# *Summer Internship Opportunities at NOAA*

***(National Oceanic and Atmospheric Administration)***

## Conduct Research with Scientists at the Marine Mammal Laboratory

The Marine Mammal Laboratory of NOAA's Alaska Fisheries Science Center (MML/AFSC) and the University of Washington's School of Aquatic and Fisheries Sciences (SAFS) request applications for student summer internships. Internships will be for about 10 weeks (during the period of June to September 2023; 30 hours per week) working on a marine mammal research project. ***Each internship will be supported on a stipend of $5,400, provided in partnership by the School of Aquatic and Fishery Sciences, the Marine Biology Program, and MML/AFSC.*** Successful applicants will be provided with a scientific mentor and online access to research resources associated with their projects.

The following marine mammal research projects may be available for internships during summer 2023 at the Marine Mammal Laboratory:

1. **Steller sea lion remote camera imagery**
   Mentors: Molly McCormley and Carey Kuhn
2. **Northern fur seal and Steller sea lion entanglement in plastic debris in Russian waters**
   Mentors: Tom Gelatt and Vladimir Burkano
3. **Population abundance, vital rate estimates, and foraging ecology of California sea lions and northern fur seals at San Miguel Island, CA**
   Tony Orr, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA
4. **Assessing bowhead and beluga whale distribution using satellite imagery**
   MML / AFS mentors:Kim Goetz and Megan Ferguson

SAFS values the strengths and professional experience that students, faculty, and staff bring to our community. We are committed to providing an excellent education to all our students of every race, gender, class, nationality, physical ability, religion, age, or sexual orientation. We are proud of the different roles that our students, staff, and faculty play in the community of the School and the College of the Environment. Science is richer and the SAFS and MML/AFSC communities are more vibrant when a diverse group of people participate in research. We are especially interested in candidates who can contribute to our programs' diversity through their life experiences, scholarship, and/or service to the institutions. People of color, women, people with disabilities, and veterans are encouraged to apply.

**ELIGIBILITY**
All UW undergraduates who graduate in Autumn 2023 or after are eligible to apply.

**HOW TO APPLY**
Please submit the following by the deadline:

- Online Application: https://forms.gle/cZXGFr4n4egtWXb58
- Application Materials: upload (using form linked above) the following materials in one pdf. Save as "LastnameFirstname_MML2023.pdf" (where Lastname and Firstname are your name):
  - Recent resumé
  - Unofficial UW transcript
  - Letter of interest (maximum of four pages) – include the name of the project that most interests you and why; tell us about yourself and your research interests; explain how the internship will further your studies and career; include other information the selection committee should be aware of, such as what it means to you to have a commitment to diversity, equity, and inclusion.

**DEADLINE FOR SUBMISSION: 11:59pm on April 9, 2023** – late or incomplete applications will not be considered

**DECISIONS: Award notifications will be made by April 28, 2023**

**Project 1:** Steller sea lion remote camera imagery

**Mentor:** Molly McCormley and Carey Kuhn, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA

**Location:** Seattle

**Length:** Approximately 10 weeks (June - August 2023)

**Project description:** This project focuses on manually processing our Steller sea lion remote camera imagery data. The main overarching goal is to assess the efficacy of our machine learning model to manual observations for all of our six Steller sea lion rookery sites. For this internship, the student will focus on one site in 2018 and manually process images previously reviewed by our machine-learning (ML) model to produce a brand resight dataset for the entire year. This dataset will then be compared to output from the ML model in order to calculate detection rates of branded Steller sea lions by processing methods. This is necessary in order to be able to determine and subsequently track ML model accuracy and efficiency. Duties will include looking through unprocessed photos to find images with known sea lion individuals and to record individual markings and corresponding behavior. Additionally, the student will participate in a 2-3 week ship-based Steller sea lion research cruise in the Aleutian Islands, Alaska. This is a great opportunity for gaining observational and hands-on animal handling experience. Surveys will be conducted using unmanned aerial systems, visual observations to identify previously-marked animals, and visits to remote camera installations for servicing. In the eastern Aleutian Islands two-days of challenging work is undertaken to hot-brand new pup cohorts and collect samples for health and condition analyses.

