



SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY

## Press Release

### FOR IMMEDIATE RELEASE

SOEST Media Contact: Tara Hicks Johnson  
808-956-3151, hickst@hawaii.edu

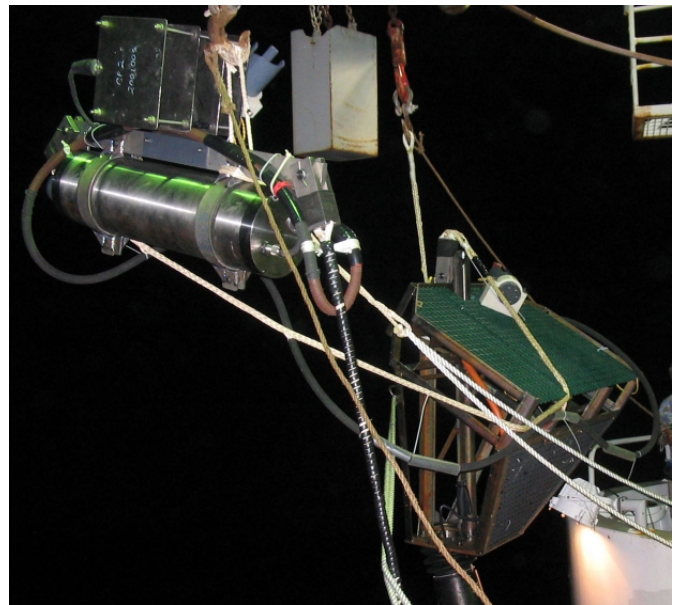
### New ocean bottom observatory successfully deployed off Hawaii

Honolulu, HI - At 3:00 AM, February 16, 2007, an acoustic release was fired, allowing the ALOHA Cabled Observatory (ACO) to settle to its new home on the ocean floor at Station ALOHA, the National Science Foundation (NSF) funded oceanographic research site approximately 100 km north of Oahu. Within minutes, observers at the AT&T Makaha Cable Station were listening to humpback whale song, inaugurating the beginning of data collection from the ACO.

The first stage of the ACO includes a cable termination and "Proof Module". "The cable was cut and moved to Station ALOHA where the termination frame was successfully spliced to the retired HAW-4 fiber optic cable, donated to the project by AT&T, and deployed on the seafloor from the US Navy cable ship USNS Zeus. This Proof Module of the ACO is to remain operational in this configuration through October," explains Fred Duennebieer, Principal Investigator for the ACO and a professor at the School of Ocean and Earth Science and Technology, at the University of Hawaii.

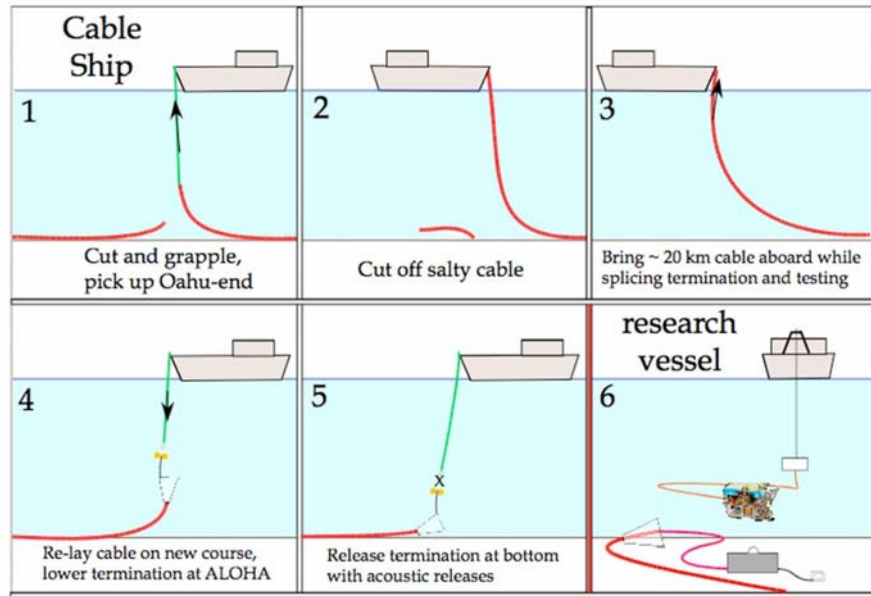
"In early November 2007 it is to be recovered and replaced with the full observatory, using the Remotely Operated Vehicle (ROV) JASON II from University of Hawaii's Research Vessel the R/V Kilo Moana. It will take the JASON ROV several dives to install the full observatory infrastructure where the Proof Module is plugged in now. The observatory will have eight connectors on it to power and supply a 2-way data path to for up to eight experiment systems. The Proof Module will be recovered and re-configured into an experiment to be plugged back into the ACO."

