of synthesis proposals in response to past Invitations, the Science Plan is past due for an update. The goal is to work with Trustee Council agency scientists, the STAC and Subcommittees, our contractors, and other interested parties to revise the Science Plan to the point where it can be released as a "color glossy" booklet. The booklet would allow a wide audience to become familiar with what the Council plans to do and why, and the process of producing the booklet would provide the Trustees a chance to participate.

The Long-term Monitoring Phase of the Restoration Program (GEM)

Adoption of the Draft Work Plan would complete the funding for the transition phase of GEM. The work proposed in the Draft Work Plan would **1)** complete the implementation for the GEM program areas of Modeling, Synthesis, Nearshore and Lingering Oil, as described in the Council's Science Plan, **2)** accelerate development of Management Applications, as requested by the Council during last year's funding cycle, **3)** complete the package of Watershed proposals funded by the Council last year by addition of its community-based water quality component, and **4)** provide for activities to complement the Council's existing Community Involvement projects. Information from projects completed during FY 2003 – FY 2005, and from ongoing projects in FY 2006, would be used to design an FY 2007 Invitation for Proposals that would start the long-term monitoring phase of the Restoration Program.

The bulk of the FY 2005 – FY 2007 Work Plan represents the completion of the implementation phase of the Gulf of Alaska Ecosystem Monitoring and Research Program, GEM (Figure A). In establishing GEM the Trustee Council recognized that understanding the impact of oiling on injured natural resources requires a baseline of environmental information that was largely lacking at the time of the spill. GEM is a truly unique opportunity to build the environmental baseline data necessary to interpret

measures of oil in the environment and its impacts on populations of plants and animals. GEM brings an emphasis on converting monitoring data into information products that serve the needs of government regulators and the public that is new to the Restoration program.

In establishing the GEM Program, the Trustee Council also recognized that complete recovery from the oil spill may not occur for decades and that full restoration of injured resources will most likely be achieved through long-term observation and necessary restoration activities. The Council further recognized that conservation and improved management of injured resources and services will require substantial ongoing investment to improve understanding of the marine and coastal ecosystem that supports the resources, as well as the people, of the spill region. In addition, prudent use of the natural resources of the spill area without compromising their health and recovery requires increased knowledge of critical ecological information about the northern Gulf of Alaska. This knowledge can only be provided through a long-term monitoring and research program that may span decades.

As a brief overview of what GEM is trying to learn, the largest information gaps in the northern Gulf of Alaska relate to how food and energy originating in the offshore marine environments are transported through the Alaska Coastal Current and nearshore areas to the watersheds. Accordingly, detecting changes in the variables that characterize the transfer of food and energy through the northern Gulf of Alaska is a top priority for the GEM Program. The GEM Program calls for building upward from oceanography through food and energy toward the large body of information that has accumulated within the management agencies over the past century on the abundance and biology of single species of large vertebrates such as seabirds, pelagic and anadromous fish, and marine and coastal mammals. In watershed and nearshore habitats where human activities are most prominent, it is important to find measures of how anthropogenic factors combine with human factors to influence these ecosystems. By filling gaps in how physical and human forces alter the transport of food and energy, changes in the large vertebrate species and prominent invertebrates, such as birds, shellfish, fish and mammals, can be understood in relation to a broad array of biological and physical observations throughout the region. In the long run, this comprehensive understanding of the ecosystems of the Gulf of Alaska is intended to lead to predictions useful to resource managers. In terms of types of long time series in these habitat types, observations on smaller to microscopic species of marine plants and animals, and physical and chemical observations from below the sea surface are widely lacking (GEM Program Document, Appendix D).

Efforts in FY 05 continue to focus on development of long-term moorings, stations, transects, and surveys in the nearshore and Alaska Coastal Current habitats, recognizing that the most expensive sampling zones to reach on a frequently recurring basis are the ACC and, at some point in the future, the offshore Gulf of Alaska. The limits on GEM fiscal resources likely will require maximum use of volunteer observing ships (VOS), which are commercial vessels that carry various monitoring instruments. Preparing for instrumentation of VOS and establishing the necessary relationships with ship operators and crews should be a priority in FY 2004 - 2006.

In addition, the GEM Science Plan calls for developing a whole ecosystem (natural resource) model, as recommended by the National Research Council (NRC

2002) that links biological and physical observations across the habitat types, as well as the North Pacific, in order to understand changes in single species of interest to managers and concerned others. The GEM ecosystem model must be developed with a global perspective given the large spatial scales over which biological and physical phenomena operate. Identification and prioritization of the variables for the GEM program depend in large part on what is needed to operate the GEM ecosystem model. High priority variables needed in the GEM program are a composite of the variables essential to the workings of the GEM ecosystem model and its components: the ocean current model, the nutrient-phytoplankton-zooplankton (NPZ) models, and the Sound Ecosystem Assessment (SEA) pink salmon model (Willette et al. 2001, Patrick et al. 2003) (see Appendix F of the GEM Program Document). In assembling the GEM ecosystem model, emphasis will be placed on detecting changes in the variables that characterize the currents and the transfer of food and energy throughout the north Gulf of Alaska. In this way, changes in the large vertebrate species that are routinely monitored by state and federal government agencies can be better understood in relation to a broad array of biological and physical observations throughout the region.

Overview of the FY 2005 – 2007 Work Plan

The Work Plan covers 48 external projects in the amount of $3.9 million for FY 2005, $3.2 million for FY 2006, and $1.0 million for FY 2007, for a total of $8.1 million in external projects for FY 2005 – 2007 (Table 1). Projected costs for internal projects in FY 06 and FY 07 could raise the annual totals to five million and three million respectively, however the Trustee Council is not being asked to obligate these amounts, as internal projects are approved on an annual basis. The total amount obligated and proposed for FY 2005 is $6.2 million which consists of the 48 external projects, a project amendment, and $1.8M million in five internal projects. The total funds obligated and proposed for all projects in this Draft Work Plan is $14.1 million.

The distribution of funding across program areas shows that Nearshore, including lingering oil effects ($2.1M) is the leading area of emphasis in FY 2005. After Nearshore and lingering oil the largest dollar value of projects is internal projects ($1.8M), followed by Watersheds ($638K), Alaska Coastal Current ($578K), Synthesis ($393K), Modeling ($228K), Community Involvement ($218K), and Management Strategy ($164K) (Table 2).

Modeling and Synthesis

Modeling is the highest priority for the EVOSTC because it is the process of turning basic data into useful information for managers, policy makers and other consumers. Modeling assembles the building blocks provided by data-generating projects in the NRDA, Restoration and GEM activities into an understandable explanation of the causes of changes in injured resources and related bird, fish and mammal species. Synthesis goes hand-in-glove with modeling, because it combines the best available information from NRDA, Restoration and GEM with current information from the scientific literature into a useful report format to guide the Council, modelers, and other users in the decision-making process. Modeling and Synthesis will focus the existing works of the last fifteen years to produce

information relevant to the 1991 court settlement agreement, as well as to guide the current development of long-term monitoring of resources that continue to be injured by the 1989 oil spill.

The top priority proposals for Modeling (McNutt and Schumacher) will provide models and teams of experts necessary to organize available information into coherent explanations of how birds, fish and mammals are produced in the northern Gulf of Alaska. McNutt and Schumacher are to provide a model of how to combine conventional modeling with input from potential users to insure the relevance of modeling efforts to management of natural resources, including oil-injured species. As identified by an EVOSTC funded project over the last two years (Adams and Mullins), the pink salmon modeling proposals (Adams and Moffitt) are top priorities for economic development in the commercial fishing industry of Prince William Sound. Models of pink salmon production were promised, but not delivered, by the SEA project under the Restoration Program (Project 320), and there is still strong community-based support for seeing this work completed.

The top priority proposals for Synthesis (Edmundson and Weingartner) would provide the required synopses of existing EVOSTC data and literature records that are essential to planning for future monitoring of oil-injured resources and allied species in the Watershed (Edmundson), Alaska Coastal Current and Offshore (Weingartner) habitat types. Combined with the existing synthesis of the Nearshore (Eckert-FY04), all required synthesis efforts for the four habitat types would be in place.

Nearshore and Lingering Oil

After modeling and synthesis, activities in the Nearshore habitat type (Bodkin, Saupe, Hoover-Miller, Konar, Schoch) and the closely allied Lingering Oil investigations (Short, Rosenberg and Irons) are the second level of priorities for FY 2005 – FY 2007 funding. Completion of the three-year process of planning for the implementation of the Council's Nearshore monitoring program (Bodkin) is the top priority, followed closely in priority by completion of the mapping of the intertidal and adjacent areas using the ShoreZone methodology in areas outside of Prince William Sound (Saupe), which was called for by the Bodkin proposal. The third priority within this program area (Hoover-Miller) offers an extension of the Nearshore work to an oil-injured species, harbor seals, in a part of the oil spill affected area not now covered by other surveys using an innovative cost-reducing technology (still videography).

The top priorities in Lingering Oil are to integrate monitoring for hydrocarbons into the Nearshore sampling program (Short) and to examine the status of an injured species that is known to be exposed to Exxon Valdez oil (Rosenberg). A close second in Lingering Oil priority is the marine bird survey (Irons) that provides an estimate of population trends in the majority of species still considered to be injured by the 1989 oil spill. All three Lingering Oil recommendations are expected to contribute critical information for determining the status of restoration of injured species in the short-term (Rosenberg and Irons) and in the long-term (Short).

The fourth ranked Nearshore proposal (Konar) is intended to provide the proposed Bodkin project with the benefit of the last two years' experience in sampling, site selection and community involvement from the Konar (&Iken) FY 03 and FY 04 projects.

Management Applications

Management Applications is an implementation strategy that is woven throughout all the Council's funded projects to the extent feasible and appropriate. All monitoring data collected at Council expense are ultimately expected to be applied to management through their use in detecting, understanding and predicting changes in populations of birds, fish and mammals (GEM Program Document). The Council requested in FY 2004 that Management Applications be emphasized as its own program area in the FY 2005 Invitation to accelerate the pace of development of applications.

The top priorities for Management Applications (Szarzi and Willette) are expected to supplement and complement an existing Watershed project (Walker FY04) and to meet a gap in Watershed information identified in the Science Plan in the Kenai River. In addition the Willette project would also test sampling methods for juvenile salmon through a combination of independent methods, providing a benefit to management programs in salmon on a coast-wide basis. The benefits to management of Szarzi and Willette would be immediate as a forecasting tool and as a guide to sustainable harvest levels for salmon in the localities sampled. The next priority proposal (Logerwell) would continue an important time series of fish species (capelin, pollock) and physical factors (fronts, currents) that are expected to contribute to management decisions in the long-term. Both target species are important parts of the food web, and thus are expected to factor into the management of other species in ecosystem-based management.

Watersheds

Watershed proposals were not invited for FY 2005, however proposals that were recommended for funding, but not funded in FY 2004, were eligible to re-submit under this Invitation. A proposal last year that offered to provide community-based sampling in support of the Walker FY 04 project (Cooper) was ranked highly by peer reviewers and the STAC for the second year in a row. The proposal scored high for both technical merit and consistency with the Science Plan. It is recommended as a priority for funding in FY 2005 because it was meant to be the community-based sampling part of the Watershed funding package passed by the Council last year. Community-based sampling is a basic strategy adopted by the Trustee Council to reduce the costs of long-term monitoring projects.

Community Involvement

Community Involvement proposals were not invited for FY 2005, however proposals that were recommended for funding, but not funded in FY 2004, were eligible to re-submit proposals under this Invitation. A proposal from last year that offered to make available a long standing community-based time series of Nearshore observations to other projects of the Council's Nearshore program for a modest amount of funding (Baird) was also favorably received by peer reviewers this year. It is recommended for funding as a community-based supplement to Nearshore sampling efforts.

Alaska Coastal Current

Alaska Coastal Current proposals were not invited for FY 2005, however proposals that were funded in FY 2004 were eligible to re-submit proposals under this Invitation. A

proposal was received to continue the long-term monitoring of the AB pod and other killer whales in the oil spill affected areas of southcentral Alaska (Matkin) that was funded in FY 2004. The proposal is highly leveraged by other funding sources, and it addresses a recovering oil-injured species that is of wide public interest. Given its small cost and the foregoing considerations, it is prudent to be a partner in this survey until the full cost of the survey is assumed by other responsible parties (i.e. National Marine Fisheries Service), or the resource is designated as a recovered species under the Restoration Program.

Table 1. Projects approved for funding by the Trustee Council in FY 2004 – 2006 and proposals recommended by the Executive Director for funding in FY 2005 – 2007. Projects are listed in alphabetical order by first author. , the funding levels by fiscal year, FY 05 – FY 07, and the government agency administering the funding. Internal projects have first author EVOS TC and are conducted by of the Trustee Council.

	Author-FY-Short Title & Project number	FY05	FY06	FY 07	Agency
1	***Adams-FY05-Pink Salmon Survival Models 050757***	***$93,700***	***$0***	***$0***	***NOAA***
2	***Baird-FY05-Connecting with Coastwalk 050743***	***$28,900***	***$20,300***	***$11,900***	***ADFG***
3	Ballachey-FY04-Oil Exposure in Nearshore Vertebrate Predators 040774	$150,500	$0		DOI
4	Ballachey-FY04-Oil Exposure in Sea Otters 040775	$126,900	$0		DOI
5	Batten-FY04-CPR data 040624	$135,200	$135,200		NOAA
6	Bechtol-FY04-Parameters in the N. Gulf of AK 040693	$56,100	$56,000		ADFG
7	Bishop-FY04-Top-down and Bottom-up Processes 040635	$164,030	$151,390		NOAA
8	Bodkin-FY04-Lingering Oil and Sea Otters 040620-2	$26,200	$6,500		DOI
9	***Bodkin-FY05-GEM Nearshore Monitoring Plan 050750***	***$227,300***	***$104,400***	***$0***	***DOI***
10	Cokelet-FY04-AK Marine Highway System Ferries 040699	$185,900	$145,900		Multiple*
11	***Cooper-FY05-Community-based Sampling 050746***	***$102,500***	***$86,000***	***$96,900***	***NOAA***
12	Day-FY04-Sediment Quality Survey 040772	$57,200	$0		DOL
13	DeLorenzo-FY04-Youth Area Watch 040210	$126,400	$133,200		ADFG
14	Eckert-FY04-Natural Variability in the Nearshore 040702	$17,500	$0		ADFG
15	***Edmundson-FY05-Synthesis of Watershed Linkages 050748***	***$84,000***	***$85,800***	***$67,200***	***ADFG***
16	***EVOS TC-FY05-ARLIS 050550***	***$130,800***	***$98,100***	***$98,100***	***ADFG***
17	***EVOS TC-FY05-Data System (INTERNAL) 050455***	***$154,600***	***$154,600***	***$154,600***	***ADFG***
18	***EVOS TC-FY05-Project Management (INTERNAL) 050250***	***$255,500***	***$255,500***	***$255,500***	***Multiple****
19	***EVOS TC-FY5-Public Information and Administration (INTERNAL) 050100***	***$853,700***	***$853,700***	***$853,700***	***Multiple****
20	***EVOS TC-FY5-Scientific Management (INTERNAL) 050630***	***$415,800***	***$415,800***	***$664,200***	***Multiple****
21	Fall-FY04-Status of Subsistence Uses 040471	$25,600	$0		ADFG
22	Finney-FY04-Marine-terrestrial Linkages 040703	$80,154	$81,117		ADFG
23	Heintz-FY04-Energy Allocation 040706	$42,300	$14,000		NOAA
24	Honnold-FY04-Marine-derived Nutrients on Sockeye Salmon 040703-A	$82,400	$86,800		ADFG

	Author-FY-Short Title & Project number	FY05	FY06	FY 07	Agency
25	***Hoover-Miller-FY05-Harbor Seal Monitoring 050749***	***$92,700***	***$130,300***	***$82,300***	***ADFG***
26	***Irons-FY05-Marine Bird Abundance 050751***	***$163,600***	***$32,700***	***$0***	***DOI***
27	Irvine-FY04-Lingering Oil on Boulder-Armored Beaches 040708	$17,200	0*		Multiple*
28	Jacobs-FY04-Synthesis on injured resources 040776	$0	$0		DOL
29	***Konar-FY05-SOP for Long-term Monitoring 050761***	***$136,100***	***$106,600***	***$120,800***	***ADFG***
30	***Logerwell-FY05-Productivity of capelin and Pollock 050755***	***$32,700***	***$112,800***	***$66,900***	***NOAA***
31	Mann-FY04-Reconstructing Sockeye Populations 040723	$90,400	$0		ADFG
32	***Matkin-FY05-Monitoring Killer Whales 2005-2007 050742***	***$20,500***	***$22,300***	***$23,800***	***NOAA***
33	***McNutt-FY05-Infrastructure for GEM 050766***	***$92,700***	***$95,300***	***$99,000***	***ADFG***
34	***Moffitt-FY05-SEA Pink Salmon Survival Model 050758***	***$18,900***	***$0***	***$0***	***ADFG***
35	Nelson-FY04-Hydrocarbon Database 040290	$22,200	$22,200		NOAA
36	Okkonen-FY04-Monitoring Program in the NE Pacific Ocean 040614	$30,366	$31,455		ADFG
37	Rice-FY04-Contaminant Inputs and CYPIA Induction 040740	$130,100	$0		NOAA
38	Rice-FY04-Lingering Population Status 040620-1	$61,000	$29,100		NOAA
39	***Rosenberg-FY05-Harlequin Duck Populations Dynamics 050759***	***$39,900***	***$0***	***$0***	***ADFG***
40	***Saupe-FY05-ShoreZone Mapping – Kodiak 050764***	***$201,300***	***$201,900***	***$0***	***NOAA***
41	Schneider-FY04-Kodiak Archipelago 040610	$63,000	$63,000		ADFG
42	***Schoch-FY05-ShoreZone Mapping for PWS 050768***	***$312,300***	***$291,400***	***$0***	***NOAA***
43	***Schumacher-FY05-Infrastructure for GEM 050745***	***$22,600***	***$24,700***	***$22,600***	***NOAA***
44	***Short-FY05-Monitoring of Anthropogenic Hydrocarbons 050763***	***$58,900***	***$58,900***	***$58,900***	***NOAA***
45	***Szarzi-FY05-Salmon Smolt Abundance 050747***	***$62,800***	***$59,200***	***$59,200***	***ADFG***
46	Thorne-FY04-Seafood Waste Discharge 040725	$111,692	$108,943		NOAA
47	Walker-FY04-Marine Derived Nutrients 040726	$153,400	$149,700		ADFG
48	Weingartner-FY04-Alaska Coastal Current 040340	$75,482	$75,482		ADFG
49	***Weingartner-FY04-Alaska Coastal Current* 050770***	***$6,200***	***-$10,500***		***ADFG***
52	***Weingartner-FY05-EVOS Synthesis Offshore 050762***	***$95,300***	***$99,700***	***$98,900***	***ADFG***
51	***Weingartner-FY05-GEM Synthesis: ACC Habitat 050770***	***$105,900***	***$111,700***	***$105,000***	***ADFG***
52	Willette-FY04-Monitoring ACC Dynamics 040670	$68,000	$27,900		ADFG
53	***Willette-FY05-Salmon Smolt Monitoring 050765***	***$68,800***	***$65,900***	***$67,000***	***ADFG***

	Author-FY-Short Title & Project number	FY05	FY06	FY 07	Agency
54	Woody-FY04-Nutrient-Based Resource Management 040712 (Knudsen)	$177,002	$152,632		DOI
	Grand Total	*$6,154,226*	*$4,947,619**	*$3,000,600**	

Notes:

- ***Includes $1.8M internal projects authorized by the Trustee Council on an annual basis**
- **Weingartner-FY 04 – Alaska Coastal Current is a project change**
- **Irvine project has been delayed to FY 2005 and 2006; no cost extension**
- **DOI and NOAA share the Irvine project $60.6:$11.1 respectively**
- **ADF&G and NOAA share the Cokelet project $15.3:$156.2 respectively**
- **ADF&G and DOI share the EVOSTC 040100 project $682.5:$160.8 respectively**
- **ADF&G, NOAA, DNR, and DOI share the EVOSTC 040250 project $57.2:$49.8:$9.9:$27.9 respectively**
- **ADF&G, DNR, and DOI share the EVOSTC 040630 project $274.1:$103.6:$13.9 respectively**

The following figures combine the proposals with the existing projects to provide graphical representation of pertinent statistics concerning various funding, invitation category (Tables 1, 2 and 3), PI professional affiliation (Table 4), and funding agency distributions for projects proposed in FY 2005-2007 (Table 5). Projects which are conducted with EVOSTC personnel (internal projects) are not represented in the figures below; only those projects conducted by outside contractors (external projects) were taken into consideration during the generation of the statistics.

Table 2. Program Area Funding Levels by Fiscal Year

Program Area	FY 2005	FY 2006	FY 2007
ALASKA COASTAL CURRENT	$577,748	$483,737	$23,800
COMMUNITY INVOLVEMENT	$218,300	$216,500	$11,900
LINGERING OIL EFFECTS	$818,300	$120,300	$58,900
MANAGEMENT STRATEGY	$164,300	$237,900	$193,100
MODELING	$227,900	$120,000	$121,600
NEARSHORE	$1,245,422	$1,094,933	$203,100
SYNTHESIS	$393,100	$297,300	$271,100
WATERSHEDS	$637,756	$570,249	$96,900

Figure 2. Figure combines the existing projects for FY 2005 with those recommended for funding by the Executive Director in FY 2005.

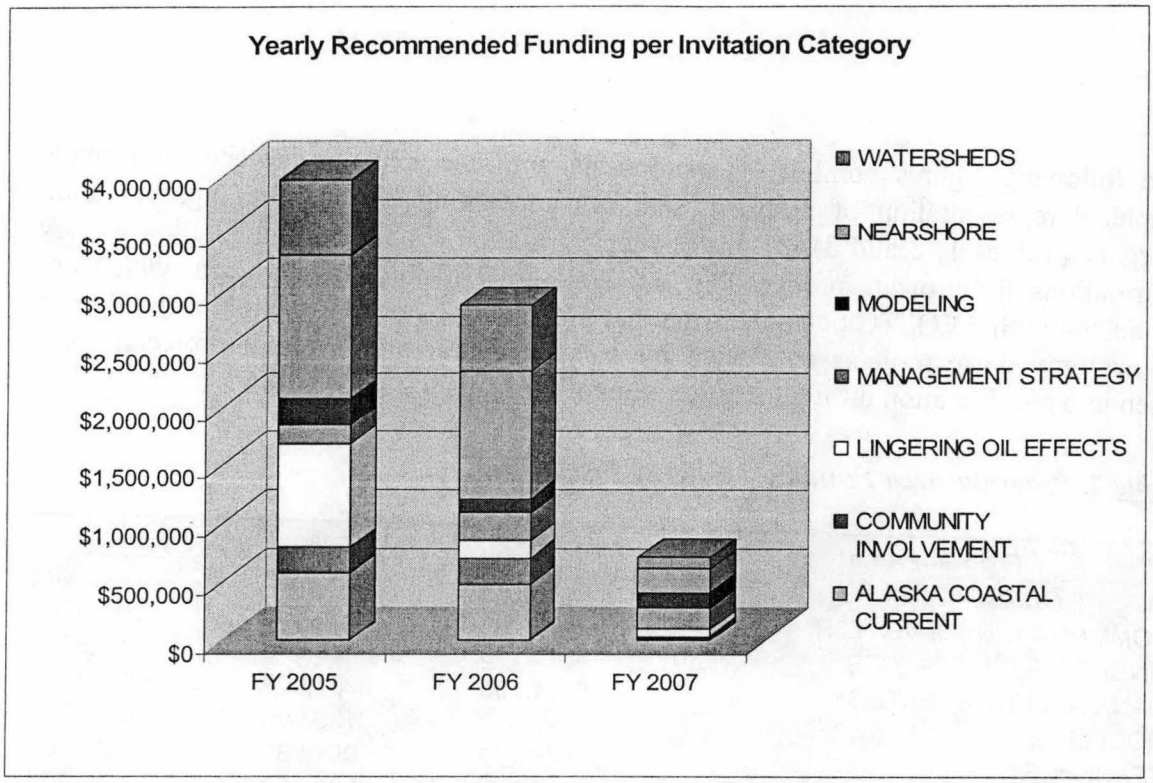

Yearly Recommended Funding per Invitation Category
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
FY 2005
FY 2006
FY 2007
WATERSHEDS
NEARSHORE
MODELING
MANAGEMENT STRATEGY
LINGERING OIL EFFECTS
COMMUNITY INVOLVEMENT
ALASKA COASTAL CURRENT

Figure 4.

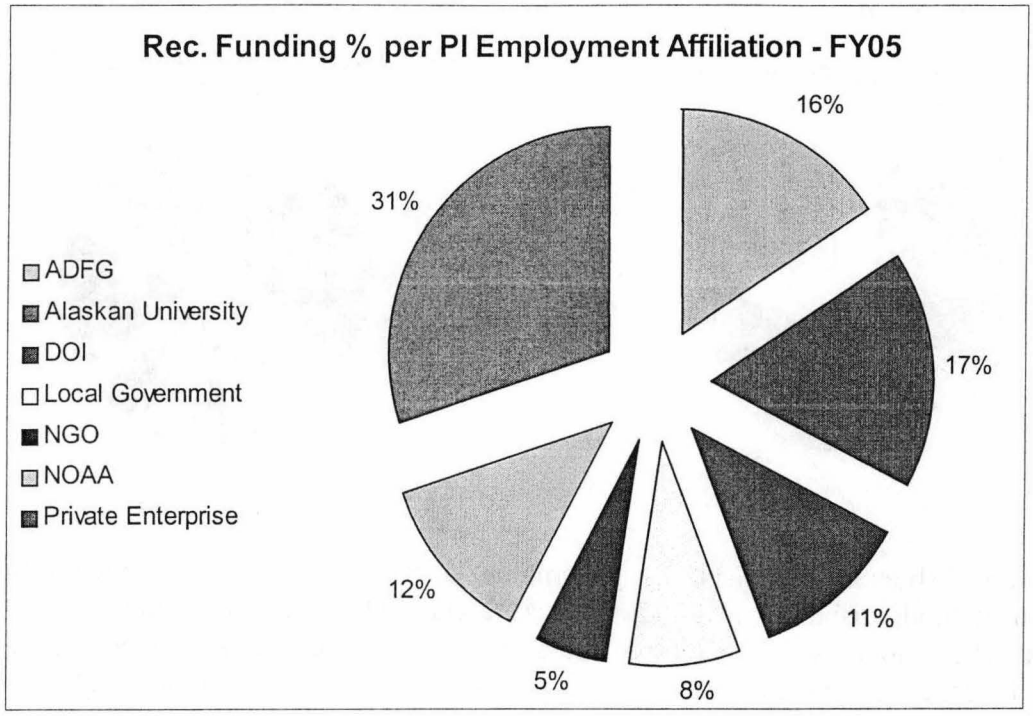
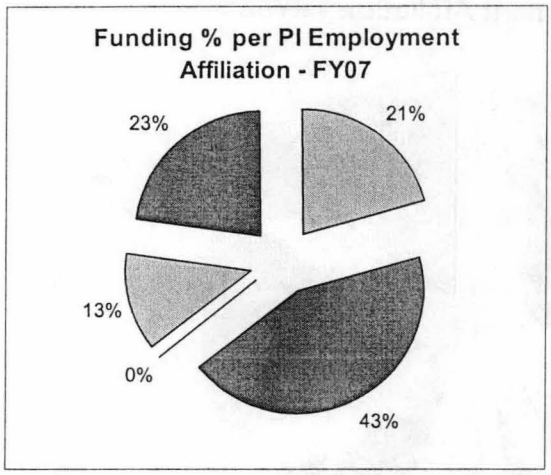
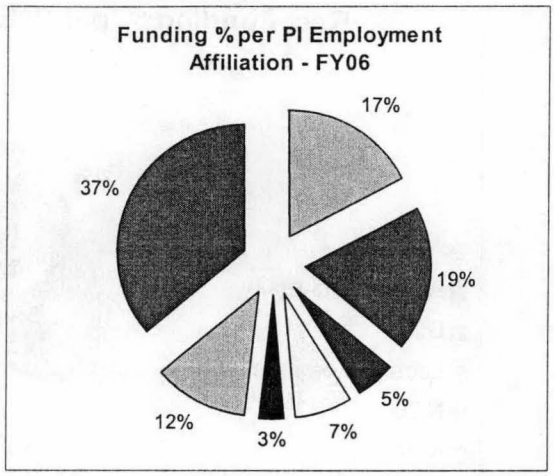

Rec. Funding % per PI Employment Affiliation - FY05
ADFG
Alaskan University
DOI
Local Government
NGO
NOAA
Private Enterprise
16%
17%
11%
8%
5%
12%
31%

Figure 4 continued...

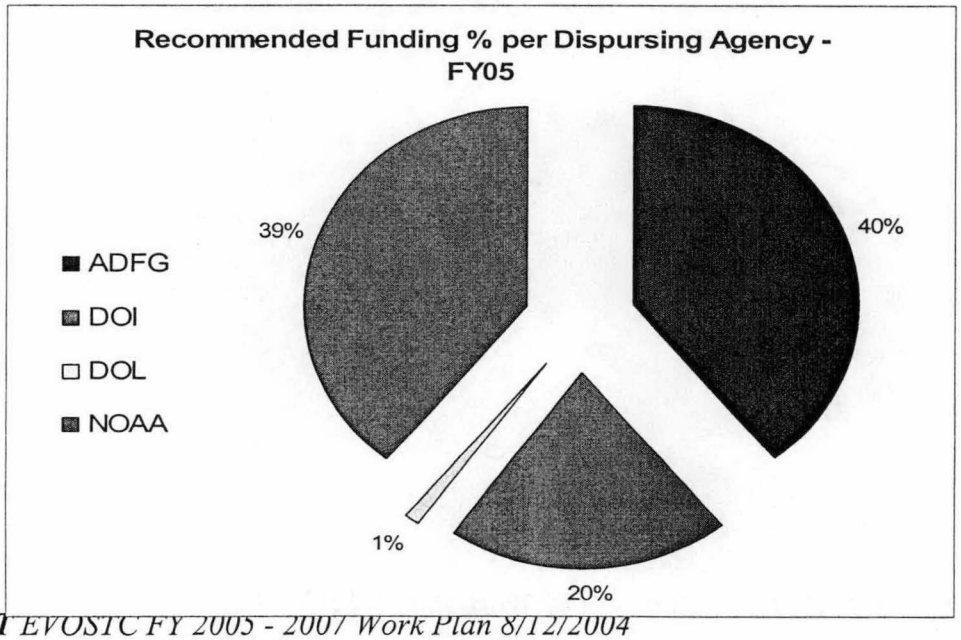




Funds are disbursed to projects by government agencies. The leading agency in the amount of funds disbursed in FY 2005 is ADF&G. ADF&G is scheduled to disburse $1.7M. The amount scheduled for disbursement by the next closest agency, NOAA, which is closely matched at $1.69M. The amounts disbursed by DOL are $889 hundred thousand respectively; however DOI has a relatively small share at $57 thousand.

The Trustee Council has an open, competitive contracting process that is designed to allow proposals from any source to be considered for funding as an external project. The system works well for this purpose as demonstrated by the fairly even distribution of funding across the home institutions of the principal investigators of external projects. Alaska Department of Fish and Game is the top recipient of EVOSTC funding for external projects at 40% percent. The low end is represented by Department of Law at 1% percent.

Figure 5. Disbursement of funds by agency for FY 2005.



Discussion of Projects in Order of Priority by Program Area

Modeling

Introduction

Modeling is the highest priority for the EVOSTC because it is the process of turning basic data into useful information for managers, policy makers and other consumers. Modeling assembles the building blocks provided by data-generating projects in the NRDA, Restoration and GEM activities into an understandable explanation of the causes of changes in injured resources and related bird, fish and mammal species. Synthesis goes hand-in-glove with modeling, because it combines the best available information from NRDA, Restoration and GEM with current information from the scientific literature into a useful report format to guide the Council, modelers, and other users in the decision-making process. Modeling and Synthesis will focus the existing works of the last fifteen years to produce information relevant to the 1991 court settlement agreement, as well as to guide the current development of long-term monitoring of resources that continue to be injured by the 1989 oil spill.

Table of Modeling Projects

Modeling	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Total Obligated for Approved Projects	**$0**	**$0**	**$0**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Adams-FY05-Pink Salmon Survival Models		$93,700	$0	$0
McNutt-FY05-Infrastructure for GEM		$92,700	$95,300	$99,000
Moffitt-FY05-SEA Pink Salmon Survival Model		$18,900	$0	$0
Schumacher-FY05-Infrastructure for GEM		$22,600	$24,700	$22,600

Totals for Projects Under Consideration		**$227,900**	**$120,000**	**$121,600**
Grand Total (Approved and Under Consideration)	**$0**	**$227,900**	**$120,000**	**$121,600**

Synopsis of Modeling Proposals

The top priority proposals for Modeling (McNutt and Schumacher) will provide models and teams of experts necessary to organize available information into coherent explanations of how birds, fish and mammals are produced in the northern Gulf of Alaska. McNutt and Schumacher are to provide a model of how to combine conventional modeling with input from potential users to insure the relevance of modeling efforts to management of natural resources, including oil-injured species. As identified by an EVOSTC funded project over the last two years (Adams and Mullins), the two pink salmon modeling proposals (Adams and Moffitt) are top priorities for economic development in the commercial fishing industry of Prince William Sound as identified by the community. Models of pink salmon production were promised by the SEA project under the Restoration Program (Project 320), and there is still strong community-based support for seeing this modeling work come to fruition.

Abstracts of Modeling Projects

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Adams-FY05-Pink Salmon Survival Models

Project Title: Implementing the Pink Salmon Survival Model: Phase I - Project Development

Location: PWS

Proposer: Ken Adams **Proposer Affiliation:** PWSFRAP

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $93,700 **FY06:** $0 **FY07:** $0

Abstract:

Funds are requested to plan the implementation of a numerical model of pink salmon survival within a framework of long- term monitoring and resource prediction. The plan will be prepared by an interdisciplinary team. PWSFRAP will coordinate workshops, internet assets, conferencing, report and proposal preparation and submission and will facilitate information exchange between the resource dependent community and the planners. The resulting plan will identify a team of implementers, a design and schedule

for field sampling, modeling activities and parameterization, data management and information protocols stipulated by GEM. It is anticipated that this planning effort will be followed by a multi-year implementation phase. When fully implemented, the pink salmon modeling program will become a functional component of the GEM whole-ecosystem model and responsive to questions of pink salmon production, harvest, management and enhancement. This proposal is a companion to the interrelated ADF&G proposal (Moffitt: Management Applications: Implementing the Pink Salmon Survival Model-Tagging technology).

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: McNutt-FY05-Infrastructure for GEM

Project Title: Building the Infrastructure for the Gulf Ecosystem Monitoring (GEM) Program

Location: GEM Monitoring Region

Proposer: Lyn McNutt **Proposer Affiliation:** UAF

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $92,700 **FY06:**$95,300 **FY07:**$99,000

Abstract:

The goal of this project is to identify and define models and observations to describe, manage and predict the status and health of the ecosystem, provide data as information to managers and coastal communities, and communicate publicly the current state of the ecosystem in the northern Gulf of Alaska (GOA). Agreement on this implementation strategy is critical to effective resource management and problem solving in the GOA. The Principal Investigators (PIs) will assemble an interdisciplinary team of scientists, managers and local stakeholders to investigate and report on ways to put in place: a biophysical model; the infrastructure necessary to implement and maintain a monitoring and data dissemination system; agreements and partnerships; software and hardware requirements; identification of existing products; and data management and information transfer requirements. The PIs will report to the EVOS Trustee Council, and will provide recommendations on how to meet the GEM Program objectives within project guidelines.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Moffitt-FY05-SEA Pink Salmon Survival Model

Project Title: Management Applications: Implementing the SEA Pink Salmon Survival Model -
Tagging Technology

Location: PWS

Proposer: Steve Moffitt **Proposer Affiliation:** ADF&G

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $18,900 **FY06:** $0 **FY07:** $0

Abstract:

This project will conduct tagging technology studies needed to develop management applications from the SEA pink salmon model. This project was conceived during a pink salmon predictive workshop recently held in Cordova March 16-18, 2004. Workshop participants recommended that preseason forecasting and numerical model validation

could be approached by a direct census of juveniles as they are leaving Prince William Sound (PWS). Catching juveniles emigrating from PWS would also enable application of a second mark to partition survival between the early marine and oceanic lifestages. At present, all juveniles of hatchery origin in PWS are otolith thermal marked. Combining estimates of stock composition obtained from otolith thermal marks and early marine survival will enable estimation of survivals of each hatchery release group and a very robust evaluation of pink salmon model simulations. The estimates will also be used to evaluate the accuracy of preseason forecasts of salmon run size obtained from a direct census of juveniles emigrating from PWS. This project will test the feasibility of using passive integrated transponder tags to partition early marine and oceanic survival of pink salmon. The project will estimate tag loss and tagging-induced mortality of juvenile pink salmon and tag detection rates at area salmon processors.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Schumacher-FY05-Infrastructure for GEM

Project Title: Building the Infrastructure for the Gulf of Alaska Monitoring (GEM) Program

Location: GEM Monitoring Region

Proposer: James Schumacher **Proposer Affiliation:** Two Crow Environmental,

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $22,600 **FY06:** $24,700 **FY07:** $22,600

Abstract:

The goal of this project is to identify and define models and observations to describe, manage and predict the status and health of the ecosystem, provide data as information to managers and coastal communities, and communicate publicly the current state of the ecosystem in the northern Gulf of Alaska (GOA). Agreement on this implementation strategy is critical to effective resource management and problem solving in the GOA. The Principal Investigators (PIs) will assemble an interdisciplinary team of scientists, managers and local stakeholders to investigate and report on ways to put in place: a biophysical model; the infrastructure necessary to implement and maintain a monitoring and data dissemination system; agreements and partnerships; software and hardware requirements; identification of existing products; and data management and information transfer requirements. The PIs will report to the EVOS Trustee Council, and will provide recommendations on how to meet the GEM Program objectives within project guidelines.

Synthesis

Introduction

The required scientific guidance for implementing the GEM program is based on putting together ideas, pieces of information from the scientific literature, and the potential relations among existing data gathering programs, including GEM (see Chapter 3 of the GEM Program Document for further information), to form a larger picture. Synthesis is the entry point to the cycle of monitoring and research. Synthesis builds on past experience to update the current understanding of the northern Gulf of Alaska marine ecosystems. It brings together existing data and information from any number of disciplines, times and regions to evaluate different aspects of the GEM Program's conceptual foundation, central hypotheses and related ideas, working from the perspective of a habitat type.

The primary purposes of the synthesis activities in FY 2004 and beyond are to (1) fully develop the introduction to the habitat types in the GEM Science Plan and (2) point out options for projects that might be implemented in FY 06 and beyond.

Synopsis of Synthesis Projects

The two synthesis projects are providing information essential to development of the nearshore habitat type in the Science Plan and the implementation of the GEM program (Eckert and Spies). The synthesis for the nearshore habitat type (Eckert) comes at a critical time in program development (see Nearshore section above). Thanks to the early start for GEM nearshore projects in Phase II of FY 2003 (see FY 2003 Work Plan), enough progress has been made in the nearshore to issue a call for implementation of monitoring in FY 2007. The synthesis of Restoration work and particularly of the ecologically oriented projects (Spies) is critical because the scientific background of the GEM Program document is largely lacking in these results. The results of most of the ecological study programs undertaken during Restoration (SEA, APEX, NVP) were not available when the scientific background was written in FY 2001. As a result, the scientific background needs to be updated with the synthesis of Restoration work provided by the Spies synthesis effort. The Science Plan needs the benefit of this work as well.

A need is met in the synthesis area by the analysis of the remaining sockeye nursery lake bottom-cores (Mann). The collection of the cores has already been funded by the Trustee Council. These lake cores have the potential to allow us to see hundreds of years into the past of salmon populations which are bellwethers for a series of marine and freshwater ecosystems. Completion of the sockeye lake core work was recommended by the Public Advisory Committee as a much needed project that would help guide development of the watershed monitoring program.

The top priority proposals for Synthesis (Edmundson and Weingartner) would provide the required synopses of existing EVOSTC data and literature records that are essential to planning for future monitoring of oil-injured resources and allied species in the Watershed (Edmundson), Alaska Coastal Current and Offshore (Weingartner) habitat types. Combined with the existing synthesis of the Nearshore (Eckert-FY04), all required synthesis efforts for the four habitat types would be in place. The watershed synthesis (Edmundson) is badly needed because the Trustee Council has made a substantial investment during FY 2004 – FY 2006 in research leading to a watershed monitoring program. As explained above, the synthesis is essential to coordinate the information produced by that investment, and to guide the STAC and Science Director in developing

the FY 2007 Invitation for Proposals for implementation of the GEM watershed monitoring program.

Table of Synthesis Projects

Synthesis	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Eckert-FY04-Natural Variability in the Nearshore	$36,300	$17,500	$0	
Mann-FY04-Reconstructing Sockeye Populations	$45,000	$90,400	$0	
Spies-FY04-EVOS Damage Assessment & Restoration	$201,700	$0	$0	
Total Obligated for Approved Projects	**$283,000**	**$107,900**	**$0**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Edmundson-FY05-Synthesis of Watershed Linkages		$84,000	$85,900	$67,200
Weingartner-FY05-EVOS Synthesis Offshore		$95,300	$99,700	$98,900
Weingartner-FY05-GEM Synthesis: ACC Habitat		$105,900	$111,700	$105,000
Totals for Projects Under Consideration		**$285,200**	**$297,300**	**$271,100**
Grand Total (Approved and Under Consideration)	**$283,000**	**$393,100**	**$297,300**	**$271,100**

Abstracts of Synthesis Projects

Project: Eckert-FY04-Natural Variability in the Nearshore

Project Title: A Synthesis of Natural Variability in the Nearshore: Can We Detect Change?

Location: Alaska (Synthesis)

Proposer: Ginney Eckert **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG

Funding Levels:

FY04: $36,300 **FY05:** $17,500 **FY06:** $0

Abstract:

One of the primary goals of the GEM program is to detect anthropogenic changes within the four focal habitats in the Gulf of Alaska; however natural variability in these systems can be so high that it prevents detection of human-induced effects. The goal of this proposal is to synthesize existing data to identify, within the nearshore habitat,

environments and species that have less natural variability so that these variables can be included in the GEM monitoring plan. Data will be synthesized from the Gulf of Alaska and across a broad range of geographic areas to identify general characteristics that predict lower levels of natural variability in nearshore marine populations. The principal investigator is well suited to conduct this analysis because she was a coauthor of the current GEM nearshore monitoring plan, and she has conducted extensive analyses of natural population variability in nearshore organisms.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: **Edmundson-FY05-Synthesis of Watershed Linkages**

Project Title: A Synthesis of Watersheds Linkages to Gulf of Alaska Ecosystems; State of knowledge and future directions

Location: Synthesis: Waterseds of the GOA Ecosystem

Proposer: Jim Edmundson **Proposer Affiliation:** ADF&G

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $84,000 **FY06:** $85,800 **FY07:** $67,200

Abstract:

Watershed science has always required the synthesis of complex spatial and temporal information in order to examine the relationships among physical, geomorphical, biological and geochemical processes. Across an integrated perspective, it is fundamental to understand that hydrologic responses and biological productivity are the cumulative product of both natural ecosystem effects and anthropogenic disturbances. This project is intended to synthesize results from state, federal, EVOS, Gulf Ecosystem Monitoring (GEM), native associations and non-government organizations (NGO) funded projects and the scientific literature in order to develop a state of knowledge and gap analysis on important linkages between coastal watersheds, watershed management, anthropogenic and biological and physical factors leading to potential change in habitat types within the Gulf of Alaska (GOA) ecosystem. The synthesis will: (a) provide a detailed document on watersheds and the link to GOA habitats, (b) identify options for future GEM watershed science and monitoring project priorities based on existing science, limits in our knowledge and the range of ongoing projects, and (c) provide specific communication products (GIS, literature database, web based information, publications, contributions to other reporting – PICES, GEM) to detail existing literature, recent projects, data and sources, gaps in knowledge and linkages between watershed and habitat types for use by GEM and researchers active in this field. The project team has an established record in this area of work and has produced important synthesis products and databases on watersheds and links to communities and ocean ecosystems. One of the pressing issues facing GEM is obtaining better assessments of watershed-ocean connections and watershed-scale influences to the socio-economic links and management of resources for coastal communities. Our watershed synthesis can serve as an umbrella for many disciplines to identify priority issues, integrate support and participation of multiple agencies, and promote long-term monitoring. As a final component of this synthesis, we will participate in networking and communication among various research groups looking at watersheds, nearshore and resource productivity in association with the Gulf of Alaska and the Gulf Ecosystem Monitoring.

Project: Mann-FY04-Reconstructing Sockeye Populations

Project Title: Reconstructing Sockeye Populations in the Gulf of Alaska over the Last Several Thousand Years: The Natural Background to Future Changes

Location: Prince William Sound, Kodiak, Kenai Peninsula

Proposer: Daniel Mann **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG

Funding Levels:

FY04: $45,000 **FY05:** $90,400 **FY06:** $0

Abstract:
We are reconstructing changes in sockeye salmon abundance over the last 10,000 years using the 15N record left by salmon carcasses in the sediments of spawning lakes. Our research question is: What is the normal variability in sockeye salmon populations in the Gulf of Alaska and how does it relate to climatic changes in the Gulf of Alaska region? Our results provide a much-needed background to monitoring studies within the GEM program and to fisheries managers who are working to preserve and restore natural salmon runs. Results from 2002 and 2003 include two, new and unexpectedly complete records of salmon abundance in lakes on the Kenai Peninsula. Both records extend back to the time of regional deglaciation around 10,000 years ago. These new cores provide records of changing 15N that are five times longer than any previous record of salmon-run history. The unexpected length and richness of these new lake-core records have motivated us to request additional funds from EVOS to cover an additional year of full funding followed by a final year of analysis and synthesis.

