



Press Release

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UH Ocean Research Program Reaches Milestone

Honolulu, HI – On March 9, 2013, the UH research vessel *Kilo Moana* returned from the 250th scientific expedition of the Hawaii Ocean Time-series (HOT) program after nearly 25 years of approximately monthly research cruises to observe and interpret habitat variability and to track climate impacts on Hawaii's marine ecosystem. "It is really satisfying to reach this milestone, and to see the growing importance of the HOT program accomplishments. We initially thought 5 years, maybe 10. Here we are at 25 years and counting," said David Karl, UHM Oceanography Professor and Director of the Center for Microbial Oceanography: Research and Education (C-MORE). "Each additional year of observations brings us closer to a fundamental understanding of how the ocean functions, and its relationships to climate."



On November 3, 1988, the University of Hawaii (UH) research vessel *Moana Wave* returned to Honolulu's pier 45 after

successfully establishing a deep ocean observation station dubbed ALOHA (A Long-term Oligotrophic Habitat Assessment) as the benchmark site for the HOT program. Roger Lukas and David Karl, who, at the time were both professors of oceanography in UH's newly created School of Ocean and Earth Science and Technology (SOEST), led the 1988 expedition. The primary objective of HOT was to obtain a long-term time-series of physical and biogeochemical observations at a location that was characteristic of the North Pacific Subtropical Gyre habitat to address U.S. Global Change Research Program goals, namely to document and understand seasonal and interannual variability of water masses and to relate variations to gyre fluctuations; to determine the relationships between microbial community structure and function including nutrient dynamics and carbon sequestration; and to measure the time-varying concentrations of carbon dioxide in the surface waters and annual atmospheres-to-ocean gas fluxes.

HOT scientists recovering sampling equipment on the deck of the UH Research Vessel *Kilo Moana*.
Photo credit: UH SOEST/HOT

“Observing the ocean carefully, consistently, frequently and long enough to capture important modes of variability is very hard work that is occasionally rewarded with fundamental discoveries,” said Roger Lukas, now UHM Oceanography Professor Emeritus.

“Completion of 250 research cruises marks a major milestone in Earth Science and puts Hawaii on the map as one of the only places in the world where we have a decadal-scale record of how the ocean responds to climate change,” said Matthew Church, lead Principal Investigator of the HOT program and Associate Professor of Oceanography in SOEST. “Through consistent and detailed measurements, the HOT program is providing invaluable records on progressive ocean acidification, changes in seawater temperatures, and changes in plankton biodiversity.”

“Station ALOHA may be the best sampled place in the world’s oceans because of the HOT Program,” said Lukas. In addition to the monthly ship-based observations, HOT program scientists have access to real-time satellite-based remote observations, unattended mooring measurements, unmanned instrumented gliders and floats, and a fiber optic cabled observatory with a broadband connection back to Oahu.

“The HOT program is providing new understanding of fundamental ocean processes, even as those processes are being modified by human activities on a global scale,” said SOEST Dean Brian Taylor. “It is essential to skillfully continue the HOT observations, experiments, data analysis and student training that we may monitor, and inform society how best to respond to, the changing ocean conditions.”

In addition to its primary mission of ocean research, the HOT program has been an invaluable training ground for undergraduate and graduate students, “UH’s floating classroom,” Karl said. “Several of our former students, and their students, are now involved in HOT program research – so the HOT influence has now extended into the next generation of marine scientists.”

The success of the HOT program, to date, is a result of the coordinated, dedicated efforts of a large team of academic scientists, marine technicians and engineers, and the professional crews of the research vessels. “The HOT program could not have been successful without phenomenal teamwork and extraordinary efforts by dedicated HOT staff and ship’s crews. Over the past 24 years, personnel on the 250 HOT cruises spent ~1000 days at sea,” Lukas said. “Key members of the HOT team should be noted for each having sailed on more than 100 cruises, and for having trained hundreds of HOT students and staff: Lance Fujieki, Dan Sadler, Fernando Santiago-Mandujano, Jeffrey Snyder, Karin Björkman, and Dale Hebel.”

“The program has been very lucky to have some of the best and brightest sea-going researchers in the world,” commented Church.

After returning from this 250th cruise, Chief Scientist Fernando Sandtiago-Mandujano said, “This cruise was very successful especially because we had very good weather and also because the science participants are very professional and have been in the project for a long time. They have a lot of experience. Also, the Captain of the *Kilo Moana* and the crew members have helped us a lot in conducting our operations successfully.”

The HOT program receives primary funding from the U.S. National Science Foundation (NSF) with contributions from the Gordon and Betty Moore Foundation and the State of Hawaii. In 2006, a new NSF-funded Science and Technology Center of excellence in microbial oceanography (cmore.soest.hawaii.edu) was established to complement the HOT program.

Video clips are available for download (<http://yousend.it/Wd86nU>):

Sound bites from the following:

- David Karl, Matthew Church, Fernando Santiago-Mandujano, and Jefery Snyder (**sound bite scripts attached**)

B-roll of the following:

- R/V *Kilo Moana*: Assorted shots of the UH's Research Vessel *Kilo Moana* (KM) (used during many HOT cruises including HOT-250) including wide shots of the ship, departing port, steaming to Station ALOHA
- CTD Operations - Deployment and Recovery: Shots of the CTD (one of the main pieces of scientific equipment used to collect data and water samples during cruises) going in and coming out of the water
- CTD Sampling: Various shots of the science party collecting water samples from the CTD.
- Sample Processing: Assorted shots of processing and analyzing water samples onboard the ship, and filtering samples collected from the CTD
- Plankton Net Tow: Shots of the net (used to collect phytoplankton and zooplankton) being recovered on deck
- Deck Work: Assorted shots of the science party and crew of the KM working on the stern of the ship deploying and recovering free drifting experiments

For more information on the **Hawaii Ocean Time-series Program**, please see

<http://hahana.soest.hawaii.edu/hot/hot.html>

The School of Ocean and Earth Science and Technology at the University of Hawaii at Manoa was established by the Board of Regents of the University of Hawai'i in 1988 in recognition of the need to realign and further strengthen the excellent education and research resources available within the University. SOEST brings together four academic departments, three research institutes, several federal cooperative programs, and support facilities of the highest quality in the nation to meet challenges in the ocean, earth and planetary sciences and technologies.

www.soest.hawaii.edu