# FY12 INVITATION
# PROPOSAL SUMMARY PAGE

**Project Title:** Long term monitoring: Environmental drivers component - Long-term monitoring of oceanographic conditions in Cook Inlet/Kachemak Bay to understand recovery and restoration of injured near-shore species.

**Project Period:** October 1, 2011 – September 30, 2016

**Primary Investigator(s):**
Angela Doroff, Kachemak Bay Research Reserve, angela.doroff@alaska.gov and
Kris Holderied, NOAA Kasitsna Bay Laboratory, kris.holderied@noaa.gov

**Study Location: Lower Cook Inlet and Kachemak Bay, Alaska**

**Abstract:** This project is a component of the integrated Long-term Monitoring of Marine Conditions and Injured Resources and Services submitted by McCammon et. al. The Kachemak Bay Research Reserve (KBRR) and NOAA Kasitsna Bay Laboratory jointly propose to continue and enhance oceanographic monitoring in Kachemak Bay and lower Cook Inlet, in order to provide the physical data needed for a comprehensive restoration monitoring program in the *Exxon Valdez* oil spill (EVOS) affected area. This project will leverage and enhance KBRR water quality monitoring stations, establish routine small boat oceanographic and plankton surveys to assess spatial, seasonal and inter-annual variability in water mass movement, leverage information from previous oceanographic surveys, provide environmental information to aid separately proposed benthic monitoring projects, and benefit from a new NOAA ocean circulation model for Cook Inlet. Long-term monitoring of physical changes and connectivity in the marine environment is essential to understand what drives both gradual and sudden changes in coastal ecosystems and estuarine systems in the affected area, including Prince William Sound and Cook Inlet. In addition to long-term effects from the EVOS, these coastal waters and habitats are impacted by the other physical stressors including climate change, ocean acidification, and continuing land-level and sedimentation changes from the 1964 earthquake and isostatic rebound from melting glaciers. The Cook Inlet/Kachemak Bay oceanographic information from this project will allow determination of patterns and trends in ocean circulation and plankton and aid in interpretation of biological monitoring data on the status and trends of injured resources in the near-shore environment. In conjunction with separately proposed oceanographic monitoring projects in PWS and the Gulf of Alaska, the project will enable assessment of whether circulation patterns in the Gulf of Alaska are synchronous with near-shore trends, which has implications for biological abundance and diversity. Our objective is to implement an enhanced, long-term Cook Inlet near-shore oceanographic monitoring program that directly informs management for sustained recovery and restoration of EVOS-injured resources in the face of environmental variability, shifts and long-term changes.

**Estimated Budget:**
**EVOSTC Funding Requested (does not include 9% overhead G&A):**
*FY12: $171.0; FY13: $156.0; FY14: $153.7; FY15:$131.4; FY16: $101.8*
*TOTAL: $714.0*
**Non-EVOSTC Funds to be used:**
*FY12: $155.0; FY13: $155.0; FY14: $155.0; FY15: $155.0; FY16: $155.0*
*TOTAL: $775.0*

**Date:** June 1, 2011

(NOT TO EXCEED ONE PAGE)

# PROJECT PLAN

## I. NEED FOR THE PROJECT

### A. Statement of Problem

Justification

The proposed lower Cook Inlet/Kachemak Bay monitoring project is designed to assist in the evaluation of recovery and restoration of injured resources in the foot print of the *Exxon Valdez* oil spill (EVOS) by providing oceanographic (temperature, salinity, turbidity), water quality, and plankton monitoring information to: 1) help understand trends observed in near-shore biological monitoring proposed under the Benthic Monitoring component of our integrated proposal (see Konar and Iken project); 2) determine if oceanic conditions and changes in the Gulf of Alaska are synchronous with near-shore trends. (see also the Weingartner and Hopcroft projects); and 3) help determine how these patterns and linkages compare between Cook Inlet and Prince William Sound (PWS) (see also the Campbell project). Long-term monitoring of physical changes is essential to understand what drives both gradual and sudden changes in coastal ecosystems. Kachemak Bay, like PWS, has been impacted by the EVOS and coastal habitats in both regions face other physical stressors including climate change, ocean acidification, and continuing land-level changes from the 1964 earthquake and isostatic rebound from melting glaciers.

This project will leverage and expand several long-term (10 years and longer) physical and biological monitoring data series in Kachemak Bay and benefit from current development of an operational NOAA ocean circulation model for Cook Inlet. It will expand on previous Cook Inlet studies on oceanography by Okkonen et al (2009) and Okkonen and Howell (2003) and on physical and biological linkages by Speckman et al. (2005). The project will also leverage Gulf of Alaska data collected during the current NPRB Gulf of Alaska Integrated Ecosystem Research Program (GOAIERP). The physical monitoring program will complement separately proposed Kachemak Bay benthic species monitoring (invertebrates, macroalgae, and sea otters – see Konar and Iken project) as well as annual Alaska Department of Fish and Game shellfish surveys. The National Park Service and U.S. Geological Survey have also implemented near-shore monitoring of injured resources along the Katmai, Kenai Fjords, and Lake Clark National Park coasts since 2006. To date, that monitoring has not been correlated with annual and seasonal circulation patterns in lower Cook Inlet and our project will allow such correlations, as well as a comparison to similar physical-biological linkages in PWS from other projects in the integrated proposal (see Campbell and Ballachey et al.). Because of the rich data history in Kachemak Bay and lower Cook Inlet, pairing the physical and biological near-shore monitoring will facilitate understanding of the impacts of environmental drivers throughout the spill-affected area. The project goal is to monitor oceanographic conditions in lower Cook Inlet and Kachemak Bay, at scales that will improve understanding of environmental conditions which may inhibit full recovery of injured resources or adversely impact recovered resources.

### B. Relevance to 1994 Restoration Plan Goals and Scientific Priorities

Please see pages 2-4 of the integrated proposal titled “Long-Term Monitoring of Marine Conditions and Injured Resources and Services,” and submited by McCammon et. al.

## II. PROJECT DESIGN
## A. Objectives

Project objectives

We propose to enhance existing oceanographic monitoring programs in Kachemak Bay and lower Cook Inlet to correlate annual and seasonal patterns and trends in ocean conditions with near-shore monitoring of injured resources and ocean conditions in the Gulf of Alaska and PWS. Specific objectives include:

1. Examine the short-term variability and track long-term trends in oceanographic and water quality parameters and plankton communities.

2. Provide environmental forcing data for correlation with biological data sets.

3. Improve understanding of water mass movement in Kachemak Bay and lower Cook Inlet.

4. Determine linkages, and temporal variability in those links, between Kachemak Bay/lower Cook Inlet, the Alaska Coastal Current and PWS, using oceanographic data from PWS, GAK1 mooring, Seward Line and NPRB GOAIERP shipboard sampling along the shelf adjacent to Cook Inlet.

