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Project No: **050750**
Date Received: _____

GEM PROPOSAL SUMMARY PAGE

(To be filled in by proposer)

Project Title: Implementation of the GEM Nearshore monitoring plan: Site selection, standard operating procedures, and data management.

Project Period: FY 05 – FY 06

Proposer(s):

Bodkin, James L. USGS, Alaska Science Center, James_Bodkin@usgs.gov

Dean, T.A. Coastal Resource Associates, coastal_resources@sbcglobal.net

Study Location: Prince William Sound, Kenai Peninsula, Cook Inlet, Kodiak

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.

Funding:	EVOS Funding Requested:	FY 05 $ 209.5	
	(must include 9%GA)	FY 06 $ 122.2	
		FY 07 $ 0	
			TOTAL: $331.7
	Non-EVOS Funds to be Used:	FY 05 $ 0	
		FY 06 $ 0	
		FY 07 $ 0	TOTAL: $ 0

Date: 12 April, 2004

RESEARCH PLAN FOR:

IMPELMENTATION OF THE GEM NEARSHORE MONITORING PLAN: SITE SELECTION, STANDARD OPERATING PROCEDURES, AND DATA MANAGEMENT

I. NEED FOR THE PROJECT

A. Statement of Problem

In January 2004, a report was submitted to the Exxon Valdez Oil Spill Trustee Council that outlined several alternative sampling designs for monitoring in the nearshore (Bodkin and Dean 2003). The next phase in the effort to implement a nearshore monitoring plan requires that specific sampling sites be selected and specific Standard Operating Procedures (SOPs) be developed for each task outlined in the selected sampling design.

B. Relevance to GEM Program Goals and Scientific Priorities

The Gulf Ecosystem Monitoring (GEM) program has five major programmatic goals:

DETECT: Serve as a sentinel (early warning) system by detecting annual and long-term changes in the marine ecosystem**,** from coastal watersheds to the central gulf;
UNDERSTAND: Identify causes of change in the marine ecosystem, including natural variation**,** human influences, and their interaction;
PREDICT: Develop the capacity to predict the status and trends of natural resources for use by resource managers and consumers;
INFORM: Provide integrated and synthesized information to the public, resource managers, industry and policy-makers in order for them to respond to changes in natural resources; and
SOLVE: Develop tools, technologies, and information that can help resource managers and regulators improve management of marine resources and address problems that may arise from human activities.

The nearshore is recognized as a critical habitat in the Gulf of Alaska ecosystem, and the portion of the GEM program that addresses the nearshore has these same goals. As an initial step in achieving these, alternative sampling designs were developed to detect and understand change in the nearshore (Bodkin and Dean 2003). The proposed work will provide detailed site selection, sampling, and data management procedures that will allow the Trustee Council to implement this plan. Detailed written procedures and documentation are required for such long-term monitoring programs to ensure that data and their usefulness outlive investigators.

Establishing a data management framework is seen as a critical and necessary step in implementing the nearshore sampling plan, and it is critical that this plan be developed coincident with the site selection and SOP development process. Therefore, our proposal will also address elements of a data management plan for the nearshore habitat. It is our intent to test the entire system, from data collection to storage, analysis, and dissemination of the data and results prior to implementation of the sampling design.

After the SOPs and database management structure are developed, we will test these procedures to determine if modifications are required to either the procedures or the SOPs. This testing will include field sampling for specific tasks (e.g. sampling of intertidal invertebrates and algae) and the transfer of the data collected to prescribed sample databases.

Community involvement is an important part of the GEM program. As part of our proposal, we also include a community involvement component that will facilitate inclusion of community members in the development and implementation of the nearshore sampling program. Specifically, we will present the proposed sampling plan to community representatives, solicit input from community members in selecting sites for sampling, and utilize community members in testing of field procedures where appropriate.

II. PROJECT DESIGN

A. Objectives

The objectives of the proposed work are:

1. Select specific sites for sampling as prescribed in the sampling designs proposed (Bodkin and Dean 2003).
2. Develop Standard Operating Procedures (SOPs) for each task outlined in the alternative sampling designs. These are to address all aspects of each task, including field sampling procedures, required laboratory analyses, data analysis, and data management.
3. Develop a structure for a database management system to be used in the nearshore.
4. Test the sampling procedures and database management system for nearshore data.
5. Facilitate community involvement in selecting sites, developing SOPs, and testing field sampling protocols.

B. Procedural and Scientific Methods

Site selection

In December 2003, Bodkin and Dean (2003) outlined several different sampling alternatives for the nearshore sampling program. Within each alternative, sampling of various types was specified at a specific number of sites. The final site selection process depends in part on which of the alternatives (or some modification thereof) is adopted as the design to be implemented. For the purposes of this proposal, we assume that the final selection of an overall sampling design will be completed prior to the start of the contract (October 2004). Here we outline generic procedures for selecting sampling sites. These procedures will be applicable to whatever plan is selected. It is also understood that the shoreline mapping program outlined in the 2005 request is an important part of the site selection process. Mapping has been completed for the Kenai/Cook Inlet area and for portions of the Kodiak region. However, mapping remains for Prince William Sound and for portions of Kodiak. It is assumed that that the shoreline mapping will be completed by fall 2005.

The alternative sampling designs outlined in Bodkin and Dean (2003) defined the universe of sampling to an area extending form Kodiak to Cordova. Within this area, sampling of three general types is to be conducted:

1) Synoptic sampling of a selected set of physical or biological variables (e.g. sea surface temperature or eelgrass distribution) that can be remotely evaluated over the entire study region or subsets of this region.
2) Intensive sampling of a suite of biological and physical parameters at a few widely scattered sites within the study area.
3) Extensive sampling of a subset of subset of biological and physical parameters at a relatively large number of sites throughout the study area.

Extensive sampling is to be conducted at both systematically selected locations (called systematic extensive sites) and at selected sites of special interest (called selected extensive sites). The latter will primarily to be used to aid in the evaluation of impacts associated with shoreline development or for evaluation of impacts of special interest to local citizens.

The sampling design to be employed in the monitoring program combines elements of systematic sampling with the intent of distributing the sampling effort somewhat evenly throughout the sampling region. To this end, we divided the coastline to be sampled into three regions (Kodiak, Lower Cook Inlet and Kenai Peninsula, and Prince William Sound, with three approximately equal size sampling blocks (in terms of the extent of shoreline) per region. This results in nine sampling blocks (Bodkin and Dean, 2003, Figure 2). As part of the proposed site selection process, the boundaries of each block will be fine-tuned based on aerial shoreline surveys and delineated in an ARCINFO database.

The sampling procedures used within each block will depend on the metric to be sampled. For metrics that can be evaluated remotely as part of the synoptic sampling effort (e.g. aerial survey estimates of eelgrass distribution and shoreline geomorphology) sampling will be conducted over the entire block, or over a relatively large sample of the entire shoreline within the block. For motile predators such as birds and sea otters, sampling will be conducted along transects that cover the entire block. Placement of these transects will be systematic, with a random start point. For intertidal invertebrates and plants, and for physical parameters that require moored instruments (e.g. subsurface water temperature) sampling will be done at more discrete sites. A site is here defined as an approximately 100-m section of coastline and the water directly adjacent to it.

