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SIDEBAR Axial Seamount Biology Catalog By Katie Bigham

http://www.interactiveoceans.washington.edu/story/Biology_at_Axial_Seamount

The deep waters overlying the Juan de Fuca Plate host amazing life forms, yet rarely are they viewed by humans, nor are most well documented digitally. Undergraduate participants in the University of Washington VISIONS '14 educational program (http://interactiveoceans.washington.edu/story/VISIONS_14) recognized this lack of available information on deep-sea organisms that live in perpetual darkness in some of the most extreme environments on Earth. This experiential learning opportunity for undergraduates took place during the 85-day construction cruise for the National Science Foundation's Regional Cabled Array, a component of the Ocean Observatories Initiative (OOI). During the VISIONS programs, students stood daily watches inside remotely operated vehicle (ROV) control labs, working alongside scientists, engineers, and the ship and ROV teams, to conduct their own research and outreach projects, and to learn about ship life.

In 2014, seven undergraduates saw a need, based on their watch-standing experience, for a comprehensive resource to address their continual question: what do you think that animal is? An online biology catalog was conceived as a resource for both scientists and the public to make it easier to identify animals observed during the annual cruises and in the video and digital still imagery streaming live back to shore from the Regional Cabled Array. As an initial effort, the students focused on the OOI cabled site called Axial Seamount, an active underwater volcano that erupted in 1998, 2011, and 2015 (see Wilcock et al., 2018, in this issue), to create a resource for identifying organisms. Thus, the Axial Seamount Biology Catalog was born.

"Best hit" high-definition video and digital still images collected by ROV-mounted cameras from 2011 to 2017 have been logged, edited, and documented by VISIONS students. The catalog currently contains images and video of 39 species, including octopuses, crabs, jellies, sea stars, and fish. Along with the video and images, students researched and compiled short descriptions of the animals' feeding habits, behaviors, and

environmental ranges. Entries include animals observed in the water column, on the seafloor, and interacting with Regional Cabled Array infrastructure.

The catalog was designed so that it could be expanded and improved over time. Indeed, on operation and maintenance cruises in 2015 and 2017, undergraduates continued to refine and add to its content. Student contributor backgrounds range from oceanography to biology, business, music, and engineering. The project has engaged students in the research process, provided a wealth of sea-going experiences, and led to the creation of a one-of-a-kind resource for Northeast Pacific biology. The resulting continually growing repository of HD video and digital still imagery is being used by numerous scientists, educators, news agencies, and documentary producers.

Images and videos from the Axial Seamount Biology Catalog can be viewed on the OOI Regional Cabled Array's website (see url above). Visitors with an interest, or expertise in, these deep-sea organisms are encouraged to suggest additions or revisions. Work is underway to include entries from coastal research sites as the current student contributors compile more images and information.

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FIGURE 1. This *Graneledone* octopus was photographed near the Escargot hydrothermal vent at Axial Seamount during VISIONS '14 with the remotely operated vehicle ROPOS. Water depth is 1,515 m. Photo credit: NSF-OOI/UW/CSSF; Dive R1723; V14