Project integration

The Kachemak Bay Research Reserve (KBRR), a State of Alaska and NOAA partnership, and the NOAA Kasitsna Bay Laboratory (KBL) are collaborating on this oceanographic monitoring project to cost-effectively leverage organization resources as well as historical data sets. To aid in interpreting the relative effects of oceanic and estuarine changes on the status and trends of injured resources in the near-shore environment, data from this effort will be related to oceanographic and plankton monitoring in Prince William Sound (Campbell proposal in the integrated program), the outer Kenai Peninsula coast (Weingartner and Hopcroft proposals), along the Gulf of Alaska (Batten proposal), and from two field years of the NPRB-funded GOAIERP. The KBRR has 10 years of water quality and meteorological data at two System-Wide Monitoring Program (SWMP) sites in Homer and Seldovia harbors. CTD temperature and salinity profile data has been collected with varying frequencies along several transects in Kachemak Bay and lower Cook Inlet, including during recent studies by Okkonen et al., 2009 and Murphy, 2010. KBRR also has near-surface salinity and temperature data on ferry routes from lower Cook Inlet to Kodiak. Water level and temperature data from 1964 to present are available from the NOAA tide station at Seldovia. Complementing the physical data, annual intertidal invertebrate and macroalgae monitoring has been conducted at sites near KBL for 9 and 10 years (also see Konar and Iken proposal). Other data sets, including extensive U.S. Fish and Wildlife Service sea otter and ADF&G shellfish surveys, also overlap the time periods of the physical data records in this region.

Leveraging

As described in Section A above, this project will leverage and expand several long-term physical oceanographic time series in Kachemak Bay, provide environmental data to support understanding in biological monitoring proposed under the integrated program as well as biological monitoring outside the EVOSTC-funded program, and benefit from current

development of an operational NOAA ocean circulation model for Cook Inlet. KBRR will provide resources for continuous monitoring of water quality and meteorological data as part of the SWMP and our project will add an additional seasonal station to that existing program. KBL will provide equipment and staff time to conduct CTD data collection. A Cook Inlet circulation model is being developed by the NOAA Coast Survey Development Laboratory and scheduled to be operational in 2013. The model will significantly help to integrate the oceanographic data in both space and time. The data collected through this project and from historical time series will facilitate the data synthesis effort of the integrated program and specifically support the year 3 joint workshop between the EVOSTC-funded long-term monitoring and herring programs. The combination of oceanographic data collected as part of the integrated program (this project, Campbell, Weingartner, Hopcroft, and through the NPRB GOAIERP will improve understanding of linkages between marine conditions on the Gulf of Alaska shelf and in the near-shore waters of Kachemak Bay, lower Cook Inlet and PWS. Determining local trends and linkages across the larger region will facilitate understanding of the environmental impacts on observed trends in the status of injured resources. Collectively, KBRR and KBL will make $155K per year of in-kind contributions to this project.

References

Murphy, M. (2010) Larval Transport of Brachyuran crab in Kachemak Bay, Alaska, MS Thesis, University of Alaska Fairbanks, Fairbanks, AK, pp. 1-113.

Okkonen S. R. (2005) Observations of hydrography and currents in central Cook Inlet, Alaska during diurnal and semidiurnal tidal cycles. Final Report OCS Study MMS 2004-058, University of Alaska Coastal Marine Institute, University of Alaska Fairbanks and USDOI, MMS, Alaska OCS Region, pp 1-24.

Okkonen S. R., Pegau S., Saupe S. (2009) Seasonality of boundary conditions for Cook Inlet, Alaska. Final Report OCS Study MMS 2009-041, University of Alaska Coastal Marine Institute, University of Alaska Fairbanks and USDOI, MMS, Alaska OCS Region, pp 1-59.

Speckman S. G., Piatt J. F., Minte-Vera C. V., Parrish J. K. (2005) Parallel structure among environmental gradients and three trophic levels in a subarctic estuary. Progress in Oceanography 66:25-65.

## B. Procedural and Scientific Methods

Project approach and logistics

The proposed Kachemak Bay and lower Cook Inlet environmental monitoring project will include data collection at continuous SWMP water quality stations in Kachemak Bay, monthly shipboard oceanographic measurements in Kachemak Bay, and seasonal shipboard oceanographic measurements in lower Cook Inlet.

In Kachemak Bay, the proposed oceanographic monitoring will combine: 1) continuous data from existing KBRR water quality and meteorological monitoring stations at the Homer and Seldovia harbors; 2) an additional shoreline water quality station to be deployed during ice-free

months in Bear Cove (near head of Kachemak Bay); and 3) monthly small-boat surveys of temperature and salinity profiles, using conductivity-temperature-depth (CTD) profiler instruments on a transect across Kachemak Bay at the Homer Spit (see Figures 1 and 2). KBRR and KBL small boats will be used for Kachemak Bay sampling. The water quality stations each have two YSI sondes to measure near-surface and near-bottom temperature, salinity, dissolved oxygen, turbidity, and pH. A Sea-Bird Electronics (SBE)19plus SEACAT CTD profiler will be used to acquire surface to bottom profiles of temperature and salinity at ten stations along the transect, with approximately 400 meters between stations. Turbidity measurements will be made with an integrated WETLabs ECO Fluorometer sensor integrated with the CTD profiler. At each station, the CTD profiler will be lowered at 1 meter/second from approximately 2 meters depth to 1-2 meters from the bottom, with a sample rate of 4 times/second. Station location will be recorded from vessel-mounted or handheld GPS units. Oceanographic data collected along shipboard transects in year 1 and 2 of the project will be analyzed for spatial and temporal (seasonal and annual) patterns, to determine if deployment of moored instruments could be used as an alternative in the final three years of the project and beyond.

In lower Cook Inlet, oceanographic monitoring will include quarterly shipboard CTD and plankton sampling, conducted at stations along transect lines across the entrance of Cook Inlet and northwest from Anchor Point (see Figure 1). A third line from Augustine Volcano to Flat Island may be sampled as an alternative to sampling the entrance line twice on a given survey (dotted line on Figure 1). The same instruments described above will be used on these surveys. Chartered boats will be used for Cook Inlet sampling, due to the routine presence of higher sea state conditions in the inlet. Station spacing will be between 1.5 and 4 km, with closer station spacing near the coasts. The sampling design leverages existing CTD survey data collected along the proposed lines, as well as along four other Cook Inlet transects (Okkonen et al., 2009). The Barabara Point line in outer Kachemak Bay will also be sampled during the Cook Inlet oceanographic surveys, to have use of the larger chartered boat for these more exposed waters. Within the project budget limit, it will only be possible to conduct the proposed lower Cook Inlet sampling during the first three years of the project. During years 4 and 5, we therefore propose to reduce the charter boat time and allocate more staff time from field data collection to data synthesis, relative to the first 3 years of the project.