Systematic extensive sampling sites will be selected based on the following criteria. First, in order to ensure approximately equal distribution of sampling sites throughout the block, the shoreline within the block will be divided into shoreline segments of approximately equal length. Different alternative sampling designs call for different numbers of sites to be sampled within each block. If, for example, a specific alternative calls for sampling at ten sites within a block, then the coastline within the block would be divided into ten segments of approximately equal length. The shoreline segments will be delineated within an ARC-View database. The exact location of the sampling site within each segment would be selected based on the availability of sampling habitat (sheltered rocky shoreline or gravel / mixed sand –gravel). All such segments will be identified by overlaying habitat information in ARC-View databases produced from shoreline mapping (Harper and Morris 2003) onto the shoreline base map with segments

identified. Of the potential sites within a segment, sites with historical data of interest (e.g. sites sampled previously for contaminants) will be given preference. These sites will be identified by overlaying ARC-View coverages of historical data collection sites provided in Bodkin and Dean (2003, Appendix A) onto the segment and habitat layers. Otherwise specific sites will be chosen at random from a list of potential sites within the segment.

Intensive sampling sites will be chosen as a subset of the systematic extensive sites identified. These will be selected from a region within the block that is expected to be relatively unaffected by local anthropogenic disturbances. Sites will be spaced such that no two sites are in close proximity (i.e. adjacent to one another). Sites with historical data will be given preference. Otherwise, sites will be selected systematically from available extensive sites within the region.

Selected extensive sites will be chosen based on their proximity to specific resources of interest (e.g. sites particularly important for subsistence use) or based on their proximity to sources of potential anthropogenic disturbance (e.g. near boat harbors or population centers). Identification of these sites will be done in consultation with community members (see facilitation of community involvement below.

Additional selected extensive sites will be added to the design as part of continuing sampling of oil contaminated shorelines (Short et al. 2003 project). The number and location of these sites will be determined after completion of sampling of oiled shorelines in 2004, and will be done in consultation with scientists conducting the sampling and analyzing those data. These sites were not part of the initial design proposed by Bodkin and Dean (2003) and may require sampling and analyses that are different than those at other extensive sites. For example, it may be necessary to analyze sediment samples for TPAH constituents rather than the more generic ultraviolet fluorescence analyses proposed for other extensive sites.

The final product produced by this task will be a GIS (ARC-View) database that delineates the sampling area and shows the location of all sampling sites for each metric to be sampled. Tables listing the sites to be sampled, metrics to be sampled at each site, and geographic coordinates for each site will be produced based in the GIS database.

Standard Operating Procedures

Standard operating procedures will be developed for all tasks in the sampling design outlined in Bodkin and Dean (2003). These can generally be categorized into 10 general tasks (Table 1). Metrics associated with each task are given in Table 2.

Table 1. List of general tasks for which SOPs will be developed and possible sources for SOP development

Task	Source
Aerial shoreline surveys	EVOS shoreline mapping (Harper and Morris 2003)
Algae and Invertebrates	EVOS NRDA (Highsmith 1994) PISCO (PISCO 2004) Glacier Bay NPP (Bodkin, unpublished)

Table 1. Continued	NaGISA/UAF (Konar and Iken 2004)
	EVOS NVP (Holland Bartels et al. 1999)
	NOAA (Houghton et al. 1993)
	UAF (Paul and Feder 1973)
Sea otter abundance	USGS (Bodkin and Udevitz 1999; Bodkin et al. 2002)
Sea otter survival	USGS (Bodkin et al. 1997; Bodkin et al 2002)
Seabird abundance	USFWS (Irons et al. 2000)
Sea otter diet	USGS (Calkins 1978, Bodkin et al 2002, Dean et al 2002)
Oystercatcher diet and productivity	USFWS (Andres 1996) and ADF&G (Tessler pers. comm.)
Physical-chemical	Manufacturer
Contaminants in mussels	NOAA Auke Bay lab (Short et al. 1996) ASTM and Standard Methods procedures
Contaminants in harbor seal tissue	ADFG, USFWS procedures Harbor seal commission

Table 2. List of metrics to be sampled for each task. Lists of intertidal plant and invertebrate species to be counted are tentative and will be finalized after an initial sampling.

Task	Metrics associated with each task
Aerial shoreline surveys	Shoreline geomorphologic type
	Relative slope and exposure
	Eelgrass canopy cover
	Kelp canopy cover
	Fucus (or brown algae) cover
	Mussel bed cover
Algae and invertebrates	Algal diversity
	Invertebrate diversity
	Fucus garderi cover
	Halosaccion glandiforme cover
	Neorhodomela larix cover
	Neorhodomela oregona cover
	Palmaria spp. cover
	Rhodoglossum – Matocarpus cover
	Ulva – Ulvaria sp. Cover
	Filamentous brown algae cover
	Filamentous green algae cover
	Invertebrate diversity

Table 2. Continued	*Balanus / Semibalalnus spp. cover*
	Cthamalus spp. Cover
	Littorina scutulata density
	Littorina sitkana density
	Mytilus trossulus density
	Tectura person density
	Lottia pelta density
	Searlesia dira density
	Nucella lamellosa density
	Pcynopodia helianthoides density
	Dermasterias imbricata density
	Evasterias trochelli density
	Pisaster ochraceus density
	Tectura persona size distribution
	Mytilus trossulus size distribution
	Protothaca staminea density*
	Protothaca staminea size distribution
	Protothaca staminea growth rate
	Macoma spp. Density
	Saxidomus gigantea density
	Grain size distribution
Sea otter abundance	Number of sea otters per block
Sea otter survival	Sea otter age at death
	Sea otter survival
Seabird abundance	Loon abundance
	Cormorant abundance
	Harlequin duck abundance
	Scoter abundance
	Barrow's goldeneye abundance
	Common goldeneye abundance
	Merganser abundance
	Black oystercatcher abundance
	Mew gull abundance
	Glaucous-winged gull abundance
	Black-legged kittiwake abundance
	Tern abundance
	Pigeon guillemot abundance
	Murrelet abundance
Sea otter diet	Dive success rate
	Percent clams in diet
	Percent crabs in diet
	Percent sea urchins in diet
	Percent mussels in diet
	Energy recovery rate
Oystercatcher diet	Percent mussels in diet

Table 2. Continued	Percent limpets in diet
	Percent snails in diet
	Percent chitons in diet
Oystercatcher production	Number of chicks/nest
Physical and Chemical	Temperature (2 depths)
	Density (2 depths)
	Temperature (air/water at 0 m depth)
	PH and dissolved oxygen (2 depths)
Contaminants in mussels	Metal screen (concentration of approximately 12 metals)
	Fluorescent hydrocarbon concentration
	Organics screen (concentration of approximately 10 organochlorides and PCBs)
	Mercury concentration
Contaminants in harbor seal tissue	Metal screen (concentration of approximately 12 metals)
	Fluorescent hydrocarbon concentration
	Organics screen (concentration of approximately 10 organochlorides and PCBs)
	Mercury concentration

All SOPs will have the following outline structure:

Title

1.0 Scope: A general description of tasks to be covered under the SOP and their use

2.0 Methods: A detailed description of methods including:

- 2.1 Site selection (if applicable): A description of the sites at which this procedure is to be used and a description of how those sites were selected.
- 2.2 Equipment and supplies required: A list of required supplies and equipment with reference to SOPs for use and maintenance of specific equipment items.
- 2.3 Sampling methods: A detailed description of the methods used including
  - 2.3.1 Field sampling techniques (e.g. placement of sampling quadrats and counting of specific taxa within each quadrat)
  - 2.3.2 Sample storage and preservation (if required)
  - 2.3.3 Sample transport (e.g. how to package and ship samples for analyses by shore based laboratories if required)
  - 2.3.4 Example data sheets or files used for data entry
- 2.4 Laboratory analyses: A detailed description of the analyses to be performed in the laboratory
  - 2.4.1 Analytical procedures (e.g. analytical procedures for the determination of age of sea otters based on laboratory analyses of teeth extracted from sea otter skulls)
  - 2.4.2 Example data sheets or files
- 2.5 Data backup, archival, and transfer: A description of how data are to be backed up, stored, and transferred to databases

3.0 Sampling schedule: Frequency of sampling and approximate sampling dates (appropriate windows for sampling)
4.0 Personnel and training: A description of the personnel and training required for each task or subtask.
5.0 Quality assurance and quality control: A description of QA/QC measures specific to the task described. Included are schedules and procedures for maintenance and calibration of any instruments used in the task and audit procedures for checking the data collection, data entry, data storage, data analysis, and reporting. Audit procedures are to include, for example, schedules and methods for assessing accuracy and precision of sampling (i.e. conducting duplicate sampling by the same or independent field crews) and for testing backup data systems.
6.0 Health and safety: Any specific health or safety requirements of a task or subtask (e.g. special handling requirements for chemical preservatives with reference to material safety data sheets).

