HOT-182 Chief Scientist's Cruise Report
R/V Kilo Moana
June 12-16, 2006
Cruise ID: KM0617
Departed: June 12, 2006 at 0900 (HST)
Returned: June 16, 2006 at 0730
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Richard L Meyer
Chief Scientist: Fernando Santiago-Mandujano
OTG Electronics/Deck Operations Technicians: Dan Fitzgerald, Gabe Foreman

1. SCIENTIFIC OBJECTIVES

The objective of this cruise was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations were to be occupied during the cruise, in the following order:

1) Station 1, referred to as Station Kahe, is located at 21 20.6'N, 158 16.4'W and was to be occupied on June 12 for about 2 hours.

2) Station 2: ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22 45'N, 158W. This is the main HOT Station and was to be occupied for 3 days from June 13 to 15.

3) Station 50, is the site of the WHOTS Mooring, located at 22 46.1 N, 157 53.4 W was to be occupied on the 4th day of the cruise for about 30 minutes.

4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21 50.8'N, 158 21.8'W was to be occupied on the 4th day of the cruise for about 2 hours.

A single CTD cast was to be conducted at Station 1 to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements. After these operations, the ship was to transit to Station ALOHA.

Upon arrival at Station ALOHA, the free-drifting sediment trap array was to be deployed. The sediment trap array was to stay in the water for about 52 hours. This was followed by two shallow CTD casts (<200 m) to collect water for incubation experiments. After this, an array with incubation experiments (gas array) was to be deployed for 24 hours. A full-depth CTD cast was to be conducted afterwards, followed by 1000-m CTD casts at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection, ending with another full-depth CTD cast.

One free-drifting array was to be deployed for 12 hours for incubation experiments on June 14.

A plankton net was to be towed near noon and midnight for 30-min intervals on June 13 and 14 at Station ALOHA.

C. Mahaffey was to deploy her hand-held plankton net on June 13 and 15 for about 30 min.

After CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating sediment trap array.

After recovering the sediment traps, the ship was to transit to Sta. 50 to conduct a 200-m CTD cast, and then back to Station ALOHA to conduct one more 1000-m CTD cast, and light casts (PRR, AC9/FRRf).

After operations at station ALOHA ended, the ship was to transit to Station 6 (Kaena).

A near-bottom CTD cast (~2500 m) was to be conducted at Station 6 including salinity samples for calibration, after which the ship was to transit to back to Snug Harbor.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on June 13, 14 and 15.

A package including a Wet Labs AC9, a Chelsea Fast Repetition Rate Fluorometer (FRRf), and a SeaBird Seacat was to be used to profile the upper 200 m at Sta. ALOHA at noon time on June 14 and 15, and in the early morning on June 15.

An Automated Trace Element Sampler (ATE) was to be deployed once on June 13.

The following instruments were to collect data throughout the cruise: shipboard ADCP, thermosalinograph, and two anemometers.

2. SCIENCE PERSONNEL

BEACH group:

Cruise Participant	Title	Affiliation
Karin Bjorkman (Watch Leader)	Research Specialist	UH
Susan Curless	Research Associate	UH
Ken Doggett	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Eric Grabowski (Watch Leader)	Research Associate	UH
Adriana Harlan	Technician	UH
Claire Mahaffey	Research Specialist	UH
Amanda Pontius	Graduate Student	UH
Donn Viviani	Graduate Student	UH
Blake Watkins	Marine Engineer	UH
Doug White	Technician	UH

PO group:

Paul Lethaby	Research Associate	UH
Matthew Markley	Undergraduate Student	UH
Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH
Jefrey Snyder	Marine Technician	UH
John Yeh	Graduate Student	UH

3. GENERAL SUMMARY

Operations during the cruise were conducted with some schedule changes during the 36-hr CTD burst period due to problems with the CTD wire and winch. Two 1000-m CTD casts were cancelled as a result.

One 1000-m CTD cast was conducted at Kahe station. Ten 1000-m CTD casts, two deep casts, and four 200-m casts were conducted at Station ALOHA. One 200-m cast was conducted near the WHOTS moorings (station 50).

The array of floating sediment traps, the gas array, and the primary productivity incubation array were deployed and recovered without incidents. The arrays drifted NNE at a mean speed of over 0.5 kt.

Three net tows were conducted at night and three during the day.

C. Mahaffey deployed her hand-held plankton net once.

The AC9/FRRf was deployed at noon three times, and one time at night.

The PRR was deployed three times at noon time.

The Automated Trace-Element Sampler was not deployed because it ran out of batteries.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, and the ship's two anemometers.

Winds were easterlies between 15 and 20 kt during the cruise.