Water samples will be collected at a subset of stations along each CTD transect for nutrient and chlorophyll-a analyses, and vertical plankton net tows will be conducted for zooplankton sampling. Water samples will be shipped to Rob Campbell at the Prince William Sound Science Center (PWSSC) for plankton and nutrient analyses under a separate project in our integrated proposal. The collaboration with PWSSC on sample analyses will allow us to make a cost-effective assessment of lower trophic levels and compare to patterns observed in PWS (Campbell proposal) and the outer Kenai coast (Hopcroft proposal). The timing of the water sampling will also attempt to capture productive conditions before, during and after the spring and autumn phytoplankton blooms. Stage composition of the copepod species sampled by the plankton net will also give information on changes in seasonal timing (phenology).

Meteorological data will also be obtained from NOAA and KBRR weather stations in Kachemak Bay and Cook Inlet for assessment of atmospheric forcing conditions.

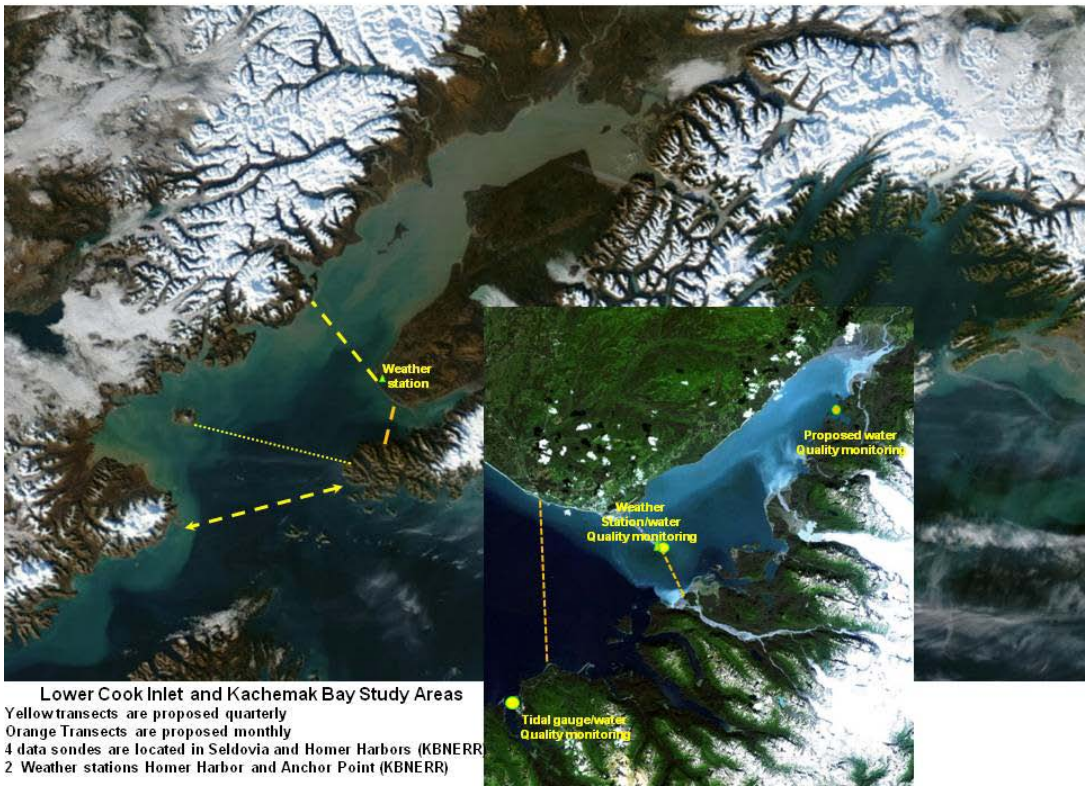


Figure 1. Proposed oceanographic monitoring locations in Kachemak Bay and lower Cook Inlet

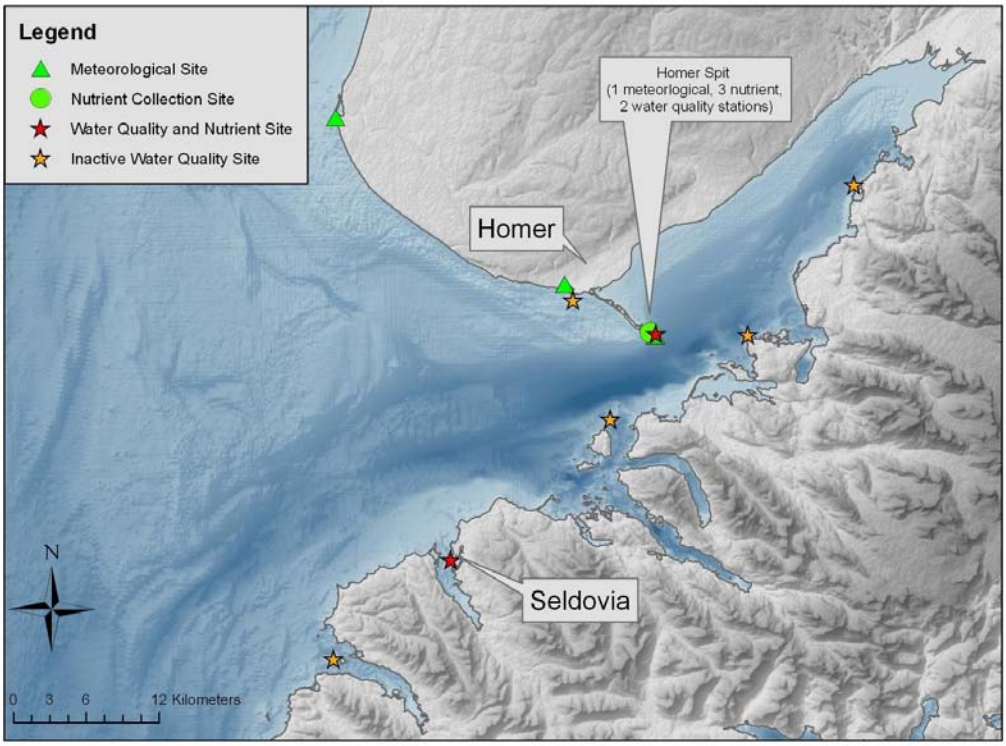


Figure 2. Locations of meteorological (green triangles) water quality (red stars) nutrient (green circles) and historic water quality stations (orange stars) within Kachemak Bay, Alaska.