**Required skills:** Image processing is time consuming and requires someone who is patient and thorough. Although the work is repetitive and slow going, viewing images of sea lions can be quite entertaining. We are looking for someone who works well independently, is detail oriented, and has good communication skills. Image work can be conducted remotely (while in office) and training will be provided for the video analysis software, but the candidate should be comfortable working with basic computer programs including Word and Excel. Additionally, while no previous field experience is necessary, we are looking for someone who is also up for the challenge of remote field work for a couple weeks. This will involve work outdoors both at sea and on remote islands, sometimes in inclement weather. Communication with the outside world during those weeks will also be limited, as there is no cellphone coverage or WiFi. While remote work can be challenging, this is a great opportunity to visit extraordinary places very few people ever get to see!

**To learn more about this project:**

- visit **https://www.zooniverse.org/projects/sweenkl/steller-watch** to learn more about our remote camera project.

**Project 2:** Northern fur seal and Steller sea lion entanglement in plastic debris in Russian waters

**Mentor:** Tom Gelatt and Vladimir Burkanov, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA

**Location:** Seattle

**Length:** Approximately 10 weeks (June - August 2023)

**Project description:** During the past two decades MML has conducted intensive surveys of Steller sea lion and northern fur seals in the remote westernmost parts of their range on Russian rookeries and haulouts. Several methods were used for data collection; traditional visual counts on land with binoculars and handheld digital cameras with telephoto lenses; collecting images from certain parts of the rookeries or haulouts using custom-built remote high-resolution digital cameras; using drones to fly over animals resting on land to collect vertical photos from low altitudes. During visual surveys biologists recorded animals entangled in a plastic debris, describing the type of plastic material, age, sex of animal and severity of the injury. These data are stored in tabular format. Images collected by fixed (on-rock) remote cameras and from drones are available at MML for review and entanglement analysis. We are seeking an intern who is interested in such a project to help us review collected images of Steller sea lions and visual data on northern fur seals to estimate and publish results on plastic debris entanglement in Russia. This work entails reviewing several sets of images to identify entangled animals, and if possible, the animal age and sex, and type of plastic material, then entering this information into a database. The intern would also perform statistical analysis using modern statistical and modeling tools to estimate the rate of entanglements by species, age, and sex, in different regions of the Russian Far East, and assistance to prepare a manuscript to publish the results. Image processing is a time-consuming process and requires someone who is patient and thorough. Although the work is repetitive and slow going, viewing images of a lot of animals on rookeries can be quite entertaining and provides an opportunity to gain experience identifying animals by age and sex and learning about their behavior. We are looking for someone who works well independently, is detail oriented, and has good communication skills. Work will be conducted remotely, and training will be provided for the images analysis software, but the candidate should be comfortable working with basic computer programs including Word, Excel, and Access, as well statistical and modeling skills.

**Required skills:**

- Interest to work with Pinnipeds, patience for tedious repetitive tasks, and ability to work independently following technical protocols.
- Familiar with MS Office software (Word, Excel, and Access), common image reviewing software, good communication and writing skills.
- Good statistical analysis and modeling skills (R or other statistical software).

**To learn more about this project and marine mammal entanglement in plastic debris:**

- https://www.fisheries.noaa.gov/insight/entanglement-marine-life-risks-and-response
- https://www.fisheries.noaa.gov/alaska/marine-life-distress/marine-mammal-entanglement-and-marine-debris-alaska
- https://www.fisheries.noaa.gov/alaska/marine-life-distress/pinniped-entanglement-marine-debris
- https://www.youtube.com/watch?v=XP7WjA68s64 (In Russian)

**Project 3:** Population abundance, vital rate estimates, and foraging ecology of California sea lions and northern fur seals at San Miguel Island, CA

**Mentor:** Tony Orr, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA

**Location:** Seattle and California

**Length:** Approximately 6 weeks (late June - August 2023)

**Project description:** This project will provide hands-on experiences by performing various research activities in the field at San Miguel Island, CA pertaining to the foraging ecology and demographic assessments of California sea lions and northern fur seals.

