**Video Shot List One**

**2010 U.S. Indonesian Ocean Exploration Partnership**

**File Name:** 10index\_agu\_h.264\_qt960.mov

**Image Credits:** NOAA *Okeanos Explorer* Program, INDEX-SATAL 2010

**Introduction**

0:00 – 0:10 Start, Expedition Title. Background footage of the Institution for Exploration’s *Little Hercules* ROV operating from NOAA SHIP *Okeanos Explorer*, examining active hydrothermal vents on Kawio Barat undersea volcano.

0:10 – 0:16 Expedition statement

0:17 – 0:37 About the expedition

0:37 – 0:44 The white outline on the map shows the operating area where both Indonesian Research Vessel *Baruna Jaya IV* and NOAA Ship *Okeanos Explorer* conducted joint operations in 2010. The expedition focused on the diversity and distribution of deep-sea habitats and marine life in unknown ocean areas in SATAL - a contraction of Sangihe and Talaud - two island chains stretching northeast of North Sulawesi in Indonesia.

0:44 – 0:50 U.S. Co-Principal Investigator, Dr. Stephen Hammond (left) and Indonesian Co-Principal Investigator Dr. Sugiarta Wirasantosa shake hands after agreeing on the area of operations for the INDEX SATAL 2010 expedition

0:51 – 0:57 NOAA Ship *Okeanos Explorer*. U.S. and Indonesian scientists aboard NOAA Ship Okeanos Explorer participated in a joint mission to explore deep-sea habitats in the Sulawesi Sea last summer in Indonesian waters.

0:57 – 1:02 Indonesian Research Vessel *Baruna Jaya IV*. U.S. and Indonesian scientists aboard Indonesian Research Vessel *Baruna Jaya IV* participated in an exploration expedition in Indonesian waters. The expedition was the first in a multi-year plan for Indonesia and the U.S. to explore marine environments together

1:04 – 1:08 Co-Principal Investigators Steve Hammond (left) and Sugiarta Wirasantosa are in Jakarta's Exploration Command Center welcoming those at sea onboard NOAA ship Okeanos Explorer to Indonesian waters. During the course of the expedition, telepresence technology brought live images from the ship to scientists ashore via satellite and high-speed Internet pathways.

**Kawio Barat Undersea Volcano**

1:08 – 1:25 Bathymetric overview of the INDEX SATAL operating area. The animation zooms to show the location of Kawio Barat underwater volcano.

1:25 – 1:30 This is a perspective view of the Kawio Barat (meaning West Kawio) undersea volcano looking from the northwest. The underwater volcano rises about 3,600 meters (nearly 12,000 feet) from the seafloor.

1:31 – 1:41 Operating from NOAA Ship *Okeanos Explorer*, high definition cameras on the camera platform image the *Little* *Hercules* remotely operated vehicle (ROV) during its descent down to Kawio Barat undersea volcano. Using telepresence technology, video collected by high definition cameras on the ROVs are sent to the ship, to satellites in space, and to Exploration Command Centers on shore in real-time.

1:41 – 1:47 Top-down view of the *Little Hercules* ROV as it examines active hydrothermal venting on Kawio Barat undersea volcano.

1:47 – 2:03 Active hydrothermal vents emit plumes that appear as “white smoke.”

2:04 – 2:18 Close-up footage showing the thriving community of shrimp, and ‘frozen’ sulphur flows near vents.

2:19 – 2:25 Large extinct hydrothermal spires often host numerous animals. This footage shows thousands of vent-endemic barnacles feeding on particles in the water column in the vent area

2:25 – 2:41 Close-up of stalked barnacles on Kawio Barat undersea volcano, feeding from the water column near hydrothermal vents.

**Site K Seamount**

2:42 – 2:48 Bathymetric animation showing “Site K” an undersea volcano

2:48 – 2:52 Video showing the diverse community of life on Site K, even at small scales. A snail is featured in this video clip.

2:52 – 2:57 Video showing the diverse community of life on Site K.