For most of the tasks to be performed, there are existing written procedures on which to base our SOPs. A listing of potential sources for information on each task is given in Table 1. Where possible, procedures will be made to conform to procedures used by other programs (e.g. PISCO or NaGISA) so that global comparisons of the data can be made seamless.

Database management plan

It is imperative that a database management system be developed coincident with SOPs in order to ensure that all appropriate data are collected, that these data can be stored efficiently, and data can be retrieved without ambiguity as to their meaning. This is especially critical in a long-term monitoring program in which the usefulness of the data is intended to outlive individual investigators.

Where possible, we envision utilizing personal digital assistants (PDAs), laptop computers, or storage chips for direct entry of data. PDAs will be used in collection of intertidal data using preloaded menu-driven data forms. Laptops will be used where possible to enter and store data for laboratory analyses, while direct storage of data onto chips is envisioned for collection of digital images and physical data from moored instruments. Collection and storage of data in this way will help to standardize the data, make for the more seamless transfer of data into databases, and help to reduce errors resulting from transcription of data from hand-written field or laboratory data sheets. Collection of the data in this manner will require that a data management system be developed. Some additional upfront costs will be required for software development and instrumentation, but will be cost effective in the longer term and will serve as an important component of the quality assurance program.

A preliminary outline for a data management structure is as follows:

1. Standard operating procedures: A complete listing of standard operating procedures for each task, including data entry forms, and the dates of each use. Nomenclature is to be developed to keep a historical record of changes to each SOP over time and ensure storage of all versions of the SOP.

2. Site directory: A complete directory of the each sites sampled with a description of the sites, a digital image if available, and the coordinates for that site.
3. Master schedule: A schedule for the proposed and actual sampling dates for each task
4. Data dictionary: A complete listing of definitions for all fields used in the data entry forms and in data files
5. Data files: The raw data associated with each site, task, and metric. Also included are subfiles for a history of any edits of the data. The version of the SOP under which the data were collected can be recalled by linking to the SOP database. Also to be included are any historical data of interest that were collected prior to the implementation of the GEM program, but used in analyses. (Note that an SOP describing how the data were obtained should be supplied for all such historical data).
6. Analyses files: All software used to manipulate or statistically analyze raw data files
7. Meta data files: Text describing the contents of each raw, data analysis, or output file
8. Output files: Output of data analyses and flow charts describing what raw data were used in the analysis, the analyses files used, and any intermediate data files produced.
9. Report files: Files containing all reports produced.
10. Quality assurance and quality control guidelines. A general description of generic QA/QC procedures to be used in the program.

We also propose that this be a web-based system in which all files are housed on a server, managed through a central facility, and accessed by individual investigators over the web.

We propose to implement a preliminary version of the plan on a desktop computer, and test this by entering data collected during field testing of SOPs (see below) and conducting simple analytical procedures (e.g. estimation of mean abundance for a particular species at all sites sampled). The specific products will be: an outline of the database management structure, all SOPs required; a preliminary site directory and master schedule; a complete data dictionary; example data, analysis, meta, output, and report files; and general QA/QC guidelines.

Testing of SOPs

Finalizing SOPs and implementing a field sampling program will require that some SOPs be field tested. This will ensure that SOPs are complete, result in standardized sampling when used by multiple field crews, provide the maximum amount of information, and can be completed within budgetary constraints. Some of the SOPs have a relatively long history of use and refinement (e.g. sea otter aerial surveys, estimation of sea otter survival based on collection of carcasses) and will require little or no testing. However, others (i.e. sampling of intertidal algae and invertebrates) will require testing to refine procedures and ensure that they can be implemented.

We propose to conduct preliminary testing of SOPs for sampling of intertidal algal and invertebrates, sampling of black oyster catcher food and productivity, and deployment of temperature monitoring devices. After preliminary SOPs are written for these procedures, we will test the procedures at two field sites, one near Homer, and one near Cordova. Both sites will be in close proximity to shore based stations so that they can be visited without the use of chartered vessels. For intertidal invertebrate and algal sampling, expert field crews will first test the procedures and modify as required so that they can be conducted within allotted time

constraints. Preliminary sampling designs and associated budgets (Bodkin and Dean 2003) specified that intertidal algal and invertebrate sampling at each site be conducted within a time frame of one or two days (for extensive and intensive sites respectively). The degree of sampling that can be completed within this time frame will be adjusted (e.g. by adjusting the number of species to be sampled or the number of subsamples collected for a given metric) to maximize the sampling effort and SOPs modified accordingly. Sampling using these modified procedures will then be carried out by other trained crews to ensure that they can be easily followed and the sampling can be completed within allotted time constraints. A similar process will be used to test and refine sampling of oyster catcher food.

Field testing of CTD monitoring devices will be conducted by purchasing and deploying an instrument at one field site (either Homer or Cordova) and collecting data using this instrument for a period of approximately one week.

For all tests, data from the field sampling efforts will be entered into a database system. From these data, we will conduct simple analyses (e.g. mean abundance for a given species at each site and mean daily temperature) and produce a report as a test of the data management system.

The products produced from this task will be refined SOPs, a report of the preliminary data from field testing, and an evaluation of the data management system.

Facilitate community involvement

Marilyn Sigman (The Center for Alaskan Coastal Studies, CACS) will be contracted as a consultant to solicit and coordinate assistance from community members in the selection of sampling sites, development of SOPs, and collection of those data suitable for sampling by local residents. They will also organize community workshops in Homer (funding requested under GEM Project proposal 040692), Seward, Cordova, Valdez, and Kodiak and to facilitate the implementation of recommendations for nearshore monitoring developed at Wisdomkeeper meetings in Port Graham and Tatitlek (Chugach Regional Resources Commission 2002, 2003). CACS will also facilitate workshop sessions for tribal environmental specialists and other community representatives at the Alaska Tribal Environmental Professional Conference in Anchorage. The Homer community/scientist workshop will have a primary focus on reviewing recommended citizen data collection protocols and QA/QC procedures and also pilot community participation in selection of long-term monitoring sites. The approach would include the review of proposed alternative sampling designs (Bodkin and Dean 2003), existing ShoreZone mapping, and additional local/traditional resource information and ecological knowledge in the context of community issues and concerns. The objectives for subsequent community and conference workshops would be to: 1) disseminate sampling designs and SOPs, 2) review existing ShoreZone mapping and solicit local/traditional resource information and ecological knowledge to identify potential long-term nearshore monitoring sites, and 3) engage citizens, organizations, local governments, and tribal entities in assisting in selection of sites, development of SOPs, and assisting in pilot sampling programs where appropriate.