## C. Data Analysis and Statistical Methods

All KBRR long-term water quality and meteorological data incur primary data quality assurance-quality control (QAQC) at the National Estuarine Research Reserve System Central Data Management Office (CDMO). Within one week of data retrieval as the provisional data are ingested into the CDMO database. The data are then emailed back to KBRR, where Reserve staff use tools provided by the CDMO, Microsoft Excel macros, to perform secondary QAQC on the data. Data that have been through secondary QAQC are submitted back to the CDMO quarterly and again annually and these data are posted as provisional plus. After annual submission to the CDMO is complete, the data undergo final tertiary QAQC by the CDMO. The data and accompanying metadata documentation are checked for completeness before dissemination as authenticated historical data via the CDMO Online Data Information Server (http://cdmo.baruch.sc.edu). Table 1 provides sensor specifications for the water quality sondes, Table 2 provides specifications for the nutrient sensors, and Table 3 provides specifications for the meteorological station sensors.

SEACAT CTD profiler data from all transects will be initially processed with standard SBE Seasoft software algorithms and averaged into 1 meter depth bins. Subsequent data processing will use Matlab software algorithms to compute density and construct along-transect distance versus depth contour plots of temperature, salinity and density. Density fields will be used to estimate the degree of vertical stratification at each station. Lateral variability across the transect and temporal variability between sampling periods will be assessed by calculating means and standard deviations for temperature, salinity and density fields. A least-squared analysis will be used to assess seasonal and annual patterns along the Homer Spit transect. The amount of freshwater at each station within the upper part of the water column will also be calculated using a reference salinity (~32 psu) consistent with earlier studies.

As described above water quality station data is provided on-line in near-real-time by the CDMO and we will work with the data management team to incorporate the data and metadata in the integrated program data services. We will also provide CTD and data in a format and with metadata compatible with the data management protocols of the integrated monitoring program. CTD data will be provided to other integrated program investigators and publicly through the program website as soon as practical, and no later than a year after initial data collection. Plankton and nutrient data analyses will be provided to the data management team by Rob Campbell, through the collaboration with PWSSC described above. We will also assist the integrated program data management team to synthesize past oceanographic data from the existing water quality station time series and CTD surveys in lower Cook Inlet.

Table 1: Specifications for water quality station sensors

| Parameter | Units | Sensor Type | Model | Range | Accuracy | Resolution |
|---|---|---|---|---|---|---|
| Temperature | Celsius (C) | Thermistor | 6560 | -5 to 50 °C | +/-0.15 °C | 0.01 °C |
| Conductivity | milli-Siemens per cm (mS/cm) | 4-electrode cell with autoranging | 6560 | 0 to 100 mS/cm | +/-0.5% of reading + 0.001 mS/cm | 0.001 mS/cm to 0.1 mS/cm (range dependent) |
| Salinity | parts per thousand (ppt) | Calculated from conductivity and temperature | | 0 to 70 ppt | +/- 1.0% of reading or 0.1 ppt, whichever is greater | 0.01 ppt |
| Dissolved Oxygen % | percent air saturation (%) | Rapid Pulse – Clark type, polarographic | 6562 | 0 to 500 % air saturation | 0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading | 0.1 % air saturation |
| Dissolved Oxygen mg/L | milligrams per Liter (mg/L); Calculated from % air saturation, temp and salinity | Rapid Pulse – Clark type, polarographic | 6562 | 0 to 50 mg/L | 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading | 0.01 mg/L |
| Dissolved Oxygen % | % Saturation | Optical probe w/ mechanical cleaning | 6150 ROX | 0 to 500% air saturation | 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater; 200-500% air saturation: +/- 15% or reading | 0.1% air saturation |
| Dissolved Oxygen mg/L | milligrams/Liter (mg/L) | Optical probe w/ mechanical cleaning | 6150 ROX | 0 to 50 mg/L | 0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater; 20 to 50 mg/L: +/- 15% of the reading | 0.01 mg/L |
| Depth | feet or meters (m) | Stainless steel strain gauge | | 0 to 30 ft (9.1 m) | +/- 0.06 ft (0.018 m) | 0.001 ft (0.001 m) |
| pH | units | Glass combination electrode | 6561 and 6561FG | 0 to 14 units | +/- 0.2 units | 0.01 units |
| Turbidity | nephelometric turbidity units (NTU) | Optical, 90 ° scatter, with mechanical cleaning | 6136 | 0 to 1000 NTU | +/- 2 % reading or 0.3 NTU (whichever is greater) | 0.1 NTU |

Table 2. Specifications for nutrient sensors at water quality stations

| Category | Parameter | Variable Name | Units of Measure | Measurement type | MDL (µg/L) | Laboratory |
|---|---|---|---|---|---|---|
| Phosphorus | Orthophosphate, Filtered | PO4F | mg/L as P | Measured | 1.5 | VIMS, UW, Cook Inlet Keeper |
| Nitrogen | Nitrite + Nitrate, Filtered | NO23F | mg/L as N | Measured | 1 | VIMS, UW, Cook Inlet Keeper |
| | Nitrite, Filtered | NO2F | mg/L as N | Measured | 0.2 | VIMS, UW, Cook Inlet Keeper |
| | Nitrate, Filtered | NO3F | mg/L as N | Calculated NO23F - NO2F | - | VIMS, UW, Cook Inlet Keeper |
| | Ammonium, Filtered | NH4F | mg/L as N | Measured | 5.4 | VIMS, UW, Cook Inlet Keeper |
| | Dissolved Inorganic Nitrogen | DIN | mg/L as N | Calculated NO23F + NH4F | - | VIMS, UW, Cook Inlet Keeper |
| Plant Pigments | Chlorophyll a | CHLA_N | µg/L | Measured | 0.02 | KBRR |
| | Phaeophytin | PHEA | µg/L | Measured | 0.02 | KBRR |
| Other Lab Parameters | Silicate, Filtered | SiO4F | mg/L as SI | Measured | 8 | VIMS, UW, Cook Inlet Keeper |