2:58 – 3:04 This beautiful footage displays a four-way association between creatures: The hermit crab is associated with the soft coral to its right (with its polyps retracted). The hermit crab is also associated with an episymbiontic anemone - the snail shell provides a home to both animals

3:05 – 3:08 Skeleton of bamboo coral that provides habitat for wide diversity of organisms

3:09 – 3:12 A deep sea black coral hosts two crabs. These crabs appear to only be found on this particular species of coral

3:13 – 3:24 Spiraling deep-sea coral

3:24 – 3:28 Bamboo corals are characterized by dark internodes that resemble those found in terrestrial bamboo plants

3:29 – 3:41 These giant sea spiders are more than eight inches across—much smaller spiders have been seen before at other seafloor vents.

3:42 – 4:03 This Pelagic (water column) sea cucumber is swimming in the near- freezing waters of the abyss, approximately 3,200 meters deep.

**Video Highlights from other ROV Dive Sites**

4:09 – 4:15 Cruise participants at work in the control room on NOAA Ship *Okeanos Explorer* while ROV operations are underway. The control room is mission central, serving a variety of operations, from mapping to ROV operations to facilitating interactions between the ship and shore.

4:16 – 4:34 Deep-Sea Chimaera. Chimaera’s are cartilaginous and have no real bones. The lateral lines running across this chimaera are mechano-receptors that detect pressure waves (just like ears). The dotted-looking lines on the frontal portion of the face (near the mouth) are ampullae de lorenzini and they detect perturbations in electrical fields generated by living organisms.

4:35 – 4:42 Bathysaurus Fish (deep-sea lizardfish)

4:43 – 4:53 One animal filmed by the ROV is this basket star. It appears to be a single animal with a mass of twisting and turning appendages, which scientists believe keep dividing. Fully extended, appendages could measure a meter long.

4:54 – 5:02 A breath-taking squid is imaged by the ROV

5:03 – 5:13 “Falls,” include wooden logs that have fallen to the deep-ocean floor where they host a community of fauna (animals) that appear separate and distinct from the surrounding ecosystem

5:13 – 5:19 Stalked crinoid (a.k.a. Sea Lily), a predominant animal throughout the oceans in the ancient fossil record

5:19 – 5:23 Stalked crinoid (a.k.a. Sea Lily), a predominant animal throughout the oceans in the ancient fossil record

5:24 – 5:31 Stunning red crinoid (a.k.a. Sea Lily)

5:32 – 5:37 Orange deep-sea coral and associate

5:37 – 5:43 A benthic (water column) fish called a Sea Robin. This fish has several sets of modified fins - some modified for perching on the seafloor, and 'wing-like' fins for swimming.

5:44 – 5:49 A galatheid crab dwelling inside a glass sponge living 833 meters deep

5:50 – 6:00 Large barrel sponge. A squat lobster, sea spider and sea lily can be seen on the sponge.

6:00 – 6:05 The *Little Hercules* ROV shines its lights on a large barrel sponge

6:05 – 6:14 A stalked sponge is filmed in the deep sea by the ROV

6:15 – 6:23 This close-up could almost pass for a flower in your garden, but appears to be a stalked sponge—probably a carnivorous sponge of the Cladorhizids, The needle-like spicules slowly extend so that an associated sticky substance can snare small passing animals

6:24 – 6:33 A stunning 10-armed sea star

6:34 – 6:40 Close up of an octopus, top predator in the coral ecosystem

6:41 – 6:46 Purple nudibranch

6:47 – 6:55 Close-up of a scaleworm, and goose-neck barnacles living on Kawio Barat underwater volcano

6:56 – 7:02 Galatheid crabs feast opportunistically on a pelagic catch

7:03 – 7:09 Brittlestar intertwined on a deep-sea coral

7:10 – 7:15 Deep-sea coral and brittlestar associates

7:16 – 7:24 Scleractinian hard coral 1,382 meters deep. Based on published results, this coral may be 1,000 to 6,000 years old.

7:25 – 7:35 Deep-sea Coral

**Expedition Closing Scenes**

7:36 – 7:42 INDEX – SATAL 2010 mission participants in the Indonesian port of Bitung, during closing ceremonies for the joint Indonesia – U.S. expedition in Indonesian waters. NOAA Ship *Okeanos Explorer* is in the background.

7:42 – 7:48 Expedition participants in front of Indonesian Research Vessel *Baruna Jaya IV* during the joint expedition's closing ceremony at the Port of Bitung

 **Credit this image:** Embassy of the United States, Jakarta, Indonesia

7:49 – 8:05 Closing scenes

**Credit other images:** NOAA *Okeanos Explorer* Program, INDEX-SATAL 2010