Project: Spies-FY04-EVOS Damage Assessment & Restoration

Project Title: A synthesis of the ecological findings from the EVOS Damage Assessment and Restoration Programs, 1989-2001

Location: No field work

Proposer: Robert Spies **Proposer Affiliation:** NOAA

Disbursing Agency: ADNR

Funding Levels:

FY04: $201,700 **FY05:** $0 **FY06:** $0

Abstract:
This project is synthesizing the results from 12 years of post-spill study in the EVOS damage assessment and restoration programs in the context of anthropogenic and natural factors causing change in the northern Gulf of Alaska ecosystem. The results of the work will be an integrated synthesis book. The book will consist of three major sections: 1. The basic structure and function of the ecosystem, 2. How does it change over time and in respond to disturbances? and, 3. The effect of the spill; a summary of the spill effects and recovery as well as how our understanding of the ecosystem has matured and what future path will help us better understand this valuable marine ecosystem? The book will be a

major product of the EVOS restoration program and help set the foundation for the Gulf Ecosystem Monitoring Program.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Weingartner-FY05-EVOS Synthesis Offshore

Project Title: EVOS Alaska Coastal Current

Location: Gulf of Alaska shelf

Proposer: Thomas Weingartner **Proposer Affiliation:** UAF

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $105,900 **FY06:** $111,700 **FY07:** $105,000

Abstract:

This proposal will provide a synthesis of the Alaska Coastal Current biological habitat for the GEM Program. This habitat is an important component of the Gulf of Alaska ecosystem and intimately linked to the Nearshore, Watershed, and Alaska Coastal Current (ACC) habitats. We will assist in developing and refining the hypotheses that form the Foundation of the GEM Science Plan and identify opportunities to solve resource management problems. We will review the scientific literature, agency reports and consult with scientists working in the Gulf of Alaska, state and federal resource managers, and GEM staff in this process. The PI's include a physical oceanographer, zooplankton biologist, and marine fisheries ecologist. All have expertise in the ACC habitat and are also submitting a separate proposal to conduct the GEM Offshore synthesis.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Weingartner-FY05-EVOS Synthesis Offshore

Project Title: EVOS Synthesis Offshore

Location: Gulf of Alaska shelf

Proposer: Thomas Weingartner **Proposer Affiliation:** UAF

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $95,300 **FY06:** $99,700 **FY07:** $98,900

Abstract:

This proposal will provide a synthesis of the Offshore biological habitat for the GEM Program. This habitat is an important component of the Gulf of Alaska ecosystem and intimately linked to the Nearshore, Watershed, and Alaska Coastal Current (ACC) habitats. We will assist in developing and refining the hypotheses that form the Foundation of the GEM Science Plan and identify opportunities to solve resource

management problems. We will review the scientific literature, agency reports and consult with scientists working in the Gulf of Alaska, state and federal resource managers, and GEM staff in this process. The PI's include a physical oceanographer, zooplankton biologist, and marine fisheries ecologist. All have expertise in the Offshore habitat and are also submitting a separate proposal to conduct the GEM ACC synthesis.

Nearshore

Introduction

The nearshore environments are the best understood of the four GEM habitat types. Basic scientific concepts of how ecosystems in the nearshore (intertidal and subtidal) are structured by physical and biological phenomena have been well developed for some time (GEM Program Document, Chapter 7.9). For the organization of sampling strategies, the most fundamental substratum distinctions are hard bottom (rocks, boulders, cobbles) and soft bottom (mobile sedimentary habitats like sands and muds). Within these two types, geomorphology varies substantially, with biological implications that often induce further habitat partitioning. Synthesis work and workshops in 2002 – 2003 have provided a strong foundation for implementing nearshore monitoring stations under GEM.

Table of Nearshore Projects

Nearshore	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Bishop-FY04-Top-down and Bottom-up Processes	$149,529	$164,030	$151,390	
Bodkin-FY04-Nearshore Monitoring Decision Process	$10,000	$0	$0	
Konar-FY04-Natural Geography in Shore Areas	$248,729	$0	$0	
Pegau-FY04-High Resolution Mapping	$15,000	$0	$0	
Ruesink-FY04-Altering the Community Structure	$81,600	$0	$0	
Thorne-FY04-Seafood Waste Discharge	$72,680	$111,692	$108,943	
Total Obligated for Approved Projects	**$577,538**	**$275,722**	**$260,333**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Bodkin-FY05-GEM Nearshore Monitoring Plan		$227,300	$104,400	$0
Saupe-FY05-ShoreZone Mapping - Kodiak		$201,300	$201,900	$0
Hoover-Miller-FY05-Harbor Seal Monitoring		$92,700	$130,300	$82,300

Konar-FY05-SOP for Long-term Monitoring		$136,100	$106,600	$120,800
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Schoch-FY05-ShoreZone Mapping for PWS		$312,300	$291,400	$0
Totals for Projects Under Consideration		**$969,700**	**$834,600**	**$203,100**
Grand Total (Approved and Under Consideration)	**$577,538**	**$1,245,422**	**$1,094,933**	**$203,100**

Synopsis of Nearshore Projects

After modeling and synthesis, activities in the Nearshore habitat type (Bodkin, Saupe, Hoover-Miller, Konar, Schoch) and the closely allied Lingering Oil investigations (Short, Rosenberg and Irons) are the second level of priorities for FY 2005 – FY 2007 funding. Completion of the three-year process of planning for the implementation of the Council's Nearshore monitoring program (Bodkin) is the top priority, followed closely in priority by completion of the mapping of the intertidal and adjacent areas using the ShoreZone methodology in areas outside of Prince William Sound (Saupe), which was called for by the Bodkin proposal. The third priority within this program area (Hoover-Miller) offers an extension of the Nearshore work to an oil-injured species, harbor seals, in a part of the oil spill affected area not now covered by other surveys using an innovative cost-reducing technology (still videography).

The top priorities in Lingering Oil are to integrate monitoring for hydrocarbons into the Nearshore sampling program (Short) and to examine the status of an injured species that is known to be exposed to Exxon Valdez oil (Rosenberg). A close second in Lingering Oil priority is the marine bird survey (Irons) that provides an estimate of population trends in the majority of species still considered to be injured by the 1989 oil spill. All three Lingering Oil recommendations are expected to contribute critical information for determining the status of restoration of injured species in the short-term (Rosenberg and Irons) and in the long-term (Short). The fourth ranked Nearshore proposal (Konar) is intended to provide the proposed Bodkin project with the benefit of the last two years' experience in sampling, site selection and community involvement from the Konar community involvement in nearshore investigations in FY 2005 or FY 2006 (Bishop, Konar, Ruesink). One project (Bodkin-Nearshore) is the conclusion of an effort to build a geographically referenced database of past nearshore investigations to guide site selection and design of nearshore monitoring stations. An additional project (Thorne) adds the dimensions of seafood waste discharge monitoring to research into the design of nearshore monitoring stations not present in any of the other nearshore projects. Taken together, the nearshore projects provide a strong start to implementing the nearshore monitoring program, making it likely that the nearshore will be the first of the habitat types to enter the monitoring phase envisioned in the Science Plan. The presence of a nearshore synthesis effort in FY 2004 (Eckert, see Synthesis section below) combined with earlier planning efforts funded by EVOSTC that were led by Carl Schoch,

Ginny Eckert and Tom Dean, makes the nearshore habitat type the most advanced. As a result of these five projects, the Synthesis project, and their precursors, the call for nearshore monitoring implementation proposals could be part of the FY 2006 Invitation for Proposals.

Future efforts should initiate the much needed formal coordination of nearshore mapping efforts that goes well beyond that provided by the low cost website (Saupe) being conducted under Data Management. The coordination effort was originally recommended for funding because it was endorsed by the EVOS sponsored workshop on mapping of coastal habitats earlier this year, and it would contribute valuable resources to the process of site selection and implementation of nearshore monitoring stations. Future efforts are also needed to allow the Science Director and the Executive Director to develop a partnership with the Prince William Sound Regional Citizen's Advisory Council to incorporate an existing time series of data on contaminants into nearshore monitoring (the PWSRCAC's Long Term Environmental Monitoring Project).

Abstracts of Nearshore Projects

Project: Bishop-FY04-Top-down and Bottom-up Processes

Project Title: Trophic Dynamics of Intertidal Soft-Sediment Communities: Interaction between Top-down and Bottom-up Processes (Renewal, Submitted under the BAA)

Location: Southeast Prince William Sound (Orca Inlet) and the Copper River Delta

Proposer: Mary Anne Bishop **Proposer Affiliation:** NGO

Disbursing Agency: NOAA

Funding Levels:

FY04: $149,529 **FY05:** $164,030 **FY06:** $151,390

Abstract:

Vast expanses of intertidal sand/mudflats serve as a critical link in the food web of nearshore communities along the southcentral Alaska coastline. The rich abundance of benthic invertebrates residing within the sediments of intertidal flats and the large network of subtidal channels that bisect these flats provide a significant prey resource for numerous species of fish, crabs, birds, and marine mammals. One of the largest expanses of intertidal mud/sand flats occurs in the Copper River Delta and southeastern Prince William Sound (Orca Inlet). Here we propose a large-scale field study that examines the physical/chemical and biological factors that limit and/or regulate invertebrate community dynamics. The largely "bottom-up" approach we propose (physical/chemical parameters – phytoplantkon/epibenthic production – invertebrate production) is balanced by the largely "top-down" focus of a companion project funded by the Prince William Sound Oil Spill Recovery Institute that examines predator dynamics and assesses their role in invertebrate community dynamics. At the completion of this project (FY 06), the results of both projects will be synthesized and a subset of key physical/chemical parameters will be identified for long- term monitoring.

Project: Bodkin-FY04-Nearshore Monitoring Decision Process

Project Title: Monitoring in the Nearshore: A Process for Making Reasoned Decisions (close-out of Project 030687)

Location: No field work. Study areas in the Gulf of Alaska

Proposer: James Bodkin **Proposer Affiliation:** DOI

Disbursing Agency: DOI

Funding Levels:

FY04: $10,000 **FY05:** $0 **FY06:** $0

Abstract:

Over the past several years, a conceptual framework for the GEM nearshore monitoring program has been developed through a series of workshops. However, details of the proposed monitoring program, e.g. what to sample, where to sample, when to sample and at how many sites, have yet to be determined. In FY 03 we were funded under Project 03687 to outline a process whereby specific alternatives to monitoring are developed and presented to the EVOS Trustee Council for consideration. As part of this process, two key elements are required before reasoned decisions can be made. These are: 1) a comprehensive historical perspective of locations and types of past studies conducted in the nearshore marine communities within Gulf of Alaska, and 2) estimates of costs for each element of a proposed monitoring program. We have developed a GIS database that details available information from past studies of selected nearshore habitats and species in the Gulf of Alaska and provide a visual means of selecting sites based (in part) on the locations for which historical data of interest are available. We also provide cost estimates for specific monitoring plan alternatives and outline several alternative plans that can be accomplished within reasonable budgetary constraints. The products that we will provide are: 1) A GIS database and maps showing the location and types of information available from the nearshore in the Gulf of Alaska; 2) A list of several specific monitoring alternatives that can be conducted within reasonable budgetary constraints; and 3) Cost estimates for proposed tasks to be conducted as part of the nearshore program. Because data compilation and management will not be completed until late in FY03 we are requesting support for close-out of this project in FY 04.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Bodkin-FY05-GEM Nearshore Monitoring Plan

Project Title: Implementation of the GEM Nearshore Monitoring Plan: Site selection, standard operating procedures, and data management

Location: PWS, Kenai Penninsula, Cook Inlet, Kodiak

Proposer: James Bodkin **Proposer Affiliation:** USGS

Disbursing Agency: DOI

Funding Recommendations:

FY05: $227,300 **FY06:** $104,400 **FY07:** $0

Abstract:

Gulf of Alaska nearshore habitats support populations that are economically,

ecologically, and socially valuable to humans. Because of their importance to humans, detecting change in nearshore habitats, both natural and anthropogenic, play a prominent role in the GEM plan. Over the past several years several steps have been taken toward implementing the GEM Nearshore Monitoring Program. These include a series of workshops to identify nearshore resources and sampling strategies, development of specific monitoring designs with cost estimates, and the creation of a spatially explicit GOA nearshore science bibliography. We are proposing to build upon the monitoring designs offered by Bodkin and Dean (2003) by selecting specific sites, developing and testing sampling protocols, and developing and testing a data management plan specific for long term sampling within the framework of existing monitoring designs. Upon completion of these tasks the Nearshore GEM monitoring plan should be well prepared for implementation.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Hoover-Miller-FY05-Harbor Seal Monitoring

Project Title: Harbor Seal Monitoring in Southern Kenai Peninsula Fjords

Location: Kenai Penninsula

Proposer: Anne Hoover-Miller **Proposer Affiliation:** Alaska SeaLife Center

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $92,700 **FY06:** $130,300 **FY07:** $82,300

Abstract:

This proposal supports an existing remote video monitoring system in Aialik Bay, a tidewater glacial fjord. This system is used to observe harbor seals in glacial ice habitats and the impacts of vessels on seals. Haulout activity, numbers of seals, vessel impacts on seals, ambient behaviors of undisturbed seals, glacial activity, ice conditions, weather, and other events affecting seals are recorded daily. Seed funding is requested to test prototype digital still cameras at land-based haulouts in Day harbor for documenting seals in a fjord lacking tidewater glaciers. Integrations of the remote monitoring into GEM; provides ecological measures of conditions at the heads of fjords that will complement long-term oceanographic monitoring in adjacent waters. This study is augmented by ancillary studies and support from the ASLC and National Park Service through a partnership in the Oceans Alaska Science and Learning Center, the University of Alaska, Fairbanks, Alaska National Maritime Wildlife Refuge System, and Port Graham Corporation.

Project: Konar-FY04-Natural Geography in Shore Areas

Project Title: Alaska Natural Geography in Shore Areas: Year 2 of a Census of Marine Life Initial Field Project

Location: Kodiak Island, PWS and Kachemak Bay

Proposer: Brenda Konar **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG

Funding Levels:

FY04: $248,729 **FY05:** $0 **FY06:** $0

Abstract:

This proposal seeks funding to complete the initial nearshore biodiversity surveys that were started in the summer of 2003 in Kodiak Island, Prince William Sound and Kachemak Bay. These surveys are part of a pole-to-pole latitudinal gradient in macroalgal rocky bottom and seagrass soft bottom habitats that is applying standardized

protocols developed under the Census of Marine Life program. In our second year of funding we will resurvey all sites that were sampled in 2003 for temporal resolution and will retrieve the temperature data loggers that were deployed at all sites in 2003 so that physical data can be incorporated for each study site. The project is heavily based on local community involvement for sampling. Expected outcomes are establishment of a biodiversity database for current regional and global comparisons and future long-term monitoring programs, capacity building, and a broad outreach to the public.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: **Konar-FY05-SOP for Long-term Monitoring**

Project Title: Implementation of a Standard Operating Procedure for Long-term Nearshore Monitoring in the Gulf of Alaska

Location: Kodiak Island, PWS, Kachemak Bay

Proposer: Brenda Konar **Proposer Affiliation:** UAF

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $136,100 **FY06:** $106,600 **FY07:** $120,800

Abstract:

Over the last two years, GEM funded an intense biodiversity study (NaGISA) within the Gulf of Alaska (GOA) to obtain baseline data for the implementation of a monitoring standard operating procedure (SOP). Here we seek funding to complete the sorting, analysis and manuscript preparation of this NaGISA biodiversity work (field season ending summer 2004), so that the information can be disseminated. We are also proposing to test an SOP for long-term monitoring of nearshore rocky and seagrass sites. This SOP is based on the extensive, observational portion of our previous sampling. In accordance with recommendations by Bodkin and Dean (2003), we suggest extensive monitoring of abundance of well-defined key organisms in various intertidal and subtidal strata at seven sites per geographical section. Sites will include our previously established sites and several new sites based on mapping information (i.e. ShoreZone) for better geographical coverage of the GOA.

Project: Ruesink-FY04-Altering the Community Structure

Project Title: Investigating the Relative Roles of Natural Factors & Shoreline Harvest in Altering the Community Structure, Dynamics & Diversity of the Kenai Peninsula

Location: Kenai Peninsula

Proposer: Jennifer Ruesink **Proposer Affiliation:** Non Alaskan University

Disbursing Agency: NOAA

Funding Levels:

FY04: $81,600 **FY05:** $0 **FY06:** $0

Abstract:
The surf swept rocky shores of the outer Kenai Peninsula are the home of three Sugpiaq native villages where the black chiton, Katharina tunicata, remains an important traditional subsistence food source. This benthic invertebrate is also a competitively dominant herbivore known to have dramatic impacts on the structure, dynamics and diversity of the rocky intertidal. In collaboration with tribal members, we will evaluate the relative roles of natural factors (predation/grazing & natural variability) and anthropogenic impacts (Katharina harvest) in altering intertidal community structure. The project addresses the core GEM hypothesis of human versus natural impacts on the structure and productivity of coastal ecosystems. It will also provide an additional field season (2004) of valuable baseline monitoring in the intertidal zone that could be continued in the future as part of a long-term time series. Local tribes will be involved in both developing and carrying out research which will match the GEM commitment to community based science.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Saupe-FY05-ShoreZone Mapping - Kodiak

Project Title: ShoreZone Mapping for Kodiak Island

Location: Kodiak Island archipelago

Proposer: Susan Saupe **Proposer Affiliation:** Cook Inlet RCAC

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $201,300 **FY06:** $201,900 **FY07:** $0

Abstract:
This project would complete a Kodiak ShoreZone mapping program initiated in 2002 by the EVOSTC and the Cook Inlet RCAC by mapping the rest of the Kodiak Island archipelago following the existing Alaska ShoreZone Mapping Protocols (Harper and Morris 2003). Aerial Video Imagery (AVI) would be collected in two 6-day surveys and would be the primary source for completing the subsequent biophysical mapping database of intertidal and shallow subtidal areas. These data will complement the 1600 km of existing mapping on Kodiak and the 7000 km so far within the GEM area. In addition to the agency and researcher support that ShoreZone has gained in Alaska---most specifically to provide needed GEM-area habitat data---there was significant community support for completing the coastal mapping shown during a recent workshop (15 March 2004) in Kodiak when the ShoreZone mapping data and products completed to date were described and demonstrated.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Schoch-FY05-ShoreZone Mapping for PWS

Project Title: ShoreZone Mapping for Prince William Sound

Location: Prince William Sound

Proposer: Carl Schoch **Proposer Affiliation:** PWSSC

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $312,300 **FY06:** $291,400 **FY07:** $0

Abstract:

A two-year program of coastal mapping in Prince William Sound (PWS) is proposed. Nearshore scientists have recognized Shore-Zone maps as the highest priority product for the GEM nearshore program following a series of community workshops, stakeholder meetings, and report recommendations. The products generated by Shore-Zone provide a spatially comprehensive reference for intertidal and subtidal habitats. Aerial Video Imagery (AVI) will be collected during the lowest tides of the year and then be used as the primary data source for intertidal and shallow subtidal mapping. Video data and in situ observations will be used to generate GIS coverages of physical and biological shoreline attributes. These attributes will be validated by a rigorous field survey in the second year of the project. Shore-Zone maps in other areas are widely used by state and federal agencies for regional planning (e.g., GRS planning, eelgrass distribution maps), and development of derivative models (e.g., potential oil residence, sandlance spawning capability).

Project: Thorne-FY04-Seafood Waste Discharge

Project Title: Impacts of Seafood Waste Discharge in Orca Inlet, Prince William Sound

Location: Orca Inlet, Prince William Sound

Proposer: Richard Thorne **Proposer Affiliation:** NGO

Disbursing Agency: NOAA

Funding Levels:

FY04: $72,680 **FY05:** $111,692 **FY06:** $108,943

Abstract:

This proposal brings together several entities with concerns over the impacts of seafood waste discharge into Cordova Harbor (Orca Inlet). The Prince William Sound Science Center (PWSSC) is acting as the facilitator of this effort because of its strategic location and long-term interest in the problem. Primary collaborators are DEC, ADF&G and Cordova seafood processors. Anticipated collaborators include the Native Village of

EYAK and the City of Cordova. The proposed research will investigate possible impacts seafood waste discharge through a series of experiments that will evaluate the nearshore community response to alternate techniques of seafood waste discharge, including different grind sizes and whole carcasses, as well as a pile remediation study. These experiments will not only aid our understanding of the historic impacts, but will form the basis for a more healthy and productive approach to seafood waste recycling. A three-year project is proposed, with the first year devoted to baseline observations and experimental design.

Lingering Oil Effects

Introduction

The Trustee Council continues to be concerned about *Exxon Valdez* oil remaining in the marine environment and any effects it may be having on injured resources. Injured resources are identified and their current status described on the Trustee Council's web site at http://www.evostc.state.ak.us/facts/status.html. Current objectives for the Lingering Oil Effects component of the Council's program are focused on examining the fate and effects of the remaining oil on injured resources and services and especially populations of two species in western Prince William Sound, harlequin ducks and sea otters. These populations have shown continuing exposure to hydrocarbons in localities where potentially toxic forms of oil from the *Exxon Valdez* are known to persist. Objectives for FY 04 also include learning about the status of subsistence uses of the injured resources in the spill affected areas for comparison to an earlier survey in 1998.

The reasons that some populations of injured species in Prince William Sound have not met the criteria established for their recovery in the nearly 14 years since the oil spill are still not clear. For some species it has not been possible to clearly separate the possible toxic effects of oiling from the possible effects of natural causes such as climate change and predation. For this reason, GEM projects that address injured species and ecosystems are designed to understand the effects of natural forces on populations and their productivity. The knowledge gained may permit at least a retrospective understanding of oil injury versus other impacts for species injured by *Exxon Valdez* oil, and provide the background on natural forces necessary to understand effects of oiling in future oil spills.

Table of Lingering Oil Projects

Lingering Oil	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Ballachey-FY04-Oil Exposure in Nearshore Vertebrate Predators	$178,000	$150,500	$0	
Ballachey-FY04-Oil Exposure in Sea Otters	$20,500	$126,900	$0	
Bodkin-FY04-Lingering Oil and Sea Otters	$134,300	$26,200	$6,500	
Day-FY04-Sediment Quality Survey	$151,000	$57,200	$0	
Fall-FY04-Status of Subsistence Uses	$298,700	$25,600	$0	

Lingering Oil	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Irons-FY04-Bird Abundance in PWS	$175,518	$0	$0	
Irvine-FY04-Lingering Oil on Boulder-Armored Beaches*	$71,700	$17,200	$0	
Jacobs-FY04-Integral Consulting	$650,000			
Lees-FY04-Assessment of Bivalve Recovery	$36,200	$0	$0	
Nelson-FY04-Hydrocarbon Database	$22,200	$22,200	$22,200	
Rice-FY04-Contaminant Inputs and CYPIA Induction	$177,300	$130,100	$0	
Short-FY04-Monitoring Exxon Valdez Oil & PWS	$45,900	$0	$0	
Total Obligated for Approved Projects	**$2,163,918**	**$555,900**	**$28,700**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Rosenberg-FY05-Harlequin Duck Populations Dynamics		$39,900	$0	$0
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Short-FY05-Monitoring of Anthropogenic Hydrocarbons		$58,900	$58,900	$58,900
Irons-FY05-Marine Bird Abundance		$163,600	$32,700	$0
Totals for Projects Under Consideration		**$262,400**	**$91,600**	**$58,900**
Grand Total (Approved and Under Consideration)	**$2,163,918**	**$818,300**	**$120,300**	**$58,900**

* Project delayed to be conducted in FY 05

Synopsis of Lingering Oil Projects

The lingering oil projects relate directly to the Trustee Council's basic responsibilities to monitor the long-term effects of the oil spill and the status of injured species (Fall, Irons, Lees, Rosenberg), to maintain evidence of oiling (Nelson), look at the fate of the *Exxon Valdez* oil outside Prince William Sound (Irvine), and at the fate and effects of oil inside Prince William Sound (Bodkin-Lingering, Ballachey-Otters, Ballachey-NVP, Rice-Population and Rice-Contaminants). A synthesis transition project (Short) offers to address the tasks necessary to integrate long-term monitoring of lingering oil effects into GEM nearshore monitoring projects.

In addition, a re-survey of sediment quality (Day-Sediment) is designed to assess in situ levels of toxicity of sediments in areas most likely to remain oil impaired. A

synthesis of scientific information relevant to injury from lingering oil (Jacobs) will provide information on the status of injured resources and options for future restoration.

Abstracts of Lingering Oil Projects

Project: Ballachey-FY04- Oil Exposure in Nearshore Vertebrate Predators

Project Title: Oil Exposure in Nearshore Vertebrate Predators

Location: Prince William Sound

Proposer: Brenda Ballachey **Proposer Affiliation:** USGS

Disbursing Agency: DOI

Funding Levels:

FY04: $178,000 **FY05:** $150,500 **FY06:** $0

Abstract:

Some of the strongest evidence of continuing effects of lingering oil from the Exxon Valdez oil spill comes from long term monitoring of vertebrate populations and their exposure to hydrocarbons. Population recovery of sea otters remained incomplete as of 2002, and individual sea otters continue to exhibit elevated levels of the Cytochrome P450 1A biomarker in areas where lingering oil deposits are most prominent. Surveys of population size and individual P450 measures of sea otters and marine birds will provide continuing information on population trend and individual exposure to lingering oil.

Project: Ballachey-FY04- Oil Exposure in Sea Otters

Project Title: Lingering Oil and Sea Otters: Pathways of Exposure and Recovery Status (continuation of work on project 040620)

Location: Prince William Sound

Proposer: Brenda Ballachey **Proposer Affiliation:** USGS

Disbursing Agency: DOI

Funding Levels:

FY04: $20,500 **FY05:** $126,900 **FY06:** $0

Abstract:

Some of the strongest evidence of continuing effects of lingering oil from the Exxon Valdez spill comes from long term monitoring of sea otter populations and their exposure to hydrocarbons. Sea otters in heavily oiled areas of western PWS had not recovered as of 2003. Through 2002, sea otters continue to exhibit elevated levels of the cytochrome P4501A biomarker in areas where lingering oil deposits are most prominent. In 2002/03, sea otters at northern Knight Island were instrumented with radiotransmitters and time-depth recorders. Ongoing monitoring of these individuals is quantifying home ranges relative to known intertidal lingering oil deposits, and when the dive data are retrieved and analyzed, we will link foraging behaviors of individual sea otters to oiled shorelines, and relate patterns of habitat use to individual variation in cytochrome levels.

For FY2005, we propose to conduct surveys of population size and distribution, continue to monitor instrumented sea otters to obtain habitat use and survival information, and obtain an additional sample of cytochrome P4501A. This will allow evaluation of continuing exposure to residual oil, population trends, and the status of recovery of sea otters in western PWS.

Project: Bodkin-FY04-Lingering Oil and Sea Otters

Project Title: Lingering Oil and Sea Otters: Pathways of Exposure and Recovery Status (continuation of project 030620)

Location: Prince William Sound

Proposer: James Bodkin **Proposer Affiliation:** DOI

Disbursing Agency: DOI

Funding Levels:

FY04: $134,300 **FY05:** $26,200 **FY06:** $6,500

Abstract:
Some of the strongest evidence of continuing effects of lingering oil from the Exxon Valdez oil spill comes from long term monitoring of sea otter populations and their exposure to hydrocarbons. Population recovery remained incomplete as of 2002, and individual sea otters continue to exhibit elevated levels of the Cytochrome P450 1A biomarker in areas where lingering oil deposits are most prominent. Work in progress is quantifying home ranges of sea otters at northern Knight Island relative to known intertidal lingering oil deposits, but relocation sampling limits our ability to link foraging behaviors to oiled shorelines. To address the question of where individuals are foraging relative to lingering oil requires data on foraging depths. In 2003 USGS will be instrumenting 20 of the radio-instrumented sea otters at Knight Island with time-depth-recorders. These instruments will provide accurate information on the proportion of each individuals foraging that occurs in intertidal habitats, the area where known oil deposits remain, for one full year. Surveys of population size and individual P450 measures will provide continuing information on population trend and individual exposure to lingering oil.

Project: Day-FY04-Sediment Quality Survey

Project Title: Sediment Quality Survey of Heavily-Oiled Beaches in PWS

Location: Prince William Sound

Proposer: Betsy Day **Proposer Affiliation:** Private Enterprise

Disbursing Agency: DOL

Funding Levels:

FY04: $151,000 **FY05:** $57,200 **FY06:** $0

Abstract:
Recent work by Short et al. (2004) demonstrated that lingering oil is found in subsurface intertidal sediments in 43 of the 91 beaches sampled during the summer of 2001. This proposed research project is directed at understanding potential ecological effects to

invertebrate populations resulting from lingering oil in subsurface intertidal sediments. Sediments from five locations containing heavily-oiled subsurface sediments, and five nearby reference areas, will be collected concurrently with the NMFS continuing lingering oil studies, and evaluated for PAHs, sediment toxicity using the mussel larvae bioassay, and benthic community structure. The results will provide information on the potential ecological impacts from lingering subsurface oil and will be evaluated using a weight-of-evidence approach. If this project shows that the heavily-oiled sediments are not causing impacts to benthic invertebrates then it can be assumed that benthic invertebrate populations in moderately or lightly-oiled sediments would not be affected by the lingering oil.

Project: Fall-FY04-Status of Subsistence Uses

Project Title: Update of the Status of Subsistence Uses in Exxon Valdez Oil Spill Area Communities

Location: Prince William Sound, Kodiak, Kenai Peninsula, and Alaska Peninsula

Proposer: James Fall **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $298,700 **FY05:**$25,600 **FY06:** $0

Abstract:

The project will provide information for an update of the status of subsistence uses in the Exxon Valdez oil spill area. Subsistence uses are a vital natural resource service that was injured by the spill and has not recovered. The project will be a partnership between the Alaska Department of Fish and Game, the Chugach Regional Resources Commission, the Kodiak Area Native Association, and the Bristol Bay Native Association. In early 2004 local research assistants and department researchers will interview face-to-face approximately 760 households in 14 communities about their subsistence activities in 2003. The questionnaire will be similar to that used in previous rounds of interviews. A planning workshop and data review workshop will be held involving study community representatives. A database with study findings and a final report will be produced. Training of local researchers and capacity building are key goals of the project.

Project: Irons-FY 04-Bird Abundance in PWS

Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer 2004

Location: Prince William Sound, Alaska

Proposer: David Irons **Proposer Affiliation:** DOI

Disbursing Agency: DOI

Funding Levels:

FY04: $175,518 **FY05:** $0 **FY06:** $0

Abstract:

We propose to conduct small boat surveys to monitor abundance of marine birds and sea

otters(Enhydra lutris) in Prince William Sound, Alaska during March and July 2004. Seven previous surveys have monitored population trends for >65 bird and 8 marine mammal species in Prince William Sound after the Exxon Valdez oil spill. We will use data collected in 2004 to examine trends from summer 1989-2004 and from winter 1990-2004 by determining whether populations in the oiled zone changed at the same rate as those in the unoiled zone. We will also examine overall population trends for the Sound from 1989-2004. Due to the lack of data prior to the Exxon Valdez oil spill, continued monitoring of marine birds and sea otters is needed to determine whether populations injured by the spill are recovering. Data collected in 2000 indicated that bald eagles (Haliaeetus leucocephalus) are increasing in winter and summer throughout Prince William Sound, harlequin ducks (Histrionicus histrionicus) are increasing in the oiled area in winter, and black oystercatchers are increasing throughout Prince William Sound in summer. Numbers of all other injured species are either not changing or are declining in the oiled area. Common loons (Gavia immer), cormorants (Phalacrocorax spp.), and common murres (Uria aalgae) are showing no trend in the oiled area; pigeon guillemots (Cepphus columba) and marbled murrelets (Brachyramphus marmoratus) are declining in the oiled areas of Prince William Sound and Kittlitz's Murrelet (Brachyramphus brevirostris) is declining throughout Prince William Sound. Results of these surveys up through 1998 have been published by Irons et al. (2000) and Lance et al. 2001). Analyses of these survey data are the only ongoing means to evaluate the recovery of most of these injured species. A Final Report will be written upon completion of the project that will address population status of species observed during the survey.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Irons-FY05-Marine Bird Abundance

Project Title: Surveys to Monitor Marine Bird Abundance in PWS during Winter and Summer 2005

Location: PWS

Proposer: David Irons **Proposer Affiliation:** USFWS

Disbursing Agency: DOI

Funding Recommendations:

FY05: $163,600 **FY06:** $32,700 **FY07:** $0

Abstract:

This project will conduct small boat surveys to monitor abundance of marine birds and sea otters (Enhydra lutris) in Prince William Sound, Alaska during March and July 2005. Seven previous surveys have monitored population trends for >65 bird and 8 marine mammal species in Prince William Sound after the Exxon Valdez oil spill. We will use data collected in 2005 to examine trends from summer 1989-2005 and from winter 1990-2005 by determining whether populations in the oiled zone changed at the same rate as those in the unoiled zone. We will also examine overall population trends for the Sound from 1989-2005. Due to the lack of data prior to the Exxon Valdez oil spill, continued monitoring of marine birds and sea otters is needed to determine whether populations

injured by the spill are recovering. Data collected in 2000 indicated that bald eagles (Haliaeetus leucocephalus) are increasing in winter and summer throughout Prince William Sound, harlequin ducks (Histrionicus histrionicus) are increasing in the oiled area in winter, and black oystercatchers are increasing throughout Prince William Sound in summer. Numbers of all other injured species are either not changing or are declining in the oiled area. Common loons (Gavia immer), cormorants (Phalacrocorax spp.), and common murres (Uria aalgae) are showing no trend in the oiled area; pigeon guillemots (Cepphus columba) and marbled murrelets (Brachyramphus marmoratus) are declining in the oiled areas of Prince William Sound and Kittlitz's Murrelet (Brachyramphus brevirostris) is declining throughout Prince William Sound. Results of these surveys up through 1998 have been published by Irons et al. (2000) and Lance et al. 2001). Analyses of these survey data are the only ongoing means to evaluate the recovery of most of these injured species. A Final Report will be written upon completion of the project that will

Project: Irvine-FY04-Lingering Oil on Boulder-Armored Beaches

Project Title: Monitoring Lingering Oil on Boulder-Armored Beaches in the Gulf of Alaska

Location: Kenai Peninsula, Alaska Peninsula

Proposer: Gail Irvine **Proposer Affiliation:** DOI

Disbursing Agency: DOI

Funding Levels: The project has been delayed and it is now (7/16/2004) scheduled to be conducted in federal fiscal years 2005 – 2006, as a no-cost extension. Funding impacts within fiscal years remain as written.

FY04: $71,700 **FY05:** $17,200 **FY06:** $0

Abstract:

We propose to continue monitoring the persistence and degradation of oil at boulder-armored Gulf of Alaska beaches that have been studied since 1992 and investigate how stability of the boulder armors affects both persistence and weathering. These sites were re-sampled in 1994 and 1999; 2004 would be the next targeted study date. The continued contamination of these sites, arrayed along the Katmai and Kenai Fjords National Park coasts, compromises the aesthetics and wilderness values of some of the most pristine wilderness-coast parklands in the world. The lack of weathering of much of the oil means that the oil, if released, could pose a risk to biota. Subsurface oil persisted at these sites in 1999 with little change in extent or chemical weathering since 1994. Data also suggests that the boulder armors are largely stable. We propose to assess changes in surface and subsurface oiling, chemical weathering of the oil, and stability of the boulder armors. Results will be published.

Project: Jacobs-FY 04-Synthesis on injured resources

Project Title: Synthesis of information on oil injured resources

Location: Prince William Sound

Proposer: Lucinda Jacobs **Proposer Affiliation:** Private Enterprise

Disbursing Agency: DOL

Funding Levels:

FY04: $650,000 **FY05:** $0 **FY06:** $0

Abstract:
An authoritative synthesis of information on the status of injured resources will be produced by an independent team of scientists. Conclusions with respect to the probable status of injured resources and possible remedies for injured resources will be presented. The natural resources and habitats of Prince William Sound and other Alaskan waters have been studied extensively for the 15 years since the occurrence of the Exxon Valdez oil spill. The collective data from studies conducted largely by natural Trustee Council-funded scientists suggest that the coastal and marine ecosystems in the oil spill region have not fully recovered, that populations of several species remain impaired, and that continued exposure to persistent, biologically available and toxic Exxon Valdez oil (EVO) might be at least partially responsible. These findings have been challenged by scientists funded by Exxon and its corporate successor. A full and complete understanding of the degree to which natural resources are injured and the degree to which that injury is caused by lingering oil is critical to defining the probability and timeframe of resource recovery, the options (if any) for restoration, and the necessity, type and geographic extent of continued monitoring and research. The project would conduct a series of evaluations using the available scientific data to provide an independent and comprehensive analysis of recovery status of key resources and define any linkage to residual oil. The overall goal of this work will be to provide information that can be used to better characterize recovery status, better define restoration options, better target future monitoring and research, and more explicitly define when restoration can be considered complete.

Project: Lees-FY04- Assessment of Bivalve Recovery

Project Title: Assessment of Bivalve Recovery on Treated Mixed-Soft Beaches in PWS

Location: Prince William Sound

Proposer: Dennis Lees **Proposer Affiliation:** Private Enterprise

Disbursing Agency: DOI

Funding Levels:

FY04: $36,200 **FY05:** $0 **FY06:** $0

Abstract:
Due to favorable weather, we were able to collect 25 percent more infaunal samples during the August 2002 field effort for Project No. 02574 than we had initially proposed for this work. This should improve the program's statistical power by about 15 percent. Current trends observed in samples analyzed to date suggest that treated sites have fewer bivalves than reference sites. Unfortunately, sediment characteristics differed substantially between the new sampling sites and those sampled during previous work in the region. Consequently, sample volumes for these infaunal samples are four to five times larger than was anticipated. Therefore, the time required to sort the samples far exceeds the budget for sorting. This proposal is directed at obtaining additional funds for

sample sorting. Accelerating the sorting process will allow us to complete sample analysis and publication of our results and will allow the Trustee Council to draw inferences regarding lingering effects to intertidal bivalve assemblages from the oil spill in a timely manner.

Project: Nelson-FY04-Hydrocarbon Database

Project Title: The Exxon Valdez Trustee Hydrocarbon Database and Interpretation Service

Location: entire spill area

Proposer: Bonita Nelson **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $22,200 **FY05:** $22,200 **FY06:** $22,200

Abstract:

This project is an on-going service project providing data and sample archiving services for all samples collected for hydrocarbon analysis in support of Exxon Valdez Oil Spill Trustee Council projects. These data represent samples collected since the oil spill in 1989 to the present and include environmental and laboratory Response (National Resource Damage Assessment - NRDA) and Restoration data. Additionally, we provide interpretive services for the hydrocarbon analysis provide public releases of the database (including FOIA requests) and maintain the hydrocarbon sample archives.

Project: Rice-FY04-Contaminant Inputs and CYPIA Induction

Project Title: Lingering Oil: Contaminant Inputs to PWS and CYPIA Induction in Fish

Location: Prince William Sound

Proposer: Stanley Rice **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $177,300 **FY05:** $130,100 **FY06:** $0

Abstract:

Recently lingering oil studies have found that Exxon Valdez oil persists, and continued CYP1A induction in sea otters and sea ducks have become the best documented long-term impacts of the spill. Exxon scientists suggest there are many other potential pollutant sources in PWS that confound measurements of CYP1A induction. The project proposed here will definitively assess contributions, if any, from other contaminant sources to contaminant stresses on biota in Prince William Sound (PWS). At a suite of sites, passive sampling devices will be deployed and then analyzed to evaluate their induction potential. Aliquots of concentrated extracts from the samplers will be injected into cultured rainbow trout (Oncorhynchus mykiss), and the induction of cytochrome P450A1A (CYP1A) measured. These measurements would compliment the on-going sea otter studies of FY04, where a final measurement of CYP1A will be made in summer 2004.

Project: Rice-FY04-Lingering Population Status

Project Title: Lingering Oil: Pathways of Exposure and Population Status (ABL)

Location: Prince William Sound

Proposer: Stanley Rice **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $60,000 **FY05:** $61,000 **FY06:** $29,100

Abstract:
Lingering oil from the Exxon Valdez oil spill remains throughout Western Prince William Sound and appears to have chronic effects on sea otter and sea duck populations in these areas. Studies conducted in 2001-02 have documented the extent of oiling throughout the sound, and as of this writing, we have determined that oil is bioavailable to predators. Bioavailability defines potential for exposure, but is not equal to exposure or significance. In 2003 and 2004, we are determining the significance of lingering oil by quantifying the probability of oil encounters in areas where sea otters and sea ducks have not recovered. Prey and passive samplers collected in 2003 will be analyzed in 2004, and will be supplemented with additional samples in 2004 to meet the needs of the on-going tagging studies of otters and ducks by USGS. With the mechanism of exposure from lower intertidal oil deposits determined, the research theme will move toward the goal of determining the extent and probability of oil exposure in three restricted areas: Herring Bay, Lower Passage, and Bay of Isles. Information gained in this project could aid in the decision process regarding future mitigation, litigation, or clean-up actions.

Project: Rosenberg-FY04-Harlequin Duck Population

Project Title: Harlequin Duck Population Dynamics in Prince William Sound: Measuring Recovery

Location: Prince William Sound

Proposer: Dan Rosenberg **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $37,100 **FY05:** $0 **FY06:** $0

Abstract:
This project will address the effects of lingering oil in nearshore habitats of Prince William Sound on populations of harlequin ducks. We will conduct winter boat surveys to test if harlequin ducks have recovered from the effects of the EVOS by comparing population structure and trends between oiled and unoiled treatments in four areas (2

oiled, 2 unoiled) of PWS. Similar structure and trends between oiled and unoiled areas will indicate populations have recovered or are in a position to recover. Work will be complimentary to studies addressing cytochrome P450 induction and over winter survival of female harlequin ducks to give a complete picture of the effects of lingering oil. We will also test for geographic differences in population structure and trend for oiled and unoiled treatments. This is a continuation of surveys begun in 1997. Up to 3 years of surveys are proposed with the results of each year determining the need for continuation.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Rosenberg-FY04-Harlequin Duck Population

Proposer: Dan Rosenberg **Proposer Affiliation:** ADF&G

Location: Prince William Sound

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $39,900 **FY06:** $0 **FY07:** $0

Abstract:

This project will address the effects of lingering oil in nearshore habitats of Prince William Sound on populations of harlequin ducks. We will also address GEM objectives for long-term monitoring of harlequin and other sea duck species. We will conduct winter boat surveys to test if harlequin ducks have recovered from the effects of the EVOS by comparing population structure and trends between oiled and unoiled treatments in four areas (2 oiled, 2 unoiled) of PWS. Similar structure and trends between oiled and unoiled areas will indicate populations have recovered or are in a position to recover. Work will be complimentary to studies addressing cytochrome P450 induction and over winter survival of female harlequin ducks to give a complete picture of the effects of lingering oil. We will also test for geographic differences in population structure and trend for oiled and unoiled treatments. This is a continuation of surveys begun in 1997. Up to 3 years of surveys are proposed with the results of each year determining the need for continuation.

Project: Short-FY04-Monitoring Exxon Valdez Oil & PWS

Project Title: Development of a Strategy for Monitoring Exxon Valdez Oil and other Contamination in PWS

Location: Prince William Sound

Proposer: Jeff Short **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $45,900 **FY05:** $0 **FY06:** $0

Abstract:

This project will evaluate alternative sampling designs and strategies for monitoring oil

from the T/V Exxon Valdez remaining on beaches in Prince William Sound, along with other hydrocarbon contaminants from anthropogenic and natural sources, and will make recommendations regarding overall sampling design, duration and frequency. The recommended strategy will be optimized for statistical power based on existing knowledge of the distributions of hydrocarbons from known sources, and will include a means of increasing power as more knowledge is gained through sampling as monitoring proceeds. The recommended strategy will incorporate results from the Prince William Sound Regional Citizens' Advisory Committee's Long Term Environmental Monitoring Program, and will explicitly recommend how the results from this program may be efficiently augmented. This project proposed here will directly address a core concern of the GEM program, by determining the persistence of Exxon Valdez oil placed in the context of other hydrocarbons in the region.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Short-FY05-Monitoring of Anthropogenic Hydrocarbons

Project Title: Long-term Monitoring of Anthropogenic Hydrocarbons in the Exxon Valdez Oil Spill Region

Location: PWS, Kodiak, Kenai Peninsula

Proposer: Jeff Short **Proposer Affiliation:** National Marine Fisheries

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $58,900 **FY06:** $58,900 **FY07:** $58,900

Abstract:

This proposal seeks support to expand the Long Term Environmental Monitoring (LTEMP) of the Prince William Sound Regional Citizens' Advisory Council (PWSRAC) in a manner that will make it substantially more powerful in its ability to detect environmental changes induced by petroleum contamination, and possibly other contaminants that have recently been identified as potential insults to the region. This expansion is designed to address the needs of both the PWSRCAC and the GEM programs, in part by combining resources of both organizations. The proposed design incorporates and integrates the existing NOAA and LTEMP monitoring datasets, and proposes a modest enlargement of effort to monitor at a substantially larger spatial scale. Most of the expansion is intended to implement a random-sampling based design that is currently being developed under an FY2004 Trustee Council funded project (Trustee Project 040724: Short - FY04 - Monitoring Exxon Valdez Oil).

Management Applications

Introduction

Management Applications is an implementation strategy that is woven throughout all the Council's funded projects to the extent feasible and appropriate. All monitoring data collected at Council expense are ultimately expected to be applied to management through their use in detecting, understanding and predicting changes in populations of birds, fish and mammals (GEM Program Document). The Council requested in FY 2004 that Management Applications be emphasized as its own program area in the FY 2005 Invitation to accelerate the pace of development of applications.