Table 3. Specifications for meteorological stations

| Parameter | Units | Sensor Type | Model | Range | Accuracy | Other |
|---|---|---|---|---|---|---|
| Temperature | Celsius (°C) | Platinum resistance temperature detector (PRT) | HMP45ASP Temperature and Relative Humidity Probe | -40°C to +60°C | ± 0.2 °C @ 20°C | |
| Relative Humidity | Percent (%) | Vaisala HUMICAP© 180 capacitive relative humidity sensor | HMP45ASP Temperature and Relative Humidity Probe | 0-100% non-condensing | Accuracy at 20°C: +/- 2% RH (0-90%) and +/- 3% (90-100%) | Temperature dependence of RH measurement: +/- 0.05% RH/°C |
| Barometric Sensor | millibars (mb) | Vaisala Barocap © silicon capacitive pressure sensor | CS-105 | Pressure: 600 to 1060 mb; Temperature: -40°C to +60°C; Humidity: non-condensing | ± 0.5 mb @ 20°C; +/- 2 mb @ 0°C to 40°C; +/- 4 mb @ -20°C to 45°C; +/- 6 mb @ -40°C to 60°C | Stability: ± 0.1 mb per year |
| Wind direction | degrees | balanced vane, 38 cm turning radius | R.M. Young 05103 Wind Monitor | 360° mechanical, 355° electrical (5° open) | +/- 5% | |
| Wind Speed | meter per second (m/s) | 18 cm diameter 4-blade helicoids propeller molded of polypropylene | R.M. Young 05103 Wind Monitor | 0-60 m/s (130 mph); gust survival 100 m/s (220 mph) | +/- 2% | |
| Precipitation | Milli-meters (mm) | Heated Tipping Bucket Rain Gauge | MetOne 380 | Temperature: 0° to +/- 50°C; Humidity: 0 to 100% | +/- 1.0% up to 1 in./hr; +0, -3% from 1 to 2 in./hr; +0, -5% from 2 to 3 in./hr | Rainfall per tip: 0.01 inch |
| Precipitation | Milli-meters (mm) | Heated Tipping Bucket Rain Gauge | Texas Electronics 525 | Temperature: 0° to +/- 50°C; Humidity: 0 to 100% | +/- 1.0% up to 1 in./hr; +0, -3% from 1 to 2 in./hr; +0, -5% from 2 to 3 in./hr | Rainfall per tip: 0.01 inch |
| LI-COR Quantum Sensor | mmoles m-2 (total flux) | High stability silicon photovoltaic detector (blue enhanced) | LI190SB | Light spectrum waveband: 400 to 700 nm; Operating Temperature: -40°C to 65°C; Humidity: 0 to 100% | typically 5 µA per 1000 µmoles s-1 m-2 | Stability: <±2% change over 1 yr |
| Li-Cor Pyranometer | mA per 1000 W m-2 | High stability silicon photovoltaic detector (blue enhanced) | LI200SZ | Light spectrum waveband: 400 to 1100 nm; Operating Temperature: -40°C to 65°C; Humidity: 0 to 100% | 0.2 kW m-2 mV-1 | Stability: <±2% change over 1 yr |

## D. Description of Study Area

Our study area is includes all of lower Cook Inlet and Kachemak Bay, Alaska (60.056, -154.365; 60.02, -150.9; 58.573, -154.349; 58.539, -151.033). See Figures 1 and 2 above. In order to improve our understanding of the physical environment (hydrographic properties at the inflow and outflow boundaries in lower Cook Inlet and water exchange with Kachemak Bay) we are proposing to replicate CTD transects conducted by Okkenon et al. (2009) and Murphy (2010) and document interactions between the physical and biological properties of the study area through nutrient sampling and plankton collection and identification. During 2012 to 2014 we will collect hydrographic measurements along transect lines crossing: 1) Kennedy Entrance and Stevenson Entrance from Port Chatham to cape Douglas; 3) Cook Inlet from Red River to Anchor Point; 4) Kachemak Bay from Barbara Point to Bluff Point, with an alternate transect line in lower Cook Inlet being Magnet Rock to Augustine Volcano. In Kachemak Bay, a single transect will be sampled monthly from the Homer Spit to Mckeon Spit during the entire study period and a YSI data sonde compatible with ongoing water quality measurements will be deployed at the head of Kachemak Bay during summer months in Bear Cove.

## E. Coordination and Collaboration with Other Efforts

See discussion above and in the narrative for the integrated proposal for details of coordination and collaboration with other efforts.

## III. SCHEDULE

**A. Project Milestones**. Note that focus on timeline to meet objectives is for the first three years.

**Objective 1**. Examine the short-term variability and track long-term trends in oceanographic and water quality parameters and plankton communities

a. Develop data structure for historical and new data for this project
*To be met by May 2012*

b. Integrate water quality station data into integrated program data management system
*To be met by October 2012 (near real-time data already provided via CDMO)*

c. Provide oceanographic data from CTD surveys to integrated program data management team
*To be met within one year of CTD data collection (ongoing through project)*

**Objective 2**. Provide environmental forcing data for correlation with biological data sets

a. Complete initial synthesis of KBRR and KBL historical oceanographic data
*To be met by October 2012*

b. Provide oceanographic data from CTD surveys to integrated program investigators
*To be met within one year of CTD data collection (ongoing through project)*

c. Complete synthesis of lower Cook oceanographic data to support year 3 workshop between long-term monitoring and herring programs
*To be met by October 2013*

**Objective 3.** Improve understanding of water mass movement in Kachemak Bay and lower Cook Inlet

a. Develop initial oceanographic trend visualization tool in conjunction with the science synthesis team of the integrated program
*To be met by October 2012*

b. Submit manuscript for publication in peer-reviewed scientific journal
*To be met by October 2014*

**Objective 4**. Determine linkages, and temporal variability in those links, between Kachemak Bay/lower Cook Inlet, the Alaska Coastal Current and PWS

a. With other integrated program investigators, science synthesis team and data management team, produce initial synthesis of oceanographic data across the region to support the year 3 workshop between the long-term monitoring and herring programs.
*To be met by October 2013*

b. Submit manuscript for publication in peer-reviewed scientific journal
*To be met by October 2016*

## B. Measurable Project Tasks

**YEAR 1**

**FFY 12, 1st quarter (October 1, 2011-December 31, 2011)**

| | |
|---|---|
| *September:* | *Project funding approved by Trustee Council* |
| *November:* | *Principal Investigator meeting for long-term monitoring program* |
| *December:* | *Start collection of historical data* |

**FFY 12, 2nd quarter (January 1, 2012-March 31, 2012)**

| | |
|---|---|
| *January:* | *Annual Alaska Marine Science Symposium* |
| *February:* | *Start monthly CTD surveys* |
| *March:* | *Start quarterly lower Cook Inlet and Barbara Point line surveys* |

**FFY 12, 3rd quarter (April 1, 2012-June 30, 2012)**

| | |
|---|---|
| *May:* | *Purchase additional YSI sonde for Bear Cove site* |
| | *Complete initial gathering of existing oceanographic data* |
| | *Set up data structure for historical and new data from this project* |
| *June:* | *Conduct lower Cook Inlet CTD survey* |

**FFY 12, 4th quarter (July 1, 2012-September 30, 2012)**

| | |
|---|---|
| *July:* | *Install seasonal water quality sonde in BearCove* |
| | *Continue monthly CTD surveys in Kachemak Bay* |
| | *Provide input to integrated program team for annual report to TC* |
| *September:* | *Conduct lower Cook Inlet CTD surveys* |

