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Woods Hole Oceanographic Institution  
**Biology Department Seminar**



Thursday, August 3, 2023 – 12:00 Noon

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## **Acoustic and Optical Imaging Techniques for Characterizing Animal Distributions in the Pelagic Ocean**

**Benjamin Grassian**

Postdoctoral Investigator at WHOI

Ocean midwaters—the vast region between the sunlit surface layers and seafloor—comprise the largest habitat on Earth but are among the least understood marine environments. Available sampling platforms (e.g. net systems, moored and shipboard sensors), are often unable to resolve marine biota at spatial scales comparable to the variability existing in their physical environment. I will present work from several studies employing in-situ and multi-sensor water column survey approaches for detailed observation of diverse epi and mesopelagic environments. The first study describes the maintenance and dispersal of a rapidly migrating micronekton thin layer recorded by a deep profiling stereo camera and concurrent shipboard echosounding. The second describes a new high resolution towed profiler, the Wire Flyer, equipped with a side-looking broadband fisheries echosounder. The processed Wire Flyer data have demonstrated the system's capacity to track migrating layers and resolve coherent biological patches in the horizontal, rising seafloor gas plumes, and scattering layer distributions tightly coupled to measured submesoscale features such as strong vertical oxygen gradients. Lastly, I will present preliminary results from my work at WHOI developing a machine learning model for the detection of zooplankton from an in-situ imaging system. These data will be used to generate forward scattering predictions for comparison to water column scattering measured during the multidisciplinary Ocean Twilight Zone project.

**HYBRID!** **In person:** Redfield Auditorium **Zoom:** <https://whoi-edu.zoom.us/j/93654353350> Meeting ID: 936 5435 3350 **By phone:** Find your local number: <https://whoi-edu.zoom.us/u/adi55y326o>