Post-doctoral Fellow Position Description

Project Title: Improving Catch Estimation of Sharks Using Electronic Monitoring

Appointment: The successful candidate will receive postdoctoral research appointments at Alaska Pacific University and the NOAA-NMFS Alaska Fisheries Science Center

Location: Anchorage, AK, but no local residency requirements

Advisors:
Prof. Brad Harris, PhD, Alaska Pacific University- FAST Lab, Anchorage, AK
Cindy Tribuzio, PhD, NOAA-AFSC Auke Bay Labs, Juneau, AK
Jason Gasper, PhD, NOAA-AKRO Alaska Regional Office, Juneau, AK
Andy Kingham, BS, NOAA-AFSC Fisheries Monitoring and Analysis, Seattle, WA

Collaborators:
Craig Rose, Pacific States Marine Fisheries Commission, EM Tech Innovation Team
Suzanne Romain, Pacific States Marine Fisheries Commission, EM Tech Innovation Team
Kelsey Magrane, Pacific States Marine Fisheries Commission, EM Tech Innovation Team
Dan Falvey, Alaska Longline Fishermen's Association

Description:
The Fisheries, Aquatic Science, & Technology Laboratory (FAST Lab) at Alaska Pacific University (APU) and the Alaska Fisheries Science Center (AFSC) are seeking a Postdoctoral Researcher to participate in, and lead portions of an innovative study to improve the estimation of shark catch in Alaskan longline fisheries. Sharks are a non-targeted group of species in Alaskan fisheries and a large portion of the shark catch comes from longline fisheries. Catch estimates from these fisheries are uncertain due to the challenges of sampling large sharks on small vessels. Electronic monitoring (EM) is a promising new tool to estimate catch; however, innovation is needed to increase its utility for assessing the size of animals caught in longline gear. This project aims to improve the estimation of catch in the longline gear fisheries where EM tools are becoming increasingly used. The successful candidate will be in the field, collecting data from sharks caught on EM vessels and interacting with industry; evaluating catch accuracy; working with developers on machine learning video analysis; and integrating results into fisheries management.

The postdoctoral researcher will have a unique opportunity to collaborate with academic (APU), agency (NOAA AFSC and Alaska Regional Office- AKRO), and industry partners, and lead the evaluation and development of methods for improving information available for the assessment

of shark stocks in Alaska. The successful candidate will also have the opportunity to collaborate and develop machine learning skills through the project's collaboration with the University of Washington Industrial & Systems Engineering Department (UW ISE).

This is a 2-3-year postdoctoral research position, and the successful candidate will provide the following products upon completion: 1) examine historical catch estimates of sharks and evaluate accuracy of current catch estimation procedures; 2) examine the effectiveness of EM ability to detect rare species such as sharks that are not routinely brought aboard the vessel; 3) evaluate if EM tools can be used to accurately estimate the size class of large sharks; and 4) incorporate size data into the data stream for AKRO-Catch Accounting to develop improved methods for estimating catch of large sharks. We anticipate that the postdoctoral researcher will lead author at least two peer-reviewed publications, at least two Technical Memorandums, and co-author other publications resulting from this project.

Specific project tasks will include:

- A statistical analysis to determine whether current methods for estimating average weight of observed catch are accurate and whether alternative weight calculation methods would improve catch estimates;
- Reconstruction of historical catch time series to examine changes in data streams (e.g., observer restructuring, implementation of EM), including development of a summary report detailing composition of catch origination through time;
- Run a voluntary reporting program for industry to report catches of large sharks and compare to EM video review data to verify EM systems ability to detect large sharks;
- Plan and conduct fieldwork to catch sharks and calibrate EM systems, likely a single multi-day survey designed to capture sharks;
- Communicate directly with fishing vessels to relate project information, including outreach, site visits to ports, work with vessels to fine-tune calibration equipment and image capture;
- Work with the EM Tech Innovation Team and UW ISE group to develop methods of identifying sharks, identifying species and measuring sharks using script based video analysis algorithm;
- Work with EM Tech Innovation Team and UW ISE group to develop interface for annotation of video and script-based video analysis algorithm;
- Develop proposals for incorporating any recommended changes to data collections or catch estimation procedures resulting from the first three project objectives into operations at AFSC Fisheries Monitoring and Analysis division and/or the AKRO.

Other tasks could include but are not limited to: work with project advisors to complete outstanding shark tagging data analyses; volunteer field work on other surveys (e.g., the AFSC Longline Survey); opportunities to collaborate on other FAST Lab projects; and work with project advisors on detailed analyses of fishery dependent catch data for sharks, such as spatial analysis of sleeper shark catch.

Requirements:
- Ph.D. in fisheries, statistics, quantitative marine ecology, data science or related discipline within the last five years.

- Prior experience managing and analyzing large data sets, database design and management skills are desirable, and experience with statistical programming languages such as R.
- Good organizational skills, proven ability to manage diverse data sets, and eagerness to work and collaborate in an interdisciplinary group.
- Strong written and oral communication skills to diverse audiences.

Stipend: ~$75,000 US/year, plus benefits and additional support for travel stipend and computing needs. The first two years of funding are provided through a grant from the NOAA National Catch Shares Program to the AFSC. Funds for the third year will be requested through the NOAA National Catch Shares Program RFP process.

To Apply: Submit a cover letter, CV and three letters of reference to em.sharks@alaskapacific.edu. Applications should be addressed to Dr. Brad Harris and will be reviewed on a rolling basis until the position is filled.

For more information: Applicants are strongly encouraged to contact Dr. Brad Harris (bharris@alaskapacific.edu) or Dr. Cindy Tribuzio (cindy.tribuzio@noaa.gov) prior to applying.