Table of Management Applications

Management	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Total Obligated for Approved Projects	**$0**	**$0**	**$0**	*
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Willette-FY05-Salmon Smolt Monitoring		$68,800	$65,900	$67,000
Szarzi-FY05-Salmon Smolt Abundance		$62,800	$59,200	$59,200
Logerwell-FY05-Productivity of Capelin and Pollock		$32,700	$112,800	$66,900
Totals for Projects Under Consideration		**$164,300**	**$237,900**	**$193,100**
Grand Total (Approved and Under Consideration)	**$0**	**$164,300**	**$237,900**	**$193,100**

**Program area appeared in Invitation of FY 05 for the first time.*

Synopsis of Management Applications

The top priorities for Management Applications (Szarzi and Willette) are expected to supplement and complement an existing Watershed project (Walker FY04) and to meet a gap in Watershed information identified in the Science Plan in the Kenai River. In addition the Willette project would also test sampling methods for juvenile salmon through a combination of independent methods, providing a benefit to management programs in salmon on a coast-wide basis. The benefits to management of Szarzi and Willette would be immediate as a forecasting tool and as a guide to sustainable harvest levels for salmon in the localities sampled. The next priority proposal (Logerwell) would continue an important time series of fish species (capelin, pollock) and physical factors (fronts, currents) that are expected to contribute to management decisions in the long-term. Both target species are important parts of the food web, and thus are expected to factor into the management of other species in ecosystem-based management.

Abstracts of Management Applications

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: **Logerwell-FY05-Productivity of capelin and pollock**

Project Title: Processes affecting the productivity of capelin and pollock in the Gulf of Alaska

Location: Kodiak Island

Proposer: Elizabeth Logerwell **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $32,700 **FY06:** $112,800 **FY07:** $66,900

Abstract:

The goal of our research is to understand the physical and biological processes affecting the productivity of capelin and pollock in the Gulf of Alaska. We will investigate physical processes, such as the formation of fronts that may drive spatial variability in zooplankton abundance and thus capelin and juvenile pollock feeding opportunities. We will investigate biological processes, such as competition between capelin and juvenile pollock, which can also impact feeding opportunities. Our work will also contribute to a growing time series on the physical and biological characteristics of capelin and pollock habitat and the potential for competition between the two. These data will eventually be applicable to understanding the influence of climate change on these populations. The study will be conducted in coordination with ichthyoplankton and juvenile fish surveys conducted in September 2005 and 2006 off the east coast of Kodiak Island.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Szarzi-FY05-Salmon Smolt Abundance

Project Title: Chinook and Coho Salmon Smolt Abundance in the Anchor River, Alaska

Location: Anchor River, Alaska

Proposer: Nicole Szarzi **Proposer Affiliation:** ADF&G

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $62,800 **FY06:** $59,200 **FY07:** $59,200

Abstract:

This project will provide the marking portion of a capture-recapture study to estimate abundance of Chinook and coho salmon smolt emigrating from the Anchor River annually from 2005 through 2007. Smolt of each species will be captured and marked each year. Non-EVOS funding of an adult weir will allow for recapturing marked adults in subsequent years. A subsample of Chinook and coho salmon smolt will be sacrificed for analysis of the concentration of marine derived nutrients (C, N, S isotopes) contained in the fish. This work will compliment several existing projects that will monitor adult Chinook and coho salmon escapements and estimate sport harvests, and measure marine derived nutrients and chemical and physical characteristics of the Anchor River watershed. Smolt abundance estimates will provide information to relate production of smolt to freshwater and marine habitats as well as adult escapement and exploitation rates.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: **Willette-FY05-Salmon Smolt Monitoring**

Project Title: Management Applications: Improving Preseason Forecasts of Kenai River Sockeye Salmon Runs through Smolt Monitoring - Technology Development

Location: Cook Inlet

Proposer: Mark Willette **Proposer Affiliation:** ADF&G

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $68,800 **FY06:** $65,900 **FY07:** $67,000

Abstract:

This project will develop and implement a smolt-monitoring program for Kenai River sockeye salmon as a tool for managing one of the largest and most accessible salmon stocks in Upper Cook Inlet. Sockeye salmon smolt population estimates will be used to develop preseason forecasts of run size for this stock. The Alaska Board of Fisheries has

specified that the Kenai River sockeye salmon run will be managed based upon preseason and inseason forecasts of run strength, and inriver escapement goals for this system vary as a function of these forecasts. This management structure causes relative uses of the resource by recreational, personal use, and commercial fishers to be strongly dependent on the accuracy of forecasts. The project will use two independent methods to estimate the population size of sockeye salmon smolt emigrating from the Kenai River watershed. GEM funding is requested to support estimation of smolt population size using mark-recapture methods. ADF&G funding will support estimation of smolt population size using side-looking sonar. During the first two years of the project, we will evaluate the accuracy and precision of our estimates and identify the methodology that provides the best estimate at the lowest cost. In the third year, we will implement this new method to estimate smolt population size. The project will also estimate the proportion of marine-derived elements in smolts, beginning a database needed to evaluate the effect of marine nutrient contributions on salmon production in this and other systems.

Watersheds

Introduction

Most coastal watersheds in south-central Alaska and elsewhere in the North Pacific are thought to be heavily influenced by marine nutrients (MDN) and carbon carried inland by animals such as salmon, river otters, bald eagles, and harlequin ducks. Yet, very little is actually known about the extent of this influence, and no monitoring programs currently measure marine effects. Without MDN information, human non-point source pollution often cannot be distinguished from natural events such as the effects of salmon spawning. Commercial and recreational fisheries for salmon are at risk of curtailment without MDN information, since the actual degree of dependence of potentially threatened or endangered terrestrial mammals, such as brown bear, on marine sources is not known, but is now presumed to be high. Without adequate measures and routine monitoring of MDN, regulations to reduce pollution and lower risks to listed species may be unnecessarily injurious to the economy, ineffectual, or both. Understanding of past oil spill injuries would be enabled and future oil related injuries would be more readily diagnosed.

The initial focus of the GEM watershed program is to conduct research on how to measure the known marine related indicators: stable isotopes of carbon, nitrogen and sulfur (C, N, S) and proxies for marine related sources of nutrients and food, such as standard water quality indicators (nitrates, ammonium). Answers are needed to the following questions: What are the best indicators? Are C, N, and S equally useful as indicators of marine linkages in all types of watersheds? Are concentrations of nitrates and ammonium in freshwater suitable proxies for stable isotopes? Are there other suitable proxies for marine-related indicators? What is the variability of marine related indicators in bodily tissues among species within watersheds? Which species or species guilds are best suited to measuring marine linkages? How do suitable species vary among different types of watersheds, i.e., heavily forested, anadromous, non-anadromous, recently

glaciated, heavy human development, pristine, and so forth? What are the indicators of terrestrial influences in nearshore marine environments?

Table of Watershed Projects

Watersheds	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Finney-FY04-Marine-terrestrial Linkages	$79,197	$80,154	$81,117	
Heintz-FY04-Energy Allocation	$48,400	$42,300	$14,000	
Honnold-FY04-Marine-derived Nutrients on Sockeye Salmon	$83,200	$82,400	$86,800	
Walker-FY04-Marine Derived Nutrients	$169,000	$153,400	$149,700	
Woody-FY04-Nutrient-Based Resource Management	$173,216	$177,002	$152,632	
Total Obligated for Approved Projects	**$553,013**	**$535,256**	**$484,249**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Cooper-FY05-Community-based Sampling		$102,500	$86,000	$96,900
Totals for Projects Under Consideration		**$102,500**	**$86,000**	**$96,900**
Grand Total (Approved and Under Consideration)	**$553,013**	**$637,756**	**$570,249**	**$96,900**

Synopsis of Watershed Projects

The addition of the Cooper project in FY 2005 will add community based water quality sampling to the watershed program. It is recommended as a priority for funding in FY 2005 because it is a valuable addition of community-based sampling for the Watershed funding package passed by the Council last year. Community-based sampling is a basic strategy adopted by the Trustee Council to reduce the costs of long-term monitoring projects.

The watershed projects represent a well coordinated and integrated package of research to be conducted throughout the spill affected areas that will lead to the implementation of an initial GEM watershed monitoring program in FY 2007 (Finney, Heintz, Honnold, Knudsen, and Walker). Geographic coverage is provided for a broad variety of coastal watersheds adjacent to Prince William Sound (Knudsen), Cook Inlet (Walker and Heintz), and Kodiak (Finney and Honnold). All recommended projects

except Heintz offer to study stable isotopes as indicators of terrestrial-marine linkages. However, the studies offer complementary coverage of different types of watersheds (lake-bearing, peat wetlands, glacial runoff), localities within and nearby watersheds (headwaters, mid-reaches, mouth, delta and nearshore), resident and anadromous fish species, measures of water quality, limnological observations and primary productivity. All projects incorporate community based sampling strategies to some extent, however the since the Trustee Council chose not to fund the Cooper proposal, the Walker-Heintz projects have been left with a diminished community involvement component, and only the Finney-Honnold projects are incorporating an existing water quality monitoring program into their study plans. The Heintz project alone is expected to provide near-term management applications through measures of the allocation of marine derived resources among growth and bodily structures of fish that can be used to understand survival. Survival of species is basic information for fishery managers.

Taken together, the watershed projects will provide enough information in three years (FY 2004 – FY 2006) to design sampling for terrestrial-marine linkages that would lead to a call for proposals for a GEM watershed monitoring program in FY 2007. As pointed out in the Science Plan, the current understanding of terrestrial-marine linkages and how to measure them is not well developed enough to expect that the final monitoring program would be initiated in FY 2007, but at least enough should be known before then to permit a useful body of systematic observations to be identified. Research and modeling may be needed for an additional decade before the final GEM watershed monitoring program can be put in place.

Abstracts of Watershed Projects

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Cooper-FY05-Community-based Sampling

Project Title: Community-based Sampling of Watershed-based and Marine-derived Nutrients

Location: Kachemak Bay and Anchor, Kasilof and Kenai River waterhseds

Proposer: Joel Cooper **Proposer Affiliation:** Cook Inlet Keeper

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $102,500 **FY06:** $86,000 **FY07:** $96,900

Abstract:

In Southcentral Alaska, healthy watersheds support the region's economic, social and cultural well-being. Cook Inlet Keeper's community-based water quality monitoring program has proved to be an efficient and cost-effective way to collect important baseline data and increase public involvement in natural resource management. Keeper will coordinate with other groups conducting nutrient sampling throughout Southcentral

Alaska and expand its community-based monitoring program to include watershed-based and marine-derived nutrient sampling to test the following hypotheses: 1) Certain nutrients, like ammonium, are useful proxies for determining levels of marine-derived nutrients in coastal watersheds; 2) Marine-derived nutrient levels in aquatic and riparian food webs vary seasonally related to salmon influx; 3) Community-based sampling of watershed-based and marine-derived nutrients is an efficient and cost-effective way to meet GEM research goals, increase public understanding of public resources, and promote sound resource management.

Project: Finney-FY04-Marine-terrestrial Linkages

Project Title: Marine-terrestrial Linkages in northern GOA Watersheds: Towards Monitoring the effects of Anadromous Marine-derived Nutrients on Biological Production

Location: Karluk Lake, Spiridon Lake, Kodiak, Alaska

Proposer: Bruce Finney **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG

Funding Levels:

FY04: $79,197 **FY05:** $80,154 **FY06:** $81,117

Abstract:

The proposed project is a comprehensive study to be done in conjunction with the Honnold project examining the role of marine-derived nutrients (MDNs) in the productivity of a sockeye nursery lake ecosystem. The research plan integrates studies of nutrient cycling, primary productivity, zooplankton dynamics, and juvenile sockeye abundance and growth, within a framework of stable isotope natural abundance. The study sites are an ideal pair, very similar in characteristics except for access by spawning salmon (anadromous Karluk Lake and control Spiridon Lake). The project will take advantage of the wealth of previous research including relatively long-term limnological data for both sites. Based on previous work, signals from MDNs are anticipated to be relatively strong, which will help elucidate nutrient pathways. The research design is the first to utilize detailed vertical and temporal sampling of the water column, coupled with measurements of rates of primary productivity, and fully integrated stable isotope analyses, with contemporaneous sampling in a well-matched pair of salmon and control lakes. The overall goal of this project is to provide the framework for designing monitoring projects to detect changes in marine terrestrial linkages in Gulf of Alaska sockeye.

Project: Heintz-FY04-Energy Allocation

Project Title: The Influence of Adult Salmon Carcasses on Energy Allocation in Juvenile Salmonids

Location: Kenai Peninsula

Proposer: Ron Heintz **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $48,400 **FY05:** $42,300 **FY06:** $14,100

Abstract:
This proposal seeks to examine the effect of adult salmon carcasses on the energy allocation in juvenile salmon. Juvenile salmon allocate energy between the competing demands of growth and energy storage to minimize exposure to predation while forestalling starvation over winter. This proposal will contrast annual energy dynamics in age-0 Dolly Varden from Kenai Peninsula streams with and without salmon carcasses present. Fatty acid analysis will be used to identify marine signal strength and persistence in the lipids of the juveniles. The investigators will combine proximate and lipid class analyses to determine the proportions of their total energy allocated to storage versus structure, and examine how seasonal variation in allocation differs among streams and carcass densities. They also will examine the influence of carcasses on growth rate and the relation between growth and energy allocation.

Project: Honnold-FY04-Marine-derived Nutrients on Sockeye Salmon

Project Title: Monitoring the Effects of Anadromous Marine-derived Nutrients on Sockeye Salmon

Location: Kodiak Island, Alaska

Proposer: Steve Honnold **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $83,200 **FY05:** $82,400 **FY06:** $86,800

Abstract:
We propose to work in conjunction with the Finney project to comprehensively examine the role of MDN in sockeye salmon nursery lake ecosystem productivity by integrating studies of nutrient cycling, primary productivity, zooplankton dynamics, and juvenile sockeye abundance and growth, within a framework of stable isotope natural abundance. The project will take advantage of previous research including relatively long-term limnological data for Karluk Lake on Kodiak Island. We will utilize detailed vertical and temporal sampling of the water column, coupled with measurements of rates of primary

productivity, and fully integrated stable isotope analyses, with contemporaneous sampling in a well matched pair of salmon (Karluk) and control (Spiridon) lakes. We propose to determine the extent to which the functioning and productivity of watersheds depends on marine-nutrient inputs and how this marine-terrestrial linkage can be better detected and understood. The overall goal of this project is to provide the framework for designing monitoring projects to detect changes in marine terrestrial linkages in Gulf of Alaska sockeye watersheds.

Project: Walker-FY04-Marine Derived Nutrients

Project Title: Presence and Effects of Marine Derived Nutrients (MDN) in Stream, Riparian and Nearshore Ecosystems on Southern Kenai Peninsula, Alaska

Location:

Proposer: Coowe Walker **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $169,000 **FY05:** $153,400 **FY06:** $149,700

Abstract:

Marine derived nutrients and carbon (MDN) delivered by salmon and other anadromous fishes are considered important drivers in riverine ecosystems, providing nutrients and food to these land-based food webs. However, we know little about the relative value of MDN compared to other nutrient and carbon sources (e.g., watershed-derived) in the Gulf of Alaska region. The objectives of this study are to develop a water chemistry proxy for monitoring salmon returns, and to track and measure MDN effects in stream, riparian and nearshore environments, on the southern Kenai Peninsula. We will accomplish this by linking stream chemistry, marine isotope signatures, marine terrestrial fatty acid ratios, and key animal and plant community density, growth, and lipid measures along a gradient from river mouth to headwaters in key watersheds. This study will be integrated with related studies proposed in other areas of southcentral Alaska to develop a broader retinal understanding and widely-applicable long-term monitoring program for the GEM region.

Project: Woody-FY04-Nutrient-Based Resource Management

Project Title: Research for Nutrient-Based Resource Management in Watersheds and Estuaries

Location: Prince William Sound

Proposer: Carol Woody (Eric Knudsen) **Proposer Affiliation:** DOI

Disbursing Agency: DOI

Funding Levels:

FY04: $173,216 **FY05:** $177,002 **FY06:** $152,632

Abstract:

Proposal offers a strategy for developing a monitoring program for watersheds that would form the basis for a comprehensive understanding of water quality and biological production in relation to natural and human induced variability. Sampling strategy effectively leverages existing funding from Oil Spill Recovery Institute and North Pacific Research Board to minimize costs. Data derived on isotopic signatures of C, N, and S will be invaluable in designing monitoring throughout the GEM area. Important new information would be produced on effects of watersheds on productivities of nearshore environments, the feasibility of using sulfur as indicator of marine related effects, and the relation of MDN to freshwater residence time in juvenile salmon.

Community Involvement

Introduction

Meaningful public and community participation has long been an essential part of the Trustee Council's process and an essential strategy for implementing the GEM Program (GEM Program Document, Chapters 1 and 3; NRC 2002). Current and future GEM monitoring projects are encouraged to have a strong community involvement component whenever possible. Comprehensive strategies for incorporating community involvement in GEM projects are being developed now under GEM Project 030575 (GEM Program Community Involvement/Community-Based Monitoring Plan) for the Council's consideration in the fall of 2003. The report is expected to provide the basis for a thorough examination of the role of community involvement in the GEM program to be conducted by the executive Director during FY 2004. Until that examination is completed and the recommended community involvement approach reviewed, and adopted by the Council, only three specific community involvement projects are being recommended.

The report on approaches to community involvement commissioned by the Trustee Council in FY 2003 will not be available until the end of September 2003. The report is expected to provide the basis for a thorough examination of the role of community involvement in the GEM program to be conducted by the Executive Director during FY 2004. Until that examination is complete funding of community involvement projects will be based on responsiveness to the criteria in the FY 04 Invitation, past performance and future utility for implementing the GEM program.

Table of Community involvement Projects

Alaska Coastal Current	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Adams-FY04-Fisheries Management	$46,760	$0	$0	

DeLorenzo-FY04-Youth Area Watch	$121,100	$126,400	$133,200	
Schneider-FY04-Kodiak Archipelago	$63,000	$63,000	$63,000	
Total Obligated for Approved Projects	**$230,860**	**$189,400**	**$196,200**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area.				
Baird-FY05-Connecting with Coastwalk		$28,900	$20,300	$11,900
Grand Total (Approved and Under Consideration)	**$230,860**	**$218,300**	**$216,500**	**$11,900**

Synopsis of Community Involvement Projects

The community involvement projects contribute directly to the Trustee Council objectives of 1) involving communities in the oil spill affected area in decisions on the questions addressed and the projects implemented (Baird), and 2) involving members of the community in collecting long-term data sets relevant to the Science Plan (Schneider, DeLorenzo). In FY 2005 the Baird project will start the process of making a long standing community-based time series of Nearshore observations available to other projects of the Council's Nearshore program for a modest amount of funding (Baird) was also favorably received by peer reviewers this year. Baird is recommended for funding as a community-based supplement to Nearshore sampling efforts.

Abstracts of Community involvement Projects

Project: Adams-FY04-Fisheries Management

Project Title: Fisheries Management Applications - Submitted under the BAA

Location: Prince William Sound

Proposer: Kenneth Adams **Proposer Affiliation:** Private Enterprise

Disbursing Agency: NOAA

Funding Levels:

FY04: $46,760 **FY05:** $0 **FY06:** $0

Abstract:

The proposal is submitted under the category of Community Involvement. The project, begun in March of FY–02, will continue to build bridges between the scientific community and resource managers, enhancement programs, subsistence and other stakeholder user groups. The scientific community is describing and attempting to predict variation in biological production whereas, the commercial fishing community desires application for this new information. We will develop a Mini-Symposium of the annual GEM workshop for presentation in small communities. We will also continue the

successful series of workshops created in Cordova for identification of PWS fishery community issues and needs and will seek resolution of the identified issues and needs by application of EVOSTC supported research. The results contained in the Sound Ecosystem Assessment (SEA) program are especially valuable to this process. This project provides clear and positive opportunities for the resource dependent community to become involved in GEM and can also help identify how products of GEM can be made meaningful to the community.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Baird-FY05-Connecting with Coastwalk

Project Title: Connecting with Coastwalk: Linking Shoreline Mapping with Community-based Monitoring

Location: Kachemak Bay

Proposer: Steve Baird **Proposer Affiliation:** ADF&G

Disbursing Agency: ADFG

Funding Recommendations:

FY05: $28,900 **FY06:** $20,300 **FY07:** $11,900

Abstract:

The project will evaluate and merge citizen-generated biological and human impact data collected over 20 years of an annual Kachemak Bay CoastWalk shoreline survey with high-resolution mapping of the physical structure of the nearshore environment in Kachemak Bay that nests geographically within ShoreZone mapping. Evaluation of data and data collection protocols and the geographic alignment of CoastWalk zones with ShoreZone units and KBRR's shoreline segments will occur during Year 1. Citizen-based data collection efforts aligned with GEM nearshore monitoring SOPs and methods will be pilot-tested in Kachemak Bay. During Year 2, a Kachemak Bay community/scientist workshop will be held to further integrate and synthesize local information into the Kachemak Bay Research Reserve GIS and to apply the GIS results to the selection of nearshore monitoring sites for community-based monitoring. Piloting will continue, with emphasis on involvement of K-12 teachers and students. During Year 3, nearshore monitoring data collection and data management will be further refined and a WEB site and data entry interface developed. This project will advance the development of a community-based nearshore monitoring program for the GEM program.

Project: DeLorenzo-FY04-Youth Area Watch

Project Title: Youth Area Watch

Location: PWS, Kenai Peninsula

Proposer: Richard DeLorenzo **Proposer Affiliation:** Local Government

Disbursing Agency: ADFG

Funding Levels:

FY04: $121,100 **FY05:** $126,400 **FY06:** $133,200

Abstract:

This project links students in the oil spill impacted area with research and monitoring projects funded by the Trustee Council and outside agencies. Youth conduct research identified and delegated by principal investigators who have indicated interest in working with students. The project involves students in the acquisition and monitoring of oceanographic and meteorological data over time. Students also develop a local restoration project, which provides them the skills to participate in community-based science. Youth Area Watch fosters long-term commitment to the goals set out in the restoration plan and is a positive community investment in that process. Participating communities in FY 04-06 will be Chenega Bay, Cordova, Seward, Tatitlek, Valdez and Whittier.

Project: Schneider-FY04-Kodiak Archipelago

Project Title: Kodiak Archipelago Youth Area Watch

Location: Kodiak Archipelago

Proposer: Teri Schneider **Proposer Affiliation:** Local Government

Disbursing Agency: ADFG

Funding Levels:

FY04: $63,000 **FY05:** $63,000 **FY06:** $63,000

Abstract:

The Kodiak Archipelago Youth Area Watch is an ongoing community involvement project designed to engage students in projects with goals aligned with the general restoration efforts of the Trustee Council. Students and site coordinators will conduct interviews with local experts and document TEK, publishing it in a District oral history magazine. Participation of KAYAW adults and students in the annual Academy of Elders/Science Camp will be strongly encouraged. Participants will share their research during annual gatherings. Such participation will serve as another avenue for more tribal members to learn about restoration efforts, scientific monitoring techniques, and occupations related to such work. Students will explore local knowledge as it relates to

marine mammal populations, inter-tidal environment, impact of humans on the coastal environment, human use overtime and intergenerational changes and cultural beliefs and practices that may provide insight in scientific studies. The value and implications of TEK will be strongly emphasized throughout the implementation of the KAYAW project.

Data Management

Introduction

The Data Management and Information Transfer component of GEM includes the following functions: data receipt, quality control (QC), storage and maintenance, archiving and retrieval, administrative support, and the systems necessary to automate as many of these procedures as possible. This component also includes programs needed to create the custom data and information products that will be provided to the modeling and applications components, and to the users of this information. Data Management and Information Transfer provides the essential function of extracting the full scientific and societal benefits from GEM projects (NRC 2002; GEM Program Document, Chapter 9). Data generated by GEM projects need to be converted into useful information that is readily available in a timely fashion to the scientific communities, resource managers, resource dependent people and their communities, policy makers, and other members of the public. In addition, data sets and information regarding other research and monitoring activities in the GEM region must be readily accessible to EVOS staff and contractors, GEM committees and working groups (if any), state and federal resource agencies, and concerned members of the public in order to facilitate gap analysis during project selection and implementation, and maximize the use of all data collected (GEM Program Document, Chapter 3).

Synopsis of Data Management Projects

The data management projects directly further GEM objectives by building a database of metadata describing marine related databases from the northern Gulf of Alaska relevant to GEM (Macklin) and by implementing a pilot project to apply the Ocean Biological Information System (OBIS) within the GEM Region (Kiefer). Both the metadatabase and OBIS projects are designed to make GEM data and the data of other sources needed by the GEM model and other projects readily and cheaply accessible. OBIS is a national standard for making primarily biological data collected by agencies available, and the metadatabase project builds on a companion effort already funded by NOAA and the NPRB.

The third data management project brings together and makes accessible much of the shoreline mapping data sets that have been gathered by GEM, Cook Inlet Regional Citizens Advisory Council, and others (Saupe). Developing coordination among shoreline mapping efforts and making information about all the data accessible in one place on the web was recommended by a GEM sponsored workshop earlier this year.

Table of Data Management Projects

Data Management — ***Funding***

Trustee Council Approved Projects	FY 2004	FY 2005	FY 2006	FY 2007
Kiefer-FY04-Alaskan Groundfish Feeding Ecology	$80,900	$0	$0	
Macklin-FY04-NGOA Metadatabase	$100,600	$0	$0	
Saupe-FY04-Habitat Web Site	$21,100	$0	$0	
Total Obligated for Approved Projects	**$202,600**	**$0**	**$0**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Totals for Projects Under Consideration		**$0**	**$0**	**$0**
Grand Total (Approved and Under Consideration)	**$202,600**	**$0**	**$0**	**$0**

Abstracts of Data Management Projects

Project: Kiefer-FY04-Alaskan Groundfish Feeding Ecology

Project Title: Alaskan Groundfish feeding Ecology: An OBIS Information System

Location: GOA, Aleutian Islands, Bering Sea

Proposer: Dale Kiefer **Proposer Affiliation:** Private Enterprise

Disbursing Agency: NOAA

Funding Levels:

FY04: $80,900 **FY05:** $0 **FY06:** $0

Abstract:

We propose to develop an OBIS data server node containing information characterizing the distribution and feeding ecology of Alaskan groundfish in relation to environmental parameters. Capitalizing upon our experience as participants in several OBIS projects and using established OBIS tools and protocols for Web-based access to biogeographic datasets, this information system will archive, analyze, and provide a means to distribute via the Internet information on the spatial and temporal distribution of a large number of groundfish and associated prey species sampled in the Gulf of Alaska, Aleutian Island waters, and the Bering Sea by NMFS Alaska Fisheries Science Center (AFSC). This biogeographic information system will include data on the gut contents of specimens as

well as environmental information characterizing the habitats of the species. These datasets provide a biogeographic description of groundfish distribution and dynamics in relation to habitat structure and environmental variability. They also provide a detailed account of interspecific and environmental interactions that are integral to ecosystem-based fisheries assessment and management approaches. Biological databases used in this project will derive from AFSC, while environmental information will come from databases at the Pacific Marine Ecological Laboratory, AFSC and other sources such as the Institute of Marine Science, University of Alaska Fairbanks. Datasets employed are diverse in nature, and will include satellite imagery, hydrographic and fishery surveys data. The information system will address the problem of integrating multivariate data that has been collected on differing spatial and temporal scales. It will also provide GIS tools to analyze, visualize, and disseminate information according to OBIS technical protocols. Our goal is to develop a pilot system that will not only augment OBIS, but also characterize the habitat and behavior of Alaskan groundfish, and provide a model of how the integration of environmental information can aid in the assessment of marine resources.

Project: Macklin-FY04-NGOA Metadatabase

Project Title: A Comprehensive, Web-accessible, Geo-referenced Metadatabase of Marine-related Physical and Biological Databases of the Northern Gulf of Alaska

Location: Seattle, WA

Proposer: S. Allen Macklin **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $100,600 **FY05:** $0 **FY06:** $0

Abstract:
This project will adapt for GEM purposes the North Pacific Ecosystem Metadatabase (NPEM, http://www.pmel.noaa.gov/np/mdb/) that has served information via the World-Wide Web since 1998. The adaptation will be a web-accessible metadatabase of marine science databases of the northern Gulf of Alaska. Appropriate records from the NPEM will be transferred to the GEM metadatabase, and additional records pertaining to GEM, PICES, NPRB, UAF/IMS, GLOBEC, FOCI, and similar research efforts will be added. Metadata will be coded to the FGDC standard using the 26 elements specified by MetaLite. As possible, metadata will include thematic, semantic and syntactic descriptors. This utility will include filtering capabilities to extract from existing metadata records those specific to the regions, habitat types, and subject areas defined by the working concepts of the GEM Science Plan. Compound searches of the metadatabase will allow selection of records by time, space, keyword, text string, etc., and results will be ranked according to their agreement with the search criteria. Work will be accomplished over a three-year period in Seattle, Washington.

Project: Saupe-FY04-Habitat Web Site

Project Title: Alaska Coastal Habitat Web Site

Location: Kenai Peninsula including Kachemak Bay and outer coast

Proposer: Susan Saupe **Proposer Affiliation:** NGO

Disbursing Agency: NOAA

Funding Levels:

FY04: $21,100 **FY05:** $0 **FY06:** $0

Abstract:
This proposal is to develop an Alaska Coastal Habitat Web Site based on several products currently being produced using ShoreZone Mapping techniques. This proposal will tie together several components in a user-friendly, web-accessible format. In a recent workshop hosted by EVOS and attended by personnel from local, state, and federal agencies, universities, and not-for profit organizations, participants strongly endorsed a coordinated process for continuing coastal mapping and the wide-spread distribution of data through web accessibility. The group also emphasized that the data should be provided in a user-friendly way that will facilitate use by the general public.This proposal outlines a plan to (a) make recently collected ShoreZone data immediately web-accessible, (b) combine ShoreZone mapping data with the existing Gulf of Alaska Coastal Imagery web site, and © combine ShoreZone mapping data with detailed site-specific data for various habitats and descriptions of biological assemblages and species.The project will be coordinated by the Cook Inlet RCAC through a subcontract to Coastal and Ocean Resources, Inc. (CORI) who developed the ShoreZone techniques and who is currently conducting various ShoreZone mapping projects in the GEM area. CORI is located in Sidney, British Columbia, where much of the work will be conducted. The Public Outreach development portion will be conducted in Kenai at the Cook Inlet RCAC offices and community visits will take place at various places on the Kenai Peninsula as well as to resources agencies in Anchorage.

Alaska Coastal Current

Introduction

Much of the Gulf of Alaska is a very deep (circa 4000m) reservoir of salty water bearing carbon and nutrients that would fuel biological production if transported to the surface waters of the GEM habitat types. Paradoxically, the ocean processes such as

thermohaline circulation and upwelling that transport deeper waters toward the relatively shallow depths appear to be absent or short-lived in the northern Gulf. The opposite condition from upwelling, coastal downwelling, is usually the case in the Gulf, particularly in winter. It is known that cross-shelf, surface Ekman transport in winter cannot account for the high nutrient concentrations observed on the inner shelf in spring (Childers 2000, Whitledge 2000). Other mechanisms are possible. In summer, when downwelling relaxes, salty, nutrient-rich water from offshore invades the inner shelf (Royer 1975), but the annual extent of the invasion varies and may be controlled by forces with periods of approximately two decades (Parker et al. 1995). Vertical mixing is strong through the winter and redistributes fresh water, salt and possibly nutrients throughout the water column, so a combination of mechanisms is possibly involved in the annual nutrient re-supply to the inner shelf (GEM Program Document, Chapter 7.6.4).

Even though upwelling appears to occur only briefly in the Gulf (GEM Program Document, Chapter 7.6.2, Royer 1982, 2000, Reed and Schumacher 1986), the northern and western Gulf and adjacent waters are nonetheless highly productive of benthic, pelagic and littoral vertebrates (fish, birds and mammals) and benthic invertebrates such as crustaceans and mollusks (i.e. Feder and Jewett 1986, Cooney 1986, Martin 1997, Witherell 1999, Kruse et al. 2000, Rogers et al. 1986, Highsmith et al. 1994, Purcell et al. 2000, Rooper and Haldorson 2000). Solving the mystery of the missing ecological mechanisms is essential to explain how the ingredients necessary for biological production of plants and animals (nutrients and food) are transported to be converted into the populations of fish, shellfish, birds, and mammals that are the centers of attention for natural resource management agencies and coastal economies.

A reasonable working solution to the mystery of the missing ecological mechanisms starts with the processes that change the strength of the factors driving the currents of the region (GEM Program Document, Chapter 7.6.4). Both the area of the ACC and adjacent shelf and slope are strongly affected by advection (mostly horizontal transport of momentum, energy, and dissolved and suspended materials by ocean currents), implying that climate perturbations, even those occurring far from the GEM study area, can be efficiently communicated into the northwestern GOA by ocean circulation (GEM Program Document, Chapter 7.6.2, p. 130). The strong advection also implies that processes occurring as far upstream as the northwestern contiguous United States might substantially influence biological production within the GEM habitat types.

Table of ACC Projects

Alaska Coastal Current	Funding			
Trustee Council Approved Projects	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**
Batten-FY04-CPR data	$135,200	$135,200	$135,200	
Bechtol-FY04-Parameters in the N. Gulf of AK	$37,600	$56,100	$56,000	
Cokelet-FY04-AK Marine Highway System Ferries	$171,500	$185,900	$145,900	
Okkonen-FY04-Monitoring Program in the NE Pacific Ocean	$27,289	$30,366	$31,455	

Weingartner-FY04-Alaska Coastal Current	$80,387	$75,482	$75,482	
Willette-FY04-Monitoring ACC Dynamics	$89,800	$68,000	$27,900	
Total Obligated for Approved Projects	**$610,778**	**$551,048**	**$471,937**	
Under consideration for Trustee Council funding 8/23/2004 in order of priority within program area				
Matkin-FY05-Monitoring Killer Whales 2005-2007		$20,500	$22,300	$23,800
Weingartner-FY04-Alaska Coastal Current*		$6,200	-$10,500	
Totals for Projects Under Consideration		**$26,700**	**$11,800**	**$23,800**
Grand Total (Approved and Under Consideration)	**$610,778**	**$577,748**	**$483,737**	**$23,800**

Notes * Weingartner-FY04-Alaska Coastal Current has requested an increment of $6.2 K for 2005 and a decrement of 10.5 K for 2006.

Synopsis of ACC Projects

GEM is now making progress by measuring the biological and physical variables that are needed to solve the mystery of the missing ecological mechanisms that transfer nutrients from the Gulf of Alaska coastward to the watersheds. These basic physical and biological observations are being acquired for relatively low cost because most of the work now underway in the Alaska Coastal Current also responds to the top priority of the Science Plan by using ships of opportunity that do not charge for carrying oceanographic instruments (Batten, Cokelet, Okkonen). Ships of opportunity are being used by GEM to document annual changes in the distributions, species composition and relative abundance of plankton (Batten) and physical and chemical conditions on the surface including temperature, salinity, fluorescence and nitrates in the Gulf of Alaska from coastal waters to the central gyre (Cokelet, Okkonen). The Alaska Marine Highway System has joined GEM as a partner by providing the ferry *Tustamena* as a platform for observations (Cokelet), and Polar Tankers continues as a partner by carrying a thermosalinograph on a vessel operating between Valdez and Long Beach. The scarcity of observations from below the surface continues to be a major challenge for GEM. Nonetheless, temperature, salinity at depth and shallow fluorescence in coastal waters are being observed from a mooring at Seward Line Station One (GAK1), which is the second oldest continuous set of subsurface observations in the North Pacific (Weingartner).

The Willette project in the Alaska Coastal Current provides the combination of a management application in salmon fisheries regulation with the opportunity to take basic physical oceanographic measurements that can define the northern extent of the intrusion of the Alaska Coastal Current into Cook Inlet in the summer. By matching the catch in the sockeye salmon fishery and the counts of escapement to sample catches, currents,

temperature and salinity from the Willette research vessel, the project is designed to give advice to fishery regulators on when to open and close salmon fisheries in central Cook Inlet.

Although observations of upper trophic level vertebrates are not a priority established in the Science Plan for the ACC, leveraging of funds from partners is one of GEM's programmatic goals, and building on established time series is a pragmatic strategy. For these reasons, continuation of the killer whale time series (Matkin) for a very nominal price is a bargain, and a welcome opportunity.

Taken as a whole, the ACC projects provide the starting point for the backbone of long-term biological and physical observations to drive the GEM biophysical modeling effort recommended for funding below. The backbone to be provided by the GEM ship of opportunity projects is as yet incomplete, lacking extensive coverage in Prince William Sound. The full implementation of the GEM ACC monitoring program must go hand in glove with the development of the GEM Model (see Modeling section below), since the exact placement of moorings, cruise transects and other monitoring platforms depends on the questions to be answered and the precision desired in the answers, which can only be understood through modeling. The data provided by GEM ACC projects will be invaluable in getting the models to the point where they can be used to advise and inform the implementation of the full GEM ACC monitoring program, perhaps in FY 2010, depending on the support provided by the Integrated and Sustained Ocean Observing System (IOOS).

The challenge for GEM in the ACC in FY 2007 and beyond is to complete the basic geographic coverage of surface measurements for the spill affected area. Reliable long term coverage of basic physical and biological variables is essential to understanding changes in salmon and herring resources in Prince William Sound, as well as fluctuations of bird and mammal populations in the northern Gulf.

Abstracts of ACC Projects FY 2004 - 2007

Project: Batten-FY04-CPR data

Project Title: Acquisition and Application of CPR data in the Gulf of Alaska - Submitted under the BAA

Location: Alaskan shelf and Gulf of Alaska

Proposer: Sonia Batten **Proposer Affiliation:** Non Alaskan University

Disbursing Agency: NOAA

Funding Levels:

FY04: $135,200 **FY05:** $135,200 **FY06:** $135,200

Abstract:

Plankton are a critical link in the marine food chain that respond rapidly to climate change and form the link between the atmosphere and upper trophic levels. Many important marine resources in the GoA are strongly influenced by changes in ocean climate. Recent CPR data have shown significant changes occurring in all plankton

communities in the GoA, associated with the recent climate shift. We will continue the acquisition of CPR data in the Gulf of Alaska on the current transect that crosses the ACC and add an additional transect in FY05 that will sample the ACC further 'downstream' and provide baseline, seasonal plankton data for the lower Cook Inlet and it's transition to the Gulf of Alaska. We also propose analysis of data already collected to investigate the links between plankton and juvenile salmon migrations, and the larval distribution of commercially important decapods sampled by the CPR.

Project: Bechtol-FY04-Parameters in the N. Gulf of AK

Project Title: Monitoring Ecosystem Parameters in the Northern Gulf of Alaska

Location: Kachemak Bay, Cook Inlet

Proposer: William Bechtol **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $37,600 **FY05:** $56,100 **FY06:** $56,000

Abstract:

This project will refine long-term monitoring of forage species populations in Cook Inlet, an area representative of ecosystem conditions and changes in the northern Gulf of Alaska. Finfish and shellfish will be sampled annually in May with a small-mesh, bottom trawl to determine whether competitive and predatory interactions or different responses to the environment may be favoring the abundance of one species over another. Project funding includes mounting a thermosalinograph on the survey platform to collect surface temperature and salinity data during all fieldwork conducted by the survey vessel throughout the calendar year. Products will include annual reports, presentations at scientific meetings, and a manuscript submission to a peer-reviewed journal. Project data will be also made available to other researchers to facilitate broader ecosystem modeling for the Gulf of Alaska. The study will incorporate community outreach and education involving local science classes in the collection of field data.

Project: Cokelet-FY04-AK Marine Highway System Ferries

Project Title: Biophysical Observation aboard Alaska Marine Highway Systems Ferries

Location: Alaska Coastal Current, Prince William Sound

Proposer: Edward Cokelet **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $171,500 **FY05:** $185,900 **FY06:** $145,900

Abstract:

The Alaska Coastal Current flows counterclockwise along the edge of the Gulf of Alaska carrying the river runoff, nutrients and plankton that fuel the productive coastal-marine ecosystem. As seen in satellite images, a strong "chlorophyll front" develops in summer between the nutrient-poor region to seaward and a productive region around Kodiak

Island that extends northward to the Kenai Peninsula. Conventional wisdom predicts that the Gulf ecosystem should not be productive because the average wind pattern favors downwelling oceanic conditions that fail to restore nutrients to the sunlit upper layers. The chlorophyll front presents a natural study area over which low- and high-productivity regions lie in close proximity. The Alaska Marine Highway System ferry M/V Tustamena crosses this front over 280 times each year. We propose to instrument the Tustamena to measure physical and biological oceanographic parameters across the Alaska Coastal Current and in Prince William Sound. This will begin a GEM oceanographic monitoring program in the Gulf that will lead to understanding nutrient replenishment and document ecosystem trends for years to come.

THE PROJECT BELOW IS RECOMMENDED FOR FUNDING STARTING IN FY 05

Project: Matkin-FY05-Monitoring Killer Whales 2005-2007

Project Title: Monitoring of Killer Whales in Prince William Sound/Kenai Fjords in 2005-2007

Location: PWS, Kenai Fjord

Proposer: Craig Matkin **Proposer Affiliation:** North Gulf Oceanic Society

Disbursing Agency: NOAA

Funding Recommendations:

FY05: $20,500 **FY06:** $22,300 **FY07:** $23,800

Abstract:

This project continues monitoring of the damaged resident AB pod and other resident pods and the petitioned as depleted AT1 transient population into a cooperative program with additional collaborative support from the Alaska Sea Life Center, NMFS and various foundations. Monitoring has occurred on a yearly basis since 1984 and was crucial in evaluating the continuing effects from the oil spill. In addition, the role of killer whales in the nearshore ecosystem and possible effects on sea otters will be examined. Community based initiatives such as Youth Area Watch and tour operator educational programs will be integrated. New techniques such as lipid fatty acid analysis for food habit study and radio tagging will be explored and contaminant monitoring will continue. The proposed work will augment current research directed at transient killerwhales(ASLC) and provide for annual monitoring of AB pod and other resident pods. The project will be integrated with oceanographic monitoring as possible.

Project: Okkonen-FY04-Monitoring Program in the NE Pacific Ocean

Project Title: A Monitoring Program for Near-Surface Temp, Salinity, and Fluorescence Fields in the northeast Pacific Ocean: Transition to an Operational Program

Location: N. Gulf of Alaska

Proposer: Stephen Okkonen **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG
Funding Levels:
FY04: $27,289 **FY05:** $30,366 **FY06:** $31,455

Abstract:
This proposed project responds to the Gulf Ecosystem Monitoring and Research Program invitation category F.2. (Alaska Coastal Current / Collecting physical and biological observations from non-AMHS ships-of-opportunity). Funds are requested to continue (1) the maintenance and operation of a thermosalinograph (TSG) that was installed on the tanker vessel Polar Alaska in July 2002 and (2) the analyses of the collected data. The TSG was originally funded as a pilot project by the EVOS Trustee Council in FY02.

Project: Stabeno-FY04-Bottom Up Control

Project Title: Surface Nutrients over the Shelf and Basin in Summer - Bottom up Control of Ecosystem Diversity

Location: Yakutat to Kodiak Island/Shelikof of Strait

Proposer: Phyllis Stabeno **Proposer Affiliation:** NOAA

Disbursing Agency: NOAA

Funding Levels:

FY04: $49,500 **FY05:** $0 **FY06:** $0

Abstract:
This proposal is for continuation of Project 030654 funded in FY03. Our goal is to better understand the extraordinary variability of nutrients (spatial, interannual and decadal), and factors controlling nearshore communities and zooplankton and juvenile salmon distributions in the northern GOA. We propose monitoring nitrate over the shelf and basin. Underway samples will be collected as part of the NMFS-OCC/GLOBEC salmon survey in July/August of 2004. This survey includes a transit across the central GOA and 10 cross-shelf oceanographic and juvenile salmon transects from Yakutat to Kodiak Island. This will be the broadest nutrient survey of the northern GOA. Nutrient maps will be used to support NPZ models and satellite-derived models of nitrate and new production, to examine mechanisms of nutrient supply such as mixing over
banks and transport up submarine canyons, and to assist resource management of salmon and other commercially important species.

Project: Weingartner-FY04-Alaska Coastal Current

Project Title: Long-Term Monitoring of the Alaska Coastal Current

Location: Gulf of Alaska Shelf offshore of Resurrection Bay

Proposer: Thomas Weingartner **Proposer Affiliation:** Alaskan University

Disbursing Agency: ADFG

Funding Levels:

FY04: $80,387 **FY05:** $75,482 **FY06:** $75,482

Abstract:

This proposal is for monitoring temperatures, salinities, and spring bloom characteristics of the Alaska Coastal Current (ACC) from a mooring and monthly sampling at station GAK 1 near Seward. The project builds upon the 33-year record at this station. These data can predict ACC (baroclinic) transport anomalies so this variable is obtained indirectly. The results will be examined with respect to variations in terrestrial runoff and atmospheric heat fluxes. We will provide daily maps of satellite scatterometer-derived winds, make theses available to the public via a website, and archive them for future analyses. All variables affect biological production at higher trophic levels. The results have value for: interpreting continuous plankton recorder data to be obtained from ferries under GEM sponsorship, evaluating performance of numerical ocean circulation models, and conducting retrospective analyses of biological productivity. Logistics costs are shared with the NSF-NOAA funded GLOBEC program.