CACS will make use of the extensive regional database of 90 potential GEM partners compiled to complete the regional capacity survey for community involvement under GEM Project G-030575 A Plan for Community Involvement and Community-based Monitoring in the Gulf

Ecosystem Monitoring Program (Sigman et. al., 2004) to invite representatives of community-based organizations, municipal governments, tribal governments, tribal organizations, educational institutions (including the Alaska SeaLife Center, Prince William Sound Science Center, Kachemak Bay Research Reserve, and RCACs), and Youth AreaWatch program coordinators to participate in the workshops. Christine Celentano, the Chugach Regional Resources Commission Environmental Program Director will assist with contacts in the tribal communities served by the organization.

C. Data Analysis and Statistical Methods

Data analyses and statistical methods used will be limited to the input and preliminary analyses of data produced from pilot sampling programs associated with testing of SOPs. Data analyses will consist primarily of the production of simple summary statistics (means and sums).

D. Description of Study Area

The proposal aims toward implementation of a nearshore sampling plan to be conducted over the area from Kodiak to Cordova. Tests of SOPs as proposed for this phase of implementation of the nearshore plan will be carried out near Homer and Cordova.

E. Coordination and Collaboration with Other Efforts

The development of standard operating procedures will rely on existing protocols developed by other agencies or resource organizations where possible (see Table 1 above). It is anticipated that the final SOPs will incorporate and conform to standards currently being employed by other programs where possible.

The alternative plans proposed by Bodkin and Dean (2003) will be revised to incorporate sampling of residual oil where possible. While the nearshore GEM sampling plans proposed have a broader set of goals and objectives than those concerned with assessment of residual oil impacts, it is recognized that continuing studies of residual oil might best be carried out if integrated with the broader-scale, long-term monitoring program. Therefore, we will explore possible integration of residual oil sampling into the GEM program. We propose to meet and coordinate possible sampling efforts with the Auke Bay Laboratory personnel in January 2005, following the completion of their sampling in summer 2004.

Many of the types of sampling efforts detailed in the alternative plans proposed by Bodkin and Dean (2003) are currently being carried out, in part, by other agencies or organizations. These include sampling of intertidal algae and invertebrates (NAGISA and UAF) sea otter abundance (USGS, FWS, TASSC), sea otter survival (USGS), sea bird abundance (USGS, FWS), temperature and other physical-chemical parameters (PWS Science Center), aerial shoreline surveys (Cook Inlet RCAC and Katchemak Bay Research Reserve), contaminants in harbor seals (ADFG and the Harbor Seal Commission) and contaminants in mussel tissues (Cook Inlet and PWS RCAC). None of these existing efforts has dedicated long-term funding to ensure that the sampling will be carried out in a consistent manner over the next century, and none of the programs is currently conducting sampling efforts at temporal and spatial scales called for in the GEM nearshore plan. However, it is likely that the GEM program can be coordinated with

existing sampling efforts to make the best use of resources and ensure that there is no overlap among programs. To this end, we propose meeting with resource agency and research organization personnel who are currently involved in nearshore sampling to discuss possible collaboration. We propose conducting a preliminary meeting in January 2005 to lay out the GEM monitoring plan, discuss possible areas of overlap, and outline methods for developing collaborative efforts. Specifically, we propose to discuss possible incorporation of GEM sampling for given tasks into agency programs, possible methods of funding, and time lines for funding, methods for ensuring procurement of consistent long-term data sets. This meeting will also afford an opportunity to initiate discussions regarding specific products that may result from the nearshore program that would be of use to resource managers.

In order to facilitate an integrated GEM sampling plan, it is necessary that plans for all four GEM habitats be implemented in an integrated fashion. It is anticipated that data from all habitats will be shared to an extent, and it is important that efforts be coordinated from the outset. In order to facilitate this integration, we propose meeting with representatives from other habitat teams in January 2005 to discuss mutual needs (e.g. comprehensive data management and system modeling plans), possible specific needs that sampling in a particular GEM habitat may be able to supply to others (e.g. sea surface temperature from satellite imagery), and possible areas of overlap.

The community involvement strategy of this project will be coordinated with a "deferred action" GEM Project proposal 040692/Connecting with CoastWalk: linking shoreline habitat mapping with community-based nearshore monitoring in Kachemak Bay (M. Sigman, co-PI) that is being resubmitted for consideration in response to the FY05 Invitation following a decision to defer action. Jim Bodkin and Tom Dean would participate in the community/scientist workshop proposed for Homer in October, 2005, and contract with the Center for Alaskan Coastal Studies (CACS) to develop a prototype for community workshops in other coastal communities and as components of annual environmental conferences attended by representatives of communities in the spill-affected area. The objectives of these workshops are described in the Community Involvement section of the proposal.

III. SCHEDULE

A. Project Milestones

Objective 1. Select specific sites.
To be met by January 06

Objective 2. Develop Standard Operating Procedures (SOPs).
To be met by January 06

Objective 3. Develop a structure for a database management system.
To be met by January 06

Objective 4. Test the sampling procedures and database management system
To be met by January 06

Objective 5. Facilitate community involvement
To be met by January 06

B. Measurable Project Tasks

FY 05, 1st quarter (October 1, 2004-December 31, 2004)

October:	Project funding approved by Trustee Council
December:	Complete preliminary draft SOPs
	Complete 1st draft of site selection for Kenai and Kodiak

FY 05, 2nd quarter (January 1, 2005-March 31, 2005)

January 12-16 (tentative):	Annual GEM Workshop
	Conduct workshop with residual oil investigators
	Conduct meeting with representatives from other habitats
	Conduct meeting with agency representatives and others currently sampling in nearshore

FY 05, 3rd quarter (April 1, 2005-June 30, 2005)

April:	Present results of January workshops and meeting regarding coordination with residual oil, other habitats, other nearshore investigators
	Complete preliminary site selection for Kenai and Kodiak
	Complete draft SOPs
	Complete draft data management plan
	Complete community involvement plan

FY 05, 4th quarter (July 1, 2005-September 30, 2005)

July:	Complete field testing of SOPs
September:	Complete entry of data in data management database
	Complete analysis of pilot data and pilot report

FY 06, 1st quarter (October 1, 2005-December 31, 2005)

December 31:	Facilitate five community workshops and a community involvement session at Alaska Tribal Environmental Professional Conference to identify potential long-term monitoring sites for community-based monitoring
	Complete site selection (assuming shoreline mapping data are available by October 1)
	Complete SOPs and data management plan

FY 06, 2nd quarter (January 1, 2006-March 31, 2006)

January:	Annual GEM Workshop
	Complete draft final report

IV. RESPONSIVENESS TO KEY TRUSTEE COUNCIL STRATEGIES

A. Community Involvement and Traditional Ecological Knowledge (TEK)

Community involvement aspects of this project are largely addressed in the above sections under task 5, Facilitation of community involvement. Community members will be informed of the project, asked to participate in key elements of decision making process, and encouraged to participate in sampling where appropriate. These objectives are to be accomplished through a series of workshops as described above, and through follow on discussions and collaborative efforts that result from these.

Hiring of local citizens will be encouraged to assist in the pilot sampling program. The anticipated full scale sampling effort to be implemented in 2006 (described in Bodkin and Dean 2003) will rely heavily on contracting with local citizens to assist in sampling and to provide operational support. Details of the extent of community involvement in the implemented final plan are described in Bodkin and Dean (2003).