**YEAR 2:**

**FFY 13, 1st quarter (October 1, 2012-December 31, 2012)**

| | |
|---|---|
| *October:* | *Continue monthly CTD transects in Kachemak Bay* |
| | *Complete initial collection of historical and new project data* |
| | *Provide initial oceanographic trend visualization tool for water quality station data* |
| *November:* | *Principal Investigator meeting for long-term monitoring program* |
| *December:* | *Remove Bear Cove water quality sonde for winter* |
| | *Conduct lower Cook Inlet CTD survey* |

**FFY 13, 2nd quarter (January 1, 2013-March 31, 2013)**

| | |
|---|---|
| *January:* | *Annual Alaska Marine Science Symposium* |
| | *Continue monthly CTD surveys in Kachemak Bay* |
| *March:* | *Conduct lower Cook Inlet CTD survey* |

**FFY 13, 3rd quarter (April 1, 2013-June 30, 2013)**

| | |
|---|---|
| *April:* | *Install BearCove water quality monitoring station* |
| | *Continue monthly CTD surveys in Kachemak Bay* |
| *June:* | *Conduct lower Cook Inlet CTD survey* |

**FFY 13, 4th quarter (July 1, 2013-September 30, 2013)**

| | |
|---|---|
| *July:* | *Continue monthly CTD surveys in Kachemak Bay* |
| | *Provide input to integrated program team for annual report to TC* |
| *September:* | *Conduct lower Cook Inlet CTD survey* |

**YEAR 3:**

**FFY 14, 1st quarter (October 1, 2013-December 31, 2013)**

| | |
|---|---|
| *October:* | *Continue monthly CTD transects in Kachemak Bay* |
| | *Provide historical/new data synthesis for workshop* |
| *November:* | *Principal Investigator meeting for long-term monitoring program and joint workshop with herring program* |
| *December:* | *Remove Bear Cove water quality sonde for winter* |
| | *Conduct lower Cook Inlet CTD survey* |

**FFY 14, 2nd quarter (January 1, 2014-March 31, 2014)**

| | |
|---|---|
| *January:* | *Annual Alaska Marine Science Symposium* |
| | *Continue monthly CTD surveys in Kachemak Bay* |
| *March:* | *Conduct lower Cook Inlet CTD survey* |

**FFY 14, 3rd quarter (April 1, 2014-June 30, 2014)**

| | |
|---|---|
| *April:* | *Install BearCove water quality monitoring station* |
| | *Continue monthly CTD surveys in Kachemak Bay* |
| *June:* | *Conduct lower Cook Inlet CTD survey* |

**FFY 14, 4th quarter (July 1, 2014-September 30, 2014)**

*July:* *Continue monthly CTD survey in Kachemak Bay*
*Provide input to integrated program team for annual report to TC*

*September:* *Conduct lower Cook Inlet CTD survey*
*Submit draft manuscript to peer-reviewed scientific journal*

**YEAR 4:**

**FFY 15, 1st quarter (October 1, 2014-December 31, 2014)**

*October:* *Continue monthly CTD survey in Kachemak Bay*

*November:* *Principal Investigator meeting for long-term monitoring program*

*December:* *Remove Bear Cove water quality sonde for winter*
*Start reduced Cook Inlet CTD survey. Timing in years 4 and 5 will depend on available funding and needs identified from data synthesis.*

**FFY 15, 2nd quarter (January 1, 2015-March 31, 2015)**

*January:* *Annual Alaska Marine Science Symposium*
*Continue monthly CTD surveys in Kachemak Bay*

**FFY 15, 3rd quarter (April 1, 2015-June 30, 2015**

*April:* *Install BearCove water quality monitoring station*
*Continue monthly CTD survey in Kachemak Bay*

**FFY 15, 4th quarter (July 1, 2015-September 30, 2015)**

*July:* *Continue monthly CTD survey in Kachemak Bay*
*Provide input to integrated program team for annual report to TC*

**YEAR 5:**

**FFY 16, 1st quarter (October 1, 2015-December 31, 2015)**

*October:* *Continue monthly CTD survey in Kachemak Bay*

*November:* *Principal Investigator meeting for long-term monitoring program*

*December:* *Remove Bear Cove water quality sonde for winter*

**FFY 16, 2nd quarter (January 1, 2016-March 31, 2016)**

*January:* *Annual Alaska Marine Science Symposium*
*Continue monthly CTD survey in Kachemak Bay*

**FFY 16, 3rd quarter (April 1, 2016-June 30, 2016**

*April:* *Install BearCove water quality monitoring station*
*Continue monthly CTD surveys in Kachemak Bay*

**FFY 16, 4th quarter (July 1, 2016-September 30, 2016)**

*July:* *Continue monthly CTD survey in Kachemak Bay*
*Provide input to integrated program team for final report to TC*

*September:* *Submit draft manuscript to peer-reviewed scientific journal*

**_EXXON VALDEZ_ OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Budget Category:** | Proposed FY 12 | Proposed FY 13 | Proposed FY 14 | Proposed FY 15 | Proposed FY 16 | TOTAL PROPOSED |
|---|---|---|---|---|---|---|
| Personnel | $66.0 | $69.3 | $72.8 | $64.2 | $63.2 | $335.5 |
| Travel | $7.8 | $7.8 | $7.8 | $12.7 | $7.8 | $44.1 |
| Contractual | $52.3 | $54.3 | $54.3 | $28.3 | $14.3 | $203.5 |
| Commodities | $21.1 | $23.6 | $17.8 | $17.4 | $14.5 | $94.4 |
| Equipment | $28.8 | $7.7 | $0.0 | $0.0 | $0.0 | $36.5 |
| **SUBTOTAL** | $176.0 | $162.7 | $152.7 | $122.7 | $99.8 | $714.0 |
| General Administration (9% of subtotal) | $15.8 | $14.6 | $13.7 | $11.0 | $9.0 | $64.3 |
| **PROJECT TOTAL** | $191.9 | $177.4 | $166.5 | $133.7 | $108.8 | $778.2 |
| Other Resources (Cost Share Funds) | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 |

In-Kind contributions: FY12 - FY16: $600.0 K in NOAA System-Wide Monitoring Program ($120.0K/year)
FY12 - FY16: $50.0K in CTD equipment ($10.0K/year)
FY12 - FY16: $125.0K in salary support for Kris Holderied and KBL staff ($25.0K/year)