Project: Willette-FY04-Monitoring ACC Dynamics

Project Title: Monitoring Dynamics of the Alaska Coastal Current and Development of Applications for Management of Cook Inlet Salmon

Location: Cook Inlet

Proposer: Mark Willette **Proposer Affiliation:** ADFG

Disbursing Agency: ADFG

Funding Levels:

FY04: $89,800 **FY05:** $68,000 **FY06:** $27,900

Abstract:
This project will use a vessel of opportunity to collect physical oceanographic and fisheries data along a transect, across lower Cook Inlet from Anchor Point to the Red River delta. Logistical support for the field sampling will be provided in part by the Alaska Department of Fish and Game which has chartered a vessel annually to fish along this transect each day during July providing in season projections of the size of salmon runs returning to the inlet. The work proposed here is for long-term monitoring of oceanographic conditions in Cook Inlet as part of these ongoing fisheries surveys. Investigators will also use physical oceanographic data collected by the project to improve management of Cook Inlet salmon through improved in season salmon run projections. Several hypotheses regarding effects of changing oceanographic conditions on salmon migratory behavior will be tested. The oceanographic data collected by the project will also provide for valuable validation of remote sensing products, improved understanding of ocean dynamics in lower Cook Inlet, and a highly powerful statistical evaluation of the oil spill risk analysis models.

Appendix A. Disposition of FY 2005 Proposals

Twenty-nine proposals were received in response to the Invitation (Master Table Appendix A). The proposals were not evenly distributed across the areas of the Invitation, with the Nearshore including Lingering Oil Effects receiving the largest response (10), followed by Synthesis, Modeling and Management Strategies (4 each), Alaska Coastal current (3) and Community Involvement and Watersheds (2 each) (see Appendix Table below). Overall, most proposals received were directly responsive to the invitation. Proposals that passed peer review and were recommended for funding by the Executive Director for funding in FY 2004, but not funded, were invited their respective program areas.

Each proposal received a thorough and independent peer review in a two stage process (Table 1 App. A). In the first stage, the proposals were reviewed for technical competency by volunteers drawn from a world wide pool of scientists and other professionals who have agreed to help the GEM Program. Reviewers were recruited at scientific meetings and they submitted their credentials through an automated web-based process to a database of peer review services. In the second stage, each proposal received additional review for technical competency and relevance to the GEM Program by the Scientific Advisory Committee with the assistance of Dr. Robert Spies, Chair, Lingering Oil Subcommittee and Mr. Rob Bochenek, EVOSTC Data Systems Manager. At the end of the two-stage review process, each proposal had been read by at least two qualified persons, and some proposals were read by as many as eight reviewers (Table 1 App. A).

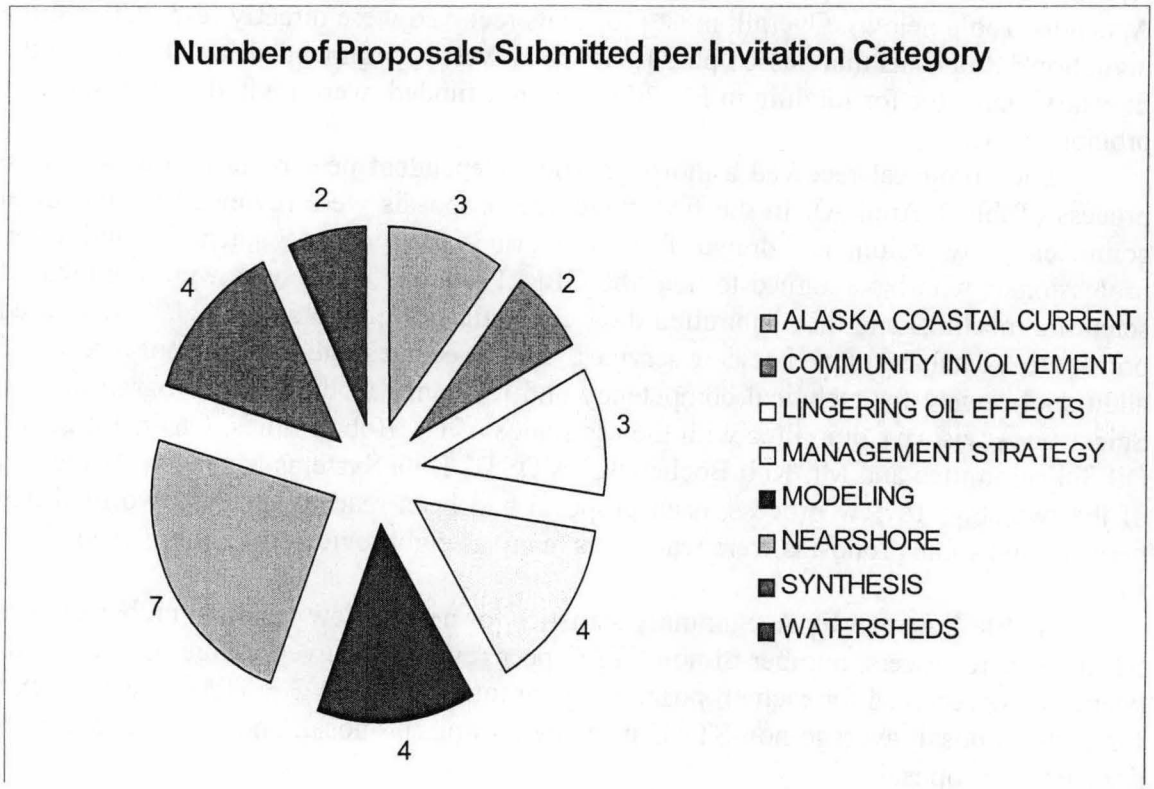
Table 1 Appendix A. Summary statistics for peer review results; number of non-STAC peer reviewers, number of non-STAC peer reviews received, range of non-STAC peer reviews received for each proposal, range of total (non-STAC + STAC) peer reviews for each proposal, average non-STAC peer reviews per proposal, and average total peer reviews per proposal.

Number of non-STAC Peer Reviewers Participating	49
Number of Non-STAC Peer Reviews Received	65
Number of STAC Reviews	71
Range of Non-STAC Peer Reviews Per Proposal	0-4*
Range of Non-STAC + STAC Peer Reviews Per Proposal	2-8
Average Number of Non-STAC Peer Reviews Per Proposal	2.24
Average Number of Total Peer Reviews Per Proposal	4.69

* Proposals receiving zero non-STAC reviews were re-submittals that had been peer reviewed during calendar 2003.

The results of the peer review were distilled into recommendations from the STAC for each proposal. The Executive Director's first recommendations were prepared in close consultation with the Science Director following the STAC meeting and they were circulated July 30, 2004 to all parties for public comment via e-mail to the approximately 1,000 people who have requested to receive Trustee Council information.

Appendix Figure showing distribution of proposals across Program Areas.



The agency liaisons were briefed on the recommendations by the Science Director on July 15, 2004. The PAC subsequently met on July 21, 2004 at EVOSTC offices with the Executive Director, the Science Director, Data Systems Manager and Dr. Brenda Norcross, recent past Co-Chair of the STAC, to discuss the proposals, the STAC recommendations, and to provide their own opinions on the proposals. For the first time this year, the proposals were provided to all PAC members on request at the same time as they were made available to the STAC.

Some of the Executive Director's Recommendations changed as a result of additional information that became available during the public review period (June 30 – July 23, 2004; Table, Appendix A)

ALASKA COASTAL CURRENT

Listing	FY05	FY06	FY07	ED REC
Etnier-FY05-Holocene Biotic Baselines	$72,500	$90,400	$69,800	Do Not Fund
Kline-FY05-Exchange between Gulf of Alaska and PWS	$139,800	$193,900	$206,200	Do Not Fund
Matkin-FY05-Monitoring Killer Whales 2005-2007	$20,500	$22,300	$23,800	Fund

Etnier-FY05-Holocene Biotic Baselines

Project Title: Late Holocene Biotic Baselines in the Gulf of Alaska

Abstract:

The research proposed here will evaluate the variability in biotic communities of the Gulf of Alaska throughout the late Holocene (i.e., the past 4-5000 years) in support of status evaluations for resources injured by the Exxon Valdez oil spill. To do this, we will compile a comprehensive database of archaeological collections in the GOA that contain zoological samples. Selected species will be used for additional demographic, isotopic, and molecular studies. As we are not proposing to excavate any archaeological sites, per se, we will rely entirely on existing sampling platforms (i.e., samples have already been excavated and curated). This will greatly enhance the efficiency of the project, and will keep costs to a minimum.

Location: GOA

PI Name: Michael Etnier **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$72,500	$90,400	$69,800

STAC Reviewers: Leslie Holland Bartels, Ron O'Dor

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. As presently structured many details required to judge the value and feasibility of the proposal and to clearly understand the intended final product are lacking. No example of the proposed database is included. The programming structure is not discussed, nor is the issue of maintenance of the database. The feasibility of access to collections listed is not addressed. Objective 2 references the conduct of studies, but the proposal does not define those specifically and provide methodology. Beyond these issues, the proposal is premature. Documentation of the types and specific uses of such data that present and likely future GEM efforts might find valuable is critical, but lacking. The linkage to the specific goals of GEM and the various recovery studies is not solid. The authors do not provide a compelling argument that the lack of such data is constraining the forward progress of GEM.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Kline-FY05-Exchange between Gulf of Alaska and PWS

Project Title: Detecting the Exchange between Gulf of Alaska and Prince William Sound

Abstract:

Stable isotope analysis will be used to understand how exchange between the Gulf of Alaska (GOA) and Prince William Sound (PWS) via the Alaska Coastal Current affects the biology of PWS through assessment of the influx of diapausing Neocalanus copepods, the keystone zooplankton taxon of the subarctic Pacific and PWS from the GOA in the Black Hole of PWS. The project will first resolve the hypothesized summer timing of the Neocalanus inflow using archived samples collected from 2001-2004. During the fall-winter of 2004-2006 the project will determine how best to assess net inflow with the minimal number of sampling stations. During the fall-winter 2006-2007 the project will begin to assess stage timing and population dynamics of diapausing and reproducing Neocalanus so as to lead to monitoring and predictive modeling. The project will recommend a sampling strategy for long-term sampling to monitor changes in the nature of the GOA inflow.

Location: PWS

PI Name: Thomas Kline **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$139,800	$193,900	$206,200

STAC Reviewers: Tom Royer, Charles Miller

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: No Consensus

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. The use of stable isotope analyses to address the exchange of Neocalanus between the Gulf of Alaska and Prince William Sound is of value, however there are doubts regarding the validity of the new sampling program that cannot be resolved without additional data. We recommend that the analysis and work up of the existing samples be made before resubmitting any revised proposal. We further recommend that the stable isotope analyses for the samples gathered since 2001 be submitted to the GLOBEC synthesis announcement of opportunity. The results of this analysis should then be used to develop a discussion of the differences between the central Gulf of Alaska and Prince William Sound. This would lead to a better posed sampling design. It should be noted that this is an interdisciplinary problem that depends on the measurement of inflow/outflow to PWS. However, it is uncertain that the measurements of inflow and outflow have been done correctly in the past. Data from GLOBEC cruises should provide adequate estimates of inflow and outflow. A serious problem in the proposed sampling was the lack of physical variables (temperature and salinity). While the proposal describes the distribution of copepods on depth surfaces, they will actually be distributed on density surfaces that must be determined from depth, salinity and temperature.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Encourages funding of the processing and analysis of existing samples, additional funding should be contingent upon availability of appropriate equipment before the sampling period—at which time the Trustee Council should consider a special allocation of funds to the project to continue sampling.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Matkin-FY05-Monitoring Killer Whales 2005-2007

Project Title: Monitoring of Killer Whales in Prince William Sound/Kenai Fjords in 2005-2007

Abstract:

This project continues monitoring of the damaged resident AB pod and other resident pods and the petitioned as depleted AT1 transient population into a cooperative program with additional collaborative support from the Alaska Sea Life Center, NMFS and various foundations. Monitoring has occurred on a yearly basis since 1984 and was crucial in evaluating the continuing effects from the oil spill. In addition, the role of killer whales in the nearshore ecosystem and possible effects on sea otters will be examined. Community based initiatives such as Youth Area Watch and tour operator educational programs will be integrated. New techniques such as lipid fatty acid analysis for food habit study and radio tagging will be explored and contaminant monitoring will continue. The proposed work will augment current research directed at transient killer whales (ASLC) and provide for annual monitoring of AB pod and other resident pods. The project will be integrated with oceanographic monitoring as possible.

Location: PWS, Kenai Fjord

PI Name: Craig Matkin **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$20,500	$22,300	$23,800

STAC Reviewers: Ron O'Dor, Charles Miller

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: No Consensus

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. It is premature with respect to the development of GEM monitoring programs in the ACC and the nearshore, since it has not been determined how monitoring of higher vertebrates will be accomplished. Other agencies, and particularly National Marine Fisheries Service, appear to have management responsibility for this species. It therefore appears appropriate to other funding sources such as activities associated with implementation of the Marine Mammal Protection Act. This proposal was not recommended for funding by the STAC last year for the same reasons.

Science Director:

The GEM Program was structured around four habitat types (Watersheds, Nearshore, Alaska Coastal Current and Offshore) in part in order to avoid conflicts and competitions for funds among geographic localities and among advocates for individual species. Funding work on killer whales is not consistent with the lack of Council funding for abundance surveys on other injured species, such as harbor seals. The EVOSTC has the guiding principles of avoiding duplication of effort and not taking over the responsibilities of other government institutions. As a number of different government entities have mandates and budgets devoted to measuring abundances of charismatic

megafauna, as well as economically important species, Council funding for continued work on killer whales is not a priority.

Public Advisory Committee:

Members of the PAC expressed a split view with support for both the STAC and the Executive Director recommendations.

Executive Director:

Although the STAC and Science Director rationales are correct, they fall short by not taking into account the continuing strong public interest in killer whales as a species injured by the Exxon Valdez Oil Spill. In addition, the proposed work is already highly leveraged by funding from the appropriate management agencies and other federal sources, so the STAC recommendation of alternate funding sources already has been accomplished by the project. As also noted last year, the modest cost of this project is a small price to pay for continuing a long-time series on an oil-injured species.

Trustee Council:

COMMUNITY INVOLVEMENT

Listing	FY05	FY06	FY07	ED REC
Baird-FY05-Connecting with Coastwalk	$28,900	$20,300	$11,900	Fund
Brodie-FY05-Mineral Creek Trail	$79,600	$108,800	$1,255,700.00	Do Not Fund

Baird-FY05-Connecting with Coastwalk

Project Title: Connecting with Coastwalk: Linking Shoreline Mapping with Community-based Monitoring

Abstract:

The project will evaluate and merge citizen-generated biological and human impact data collected over 20 years of an annual Kachemak Bay CoastWalk shoreline survey with high-resolution mapping of the physical structure of the nearshore environment in Kachemak Bay that nests geographically within ShoreZone mapping. Evaluation of data and data collection protocols and the geographic alignment of CoastWalk zones with ShoreZone units and KBRR's shoreline segments will occur during Year 1. Citizen-based data collection efforts aligned with GEM nearshore monitoring SOPs and methods will be pilot-tested in Kachemak Bay. During Year 2, a Kachemak Bay community/scientist workshop will be held to further integrate and synthesize local information into the Kachemak Bay Research Reserve GIS and to apply the GIS results to the selection of nearshore monitoring sites for community-based monitoring. Piloting will continue, with emphasis on involvement of K-12 teachers and students. During Year 3, nearshore monitoring data collection and data management will be further refined and a WEB site and data entry interface developed. This project will advance the development of a

community-based nearshore monitoring program for the GEM program.

Location: Kachemak Bay

PI Name: Steve Baird **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$28,900	$20,300	$11,900

STAC Reviewers: Steve Braund, Ron O'Dor

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The proposal is responsive to the invitation (shore zone mapping of the nearshore target area, integrate community involvement) and is consistent with GEM strategies (incorporate community involvement and local knowledge) and goals (detect change, provide information to facilitate understanding of causes of change). The project provides a link between nearshore community-based information and long-term monitoring applicable to GEM. The project will build on an existing (19 year) citizen-based, volunteer monitoring program (that is presumably responsive to community concerns) and combine it with a GEM-funded GIS mapping project to assess the utility of this method for future GEM monitoring.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC and Executive Director recommendations.

Executive Director:

Concur with STAC recommendation. The project is exemplary of exploring cost effective approaches to collecting baseline data in environments that are vulnerable to oil spills.

Trustee Council:

Brodie-FY05-Mineral Creek Trail

Project Title: Mineral Creek Commemorative Trail and Interpretation

Abstract:

Mineral Creek overlooks the Port Of Valdez. The property was purchased through the EVOS small-parcel program. The proposed Project will not only fulfill the requirements of the Small parcel program in providing replacement and restored injured resources but

will provide the essential information and interpretation of the GEM program; including the cause, the effects, the continuing aftermath of research, restoration and the natural processes of the 1989 event. The public will be involved in the planning and design of this road-accessible 92-acre parcel. The City of Valdez donated an additional 50 acres adjacent to the parcel for the purposes of restoration and public benefit. A system of trails, boardwalks and interpretive panels may be developed including support facilities of parking area and latrine at the conclusion of an on-going public involvement process.

Location: West Mineral Creek

PI Name: Margaret Brodie **Disbursing Agency:** ADNR

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$79,600	$108,800	$1,255,700

STAC Reviewers: Steve Braund, Ron O'Dor

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. While the proposal is responsive to the information transfer portion of the invitation for proposals, it does not describe the type of information that will be displayed and how the display will specifically address the EVOS program. Furthermore, there was a lack of public support for interpretive/educational exhibits. According to the Mineral Creek state Recreation Site Development Questionnaire in the proposal, 13 percent of the respondents who answered, "What do you consider important," answered "Interpretative/educational exhibits." Thirty-five percent of those who responded considered interpretative/education exhibits "somewhat important," while nearly half (48 percent) considered them "not important." This $1.4M proposal would contribute minimally to the scientific, public involvement and monitoring goals of GEM.

Science Director:

Concur with the STAC recommendation. The proposal was not responsive to the Invitation.

Public Advisory Committee:

Concur with the Executive Director and Science Director recommendations.

Executive Director:

Concur with the STAC and Science Director recommendatoins.

Trustee Council:

LINGERING OIL EFFECTS

Listing	FY05	FY06	FY07	ED REC
Irons-FY05-Marine Bird Abundance		$163,600	$32,700	$0 Fund
Rosenberg-FY05-Harlequin Duck Populations Dynamics	$39,900	$0	$0	Fund
Short-FY05-Monitoring of Anthropogenic Hydrocarbons	$58,900	$58,900	$58,900	Fund

Irons-FY05-Marine Bird Abundance

Project Title: Surveys to Monitor Marine Bird Abundance in PWS during Winter and Summer 2005

Abstract:

This project will conduct small boat surveys to monitor abundance of marine birds and sea otters (Enhydra lutris) in Prince William Sound, Alaska during March and July 2005. Seven previous surveys have monitored population trends for >65 bird and 8 marine mammal species in Prince William Sound after the Exxon Valdez oil spill. We will use data collected in 2005 to examine trends from summer 1989-2005 and from winter 1990-2005 by determining whether populations in the oiled zone changed at the same rate as those in the unoiled zone. We will also examine overall population trends for the Sound from 1989-2005. Due to the lack of data prior to the Exxon Valdez oil spill, continued monitoring of marine birds and sea otters is needed to determine whether populations injured by the spill are recovering. Data collected in 2000 indicated that bald eagles (Haliaeetus leucocephalus) are increasing in winter and summer throughout Prince William Sound, harlequin ducks (Histrionicus histrionicus) are increasing in the oiled area in winter, and black oystercatchers are increasing throughout Prince William Sound in summer. Numbers of all other injured species are either not changing or are declining in the oiled area. Common loons (Gavia immer), cormorants (Phalacrocorax spp.), and common murres (Uria aalgae) are showing no trend in the oiled area; pigeon guillemots (Cepphus columba) and marbled murrelets (Brachyramphus marmoratus) are declining in the oiled areas of Prince William Sound and Kittlitz's Murrelet (Brachyramphus brevirostris) is declining throughout Prince William Sound. Results of these surveys up through 1998 have been published by Irons et al. (2000) and Lance et al. 2001). Analyses of these survey data are the only ongoing means to evaluate the recovery of most of these injured species. A Final Report will be written upon completion of the project that will address population status of species observed during the survey.

Location: PWS

PI Name: David Irons **Disbursing Agency:** DOI

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$163,600	$32,700	$0

STAC Reviewers: Leslie Holland Bartels, Ron O'Dor

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The proposal is a straightforward continuation of a well-proven and valuable survey of marine birds and marine mammals (e.g. sea otters) within PWS. Previous surveys have been conducted and the authors demonstrate the increasing level of statistical confidence to detect change that results from each previous and the proposed survey. Power to detect change, assuming a constant pattern of change, is reaching useful levels >70%. With the addition of the 2005 survey, a much better assessment of not only recovery status, but also required survey frequency into the future, can be gained. The project is cost-effective for the spatial and species extent for which data will be obtained. Additional information on abundance trends in injured species is particularly useful during implementation of the GEM Program, as it aids in design of the monitoring program.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Rosenberg-FY05-Harlequin Duck Populations Dynamics

Project Title: Harlequin Duck Populations Dynamics in Prince William Sound: Measuring Recovery

Abstract:

This project will address the effects of lingering oil in nearshore habitats of Prince William Sound on populations of harlequin ducks. We will also address GEM objectives for long-term monitoring of harlequin and other sea duck species. We will conduct winter boat surveys to test if harlequin ducks have recovered from the effects of the EVOS by comparing population structure and trends between oiled and unoiled treatments in four areas (2 oiled, 2 unoiled) of PWS. Similar structure and trends between oiled and unoiled areas will indicate populations have recovered or are in a position to recover. Work will be complimentary to studies addressing cytochrome P450 induction and over winter survival of female harlequin ducks to give a complete picture of the effects of lingering

oil. We will also test for geographic differences in population structure and trend for oiled and unoiled treatments. This is a continuation of surveys begun in 1997. Up to 3 years of surveys are proposed with the results of each year determining the need for continuation.

Location: PWS

PI Name: Dan Rosenberg **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$39,900	$0	$0

STAC Reviewers: Leslie Holland Bartels, Ron O'Dor

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The harlequin duck is an injured species of special concern due to evidence of continuing exposure to oil contamination resulting from the 1989 spill. Its status as an injured species is based in part on trends in abundance in oiled and unoiled areas, which this proposal will address. The proposal would continue a valuable time series of abundance that would minimize the equivocal nature of various harlequin duck data sets relative to population status and recovery. The additional surveys over time can both increase power to detect change and extend the value of time post-spill series for understanding status of the injured species. The project is highly cost effective, has well respected investigators, and should result in valuable information. Given the specific sampling requirements to properly survey harlequin ducks, it seems appropriate that a specific survey is required above, and complementary to, the more general marine bird survey proposed by Irons. The STAC points out that it strongly supports projects such as this one that are aimed at demonstrating statistically that they are no longer necessary.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Short-FY05-Monitoring of Anthropogenic Hydrocarbons

Project Title: Long-term Monitoring of Anthropogenic Hydrocarbons in the Exxon Valdez Oil Spill Region

Abstract:

This proposal seeks support to expand the Long Term Environmental Monitoring (LTEMP) of the Prince William Sound Regional Citizens' Advisory Council (PWSRAC) in a manner that will make it substantially more powerful in its ability to detect environmental changes induced by petroleum contamination, and possibly other contaminants that have recently been identified as potential insults to the region. This expansion is designed to address the needs of both the PWSRCAC and the GEM programs, in part by combining resources of both organizations. The proposed design incorporates and integrates the existing NOAA and LTEMP monitoring datasets, and proposes a modest enlargement of effort to monitor at a substantially larger spatial scale. Most of the expansion is intended to implement a random-sampling based design that is currently being developed under an FY2004 Trustee Council funded project (Trustee Project 040724: Short - FY04 - Monitoring Exxon Valdez Oil).

Location: PWS, Kodiak, Kenai Peninsula

PI Name: Jeff Short **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$58,900	$58,900	$58,900

STAC Reviewers: Phil Mundy, Ron O'Dor

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. It is a good fit to the Invitation under Lingering Oil and Nearshore development of standard operating procedures (SOP). It also complements and would directly utilize the results of current GEM Lingering Oil study: Short - FY04 - Monitoring Exxon Valdez Oil (040724). The FY 04 study is designed to provide recommendations on how to integrate monitoring for the lingering effects of the Exxon Valdez oil spill into GEM Nearshore monitoring programs. The proposal responds directly to the Science Plan (Establish a strategy for monitoring persistence of Exxon Valdez oil, and its relationship to other sources of contamination in PWS) by establishing a background hydrocarbon reference station at Hinchinbrook Entrance and by developing a random sampling approach that would serve as a proxy measure for human development pressure on the nearshore environment. The random sampling approach would simultaneously track the persistence of lingering oil from the EVOS, and serve as a large geographic scale monitoring "station" reflecting human development pressure over a long time scale. The technical merit of the sampling

protocols and laboratory analyses is established by adopting the methods of the long-established Long Term Environmental Monitoring Program (LTEMP).

Science Director:

Concur with the STAC recommendation. This proposal makes the lingering oil investigations an integral part of the GEM Nearshore Program.

Public Advisory Committee:

Concur with STAC and Science Director recommendations.

Executive Director:

Concur with STAC and Science Director recommendations.

Trustee Council:

MANAGEMENT STRATEGY

Listing	FY05	FY06	FY07	ED REC
Logerwell-FY05-Productivity of capelin and pollock	$32,700	$112,800	$66,900	Fund
Otis-FY05-Temporal Stability of Fatty Acids	$67,700	$89,400	$25,100	Do Not Fund
Szarzi-FY05-Salmon Smolt Abundance	$62,800	$59,200	$59,200	Fund
Willette-FY05-Salmon Smolt Monitoring	$68,800	$65,900	$67,000	Fund

Logerwell-FY05-Productivity of capelin and pollock

Project Title: Processes affecting the productivity of capelin and pollock in the Gulf of Alaska

Abstract:

The goal of our research is to understand the physical and biological processes affecting the productivity of capelin and pollock in the Gulf of Alaska. We will investigate physical processes, such as the formation of fronts, that may drive spatial variability in zooplankton abundance and thus capelin and juvenile pollock feeding opportunities. We will investigate biological processes, such as competition between capelin and juvenile pollock, which can also impact feeding opportunities. Our work will also contribute to a growing time series on the physical and biological characteristics of capelin and pollock habitat and the potential for competition between the two. These data will eventually be applicable to understanding the influence of climate change on these populations. The study will be conducted in coordination with ichthyoplankton and juvenile fish surveys conducted in September 2005 and 2006 off the east coast of Kodiak Island.

Location: Kodiak Island

PI Name: Elizabeth Logerwell **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$32,700	$112,800	$66,900

STAC Reviewers: Brenda Norcross, Tom Royer

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Do Not Fund

Executive Director: Fund

Trustee Council:

STAC:

This proposal is recommended for funding. The proposal is an appropriate response to Management Applications in the Invitation as it fits the criteria of developing management applications or extension of existing multi-species survey to non-commercial species; however the management applications would not result for many years. NOAA/AFSC has been funding research on larval and juvenile pollock around Kodiak Island for more than 20 years. In doing so, they have made great strides in the understanding of this species and its relationship to oceanography. The background supplied in this proposal shows that this project is well developed and that the PIs are well qualified to continue this research. While it is certainly of scientific interest for fisheries management in the northern Gulf of Alaska to have the time series continue, the value of continuing this particular time series that the federal government has been funding has not been established in relation to other GEM activities in the Alaska Coastal Current.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

The PAC recommends not to fund this project. There is concern that it appears to be a normal agency function that should not be funded by the TC. The group discussed concerns about possible funding of National Oceanic and Atmospheric Administration ship and personnel time with this proposal and the need to examine more species.

Executive Director:

Concur with the STAC recommendation but designate this as a lower priority for funding in response to concerns expressed by the PAC.

Trustee Council:

Otis-FY05-Temporal Stability of Fatty Acids

Project Title: Temporal Stability of Fatty Acids used to Discriminate Pacific Herring in Alaska

Abstract:

This project follows up on a promising pilot study that demonstrated the ability to discriminate Alaska herring stocks at relatively fine spatial scales (> 100 km) based on the fatty acid composition of their heart tissue. The investigators propose to assess the temporal stability and biological variability of stock discrimination criteria derived from fatty acid analysis of herring cardiac tissues. Samples will be collected during the spring and fall/winter of 2005 and 2006 from putative herring stocks from Sitka, PWS, Kamishak, Kodiak, Dutch Harbor, Togiak, and Kuskokwim Bay. Results should allow managers to better define ecologically significant stock boundaries, which would likely affect how commercially exploited herring populations are assessed and managed. Results will be published in a peer-reviewed report and may lead to revision of fishery management plans for affected areas. Keywords: Pacific herring, stock identification, fatty acid analysis, Gulf of Alaska

Location: Gulf of Alaska and Bering Sea

PI Name: Ted Otis **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$67,700	$89,400	$25,100

STAC Reviewers: Leslie Holland Bartels, Ron O'Dor

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. If this project were successful, the results would be highly advantageous to management of herring stocks in Alaska. The proposal is highly leveraged as it depends heavily on ADF&G platforms and existing data collection programs and thus is quite cost effective. Nonetheless, a positive recommendation can not be given until there is scientific peer validation of the method. Other methods such as molecular genetics may work as well and should be addressed as alternatives in any subsequent proposal.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation; however herring are important to investigate. Encourage the PI to respond to reviewer comments and resubmit the project as a pilot next year. The Trustee Council should encourage herring proposals since this is still an injured species.

Executive Director:

Concur with the STAC recommendation and support PAC recommendation by calling for herring workshop as part of re-examining Injured Species list in FY 2005.

Trustee Council:

Szarzi-FY05-Salmon Smolt Abundance

Project Title: Chinook and Coho Salmon Smolt Abundance in the Anchor River, Alaska

Abstract:

This project will provide the marking portion of a capture-recapture study to estimate abundance of Chinook and coho salmon smolt emigrating from the Anchor River annually from 2005 through 2007. Smolt of each species will be captured and marked each year. Non-EVOS funding of an adult weir will allow for recapturing marked adults in subsequent years. A subsample of Chinook and coho salmon smolt will be sacrificed for analysis of the concentration of marine derived nutrients (C, N, S isotopes) contained in the fish. This work will compliment several existing projects that will monitor adult Chinook and coho salmon escapements and estimate sport harvests, and measure marine derived nutrients and chemical and physical characteristics of the Anchor River watershed. Smolt abundance estimates will provide information to relate production of smolt to freshwater and marine habitats as well as adult escapement and exploitation rates.

Location: Anchor River, Alaska

PI Name: Nicole Szarzi **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$62,800	$59,200	$59,200

STAC Reviewers: Phil Mundy, Charles Miller

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. The proposal is a good fit with the Invitation, responding directly to the Management Applications solicitation. In that regard, it complements an ongoing watershed project (Walker-FY04-Marine Derived Nutrients). However, it omits an important part of the Invitation requirement, which is preserving samples of smolts for estimation of the proportion of marine derived nutrients in the smolt. In so doing it could provide important information described by the Science Plan as, "Identify and demonstrate statistically rigorous sampling strategies for detecting marine signals and proxies from plants and animals in the marine watersheds ..." Such an MDN determination would be in addition to existing objectives of enabling detection of a potential change in the trend in marine survival separate from a potential change in the trend in freshwater survival. The proposal has substantial technical merit for estimating smolt abundance, age and size distributions of known precision that will be useful to

interpreting the results from Walker-FY04-Marine Derived Nutrients. Potential management applications are substantial and include 1) predictors of future adult salmon returns allowing more responsive management to assure sustainable escapements while optimizing harvest opportunities, 2) using juvenile production as an indicator of freshwater ecosystem health, 3) identification and control of factors that influence salmon population trends, 4) use of marine survival information to further explain causes and variability in salmon population trends, and 5) recovery of tagged adult Chinook and coho salmon during their ocean migration to provide location and interception information to aid in interpretation of the effect of ocean and climate on marine survival of salmon and related species. Community involvement strategies are apparent, but not well explained. The proposal is responsive to all five of GEM's major goals, providing data and analysis relevant to detecting and understanding change in watersheds, informing managers and other interested parties about impending changes in natural resources, solving resource management problems with appropriate information, and predicting future states of natural resources. The proposal is also particularly responsive to two of the six "implementation" goals of GEM, because it leverages application of EVOSTC funds to augment ongoing monitoring work funded ADF&G, and it would facilitate application of GEM research and monitoring results to benefit conservation and management of marine resources, as explained under management applications, above. The budget is highly leveraged by funds from other sources and is reasonable for the proposed objectives; however it does not contain adequate resources for determinations of MDN in smolt.

Science Director:

Concur with the STAC recommendation. This proposal is a strong response to the Management Applications section of the Invitation.

Public Advisory Committee:

Concur with the STAC and Science Director recommendations; however the proposal needs to make better connections with the communities it serves. In particular the ADF&G Regional Planning Team and the regional aquaculture associations have relevant information to share and interests in the outcome of the work and they should be consulted.

Executive Director:

Concur with the STAC, Science Director and PAC recommendations and direct project to make appropriate community contacts as advised by PAC.

Trustee Council:

Willette-FY05-Salmon Smolt Monitoring

Project Title: Management Applications: Improving Preseason Forecasts of Kenai River Sockeye Salmon Runs through Smolt Monitoring - Technology Development

Abstract:

This project will develop and implement a smolt-monitoring program for Kenai River

sockeye salmon as a tool for managing one of the largest and most accessible salmon stocks in Upper Cook Inlet. Sockeye salmon smolt population estimates will be used to develop preseason forecasts of run size for this stock. The Alaska Board of Fisheries has specified that the Kenai River sockeye salmon run will be managed based upon preseason and in season forecasts of run strength, and in river escapement goals for this system vary as a function of these forecasts. This management structure causes relative uses of the resource by recreational, personal use, and commercial fishers to be strongly dependent on the accuracy of forecasts. The project will use two independent methods to estimate the population size of sockeye salmon smolt emigrating from the Kenai River watershed. GEM funding is requested to support estimation of smolt population size using mark-recapture methods. ADF&G funding will support estimation of smolt population size using side-looking sonar. During the first two years of the project, we will evaluate the accuracy and precision of our estimates and identify the methodology that provides the best estimate at the lowest cost. In the third year, we will implement this new method to estimate smolt population size. The project will also estimate the proportion of marine-derived elements in smolts, beginning a database needed to evaluate the effect of marine nutrient contributions on salmon production in this and other systems.

Location: Cook Inlet

PI Name: Mark Willette **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$68,800	$65,900	$67,000

STAC Reviewers: Phil Mundy, Leslie Holland Bartels

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The proposal responds to the Management Application section of the Invitation that calls for, "utilize or augment existing biological monitoring programs to develop a new application or enhance an existing application to management, while building the basic data to implement the GEM ecosystem model." It is responsive to the Science Plan call to, "Identify and demonstrate statistically rigorous sampling strategies for detecting marine signals and proxies from plants and animals in the marine watersheds ..." Technical merit of this proposal is very high, as it adequately copes with the formidable difficulties of estimating smolt abundance in the Kenai River, as the proposal notes, estimation of smolt abundance in the Kenai has failed in the past. The proposal demonstrates a thorough understanding of the challenges, and it proposes an adaptive and innovative strategy for meeting the challenges, using a variety of sampling techniques at a number of different locales in the

watershed. Potential management applications are substantial and include 1) predictors of future adult salmon returns allowing more responsive management to assure sustainable escapements while optimizing harvest opportunities, 2) using juvenile production as an indicator of freshwater ecosystem health, 3) identification and control of factors that influence salmon population trends, 4) use of marine survival information to further explain causes and variability in salmon population trends, and 5) recovery of tagged adult Chinook and coho salmon during their ocean migration to provide location and interception information to aid in interpretation of the effect of ocean and climate on marine survival of salmon and related species. Community involvement strategies are apparent but not well explained. The proposal is responsive to all five of GEM's major goals, providing data and analysis relevant to detecting and understanding change in watersheds, informing managers and other interested parties about impending changes in natural resources, solving resource management problems with appropriate information, and predicting future states of natural resources. The proposal is also particularly responsive to two of the six "implementation" goals of GEM, because it leverages application of EVOSTC funds to augment ongoing monitoring work funded ADF&G, and it would facilitate application of GEM research and monitoring results to benefit conservation and management of marine resources, as explained under management applications, above. The budget is highly leveraged by funds from ADF&G sources and it is reasonable for the proposed objectives." The Pis are exceptionally well qualified to do this type of work, and their salaries are not charged for in the budget, which includes only extra seasonal personnel costs. The proposal was exceptionally well written and the methods and limitations of the sampling gears were carefully explained.

Science Director:

Concur with the STAC recommendation. This proposal is a strong response to the Management Applications section of the Invitation.

Public Advisory Committee:

Concur with the STAC and the Science Director recommendations; however the proposal needs to make better connections with the communities it serves. In particular the ADF&G Regional Planning Team and the regional aquaculture associations have relevant information to share and interests in the outcome of the work and they should be consulted.

Executive Director:

Concur with the STAC, Science Director and PAC recommendations and direct project to make appropriate community contacts as advised by PAC.

Trustee Council:

MODELING

Listing	FY05	FY06	FY07	ED REC
Adams-FY05-Pink Salmon Survival Models	$93,700	$0	$0	Fund
McNutt-FY05-Infrastructure for GEM	$92,700	$95,300	$99,000	Fund
Moffitt-FY05-SEA Pink Salmon Survival Model	$18,900	$0	$0	Fund
Schumacher-FY05-Infrastructure for GEM	$22,600	$24,700	$22,600	Fund

Adams-FY05-Pink Salmon Survival Models

Project Title: Implementing the Pink Salmon Survival Model: Phase I - Project Development

Abstract:

Funds are requested to plan the implementation of a numerical model of pink salmon survival within a framework of long- term monitoring and resource prediction. The plan will be prepared by an interdisciplinary team. PWSFRAP will coordinate workshops, internet assets, conferencing, report and proposal preparation and submission and will facilitate information exchange between the resource dependent community and the planners. The resulting plan will identify a team of implementers, a design and schedule for field sampling, modeling activities and parameterization, data management and information protocols stipulated by GEM. It is anticipated that this planning effort will be followed by a multi-year implementation phase. When fully implemented, the pink salmon modeling program will become a functional component of the GEM whole-ecosystem model and responsive to questions of pink salmon production, harvest, management and enhancement. This proposal is a companion to the interrelated ADF&G proposal (Moffitt: Management Applications: Implementing the Pink Salmon Survival Model-Tagging technology).

Location: PWS

PI Name: Ken Adams **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$93,700	$0	$0

STAC Reviewers: Phil Mundy, Tom Royer

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

Science Director:

Concur with the STAC recommendation. This project is an integral part of the modeling program area (McNutt, Schumacher, Adams and Moffitt). The Adams project will continue the process of using data from past Restoration projects to generate understanding of the status of injured species in Prince William Sound. In addition the Adams project will lead to salmon fishery management products (survival estimates, abundance forecasts). The modeling program area is the highest priority among all program areas. Modeling is the process of turning basic data into useful information for managers, policy makers and other consumers. Modeling assembles the building blocks provided by data-generating projects in the other program areas (four habitats, lingering oil, and synthesis) into an understandable explanation of the causes of changes in injured species and other bird, fish and mammal species.

The proposal is recommended for funding. It is highly responsive to the Invitation in both modeling and fisheries management applications. It is exemplary of meaningful community involvement, as it originates from non-scientists who reside in Cordova, an oil spill-affected community. It is supportive of the Science Plan as a contribution to development of the GEM whole ecosystem fisheries model. It was rated highly by non-STAC peer reviewers for technical merit and the abilities of the PI's. Its relevance to fisheries management is that it would provide a solid basis for managing pink salmon fisheries and for forecasting adult returns one year in advance. The PI's are community based commercial fishermen who have long promoted community involvement through workshops and distribution of information and collection of public feedback. The project would provide products relevant to all five GEM goals (detect, understand, inform, solve, predict) using methods and approaches that are consistent with several GEM programmatic goals in that it would leverage Council funds through using information resources from local organizations such as the Prince William Sound Science Center, ADF&G and other ongoing monitoring work funded by other entities; it involves other government agencies, non-governmental organizations, stakeholders, policy makers, and the general public in a collaborative process to achieve the mission and goals of GEM; it increases community involvement and uses local knowledge for the purposes of enhancing long-term stewardship of living marine resources, and it facilitates application of GEM research and monitoring results to benefit conservation and management of marine resources. The costs are reasonable to the tasks at hand and are necessary to insure participation of all necessary parties.

Public Advisory Committee:

Concur with the STAC and Executive Director recommendations.

Executive Director:

Concur with STAC and Science Director recommendations. This project provides essential support for a Modeling project that is a top priority for the GEM Program.

Trustee Council:

McNutt-FY05-Infrastructure for GEM

Project Title: Building the Infrastructure for the Gulf Ecosystem Monitoring (GEM) Program

Abstract:

The goal of this project is to identify and define models and observations to describe, manage and predict the status and health of the ecosystem, provide data as information to managers and coastal communities, and communicate publicly the current state of the ecosystem in the northern Gulf of Alaska (GOA). Agreement on this implementation strategy is critical to effective resource management and problem solving in the GOA. The Principal Investigators (PIs) will assemble an interdisciplinary team of scientists, managers and local stakeholders to investigate and report on ways to put in place: a biophysical model; the infrastructure necessary to implement and maintain a monitoring and data dissemination system; agreements and partnerships; software and hardware requirements; identification of existing products; and data management and information transfer requirements. The PIs will report to the EVOS Trustee Council, and will provide recommendations on how to meet the GEM Program objectives within project guidelines.

Location: GEM Monitoring Region

PI Name: Lyn McNutt **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$92,700	$95,300	$99,000

STAC Reviewers: Phil Mundy, Brenda Norcross

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. It is a collaborative proposal with Dr. James Schumacher (Two Crow). The proposal directly responds to the Invitation in the Modeling category. The proposal is directly designed to meet a major need identified by the Science Plan, a whole ecosystem (natural resource) model. The model was also recommended by the National Research Council in its review of the GEM program, and is a requisite for converting monitoring observations into information useful to resource managers, stakeholders and members of the concerned public. This proposal would provide the first step in developing a GEM model that would link biological and physical

observations across the habitat types, as well as the North Pacific, in order to understand trends in injured species and related species of interest to managers and concerned others in the oil spill affected areas. The proposal has high technical merit in that it would bring together the top modelers in the North Pacific to recommend state-of-the-art approaches to building the GEM model. The proposal is highly relevant to the Council's implementation strategies of management applications and community involvement. As detailed in Chapter 8 of the GEM Program Document, the modeling in this proposal is essential to bring together monitoring data into coherent explanations of how natural resources change through time. Resource managers who must cope with changes in the abundance of natural resources would be able to use this information in regulations and other management operations and in planning efforts. The proposal is highly responsive to community involvement in that it would bring together stakeholders with modelers to define needed outcomes of the model. The proposal is particularly relevant to three of the five goals of GEM, inform, solve and predict. The proposed model would lead to visualizations of changes in natural resources in relation to changes in human and natural forces that would inform managers and stakeholders. Model explanations of how natural resources may change in relation to changing ocean and atmospheric conditions could be used to help solve some natural resource management problems. In the long term, the modeling effort initiated by this proposal is expected to predict future states of natural resources in the northern Gulf of Alaska. In response to concerns expressed last year by the Trustee Council, the budget is targeted at key personnel and workshop expenses necessary to conduct this effort. The professional qualifications of project personnel are excellent, and as a team they are well connected to the modeling community and well respected for their past performances.

Science Director:

Concur with the STAC recommendation. Modeling is a basic prerequisite to converting data into information useful to managers, policy makers and others. The full value of the data from the Restoration Program and from GEM cannot be realized without the effective modeling program this proposal would provide.

Public Advisory Committee:

Concur with the STAC, Science Director and Executive Director recommendations.

Executive Director:

Concur with STAC and Science Director recommendtions. Modeling is a top priority not only for the GEM Program, but for all other aspects of tracking and

understanding the status of oil-injured species as well.

Trustee Council:

Moffitt-FY05-SEA Pink Salmon Survival Model

Project Title: Management Applications: Implementing the SEA Pink Salmon Survival Model - Tagging Technology

Abstract:

This project will conduct tagging technology studies needed to develop management applications from the SEA pink salmon model. This project was conceived during a pink salmon predictive workshop recently held in Cordova March 16-18, 2004. Workshop participants recommended that preseason forecasting and numerical model validation could be approached by a direct census of juveniles as they are leaving Prince William Sound (PWS). Catching juveniles emigrating from PWS would also enable application of a second mark to partition survival between the early marine and oceanic lifestages. At present, all juveniles of hatchery origin in PWS are otolith thermal marked. Combining estimates of stock composition obtained from otolith thermal marks and early marine survival will enable estimation of survivals of each hatchery release group and a very robust evaluation of pink salmon model simulations. The estimates will also be used to evaluate the accuracy of preseason forecasts of salmon run size obtained from a direct census of juveniles emigrating from PWS. This project will test the feasibility of using passive integrated transponder tags to partition early marine and oceanic survival of pink salmon. The project will estimate tag loss and tagging-induced mortality of juvenile pink salmon and tag detection rates at area salmon processors.

Location: PWS

PI Name: Steve Moffitt **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$18,900	$0	$0

STAC Reviewers: Charles Miller, Leslie Holland Bartels

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommend for funding. The proposal would provide an important measure to the modeling program, an estimate of the estuarine survival of pink salmon. As a forecast tool, the measure would also have fishery management applications. In addition, it would advance the use of an important tagging technology in Alaska by

creating a base of knowledgeable individuals who could transfer the technology to other areas.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation. The PAC wants question of timing for insertion of tags in young fish and then counting tagged fish addressed in the work. Is another year needed for the project to capture same year class?