We arrived back at Snug Harbor on June 16 at 0730.

4. R/V KILO MOANA, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Kilo Moana continues to maintain the excellent ship support for our work. The officers and crew were most helpful and accommodating. They showed enthusiasm and concern for our work and were very flexible in receiving changes in our operational schedule.

Technical support during this cruise was excellent. OTG personnel were available at any time to assist in our work and made things much easier for us.

5. DAILY REPORT OF ACTIVITIES (HST)

June 9, 2006; Loading Day

Equipment loaded during this day, and the CTD system was tested.

June 12, 2006

The ship departed from Snug harbor at 0900. Safety briefing by the Captain conducted at 0930, followed by a science meeting in which cruise activities were briefly reviewed, and safety issues were addressed.

Fire and abandon ship drills conducted at 1000.

Arrived at Kahe Station at 1140. CTD wire weight cast (400 lb) to 500 m, during which J. Snyder inspected the CTD wire.

The Profiling Reflectance Radiometer (PRR) was deployed at 1230

A 1000-m CTD cast was conducted at 1300. After the cast ended, the ship headed to station ALOHA

The ship arrived to Station ALOHA at 2215. The sediment traps array was deployed immediately.

One 200-m CTD cast was conducted at 2330 after the sediment traps deployment.

June 13, 2006

One 200-m CTD casts was conducted before the gas array deployment.

The gas array was deployed at 0400.

One deep CTD cast was conducted at 0440. Glitches were observed in the primary set of sensors' signals, caused by strings of organic material blocking the CTD plumbing. The secondary sensors worked fine.

The CTD wire jumped the sheave at the base of the crane when the CTD was about to be recovered after the deep cast. The crane's ladder was inadvertently left extended, and it pushed the wire out of the sheave when the crane was repositioned for CTD recovery. The wire was put back on the sheave by momentarily releasing tension with a wire grabber tied to the deck. The CTD was safely brought back on board.

Four 1000-m CTD casts were conducted this day.

The CTD wire jumped the sheave inside the winch, while taking up slack for the CTD cast before the primary production array deployment. The damaged section of wire had to be cut and reterminated. Two casts of the 36-hr burst period had to be cancelled.

The ATE sampler was not deployed because it ran out of batteries.

Two net tows were conducted near noon, and one at night.

C. Mahaffey deployed her net tow in the morning.

Easterlies at 10-15 kt, with smooth seas.

June 14, 2006

Six 1000-m CTD casts were conducted on this day, and the 36-hr CTD burst period ended with a second deep cast that started at 2300.

The gas array was recovered at 0950, at 23 1.6'N, 157 54.9'W, about 17 nm NNE from ALOHA Station.

The primary productivity array was deployed at 0630 and recovered at 1920 at 22 52.4'N, 157 58.1'W, about 7.5 nm NNE from ALOHA. The buoy hit the stern during recovery, and the RDF antennae and strobe light broke off and fell overboard.

AC9/FRRf casts were conducted early in the morning and at noon time.

One PRR cast was conducted at noon time.

Two net tows were conducted at night and one near noon.

Easterly winds at 20 kts, with moderate swell.

June 15, 2006

Two 200-m CTD casts were conducted at ALOHA, and one 200-m CTD cast near the WHOTS mooring (Station 50).

The sediment traps array was recovered at 0645 at 23 7'N, 157 55.9'W. The array drifted NNE about 22 nm from ALOHA Station.

One PRR cast was conducted at 11:30.

Two consecutive AC9/FRRf casts were conducted at Station ALOHA at noon time.

One near-bottom cast was conducted at Station Kaena (Sta 6).

Since operations at station Kaena ended earlier that scheduled, the ship transited to a nearby location where J. Yeh's benthic camera package was lost in a previous deployment, to determine if the package was still there. The camera was located at 21 45.27'N, 158 39.66'W. The releases responded upon acoustic interrogation from the ship.

Easterly winds up to 23 kt. Large swell.

June 16, 2006

Arrived at Snug Harbor at 0730. Full off-load.

HOT program sub-components:

Investigator:	Project/Institution:
Dave Karl	Core Biogeochemistry/UH
Roger Lukas	Hydrography/UH
Bob Bidigare	HPLC pigments/UH
Mike Landry	Zooplankton dynamics/UH
Mark Abbott/Ricardo Letelier	Optical measurements/OSU

Ancillary programs:

Investigator:	Project/Institution:
Charles Keeling	CO2 dynamics and intercalibration/SIO

Paul Quay DI13C and O isotopes/UW
Penny Chisholm Prochlorococcus population dynamics/MIT
Zehr/Church/Montoya Diversity and activities of nitrogen-fixing microorganisms/UH