B. Resource Management Applications

Resource managers have been an important part of the GEM nearshore planning process from its inception. Input from managers, obtained through a series of workshops conducted as part of Project 02395 resulted in an initial conceptual design for monitoring in the nearshore (Schoch et al 2002) and subsequent detailed sampling alternatives (Bodkin and Dean 2003). The designs presented in Bodkin and Dean (2003) reflect the specific concerns of resource managers mandated with protecting nearshore resources (e.g. eelgrass, kelp and other fish habitat considerations; status of nearshore wildlife, contaminants; the status of subsistence resources, impacts of coastal development). Our intent is to include resource managers in the final planning and implementation phases of the project by hosting a resource manager workshop in conjunction with the January 05 annual EVOS meeting as described in section II.E above.

V. PUBLICATIONS AND REPORTS

No publications are anticipated as the result of this project.

VI. PROFESSIONAL CONFERENCES

It is our intent to present the final monitoring plan for the nearshore at an appropriate national meeting in FY06. No specific meeting has yet been identified.

VII. REFERENCES

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Bodkin, J.L., and M.S. Udevitz. 1994. An intersection model for estimating sea otter mortality along the Kenai Peninsula. In: Loughlin T (ed) Marine mammals and the *Exxon Valdez*. Academic Press, San Diego, p 81-95

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Bodkin, J.L., B.E. Ballachey, T.A. Dean, A.K. Fukuyama, S.C. Jewett, L.L. McDonald, D.H. Monson, C.E. O'Clair, and G.R. VanBlaricom. 2002. Sea otter population status and the process of recovery following the 1989 *Exxon Valdez* oil spill. Mar Ecol Prog Ser. 241:237-253.

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Dean, T.A., J.L. Bodkin, A. Fukuyama, S.C. Jewett, D.H. Monson, C.E. O'Clair, G.R. VanBlaricom. 2002. Food limitation and the recovery of sea otters following the *Exxon Valdez* oil spill. Marine Ecology Progress Series 241;255-270

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Highsmith R.C., M.S. Stekoll, W.E. Barber, L.L. McDonald, D. Strickland, W.P. Erickson. 1994. Comprehensive assessment of coastal habitat. *Exxon Valdez* oil spill state/federal natural resource damage assessment. Final report of coastal habitat study 1A. Exxon Valdez Oil Spill Trustee Council, Anchorage, AK

Houghton, J. P., D. C. Lees, T. A. Ebert, and W.B. Driskell. 1993. Evaluation of the condition of Prince William Sound shorelines following the Exxon Valdez oil spill and subsequent shoreline treatment. NOAA Technical Memorandum NOS ORCA 67. Bethesda. 210 pp.

Irons, D.B., S.J. Kendall, W.P. Erickson, and L.L. McDonald. 2000. Nine years after the Exxon Valdez oil spill: effects on marine bird populations in Prince William sound, Alaska. Condor 102:723-737.

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Schoch, K., G. Eckert, and T. Dean. 2002. Long Term Monitoring in the Nearshore: Designing Studies to Detect Change and Assess Cause. Draft Report to the Exxon Valdez Oil Spill Trustee Council, Anchorage.

Short, J.H., T.J. Jackson, M.L. Larsen, and T.L. Wade. 1996. Analytical methods used for the analysis of hydrocarbons in in crude oil, tissues, sediments, and seawater collected for natural resource damage assessment of the Exxon Valdez oil spill. Pg 140-148 . In: Rice SD, Spies RB, Wolfe DA, Wright BA (eds) Proceedings of the *Exxon Valdez* oil spill symposium. Am Fish Soc Symp 18. American Fisheries Society, Bethesda,

Sigman, M.J., M.E. Hogan, P. McColllum, P. Schwalenberg-Brown, N. Bird, H.P. Huntington, J.J. Spaeder, and R. Ted Cooney. 2004. A Plan for Community Involvement and Community-based Monitoring in the Gulf of Alaska Ecosystem Monitoring Program. EVOS/GEM Project Final Report G-030575. Exxon Valdez Oil Spill Trustee Council. Anchorage, AK.

VIII. RESUMES

James L. Bodkin March 2004

Research Wildlife Biologist, Alaska Science Center, USGS, 1011 E. Tudor Road, Anchorage, Alaska, 99503. phone 907-786-3550, fax 907-786-3636 email, james_bodkin@usgs.gov.

Education:

1985 -MS, California Polytechnic State University, San Luis Obispo, CA. (Wildlife Biology)
1976- BS, Long Beach State University (Biology), Long Beach, CA
1972 - AS, Cypress College (Biology), Cypress, CA

Memberships:

Society for Marine Mammalogy
American Society of Mammalogists
Society for Conservation Biology
Wildlife Society
Western Society of Naturalists
National Geographic Society

Responsibilities:

I lead Alaska sea otter research and the marine science program for the Alaska Science Center. The mission of the Center is to provide biological information and research findings to resource managers, policymakers, and the public to support sound management of biological resources and ecosystems in Alaska and throughout the North Pacific Ocean. The Alaska sea otter project is one of two USGS sea otter research programs, the other led by James Estes, located in Santa Cruz, CA.

Responsible for designing, developing and directing multi-disciplinary research programs for studying North Pacific coastal marine ecosystems, focusing on sea otter populations and their role in structuring coastal marine communities in Alaska. Current research programs encompass three broad objectives, including, 1) designing, developing and testing methods to assess the status of sea otter populations, 2) describing processes responsible for structuring coastal marine communities, and 3) determining the status of recovery of sea otter populations affected by the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska.

Scope of each of the three research programs**:**

> **Designing, developing and testing methods to assess the status of sea otter populations**. Appropriate conservation and management of sea otter populations requires accurate knowledge on the status of populations relative to available resources, primarily food and space. Current projects to evaluate population status include measures of abundance (density), age and sex specific fecundity and survival, individual condition and bio-markers, and activity-time budgets. Remote sensing devices (time-depth recorders) are currently being tested as a new method to estimate time budgets.

Describing processes responsible for structuring coastal marine communities. Processes responsible for driving the structure and function of north Pacific coastal communities are complex and not well understood, yet managers of coastal resources need to understand causes of variation and change in coastal communities. Current projects include a) defining coastal marine community structure in terms of physical character, biological productivity, and species composition and abundance of algae, macro-invertebrates, fishes, birds and mammals, and b) employing comparative and experimental methods to allow inference regarding cause of change in the coastal system.

Determine the status of recovery of sea otter populations affected by the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska. Natural resources are subjected to increasing levels of anthropogenic disturbance, as exemplified by this nation's largest oil spill, the Exxon Valdez spill of 1989. Previous methods to understand the acute and chronic effects of disturbances at both species and ecosystem levels are poorly developed, often leading to uncertainty. Project objectives include developing new tools and approaches to improve our understanding of catastrophic perturbations and methods to describe the processes of how systems recover and to identify factors that can constrain system recovery.

Selected Publications**:**

Bodkin, J. L. and M.S. Udevitz. 1999. An aerial survey method to estimate sea otter abundance. in: Garner, G.W., S.C. Amstrup, J.L. Laake, B.F.J. Manly, L.L. McDonald, and D.G. Robertson, (eds.) Marine mammal survey and assessment methods. Balkema Press, Netherlands pg. 13-26

Bodkin, J.L., A.M. Burdin and D.A. Ryzanov. 2000. Age and sex specific mortality and population structure in sea otters. Marine Mammal Science 16(1):201-219.

