

**FY16 PROJECT PROPOSAL SUMMARY PAGE**  
**Continuing, Multi-Year Projects**

**Project Title: Long-term monitoring: Pelagic monitoring component - Monitoring long-term changes in forage fish distribution, abundance, and body condition in Prince William Sound**

**Project Period:** February 1, 2016 – January 31, 2017

**Primary Investigator(s):** John Piatt and Mayumi Arimitsu, U.S. Geological Survey, Alaska Science Center

**Study Location:** Prince William Sound

**Project Website :** [http://alaska.usgs.gov/science/biology/seabirds\\_foragefish/](http://alaska.usgs.gov/science/biology/seabirds_foragefish/)

**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. In response to a lack of recovery of wildlife populations following the Exxon Valdez Oil Spill (EVOS), and evidence of natural background changes in forage fish abundance, there was a significant effort to document forage fish distribution, abundance, and variability in Prince William Sound (PWS) since the 1990's. We proposed to adopt some of these earlier sampling techniques, and also incorporate new methods to monitor forage fish in Prince William Sound with fishing and acoustic surveys of forage fish, and to measure indices of forage fish condition. In this last year of the project, we will not conduct field work. We will complete analysis of all data collected in FY12-15 and produce a final report on methods for long-term monitoring of forage fish distribution, abundance and condition in Prince William Sound.

**Estimated Budget:**

**EVOSTC Funding Requested\*** (must include 9% GA):

FY12	FY13	FY14	FY15	FY16	TOTAL
\$209.9	\$202.5	\$202.5	\$202.5	\$150.3	\$967.6

**Non-EVOSTC Funds to be used:**

FY12	FY13	FY14	FY15	FY16	TOTAL
\$339.0	\$130.0	\$130.0	\$130.0	\$110.0	\$839.0

\* Figures given in \$1,000 increments

**Date:** September 1, 2015

## **I. EXECUTIVE SUMMARY**

As originally proposed, the objectives of this work are to 1) identify robust indices for monitoring forage fish populations over time and devise a sampling strategy for long term monitoring of those indices, 2) assess the current distribution, abundance, species composition, and body condition of forage fishes (other than herring) in selected areas of Prince William Sound at selected times of the year, and 3) relate abundance and distribution of forage species to abiotic characteristics of the marine environment. We have made significant progress towards these goals, and completed the field work component of the project.

During past reporting periods we worked closely with the Herring Research and Monitoring Program Manager and an experienced spotter pilot to implement a survey design that increases encounter rate to sample target species. In 2015 we again worked in conjunction with juvenile herring aerial survey team by providing equipment and expertise for data collection, aerial survey validation, data management, and mapping. We successfully carried out field sampling and validation of aerial observations in Prince William Sound in July 2015, although results were not available at the time of this report.

## **II. COORDINATION AND COLLABORATION**

### **A. Within an EVOSTC-Funded Program**

We have undertaken several collaborative projects within the program:

- 1) Aerial-acoustic survey for forage fish, including juvenile herring, with Scott Pegau (PWSSC), HRM coordinator. We have been working closely with Dr. Pegau through the 2015 summer aerial surveys. We provided equipment and expertise in survey data collection and data management, including data recorders, software, mapping services, cameras and accessories.
- 2) In 2015 we worked with Herring Program leads Scott Pegau, Paul Hershberger (USGS), and Kristen Gorman (PWSSC) to collect age 1 herring for disease research. We also observed Pacific sand lance with possible disease symptoms. We sent these samples to Hershberger for disease testing.
- 3) Humpback whale prey study with Jan Straley (UAS) and John Moran (NOAA), GWA humpback whale PIs, and Mary Anne Bishop (PWSSC), GWA fall and winter seabird abundance PI. We devoted vessel time and personnel during cruises in July and September 2014 to facilitate a broader understanding of humpback whale, seabird foraging dynamics and forage fish availability in Prince William Sound. We shared research platforms and collaborated on survey techniques that benefited our collective program components and promoted greater integration of pelagic program components.
- 4) We are working with the Kathy Kuletz (USFWS), Robb Kaler (USFWS) and others in the pelagic seabird group conducting Sound-wide surveys to coordinate on data analysis and future overlap of our respective projects.

