

## Makai, UH in B-SAUV Trials

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Makai Ocean Engineering and the University of Hawaii (UH) have jointly developed a novel autonomous underwater vehicle (AUV) that can effectively deploy seafloor sensing equipment by combining features of a free-swimming AUV and those of a bottom crawling vehicle.

This ‘hybrid’ autonomous underwater vehicle is called the Bottom-Skimming AUV, or B-SAUV.

The B-SAUV is propelled by thrusters but can touch, glide along, and interact with the seafloor. The B-SAUV is unique in that it autonomously adjusts its wet weight (by dynamically controlling its buoyancy) in order to control how it interacts with the ocean floor. The B-SAUV moves through the ocean using its thrusters and operating in three different buoyancy modes:

- Low Buoyancy: the B-SAUV presses on the seafloor with its full wet weight;
- Medium Buoyancy: the B-SAUV lightly ‘skims’ along the bottom at a desired wet weight (to adjust for existing bottom conditions);
- High Buoyancy: the B-SAUV ‘flies’ temporarily above the bottom in the water column in order to overcome obstacles.

The B-SAUV is controlled by a computer hardware and software system that, in addition to autonomously controlling buoyancy, enables it to navigate autonomously to a predefined location and install (and log data from) oceanographic sensors in the seafloor. These sensors are carried as a payload within the body of the B-SAUV and can be used for environmental monitoring or remote sensing.

Makai and UH have been working on the concept, designs, fabrication, and testing of the prototype B-SAUV since 2011. Most recently in November 2014, Makai and UH finished a successful at-sea test and demonstration of

the complete prototype vehicle. The test validated operation of all critical subsystems and vehicle controls.

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