Bodkin, J.L. 2001. Marine Mammals: Sea otters. Pages 2614-2621. in Steele, J. S.Thorpe and K. Turekian (eds.) Encyclopedia of Ocean Sciences. Academic Press, London UK. (invited ms)

Bodkin, J.L., B.E. Ballachey, T.A. Dean, A.K. Fukuyama, S.C. Jewett, L.M. McDonald, D.H.Monson, C.E. O'Clair and G.R. VanBlaricom. 2002. Sea otter population status and the process of recovery from the Exxon Valdez oil spill. Marine Ecology Progress Series. 241:237-253.

Peterson, C.H., S.D. Rice, J.W. Short, D. Esler, J.L. Bodkin, B.E. Ballachey, D.B. Irons. 2003. Long-term ecosystem response to the Exxon Valdez oil spill. Science 302:2082-2086.

Collaborators:

Dr B.E. Ballachey, USGS, Dr. T.A. Dean, Coastal Resource Associates, Ms A.M. Doroff, USFWS, Dr. D. Esler, Simon Fraser Univ., Dr. J.A. Estes, USGS, Dr. D.B. Irons USFWS, Dr. C.H. Peterson, Univ. North Carolina, Dr. John Piatt, Alaska Science Center, Dr S.D. Rice NOAA, Mr J.W. Short, NOAA, Dr P. Snyder, Purdue University, Ms. M. Staedler, Monterey Bay Aquarium

Thomas A. Dean

Coastal Resources Associates Inc.
5674 El Camino Real, Suite M
Carlsbad, CA 92008

Phone: (760) 603-0612
Email: coastal_resources@sbcglobal.net

Education:

University of Delaware, Ph.D., Biology	1977
East Carolina University, M.A., Biology	1973
Gettysburg College, B.A., Biology	1970

Professional Experience:

President Coastal Resources Associates, Inc.	1988 to Present
Associate Research Biologist University of California, Santa Barbara	1978 to 1987
Senior Staff Ecologist E.H. Richardson Associates	1976 to 1978

Biographic Summary:

Dr. Dean is a marine ecologist with over 25 years of experience. He specializes in nearshore communities and in assessment of impacts on nearshore resources. He has served as a principal investigator as part of two of the largest marine impact assessment projects ever conducted: the assessment of the impacts from the discharge of heated cooling water from the San Onofre Nuclear Generating Station and the effects of the *Exxon Valdez* oil spill. In addition, Dr. Dean has directed a number of smaller scale projects evaluating impacts of harbor development, characterizing the toxicity of sediments and waste water, evaluating the impacts of sewage spills, and developing techniques for the mitigation of impacts and restoration of nearshore biological resources. His work has led to the publication of over 35 manuscripts in the peer reviewed literature and numerous technical reports.

Dr. Dean founded and became President of Coastal Resources Associates, Inc. (CRA) in 1988. CRA specializes in environmental studies in coastal areas of the northeastern Pacific. Projects have included siting and design of the San Clemente artificial reef. This is the largest artificial reef system in California and was designed to mitigate for losses of kelp resources. Dr. Dean also directed laboratory investigations of waste water and sediment toxicity specializing in the development of sensitive life-stage tests and the evaluation of special toxicity problems. Dr. Dean has served as an advisor to the State of California Water Resources Board on marine toxicity testing since 1986 and was instrumental in the development and implementation of

sensitive life-stage tests for marine organisms native to California and in the selection of test protocols now widely used in routine testing throughout the Pacific.

Since 1989, Dr. Dean has been funded by the *Exxon Valdez* Oil Spill Trustee Council to evaluate impacts and assess recovery of nearshore resources following the *Exxon Valdez* oil spill. Earlier works examined the impact of the spill on nearshore plants and invertebrates as part of the natural resource damage assessment (NRDA). More recent studies focused on factors responsible for the lack of recovery of representative nearshore vertebrate predator species (e.g. sea otters and river otters) and especially on the role of invertebrate food resources as a pathway of exposure to residual oil. Current projects are focusing on the development of design for a long-term nearshore monitoring effort for the Gulf of Alaska. The plan is being developed to detect change, determine causes for change, and advise the public and regulatory agencies with respect to mitigation of man-induced impacts over the next century.

Recent Publications:

Bowyer, R.T., G.M. Blundell, M. Ben-David, S.C. Jewett, T.A. Dean, L.A. Duffy. 2003. Effects of the *Exxon Valdez* oil spill on river otters: injury and recovery of a sentinel species. Wildlife Monographs 67:1-53.

Dean, T.A., J.L. Bodkin, A. Fukuyama, S.C. Jewett, D.H. Monson, C.E. O'Clair, G.R. VanBlaricom. 2002. Food limitation and the recovery of sea otters following the *Exxon Valdez* oil spill. Marine Ecology Progress Series 241:255-270

Bodkin, J.L., B. Ballachey, T.A. Dean, F.K. Fukuyama, S.C. Jewett, L.L. McDonald, D.H. Monson, C.E. O'Clair, and G.R. Van Blaricom. 2002. Sea otter population status and the process of recovery following the 1989 *Exxon Valdez* oil spill. Marine Ecology Progress Series 241:237-253

Golet, H.G., P.E. Seizer, A.D. McGuire, D.D. Roby, J.B. Fischer, K.J. Kuletz. D.B. Irons, T. A. Dean, S.C. Jewett, and S.H. Newman. 2002. Long-term direct and indirect effects of the the *Exxon Valdez* oil spill on pigeon guillemots in Prince William Sound, Alaska. Marine Ecology Progress Series 241:287-304

Esler, D., T.D. Bowman, K.A. Trust, B.E. Ballachey, T.A. Dean, S.C. Jewett, C.E. O'Clair. 2002. Harlequin duck population recovery following the *Exxon Valdez* oil spill: Progress, process, and constraints. Marine Ecology Progress Series 241: 271-286

Collaborators:

B.E. Ballachey, USGS; M. Ben-David, UAF; G. Blundell, UAF; J. Bodkin, USGS; T. Bowman, USFWS; T. Bowyer, UAF; L. Deysher, Coastal Resources; L. Duffy, UAF; D. Esler, Simon Fraser Univ.; J. Fischer, USFWS; A. Fukuyama, Univ. Washington; G. Golet, USFWS; B. Grove, Southern California Edison Co.; D. Irons USFWS; A. Jahn, MEC Analytical, S. Jewett, UAF; K. Kuletz, USFWS; L. McDonald, West Inc.; D. Monson, USGS; S. Newman, UC Davis; C. O'Clair, NOAA; D. Roby, USGS; P. Seizer, UAF; K. Trust, USFWS; G. VanBlaricom, USGS

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

	PROPOSED TRUSTEE AGENCY TOTALS (FY 05-07))					
	ADEC	ADF&G	ADNR	USFS	DOI	NOAA
					$316.7	$15.0

Budget Category:	Proposed FY 05	Proposed FY 06	Proposed FY 07	TOTAL PROPOSED
Personnel	$79.5	$35.6	$0.0	$115.1
Travel	$14.1	$1.7	$0.0	$15.8
Contractual	$77.7	$74.8	$0.0	$152.5
Commodities	$3.0	$0.0	$0.0	$3.0
Equipment	$17.9	$0.0	$0.0	$17.9
Subtotal	$192.2	$112.1	$0.0	$304.3
General Administration (9% of subtotal)	$17.3	$10.1	$0.0	$27.4
Project Total	$209.5	$122.2	$0.0	$331.7

Cost-share Funds: None

USGS Totals (includes contracts with Coastal Resource Associates and Center for Alaskan Coastal Studies)
FY05: $194.5 K
FY06: $122.2 K

NOAA Totals
FY05: $15.0 K
FY06: $0 K

FY 05-07

Date Prepared: 4/15/04

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 2A
MULTI-TRUSTEE AGENCY SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Budget Category:	Proposed FY 05	Proposed FY 06	Proposed FY 07	TOTAL PROPOSED
Personnel	$69.0	$35.6	$0.0	$104.6
Travel	$10.8	$1.7	$0.0	$12.5
Contractual	$77.7	$74.8	$0.0	$152.5
Commodities	$3.0	$0.0	$0.0	$3.0
Equipment	$17.9	$0.0	$0.0	$17.9
Subtotal	$178.4	$112.1	$0.0	$290.5
General Administration (9% of subtotal)	$16.1	$10.1	$0.0	$26.1
Project Total	$194.5	$122.2	$0.0	$316.6

Cost-share Funds:
In this box, identify non-EVOS funds or in-kind contributions used as cost-share for the work in this proposal. List the amount of funds, the source of funds, and the purpose for which the funds will be used. Do not include funds that are not directly and specifically related to the work being proposed in this proposal.

