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## **Improving Visual Survey Capabilities for Marine Mammal Studies**

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### **LONG-TERM GOALS**

The Navy sponsors research to improve efforts to mitigate interactions between fleet activities and marine mammals. Fundamental information on the occurrence, abundance, and status of marine mammals is typically derived from visual surveys, and data from such surveys are most often used to estimate population abundance, develop predictive relationships between marine mammal distribution and oceanographic conditions, or as “ground truth” for other marine mammal detection methods. Surveys require human observers to systematically scan the ocean surface for the presence of air-breathing mammals, and they can be conducted from ships, aircraft, or land. For ship- and land-based surveys, powerful, pedestal-mounted, 25×150 “big-eye” binoculars (Figure 1) are required to accurately identify marine mammals at distances of up to several kilometers from the observing platform. Fujinon 25×150 MTM binoculars are the standard for government and academic marine mammal research, and the long-term goal of this project is to acquire 4 of these binoculars to support funded Department of Defense (DoD) projects.

### **OBJECTIVES**

The sole objective of this project is to purchase 4 Fujinon 25×150 MTM binoculars.

### **APPROACH**

The purchase of big-eye binoculars will substantially improve the efficacy of funded Navy/DoD projects. The ONR Marine Mammals and Biology (MMB) program has funded a project to conduct marine mammal visual surveys in the Bay of Bengal as part of the ONR-and NRL-funded Air-Sea Interactions in the Northern Indian Ocean Regional Initiative (ASIRI) program, a physical oceanographic research effort to study upper ocean processes and air-sea interactions that regulate the Asian monsoons. We will use the DURIP-funded big-eye binoculars to characterize the occurrence, distribution, and habitat associations of cetaceans in the oceanic waters of the Bay of Bengal during 2013-2015. We also hope to expand our project by (1) collaborating with Indian scientists conducting complementary physical oceanographic studies in the Bay of Bengal, (2) equipping an Indian oceanographic vessel with loaned DURIP-funded big-eye binoculars, (3) training Indian scientists in

marine mammal detection and identification, and (4) collaborating with our Indian colleagues through scientist, student and postdoc exchanges to analyze and publish survey results.

I will also use the DURIP-funded big-eye binoculars in a project current funded by the DoD Environmental Security Technology Certification Program. This project will demonstrate and evaluate real-time passive acoustic detection, classification, and reporting from autonomous platforms, a capability that has been developed with support from the ONR MMB program. The DURIP-funded big-eye binoculars will be used to collect critical ground-truth visual observations from ship- and land-based platforms in proximity to autonomous platforms that can detect and report the occurrence of several species of baleen whales. This technology will ultimately be used to help the Navy mitigate interactions with marine mammals.

## **WORK COMPLETED**

To date, the binoculars have been ordered from Fujinon through Baker Marine Instruments, who will install reticles when the binoculars are received. I have also contracted the machine shop at the Scripps Institution of Oceanography to fabricate 4 stands upon which the binoculars can be mounted. These are being custom built to my specifications. The binoculars and the stands should be shipped to WHOI by mid-December 2014.

## **RESULTS**

No results to report.

## **IMPACT/APPLICATIONS**

The purchase of the binoculars will facilitate Navy and DoD research.



*Figure 1. Fujinon 25×150 MTM “big-eye” binoculars being used at sea.*