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Schumacher-FY05-Infrastructure for GEM

Project Title: Building the Infrastructure for the Gulf of Alaska Monitoring (GEM) Program

Abstract:

The goal of this project is to identify and define models and observations to describe, manage and predict the status and health of the ecosystem, provide data as information to managers and coastal communities, and communicate publicly the current state of the ecosystem in the northern Gulf of Alaska (GOA). Agreement on this implementation strategy is critical to effective resource management and problem solving in the GOA. The Principal Investigators (PIs) will assemble an interdisciplinary team of scientists, managers and local stakeholders to investigate and report on ways to put in place: a biophysical model; the infrastructure necessary to implement and maintain a monitoring and data dissemination system; agreements and partnerships; software and hardware requirements; identification of existing products; and data management and information transfer requirements. The PIs will report to the EVOS Trustee Council, and will provide recommendations on how to meet the GEM Program objectives within project guidelines.

Location: GEM Monitoring Region

PI Name: James Schumacher **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$22,600	$24,700	$22,600

STAC Reviewers: Phil Mundy, Brenda Norcross

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. It is a collaborative proposal with Dr. Lyn McNutt. The proposal directly responds to the Invitation in the Modeling category. The proposal is directly designed to meet a major need identified by the Science Plan, a whole ecosystem (natural resource) model. The model was also recommended by the National Research Council in its review of the GEM Program, and is a requisite for converting monitoring observations into information useful to resource managers, stakeholders and members of the concerned public. The proposal is the first step in developing a GEM model that would link biological and physical observations across the habitat types, as well as the North Pacific, in order to understand trends in injured species and related species of interest to managers and concerned others in the oil spill affected areas. The proposal has high technical merit in that it would bring together the top modelers in the North Pacific to recommend state-of-the-art approaches to building the GEM model. The proposal is highly relevant to the Council's implementation strategies of management applications and community involvement. As detailed in Chapter 8 of the GEM Program Document, the modeling in this proposal is essential to bring together monitoring data into coherent explanations of how natural resources change through time. Resource managers who must cope with changes in the abundance of natural resources would be able to use this information in regulations and other management operations and in planning efforts. The proposal is highly responsive to community involvement in that it would bring together stakeholders with modelers to define needed outcomes of the model. The proposal is particularly relevant to three of the five goals of GEM, inform, solve and predict. The proposed model would lead to visualizations of changes in natural resources in relation to changes in human and natural forces that would inform managers and stakeholders. Model explanations of how natural resources may change in relation to changing ocean and atmospheric conditions could be used to help solve some natural resource management problems. In the long term, the modeling effort initiated by this proposal is expected to predict future states of natural resources in the northern Gulf of Alaska. In response to concerns expressed last year by the Trustee Council the budget is targeted at key personnel and workshop expenses necessary to conduct this effort. The professional qualifications of project personnel are excellent, and as a team they are well connected to the modeling community and well respected for their past performances.

Science Director:

Concur with the STAC recommendation. Modeling is a basic prerequisite to converting data into information useful to managers, policy makers and others. The full value of the data from the Restoration Program and from GEM cannot be realized without the effective modeling program this proposal would provide.

Public Advisory Committee:

Concur with STAC, Science Director and Executive Directors recommendations.

Executive Director:

Concur with the STAC recommendation. Modeling is a basic prerequisite to converting data into information useful to managers, policy makers and others. The full value of the data from the Restoration Program and from GEM cannot be

realized without the effective modeling program this proposal would provide.

Trustee Council:

NEARSHORE

Listing	FY05	FY06	FY07	ED REC
Bodkin-FY05-GEM Nearshore Monitoring Plan	$227,300	$104,400	$0	Fund
Hoover-Miller-FY05-Harbor Seal Monitoring	$92,700	$130,300	$82,300	Fund
Konar-FY05-SOP for Long-term Monitoring	$136,100	$106,600	$120,800	Fund
Lees-FY05-Climate Change and Human Activities	$197,800	$230,000	$0	Do Not Fund
Saupe-FY05-ShoreZone Mapping - Kodiak	$201,300	$201,900	$0	Fund
Schoch-FY05-ShoreZone Mapping for PWS	$312,300	$291,400	$0	Fund
Vick-FY05-ACCOS	$223,300	$0	$0	Do Not Fund

Bodkin-FY05-GEM Nearshore Monitoring Plan

Project Title: Implementation of the GEM Nearshore Monitoring Plan: Site selection, standard operating procedures, and data management

Abstract:

Gulf of Alaska nearshore habitats support populations that are economically, ecologically, and socially valuable to humans. Because of their importance to humans, detecting change in nearshore habitats, both natural and anthropogenic, play a prominent role in the GEM plan. Over the past several years several steps have been taken toward implementing the GEM Nearshore Monitoring Program. These include a series of workshops to identify nearshore resources and sampling strategies, development of specific monitoring designs with cost estimates, and the creation of a spatially explicit GOA nearshore science bibliography. We are proposing to build upon the monitoring designs offered by Bodkin and Dean (2003) by selecting specific sites, developing and testing sampling protocols, and developing and testing a data management plan specific for long term sampling within the framework of existing monitoring designs. Upon completion of these tasks the Nearshore GEM monitoring plan should be well prepared for implementation.

Location: PWS, Kenai Penninsula, Cook Inlet, Kodiak

PI Name: James Bodkin **Disbursing Agency:** DOI

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$227,300	$104,400	$0

STAC Reviewers: Brenda Norcross, Tom Royer

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. This proposal builds on the Bodkin and

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with STAC and note that it is expected that this project will provide an inventory of all who are working on projects in a given area.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Hoover-Miller-FY05-Harbor Seal Monitoring

Project Title: Harbor Seal Monitoring in Southern Kenai Peninsula Fjords

Abstract:

This proposal supports an existing remote video monitoring system in Aialik Bay, a tidewater glacial fjord. This system is used to observe harbor seals in glacial ice habitats and the impacts of vessels on seals. Haulout activity, numbers of seals, vessel impacts on seals, ambient behaviors of undisturbed seals, glacial activity, ice conditions, weather, and other events affecting seals are recorded daily. Seed funding is requested to test prototype digital still cameras at land-based haulouts in Day harbor for documenting seals in a fjord lacking tidewater glaciers. Integrations of the remote monitoring into GEM; provides ecological measures of conditions at the heads of fjords that will complement long-term oceanographic monitoring in adjacent waters. This study is augmented by ancillary studies and support from the ASLC and National Park Service through a partnership in the Oceans Alaska Science and Learning Center, the University of Alaska, Fairbanks, Alaska National Maritime Wildlife Refuge System, and Port Graham Corporation.

Location: Kenai Penninsula

PI Name: Anne Hoover-Miller **Disbursing Agency:** ADFG

FY05 Funding Requested **FY06 Funding Requested** **FY07 Funding Requested**

$92,700	$130,300	$82,300

STAC Reviewers:

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The proposal is a good fit with two areas of the Invitation in that it is 1) responsive to Nearshore in developing techniques and SOP for nearshore monitoring in the area of human effects, and 2) it responds directly to needs in Lingering Oil by linking an injured species to development of the nearshore monitoring program. The proposal also is a good match to the Science Plan, because it addresses an identified gap, measuring the effect of human activities on the nearshore environment. It also proposes to add an important set of physical habitats as yet unaddressed within the Nearshore program, fjords with and without tidewater glaciers. Arguments for the possibility of low cost long-term nearshore monitoring of harbor seal haul out sites and human activities into the GEM program are compelling, however only testing and experience will provide proof of concept. Technical methods and statistical approaches are straight forward, although the proposed remote still cameras are admittedly experimental. There is very good potential for management application through identifying steps that can be taken to further reduce the impact of vessels on wildlife in the fjords. That the proposal addresses management concerns of the National Park Service and the Port Graham Corporation is evidenced by their collaboration in this work. Community involvement is strong. The proposal speaks to the first two of GEM's five major goals (detect and understand) in that it offers to identify the degree and longevity of perturbations caused by humans on harbor seals within the context of natural variation. It proposes to do so by taking observations on harbor seals and human activities that can be combined with long-standing (i.e. GAK1) and newly developing (i.e. Chiswell mooring, GLOBEC LTOP, NSF (mesoscale) studies and Tustumena ferry box) physical time series in the region. The proposal is strong in that it leverages funds for ongoing monitoring work and personnel and it involves a substantial number of other entities. The personnel are highly qualified local scientists. The STAC expects the data management plan for this project to address digitization of the data, reduction of the data and long-term archiving of the data.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Konar-FY05-SOP for Long-term Monitoring

Project Title: Implementation of a Standard Operating Procedure for Long-term Nearshore Monitoring in the Gulf of Alaska

Abstract:
Over the last two years, GEM funded an intense biodiversity study (NaGISA) within the Gulf of Alaska (GOA) to obtain baseline data for the implementation of a monitoring standard operating procedure (SOP). Here we seek funding to complete the sorting, analysis and manuscript preparation of this NaGISA biodiversity work (field season ending summer 2004), so that the information can be disseminated. We are also proposing to test an SOP for long-term monitoring of nearshore rocky and seagrass sites. This SOP is based on the extensive, observational portion of our previous sampling. In accordance with recommendations by Bodkin and Dean (2003), we suggest extensive monitoring of abundance of well-defined key organisms in various intertidal and subtidal strata at seven sites per geographical section. Sites will include our previously established sites and several new sites based on mapping information (i.e. ShoreZone) for better geographical coverage of the GOA.

Location: Kodiak Island, PWS, Kachemak Bay

PI Name: Brenda Konar **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$136,100	$106,600	$120,800

STAC Reviewers: Ron O'Dor, Charles Miller

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. The project would support the implementation process for nearshore monitoring now being developed. The proposal is consistent with the Nearshore planning process and the model of Bodkin and Dean (2003). New information will be gained from areas that are presently poorly known.

Science Director:

Concur with the STAC recommendation. This project has developed a data set that is expected to be very useful to understanding long-term change during the two previous years of work, and that experience would be highly valuable to the planning process for implementing the Nearshore program.

Public Advisory Committee:

Concur with the STAC and Science Director recommendations.

Executive Director:

Concur with the STAC and Science Director recommendations.

Trustee Council:

Lees-FY05-Climate Change and Human Activities

Project Title: Monitoring Effects of Climate Change and Human Activities in West Cook Inlet - Phases I & II

Abstract:

A major objective for GEM is to monitor changes resulting from natural and human causes. Earlier studies provide a strong record that the benthic biota on the west side of Cook Inlet includes a significant, geographically isolated relict Arctic fauna.

Because of their Arctic affinities, many of these species may be sensitive to a variety of human activities or temperature increases associated with climate change. This provides a unique opportunity for GEM to evaluate effects of global warming and construction of a major port in northern Kamishak Bay supporting development and operation of the Pebble gold/copper mine. Records from the 1970s provide a basis for extending the time series for long-term comparisons. The proposed study will expand our knowledge of species composition and distribution of relict Arctic biota. This information, critical for selecting monitoring stations, will be used to plan and implement a long-term monitoring program designed to meet GEM's goals.

Location: Western Lower Cook Inlet

PI Name: Dennis Lees **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$197,800	$230,000	$0

STAC Reviewers: Steve Braund, Leslie Holland Bartels

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is not recommended for funding. The subject matter of the proposal is premature with respect to the planning process for the GEM nearshore program. The Invitation requested a process for selecting monitoring sites in concert with past information developed by prior GEM work. Such a proposal might be appropriate at the conclusion to the GEM nearshore planning process. However, the results of the planning process would be necessary for the STAC to evaluate nearshore monitoring proposals of this type.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Saupe-FY05-ShoreZone Mapping - Kodiak

Project Title: ShoreZone Mapping for Kodiak Island

Abstract:

This project would complete a Kodiak ShoreZone mapping program initiated in 2002 by the EVOSTC and the Cook Inlet RCAC by mapping the rest of the Kodiak Island archipelago following the existing Alaska ShoreZone Mapping Protocols (Harper and Morris 2003). Aerial Video Imagery (AVI) would be collected in two 6-day surveys and would be the primary source for completing the subsequent biophysical mapping database of intertidal and shallow subtidal areas. These data will complement the 1600 km of existing mapping on Kodiak and the 7000 km so far within the GEM area. In addition to the agency and researcher support that ShoreZone has gained in Alaska---most specifically to provide needed GEM-area habitat data---there was significant community support for completing the coastal mapping shown during a recent workshop (15 March 2004) in Kodiak when the ShoreZone mapping data and products completed to date were described and demonstrated.

Location: Kodiak Island archipelago

PI Name: Susan Saupe **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$201,300	$201,900	$0

STAC Reviewers: Brenda Norcross, Tom Royer

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. This proposal is well written, stating clear objectives, methods and expected accomplishments. The principle investigators are the best qualified to undertake this, as they have been involved in all aspects of the shore-zone mapping projects that have been finished to date. Saupe has secured considerable amounts of funds from sources outside EVOSTC to make this broad-scale mapping one the heaviest leveraged to date. This proposal comprehensively addresses the need for an accessible database, and presents the format of it. Furthermore, the Pis have presented extremely successful workshops over the past year that were attended by resource agency personnel, local citizens and other user groups such as the US Coast Guard. The data are on a user-friendly website that can be accessed readily. In short, there is no doubt that these PI's can produce what they promise, and on time, as evidenced by their strong track record of doing so. This is a one-time project that will not have to be repeated for another 10-25 years and is an excellent investment as it will serve as a basis for all future nearshore and watershed projects. Outside reviews were overwhelmingly positive.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Schoch-FY05-ShoreZone Mapping for PWS

Project Title: ShoreZone Mapping for Prince William Sound

Abstract:

A two-year program of coastal mapping in Prince William Sound (PWS) is proposed. Nearshore scientists have recognized Shore-Zone maps as the highest priority product for the GEM nearshore program following a series of community workshops, stakeholder meetings, and report recommendations. The products generated by Shore-Zone provide a spatially comprehensive reference for intertidal and subtidal habitats. Aerial Video Imagery (AVI) will be collected during the lowest tides of the year and then be used as the primary data source for intertidal and shallow subtidal mapping. Video data and in situ observations will be used to generate GIS coverages of physical and biological shoreline attributes. These attributes will be validated by a rigorous field survey in the second year of the project. Shore-Zone maps in other areas are widely used by state and federal agencies for regional planning (e.g., GRS planning, eelgrass distribution maps),

and development of derivative models (e.g., potential oil residence, sandlance spawning capability).

Location: Prince William Sound

PI Name: Carl Schoch **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$312,300	$291,400	$0

STAC Reviewers: Brenda Norcross, Ron O'Dor

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. This is a parallel proposal to that submitted by Saupe and Harper (Kodiak Island). It is also expected to serve as one reference for other nearshore and watershed projects. Peer reviewers rated the technical competency of the proposal highly.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

The PAC recommends to fund this project, with the direction that they cooperate with Alyeska on data.

Executive Director:

The changes made in the re-written proposal and the advice of the PAC have caused me to recommend finding for this project.

Trustee Council:

Vick-FY05-ACCOS

Project Title: Alaska Coastal Communities Observer System (ACCOS)

Abstract:

ACCOS – Alaska Coastal Community Observer system - is proposed to be a lay program designed to work with state and federal agencies and non-governmental groups in the pursuit of a stream-lined community-interactive exchange of local and traditional knowledge (LTK) applicable to the adjacent marine environment for the expressed purpose of having the scientific and non-scientific communities be aware of and work toward solutions to common interests, such as Essential Fish Habitat, invasive species,

marine mammal protections, etc. The emphasis would be on current marine observations reporting by coastal community residents, fisherman, students, teachers, tourists, and others. ACCOS would also be designed to help scientific and government organizations post their own particular special needs and surveys to communities. ACCOS would have its own web-site with links. It could be a comprehensive, one-stop posting system for any scientific endeavor that would require community awareness or participation as well as being a way to report marine and coastal activity on an on-going basis. The initial pilot program is located in Prince William Sound.

Location: Prince William Sound

PI Name: Gale Vick **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$223,300	$0	$0

STAC Reviewers: Tom Royer, Charles Miller

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. Even though the strength of the proposal is that it would get the communities involved in the observations, without a framework for these observations they might not prove useful. To be of value, the observations must be accurate, frequent enough, and long enough to resolve the variability in the ecosystem. The observing network would have to be carefully designed and implemented. This will require a melding of the community observers and the scientists and this does not appear anywhere in the proposal. Simply placing information on a web site would not be useful to many. However, systematic observations on the AOOS web site could and would be used by many. With a purpose of GOAC3 to keep the maximum fisheries effort within a sustainable environment it is questionable how objective the observations would be. There is no one in the proposal with the background and ability to design and implement a long term observing program. The proposal does not address the problem and is not well developed. The usefulness of placing information on a database is questionable and the proposal may be seen as a planning exercise in the creation of a website.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with STAC recommendation; however the PI is encouraged to work with the McNutt project during FY 2005 and to submit a revised proposal for FY 06—the

Trustee Council should strive to keep the Coastal Communities group as active participants in EVOS work in FY 2005.

Executive Director:

Concur with STAC recommendation.

Trustee Council:

SYNTHESIS

Listing	FY05	FY06	FY07	ED REC
Edmundson-FY05-Synthesis of Watershed Linkages	$84,000	$85,800	$67,200	Fund
Merritt-FY05-Synthesis of Watershed-marine Linkage	$82,300	$71,900	$67,500	Do Not Fund
Weingartner-FY05-EVOS Synthesis Offshore	$95,300	$99,700	$98,900	Fund
Weingartner-FY05-GEM Synthesis: ACC Habitat	$105,900	$111,700	$105,000	Fund

Edmundson-FY05-Synthesis of Watershed Linkages

Project Title: A Synthesis of Watersheds Linkages to Gulf of Alaska Ecosystems; State of knowledge and future directions

Abstract:

Watershed science has always required the synthesis of complex spatial and temporal information in order to examine the relationships among physical, geomorphical, biological and geochemical processes. Across an integrated perspective, it is fundamental to understand that hydrologic responses and biological productivity are the cumulative product of both natural ecosystem effects and anthropogenic disturbances. This project is intended to synthesize results from state, federal, EVOS, Gulf Ecosystem Monitoring (GEM), native associations and non-government organizations (NGO) funded projects and the scientific literature in order to develop a state of knowledge and gap analysis on important linkages between coastal watersheds, watershed management, anthropogenic and biological and physical factors leading to potential change in habitat types within the Gulf of Alaska (GOA) ecosystem. The synthesis will: (a) provide a detailed document on watersheds and the link to GOA habitats, (b) identify options for future GEM watershed science and monitoring project priorities based on existing science, limits in our knowledge and the range of ongoing projects, and (c) provide specific communication products (GIS, literature database, web based information, publications, contributions to other reporting – PICES, GEM) to detail existing literature, recent projects, data and sources, gaps in knowledge and linkages between watershed and habitat types for use by GEM and researchers active in this field. The project team has an established record in this area of work and has produced important synthesis products and databases on watersheds and links to communities and ocean ecosystems. One of the pressing issues facing GEM is obtaining better assessments of watershed-ocean connections and watershed-scale influences to the socio-economic links and management of resources for coastal communities. Our watershed synthesis can serve as an umbrella for many disciplines to identify priority issues, integrate support and participation of multiple agencies, and promote long-term monitoring. As a final component of this

synthesis, we will participate in networking and communication among various research groups looking at watersheds, nearshore and resource productivity in association with the Gulf of Alaska and the Gulf Ecosystem Monitoring.

Location: Synthesis: Waterseds of the GOA Ecosystem

PI Name: Jim Edmundson **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$84,000	$85,800	$67,200

STAC Reviewers: Brenda Norcross, Phil Mundy

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. The proposal is in response to the Invitation for Watershed Synthesis. This proposal starts with a statement that indicates the Pis understand the problem. The survey of stakeholder, manager and scientific needs is an important component providing information that cannot be gleaned from refereed or gray literature. These PI's recognize the importance of conducting an accurate survey, as evidenced by prior contact with a survey researcher who will help with design and implementation. Overall, the proposal looks like it will produce a useful relevant synthesis.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Merritt-FY05-Synthesis of Watershed-marine Linkage

Project Title: Synthesis of Watershed-marine Linkages for Analysis and Planning

Abstract:

A synthesis of scientific literature and expert judgment relating to how biogeochemical processes link coastal watersheds to marine environments will be conducted to facilitate development of the GEM Science Plan. Facilitated workshops and roundtable discussions with members of the scientific community and other knowledgeable persons will provide information to develop a gap analysis and prioritization of information

needs, to focus the invitation of proposals. A systems approach will be used to assist in structuring the information, identifying data gaps, and prioritizing information needs.

Location: Watersheds of the GEM area.

PI Name: Margaret Merritt **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$82,300	$71,900	$67,500

STAC Reviewers: Brenda Norcross, Phil Mundy

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. The proposal is procedural, with limited technical content. The experience of the proposer in watershed-marine linkages is not well established. While the proposal details the mechanics of gathering information, assembling a database, sorting out needed information, presenting results, and other functions, it does not specifically establish how these generic activities would be applied to the watershed synthesis.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Weingartner-FY05-EVOS Synthesis Offshore

Project Title: EVOS Synthesis Offshore

Abstract:

This proposal will provide a synthesis of the Offshore biological habitat for the GEM Program. This habitat is an important component of the Gulf of Alaska ecosystem and intimately linked to the Nearshore, Watershed, and Alaska Coastal Current (ACC) habitats. We will assist in developing and refining the hypotheses that form the Foundation of the GEM Science Plan and identify opportunities to solve resource management problems. We will review the scientific literature, agency reports and consult with scientists working in the Gulf of Alaska, state and federal resource managers, and GEM staff in this process. The PI's include a physical oceanographer, zooplankton biologist, and marine fisheries ecologist. All have expertise in the ACC

habitat and are also submitting a separate proposal to conduct the GEM ACC synthesis.

Location: Gulf of Alaska shelf

PI Name: Thomas Weingartner **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$95,300	$99,700	$98,900

STAC Reviewers: Tom Royer, Brenda Norcross

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. Weingartner, Coyle and Kruse have submitted two closely coupled proposals to synthesize information on the Alaska Coastal Current and the offshore region. Their similarity reflects the interdependency of the GEM habitat types and the similar interests and backgrounds of the PI's. The proposal is responsive to the Invitation. The background discussion of the Gulf of Alaska ecosystem is good and they will tie together much of the ongoing work that they and others have been doing and are continuing to do in the Gulf of Alaska. All of the PIs are well versed in the current state of knowledge and research in the region. They are well equipped to address the status and trends in the GOA ecosystem. They are also working with many of the other entities in the region.

Science Director:

Concur with the STAC recommendation. This proposal is a strong response to the Synthesis section of the Invitation.

Public Advisory Committee:

Concur with the STAC and Science Director recommendations.

Executive Director:

Concur with the STAC and Science Director recommendations.

Trustee Council:

Weingartner-FY05-GEM Synthesis: ACC Habitat

Project Title: GEM Synthesis: Alaska Coastal Current Habitat

Abstract:

This proposal will provide a synthesis of the Alaska Coastal Current (ACC) biological habitat for the GEM Program. This habitat is an important component of the Gulf ofAlaska ecosystem and is intimately linked to the Nearshore, Watershed, and Offshore habitats. We will assist in the developing and refining the hypotheses that form the

foundation of the GEM Science Plan and identify opportunities to solve resource management problems. We will review the scientific Literature, agency reports and consult the scientists working in the Gulf of Alaska, state and federal resource managers, and GEM staff in the process. The PI's include a physical oceanographer, zooplankton biologist, and marine fisheries ecologist. All have expertise in the Alaska Coastal Current habitat and are submitting a separate proposal to conduct the GEM Offshore synthesis.

Location: Gulf of Alaska shelf

PI Name: Thomas Weingartner **Disbursing Agency:** ADFG

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$105,900	$111,700	$105,000

STAC Reviewers: Tom Royer, Brenda Norcross

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is recommended for funding. Weingartner, Coyle and Kruse have submitted two closely coupled proposals to synthesize information on the Alaska Coastal Current and the offshore region. Their similarity reflects the interdependency of the GEM habitat types and the similar interests and backgrounds of the Pis. The proposal is responsive to the Invitation. The background discussion of the Gulf of Alaska ecosystem is good and they will tie together much of the ongoing work that they and others have been doing and are continuing to do in the Gulf of Alaska. All of the PIs are well versed in the current state of knowledge and research in the region. They are well equipped to address the status and trends in the GOA ecosystem. They are also working with many of the other entities in the region.

Science Director:

Concur with the STAC recommendation. This proposal is a strong response to the Synthesis section of the Invitation.

Public Advisory Committee:

Concur with the STAC and Science Director recommendations.

Executive Director:

Concur with the STAC and Science Director recommendations.

Trustee Council:

WATERSHEDS

Listing	FY05	FY06	FY07	ED REC
Cooper-FY05-Community-based Sampling	$102,500	$86,000	$96,900	Fund
Mazumder-FY05-Marine-derived Nutrients	$179,500	$168,200	$165,700	Do Not Fund

Cooper-FY05-Community-based Sampling

Project Title: Community-based Sampling of Watershed-based and Marine-derived Nutrients

Abstract:
In Southcentral Alaska, healthy watersheds support the region's economic, social and cultural well-being. Cook Inlet Keeper's community-based water quality monitoring program has proved to be an efficient and cost-effective way to collect important baseline data and increase public involvement in natural resource management. Keeper will coordinate with other groups conducting nutrient sampling throughout Southcentral Alaska and expand its community-based monitoring program to include watershed-based and marine-derived nutrient sampling to test the following hypotheses: 1) Certain nutrients, like ammonium, are useful proxies for determining levels of marine-derived nutrients in coastal watersheds; 2) Marine-derived nutrient levels in aquatic and riparian food webs vary seasonally related to salmon influx; 3) Community-based sampling of watershed-based and marine-derived nutrients is an efficient and cost-effective way to meet GEM research goals, increase public understanding of public resources, and promote sound resource management.

Location: Kachemak Bay and Anchor, Kasilof and Kenai River waterhseds

PI Name: Joel Cooper **Disbursing Agency:** NOAA

FY05 Funding Requested	FY06 Funding Requested	FY07 Funding Requested
$102,500	$86,000	$96,900

STAC Reviewers: Steve Braund, Brenda Norcross

Funding Recommendations:

STAC: Fund

Science Director: Fund

Public Advisory Committee: Fund

Executive Director: Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

The proposal is recommended for funding. The proposal is an important element of last

year's (FY 04) Invitation and it was recommended for funding by the STAC, SD and Ed last year, but not funded. It is consistent with GEM strategies (incorporate community involvement) and Science Plan (begin to learn how to measure marine effects in watersheds, provide information to facilitate understanding of causes of change). The project's funding is highly leveraged, with nearly 50% of project costs provided from other sources. The program incorporates an ongoing community-based monitoring program that presumably reduces costs and strives to collect data toward GEM program hypotheses and questions.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation and recommend that the Trustee Council consider similar ones in the future for Kodiak and PWS areas.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Mazumder-FY05-Marine-derived Nutrients

Project Title: Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change

Abstract:

Kenai River Watershed (Kenai RW) is recognized as a national treasure for its abundant fish, wildlife and diversity of habitats. Extensive consultation among stakeholders, communities, agencies and other researchers has led to this proposal on the role of marine-derived nutrients (MDN) in sustaining the productivity of Kenai RW. In the first two years, we propose to develop, compare and contrast robust methods and monitoring protocols to detect, understand and predict changes in MDN and its linkage to productivity and biological (salmon) resources. We will test the robustness and validity of several distinct indicators or proxies (nutrients, stable isotopes, fatty acids, contaminants, foodwebs) of MDN across different ecosystem components of Kenai RW. In the 2nd and 3rd year, we will synthesize and publish data, compare results with other complementary watershed projects and produce a final GEM report, and complete the validation of these indicators to quantify the fate/transport of MDN linking various components of the watershed and their implications for the productivity of Kenai RW and its salmon and trout populations. We will actively participate in networking and communication among various research groups looking at watershed level changes in MDN and resource productivity in association with the Gulf of Alaska.

Location: Kenai River Watershed

PI Name: Asit Mazumder **Disbursing Agency:** ADFG

FY05 Funding Requested **FY06 Funding Requested** **FY07 Funding Requested**

$179,500	$168,200	$165,700

STAC Reviewers: Tom Royer, Charles Miller

Funding Recommendations:

STAC: Do Not Fund

Science Director: Do Not Fund

Public Advisory Committee: Do Not Fund

Executive Director: Do Not Fund

Trustee Council:

Rationales For Funding Recommendations:

STAC:

This proposal is not recommended for funding. There is concern regarding the ability to determine the critical MDN or substances in the KR watershed and how they influence changes the ecosystem. How can the proposers be assured that they have identified the critical components of this ecosystem? The proposal relies on regression analyses to test the relationships between MDN, biological and physical parameters. This does not establish cause and effect. For example, changes in salmon abundance might be affected by open ocean conditions rather than local watershed conditions. The hope is stated here that multiple regression analyses, including non-linear and non-parametric versions will help to find a relationship between MDN supply rates (anadromous fish inputs) and some of the many variables to be extracted from the watershed. This will fulfill what they state is their principal goal, to find one or more proxy variables for rates of MDN supply. Nothing is said, however, about how the fish inputs will be quantified. There is no statement of who will carry out the analyses or where they will be done. The inability to measure the sensitivity of the ecosystem to MDN is also worrisome. It is curious that the works of other researchers addressing the MDN distributions in the region such as Finney et al. are not referenced in this proposal. Are there possibly already accepted protocols for this type of sampling? If not, can they really be established and tested in two years? Decades of sampling will be required to determine the interannual signal of MDN and its strength will be a function of biological and physical factors. It is unclear as to how they will separate these influences. The specific testable hypotheses (p. 4) are not connected with the proposed data set. Statistical testing of these is not possible. They need a model that can be tested with the data sets to be gathered.

Science Director:

Concur with the STAC recommendation.

Public Advisory Committee:

Concur with the STAC recommendation.

Executive Director:

Concur with the STAC recommendation.

Trustee Council:

Master Table Appendix A. An outline of the record of decision on each proposal received consists of author and title, the amounts requested by fiscal year, the amounts authorized by the Trustee Council on August 23, 2004, for each project, the recommendations on each project of the Scientific Technical Advisory Committee, Science Director, Public Advisory Committee, Executive Director and the Trustee Council.

	FUNDING AMOUNTS			FUNDING RECOMMENDATIONS			
Listing	FY05	FY06	FY07	STAC_Rec	SD_Rec	PAC_Rec	ED_Rec
Adams-FY05-Pink Salmon Survival Models	$93,700	$0	$0	Fund	Fund	Fund	Fund
Baird-FY05-Connecting with Coastwalk	$28,900	$20,300	$11,900	Fund	Fund	Fund	Fund
Bodkin-FY05-GEM Nearshore Monitoring Plan	$227,300	$104,400	$0	Fund	Fund	Fund	Fund
Brodie-FY05-Mineral Creek Trail	$79,600	$108,800	$1,255,700	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Cooper-FY05-Community-based Sampling	$102,500	$86,000	$96,900	Fund	Fund	Fund	Fund
Edmundson-FY05-Synthesis of Watershed Linkages	$84,000	$85,800	$67,200	Fund	Fund	Fund	Fund
Etnier-FY05-Holocene Biotic Baselines	$72,500	$90,400	$69,800	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Hoover-Miller-FY05-Harbor Seal Monitoring	$92,700	$130,300	$82,300	Fund	Fund	Fund	Fund
Irons-FY05-Marine Bird Abundance	$163,600	$32,700	$0	Fund	Fund	Fund	Fund
Kline-FY05-Exchange between Gulf of Alaska and PWS	$139,800	$193,900	$206,200	Do Not Fund	Do Not Fund	No Consensus	Do Not Fund
Konar-FY05-SOP for Long-term Monitoring	$136,100	$106,600	$120,800	Fund	Fund	Fund	Fund
Lees-FY05-Climate Change and Human Activities	$197,800	$230,000	$0	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Logerwell-FY05-Productivity of capelin and Pollock	$32,700	$112,800	$66,900	Fund	Fund	Do Not Fund	Fund
Matkin-FY05-Monitoring Killer Whales 2005-2007	$20,500	$22,300	$23,800	Do Not Fund	Do Not Fund	No Consensus	Fund

Mazumder-FY05-Marine-derived Nutrients	$179,500	$168,200	$165,700	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
McNutt-FY05-Infrastructure for GEM	$92,700	$95,300	$99,000	Fund	Fund	Fund	Fund
Merritt-FY05-Synthesis of Watershed-marine Linkage	$82,300	$71,900	$67,500	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Moffitt-FY05-SEA Pink Salmon Survival Model	$18,900	$0	$0	Fund	Fund	Fund	Fund
Otis-FY05-Temporal Stability of Fatty Acids	$67,700	$89,400	$25,100	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Rosenberg-FY05-Harlequin Duck Populations Dynamics	$39,900	$0	$0	Fund	Fund	Fund	Fund
Saupe-FY05-ShoreZone Mapping - Kodiak	$201,300	$201,900	$0	Fund	Fund	Fund	Fund
Schoch-FY05-ShoreZone Mapping for PWS	$312,300	$291,400	$0	Fund	Fund	Fund	Fund
Schumacher-FY05-Infrastructure for GEM	$22,600	$24,700	$22,600	Fund	Fund	Fund	Fund
Short-FY05-Monitoring of Anthropogenic Hydrocarbons	$58,900	$58,900	$58,900	Fund	Fund	Fund	Fund
Szarzi-FY05-Salmon Smolt Abundance	$62,800	$59,200	$59,200	Fund	Fund	Fund	Fund
Vick-FY05-ACCOS	$223,300	$0	$0	Do Not Fund	Do Not Fund	Do Not Fund	Do Not Fund
Weingartner-FY05-EVOS Synthesis Offshore	$95,300	$99,700	$98,900	Fund	Fund	Fund	Fund
Weingartner-FY05-GEM Synthesis: ACC Habitat	$105,900	$111,700	$105,000	Fund	Fund	Fund	Fund
Willette-FY05-Salmon Smolt Monitoring	$68,800	$65,900	$67,000	Fund	Fund	Fund	Fund
Weingartner-FY04-Alaska Coastal Current*	$6,200	-$10,500			Fund		Fund

End Document

Comments on FY 05 Draft Work Plan funding recommendations by project

ShoreZone Mapping for Kodiak

Linda Freed
City of Kodiak

Michelle Stearns
Kodiak Island Borough

David Banks
The Nature Conservancy

ShoreZone Mapping for Prince William Sound

David Banks
The Nature Conservancy

Larry Evanoff
Chenega IRA Council

Nancy Bird
Prince William Sound Science Center

Mead Treadwell
US Arctic Research Commission

Exchange between Gulf of Alaska and Prince William Sound

Walter Parker

Nancy Bird
Prince William Sound Science Center

Mead Treadwell
US Arctic Research Commission

ACCOS-PWS Pilot Project

Gail Vick
Gulf of Alaska Coastal Communities Coalition

Proposed modifications to ACCOS-PWS Pilot Project

Gail Vick
Gulf of Alaska Coastal Communities Coalition

Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change

Dr. Asit Mazumder, et. al.

Cherri Womac

From: Freed, Linda [lfreed@city.kodiak.ak.us]
Sent: Friday, July 23, 2004 12:58 PM
To: cherri_womac@evostc.state.ak.us
Cc: Pat Carlson (E-mail); Michelle Stearns (E-mail); Barbara Stevens (E-mail); Carolyn Floyd (E-mail); Charlie Davidson (E-mail); Dave Woodruff (E-mail); Debbie Marlar (E-mail); Gabriel Saravia (E-mail); Tom Walters (E-mail)
Subject: EVOSTC's FY05-07 DRAFT Funding Recommendations - Comments

TO: Gail Phillips, Executive Director, EVOSTC
Exxon Valdez Oil Spill Trustee Council
441 W. 11th Ave Suite 500
Anchorage, AK 99501

Via E-Mail

FROM: City of Kodiak

DATE: July 23, 2004

RE: Comments on the EVOSTC's FY05-07 DRAFT Funding Recommendations

I am writing, on behalf of the City of Kodiak, in support of the proposal submitted to the Exxon Valdez Oil Spill Trustee Council (EVOSTC) for FY05 - FY07 funding for completion of ShoreZone mapping for Kodiak Island. The proponent of this project (Saupe) has previously completed mapping of about 1,000 miles of shoreline on Kodiak Island, made the results publicly available and has conducted workshops in Kodiak that attracted a broad spectrum of agency personnel, teachers and interested public.

The use of a website to display comprehensive imagery and environmental data is a highly useful planning tool and obviously an important oil spill response resource. Completion of this project will provide the entire region with a data set that can aid in rapid decision making in the event of a spill. As you are aware, knowledge of shoreline types and shoreline resources (for example, island-wide coverage of significant habitat, such as eelgrass and kelp distributions) are key to the determination and implementation of appropriate and effective oil spill response strategies.

The City of Kodiak strongly encourages the EVOSTC to support funding for this proposed FY05 project for the Kodiak area. While the project is an important element of the EVOS Gulf Ecosystem Monitoring (GEM) program, the project also provides an important community asset for Kodiak. If you need any additional information from me, contact information is provided below. Thank you for your consideration of these comments. Linda L. Freed City Manager, City of Kodiak 710 Mill Bay Road Kodiak, Alaska 99615
(907) 486-8640 (voice)
(907) 486-8600 (fax)
lfreed@city.kodiak.ak.us

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Linda Freed
City Manager
City of Kodiak
710 Mill Bay Road, Suite 211
Kodiak, AK 99615

Dear ~~Ms. Freed:~~ Linda –

Thank you for your letter supporting the Saupe ShoreZone Mapping proposal.

Your comments will be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Thanks!

Gail Phillips
Executive Director

Kodiak Island Borough

Community Development Department
710 Mill Bay Road
Kodiak, Alaska 99615
Phone (907) 486-9363 Fax (907) 486-9396

19. July 2004

Ms. Gail Philips, Director
Exxon Valdez Oil Spill Trustee Council
441 West 5th, Suite 500
Anchorage, AK 99501-2340

BY FAX 907-276-7178

RE: **Saupe-FY05-ShoreZone Mapping-Kodiak Island**

Dear Ms. Phillips:

On one of my first days in Kodiak last summer, I learned through the local newspaper about the EVOS ShoreZone Mapping project in the Kodiak Archipelago. I was very impressed with the technology being used, the habitat data that has subsequently been collected, and its future application for nearshore and coastal management planning in the Kodiak Archipelago.

I have also visited the user-friendly website that has been set up to access the data and images, and well as attended the March 2004 community meetings in Kodiak that were conducted by the Cook Inlet Regional Citizens Advisory Council. The Borough has requested, and will also be receiving, the completed ArcView coverage and the linked Access database from CIRCAC so that we can integrate this information into our GIS.

The Kodiak Island Borough is very much in support of the current CIRCAC proposal for completion of the ShoreZone mapping on Kodiak Island during FY05. We strongly encourage EVOS to continue the support of this program that will provide island-wide

coverage of important habitat data that can also be integrated into our GIS system. While we recognize that the project is an important element of the EVOS Gulf Ecosystem Monitoring (GEM) program, the project will also provide the Borough with a powerful planning tool and community resource.

Please do not hesitate to contact me if you require any additional information or have further questions.

Sincerely,

Michelle R. Stearns

Michelle R. Stearns, AICP, Director
Department of Community Development

Cc: EVOS Trustee Council Members:
Joe Meade, Chugach National Forest, Fax 907-743-9476
James W. Balsiger, NMFS, Fax 907-586-7249
Drue Pearce, US Interior Dept., Fax 907-219-0229
Kevin Duffy, ADFG, Fax 907-465-2332
Ernesta Ballard, DEC, Fax 907-465-5070
Gregg Renkes, AK Dept. Law, Fax 907-465-2075

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Michelle Stearns
AICP Director
Dept of Community Development
Kodiak Island Borough
710 Mill Bay Road
Kodiak, AK 99615

Dear Ms. Stearns:

Thank you for your letter supporting the Saupe ShoreZone Mapping proposal.

A copy of your letter was given to the Public Advisory Committee at their July 21 meeting. It will also be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail Phillips
Executive Director

Cherri Womac

From: Mead Treadwell [meadt@ventureadastra.com]
Sent: Thursday, July 22, 2004 1:01 PM
To: Gail Phillips
Cc: 'Nancy Bird'
Subject: Comment 1 on EVOS 2005 Workplan

July 21, 2004

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Gail:

As you and the Trustees consider public comment on the Draft 2005 Proposal Funding Report, I request your reconsideration of the ShoreZone Mapping Project for Prince William Sound.

We all remember much about the tragedy of Exxon Valdez, but one which has stuck with me was the fact we were rushing, ahead of spreading oil, to get some kind of baseline on the resources about to be creamed. We had so little current information.

It was that experience that convinced me to work for strong, continued observation, modeling and mapping of the Sound's resources. One model we got was from Sullom Voe in the Shetlands, and work done there to measure resources at risk almost continuously. The effort to map the sound, and to keep that up to date, is one that should involve communities, the PWSRCAC, management agencies, resource users and the science institutions working in the Sound, and others. As I understand it, these groups are ready to be involved, and I'm hopeful that EVOS will also be.

In my work in support of science in Alaska and the Arctic I occasionally come across conflicts between "competitive" science, where proposals are reviewed up or down by science peers, and the need perceived by the citizenry for science funding groups to work together in support of infrastructure, staff continuity in our science institutions, and longer term objectives. While the funding process of EVOS Trustees usually takes these factors into account, I feel rejection of the mapping program at this stage would slow down what we have all sought as long term goals.

Thanks again for this opportunity to comment.

Sincerely,

Mead Treadwell

Mead Treadwell
CEO, Venture Ad Astra
Commissioner, U.S. Arctic Research Commission

Cherri Womac

From: Mead Treadwell [meadt@ventureadastra.com]
Sent: Thursday, July 22, 2004 1:01 PM
To: Gail Phillips
Cc: 'Nancy Bird'
Subject: Comment 2 on EVOS 2005 Workplan

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Gail:

The Draft 2005 Proposal Funding Report has a "do not fund" recommendation for the proposal titled "Exchange between Gulf of Alaska and Prince William Sound."

Nancy Bird, President of the Prince William Sound Science Center, and Tom Kline, the PI for the project, have written to you at length, and I can add little to the scientific reasoning in their letters.

My concern, however, is this: The work of the SEA program taught me, as a layman, that the plankton from the Gulf are a primary driver of energy in the Prince William Sound food chain. If currents change, if wind widely distributes a plankton bloom, if temperature stills the bloom, the effect through the food web to Pollock, herring, and salmon is dramatic. It has been this research and correlation that has helped lead us to more advanced understanding and modeling of this ecosystem. That modeling has tremendous impacts on management in the Sound, and frankly, nationally and internationally. (Remember when escapement of the previous year class was about the only indicator for prediction of a salmon run? Now we have much more.)

As I read the STAC comments, the problem with the Kline proposal is easily fixed. It should be funded, with that condition, and this important baseline monitoring should continue this year rather than be postponed.

If EVOS and GEM have any intention of understanding the ecosystem relationships here, and completing this monitoring/modeling program of national importance, we should not forget the most basic building block in the food chain!

Thank you very much.

Sincerely,

Mead

Mead Treadwell
CEO, Venture Ad Astra
Commissioner, U.S. Arctic Research Commission
Senior Fellow, Institute of the North
1007 West Third Ave., Ste. 200
Anchorage, AK 99501
907 278 4800 office
907 223 8128 mobile

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Mead Treadwell
CEO, Venture Ad Astra
Commissioner, US Arctic Research Commission
Senior Fellow, Institute of the North
1007 West Third Avenue, Suite 200
Anchorage, AK 99501

Dear Mr. Treadwell: Mead-

Thank you for your comments supporting the Schoch ShoreZone Mapping and Kline Exchange between Gulf of Alaska and Prince William Sound proposals.

Mr. Schoch's original proposal had several problems in it. We requested that he send us a revised proposal, which he has done. The revisions he offered are more in line with our original request, and I will be changing my recommendation to fund his proposal.

Your comments will also be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Gail Phillips
Executive Director

Thanks for your input, Mead- it helped!

July 20, 2004

Ms Gail Phillips, Executive Director
Exxon Valdez Oil Spill trustee Council

fax: 907 276 7178

RE: Comment on the Schoch Prince William Sound Science Center ShoreZone Proposal

Dear Ms. Phillips,

In 2004 the Prince William Sound RCAC sponsored a ShoreZone coastal imaging survey of the western portion of Prince William Sound. Much of this surveyed centered on traditional use areas of Chenega, including surveys of LaTouche, Evans, Elrington, Chenega and Bainbridge Islands.

Habitat mapping associated with this survey and with proposed 2005 surveys are the subject of a proposal (the Schoch ShoreZone proposal) for the EVOS 2005 Work plan. You have not recommended this project to the Trustees, although the Science and Technical Advisory Committee and Science Director did recommend the project.

Chenega hopes that this project will be included in the EVOS 2005 work plan. In addition to the benefits of having the field surveys based in the Sound communities (Chenega and possibly other communities are proposed), the habitat information (a) significantly augments existing spill response tools, (b) provides new data that will be used for environmental planning (like eelgrass and kelp occurrence), and (c) will result in improved monitoring and restoration of oil-affected shorelines within the Sound. The public availability of the information is an important element of the proposed program.

The proposed program will be an important community asset and we urge the EVOS Trustees to fund the project.

Sincerely,

Larry W. Evanoff

President

Post Office Box 8079 Chenega Bay, Aluska 99574* telephone (907) 573-5132 * fax (907) 573-5120
Accounting (907) 573-5134 * Tribal Enrollment (907) 573-5461 * ICWA (907) 573-5386 * FVA (907) 573-5151
Environmental Program (907) 573-5476 * CHR (907) 573-5212
E-mail – chenegaira@starband.net

Exxon Valdez Oil Spill Trustee Council

441 W 5th Ave , Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Larry Evanoff, President
Chenega IRA Council
PO Box 8079
Chenega Bay, AK 99574

Dear Larry:

Thank you for your letter of recommendation for the Schoch ShoreZone Mapping proposal.

Mr. Schoch's original proposal had several problems in it. We requested that he send us a revised proposal, which he has done. The revisions he offered are more in line with our original request, and I will be changing my recommendation to fund the proposal.