FY 05-07

Date Prepared:4/15/04

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3A
TRUSTEE
AGENCY
SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
Jim Bodkin	Principal Investigator		2.0	8.8		17.6
George Esslinger	Wildlife biologist		3.0	5.6		16.8
Kim Kloecker	Wildlife biologist		2.0	5.6		11.2
To be named	Field technician		1.0	5.4		5.4
To be named	Field technician		3.0	4.5		13.5
To be named	Field technician		1.0	4.5		4.5
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		12.0	34.4	0.0	
					Personnel Total	$69.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
RT Anchorage to Cordova, Bodkin	0.3	1	6	0.2	1.5
RT Anchorage to Cordova, 3 field personnel	0.3	3	6	0.6	4.5
RT Anchorage to Homer, Bodkin	0.2	1	5	0.2	1.2
RT Anchorage to Homer, 3 field personnel	0.2	3	5	0.6	3.6
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$10.8

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:		Contractual Sum
Description		
4A Linkage	Contracts with Coastal Resource Associates and Center for Alaskan Coastal Studies	77.7
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$77.7

Commodities Costs:	Commodities Sum
Description	
Software for PDA's	0.8
Software for data management	1.2
Misc field supplies	1.0
Commodities Total	$3.0

FY 05

Project Number: 050750
Project Title: Implementation of the GEM Nearshore Monitoring Program
Agency: USGS

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases:		Number of Units	Unit Price	Equipment Sum
Description				
4	Palm or similar PDAs			3.2
4	Garmin GPS			2.4
1	CTD			12.0
1	Temperature recording device			0.3
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$17.9

Existing Equipment Usage:		Number of Units	Inventory Agency
Description			

FY 05

Project Number: 050750
Project Title: Implementation of the GEM Nearshore monitoring program
Agency: USGS

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
Jim Bodkin	Principal Investigator		2.0	9.1		18.2
George Esslinger	Wildlife Biologist		2.0	5.8		11.6
Kim Kloecker	Wildlife Biologist		1.0	5.8		5.8
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		5.0	20.7	0.0	
					Personnel Total	$35.6

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0.0
RT Anchorage to San Diego, Bodkin	0.7	1	5	0.2	1.7
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$1.7

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:		Contractual Sum
Description		
4A Linkage	Contracts with Coastal Resource Associates and Center for Alaskan Coastal Studies	74.8
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$74.8

Commodities Costs:		Commodities Sum
Description		
	Commodities Total	$0.0

FY 06

Project Number:
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						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	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0.0
					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

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
4A Linkage	0.0
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$0.0
Commodities Costs:	Commodities Sum
Description	
Commodities Total	$0.0

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY 07

Project Number:
Project Title: Implementation of the GEM nearshore monitoring program
Agency: USGS

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Budget Category:	Proposed FY 05	Proposed FY 06	Proposed FY 07	TOTAL PROPOSED
Personnel	$10.5	$0.0	$0.0	$10.5
Travel	$3.3	$0.0	$0.0	$3.3
Contractual	$0.0	$0.0	$0.0	$0.0
Commodities	$0.0	$0.0	$0.0	$0.0
Equipment	$0.0	$0.0	$0.0	$0.0
Subtotal	$13.8	$0.0	$0.0	$13.8
General Administration (9% of subtotal)	$1.2	$0.0	$0.0	$1.2
Project Total	$15.0	$0.0	$0.0	$15.0
Other Funds				

Cost-share Funds:
In this box, identify non-EVOS funds or in-kind contributions used as cost-share for the work in this proposal. List the amount of funds, the source of funds, and the purpose for which the funds will be used. Do not include funds that are not directly and specifically related to the work being proposed in this proposal.

FY 05-07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3A
TRUSTEE
AGENCY
SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						0.0
Mandy Lindeberg			1.5	7.0		10.5
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		1.5	7.0	0.0	
					Personnel Total	$10.5

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
RT Juneau to Anchorage	0.4	1	1	0.2	0.6
RT Juneau to Cordova	0.4	1	5	0.2	1.4
RT Juneau to Homer	0.3	1	5	0.2	1.3
					0.0
					0.0
					0.0
				Travel Total	$3.3

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$0.0
Commodities Costs:	Commodities Sum
Description	
Commodities Total	$0.0

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:		GS/Range/	Months	Monthly		Personnel
Name	Description	Step	Budgeted	Costs	Overtime	Sum
						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	Travel
Description	Price	Trips	Days	Per Diem	Sum
					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

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$0.0
Commodities Costs:	Commodities Sum
Description	
Commodities Total	$0.0

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:						
Name	Description	GS/Range/ Step	Months Budgeted	Monthly Costs	Overtime	Personnel Sum
						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:					
Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					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

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$0.0
Commodities Costs:	Commodities Sum
Description	
Commodities Total	$0.0

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY 07

Project Number:
Project Title: Implementation of the GEM nearshore monitoring program
Agency: NOAA/NMFS Auke Bay Lab

FORM 3B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Budget Category:	Proposed FY 05	Proposed FY 06	Proposed FY 07	TOTAL PROPOSED
Personnel	$61.6	$55.8	$0.0	$117.4
Travel	$7.6	$10.5	$2.8	$20.9
Contractual	$0.0	$0.0	$0.0	$0.0
Commodities	$1.4	$0.8	$0.0	$2.2
Equipment	$0.0	$0.0	$0.0	$0.0
Subtotal	$70.6	$67.1	$0.0	$140.5
Indirect (rate will vary by contractor)	$7.1	$7.7		
Project Total	$77.7	$74.8	$0.0	$140.5

Indirect rate for Coastal Resources Associates Inc.: 9%
Personnel costs include benefits equaling 32% of salary. No additional fees are being assessed.