The location of the ACO is ideal, in that it builds on the exceptionally well characterized research site Station ALOHA. Station ALOHA has been the site of ~monthly shipboard observations of water column physics, biogeochemistry, and ecosystems for over 18 years under the Hawaii Ocean Time-series (HOT) Program. While the analyses of data from these cruises have resulted in the publication of over 200 scientific papers, the sampling technologies for the subsurface monitoring applications have been inadequate for studying changes that occur between cruises. Moored autonomous instruments have been maintained during the past 3 years to partially address this, but the recorded subsurface data is only available once or twice/year when the moorings are serviced. With the installation of the ALOHA Observatory, periodic cruises will still be required to obtain water samples, to provide spatial coverage, and to install new systems at the observatory, but the capabilities of the observatory will allow data from subsurface instruments to be retrieved continuously, allow commands to be



Proof Module and cable termination being deployed off the USNS Zeus

sent to the instruments, and provide power to instruments thus extending their duration, all of which greatly expand opportunities for research.



During the five-day cruise, the 513-foot Zeus Cable Repair ship cut and recovered the retired HAW-4 electro-optical telecommunications cable, pulled aboard 20 km of cable, laid it back out to Station ALOHA, spliced the cable to the ACO cable termination frame, tested the system, and lowered the frame and Proof Module to the ocean floor in 4,700 m of water.

“We hope to install acoustic modems on some of the existing moored subsurface instruments to send a subset of the measurements back to shore in near-real time (via surface-buoy to satellite) or in real-time (via an acoustic link with the observatory)”, says Roger Lukas, Co- Investigator of the ACO project and one of the lead researchers for Station ALOHA. “An issue is that the power that is required for these acoustic signals will require additional battery packs. With sufficient funding, these moorings could be connected directly to the observatory and obtain their power from the cable, and pass full datasets back to shore in real-time. This will ultimately allow adaptive sampling of the entire water column at ALOHA.” The ALOHA Observatory will provide power and communications capability necessary for real-time continuous monitoring of the ocean environment for at least a decade. These capabilities will also support short-duration experiments.

A hydrophone currently on the Proof Module is sensitive to frequencies from 0.01 Hz to 40 kHz and is recorded on two channels. “We have a pressure sensor along with the hydrophone which can detect changes in sea level of a few mm, so we very easily see tides,” adds Duennebie, “We should be able to detect even very small tsunamis, and we’ll also see the passage of ocean waves from distant and local storms.” At higher frequencies, the hydrophone should be able to detect earthquake p-waves and T-phases and possibly signals from distant shallow submarine volcanic eruptions. The hydrophone also picks up the magnificent noises of marine mammals, including fin whales, humpback whales, and sperm whales. (Listen to the initial sounds recorded at <http://www.soest.hawaii.edu/GG/DeepoceanOBS/index.htm>)

Funding for the ACO is provided by the National Science Foundation. Proposals are currently being organized for other modules to be installed at the ACO. Possible infrastructure proposals could extend the monitoring capabilities of the experiments on the seafloor to the ocean surface, allowing for investigators to monitor their experiments and modify them remotely as conditions warrant via Internet connection. Web access will allow grade school and college students to observe the data and draw their own conclusions concerning implications about important topics such as global warming and the state-of-health of the oceans.

Frederick K. Duennebie, Professor, Department of Geology & Geophysics, University of Hawaii at Manoa  
E-mail: [fkd@hawaii.edu](mailto:fkd@hawaii.edu), Phone: (808) 956-4779

Roger Lukas, Professor, Department of Oceanography, University of Hawaii at Manoa  
E-mail: [rlukas@hawaii.edu](mailto:rlukas@hawaii.edu), Phone: (808) 956-7896

**The real-time link to the hydrophone at Station ALOHA is now up and working most of the time. Catch it before the whales leave for the summer! Please see the ACO Deployment web site, [www.soest.hawaii.edu/GG/DeepoceanOBS](http://www.soest.hawaii.edu/GG/DeepoceanOBS)**