A copy of your letter was given to the Public Advisory Committee at their July 21 meeting. Your recommendation will also be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Gail Phillips
Executive Director

Thanks!

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

The Nature Conservancy in Alaska
715 L Street, Suite 100
Anchorage, AK 99501

tel [907] 276-3133
fax [907] 276-2584

nature.org

July, 22, 2004

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council(EVOS)
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Ms. Phillips:

Thank you for the opportunity to comment on the EVOS FY 2005-07 Draft Funding Recommendations. The Nature Conservancy supports funding for two proposals, ShoreZone Mapping for Kodiak and ShoreZone Mapping for Prince William Sound.

The Nature Conservancy has been developing regional conservation strategies for Alaska in a number of areas with formalized ecoregional assessments. The ShoreZone mapping proposals are of significant interest to the Conservancy as we have found this dataset to be of considerable value for conservation planning throughout Washington and British Columbia, where the entire coastline has been mapped.

A ShoreZone map of Prince William Sound is particularly important as it will provide comprehensive coverage in a critical coastal and marine conservation area of Alaska. Prince William Sound is an area in need of mapping, especially for oil spill prevention planning. The mapping project will also provide valuable biological and geophysical data unavailable through any other existing source. That the Invitation for Proposals specifically invited ShoreZone mapping is a recognition by EVOS of this project's unique value.

The Conservancy is also seeking funds from various sources to complete a map of the entire coast of Alaska using the ShoreZone method. Approval of these funding requests by EVOS will help our efforts to leverage additional dollars for unmapped areas of the state.

Thanks again for the opportunity to comment.

Sincerely,

David Banks
State Director

Exxon Valdez Oil Spill Trustee Council

441 W 5th Ave , Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

David Banks
State Director
The Nature Conservancy
715 L Street, Suite 100
Anchorage, AK 99501

Dear Mr. Banks:

Thank you for your letter supporting the Saupe and Schoch ShoreZone Mapping proposals.

Mr. Schoch's original proposal had several problems in it. We requested that he send us a revised proposal, which he has done. The revisions he offered are more in line with our original request, and I will be changing my recommendation to fund his proposal.

Your letter will be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail Phillips

Gail Phillips
Executive Director

PRINCE WILLIAM SOUND
SCIENCE CENTER
CORDOVA ALASKA
P.O. Box 705 – Cordova, AK 99574
(907) 424-5800 – fax 424-5820

July 20, 2004

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Gail:

Thank you for this opportunity to comment on the Draft 2005 Proposal Funding Report. I request your reconsideration of the ShoreZone Mapping Project for Prince William Sound.

It is very surprising to have this project not be recommended for funding in FY05 since the Invitation for Proposals specifically invited this project. While it's great that other regions now have this new and highly recommended tool for their use in the event of another oil spill or natural disaster, as a Cordova resident I find it unreasonable to further delay implementation of this project in Prince William Sound, the heart of oil shipping lanes. No other mapping system provides the kind of biological and geophysical data offered through ShoreZone; its data sets provide an excellent ability to search for specific habitats, species and/or physical data. That's why the system was recognized as the highest priority product for the GEM nearshore program (based on recommendations of nearshore scientists and input from stakeholders at workshops).

Both government and private agencies have already invested their cash support for much of the Kenai Peninsula and Cook Inlet to be mapped. This year, the Prince William Sound Regional Citizens' Advisory Council awarded $40,000 so that mapping work in Prince William Sound could begin this summer. The Council expected the EVOS Trustee Council to lend its support for the project's continuation because the 2005 invitation specifically invited this project. Some preliminary results of the 2004 survey work is graphically displayed in a recent letter sent to you by one of the project's principal investigators, Carl Schoch. These maps dramatically demonstrate the strengths of the ShoreZone system in comparison to other maps now available. Since the STAC recommends this project for FY05 funding in a slightly revised format, it seems inappropriate to fund other uninvited projects without also supporting this one. As

requested, this project's scope of work and budget has been revised to total almost $120,000 less than originally budgeted.

Thanks again for this opportunity to comment.

Sincerely,

Nancy Bird
President

cc: Phillip Mundy, Science Director
Public Advisory Committee members

Enclosure: Letter to Gail Phillips from G. Carl Schoch

PRINCE WILLIAM SOUND
OIL SPILL RECOVERY INSTITUTE

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
441 W. 5th Ave.
Anchorage, AK 99501

Re: response to the STAC Statement of Contingencies

Dear Gail,

The high priority given to Shore-Zone mapping has evolved from a long series of EVOSTC funded workshops and reports including the Habitat Mapping Workshop chaired by Norcross, the Nearshore Monitoring Workshops of Schoch, Eckert and Dean, and the workshop of Dean and Bodkin. There was consensus among all of these efforts that Shore-Zone mapping be given the highest priority to provide a spatially comprehensive habitat inventory over the entire GEM region. Such a habitat inventory would serve as a foundation for making comparisons across large areas by controlling for habitat type and ensuring that future monitoring sites can be selected through a quantitative assessment of habitat similarity. This priority was reflected by the EVOSTC 2005 Invitation, and our proposal is specifically in response to the listed request for nearshore projects.

As requested by the Scientific and Technical Advisory Committee, following their positive recommendation for funding, the Shore-Zone mapping proposal for Prince William Sound has been revised according to the Statement of Contingencies. The proposal and budget have also been revised to reflect a very recent effort to map the western shoreline of Prince William Sound with funding provided by the Prince William Sound Regional Citizens Advisory Council. This critical funding allowed for the continuation of Shore-Zone image acquisition in Alaska during the summer of 2004, and those data will be posted on the internet by the end of this month: http://www.coastalaska.net. While there were not enough funds to produce the GIS maps from this imagery, the 2004 PWS RCAC funding will allow a substantial reduction in the proposed EVOS contribution for completing the remaining portion of the Sound. Further reductions were possible due to the requested elimination of the Copper River Delta and Kayak Island from the proposed project, and the salary contributions from NMFS, RCAC, and OSRI of key individuals participating in the image and data acquisition. These leveraging and partnering opportunities have reduced our proposal by $183.1K. Importantly, these contributions, and the momentum building among many different agencies and organizations to fund the continuation of Shore-Zone mapping, all point to the

stakeholder need for these data and for the EVOSTC to complete the mapping in the GOA.

The Statement of Contingencies we received specifically requested that we address the use of existing video imagery owned by Alyeska. While the prospect of existing imagery is conceptually appealing to a funding organization, the realities of using these data for Shore-Zone mapping are problematic. The PWS RCAC has worked with Schoch and Harper to assess the availability of this video imagery and the derived data products. While Alyeska will potentially allow access to the data products (contingent on a public needs process, Gail Colby, pers. com.), it is still uncertain if the video imagery is accessible and because of this recalcitrance to release the imagery, it seems unlikely that these data will be allowed for broad public distribution on the internet. However, access to the imagery is but one facet of a more complex process. The objectives for acquiring those video images was considerable different from the objectives of Shore-Zone. This is best shown by using an example from our recent survey of western PWS.

The Sensitive Areas Work Group for Prince William Sound has identified *eelgrass* as a high priority resource that is sensitive to spill impacts; and NMFS also considers eelgrass an important Essential Fish Habitat (EFH) for spawning herring and a nursery for juvenile salmon and pollock. Figure 1A shows the type of data presently available for Prince William Sound (data source: Alyeska Graphical Resource Database 2004). Figure 1B shows the eelgrass distribution recently assembled from July 2004 Shore-Zone survey imagery. We found that of the 126 km of shoreline on Evans Island, 12% of the shoreline contains *continuous* eelgrass shown by a red line, and 14% contains *patchy* eelgrass shown by a green line (total eelgrass = 26% or 34km). The Alyeska GRD does not indicate any eelgrass in the bay north of Chenega village, although we found this to contain one of the largest eelgrass beds on Evans Island during Shore-Zone 2004.

Figure 1A. Eelgrass data for the Evans Island area obtained from the Alyeska GRD 2004. Note that eelgrass beds are depicted as point data with no area or shoreline length.

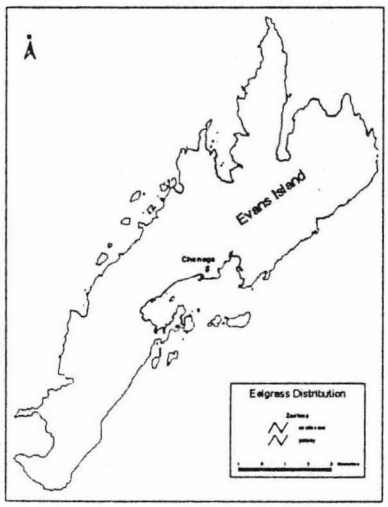


Figure 1B. The distribution of eelgrass on Evans Is, compiled from 2004 ShoreZone imagery and survey data. Data are depicted as lines with shoreline length.

By examining the map of existing Shore-Zone coverage (Fig. 2), you will note that Prince William Sound is one of the last areas within the Gulf of Alaska that remains to be mapped. Interestingly, with all of Washington State, and British Columbia already mapped, there is growing momentum to continue the efforts further north. For example, Glacier Bay National Park has committed to funding Shore-Zone mapping of the outer coast from Icy Strait to Yakutat, and the National Marine Fisheries Service has recently funded an effort in SE Alaska. This means that the shoreline from Aniakchak (on the Alaska Peninsula) to Johnstone Bay (just west of PWS), and the shoreline from SE Alaska to Yakutat will be mapped with Shore-Zone. Paradoxically, this leaves Prince William Sound, the area most impacted by the Exxon Valdez oil spill, as one of the last remaining shorelines to be mapped.

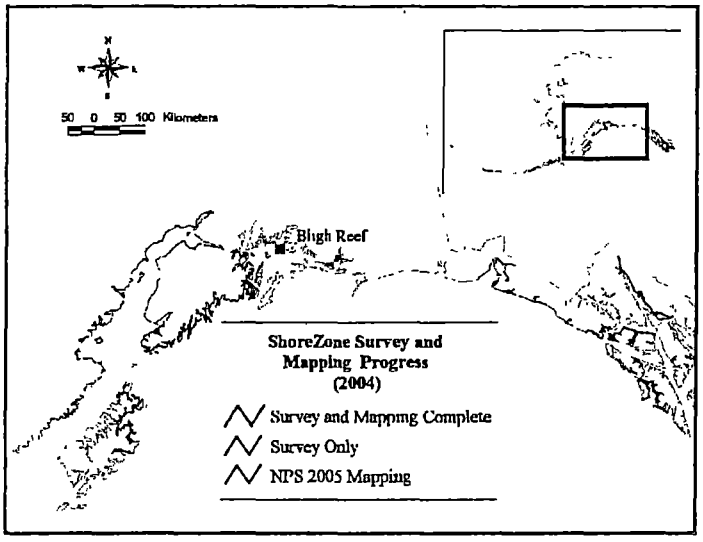


Figure 2. Gulf of Alaska Shore-Zone Mapping

We understand the limitations of funding such a large project, especially when there are so many other interesting projects being proposed, but nevertheless, we hope you will reconsider your recommendation in the draft 2005 Workplan and encourage the Trustee Council to fund this much needed project.

Best regards,

G. Carl Schoch
Prince William Sound Oil Spill Recovery Institute
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July 20, 2004

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Gail:

Thank you for this opportunity to comment on the Draft 2005 Proposal Funding Report. I request reconsideration of the recommendation regarding the proposal titled "Exchange between Gulf of Alaska and Prince William Sound."

While the reviews indicate support for this project at a future date, I note that this project was already recommended for deferred funding in FY04 and that there are significant reasons for it to begin not later than FY05. I summarize those reasons below. Also attached is a more detailed explanation on this project regarding questions and points raised by the reviewers and the STAC (July 20 letter from Thomas Kline addressed to Phil Mundy).

This project needs to begin in FY05 because:

- This project's results will provide a stronger foundation for the successful development of the pink salmon modeling project which is being recommended for FY05 funding (two companion proposals by co-Principal Investigators Ken Adams and Ross Mullins and also by Steve Moffitt).
- A major oceanographic observation program in Prince William Sound commences in the fall of 2004 and will continue for, at least, five years ("Enhancements to the Prince William Sound Observing System: Improving real-time data streams and model output," supported by two separate NOAA grants to the EVOS Trustee Council and the Prince William Sound Science Center and, also by the Oil Spill Recovery Institute). It is critical that the biological observations offered through this project be implemented soon to take advantage of the data that the expanding physical observation program offers. The oceanographic observations focus on investigating the exchange between the Gulf of Alaska and Prince William Sound, and will provide the necessary measurements of inflow/outflow to the Sound and physical variables (temperature and salinity), cited by the STAC reviewers.
- While alternate sources of funding are suggested in the reviews, the GLOBEC program director states that such analysis would have to be highly justified and would

only be supported by GLOBEC for analysis dealing with salmon survival *after* they leave Prince William Sound. The project proposed to GEM is aimed at better understanding the *recruitment into PWS* of the zooplankton species comprising the majority of the diet of pink salmon fry after they leave the streambeds or are released from hatcheries. This project will provide data necessary to improve predictions of zooplankton populations that would, in turn, benefit both wild stock and hatchery salmon production.

- This project currently has strong potential for two significant leverages of other resources which will not likely be available at a later date. The first is using private foundation funds for the equipment purchase; this represents a substantial institutional investment. The second is that a very strong post-doctoral candidate wanting to work on this project has submitted another proposal (to a Norwegian funding source) that would complement this one. The proposal involves comparing the ecology of a zooplankton species, *Themisto libellula*, common to both PWS and the eastern Arctic waters near Svalbard, Norway; this species is also being used in Norway to understand impacts of oil spills on the marine ecosystem.
- It is important to not let the 10-year time series of *Neocalanus* stable isotope analysis in the Prince William Sound region lapse as Dr. Donald Schell's work indicates stable isotope times series may reveal ecological shifts in Alaskan waters. This time series began with the Sound Ecosystem Assessment program in 1994 and it will be a significant loss if it ends this year as GLOBEC's fieldwork closes out.

Let me close by reiterating that the time series of physical and biological data in Prince William Sound should absolutely not lapse and should receive prime attention because of the extensive use of the Sound by both commercial and sport fishers, and by the transport of oil. No other part of the Gulf of Alaska has a greater combined commercial and recreational use by man or as great of a potential detrimental impact on its resources by man's oil transport activities.

Thanks again for this opportunity to comment.

Sincerely,

Nancy Bird
President

cc: Phillip Mundy, EVOS Trustee Council Science Director
EVOS Trustee Council Public Advisory Committee members

Enclosure: July 20, 2004 Letter to Phillip Mundy from Thomas C. Kline, Jr.

PRINCE WILLIAM SOUND SCIENCE CENTER
CORDOVA ALASKA

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July 20, 2004

Phillip Mundy, Ph.D.
Science Director
Exxon Valdez Oil Spill Trustee Council
550 West 4th Ave., Suite 500
Anchorage, AK 99501

Dear Phil:

I would like the Exxon Valdez Oil Spill Trustee Council to reconsider my proposal titled *Exchange between GOA and PWS* for FY05 funding. I respond below to the issues brought up by the STAC review. Whereas sophisticated physical models for the Prince William Sound (PWS) and adjacent systems already exist, knowledge of many fundamental aspects of the biology of PWS is lacking. There is a great need to overcome this deficiency.

The three *Neocalanus* species play a critical ecological role in PWS. As Ted Cooney showed during the 2004 pink salmon workshop in Cordova, late copepodid stage *Neocalanus* form the overwhelming majority of the diet of hatchery released salmon. In order to model pink salmon survival we need to be able to parameterize their food, which is also the food of their predators, therefore being doubly important. Our modeling efforts will be for naught without this information. The tact I am taking with this project is to sample when the population is least dynamic, the diapause phase. The Sound Ecosystem Assessment (SEA) program demonstrated through stable isotope abundance that the source for the diapausing population varies from year to year. It is unknown whether the total population size also varies, but given the change in source, it seems less likely that the population would not also vary in size. Previous sampling has not been quantitative, for example, sample variance was not determined. Thus many questions remain about the nature of the PWS *Neocalanus* populations.

A goal of this project is to systematically and quantitatively sample populations of diapausing *Neocalanus*. Further refinement of the sampling strategy requires empirical data. Once we know how much the over wintering population varies, we will be able to ascertain whether these inter-annual differences along with inter-annual differences in advection can explain the variability observed in spring plankton. The inter-annual differences in advection were hypothesized during the SEA program to be related to the April-May Bakun Upwelling Index. Modeling the plankton population could be initialized using an empirically determined reproductive population size, which would be a result of this project. The reproductive population size, in turn, may be modeled based on Gulf-Sound exchange processes as a future project. The timing aspects of the Gulf influx resulting from this project would provide a starting point. Certainly, the issues associated with the life-history stages leading up to influx are more complex. However, this project is cost effective in studying the diapause questions and could then lead to more cost effective early life-stage science based on more refined and focused questions than what can be posed today.

The years prior to SEA suggested that the Bakun Upwelling Index during April-May was related to zooplankton processes, in particular *Neocalanus* abundance. Why the switch took place during SEA has not been addressed. Empirical studies directed at the pelagic ecosystem of PWS have been pretty much on hold since March 1998 with the end of SEA project sampling. The GLOBEC project provided a stopgap opportunity for sampling. GLOBEC PWS sampling was done opportunistically because weather in the Gulf prevented sampling operations. It was better to sample in PWS rather than remain anchored in, e.g., Thumb Cove of Resurrection Bay. However, many of the samples collected in PWS during GLOBEC remain unanalyzed without much hope for analysis outside of GEM. The GLOBEC samples that have been identified for analysis in this project have the potential to narrow the time when exchange between PWS and the Gulf takes place. This is an ecologically critical event and will address a question of great importance to PWS as it could be used to develop hypotheses explaining the variable response to the Bakun Upwelling Index.

I appreciate this opportunity to further explain and respond to each of the points made in the STAC recommendation.

STAC: "The use of stable isotope analyses to address the exchange of *Neocalanus* between the Gulf of Alaska and Prince William Sound is of value, however there are doubts regarding the validity of the new sampling program that cannot be resolved without additional data. We recommend that the analysis and work up of the existing samples be made before resubmitting any revised proposal. We further recommend that the stable isotope analyses for the samples gathered since 2001 be submitted to the GLOBEC synthesis announcement of opportunity."

Response: Whereas the STAC thinks positively about the first goal of the proposal, they recommend that this be funded through the forthcoming GLOBEC call for proposals. However, this call for proposals will be for synthesis of data collected during phases I and II of the U.S. GLOBEC Northeast Pacific (NEP) Program and is not aimed at further analyses of samples. I spoke with Hal Batchhelder, the Executive Director of the U.S. GLOBEC NEP Program. He told me that proposals for additional analyses have not been favorably reviewed in past GLOBEC synthesis phases. Any sample analysis proposal would have to be highly justified and would have to address GLOBEC NEP issues and these deal with salmon survival *after* they leave PWS. The proposed project is aimed at better understanding the recruitment into PWS of the zooplankton species that form the majority of the diet of pink salmon while they reside in PWS after their release from hatcheries or, for the wild stocks, after they leave streambeds. The goal is to lead to better predictions of zooplankton populations that would benefit both wild stock and hatchery salmon production. EVOS-GEM is thus the appropriate funding source. It should be pointed out that the Black Hole area of PWS was directly in the path of the oil spill. The GLOBEC call for proposals will not be released until December 2004, with proposals due in the spring of 2005. Funding would not likely start before 2006. Assuming that the results would be available until 2007, a revised sampling program would have to be proposed in 2008 to start in 2009. By 2009 the present physical observation program would be at or near an end. The prospects of funding this project through GLOBEC thus appear both remote and distant.

STAC "The results of this analysis should then be used to develop a discussion of the differences between the central Gulf of Alaska and Prince William Sound. This would lead to a better posed sampling design."

Response: There is some urgency to funding this proposal in 2005. One, with GLOBEC sampling at an end, the now ten-year time series of *Neocalanus* stable isotope analysis that began with SEA could come to an end. Schell has shown that a stable isotope time series may be revealing of ecological shifts in Alaskan waters. Two, this project will be matched with private foundation funds representing a substantial institutional investment. Three, a very strong post-doc candidate (to work on this project) has submitted another proposal that would dovetail with this one. This would involve comparing the ecology of an important zooplankton species that is common to both PWS and eastern Arctic waters around Svalbard, Norway. Furthermore, this organism, *Themisto libellula* is being used there to understand impacts of oil spills on the marine ecosystem (the prospective post-doc is presently a Ph.D candidate at UNIS, Svalbard). The proposed GEM project could thus segue into better understanding effects of oil spills in the pelagic ecosystem. According to Jeff Short, other than the Ph.D. thesis research on the photo-toxicity on *Calanus* and *Metridia* to oil by Switgard Duesterloh, there has been no research on the effects of oil on the zooplankton of PWS. Here is a great opportunity to close this gap. Four, a major oceanographic observation program in PWS is about to commence that is virtually devoid of biology. This program will investigate exchange between PWS and the Gulf and would nicely dovetail with the observations being proposed as objectives #3 and #4 of this proposal. Thus a *Neocalanus* observation program needs to be implemented very soon to exploit the synergism that the physical observation program will have to offer. I propose to work with others, e.g., Ted Cooney, in perfecting the sampling design during the course of the project.

STAC: "It should be noted that this is an interdisciplinary problem that depends on the measurement of inflow/outflow to PWS. However, it is uncertain that the measurements of inflow and outflow have been done correctly in the past. Data from GLOBEC cruises should provide adequate estimates of inflow and outflow."

Response: The proposed project will be using geochemical tracers, i.e., stable isotope abundance, to detect occurrence of copepods originating in the Gulf of Alaska. The inferences enabled by this technique do not depend upon direct measures of inflow (Kline,1999). Nevertheless, there would be a synergistic relation with the about to be implemented observation program, which would benefit greatly by having some biological observations. For

example, what were the physical conditions that prevailed in years when GOA origin copepods predominated as in 1995? Whereas I was able to show that most of the copepods in 1995 came from the Gulf, I could only speculate, based on published works as to the causal mechanism, for a lack of appropriate physical measurements.

STAC: "A serious problem in the proposed sampling was the lack of physical variables (temperature and salinity)."

Response: One of the advantages to the HBMN pointed out in the proposal is that it can be equipped with probes that measure salinity and fluorescence in addition to pressure, which is required for net actuation. The pressure and salinity data are combined to assess density in sigma-t units. Funds for these instruments and the HBMN will come from private foundation grants. An equipment technician will work on this project to ensure that the instrumentation works and that the resulting data can be integrated with physical data being collected in other projects. The physical variables are not lacking.

STAC: "While the proposal describes the distribution of copepods on depth surfaces, they will actually be distributed on density surfaces that must be determined from depth, salinity and temperature."

Response: The suggestion that the copepods "will actually be distributed on density surfaces" i.e., on layers of constant sigma-t value or isopycnals, cannot be reconciled with data collected on GLOBEC cruises. Due to down-welling in the Gulf, isopycnals are tilted. At diapause depths in PWS, sigma-t values are about 26.0 +/- 0.2. In the Gulf, the 26.0 isopycnal is found within the upper 100m at the offshore stations where diapausing *Neocalanus* are found at depth (we have found them diapausing from 400 to 600m, but 600m has been the depth limit of our sampling). If they were distributed on isopycnals, they would diapause in PWS or the Gulf but not both. This is not true as they diapause in both the Gulf and in PWS. In PWS, they diapause in water that is less dense than in the Gulf.

Additional points addressing individual reviewer points separate from the STAC review:

Present GLOBEC funds are available to analyze a total of 250 diapausing *Neocalanus* sampled at GAK13 (on the continental slope in the Gulf of Alaska) and not for PWS. I was not referring to Connell's work with the keystone reference but rather the role of a keystone in an arch. The role of *Neocalanus* as food for both salmon and salmon predators is like a keystone that keeps the left and right side of the arch supporting each other and not collapsing. To save space in the proposal, the data of feeding stage *Neocalanus* collected over several years were shown as one figure. There are data for each year for which diapausing samples will be analyzed that show the isotopic distinction between those from PWS and those from the Gulf. In phase II of GLOBEC (2001 to 2004), feeding stage *Neocalanus* have been sampled several times per year. I will be seeking additional funding to sample the spring-summer post-GLOBEC as suggested. I am not rejecting Mackas's hypothesis but am trying to eliminate several others (see cartoon figure in proposal). Goal #3 is to ascertain whether there are lateral population gradients; until someone goes out and collects the appropriate samples we will never know.

A tacit assumption during the SEA project was that the size of the diapausing population was constant, thus the number of potential offspring was constant. The variable was the removal of offspring from PWS by river-lake processes. We failed to show a river-lake relationship during SEA, unlike the previous years. The study may have been confounded if the population size varied due to differences in the size of the reproductive population when at diapause. The diapause population has not been sufficiently sampled in the past to determine whether or not it does not vary in size from year to year.

The inability to morphologically distinguish early *Neocalanus* stages, e.g. the naupliar stages, will be overcome using genetic tools presently under development and could be used for GEM monitoring or other later studies. The questions being addressed here however pertain to late stages that can be distinguished by morphological differences.

The winches we have were used to deploy CTD's in PWS during the SEA program. They have 1000m of conducting cable and are portable (can be bolted down). There are several potential vessels in Cordova that could be used and will be chosen using a bidding process so we really cannot be more specific about the actual vessel to be used. The HBMN is the only net of its type available on the world market according to the ICES zooplankton

manual. It is possible that others are made but not available for sale. Updating software of older instruments to newer computers is a major problem today. Hydro-Bios has been on the world market for many years as a supplier of oceanographic sampling equipment and thus has a record of support. This may not be the case for smaller suppliers. For example, it is problematic that there is no upgrade available to allow a MOCNESS to be used on newer PCs and OSs (pers. comm. K. O. Coyle, UAF).

Please let me know if you have any questions or would like further explanation on any of these issues. Thank you again for this opportunity to clarify some points in my proposal.

Sincerely,

Thomas C. Kline, Jr., Ph.D.

cc: Gail Phillips, Executive Director, EVOS Trustee Council

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Nancy Bird, President
Prince William Sound Science Center
PO Box 705
Cordova, AK 99574

Dear Nancy:

Thank you for your letters supporting the Schoch ShoreZone Mapping and Kline Exchange between Gulf of Alaska and Prince William Sound proposals.

Mr. Schoch's original proposal had several problems in it. We requested that he send us a revised proposal, which he has done. The revisions he offered are more in line with our original request, and I will be changing my recommendation to fund his proposal.

Copies of your letters were given to the Public Advisory Committee during their July 21 meeting. Your letters will also be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Gail Phillips
Executive Director

Thanks for your input, Nancy. We helped!

Cherri Womac

From: walter b. parker [wbparker@gci.net]
Sent: Friday, July 23, 2004 11:45 AM
To: cherri_womac@evostc.state.ak.us
Subject: Comment on Proposal Funding Report

These comments refer to Project Title: Detecting the Exchange between Gulf of Alaska and Prince William Sound, which was not recommended for funding in the 2004-06 GEM workplan.

Watching the development of the Sound Ecosystem Assessment for over a decade and GLOBEC Northeast Pacific since its inception, one of the great holes it seems to me has been research to tie these two efforts together on an ecosystem basis. Kline's research has been one of the few efforts to do so. I am not quite sure, despite several years of discussion, where Prince William Sound fits in the habitat structure of GEM, Watersheds, Alaska Coastal Current, Nearshore and Offshore. After reviewing the GEM and GLOBEC work programs, I am even more convinced that in addition to the extensive current work underway, there should be a continuation of research to develop the biological ties between the Gulf and PWS. We need more research in this area, and if one of the few scientists working on filling this hole is denied funding, it will hardly attract others to submit proposals. As noted by the reviewers, this is an interdisciplinary problem, but the recommendation for not funding keeps it a basic current measuring problem, without adding information at basic tropic levels.

Walter B. Parker
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Exxon Valdez Oil Spill Trustee Council

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July 29, 2004

Walter B. Parker
3724 Campbell Airstrip Road
Anchorage, AK 99504

Dear ~~Mr. Parker~~: Walt -

Thank you for your letter supporting the Kline Exchange between Gulf of Alaska and Prince William Sound proposal.

Your comments will be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Thanks!

Gail Phillips
Executive Director

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

August 4, 2004

Ms. Gale Vick
Executive Director
Gulf of Alaska Coastal Communities Coalition
P.O. Box 201236
Anchorage, Alaska 99520

Dear ~~Gale~~ Gale:

Thank you for taking the time to send us your proposed modifications to the ACCOS/Alaska Coastal Community Observer System. As you know, our Public Advisory Committee (PAC) recently met to go through the proposed projects.

The PAC spent quite a bit of time discussing your project. It did not make a recommendation to fund your project at this time. However, they do encourage you to work with Lyn McNutt and submit a revised project for FY 06.

At your convenience, Phil and I would like to invite you to come in and meet with us regarding your proposal. We would encourage you to bring Heather McCarty and anyone else you may choose with you. I am not comfortable with your policy expectations and we would like to sit down together to discuss these with you.

Phil and I are fine with the concept of local residents doing the data collection. However, since we do have in-house staff coordinating our Community Involvement activities, we do not support funding for an outside community coordinator.

Please give a call and let Elizabeth know when you might be able to meet with us after August 23rd.

Sincerely,

Gail

Gail Phillips
Executive Director

Cc: Phil Mundy, Science Director
Dick Dworsky, Science Coordinator

Gulf of Alaska Coastal Communities Coalition (GOAC3)
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Phone: (866) 561-7633 or (907) 561-7633 Fax: (907)561-7634
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July 22, 2004

TO: Gail Phillips. EVOS/TC Executive Director
Members of the EVOS Trustee Council

RE: Comments on proposals for FY05 funding
ACCOS / Alaska Coastal Community Observer System
Proposed modification

Dear Gail and members of the Trustee Council:

As you may know, the GOAC3 (Gulf of Alaska Coastal Communities Coalition) - a 501(c)6 non-profit - represents the smaller coastal communities of the Gulf of Alaska as an advocate for community-held fishing rights. As part of our mission, we are also concerned about sustainable fisheries and habitat protections and the need for relevant science that incorporates local and traditional knowledge (LTK.)

Our belief in this is so strong that we created a concept for an Alaska Coastal Community Observer System (ACCOS) and submitted a proposal to EVOS for FY05 funding of a pilot project in Prince William Sound. The project was not recommended for funding by the EVOS scientific team.

On July 19, we submitted a letter – primarily intended for the PAC (Public Advisory Committee) meeting on July 21 – to express our desire to move forward with some kind of option so that the initiative is not lost for another year. We offered a significant reduction of the program so we could focus FY05 on creating a process by which ACCOS might be better defined by integrating with another proposal for Prince William Sound. We suggested Lyn McNutt and Two Crow's (AKA Jim Schumacher) "Building the Infrastructure for the Gulf Ecosystem Monitoring (GEM) Program."

The McNutt/Two Crow project emphasizes an Integrated Management approach to defining and combining objectives for a monitoring and modeling program that includes community stakeholders, managers/policymakers, economic interests, and scientific researchers. Their proposal focuses on developing agreements and partnerships with each of these groups, and defining mutual objectives that will benefit the larger user community. GOAC3 agrees with McNutt/Two Crow in believing that community and other stakeholder objectives form a sound basis for monitoring and management of resources.

Before defining a monitoring or modeling program, the communities themselves must first articulate their needs and expectations. These can then be integrated into the requirements of resource managers and policymakers to provide clearly-defined objectives for the scientific community.

Because our organization has a strong base in the entire North Gulf, we feel that we can easily coordinate with the North Gulf communities, providing the community stakeholder requirements for the McNutt/Two Crow project. In turn, the McNutt/Two Crow project offers us a framework for our information gathering, and an opportunity to interact with other groups, including other area resource users and managers, in working toward common goals for integrating LTK. Our original proposal anticipated a full-blown pilot project in Prince William Sound only; the modified proposal would be coordinating with communities in the entire GEM area without conducting a pilot.

I have spoken many times with Lyn McNutt who emphasized the need for having a focused component for Community Objectives in their project. As a member of her original proposal's review team, I discussed with her how we can work toward a mutual goal. The ACCOS project fits well with the McNutt/ Two Crow objective of being "responsive to community involvement in that it would bring together stakeholders with modelers to define needed outcomes of the model." (From the EVOS/ STAC review July 2004) While this is not the full ACCOS objective, working with the McNutt/Two Crow project will provide a starting point for our work, as well as a needed component for them.

We are, therefore, proposing the following modifications to our ACCOS proposal for consideration for FY05 funding:

(1) The project would no longer be focused on undertaking a pilot project in PWS, but instead would consist of preparation of a detailed report on the needs and expectations of community stakeholders within the Integrated Management approach to the McNutt / Two Crow project community component;

(2) Our team (GOAC3 and additional staff) would work with Lyn McNutt / Two Crow's project by providing a focal point for the definition of the community needs and their integration into the larger GEM Program;

(3) Project funding need would be greatly reduced to approximately $40,000 to fund a community coordinator, to develop and implement a recording system, and to help define an information transfer framework, in conjunction, with the project's original review team and others.

To eliminate any accounting burden on Ms. McNutt, and reduce additional indirect costs, money for this portion of the project should be allocated directly to GOAC3. GOAC3 will provide, as an in-kind contribution, all indirect costs (office, administrative staff, accounting, travel, communications and reproduction) for an estimated total of $20,000. (GOAC3 has internal and external bookkeepers and is subject to an annual audit.) McNutt and Two Crow would provide

oversight to the GOAC3 project as it relates to defining the community objectives as stated in their original proposal.

In conclusion, during the discussions at the July 21 PAC meeting, I was struck by several immediate and common needs:

(1) The need for a uniform process that all researchers can use to recognize community objectives relevant to their research and to utilize community observation

(2) The need for community residents and other stakeholders to participate in specific area research

(3) The need for community residents and other stakeholders to be able to incorporate their observations toward the identification of research needs

(4) The number of PAC members who expressed their deep concern that such a process be identified quickly

While working within the McNutt/Two Crow project framework is a positive and cost-effective way to begin defining a process for identifying community needs and expectation relevant to local-area research projects, the GOAC3 will also continue to pursue their goal of developing a community observation system, as well as a means by which those observations can contribute to marine science. Ultimately we see our mutual goals as being multi-fold and mutually beneficial.

We hope that you will see our modified proposal as a way of making this first valuable step.

Thank you.

Sincerely,

Gale K. Vick, Executive Director
Gulf of Alaska Coastal Communities Coalition (GOAC3)

Cc: GOAC3 Board of Directors and Technical Team
Members of the EVOS/TC Public Advisory Committee (PAC)
Lyn McNutt, Geophysical Institute, University of Alaska Fairbanks

Attachments: GOAC3 Board of Directors
Letter of May 19, 2004

GULF OF ALASKA COASTAL COMMUNITIES COALITION
BOARD OF DIRECTORS & TECHNICAL TEAM
July 23, 2004

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Tom Panamaroff, **Treasurer**

GULF OF ALASKA COASTAL COMMUNITIES COALITION
BOARD OF DIRECTORS & TECHNICAL TEAM
July 23, 2004

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July 19, 2004

TO: Gail Phillips. EVOS/TC Executive Director
Members of the EVOS Trustee Council
Members of the EVOS / TC Public Advisory Committee (PAC)

RE: Comments on proposals for FY05 funding
ACCOS / Alaska Coastal Community Observer System

Dear Gail and the members of the Trustee Council and Public Advisory Committee:

On behalf of the Board of Directors for the Gulf of Alaska Coastal Communities Coalition (GOAC3) and myself, as a commercial fisherman in Prince William Sound, as a Director for the Prince William Sound Science Center, and as a member of the North Pacific Research Board Advisory Panel, I am writing regarding specific comments on the proposals for the EVOS/TC FY05 funding related to the Alaska Coastal Communities Observer System (ACCOS) proposed pilot.

This letter expresses our disappointment over the recommendations of the proposal review team to not fund the ACCOS-PWS Pilot Project for FY05. We feel strongly that this program of institutionalized community observation should be funded. There is a growing national concern that coastal communities are disenfranchised from both the scientific data collection and the resulting regulatory action that so heavily impacts them. The National Research Council, the U.S. Commission on Ocean Policy and the Pew Oceans Commission have all recommended a substantially enhanced and institutionalized way to incorporate local and traditional knowledge (LTK or TEK) and to include communities in everything from creating indices to collaborative research efforts.

EVOS itself has specifically stated that "it would have been desirable to see TEK and coordination with the local communities in PWS." [1] We feel that the ACCOS project has tremendous potential to help fill that need.

The proposed ACCOS pilot project in Prince William Sound is just that – a pilot project. If successful, this project can be replicated all over Alaska and other places, integrating local and traditional knowledge with scientific knowledge through a variety of programs and options, and creating, possibly, a truly collaborative way of conducting near-shore research.

However, we are more concerned in outcomes than in pride of ownership and we see an opportunity that we suggest at the end of this letter.

The ACCOS proposal grew out of several concerns:

- to give voice to the frustration that many local community residents have over having no vehicle to report their localized observations
- to help indicate where current or future research needs might be
- to help develop indices or "alerts" that might not have any other way of being reported
- to help create better and more sustainable economic opportunities
- to forge new alliances which will hopefully help us all solve problems faster – and together- at less expense
- to help buffer our coastal communities from the consequences of managerial decisions based on poor or non-existent science by seeking ways to find out what research may be needed and how soon regarding pending regulatory changes
- to help educate all members of the community regarding their role in habitat protection and restoration
- to foster a better understanding of community dynamics among researchers and regulatory agencies
- to help develop research models that integrate sustained use of local and traditional knowledge (LTK)
- to help educate community members – and even visitors – in being more "scientific" about their observations and recording of those observation

This would further help communities by:

- Creating greater awareness of near-shore needs or problems through lay observations of:
  - Salmon stream erosion
  - Presence of invasive species[2]
  - Near-shore depletion of halibut
  - Debris
  - Marine mammal interactions[3], changes in water temperature, increase of indicators such as jellyfish, etc.
  - Near-shore pollution
  - Gear conflicts that affect habitat
  - Interactions between high-powered jet skiis, etc., and near-shore habitat
- Helping to provide information to local area planning, such as through the current Sitka Sound Local Area Management Plan (LAMP) and other proposed LAMPs in Prince William Sound and on Kodiak and other areas
- Working with community groups to develop marine-sustainable models for economic development
- Working with environmental organizations to identify or support indices

It is disappointing that the EVOS/TC staff and reviewers have not seen the inherent value of the project. The decision seems to have been based on four issues:

1. lack of statistical model
2. lack of appropriate principal investigators
3. concern over outcome being prejudiced
4. concern that the project was a glorified web site[4]

There can never be a true statistical model for this project. This is not a quantitative process. This is a social, political, economic and humanitarian process. The point of the proposal was to develop a data collection and interpretative model for incorporating local and traditional knowledge into the many phases of scientific investigation.

The proposal's "principal investigators" are most definitely not scientists nor social researchers. That is not what the project calls for. The Pilot Project Team consisted of long-time leaders within the Prince William Sound Community as well as one individual who is a well respected social economic researcher and two other individuals with a long history of credentials in developing related projects. The proposal was specific that this was a team that would be responsible for working with agencies from National Marine Fisheries, Alaska Department of Fish and Game and others to develop a data collection format that would be amenable to joint specific goals and then would be field tested.

More disturbing is that the EVOS / STAC summary indicates that the reviewers may have a built-in bias toward any stakeholder participation. (" With a purpose of GOAC3 to keep the maximum fisheries effort within a sustainable environment it is questionable how objective the observations would be.")

The ACCOS project clearly proposes to include *all* community members – including residents, teachers, students, visitors, subsistence users and sports fishermen, as well as commercial fishermen. The concept of having a "rigged" system is neither possible nor warranted. This is about community observations being recorded in perpetuity. All "lay" observations will be naturally biased but a pattern will emerge that will either substantiate or refute specific claims.

To be taken seriously by the scientific community, to have a framework for relaying information, to forge better working relationships, all of these and more are the perennial problems that communities face. You hear it time and time again. You hear about how disconnected the science community is from the people who need that science in order to have a better quality of life. And why? Because there is an ingrained bias – admittedly on both sides – and there are precious few ways to bridge those gaps. Our coastal communities want and need to know that their observations can be validated and heard by the scientific community, as surely they affect their immediate environment and working world. [5]

A program like ACCOS must be institutionalized in order to be successful. It can be loosely administered by schools[6], municipal or tribal governments, regional economic development groups, or other local organizations to ensure that it is, in fact, being used, and it can be monitored on a regular basis by agencies who want that information.

As an alternative to funding the ACCOS proposal in full, we are highly supportive of Lyn McNutt's FY05 Infrastructure for GEM proposal. This proposal is not the same as ACCOS but it utilizes many of the same concepts in the expectation of developing a model. It is extremely important that this project go forward.

It is also a prime opportunity to go one step beyond, creating a model that could be used in a future ACCOS pilot project. I believe Ms. McNutt's project can easily accommodate an additional component that will assist both our goals. I have discussed this in brief with Lyn and she is agreeable to further discussion on how this might work.

Therefore, I hope that you will consider additional funding for Ms. McNutt's project that will help us to develop such a model. Ms. McNutt also has experience working with a Canadian model that may be similar to what we envision. Her knowledge and expertise, as well as the knowledge of the other PIs on this project will be something we cannot replicate. Our combined experience and knowledge will, similarly, aid her project.

Because of time constraints, we have not discussed a scope of work or budget. Since much of the proposed ACCOS project budget was focused on managing the pilot, the amount that would be tailored to Ms. McNutt's project would be significantly less. Our goal, for the moment, would be to develop a model that would assist both our efforts. If the EVOS/TC is amenable, then we can develop a budget and work plan fairly quickly.

I encourage you to strongly consider this option. In a time when are coastal communities are seeking to be heard, in a time when state and national organizations are also encouraging this, in a time when we all need to be working together, we need to find models – and quickly – which can be successful (and relatively inexpensive) in perpetuity. If we keep closing the door to our local (current) and traditional observations, we have not only lost a tremendous amount of collective and valuable knowledge, but we have lost an opportunity to help enlist our coastal communities in creating better local environments. And, we have aggravated a growing political problem. Despite old time and long-held biases against "anecdotal information", community observations have a very important role in our collective knowledge base.

Thank you.

Sincerely,

Gale K. Vick, Executive Director
Gulf of Alaska Coastal Communities Coalition (GOAC3)

Cc: GOAC3 Board of Directors and Technical Team
Lyn McNutt, University of Alaska Fairbanks

[1] EVOS/TC Director's comments regarding Schoch-FY05-ShoreZone Mapping for PWS

[2] This was particularly brought home to me two years ago when I was fishing a remote stream in the Cordova area. I caught what I originally thought was a jack king but then, on further inspection, realized was an Atlantic salmon. Because we were traveling by helicopter and had a weight problem, and because the weather was quite bad, I was talked out of keeping it to take back for ADF&G. I regret that decision. Had there been an ACCOS system in place, I would have definitely taken the fish back whole. I did report the sighting to an ADF&G biologist/manager, but having no LTK component for incorporating the "sighting", I am sure it remains very anecdotal, if not lost. However, I have heard of other fishermen catching Atlantics on that same stream. It would be highly useful to have ALL tourists and others fishing rivers to look for and report invasive species. This could be especially helpful in the reporting of Northern Pike as an imported species to localized lakes and rivers.

[3] Almost every commercial fisherman I know, including myself, has seen multiple marine-mammal and other interaction, such as Orca attacks on sea lions, seals and otter, by-catch of salmon shark (no way to report), marine and wildlife sightings that are atypical.
[4] The proposed web site is only a mechanism, it is not meant to be an end product. The end product is the *process* that people use to share static and fluid information, integrating with many other programs resulting not just in a data bank of local and traditional knowledge, but in a ***useful tool*** that helps to identify or support issues.

[5] Had there been an extensive program like ACCOS in place prior to the lawsuits regarding the Steller sea lions, there might have been sufficient local and traditional information to encourage a more serious review of what was really going on. There might have been collaborative research efforts already working. There might have been enough "anecdotal" data to indicate that there might be other environmental influences beyond the assumed – and now largely disputed – theory that fishermen competing for forage food is causing the decline in the Western herd. The subsequent lawsuits, based on poor science, have had a devastating impact on our community small boat fleets.

[6] One of the ways that money could be saved is to work with local schools to incorporate monitoring of this program as part of their science curricula, assigning this as a project to students or others during the summer months.

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Lyn McNutt, University of Alaska Fairbanks

[1] EVOS/TC Director's comments regarding Schoch-FY05-ShoreZone Mapping for PWS

[2] This was particularly brought home to me two years ago when I was fishing a remote stream in the Cordova area. I caught what I originally thought was a jack king but then, on further inspection, realized was an Atlantic salmon. Because we were traveling by helicopter and had a weight problem, and because the weather was quite bad, I was talked out of keeping it to take back for ADF&G. I regret that decision. Had there been an ACCOS system in place, I would have definitely taken the fish back whole. I did report the sighting to an ADF&G biologist/manager, but having no LTK component for incorporating the "sighting", I am sure it remains very anecdotal, if not lost. However, I have heard of other fishermen catching Atlantics on that same stream. It would be highly useful to have ALL tourists and others fishing rivers to look for and report invasive species. This could be especially helpful in the reporting of Northern Pike as an imported species to localized lakes and rivers.

[3] Almost every commercial fisherman I know, including myself, has seen multiple marine-mammal and other interaction, such as Orca attacks on sea lions, seals and otter, by-catch of salmon shark (no way to report), marine and wildlife sightings that are atypical.
[4] The proposed web site is only a mechanism, it is not meant to be an end product. The end product is the *process* that people use to share static and fluid information, integrating with many other programs resulting not just in a data bank of local and traditional knowledge, but in a *useful tool* that helps to identify or support issues.