### **B. With Other EVOSTC-funded Projects**

We are working with the Gulf of Alaska Integrated Ecosystem Research Program (GOAIERP) leads in their ongoing North Pacific Research Board funded synthesis efforts, particularly with respect to the role of embayments in the Gulf of Alaska (GOA). We anticipate that the data collected by the Gulf Watch Alaska forage fish component and historical APEX work in Cook Inlet will facilitate broad synthesis in conjunction with the GOAIERP effort. We will participate in a GOAIERP workshop in March 2016, which will investigate research questions related to mechanisms of exchange between embayments and offshore areas in the GOA, and connectivity between their respective communities.

### **C. With Trustee or Management Agencies**

None at this time.

### **III. PROJECT DESIGN – PLAN FOR FY16**

#### **A. Objectives for FY16**

Identify the primary objectives for your project for FY16 as submitted in your original proposal.

- 1) Identify robust indices for monitoring forage fish populations over time and devise a sampling strategy for long term measurement of those indices,
- 2) Assess the current distribution, abundance, species composition, and body condition of forage fishes (other than herring) in selected areas of Prince William Sound (PWS) at selected times of the year, and
- 3) Relate abundance and distribution of forage species to abiotic characteristics of the marine environment.

#### **B. Changes to Project Design**

We have made significant progress and are on track to achieve our goals. Based on findings during historical work on forage fish and our surveys in 2012-13, we modified the study design for the 2014-15 field seasons (detailed in a protocol changes for project 12120114 document, available on the AOOS ocean workspace). The changes we implemented in 2014-2015 improved our ability to meet the project objectives by modifying historical aerial survey methods to increase repeatability and facilitate greater certainty in species composition and school density, as well as simplify the data collection and processing effort. We sampled a subset of aerial survey areas with acoustic and net-capture methods, and we used a spotter plane to identify forage schools in near-surface (< 10-15 m) waters.

In FY16 we will focus our efforts on data analysis and writing. As originally planned, we do not have field work scheduled for 2016.

### **IV. SCHEDULE**

#### **A. Project Milestones for FY 16**

**Objective 1.** Identify robust indices for monitoring forage fish populations over time and devise a sampling strategy for long term monitoring of those indices.

*To be met by Jan 2017*

**Objective 2.** Assess the current distribution, abundance, species composition, and body condition of forage fishes (other than herring) in selected areas of PWS and at selected times of year.

*To be met by Jan 2017*

**Objective 3.** Relate abundance and distribution of forage species to abiotic and biotic characteristics of the marine environment.

*To be met by Jan 2017*

#### **B. Measurable Project Tasks for FY 16**

##### **FY 16, 1st quarter (February 1, 2016 - April 31, 2016)**

*Feb-Apr:* Update project outreach website, analyze and summarize data

*Mar:* 2015 Annual Report

##### **FY 16, 2nd quarter (May 1, 2016-July 30, 2016)**

*June 30:* upload 2015 data to workspace, update metadata

*June - Jul: analyze data, writing*

**FY 16, 3rd quarter (August 1, 2016 – October 31, 2016)**

*Aug - Oct: analyze data, writing*

**FY 16, 4th quarter (November 1, 2016- January 31, 2017)**

*Nov: PI meeting*

*Jan 31: Final report due*

**V. PROJECT PERSONNEL – CHANGES AND UPDATES**

No changes.

**VI. BUDGET**

**A. Budget Forms (Attached)**

We have provided budget forms to accompany this document, however, cumulative numbers were unavailable at this time. Our spending plan since the last required full budget review in Feb. 2015 is on track and we do not anticipate any changes.

**B. Changes from Original Proposal**

C. Our FY16 funding request does not differ from our original proposal.

**D. Sources of Additional Funding**

Please see budget form provided separately.