The intern will be able to choose an element of one of the activities to be conducted in the field to formulate a question, collect or analyze data, and write a brief synopsis of their findings. Examples of activities include: counting individual pinnipeds from aerial imagery obtained from uncrewed aerial systems (UAS), analyzing age and sex class distribution of tagged animals, and determining timing of reproductive events and condition of pups.

*In the field* – The intern may 1) help with resight efforts of marked individuals (carried out by foot and by UAS) for vital rate studies; 2) aid in conducting surveys and censuses of pinnipeds (primarily of live and dead pups) using UAS and walking through the rookery to estimate pup production and total number of individuals in a focal area to examine trends of abundance on the island; 3) weigh northern fur seal pups to assess health condition and mark them for growth rate and demographic studies; and 4) collect fecal and tissue samples for dietary and foraging ecological studies.

**Required skills:**

- *Computer skills* - Experience with Microsoft Office software (primarily Word, Excel, and Access) or similar software products and an understanding of photographic image reviewing software will be helpful.
- *Physically fit* - The fieldwork component associated with this internship is physically demanding and requires the intern to be physically fit. Fieldwork will be conducted on a remote island off southern California, where it is typically cold, windy and foggy during a good part of the field season. Traveling to research areas is done by hiking, sometimes as far as 32 km (20 mi) usually > 8 km (5 mi) and climbing hills up to 100 m (330 ft). The intern should be able to carry backpack loads > 23 kg (50 lb). Some of the field projects involve capturing and handling (primarily pups) individuals of both species, so the intern should be able to lift up to 23 kg (50 lbs) with no problems.
- *Team attitude* - The field location is a remote site with no other people other than the field team of 2-3 people. The intern will be living and working closely with the field team in a small rustic cabin with no running water, limited internet, no television, and limited conveniences of home. They should be able to get along with other team members, follow instructions and technical protocols, and contribute to cooking and cleaning - for both safety and healthy team dynamics.

**To learn more about this project:**

- California Current Ecosystem Program
- California sea lions
- Northern fur seals

**Project 4:** Assessing bowhead and beluga whale distribution using satellite imagery

**Mentors:** Kim Goetz and Megan Ferguson, Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA

**Location:** Seattle

**Length:** Approximately 10 weeks (June - August 2023)

**Project description:** This internship involves examining very high resolution satellite imagery collected in Arctic waters to annotate sightings of cetaceans and other noteworthy objects. Imagery exists for two study areas: 1) Norton Sound, where the target species is the beluga; and 2) Beaufort Sea, where the target species is the bowhead whale. Analysis of the Norton Sound imagery is the highest priority and will be the initial focus of the internship. However the Norton Sound images have not been examined previously and it is unknown whether they are of sufficient quality and, if so, whether belugas are visible in the imagery. Preliminary examination of the Beaufort Sea imagery has identified bowhead whale sightings; therefore, if the Norton Sound imagery is not adequate, the bowhead dataset is available as a trusted alternative. These annotations will be incorporated into an existing collaborative project to build detectors for the purposes of machine learning in the future. Experience gained from this internship will allow the intern to write a paper from the image analysis. The intern will also be able to interpret the results of their findings within the context of the species' role in the ecosystem and how this emerging tool of satellite imagery may further our understanding of cetaceans and assist with future management and conservation issues.

**Required skills:**

- Positive attitude
- Patience for tedious repetitive tasks
- Ability to follow technical protocols
- Ability to accurately record data and keep detailed documentation of any issues or modifications to protocols that may arise
- Helpful to have familiarity with aerial surveys for bowhead/beluga
- Helpful to have familiarity with ArcGIS or ArcPro

**To learn more about this project:**

- Geospatial Artificial Intelligence for Animals
- Annotating VHR satellite imagery

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