[5] Had there been an extensive program like ACCOS in place prior to the lawsuits regarding the Steller sea lions, there might have been sufficient local and traditional information to encourage a more serious review of what was really going on. There might have been collaborative research efforts already working. There might have been enough "anecdotal" data to indicate that there might be other environmental influences beyond the assumed – and now largely disputed – theory that fishermen competing for forage food is causing the decline in the Western herd. The subsequent lawsuits, based on poor science, have had a devastating impact on our community small boat fleets.

[6] One of the ways that money could be saved is to work with local schools to incorporate monitoring of this program as part of their science curricula, assigning this as a project to students or others during the summer months.

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Gail Vick, Executive Director
Gulf of Alaska Coastal Communities Coalition
PO Box 201236
Anchorage, AK 99520

Dear Ms. ~~Vick~~ Gale –

Thank you for your comments supporting the Vick Alaska Coastal Communities Observer System proposal.

I appreciated your attendance and participation at the July 21 Public Advisory Committee's meeting and your quick written response to their comments and concerns regarding your proposal. Both of your comments will be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail

Gail Phillips
Executive Director

Thanks for your input!

July 22, 2004

Gail Phillips
Executive Director
Exxon Valdez Oil Spill Trustee Council
441 West Fifth Avenue, Suite 500
Anchorage, AK 99501

Re: Comments on Review of Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change

Please find enclosed our comments on the spring 2004 review of the EVOS proposal submission by Mazumder et al. titled "Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change". We would like to respond to each of the reviewers' comments from the EVOS STAC review (Appendix I). We provide the full comments below with four supporting figures (1 to 4) and Appendix I: 2004 EVOS STAC Review (for FY05 funding) and Appendix II: 2003 EVOS STAC Review (for FY04 funding).

However, to summarize, we would like to indicate our disappointment with the review process and outcome. Our work and efforts in the Kenai watershed and directly with EVOS and numerous research and community based proponents have led to the input and development of the EVOS watershed theme and other already funded watershed projects. Many of our ideas and background efforts have led to the phrasing and direction of the initiatives EVOS has taken in understanding the links between the Gulf of Alaska and coastal watersheds. Little of this effort appears to have been considered or understood in this review process. The Kenai project was developed with input from many researchers, community and industry stakeholders with direct partnership to salmon stock and watershed managers and EVOS, as the major research direction needed to address the gaps in knowledge regarding the links between returning salmon, ocean ecosystems and watershed foobwebs and ecosystem processes.

The literature acknowledges that paleolimnological studies (e.g. Finney et al. 2000) with century based time scales, provide no resolution to detect or understand mechanisms related to important marine nutrient inputs into watersheds on annual or even decadel scales important to resource managers, communities and industry. This is particularly evident in the Kenai watershed where the direct examination and annual assessment of marine derived nutrient input can and will have direct implications on management of salmon stocks, salmon habitats and other wildlife and marine based resources in the area. It is for this reason that we had proposed to research a variety of assessment protocols and techniques to develop practical tools for use by resource managers to understand the linkages between oceans and watersheds. We found the reviewers comments totally unaware of the technical issues involved in developing the research to evaluate potential surrogates to understand the

critical links and processes between salmon returning from the Gulf of Alaska (GOA) and foodwebs and ecosystems in coastal watersheds of Alaska. Below we discuss the reviewers' comments.

At this point we would be surprised if the proposal funding recommendations were altered (although we would welcome such an action), but felt it important that EVOS understand the shortcomings in the present review. As a final statement, given the importance of the Kenai River Watershed and its fisheries and aquatic resources to Alaska and GOA ecosystems, it is our desire to see that the proposed marine derived nutrient research in the Kenai River watershed proceeds with the support of EVOS. We have seen unprecedented review, revision and discussion on this work and wish to proceed with EVOS support.

Thanking you for your sincere effort at looking into the justification of review process and funding recommendation on our behalf.

Sincerely,

Kenai Research Team.

Dr. Asit Mazumder
Research Chair and Professor

Jim Edmundson
ADFG Research Supervisor

Mark Willette
ADFG Research Biologist

Robert Clark
ADFG Senior Research Scientist

Dr. Mark Johannes.
Research Scientist

Contact:
Dr. Asit Mazumder
University of Victoria
250-472-4789
email: maumzder@uvic.ca

Maumzder et al. comments to EVOS July 23, 2004

2004 EVOS STAC review (bolded) and Proponents' Responses.

1. This proposal is not recommended for funding.

Proponent Response: This recommendation is very disappointing considering the effort and interest the entire group of researchers, community and industry stakeholders have taken and sponsored in promoting research links between watersheds and the GOA. This proposal was recommended for funding in FY03 contingent upon making suitable streamlining of the proposal and upon providing a smaller budget. Proponents made satisfactory changes to the proposal in FY03 and this proposal was invited for resubmission in FY04 competition.

2. There is concern regarding the ability to determine the critical MDN or substances in the KR watershed and how they influence changes the ecosystem. How can the proposers be assured that they have identified the critical components of this ecosystem?

Proponent Response: The main focus of the Kenai proposal was to develop robust surrogate parameters and protocols to assess and quantify input of marine derived nutrients as a direct function of salmon spawner and carcass density (e.g. Figure 1). Our research in the Kenai had intended to explore a variety of surrogate measures to provide practical protocols and assessment tools to be used in managing economically important salmon stocks and habitats. The technical foodweb parameters proposed for measurement in the Kenai were developed by our team of researchers and to some extent used in two EVOS funded proposals (Walker and Cooper). All the existing research and literature supports the study design and analytical protocols we have proposed for this research. We do agree with the notion that this science is complicated and needs careful review and analysis of robust surrogate parameters across a variety of naturally varying systems as proposed for the Kenai.

3. The proposal relies on regression analyses to test the relationships between MDN, biological and physical parameters. This does not establish cause and effect. For example, changes in salmon abundance might be affected by open ocean conditions rather than local watershed conditions.

Proponent Response: Regression analysis had been proposed as one of the possible final summary analyses to test the potential association and variation between salmon carcass deposition and marine derived nutrients and surrogate parameters across phenotypically distinct salmon stocks and watershed units in the Kenai. Correlation and regression analyses are appropriate tools to test the robustness of surrogate variables as a predictor of MDN and spawner density. Bilby et al. (2001) has successfully used this type of statistical analysis to validate the dependence (Y variable) of N-15 as a surrogate for marine derive nutrient input from salmon carcasses (Figure 1 – *from Fig 2 - Bilby, R.E., B R Fransen, J K. Walter, C J. Cederholm and W.J. Scarlett. 2001. Preliminary evaluation of the use of nitrogen stable isotope ratios to establish escapement levels for Pacific salmon Fisheries 26 6-14.*). Finney et al. (2000) used correlation to present the association of sedimentary N-15 and spawner density (Figure 2 – *from Fig. 2 Finney BP, Gregory-Eaves I, Sweetman J, Douglas MSV, Smol JP. 2000. Impacts of climatic change and fishing on Pacific salmon abundance over the past 300 years. Science 290.795-799.*).

One of our purposes in proposing the use of regression analysis was to present our results in a manner consistent with existing studies. Use of regression analysis is intended to test the robustness of surrogate parameters as indicators of marine derived nutrient input in unique watershed basins under variable independent spawner densities. Our proposal made it clear that many types of statistical

analyses were needed. The sample design was set, and to some extent the success of our research, data and analysis will determine the appropriateness and use of individual statistical analyses. Regression was suggested as one of those potential techniques. We feel that our study design and approach are valid, and are supported by existing peer-reviewed research, including our own work in this field.

4. The hope is stated here that multiple regression analyses, including non-linear and non-parametric versions will help to find a relationship between MDN supply rates (anadromous fish inputs) and some of the many variables to be extracted from the watershed. This will fulfill what they state is their principal goal, to find one or more proxy variables for rates of MDN supply. Nothing is said, however, about how the fish inputs will be quantified.

Proponent Response: The reviewers may have missed several statements and tables in the proposal where we clearly outline the existing knowledge and extent of annual (ongoing) salmon escapement surveys by ADF&G and other key partners. The salmon stock assessment in the Kenai had been intended as a direct partnership between our research team and salmon and habitat managers to provide valid seasonal estimates of salmon spawner distribution, density and carcass deposition. It should also be noted that the Kenai proposal was authored by key sports and commercial fisheries research and management biologists with ADF&G active in the Kenai watershed.

5. There is no statement of who will carry out the analyses or where they will be done. The inability to measure the sensitivity of the ecosystem to MDN is also worrisome. It is curious that the works of other researchers addressing the MDN distributions in the region such as Finney et al. are not referenced in this proposal.

Proponent Response: The proposal clearly outlines field and laboratory activities and names individuals and teams for analysis and delivery of research products. The Kenai project indicates successful partnership between a research team and salmon stock assessment and management (ADF&G). The proposal outlines that the research team will work with ADF&G, under ADF&G leadership for fieldwork and under UVic leadership for analytical work. The issue of ecosystem sensitivity, foodweb function and structure in response to marine derived nutrients has not been addressed by Finney et al.

6. Are there possibly already accepted protocols for this type of sampling? If not, can they really be established and tested in two years? Decades of sampling will be required to determine the interannual signal of MDN and its strength will be a function of biological and physical factors. It is unclear as to how they will separate these influences.

Proponent Response: The protocols have been developed following two years of consultation with numerous researchers, managers and stakeholders, four years of exploratory research by our team, partnership with two complimentary studies in Alaska and BC, and two ongoing Ph.D. graduate theses. The study approach we developed in the Kenai proposal is also being used in two EVOS funded projects. We agree that two years is not enough time to define clear patterns and mechanism, however the investment from EVOS into Kenai watershed research would have sponsored considerable added research funding (double) from within and outside Alaska to continue this research and management efforts to explore the links between ocean ecosystems and major economic resources in the Kenai watershed.

7. The specific testable hypotheses (p. 4) are not connected with the proposed data set. Statistical testing of these is not possible. They need a model that can be tested with the data sets to be gathered.

Proponent Response: We disagree strongly with the reviewers. This is a casually made statement with no merit. The proposal presents in extraordinary detail the extent and type of data collection, and associated hypotheses (See details from proposal below). At the basis of this discussion there are three points to elaborate.

First is an understanding of research in foodwebs and watersheds. Mazumder, Edmundson, Johannes, Willette and Clark have published extensively on this subject in relation to nutrient flow, structure and mechanism across North America in numerous fish and salmon communities and a variety of ecosystem types. The proposal reflects the experience of these researchers.

Second, the literature on marine derived nutrients, foodwebs and nutrient flow in watersheds uses various parameters and statistical analyses, like regression, to quantify the association between independent and dependent variables like salmon carcass density and (a) juvenile salmon growth (Figure 1, 2), (b) zooplankton and (c) sedimentary nitrogen isotopes (Figure 2), (d) nutrient concentrations, periphyton (chlorophyll) (Figure 3 – *from Fig 10 Johnston, T N , E A MacIsaac, P J Tschaplinski and K J Hall 2004 Effects of the abundance of spawning sockeye salmon (Oncorhynchus nerka) on nutrients and algal biomass in forested streams Can Jour Fish and Aquat Sci 61 384-403.)* The hypotheses we detailed in the proposal (presented below) use an understanding that quantified salmon carcass input can be associated with dependent variables like nutrients dissolved in water, nutrients consumed or absorbed by other trophic levels including phytoplankton, juvenile salmon, resident fish, and even wildlife (Figure 4 – *from Spencer, C N , B.R McClelland, and J.A Stanford 1991. Shrimp stocking, salmon collapse and eagle displacement. Bioscience 41 14-21.)* The literature establishes that a positive association may exist between salmon carcass density in freshwater and nutrients or foodweb production.

Third, the Kenai is an economically and biologically rich and diverse watershed. Research has established that genetically and phenotypically unique salmon stocks and races exist across individual sub-basins, rivers and lakes systems within the watershed (Edmundson et al. 2003, Schmidt et al. 1995, 1998, Seeb et al. 2000). Further that these unique salmon stocks and races are set within distinct freshwater typed habitats in streams and lakes of the watershed (clear, stained and turbid). We have used these biological and environmental habitat characteristics to develop a study plan to collect statistically independent samples based on the known characteristics of salmon stocks and their density and collected surrogate marine derived nutrient parameters. The proposed study sites within the Kenai River watershed are the basis of ongoing salmon stock assessments by ADF&G. Our intention is to tie these estimates of salmon density to our measures of surrogates for marine derived nutrients to provide clear independent tests of the association between salmon density, spawners and carcasses with parameters potentially measuring the contribution of marine derived nutrients. In our original 2003 proposal, we had presented a study design to test for marine derived nutrients across a series of watersheds in parallel to ADF&G salmon assessments (Appendix II).

Edmundson, J A , T M Willette, J M Edmundson, D. C. Schmidt, S R Carlson, B G. Bue and K E Tarbox 2003. Sockeye salmon overescapement (Kenai River Component), *Exxon Valdez* Oil Spill Restoration Project Final Report (Restoration Project 96258A-1), Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage, Alaska.

Schmidt DC, Carlson SR, Kyle GB, Finney BP. 1998 Influence of carcass-derived nutrients on sockeye salmon productivity of Karluk Lake, Alaska importance in the assessment of an escapement goal. North American Journal of Fisheries Management 18 743-763

Schmidt DC, Tarbox KE, Kyle GB, Carlson SR 1995 Sockeye salmon overescapement, *Exxon Valdez* Oil Spill Restoration Project Annual Report (Restoration Project 93258). Alaska Department of Fish and Game. Regional Informational Report 5J95–15.46 p.

Seeb, L. W , C. Habicht, et al (2000). "Genetic Diversity of Sockeye Salmon of Cook Inlet, Alaska, and Its Application to Management of Populations Affected by the Exxon Valdez Oil Spill." Transactions of the American Fisheries Society [Trans Am Fish. Soc] 129(6). 1223-1249.

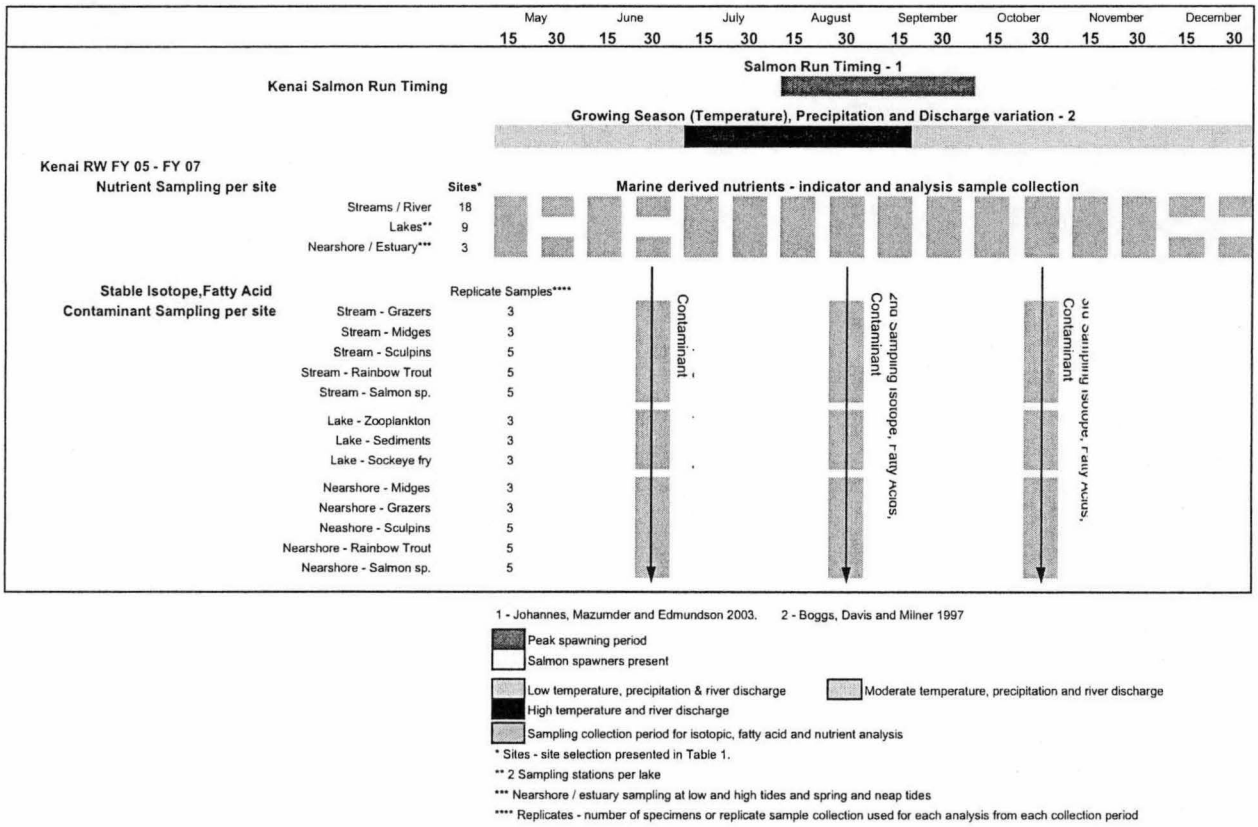
Please find below the details from Page 4 (Hypotheses) and Page 7 (Sampling protocol and data) From Mazumder et al. 2004 Kenai Proposal Page 4.

Our research plan is driven by the following specific testable hypotheses that:

A. *inputs of MDN to watersheds can be detected in food webs at selected trophic levels as an indicator signature (stable isotope, chemical, biochemical) rather than increased trophic level biomass or productivity;*
B. *the occurrence and magnitude of MDN input, as a function of anadromous fish run strength, will be dependent on the habitat type of the sub basin (water type and hydrology) (i.e. clear, glacial, stained) and ecosystem types (i.e. stream, lake, estuary);*
C. *inputs of MDN to watersheds are proportional to the run strength (biomass) of anadromous fish entering these watersheds or sub basins and independent of climatic and anthropogenic inputs;*
D. *MDN uptake in aquatic foodwebs is primarily through direct consumption of fish carcasses and eggs rather than through bottom-up decomposition and microbial uptake; and,*
E. *the isotopic signatures of $\delta^{15}N$ at any trophic level is a consistent indicator of MDN input.*

From Mazumder et al. 2004 Kenai Proposal Table 2, Page 7.

***Table 2**: Proposed sampling protocol using nutrient, isotopic, fatty acid, and contaminant indicators of MDN relative to know salmon run timing and trends in growing summarized from climate data and the Kenai RW hydrograph.*



Mazumder Reply Figure 1

From Bilby, R. E., B. R. Fransen, J. K. Walter, C. J. Cederholm and W. J. Scarlett. 2001. Preliminary evaluation of the use of nitrogen stable isotope ratios to establish escapement levels for Pacific salmon. Fisheries 26:6-14.

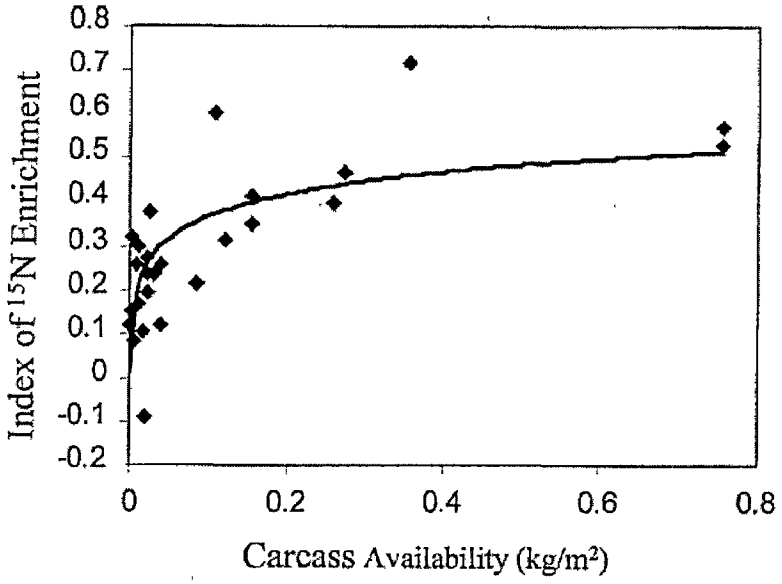


Figure 2. The relationship between the level of enrichment with 15N in the muscle of coho parr and the abundance of carcass material at that site. Carcass abundance is presented as kg wetweight carcass tissue per m^2 streambed surfacearea. Calculation of enrichment index is described in the text.
Regression statistics: enrichment index = 0.073 ln(carcass abundance) + 0.534; $R^2 = 0.49$; p =6.16x10-5.

Mazumder Reply Figure 2

Finney BP, Gregory-Eaves I, Sweetman J, Douglas MSV, Smol JP. 2000. Impacts of climatic change and fishing on Pacific salmon abundance over the past 300 years. Science 290:795-799.

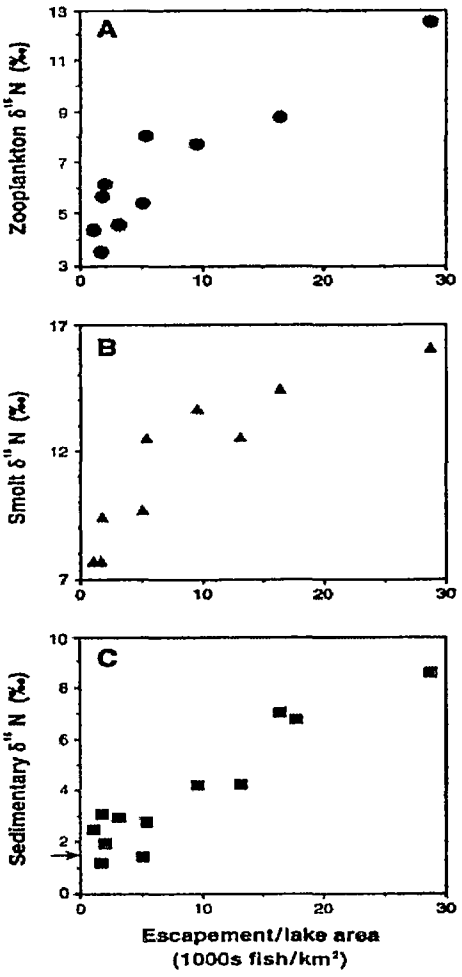


Fig. 2. The influence of SDN loading, as represented by the escapement/lake area ratio (i e , the density of adult sockeye returning to the lake ecosystem to spawn), on the d15N signature of components of the nursery lakes' foodweb (zooplankton and juvenile sockeye salmon)and surface sediments. Relations between the escapement/lake area ratio and (**A**) the d15N ofzooplankton (r =0 92, $P < 0.01$), (**B**) the d15N of juvenile sockeye (smolts) ($r = 0.88$, $P<$, 0.01), and (**C**) the d15N of sediments (r=0 94, $P < 0.01$) The arrow on the vertical axis of (C) is the average d15N of sediments from 33 lakes in Alaska without salmon (1.5 $\pm$0.9‰). These nursery lakes span a large gradient in SDN loading and cover a large portion of the range of sockeye in Alaska. Sampling and analytical methods, sample variability, and site locations are described in (*18*). Samples of zooplankton and juvenile sockeye were not available from all 12 sites.

Mazumder Reply Figure 3

Johnston, T.N., E.A. MacIsaac, P.J. Tschaplinski and K.J. Hall. 2004. Effects of the abundance of spawning sockeye
salmon (*Oncorhynchus nerka*) on nutrients and algal biomass in forested streams. CJFAS. 61:384-403.

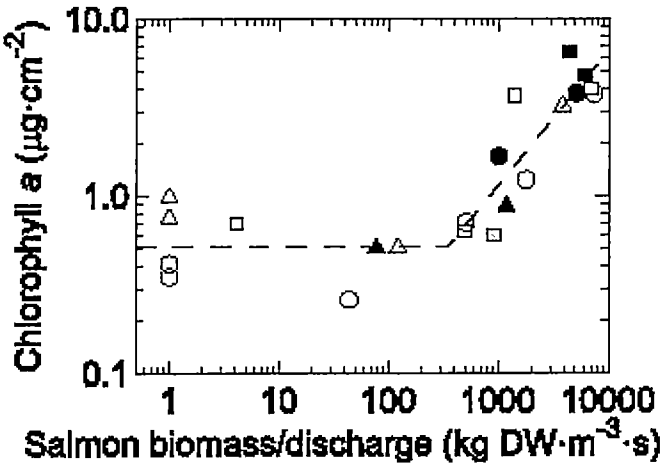
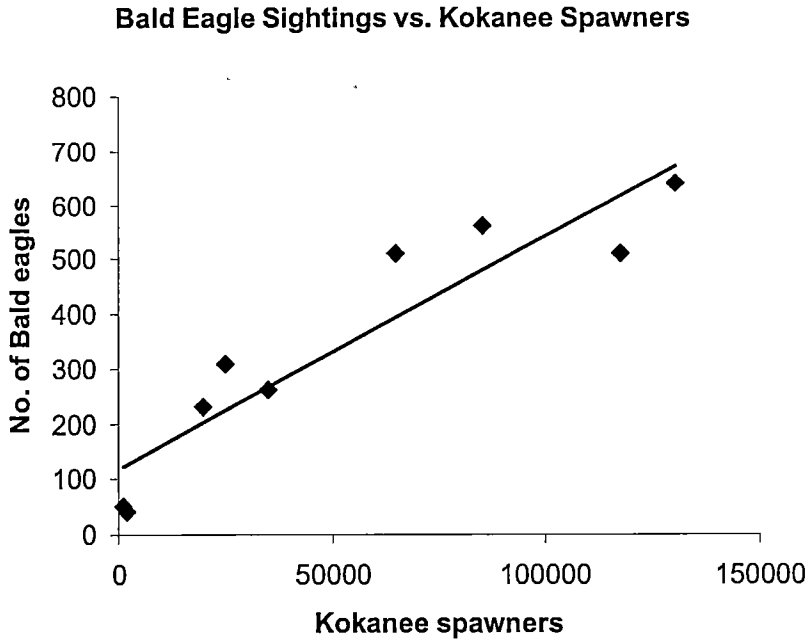


Fig. 10. Piecewise linear regression (broken line) of postspawning maximum epilithic chlorophyll *a* concentration against salmon (*Oncorhynchus nerka*) carcass biomass per unit discharge. Carcass biomass per unit discharge has been increased by 1 to show reaches that did not receive spawners. Symbols: triangles, Bivouac Creek; circles, Forfar Creek; squares, Gluskie Creek; solid, 1996; shaded, 1997; open, 1998.

Mazumder Reply Figure 4

Spencer, C.N., B.R. McClelland, and J.A. Stanford. 1991. Shrimp stocking, salmon collapse and eagle displacement. Bioscience 41:14-21.



Appendix I

EVOS 2004 (FY-05) Recommendations

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WATERSHEDS

FY05 Funding Requested

$179,500.00

FY06 Funding Requested

$168,200.00

FY07 Funding Requested

$165,700.00

Abstract:

Kenai River Watershed (Kenai RW) is recognized as a national treasure for its abundant fish, wildlife and diversity of habitats. Extensive consultation among stakeholders, communities, agencies and other researchers has led to this proposal on the role of marine-derived nutrients (MDN) in sustaining the productivity of Kenai RW. In the first two years, we propose to develop, compare and contrast robust methods and monitoring protocols to detect, understand and predict changes in MDN and its linkage to productivity and biological (salmon) resources. We will test the robustness and validity of several distinct indicators or proxies (nutrients, stable isotopes, fatty acids, contaminants, foodwebs) of MDN across different ecosystem components of Kenai RW. In the 2nd and 3rd year, we will synthesize and publish data, compare results with other complementary watershed projects and produce a final GEM report, and complete the validation of these indicators to quantify the fate/transport of MDN linking various components of the watershed and their implications for the productivity of Kenai RW and its salmon and trout populations. We will actively participate in networking and communication among various research groups looking at watershed level changes in MDN and resource productivity in association with the Gulf of Alaska.

Location: Kenai River Watershed

PI Name: Asit Mazumder **Lead Agency:** ADFG

STAC Reviewers: Tom Royer, Charles Miller

STAC: Do Not Fund

Project Title: Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change

Funding Recommendations:

Science Director: Do Not Fund

Public Advisory Committee:

Trustee Council:

Executive Director: Do Not Fund

Mazumder-FY05-Marine-derived Nutrients

63

WATERSHEDS

STAC:

This proposal is not recommended for funding. There is concern regarding the ability to determine the critical MDN or substances in the KR watershed and how they influence changes the ecosystem. How can the proposers be assured that they have identified the critical components of this ecosystem? The proposal relies on regression analyses to test the relationships between MDN, biological and physical parameters. This does not establish cause and effect. For example, changes in salmon abundance might be affected by open ocean conditions rather than local watershed conditions. The hope is stated here that multiple regression analyses, including non-linear and non-parametric versions will help to find a relationship between MDN supply rates (anadromous fish inputs) and some of the many variables to be extracted from the watershed. This will fulfill what they state is their principal goal, to find one or more proxy variables for rates of MDN supply. Nothing is said, however, about how the fish inputs will be quantified. There is no statement of who will carry out the analyses or where they will be done. The inability to measure the sensitivity of the ecosystem to MDN is also

worrisome. It is curious that the works of other researchers addressing the MDN distributions in the region such as Finney et al. are not referenced in this proposal. Are there possibly already accepted protocols for this type of sampling? If not, can they really be established and tested in two years? Decades of sampling will be required to determine the interannual signal of MDN and its strength will be a function of biological and physical factors. It is unclear as to how they will separate these influences. The specific testable hypotheses (p. 4) are not connected with the proposed data set. Statistical testing of these is not possible. They need a model that can be tested with the data sets to be gathered.

Rationales For Funding Recommendation

Science Director:

Concur with STAC

Public Advisory Committee:

Executive Director:

Concur with STAC

Trustee Council:

Appendix: Draft 2005 Proposal Funding Report

Appendix II

EVOS 2003 (FY-04) Recommendations
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Mazumder-FY04-Marine-Derived Nutrients $120,000.00 $120,000.00 $120,000.00 Fund Contingent

Gulf of Alaska Ecosystem Monitoring, Draft FY 2004 Work Plan 8/22/2003 77
Project: Mazumder-FY04-Marine-Derived Nutrients
Project Title: Marine-Derived Nutrients in the Kenai and Adjacent Watersheds: Methods for Detecting Change
Location: Cook Inlet drainage basin, Kenai Peninsula, Kenai River watershed
Proposer: Asit Mazumder ***Proposer Affiliation:*** Alaskan University
Lead Agency: NOAA
Funding Recommendations:
FY04: $120,000.00 ***FY05:*** $120,000.00 ***FY06:*** $120,000.00
Abstract:
Kenai River Watershed (KenaiRW) is recognized for its abundant fish, wildlife and diversity of landscapes. Extensive consultation among stakeholders, communities and agencies has led to this proposal on the role of marine-derived nutrients (MDN) in sustaining the productivity of Kenai RW. We propose to develop robust methods and monitoring protocols to detect, understand and predict changes in MDN and its linkage to productivity and resources. We will test the robustness of several indicators (nutrients, stable isotopes, fatty acids, contaminants, foodwebs) of MDN in different ecosystem components of KenaiRW and seven other watersheds around Cook Inlet. In the 3rd year, we will begin testing the validity of these indicators to quantify the fate/transport of MDN linking various components of the watershed and their implications for the productivity of KenaiRW. We will also develop a platform for networking and communication among various research groups looking at watershed level changes in MDN and resource productivity.
STAC Recommendation:
The proposal is well beyond the scope of the Invitation with regard to annual cost and the types of activities that are appropriate to GEM watersheds at this time. The proposal addresses the fundamental measurement questions posed in the Science Plan and the Invitation in objectives 1 – 3 and 8. Objectives 1 – 3 require thoroughly sampling one relatively large and complex watershed, when basic questions of how to measure marine influences in watersheds may best be answered at lower cost by sampling smaller, less complex watersheds that provide more geographic contrast. Objective 8 effects coordination among cooperating parties. Objectives 4 – 7 presume to make choices regarding modeling and selection of MDN measures and indicator species that are not envisioned in GEM planning until late FY 06 to early FY 07 when the results of the current phase of GEM watershed work becomes available. The GEM modeling program that will link the habitat types and guide investment in research is not prepared to handle the output from this ambitious sampling program. It is also not clear present knowledge of the variability in proposed measures of MDN and proxies is sufficient to design sampling of the scale of the proposal. Addition of matching funds would take the three year cost of this project to US$ 1.2M which is well beyond the level of funding justified by the current state of knowledge of marine-terrestrial linkages in GEM watersheds. Recommend that proposal be revised to eliminate sampling sites outside the Kenai River watershed, and reduced within the watershed to a representative of each habitat type, and to focus on achieving objectives 1, 2, 3, and 8 over a three year period. Fund reduced.*Gulf of Alaska Ecosystem Monitoring, Draft FY 2004 Work Plan 8/22/2003* 78

Executive Director's Recommendation:
The proposal provides needed measures of marine linkages in a watershed that is at high risk of degradation due to human activities, however its scope is far broader than envisioned in the Invitation for Proposals. A revised proposal incorporating the recommendations of the STAC for an amount not to exceed 120K is needed before this proposal can move forward. In addition, in order to move forward a letter from the PI's is required agreeing

to participate in a watershed workshop will be held at the January 2005 GEM meeting, and to present an up-to-date report on progress and participate in comparison and evaluation of methods. Fund contingent on receipt of revised proposal.

Exxon Valdez Oil Spill Trustee Council

441 W. 5th Ave., Suite 500 • Anchorage, Alaska 99501-2340 • 907/278-8012 • fax 907/276-7178

July 29, 2004

Dr. Azit Mazumder
University of Victoria, Dept of Biology
PO Box 3020 STN CSC
Victoria, British Columbia
CANADA V8W 3N5

Dear Dr. Mazumder:

Thank you for your comments supporting the Mazumder Marine-derived Nutrients in the Kenai River Watershed: Methods for Detecting Change proposal.

Your comments will be included in the meeting packet provided to the Trustees for their August 23 meeting.

Thank you for this public support. I appreciate it.

Sincerely,

Gail Phillips
Executive Director

Motion to approve selection of the nominees as identified in Executive Director's memo dated Aug 10, 2004.

INTEREST GROUP SUMMARY SHEET

Nominee	Aquaculture /Mariculture	Commercial Fishing	Commercial Tourism	Conservation/ Environmental	Local Government	Marine Trans-portation	Native Land-owners	Public at Large	Recreation Users	Regional Monitor-ing	Science/ Technical	Sport Hunting and Fishing	Subsistence	Tribal Govern-ment	TC Selection
Torie Baker, Cordova		O						X							
*Jason Brune, Anchorage								X			X				
*Kurt Eilo, Anchorage				X				X				X			
*Larry Evanoff, Chenega Bay							X	X					X	X	
Gary Fandrei, Kenai	O	X		X				X		X	X				
John Gerster, Anchorage	X							O		X	X				
*Randy Hagenstein, Anchorage		X		X				X	X						
*Lisa Ka'aihue, Anchorage								X		X					
Robert Kopchak, Cordova		X						O							
Pat Lavin, Anchorage				O				X							
*Vern McCorkle, Anchorage								X							
Charles Meacham, Juneau		X						X			O				
Brenda Norcross, Fairbanks								X			O				
Pat Norman, Port Graham							O	X					X	X	
*Theresa Obermeyer, Anchorage								X							
Ed Page, Juneau						O		X							
*Bob Patterson, Anchorage								X							
*Ron Peck, Anchorage			X					X							
Martin Robards, Anchorage				O				X			X				
Stacy Studebaker, Kodiak				X				X	O						
*Andrew Teuber, Kodiak							X	X					X	X	
*Mead Treadwell								X		X	X				
Ed Zeine, Cordova					O			X							

* = New applicant O = Represented this position during last PAC term X = Potential to represent this position *NO MORE THAN 3 REPS IN ANY INTEREST*

-----Original Message-----
From: Brenda L. Norcross [mailto:norcross@ims.uaf.edu]
Sent: Thursday, July 15, 2004 8:20 AM
To: GEM STAC:
Cc: Gail Phillips:
Subject: Scientists issue statement on scientific peer review

STAC members-

FYI for our phone conference about the STAC review process.

Brenda

Date: Thu, 15 Jul 2004 09:30:18 -0400
From: "Annie Drinkard" <Annie@esa.org>
To: <annie@esa.org>
Subject: Press Release: Scientists issue statement on scientific peer review

CONTACT (Media Only):
Nadine Lymn Phone: 202-833-8773 x 205
Email: nadine@esa.org
Annie Drinkard Phone: 202-833-8773 x 211
Email: annie@esa.org

MEDIA ADVISORY

For Immediate Release
July 15, 2004

Scientists issue statement on scientific peer review

The issue of scientific peer review has received a significant amount of attention from both Congress and the Administration. When it comes to peer review of in-house agency science and the body of science underlying management decisions, it has become clear that, in some cases, significant confusion exists regarding what constitutes good, adequate and much needed review versus review that may be ineffective or counterproductive. In an effort to provide assistance in this regard, 13 scientific organizations representing over a quarter million individual scientists have issued a statement on scientific peer review.

The American College of Preventive Medicine, American Fisheries Society, American Institute of Biological Sciences, American Public Health Association, American Society of Agronomy, American Society of

Limnology and Oceanography, Association of Teachers of Preventive Medicine, Crop Science Society of America, Ecological Society of America (ESA), Estuarine Research Federation, Institute of Food Technologies, Society for Conservation Biology, and Soil Science Society of America, all endorsed the statement, which was developed by ESA.

"We believe a clear statement from a large portion of the scientific community on scientific peer review will be helpful to policy makers," said Ecological Society of America President William Schlesinger.

In particular, the statement is intended to provide a useful tool for Members of Congress and their staff to evaluate proposed peer review regimes using criteria developed by scientists. In addition, the groups hope that scientists themselves may find the statement a useful reference when providing input to policy makers on peer review regimes.

"Our statement both supports the concept of peer review and intends to inform policy makers about how it is best applied," explains Schlesinger. "While scientific peer review is an important tool for decision makers, a poorly designed process can do more harm than good."

The statement, endorsed by the 13 scientific organizations offers a list of important considerations for government scientific peer review of agency-produced science and the body of science underlying management decisions including:

- The first priority in choosing reviewers should be to engage the most competent scientists.

- Scientific peer review should be insulated from politics as much as possible.

- Even the best scientific peer review cannot give policy makers the 'right' answer.

- Scientific peer review must maintain programmatic flexibility.

- All scientific peer review must be based upon an assumption of integrity.

- Efforts to revise the process of peer review should acknowledge the differences in professional culture that often divide scientists, policy makers, and the public.

The full statement is available at:
http://www.esa.org/pao/esaPositions/#pstatements

For more information, please contact Maggie Smith at the Ecological Society of America, 202.833.8773, ext. 224; Maggie@esa.org or Nadine Lymn, 202.833.8773, ext. 205; Nadine@esa.org

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The Ecological Society of America (ESA) is a scientific, non-profit, 8000-member organization founded in 1915. Through ESA reports, journals, membership research, and expert testimony to Congress, ESA seeks to promote the responsible application of ecological data and principles to the solution of environmental problems. ESA publishes four scientific, peer-reviewed journals: Ecology, Ecological Applications, Ecological Monographs, and Frontiers in Ecology and the Environment. For more information about the Society visit www.esa.org

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Public Affairs Office: ESA Positions

Position Statement on Scientific Peer Review

American College of Preventive Medicine

American Fisheries Society

American Institute of Biological Sciences

American Public Health Association

American Society of Agronomy

American Society of Limnology and Oceanography

Association of Teachers of Preventive Medicine

Crop Science Society of America

Ecological Society of America

Estuarine Research Federation

Peer review is an integral component of scientific research and publishing. It allows the scientific community to maintain quality control of research through the review of research proposals, journal manuscripts and other reports. Academic peer review, although far from perfect, is the best tool scientists have to ensure high standards for their professional work.

This idea has been translated into the policy arena through 'scientific peer review' – the review, by scientific experts, of in-house agency science or the body of science underlying management decisions. These types of reviews are critically important tools for policy makers. They allow experts from both inside and outside the federal government to provide technical advice and analysis, increasing public confidence in federal science, and ensuring that the best quality information is used in decision making.

However, it is critical that scientific peer review programs be carefully designed to maintain objectivity, quality and thoroughness. While scientific peer review is an important tool for decision makers, a poorly designed process can do more harm than good. It is for this reason that we endorse the following list of important considerations for government scientific peer review of agency-produced science and the body of science underlying management decisions.

- **The first priority in choosing reviewers should be to engage the most competent scientists.** Therefore, conflict of interest exclusions must be carefully designed to balance barring those with a direct conflict of interest and the reality of a finite pool of suitable reviewers. The key issue in selecting reviewers is whether they bring the necessary scientific knowledge and objectivity to reviewing the matter at hand.
- **Scientific peer review should be insulated from politics as much as possible.** Oversight of scientific peer review should be vested in scientists and science managers within the agencies. This adds assurance that the composition of panels is not being unduly influenced by politics and constitutes a representative subset of the scientists most competent to review and assess the topic. The agencies must be trusted to perform the task of constituting and overseeing fair and independent scientific peer review efforts, without interference from political entities.
- **Even the best scientific peer review cannot give policy makers the 'right' answer.** Scientific peer review can provide assurances that rigorous, transparent and respected methods were followed, that the data were reasonably interpreted, and that the stated conclusions logically follow from the results. However, often more than one interpretation of the data set can be made, and there may be no way to determine which interpretation is 'best'. Where data are limited or other uncertainties abound, scientific peer review can point these problems out, but it cannot overcome them.
- **Scientific peer review must maintain programmatic flexibility.** While guidelines can help to ensure that certain standards are met and maintained,

Institute of Food Technologists

Soil Science Society of America

Society for Conservation Biology

an overly rigid process, particularly for scientific peer review of the body of science underlying policy decisions, will result in inefficient use of time and resources. It may be overly prescriptive to stipulate the number of reviewers, the questions they must answer, or the type of report they must produce for the broad range of agency scientific work.

All scientific peer review must be based upon an assumption of integrity. While commonsense measures can be taken to weed out direct conflicts of interest, an implementable system can never be fully cleared of all potential conflicts of interest. Instead, fair reviews are the product of professional standards of conduct that are a fundamental component of training in scientific research. Scientific peer review must ultimately rest on the presumed integrity of the reviewers.

Efforts to revise the process of peer review should acknowledge the differences in professional culture that often divide scientists, policy makers, and the public. The academic model of peer review calls on reviewers to be as critical as possible. This is done so that authors are able to make improvements where they can and so that the weaknesses of the work are understood and acknowledged. Thus, results from scientific peer review that highlight uncertainties, questions and alternative explanations do not mean that the science was not well done or that its findings are invalid. Science is inherently uncertain and there will always be unanswered questions and areas where more research is needed. However, acknowledging uncertainty should not be equated with an inability to draw conclusions; managers often must act without complete certainty. Scientific peer review, properly carried out by competent peer scientists, can reassure managers, decision makers, and the public that such difficult decisions are based on research that represents the current state of our scientific understanding.

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NEWS FROM THE KACHEMAK BAY RESEARCH RESERVE

PROJECT: SALMON DERIVED NUTRIENTS

Volume 1, Issue 1
Summer 2004

NEW RESEARCH PROJECT ENGAGES ON THE ANCHOR RIVER

The Kachemak Bay Research Reserve launched a new project this spring designed to understand how nutrients from returning salmon support stream food webs and especially the development of young salmon.

Pacific salmon give perhaps the ultimate sacrifice when they die after spawning, contributing their decomposing carcasses as food not only for young salmon, but also for the entire watershed ecosystem. Young salmon are born in freshwater streams. They travel out to the ocean as soon as they are old enough, where they spend several years growing on the oceans bounty, gaining 90% of their weight before returning to the freshwater streams where they were born to spawn, die and decompose.

Scientists have developed a technique, called stable isotope analysis, which can be used to measure the proportion of nutrients (carbon, nitrogen and sulfur) that are derived from ocean sources and terrestrial sources. Using this method, scientists on the project will trace the productivity in the Anchor River's food webs derived from nutrients that originated in the ocean, and carried into the freshwater stream systems through the bodies of salmon.

Researchers working on the project are sampling water chemistry, adult and juvenile fish, stream invertebrates and vegetation at seven locations from the headwaters to the river mouth on the North Fork/ Chakok branches of the Anchor River, which supports runs of chinook and coho salmon and on Happy Valley Creek, which has no salmon runs due to a natural waterfall barrier.

Coowe Walker and Lisa Tracy collect water samples at the North Fork weir site

Inside Stories

HELP FROM THE COMMUNITY MAKES THE PROJECT SUCCESSFUL

We are fortunate to have support from the local community to make this project happen. Several property owners have given us permission to use their land. Dennis Heatley and Myra Gilliam generously allowed us to place a weir on the North Fork of the Anchor River as it flows through their property, and to keep a camp for the weir technicians. Ron Wilhoit , Virginia and Mark Talley and the Ninilchik Village Tribe have granted permission to access sampling stations on the North Fork/Chakok branches of the Anchor River. Terry Eastham gave permission to access sampling stations on Happy Valley Creek. John Martin has donated his time and energy to collect weights of chinook salmon kept by anglers on the Anchor River. Thanks to all who have shared their enthusiasm and helped out !

YOU ARE WHAT YOU EAT: THE SCIENCE OF TRACKING NUTRIENTS THROUGH FOOD WEBS

Nutrients are the building blocks of all living tissue. They form the proteins, enzymes and other organic molecules that make up the bodies of all plants and animals. Oxygen, carbon, nitrogen, phosphorous and sulfur are required in the largest amounts. But, how can we measure something that we can't see or hear?

A dead chinook salmon on the stream bed of the North Fork. As the fish decompose, their nutrients enter the water and the stream food web.

Thanks to the advances of modern science we can analyze plant and animal tissue in many sophisticated ways. These techniques give us the ability to measure the amount and type of fat in tissue, whether nutrients are used for growth or body maintenance and the origin of the nutrients contained in the tissue.

