

## 2022 COOPERATIVE SUMMER FELLOWSHIP PROGRAM – PROJECT PROPOSAL

APPLICANT TYPE: ESA;GIS;

PROJECT TITLE: NEARSHORE MARINE ECOSYSTEM STUDIES IN SOUTHCENTRAL ALASKA

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Discipline: Ecology;Wildlife Biology;Data management;

### PROJECT DESCRIPTION

#### BACKGROUND

Nearshore ecosystems include many resources that are of high ecological, recreational, subsistence, and economic value. They also are subject to influences from a wide variety of natural and human-caused perturbations, which can originate in terrestrial or oceanic environments. Our research is designed to evaluate sources of variation in the nearshore and how they influence resources of high conservation interest.

Focal area 1: Sea Otter Population Assessment. Apart from 13 small remnant populations, sea otters were extirpated from their historic range in the north Pacific Ocean during the 18th and 19th centuries because of the commercial harvest for their fur. During most of the 20th century, through protection and reintroduction, sea otter populations generally increased in abundance and distribution such that most of their range in Alaska, except for southeast Alaska, was occupied by 2000. Because sea otter populations occur over vast and remote areas and may display divergent trends in abundance over relatively small spatial scales, determining population status and trends can be challenging. Methods to assess sea otter population status and trends are important to resource managers in identifying potential conflicts, identifying mechanisms of change, and improving the ability to detect and respond to change from human induced sources.

Objectives: 1) identify the degree of population structuring among north Pacific sea otter populations, 2) accurately and precisely estimate the status of sea otter populations, 3) identify cause(s) of change in the status and numeric trends of sea otter populations, 4) determine the role of density dependent processes in affecting change in sea otter populations, and 5) evaluate the effects of population reductions and translocations on sea otter genetic variability.

Focal area 2: Long-term Monitoring. The Alaska Science Center, and preceding Department of Interior agencies, has been engaged in monitoring sea otter populations for more than 50 years. It became evident that monitoring single species often provides little insight as to why changes in abundance occur over time. As a result, we have been engaged in development, design and testing of monitoring protocols for nearshore habitats and species that are best described as “ecosystem” or “food web” based monitoring. Through careful selection of species and processes (growth, survival, and diet) we expect to gain a better understanding of the interaction between various trophic levels.

Objectives: 1) provide sound scientific information on Gulf of Alaska nearshore ecosystems to management agencies, the scientific research community, and the public, 2) identify and help understand the impacts of multiple factors (broad-scale environmental variation, local perturbations) on spatial and temporal scale changes

in nearshore ecosystems, and 3) explore whether the magnitude and timing of changes in nearshore ecosystems correspond to those measured in pelagic ecosystems.

#### INTERN TASKS

Work with project staff to enter, proof, and manage data.

- We have >20 years of sea otter aerial survey data that have been processed for population abundance but not otter distributions. Tasks related to this include: aiding in digitizing otter locations, quality assurance/control, and metadata creation. Knowledge and skills using GIS are critical to this task.
- We will be collecting sea otter foraging data all summer from throughout the Gulf of Alaska. Tasks related to this include: entering the data into a Microsoft Access database.
- We are developing new sea otter aerial survey techniques involving photography-based observations. Tasks related to this include: aiding staff in scoring photos, quality assurance/control, and metadata creation.

Work with project staff to perform lab work.

- We will be collecting mussels as part of our monitoring work. Tasks related to this include: lab time to sort and measure mussels, data entry, quality assurance/control, and metadata updates.
- We will be collecting sea otter skulls as part of our monitoring work. Tasks related to this include: lab time to collect teeth for age analysis from each skull and cleaning the skulls for submission to the University of Alaska Museum of the North, data entry, quality assurance/control, and metadata updates.

Work with project staff to perform field work.

- We have numerous field trips planned throughout southcentral Alaska this summer. Intern participation depends on space availability (limited bunks on the research vessels), desire to get in the field, and intern's additional skills (marine bird ID, boating skills, marine algae identification, general field skills).

#### BENEFITS TO INTERN

The intern will benefit from working with ecological researchers at all levels of professional development, from biotechs and volunteers to project leaders with many years of experience. Additionally, we work with many university, federal, state, and NGO partners so the intern will engage with many other entities conducting ecological research and management. We have had interns go on to attend graduate school with our collaborators or get science-related jobs based on their experiences and our recommendations.

The intern will be guided in the work they're doing with and for our project. Data lifecycle standards will be explained and tasks involved in carrying out the lifecycle will be taught and reinforced. Managing data is a critical skill for new scientists and learning from USGS will be a 'gold standard' for any students interested in attending graduate school in the future.

The Alaska Science Center is an integrated center so the intern will have the opportunity to meet scientists from all USGS disciplines.

ASC has a weekly ecosystems morning coffee hour, a weekly 'Science Friday' informal discussion session, and a brown bag seminar series that the intern will be encouraged to attend. We will also encourage them to participate in any training opportunities that arise (from field skills such as bear safety to DEIA offerings).

#### MENTORING PLAN

Project member Kim Kloecker oversees several local student volunteers and will organize regular group meetings throughout the summer to discuss their tasks, progress, problems, and opportunities; the intern will be part of these sessions. We will discuss translating internship tasks into resume/CV items, researching graduate schools, and different career paths. This summer we also plan to utilize the resources (especially the video series) on the YES Internship SharePoint site for mentoring our interns and furthering their professional development. We will borrow guidelines and ideas from both the USGS mentoring program and the Anchorage School District mentoring program to ensure that interns receive professional development, soft skills, and benefits beyond data and lab skills and their paycheck.

#### ADDITIONAL DETAILS

##### STUDENT SKILLS AND INTERESTS

- Knowledge and experience with spreadsheets such as Microsoft Excel or Google Sheets.
- Ability and desire to learn new tasks and follow specific instructions.
- Willingness to perform repetitive tasks until the job is finished.
- Curiosity about nearshore ecosystems and how their summer tasks fit into our research.
- Flexibility to deal with often changing situations.
- Interest in meeting and working with a lot of people.
- Not required, but preferred: GIS experience.
- Bonus skills: bird ID, marine algae and invertebrate ID, small boat skills.

LOCATION: Anchorage/AK

##### ACTIVITY LEVEL:

Level 8-2: The work requires some physical exertion such as long periods of standing, walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; or recurring lifting of moderately heavy items. The work may require specific, but common, physical characteristics and abilities such as above-average agility and dexterity.

FIELD WORK	0-25%	VIRTUAL?	No
LAB WORK	25-50%		
OFFICE WORK	25-50%		
OTHER	0-25%		

PROJECTED START DATE 4/25/2022  
EXPECTED DURATION Spring/Summer (August-ish)