HOT-183 Chief Scientist's Cruise Report
R/V Kilo Moana
July 11-15, 2006
Cruise ID: KM0621
Departed: July 11, 2006 at 0900 (HST)
Returned: July 15, 2006 at 0730
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Bryon Wilson
Chief Scientist: Fernando Santiago-Mandujano
OTG Electronics/Deck Operations Technicians: Steve Poulos, 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. Five 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 July 11 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 July 12 to 14.

3) Station 51, is the site of the MOSEAN Mooring, located at 22 46.009'N, 158 5.533'W was to be occupied on July 15 for about 30 minutes.

4) Station 50, is the site of the WHOTS Mooring, located at 22 46.1 N, 157 53.4 W was to be occupied on July 15 for about 30 minutes.

5) 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 200 m and one 100 m CTD casts 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 July 13.

A plankton net was to be towed near noon and midnight for 30-min intervals on July 12 and 13 at Station ALOHA.

C. Mahaffey was to deploy her hand-held plankton net on July 13 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. 51 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 this the ship was to transit to Sta. 50 to conduct a 200-m CTD cast.

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 back to Snug Harbor.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on July 12, 13 and 14.

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 July 13 and 14, and in the early morning on July 14.

An Automated Trace Element Sampler (ATE) was to be deployed once on Jly 14.

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
Cynthia Peacock	Technician	UW
Dan Sadler	Research Associate	UH
Blake Watkins	Marine Engineer	UH
Doug White	Technician	UH

PO group:

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

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned. The primary production array was lost during recovery on July 13. Only the spar buoy and floats were recovered.

One 1000-m CTD cast was conducted at Kahe station. Twelve 1000-m CTD casts, two deep casts, two 200-m and one 50-m CTD casts were conducted at Station ALOHA. One 250-m CTD cast was conducted near the MOSEAN mooring (station 51), and one 200-m cast was conducted near the WHOTS mooring (station 50). One 2400-m CTD cast was conducted at Station Kaena.

The array of floating sediment traps, the gas array, and the primary productivity incubation array were deployed and recovered without incidents, with the exception of the primary productivity array, which was lost during recovery. The arrays drifted SW.

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

The AC9/FRRf was deployed at noon once, and once at night.

The PRR was deployed three times at noon.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, and the ship's two anemometers. The ADCP showed a persistent southwestward current of up to 1/2 kt in the upper 100 m.

Winds were easterlies between 15 and 25 kt during the cruise.

We arrived back at Snug Harbor on July 15 at 0730.

Various Navy ships, planes and helicopters were present near the study area, apparently conducting exercises as part of RimPAC.

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)

July 10, 2006; Loading Day

Equipment loaded during this day, and the CTD system was tested. Container vans and heavy equipment were loaded on July 3rd.

July 11, 2006

The ship departed from Snug harbor at 0900. Safety briefing by the Captain conducted at 1000, followed by a science meeting in which cruise activities were briefly reviewed, and safety issues were addressed.

Fire and abandon ship drills conducted at 1030.

Arrived at Kahe Station at 1145. CTD wire weight cast (400 lb) to 500 m, during which J. Snyder inspected the CTD wire. An on-deck CTD-wire tension test to 2000 lb was conducted at 1230.

The Profiling Reflectance Radiometer (PRR) was deployed at 1300.

A 1400-m CTD cast was conducted at 1320. After the cast ended, the ship headed to station ALOHA. The altimeter was successfully tested during this cast.

The ship arrived to Station ALOHA at 2210. The sediment traps array was deployed at midnight.

July 12, 2006

One 200-m CTD cast was conducted at 0010 after the sediment traps deployment. One 200-m and one 50-m CTD casts were conducted before the gas array deployment.

The gas array was deployed at 0500.

One deep CTD cast was conducted at 0550. The altimeter signal was intermittent near the bottom, but the pinger signal was very clear.

Four 1000-m CTD casts were conducted this day. The ISUS was installed in the rosette and connected to the CTD before these casts, and worked properly.

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

Easterlies at 20-25 kt.

July 13, 2006

Eight 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 0745, at 22 39.8'N, 159 11.9'W, about 12 nm SW from ALOHA Station.

The primary productivity array was deployed at 0600. The array was lost during recovery in the evening of July 13. The array's line

snagged around the rudder post/propeller, and evenutally the line severed. Only the spar buoy and floats were recovered. The array drifted about 8 nm SW from the center of ALOHA to 22 43.4'N, 158 4.6'W.

One AC9/FRRf cast was conducted 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 15-20 kts. It rained sporadically at night and in the morning.

July 14, 2006

One 250-m CTD cast was conducted near the MOSEAN mooring (Station 51), and one 200-m CTD cast near the WHOTS mooring (Station 50).

The sediment traps array was recovered at 0630 at 22 36.7'N, 158 22.7'W. The array drifted SW almost 23 nm from ALOHA Station.

Once PRR cast was conducted at 1245.

One AC9/FRRf cast was conducted at 0315, at Station ALOHA.

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

Easterly winds at 15-20 kt. It rained sporadically.

July 15, 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