Nutrients are made up of atoms, which like all atoms, have a nucleus, protons and neutrons. Both protons and neutrons weigh the same. Protons are positive charges, and they are the defining characteristic of a given element. The number of neutrons in an atom may vary, resulting in what scientists call different isotopes. Elements of many nutrients have two or more stable isotopes. Carbon and nitrogen isotopes are very useful for tracking biological processes because these two elements are found in the earth, in the atmosphere and in all living things. Both carbon and nitrogen have a heavy isotope , which is less abundant, and a light isotope, which is abundant.

The stable isotopes of nitrogen and carbon are heavier in the ocean than on land. These heavier isotopes end up in the food chain of fresh water watersheds when salmon migrate upstream to spawn, die and decompose. Researchers in Washington State found that salmon provide food for no fewer than 137 species of microbes, stream invertebrates, mammals and birds.

Adult salmon migrating upstream are released through a trap door in the weir after they've been counted, and measured for length and girth.

Dolly Varden collected in minnow traps.

We call the nutrients that salmon bring to the watershed 'marine-derived' or 'salmon-derived' nutrients. We think that these nutrients are important to the health of stream ecosystems, and especially to the growth and development of young fish. But, how can we know?

As part of this study, we will be measuring fatty acid and lipid levels in juvenile fish. Fatty acids create lipids, which are fats. Greater fat content, especially 'good fat' is thought to lead to increased growth rates and body size, which would help fish survive. Recent evidence suggests that higher omega-3 fatty acids (the same ones that are publicized for why we should eat more salmon) are present in fish when salmon-derived nutrients are present.

When migrating salmon enter a stream their normal body functions (urination) causes increases in nitrogen in the form of ammonium. Once they spawn, die and begin decomposing, nutrients contained in their bodies are released into the water causing increases in nitrogen in the forms of nitrate and ammonium. We will measure ammonium and nitrate levels frequently at the weir site during the salmon runs. Our goal is to determine if there is a consistent correlation between these nutrient levels and fish numbers. If there is, it may be possible to develop a method that uses stream chemistry as a tool for assessing salmon escapement.

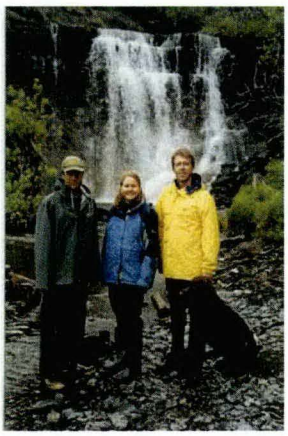
MEET THE PROJECT STAFF

This is an ambitious project, requiring a lot of dedicated people:

- Coowe Walker, Watershed Specialist with the Research Reserve is leading coordination of the project.
- Mark Wipfli, Professor, University of Alaska, School of Fisheries and Ocean Sciences leads the methods development and is the science advisor for the project.
- Craig Stricker, US Geological Survey, Denver is responsible for the stable isotope analysis portion of the project.
- Ron Heintz, with the National Marine Fisheries Service, is conducting studies into the effects of nutrients on juvenile fish growth.
- Dan Rinella, PhD grad student with UAF, is working on food web analysis.
- Steve Baird, GIS specialist with the Reserve assists with field work.
- Justin Theriot and Melissa McCray are the project weir technicians.
- Lisa Tracy is the multi-talented and energetic intern on the project. Lisa arrived in Alaska just a few days after graduating from St. Thomas University in Minnesota.

"I find this project (Salmon Derived Nutrients) fascinating because it looks in depth at the incredibly extensive connections between ecosystems. I think it is amazing how every process relies on others; every plant, bug and fish is greatly influenced by tiny changes in its environment. We see this from the shining sun which gives organisms energy to create food, and the movement of individuals to better spawning grounds, to the death of those organisms and the dispersal of that energy. I am glad to be working on a project that will help us better understand how these processes work together."

-Lisa Tracy



From left to right: Dan Rinella, Lisa Tracy, Mark Wipfli, at the waterfall on Happy Valley Creek.

ONE FISH, TWO FISH, RED FISH, BLUE FISH.....

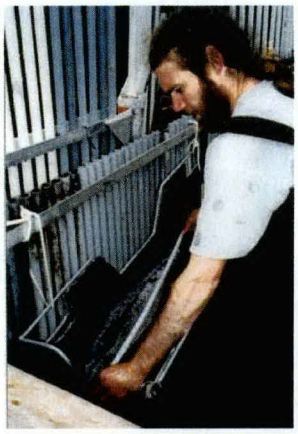
If Dr. Suess was a weir technician he could count fish all day and night. That is exactly what Reserve research technicians will be doing this spring, summer and fall at a new weir site located on the North Fork of the Anchor River. A fish weir is any sort of fence or barrier that blocks the passage of fish, but allows the flow of water.

"If Dr. Suess was a weir technician he could count fish all day and night."

With help from the Alaska Department of Fish and Game, Sportfish Division, we installed a weir that is made of floating panels constructed of PVC plastic. King salmon (chinook) and silver salmon (coho) migrating upstream are trapped on the downstream side of the weir. All fish are counted and a sub sample of fish will be measured for length, girth and sex, and a scale will be taken so that the fish can be aged. The weir technicians are careful to gently handle the fish so that they can continue their upstream journey unharmed.

In addition to monitoring fish, we will also be sampling water chemistry at the weir site. Both living and dead fish release nutrients into the water. Living fish expel wastes as part of their bodily functions, and dead fish decompose. We intend to find out if it's possible to use changes in water chemistry as a measure of fish numbers in the streams.

By measuring length, girth and weights of fish caught by sport fishers on the main stem of the Anchor we will be able to create a model that predicts weight based on length and girth. This model can then be used to estimate weights of fish sampled at the weir. In this way, we will get an estimate of total biomass of fish moving up the North Fork of the Anchor, and we can relate this biomass to the nutrient loads in the system.



Weir technician, Justin Theriot, measures an adult chinook salmon temporarily held at the weir on the North Fork of the Anchor River.

NEWS FROM THE KACHEMAK BAY RESEARCH RESERVE

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Email: coowe_walker@fishgame.state.ak.us

The Research Reserve is dedicated to enhancing understanding and appreciation of the Kachemak Bay estuary and adjacent waters to ensure that these ecosystems remain healthy and productive.

The salmon derived nutrients project is a collaborative effort between the Research Reserve, which is part of the Alaska Department of Fish and Game, Sport Fish Division, the University of Alaska, Fairbanks, School of Fisheries and Ocean Sciences, the US Geological Survey, Denver, and the National Marine Fisheries Service, Auke Bay Laboratory, with additional support from the Alaska Department of Fish and Game, Sportfish Division.

This project is funded by the Gulf Ecosystem Monitoring program of the Exxon Valdez Oil Spill Trustee Council.

STREAM FOOD WEBS AND SALMON-DERIVED NUTRIENTS

Question: What are nutrients?

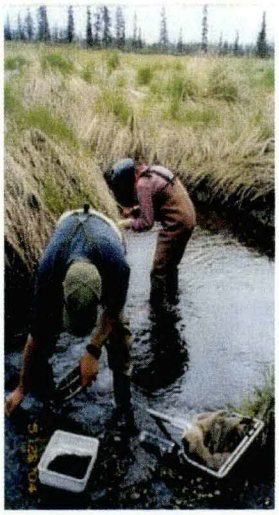
Answer: Nutrients are the chemical elements that form the proteins, enzymes and other organic molecules that make up our bodies, and the bodies of other animals and plants. Oxygen, carbon, nitrogen, phosphorous and sulfur are required in the largest amounts.

Question: What are salmon-derived nutrients?

Answer: Salmon-derived nutrients come from adult salmon that are returning to spawn, and subsequently die and decompose.

Question: How can you be sure that the nutrients that are present are from returning salmon?

Answer: Nutrients have different stable isotopes depending on whether they originate on land or from the ocean. We will analyze the tissue of juvenile fish, stream invertebrates and plants to determine what proportion is made up of salmon-derived nutrients.



Dan Rinella and Coowe Walker collect stream invertebrates to be analyzed for stable isotopes and fatty acid/lipid contents.

Question: How do you know if the salmon-derived nutrients benefit young fish?

Answer: By measuring fat levels and growth rates.

Question: How will this research benefit management of salmon?

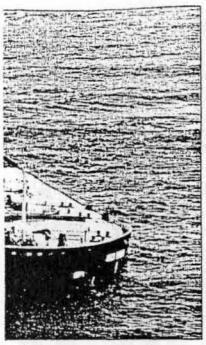
Answer: By contributing to our understanding of how escapement contributes to young fish development and survival.

For more information on this project, please contact Coowe Walker, Watershed Specialist for the Kachemak Bay Research Reserve: 907-226-4651.

Sir Alister Hardy Foundation for Ocean Science

The Continuous Plankton Recorder Survey Est. 1931

Annual Report 2003



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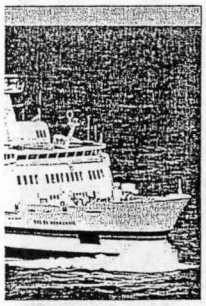

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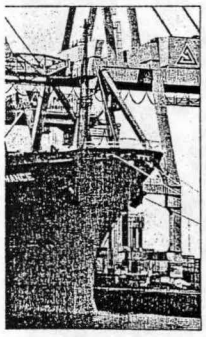

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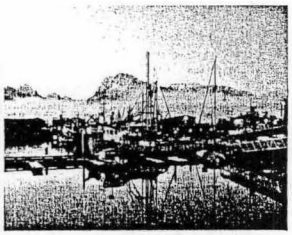
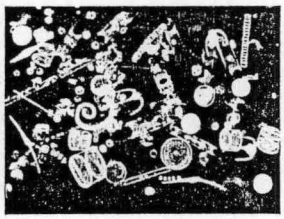
Annual Report 2003





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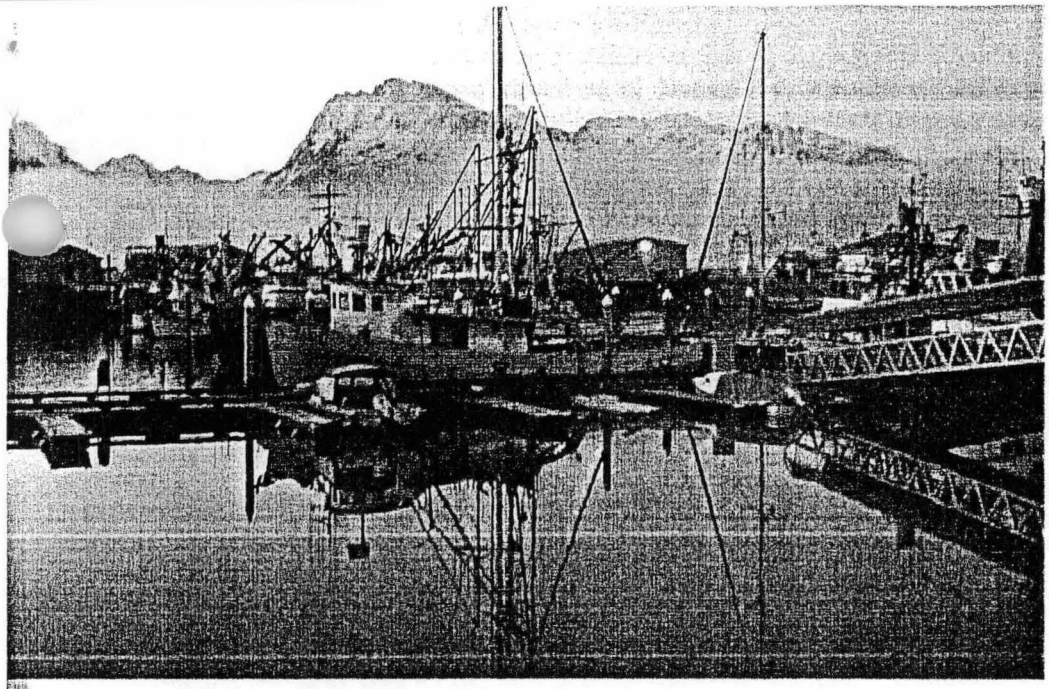

Valdez Harbour, Alaska. The northern end of the Pacific AC route.
Source: Lance Gregory

CPR Survey Operations

During 2003 CPRs sampled for 93,280 nautical miles for the core North Atlantic survey, providing a total of 4,731 samples from 26 different routes. A further 17,872 nautical miles were sampled on two routes in the North Pacific giving another 447 samples for analysis. 2003 had one of the highest years of sampling since the survey started in 1931.

The Staff and Council

The main challenge met during 2003 was a large increase in the analysis backlog. The Survey is fortunate in that the quality of analysis work and the dedication of the individual analysts remained as high as ever so that the backlog was managed successfully and brought under control. In part to help meet this backlog we recruited two analysts during the year: we were very pleased to take on Dave Conway with his great depth of experience, joining Nick Halliday on short-term contract, and to recruit Claire Taylor as a brand new trainee. During the year the towed mileage increased once more and the consequently increased logistics load was met by taking on Debbie Snelling as a part-time preparer of silks to support the Operations Team. Linda Horsfield and Heidi Bishop also joined us for various periods, Linda to support Marion Smith in Ruth Saxby's absence and Heidi to conclude her successful Sample Curating programme for the Survey.

The Research Team also developed during the year. The post of Science Manager was established early on in response to the increasingly busy research workload and the expanding number of proposals; Martin Edwards was offered and accepted the extra responsibility of the appointment. We wish him well. In the autumn Gregory Beaugrand left SAHFOS after a very rewarding and productive 5-year Ph.D. and research appointment with the Survey, and we successfully maintained our *entente* with the appointment of Sophie Leterme as the new Ph.D. student. We expect to see Gregory back with us regularly in years to come. During the year Dr Dave Schoeman from the University of Port Elizabeth, Carlos Mendes from IPIMAR, Portugal and Dionysios Raitsos-Exarchopoulos from the University of Plymouth helped to share the research load for different periods of time.

There was a secondary challenge during the year – that of illness. The temporary absences of Tanya Jonas, Ruth Saxby and Joh Sidey were met by a supportive staff and we all share Tanya's and Ruth's satisfaction with their progress and return to their respective responsibilities. Then, sadly, the year came to a desperate conclusion with Joh's very serious road traffic accident and her extensive injuries - in the face of such calamities words are inadequate. The 2003 Pay Award marked the full adoption of the SAHFOS Pay Scale, based on the last NERC award less 5%, which had been planned for a number of years. It coincided with the first Contribution Awards, which went to Jean Nyman, Lance Gregory, Roger Barnard, Gregory Beaugrand, Clare Buckland, David Johns, Joh Sidey and Claire Wotton. The Annual Staff Reports for 2002 adopted

a new format aiming to identify individual development needs, and training subsequently increased during the year

The Foundation continued to enjoy positive leadership from the Trustees, who shoulder the final responsibility for the staff and the Survey The April Council meeting and AGM were held at Citadel Hill in Plymouth and the November meeting was held in Paris courtesy of IFREMER They gave consideration during the year to the appointment of a Patron and to the arrangements for the future of the President and Director The April Council meeting and AGM approved the appointment of Dr Siân Pullen of the WWF Mr Wates, Dr Bernal and Professor Pentreath were re-elected and the meetings were the first attended by Mrs Caroline Mitchell of Serpell Eaton Solicitors The November meeting was attended by Dr Vestergaard of the IOC

Tow logistics and operations

Sampling operations

Since the first Continuous Plankton Recorder tow was made by the SS *Albatross* between Hull, NE England and Bremen, Germany on the 15/16 September 1931, more than 259 vessels have helped voluntarily to maintain the survey The Foundation is greatly indebted to the captains and crews, ship owners, management companies, charterers, port staff, stevedores and agents Their support is gratefully acknowledged, as without it this valuable plankton research could not be economically performed Due to their practical help and kind co-operation 124,580 nm (111,152 analysed nm) of plankton sampling were achieved in 2003 The ships and companies that participated during 2003 are listed in Appendix D and photographs of the tow vessels participating during 2003 are pictured on the inside of the covers Captain Peter Pritchard's close liaison with the ships of opportunity lies at the heart of the Survey's operational success

Davit/ Tow Point Changes There were two ship changes during 2003 and one davit change

1 In August from the *CAST Performance* to the *CAST Prospect* (CP Ships) at Liverpool, to maintain the D and W routes
2 In November a hinged tow arm was fitted to the *Duc de Normandie* (Brittany Ferries) at Plymouth, to resume the PR route after a 9 year gap
3 The old, corroded tow davit on the *Tor Selandia* was replaced by a refurbished unit (DFDS Tor Line) during dry docking at Frederikshavn, Denmark in November 2003 The old davit was shipped back to Immingham

Pacific The VLCC *Polar Alaska* (Conoco Phillips Marine) continued the AC route in January 2003 She then towed between Valdez, Alaska and California in March, May, June, July, August and September The plankton recorder was returned to Plymouth from San Francisco in October The tow davit from the *Polar Independence* (ex AC route) remains in storage at US Port Services, San Pedro, California Professor Bob Benda of Valdez unloaded, serviced and reloaded the internal filter cassettes for each of the five tow sets A very high filter success rate of 97% was achieved This gives credit to the training given by Lance Gregory in November 2002 The unloaded plankton samples were posted from Valdez, Alaska to the Institute of Ocean Sciences (IOS), Sidney, Vancouver Island The samples were cut and 20% of them were analysed at IOS Sidney, with the balance being posted to SAHFOS in Plymouth

The Ro-Ro *Skaubryn* of Seaboard International Shipping Co., North Vancouver resumed the Vancouver Island to Hokkaido Island, Japan, VJ route from 1 April 2003 Two sets of 3500 nautical mile tows were done in April and June A third set of 3000 nautical miles was completed in September / October 2003 A good filter success rate of 84% was achieved The plankton recorders were unloaded, serviced and reloaded at Crofton, Vancouver Island, by a team from the Nanaimo Marine Laboratory trained by Roger Barnard Dr Sonia Batten visited the *Skaubryn* with her local team before each tow set The CPR was offloaded at Ulsan, Korea and flown back to London in late October 2003

Iceland: The Foundation is well aware of the unstinting service provided by the scientists of the Marine Research Institute, Reykjavik, Iceland for transferring the plankton recorders, every four weeks, between the various Eimskip vessels trading to the East Coast of North America (Anna Rosa Bodvarsdottir and Hildur Petursdottir). Their logistical support and communication has been a valuable asset to the Survey over many years Eimskip Shipping Company of Reykjavik has continuously supported the Survey through various changes of ships on routes to and from Iceland. The *Skogafoss* and *Selfoss* have towed recorders on the E, Z, LR and V routes each month during 2003.

CPR Workshop

A total of 58 repairs were carried out to damaged recorders throughout the year In addition there were six major refurbishments of internal slides, stops and filter mechanisms These are part of the rolling programme to rebuild worn units throughout the fleet There were 12 replacements of box tail units due to damage or corrosion Propeller shafts, bushes, flexible spring couplings and thrust bearings were replaced Four CPR feet were replaced due to side impact damage This indicates their usefulness in protecting the CPR side blisters Damage sustained by the CPR box frames due to feet impact damage was investigated by Lance Gregory and Peter Pritchard It was decided in June 2003 to try a new 'fender' instead of the two feet on CPR 85. This was tested on the *European Ambassador,* a 25 knot, high-sided ferry It was successful in avoiding repeated CPR mid box frame damage due to the direct connection with the old feet Another eight CPRs have been fitted with stainless steel loop fenders They give a good degree of shock absorption and are only bolted directly to the CPR nose cone This avoids costly CPR mid section box frame damage Tow depth trials have been held from various ships using both feet and fenders, using Aquapack data recorders There was no appreciable change in tow depth Six blisters were replaced due to impact damage The starboard blisters contain the filter cassette fusee cones and drums, which if

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displaced would cause the filter mesh transport to fail Due to the ageing of the plankton recorder fleet (some are over 64 years old (CPR 12)) there is now an increased need for replacing worn out drive system gears Nine gearboxes were rebuilt and three tow eyes were replaced due to wear and age. These were replaced with more robust eye brackets Two CPRs had their nose lead ballast secured with epoxy resin which prevents the lead from flaking away into the filter cassette

Filter silk

Roger Barnard, the technician who prepares the filter silk, services and loads the cassettes, again had a very busy year. From May to July Marianne Wootton assisted Roger with silk preparation and cassette unloading. Thereafter Debbie Snelling was recruited to assist with filter silk preparation on a part-time basis. Diligent and accurate loading and servicing of the filter cassettes resulted in a very high success rate of 89 17% 323 filter cassettes were loaded which produced 31,230 x 2" silk mesh divisions in 2003. This continues the upward trend in the number of nautical miles sampled Throughout this period a total of 70 pairs of 110 filter division silk mesh was ordered by the Australian Antarctic Division (AAD), Tasmania and this was completed and despatched accordingly. An order for 25 pairs of 60 2" filter division silks was also completed for the Narragansett National Marine Fisheries Laboratory, Rhode Island.

Filter cassette maintenance

Due to the age and wear on the filter cassettes considerable repair and maintenance work has been necessary. The routine repair and maintenance to the filter cassettes consisted of replacing fusee cones, bushes, gear securing pins and link plates The planned maintenance system of completely overhauling the more worn CPRs was continued. The overall 89 17% plankton sampling success rate during 2003 also reflects the quality of the workshop team

Technical development

During the year there was much professional collaboration between the scientists and technicians in development projects The Chelsea Instruments Minipack was deployed on the M route between Aberdeen and Stavanger, Norway and on the SA route between Bilbao and Land's End Aquapacks were deployed on the C (Humber to NW Denmark) and A (Lerwick, Shetland to Aberdeen) routes Temperature minilog sensors are deployed on several other routes each month The technicians liase with the scientists to fit and remove the sensors On 29 May 2003 the flowmeter from CPR 171 was loaned to Tasmania, Australia to assist a PhD student working with Dr Graham Hosie of the Southern Ocean Continuous Plankton Survey Thermosalinographs are fitted to the *Skogafoss* on the E and Z routes plus the *Santa Maria* on the B route There is collaboration between SAHFOS and the National Marine Fisheries Laboratory, Narragansett, Rhode Island, USA (*Skogafoss*) and the University of East Anglia, Norwich (*Santa Maria*) with our plankton data and the temperature and salinity recordings

Health and Safety

During 2003, detailed risk assessments and safe working practice notes were conducted throughout the laboratory and workshops These covered manual handling of CPR's, tow wires and carriage boxes This was improved by the fitting of three wire storage racks on the outside of the workshop wall. This enables the 27 - 36 kg wire coils to be lifted from the carriage boxes and placed on the storage racks using the fork lift truck, as well as the 87 kg CPR tow fish. In consultation with analysts, the microscope bench heights were compared with other institutions and have been adjusted on receipt of the new microscope Seating and feet positions were analysed to produce more ergonomically comfortable conditions for plankton analysis The handling of formalin and other chemicals during the mixing of the required solutions was subjected to a risk assessment and safe working practice notes

SAHFOS is under a statutory obligation to comply with the relevant marine, harbour, transport and handling regulations regarding movement of the plankton recorders and the use of the tow points and davits. Records are kept of all the CPR tow fish bodies, tow wires, shackles, davit and tow point components These comply with the ISM code for ships. Tow points and davits are inspected every six months by the ship, then thoroughly inspected annually and tested quadrennially from the installation date for a standard 2 tonnes safe working load Any repairs, service or modifications required by the ship operators or regulatory inspectors are complied with. There were no accidents or injuries to marine, port or transport personnel during 2003.

Analysis procedures and database management

Sample analysis

During 2003 CPRs sampled for 93,280 nautical miles, providing a total of 4731 samples, from 26 different routes, for the core North Atlantic survey (Fig 2 and Table 1) A further 17,872 nautical miles were sampled on two routes in the North Pacific, giving another 447 samples for analysis. The longest route, between Vancouver (49°N 125°W) and Japan (43°N 146°E) was towed three times in April, June, and September/October, providing 8,389 nautical miles of sampling Once again the number of miles towed and samples analysed have increased and is the highest since SAHFOS was formed in 1991. (Fig. 3). In 2003 three new analysts, Dave Conway, Doug Moore and Claire Taylor, joined the team and one former analyst, Sonia Batten, rejoined the team making 18 analysts in all. Sonia and Doug are based in Canada and they undertake the cutting of all and the analysis of a proportion of the Pacific samples. Two more of the analysts were unfortunately on prolonged sick leave during the year In spite of their absence the analysis backlog has been reduced and only 336 samples from 2003 are still awaiting analysis at 27/2/2004, compared with 637 at the same time last year The sample allocation for each full-time analyst was also reduced to 405 samples in 2003.

Table 1

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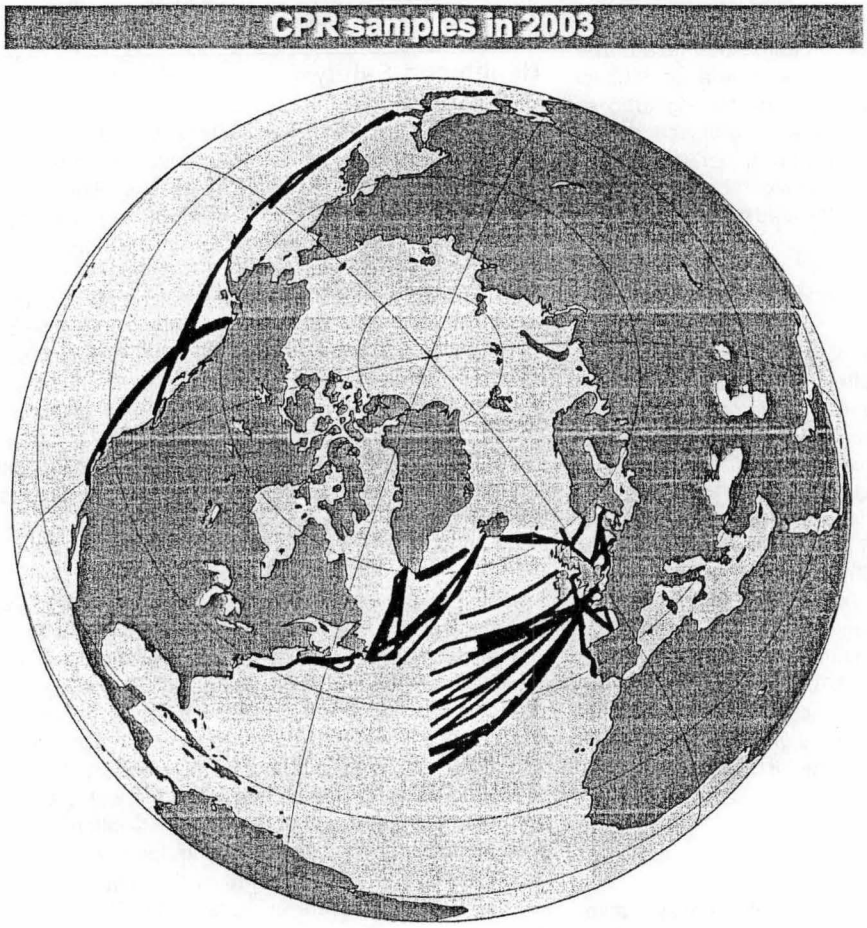


Figure 2. CPR samples in 2003 for the North Atlantic and North Pacific

Table 1. Monthly breakdown of CPR sampling in 2003 (including Pacific)

Month	Tows made[1]	Tows for analysis	Samples for analysis[2]	Miles sampled
January	26	23	401	8661
February	26	21	391	7682
March	26	25	463	9871
April	29	29	499	11507
May	26	24	422	9155
June	34	32	491	11910
July	26	23	425	8676
August	25	25	419	8970
September	31	31	515	11330
October	27	23	381	8317
November	25	23	416	8199
December	23	19	355	6875
Totals	**324**	**298**	**5178**	**111152**

Notes.1. Includes all failed and non-analysed tows from the core survey and the Pacific.
2. As at 27 Feb 04, 336 samples from 2003 were still awaiting analysis.

In 2003, SAHFOS continued collaborating with Micro Instruments Ltd. to design and build a new microscope for CPR analysis. A new microscope has become a priority in recent years, as all but one of the CPR microscopes presently in use are about fifty years old and difficult to maintain. The new design had to ensure the consistency of the analysis method, while offering improved technology and ergonomics. In the latter half of the year the prototype was delivered for trial over a few months. All analysts tested the microscope and made suggestions for improvements, which were carried out in December 2003. The microscope (Fig. 4) has been returned to SAHFOS and is now in regular use. If it proves to be a success, more will be ordered next year.

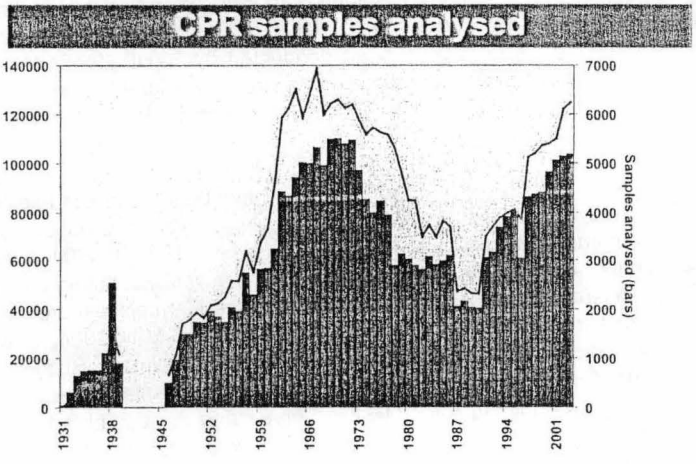


Figure 3. Miles towed and samples analysed by the CPR survey since operations began in 1931.

Database management

During 2003, there have been few changes to the information technology hardware used within SAHFOS. Two new printers have been purchased to allow staff to print high quality double-sided documents throughout the organisation. All Dell GX110 computers (originally purchased in 2000) were upgraded so that they could operate Windows 2000. This was necessary as Microsoft withdrew support for Windows NT. The machines had to be upgraded to Windows 2000 to avoid potential security issues in the future. Following removal of support for the flexi-time system, a new timesheet was designed and implemented by the Database Manager. This system is proving very effective.

A need to redesign the database was identified in 2003, due to later versions of Microsoft ACCESS not being fully backward compatible. Initial investigations have been made into suitable software to house the CPR data. Currently MySQL is the favoured alternative to ACCESS as this software can support multiple users and the costs are lower than other alternatives. The SAHFOS web site has been updated throughout the year and has been used to highlight important news and events. This year the education pages have been revamped to appeal to the target audience. Web pages that allow you to download temperature data collected using minilogs have been added. These pages are being updated regularly with

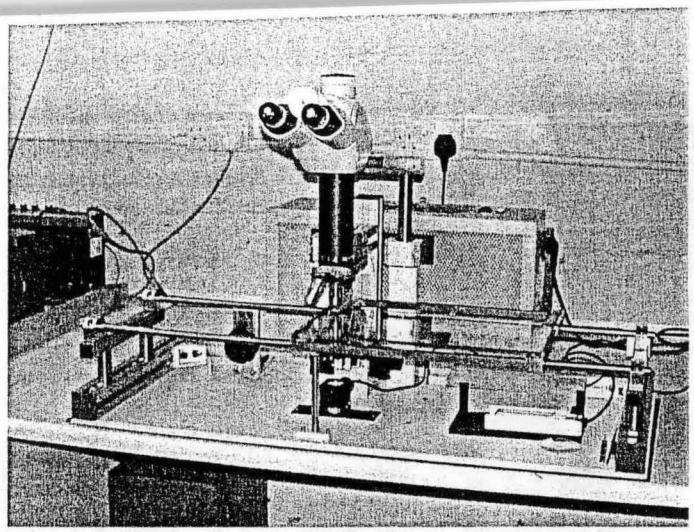


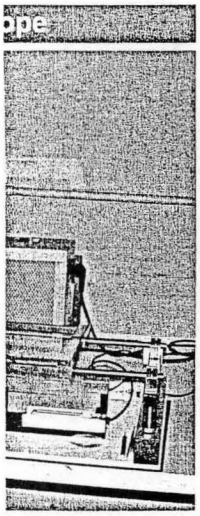
Figure 4. The new CPR microscope designed by Micro Instruments Ltd. and SAHFOS.

newly collected data and historical data are steadily being included .

The Pacific project now has several pages dedicated to it and these have been a major success in 2003. Data about species found on analysed samples was available on the web within 10 weeks of the sample being collected. These pages are graphically pleasing and offer some interactivity for the visitor and are a useful addition to the SAHFOS web site. SAHFOS was charged with designing a web site for the SCOR Working Group (115). The structure has now been established and a complex site is awaiting content from members of the Working Group. Presence/Absence data is now on the verge of being available via the OBIS data portal: thanks to help from Karen Stocks and Phoebe Zhang.

Pacific CPR operations

The Pacific survey underwent some modifications during 2003, so that objectives could be more tailored to the priorities of the two funding sources, the Exxon Valdez Oil Spill Trustee Council Gulf Ecosystem Monitoring (EVOS GEM) programme and the North Pacific Research Board (NPRB). In terms of sampling, changes were minor - the east to west (VJ) route was towed in April, June and October to provide more even seasonal sampling. This is now to be the pattern of sampling that will be repeated in subsequent years. In terms of sample analysis, changes were more substantial, although remaining within the well-established procedures developed by SAHFOS. A collaborative agreement was set up between SAHFOS and the Department of Fisheries and Oceans (DFO) Canada, Institute of Ocean Sciences in Sydney, BC so that a DFO zooplankton technician (Doug Moore), could visit SAHFOS for 3 weeks in April to receive training in sample preparation and phytoplankton analysis. On his return to British Columbia, Doug took over the cutting and sample preparation of all the completed Pacific tows. The silks unloaded by Bob Benda in Valdez, Alaska, and the team in Nanaimo, BC were then sent direct to Doug. A special CPR microscope and stage were transferred to the lab in Canada (the EVOS GEM funding provided for a newly



by Micro Instruments

built microscope) and about 20% of the samples to be analysed were retained at DFO with the rest being posted to SAHFOS. These retained samples were analysed by Doug and Sonia Batten (who was happy to get back to some sample analysis after a 2-year break) as rapidly as possible, while the remaining samples were integrated with the Atlantic samples and processed routinely by the SAHFOS team. Once the subset of samples had been processed, the data obtained were posted on the SAHFOS web site (extra pages were created by Darren Stevens) and a comparison made with previous data. This enabled a very rapid assessment to be made of the plankton communities through 2003, the 'record' being data posted within 10 weeks of sampling. Although it will not be possible to determine if the sub-sampling produced accurate descriptions of the plankton until all of the samples have been processed and quality controlled, (during 2004), the results have proved promising and are summarised in the Research section of this report.

Bird and mammal observations were made on all 3 VJ tows by Mike Henry, to give a total of 5 tows with bird/mammal and plankton data. There was significant seasonality in the types and densities of seabirds seen (7,892 in April compared to 596,926 in June) and a wealth of data for our collaborators to analyse. Further funding has been applied for to continue this sampling after spring 2004. The simultaneous CPR and bird data from June 2002 are now being integrated and are revealing interesting regional patterns across the North Pacific. Funding from the NPRB allowed us to order a Chelsea Instruments Minipack for this route so that temperature, salinity and fluorescence data can also be obtained during 2004.

The only negative point in 2003 was the fact that Polar Tankers decided to end their involvement in CPR towing along the AC (Alaska to California) route at the end of the season. Intensive efforts to find a replacement ship for the same route were unsuccessful, however Capt. Peter Pritchard did obtain an agreement from Horizon to use the *Horizon Kodiak* on a route from the lower Cook Inlet (near Anchorage) to Puget Sound. This route is attractive to the EVOS GEM funders, since it still crosses the Alaskan shelf and the Alaskan Coastal current and will still provide good coverage of the Gulf of Alaska. However, it does mean that there will be no sampling south of about 50°N, offshore of California and Oregon. Opportunities for funding this section will be explored in the future.

S. Batten: soba@sahfos.ac.uk

Southern Ocean CPR Survey

Australian Antarctic Division and National Institute of Polar Research, Tokyo

Routine tows

The 2002/03 Antarctic season has again been fairly busy for the SO-CPR Survey. Thirty-eight routine tows were completed between October and March, covering approximately 12,500 nautical miles, or 2,500 samples. Most of the tows (25) were conducted from the Australian research vessel *Aurora Australis*, five from the Japanese icebreaker *Shirase* along its supply route from Fremantle to Syowa station and back to Sydney, and eight on the *Umitaka Maru*, Tokyo University of Marine Science and Technology, between Fremantle and Hobart via the eastern Antarctic coast. In addition to the routine tows, dedicated experimental tows were conducted from the *Aurora Australis* to assess the catchability of smaller zooplankton poorly represented in CPR samples using standard 270 µm mesh. The developmental stages of the cyclopoid copepod *Oithona similis* are of particular interest as the adults of this species dominate the Southern Ocean CPR samples, usually comprising more than 50% of the catch by numbers. Time-Depth Recorders (TDR's) were fitted to the CPR during routine trawls on *Aurora Australis* in January and March 2003 to determine the relationship between sampling depth and ship speed. Such studies had already been conducted by SAHFOS (Batten et al. 2003) but not for the Australian designed Type II, Mark V CPR. Results of both experimental studies are described below.

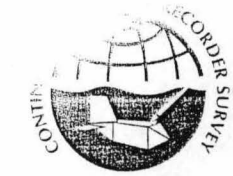
A total of 29 routine tows have been completed so far for the 2003/04 Antarctic season, with 24 tows on *Aurora Australis* and five on *Shirase*. The 2003/04 Antarctic season has concluded for those vessels, but an additional six tows are expected from the German research vessel *Polarstern*, during late March and May 2004, between Cape Town and Dronning Maud Land coast. Success with these tows will lead to the German Antarctic programme joining the SO-CPR Survey and the establishment of a new route between Cape Town and Georg von Neumayer station covering the eastern Atlantic sector of the Southern Ocean.

Experimental tows

Two methodological aspects were investigated during the mid-summer *Aurora Australis* voyage of the 2002/03 Antarctic field season: 1. sampling depth of the Type II, Mark V CPR used in the Southern Ocean CPR Survey; 2. sampling efficiency of the 270µm mesh used in the CPR programme.

1. Time-Depth Recorders (TDR's) were fitted to the CPR for all routine tows. A strong correlation was observed between ship speed and CPR depth. At speeds above 10 knots the average sampling depth was 10.3m, deeper than the mean operational depth of the SAHFOS CPR (6.7m). Below 10 knots however, sampling depth rapidly increased. Variation in sampling speed, and hence depth, is an important consideration in the Southern Ocean where speed is frequently reduced due to weather and the presence of ice-bergs. This is particularly important if slow ship speed results in the CPR dropping below the prop wash which mixes the top 20m. The work completed with the TDR's will enable back-calculation of CPR sampling depth for all previous seasons.

2. We set out to investigate the efficiency of 270µm mesh at sampling the smaller size fractions of the pelagic community (particularly small calanoid and cyclopoid copepods) by direct comparison with finer mesh sizes. Four 12 hour runs were completed, one each with 125µm, 170µm, 224µm and 270µm nylon mesh. The loan of an electro-magnetic flow meter from SAHFOS enabled volume filtered measurements to be recorded. This was vital for quantification of abundance levels, given the clogging potential of the finer mesh sizes. Laboratory analysis of these samples will be completed during 2004.



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tal Corporation, claims it produces clean-burning gases that can then be converted into electricity. According to the Environmental Protection Agency, the United States turns out 214 tons of hazardous waste every year. The Plasma Converter virtually vaporizes toxic refuse such as asbestos, contaminated soils, and old computers, which are otherwise difficult and expensive to dispose of. This machine could take recycling to a whole new (atomic) level.

—DAN PORRAS

Dry-Cleaning Ducks

In the past, birds caught in oil spills like the *Exxon Valdez* accident in Alaska were cleaned with liquid detergent, a time-consuming process that is stressful for the birds. Now it's possible to spray oil-covered birds with a fine (nontoxic) iron dust and then use powerful magnets to strip away the sludge, scientists at Victoria University in Melbourne, Australia, have concluded. This method removed up to 98 percent of contaminants from dead mallard ducks and little penguins, reports John Orbell, one of the researchers. (The testing has not yet been done on live birds; researchers want to be 100 percent sure it's not harmful.) He notes that the iron powder is also better for the environment than phosphate-based detergents, which cause water pollution and can spur toxic algal blooms.

—REBECCA CLARREN

life by **Jeff Hull** photograph by florian graner

JEWELS OF THE DEEP

IN THE SUMMER OF 2002, BIOLOGIST Jon Heifetz lay on his belly in the observation port of a cramped two-man Delta submarine, drifting 1,000 feet down through the Aleutian Islands' cold, inky waters. Once the Delta reached the bottom and the lights flicked on, Heifetz was dazzled by a tableau bursting with color and life. "One hundred percent of the seafloor was covered in corals in deep reds and green hues, sponges in yellow shades," he says. Heifetz and a group of five scientists who also went down in two-partner sub teams were so awed that one of the scientists, Robert Stone, dubbed the five areas within the 40-mile-wide, 175-mile-long trajectory the Coral Gardens of the Aleutians.

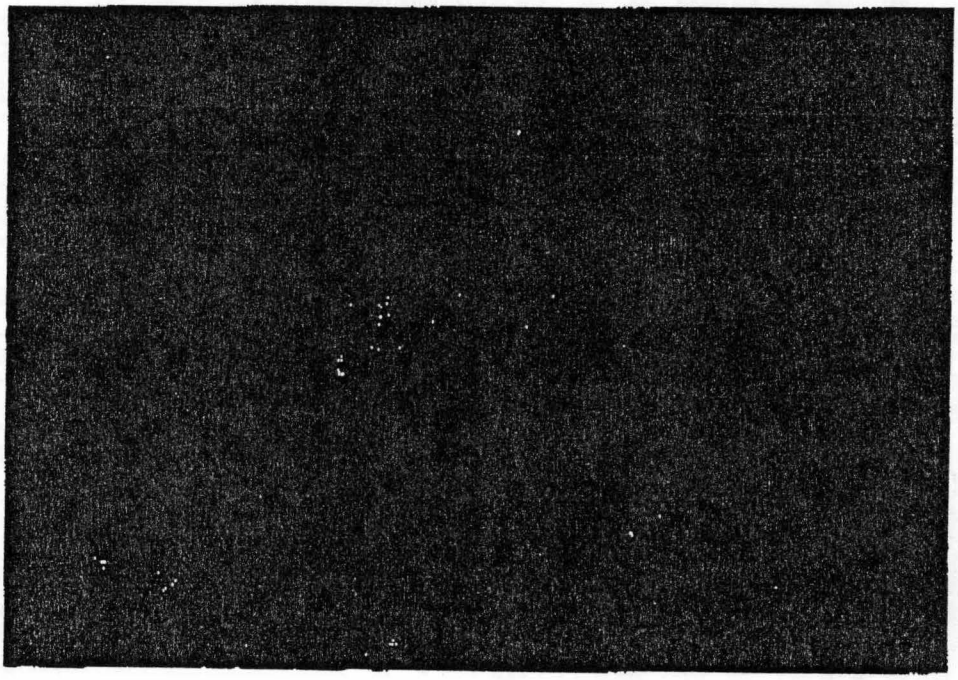
Heifetz, a fishery research biologist with the National Oceanic and Atmospheric Administration, is one of only a handful of people ever to see the Coral Gardens of the Aleutians, which are thought to contain the highest diversity and abundance of deep-sea corals in the world. Discovery of the gardens and other millennia-old formations like them has triggered a battle over the protection of deep-sea corals in the Gulf of Alaska.

When a 2000 court order forced the National Marine Fisheries Service (NMFS) to reconsider the way fish habitat is identified and protected, coral advocates hoped vast swaths of deep-sea formations would be protected from fishing gear. Worldwide, bottom trawl fishing is recognized as the most pressing threat to deep-sea corals. Last February more than 1,300 scientists, including such luminaries as Edward O. Wilson and Sylvia Earle, called for a moratorium on bottom trawling in international waters in order to protect deep-sea corals.

But Alaska's billion-dollar commercial-fishing industry balked at increased regulation, and a draft of the NMFS proposal, released last January, stated the agency preferred to impose no new restrictions on destructive fishing practices.

More than 33,000 public comments—the most ever received by the agency—poured into the NMFS offices in the next 90 days, most asking for the protection of more coral areas, including the Coral Gardens, that scientists, conservation groups, and some fishermen had designated "habitat of particular concern." A final decision is expected in June 2005.

"According to the [federal] guidelines, you really have to make a connection to commercial fish and sustainability of fisheries in order to warrant protection as essential habitat. But that's almost separate from the inherent value of these places," Heifetz says. "They're unique and fragile environments. Simply as a living marine resource, they should be offered some protection."



(TW PHOTO ILLUSTRATION: ED TOTHERINGHAM

ANCHORAGE DAILY NEWS
August 9, 2004

KODIAK

Gray whale skeleton to greet refuge visitors

More than four years after being buried, a gray whale carcass will emerge this week on the way to eventual public display as an articulated skeleton in a new Kodiak National Wildlife Refuge visitors center.

"We Dig Whales" gets under way Friday with a weeklong excavation, unearthing remains buried in June 2000 to allow the flesh to decay.

"The end product should be something the community is really proud of," project coordinator Stacey Studebaker said.

Studebaker and her husband, Mike Sirofchuck, saw the dead whale drifting at sea while they were kayaking. When the whale beached on state land, Studebaker saw an opportunity to recover a bit of natural history and organized the burial in a 40-foot trench with volunteer help.

"At that time I had no idea where we were going to put the skeleton," she said.

The answer came during conversations with refuge manager Leslie Kerr in December. Kerr suggested making the whale skeleton an attraction in a planned visitors center.

"It just seemed like a neat opportunity," Kerr said. "What else do you do with a 35-foot whale skeleton?"

Earlier this year, a test hole dug to check the decomposition showed the whale was ready for the next stage of the project.

— The Associated Press