**FY12-16**

**Program Title: LTM-Lower Cook Inlet**
**Team Leader: Doroff and Holderied**

**SUMMARY**

| Budget Category: | Proposed FY 12 | Proposed FY 13 | Proposed FY 14 | Proposed FY 15 | Proposed FY 16 | TOTAL PROPOSED |
|---|---|---|---|---|---|---|
| Personnel | $66.0 | $69.3 | $72.8 | $64.2 | $63.2 | $335.5 |
| Travel | $3.7 | $3.7 | $3.7 | $6.1 | $3.7 | $20.9 |
| Contractual | $49.8 | $51.8 | $51.8 | $25.8 | $11.8 | $191.0 |
| Commodities | $8.1 | $16.6 | $10.8 | $8.4 | $8.5 | $52.4 |
| Equipment | $23.8 | $0.0 | $0.0 | $0.0 | $0.0 | $23.8 |
| **SUBTOTAL** | $151.4 | $141.4 | $139.0 | $104.6 | $87.2 | $623.5 |
| General Administration (9% of subtotal) | $13.6 | $12.7 | $12.5 | $9.4 | $7.8 | $56.1 |
| **PROJECT TOTAL** | $165.0 | $154.1 | $151.6 | $114.0 | $95.0 | $679.6 |
| Other Resources (Cost Share Funds) | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 |

**In-Kind contributions:** FY12 - FY16: $600.0 K in NOAA System-Wide Monitoring Program ($120.0K/year)
FY12 - FY16: $25.0K in CTD equipment ($5.0K/year)

**FY12-16**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4A**
**TRUSTEE AGENCY**
**SUMMARY**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | Budgeted | Costs | Overtime | Sum |
| Doroff, Angela | Long-term monitoring of marine conditions | 3.0 | 8.0 | | 24.0 |
| Fishery Biologist | | 6.0 | 7.0 | | 42.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 15.0 | 0.0 | |
| | | | | **Personnel Total** | $66.0 |

| **Travel Costs:** | Ticket | Round | Total | Daily | Travel |
|---|---|---|---|---|---|
| Description | Price | Trips | Days | Per Diem | Sum |
| Marine Science Symposium - F&G | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - F&G | 0.1 | 6 | | | 0.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $3.7 |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

| **Contractual Costs:** | | Contract |
|---|---|---|
| Description | | Sum |
| Calibration and repair | | 0.5 |
| Shipping - samples | | 1.3 |
| Boat charters | | 48.0 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $49.8 |

| **Commodities Costs:** | Commodities |
|---|---|
| Description | Sum |
| Boat fuel and repair | 8.1 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $8.1 |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

| **New Equipment Purchases:**<br>Description | Number of Units | Unit Price | Equipment Sum |
|---|---|---|---|
| Equipment | 2.0 | 11.9 | 23.8 |
| | | | 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** | $23.8 |

| **Existing Equipment Usage:**<br>Description | Number of Units | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**EQUIPMENT DETAIL**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | Budgeted | Costs | Overtime | Sum |
| Doroff, Angela | | 3.0 | 8.4 | 0.0 | 25.2 |
| Fishery Biologist | | 6.0 | 7.4 | 0.0 | 44.1 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 15.8 | 0.0 | |
| | | | | **Personnel Total** | $69.3 |

| **Travel Costs:** | Ticket | Round | Total | Daily | Travel |
|---|---|---|---|---|---|
| Description | Price | Trips | Days | Per Diem | Sum |
| Marine Science Symposium - F&G | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - F&G | 0.1 | 6 | | | 0.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $3.7 |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

| **Contractual Costs:** | Contract |
|---|---|
| Description | Sum |
| Calibration and repair | 2.5 |
| Shipping - samples | 1.3 |
| Boat charter | 48.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total** | $51.8 |

| **Commodities Costs:** | Commodities |
|---|---|
| Description | Sum |
| Boat fuel and repair | 7.7 |
| Probes | 2.9 |
| Sensors/probes | 6.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $16.6 |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

| **New Equipment Purchases:**<br>Description | Number<br>of Units | Unit<br>Price | Equipment<br>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:**<br>Description | Number<br>of Units | Inventory<br>Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**EQUIPMENT DETAIL**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | Budgeted | Costs | Overtime | Sum |
| Doroff, Angela | | 3.0 | 8.8 | 0.0 | 26.5 |
| Fishery Biologist | | 6.0 | 7.7 | 0.0 | 46.3 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 16.5 | 0.0 | |
| | | | | **Personnel Total** | $72.8 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Symposium - F&G | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - F&G | 0.1 | 6 | | | 0.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $3.7 |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

| **Contractual Costs:** | |
|---|---|
| Description | Contract Sum |
| Calibration and repair | 2.5 |
| Shipping - samples | 1.3 |
| Boat Charters | 48.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total** | $51.8 |

| **Commodities Costs:** | Commodities |
|---|---|
| Description | Sum |
| Boat fuel and repair | 7.7 |
| Probes | 3.1 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $10.8 |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

| **New Equipment Purchases:**<br>Description | Number<br>of Units | Unit<br>Price | Equipment<br>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:**<br>Description | Number<br>of Units | Inventory<br>Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**EQUIPMENT DETAIL**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | Budgeted | Costs | Overtime | Sum |
| Doroff, Angela | | 3.0 | 9.3 | 0.0 | 27.8 |
| Fishery Biologist | | 4.5 | 8.1 | 0.0 | 36.5 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 17.4 | 0.0 | |
| | | | | **Personnel Total** | $64.2 |

| **Travel Costs:** | Ticket | Round | Total | Daily | Travel |
|---|---|---|---|---|---|
| Description | Price | Trips | Days | Per Diem | Sum |
| Marine Science Symposium - F&G | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - F&G | 0.1 | 6 | | | 0.5 |
| National Conference - F&G | 1.2 | 1 | 5 | 0.3 | 2.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $6.1 |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

| **Contractual Costs:** | Contract |
|---|---|
| Description | Sum |
| Calibration and repair | 2.5 |
| Shipping - samples | 1.3 |
| Boat charter | 22.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total** | $25.8 |

| **Commodities Costs:** | Commodities |
|---|---|
| Description | Sum |
| Boat fuel and repair | 6.5 |
| Probes | 1.9 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $8.4 |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

| **New Equipment Purchases:**<br>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:**<br>Description | Number of Units | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**EQUIPMENT DETAIL**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | Budgeted | Costs | Overtime | Sum |
| Doroff, Angela | | 3.0 | 9.7 | 0.0 | 29.2 |
| Fishery Biologist | | 4.0 | 8.5 | | 34.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 18.2 | 0.0 | |
| | | | | **Personnel Total** | $63.2 |

| **Travel Costs:** | Ticket | Round | Total | Daily | Travel |
|---|---|---|---|---|---|
| Description | Price | Trips | Days | Per Diem | Sum |
| Marine Science Symposium - F&G | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - F&G | 0.1 | 6 | | | 0.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $3.7 |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

| **Contractual Costs:** | | Contract |
|---|---|---|
| Description | | Sum |
| Calibration and repair | | 2.5 |
| Shipping - samples | | 1.3 |
| Boat charter | | 8.0 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $11.8 |

| **Commodities Costs:** | Commodities |
|---|---|
| Description | Sum |
| Boat fuel and repair | 6.5 |
| Probes | 2.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $8.5 |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

| **New Equipment Purchases:**<br>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:**<br>Description | Number of Units | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Angela Doroff**
**Agency: Fish & Game/SF/KBRR**