Contract totals for **Coastal Resources Associates Inc.**
FY05: (salary 51.6 K + travel 7.2 K + commodities 0.8 K) (indirect rate .09) = **$65.0 K**
FY06: (salary 35.2 K + travel 4.4 K) (indirect rate .09) = **$43.2 K**

Indirect rate for Center for Alaskan Coastal Studies: 15%

Contract totals for **Center for Alaskan Coastal Studies**
FY05: (salary 10.0 K + travel 0.4 K + commodities 0.6 K) (indirect rate .15) = **$12.7 K**
FY06: (salary 20.6 K + travel 6.1 K + commodities 0.8 K) (indirect rate .15) = **$31.6 K**

FY 05-07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4A
Non-Trustee
SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:			Months	Monthly		Personnel
	Name	Description	Budgeted	Costs	Overtime	Sum
	Tom Dean, Coastal Resources Assoc, Inc.	Principal Investigator	6.0	8.6		51.6
	Marilyn Sigman, Center for Alaskan Coastal Studies	Community Coordinator	2.0	5.0		10.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
		Subtotal	8.0	13.6	0.0	
					Personnel Total	$61.6

Travel Costs:		Ticket	Round	Total	Daily	Travel
	Description	Price	Trips	Days	Per Diem	Sum
	RT San Diego to Anchorage, Dean	0.7	3	12	0.2	4.5
	RT Anchorage to Homer, Dean	0.2	1	5	0.2	1.2
	RT Anchorage to Cordova, Dean	0.3	1	6	0.2	1.5
						0.0
	RT Homer to Anchorage, Sigman	0.2	1		0.2	0.2
	RT Homer to Port Graham, Sigman	0.1	1			0.1
	RT Homer to Seldovia, Sigman	0.1	1			0.1
						0.0
						0.0
						0.0
						0.0
						0.0
				Travel Total		$7.6

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Personnel & Travel DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
Contractual Total	$0.0

Commodities Costs:	Commodities Sum
Description	
Computer software, Coastal Resources Assoc, Inc	0.8
Copy costs and telephone, Center for Alaskan Coastal Studies	0.6
Commodities Total	$1.4

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Contractual & Commodities DETAIL

EXXON VALDEZ **OIL SPILL TRUSTEE COUNCIL**
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			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
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units

FY 05

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs: Name	Description		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Tom Dean, Coastal Resources Assoc, Inc.	Principal Investigator		4.0	8.8		35.2
						0.0
						0.0
Marilyn Sigman, Center for AK Coastal Studie	Community Coordinator		3.0	5.0		15.0
Bree Murphy	Environmental Educator		2.0	2.8		5.6
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
	Subtotal		9.0	16.6	0.0	
					Personnel Total	$55.8

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					0.0
RT San Diego to Anchorage, Dean	0.7	1	12	0.2	3.1
RT San Diego to professional conference for presentation	0.5	1	4	0.2	1.3
					0.0
RT Homer to Anchorage, Sigman	0.3	4	8	0.2	2.8
RT Homer to Kodiak, Sigman	0.3	1	4	0.2	1.1
RT Homer to Cordova, Sigman	0.2	1	4	0.2	1.0
RT Homer to Seward, Sigman	0.0	1	3	0.2	0.6
RT Homer to Seldovia, Sigman	0.1	2			0.2
RT Homer to Port Graham, Sigman	0.1	2			0.2
RT Homer to Nanwalek, Sigman	0.1	2			0.2
					0.0
				Travel Total	$10.5

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Personnel & Travel DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
Contractual Total	$0.0

Commodities Costs:	Commodities Sum
Description	
Copy costs and telephone, Center for Alaskan Coastal Studies	0.8
Commodities Total	$0.8

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		New Equipment Total	$0.0

Existing Equipment Usage: Description	Number of Units	

FY 06

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Equipment
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Personnel Costs:			Months	Monthly		Personnel
	Name	Description	Budgeted	Costs	Overtime	Sum
						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	Travel
	Description	Price	Trips	Days	Per Diem	Sum
						0.0
						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

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

Contractual Costs:	Contractual Sum
Description	
Contractual Total	$0.0

Commodities Costs:	Commodities Sum
Description	
Commodities Total	$0.0

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 05 - FY 07

New Equipment Purchases:	Number of Units	Unit Price	Equipment Sum
Description			
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Indicate replacement equipment with an R.		**New Equipment Total**	$0.0

Existing Equipment Usage:	Number of Units	
Description		

FY 07

Project Number: 050750
Project Title: Implementation of the GEM nearshore monitoring program
Name of Contractors: Coastal Resources Assoc, Inc. and Center for Alaskan Coastal Studies

FORM 4B
Equipment
DETAIL

IX. **BUDGET JUSTIFICATION**

Justification for each item in the attached budget is as follows:

FY05

Personnel - $79,500

Responsibilities of each person are as follows:

Jim Bodkin (PI) - Project oversight, assist in production of standard operating procedures for sea otter related tasks and for seabirds and mammals, assist in site selection.
George Esslinger - GIS analaysis, selection of sampling sites based on GIS databases, assist in collating GIS related standard operating procedures.
Kim Kloecker - Assist in development of the data management plan, develop software for PDAs used in intertidal sampling, manage databases for testing of field sampling, manage data management system.
Mandy Lindeberg - Assist in collating standard operating procedures for contaminants, assist in field testing of intertidal invertebrate and algal sampling.
2 Technical staff to be named – Assist in gathering, collating, and formatting of standard operating procedures.
Technical staff to be named – Assist in software development for PDAs and development of the data management infrastructure.

Travel – $14,100

Travel is for Jim Bodkin, M. Lindeberg, and 3 unnamed technicians for travel to field sites in Cordova and Homer for testing of SOPs.

Commodities – $3,000

Commodities include software needed for data management and for PDAs as well as miscellaneous field sampling gear (e.g. shovels, sieves, sample jars, etc.).

Equipment – $17,900

Equipment includes PDAs used for logging data in the field, integrated GPS systems, and representative instruments used in the collection of CTD and temperature data. The latter will be sued to test these systems prior to purchase of a larger number of instruments during the full implementation of nearshore sampling.

Contractual – $77,700

Contracts are for Coastal Resources Associates (CRA, Dr. Thomas Dean) and for The Center for Alaskan Coastal Studies (CACS, Marilyn Sigman). Dr. Dean will be responsible for assisting in project oversight, writing of standard operating procedures, writing the data management plan, overseeing the site selection process, assisting in field sampling, and report writing. Travel for

Dr. Dean includes 1 trip from San Diego to Anchorage for the annual EVOS meeting, one trip to attend community workshops, and 1 trip for field sampling (with visits to Homer and Cordova). Commodities for CRA include software needed to interface with PDAs and the data management system. Ms. Sigman will be responsible for organizing and running community involvement workshops, assisting in obtaining assistance from community residents in field sampling, and writing a community involvement plan. Her travel is for attending the annual EVOS meeting and attending workshops. Commodities for CACS include copy and software costs.

FY06

Personnel - $35,600

Responsibilities of each person are as follows:

Jim Bodkin (PI) - Project oversight, report preparation and attending and presenting results at the annual EVOS meeting.
George Esslinger - GIS analaysis, selection of sampling sites based on GIS databases (for areas in which shoreline surveys are completed in fall 2005).
Kim Kloecker - Assist in development of the data management plan, manage databases for testing of field sampling, manage data management system.

Travel – $1,700

Jim Bodkin for travel to San Diego to conduct and interpret analyses, and prepare final report in collaboration with Dr Tom Dean.

Commodities – none

Equipment – none

Contractual – $74,800

Contracts are for Coastal Resources Associates (CRA, Dr. Thomas Dean) and for The Center for Alaskan Coastal Studies (CACS, Marilyn Sigman and Bree Murphy). Dr. Dean will be responsible for assisting in project oversight, overseeing the site selection process, analyzing data form field testing, writing the final report, and attending and presenting results at the annual EVOS meeting. Travel for Dr. Dean includes 1 trip from San Diego to Anchorage for the annual EVOS meeting, and 1 trip for presentation at a professional conference. Ms. Sigman will be responsible for organizing and running community involvement workshops, assisting in obtaining assistance from community residents in field sampling, and writing a community involvement plan. She will be assisted by Ms. Murphy. Their travel is for attending the annual EVOS meeting and attending workshops. Commodities for CACS include copy and telephone costs.