**FORM 4B**
**EQUIPMENT DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Budget Category:** | Proposed FY 12 | Proposed FY 13 | Proposed FY 14 | Proposed FY 15 | Proposed FY 16 | TOTAL PROPOSED |
|---|---|---|---|---|---|---|
| Personnel | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 |
| Travel | $4.2 | $4.2 | $4.2 | $6.6 | $4.2 | $23.3 |
| Contractual | $2.5 | $2.5 | $2.5 | $2.5 | $2.5 | $12.5 |
| Commodities | $13.0 | $7.0 | $7.0 | $9.0 | $6.0 | $42.0 |
| Equipment | $5.0 | $7.7 | $0.0 | $0.0 | $0.0 | $12.7 |
| **SUBTOTAL** | $24.7 | $21.4 | $13.7 | $18.1 | $12.7 | $90.5 |
| General Administration (9% of subtotal) | $2.2 | $1.9 | $1.2 | $1.6 | $1.1 | $8.1 |
| **PROJECT TOTAL** | $26.9 | $23.3 | $14.9 | $19.7 | $13.8 | $98.6 |
| Other Resources (Cost Share Funds) | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 |

**In-Kind contributions:** FY12 - FY16: $25.0K in CTD equipment ($5.0K/year)
FY12 - FY16: $125.0K in salary support for Kris Holderied and KBL Staff ($25.0K/year)

**FY12-16**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4A**
**TRUSTEE AGENCY**
**SUMMARY**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | 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 |
| | | | | | 0.0 |
| | | Subtotal | 0.0 | 0.0 | |
| | | | | **Personnel Total** | $0.0 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Syposium - NOAA | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - NOAA | 0.1 | 12 | | | 1.0 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $4.2 |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Contractual Costs:** Description | | Contract Sum |
|---|---|---|
| Calibration and repair | | 2.5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $2.5 |

| **Commodities Costs:** Description | Commodities Sum |
|---|---|
| Supplies | 3.0 |
| KBL Computer | 5.0 |
| KBL boat fuel | 5.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $13.0 |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **New Equipment Purchases:** Description | Number of Units | Unit Price | Equipment Sum |
|---|---|---|---|
| CTD sensors | 1.0 | 5.0 | 5.0 |
| | | | 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** | $5.0 |

| **Existing Equipment Usage:** Description | Number of Units | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY12**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**EQUIPMENT DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | 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 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 0.0 | 0.0 | |
| | | | | **Personnel Total** | $0.0 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Syposium - NOAA | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - NOAA | 0.1 | 12 | | | 1.0 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $4.2 |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Contractual Costs:** Description | | Contract Sum |
|---|---|---|
| Calibration and repair | | 2.5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $2.5 |

| **Commodities Costs:** Description | Commodities Sum |
|---|---|
| Supplies | 2.0 |
| KBL boat fuel | 5.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $7.0 |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **New Equipment Purchases:** Description | Number of Units | Unit Price | Equipment Sum |
|---|---|---|---|
| CTD Sensors | 1.0 | 7.7 | 7.7 |
| | | | 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** | $7.7 |

| **Existing Equipment Usage:** Description | Number of Units | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY13**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**EQUIPMENT DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | 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 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 0.0 | 0.0 | |
| | | | | **Personnel Total** | $0.0 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Syposium - NOAA | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - NOAA | 0.1 | 12 | | | 1.0 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $4.2 |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Contractual Costs:** Description | | Contract Sum |
|---|---|---|
| Calibration and repair | | 2.5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $2.5 |

| **Commodities Costs:** Description | Commodities Sum |
|---|---|
| Supplies | 2.0 |
| KBL boat fuel | 5.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $7.0 |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **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 | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY14**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**EQUIPMENT DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | 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 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 0.0 | 0.0 | |
| | | | | **Personnel Total** | $0.0 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Syposium - NOAA | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - NOAA | 0.1 | 12 | | | 1.0 |
| National Conference - NOAA | 1.2 | 1 | 5 | 0.3 | 2.5 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $6.6 |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Contractual Costs:** Description | Contract Sum |
|---|---|
| Calibration and repair | 2.5 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total** | $2.5 |

| **Commodities Costs:** Description | Commodities Sum |
|---|---|
| Supplies | 1.0 |
| KBL Computer | 3.0 |
| KBL boat fuel | 5.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $9.0 |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **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 | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY15**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**EQUIPMENT DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Personnel Costs:** | | Months | Monthly | | Personnel |
|---|---|---|---|---|---|
| Name | Project Title | 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 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | Subtotal | 0.0 | 0.0 | |
| | | | | **Personnel Total** | $0.0 |

| **Travel Costs:** Description | Ticket Price | Round Trips | Total Days | Daily Per Diem | Travel Sum |
|---|---|---|---|---|---|
| Marine Science Syposium - NOAA | 0.3 | 2 | 5 | 0.4 | 2.6 |
| Water/Air taxi within Kachemak Bay - NOAA | 0.1 | 12 | | | 1.0 |
| Principal Investigator Meeting - Anchorage | 0.2 | 1 | 2 | 0.2 | 0.6 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | | 0.0 |
| | | | | **Travel Total** | $4.2 |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**PERSONNEL &**
**TRAVEL DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **Contractual Costs:** Description | | Contract Sum |
|---|---|---|
| Calibration and repair | | 2.5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| If a component of the project will be performed under contract, the 4A and 4B forms are required. | **Contractual Total** | $2.5 |

| **Commodities Costs:** Description | Commodities Sum |
|---|---|
| Supplies | 1.0 |
| KBL boat fuel | 5.0 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| **Commodities Total** | $6.0 |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**CONTRACTUAL & COMMODITIES DETAIL**

***EXXON VALDEZ* OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**

| **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 | Inventory Agency |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**FY16**

**Program Title: Long-Term Monitoring**
**Team Leader: Kris Holderied**
**Agency: NOAA**

**FORM 4B**
**EQUIPMENT DETAIL**

**_EXXON VALDEZ_ OIL SPILL TRUSTEE COUNCIL**
**DETAILED BUDGET FORM FY 12-FY16**