HOT-193 Chief Scientist's Cruise Report
R/V Kilo Moana
July 6-10, 2007

Cruise ID: KM0709
Departed: July 6, 2007 at 0900 (HST)
Returned: July 10, 2007 at 0730
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Philip Smith
Chief Scientist: Fernando Santiago-Mandujano
OTG Electronics/Deck Operations Technicians: Tobin Chen, Daniel Fitzgerald

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 July 19 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 7 to 9.

3) Station 52, is the site of the WHOTS Mooring, located at 22 40.208'N, 157 57.001'W was to be occupied on July 9 for about 30 minutes.

4) A bottom moored sediment trap was to be deployed at 22 51.75'N, 157 55.00'W on July 9. This operation would take about 4 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. The underwater bottom camera was to be deployed en route 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 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 8.

A plankton net was to be towed near noon and midnight for 30-min intervals on July 7 and 8 at Station ALOHA.

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. 52 to conduct a 200-m CTD cast, and then transit to back to Station ALOHA to conduct light casts (PRR, AC9/FRRf).

After operations at station ALOHA ended, the ship was to transit to Station 52 to conduct another 200-m CTD cast, after which the ship was to transit to deploy the sediment trap mooring.

A bottom moored sediment trap was to be deployed at 22 51.75'N, 157 55.00'W in the evening of July 9. A triangulation of the mooring would be conducted after the deployment with an acoustic transponder to determine it's position. After completing these operations, 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 6, 8 and 9.

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 8 and 9, and in the early morning on July 9.

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

2. SCIENCE PERSONNEL

Cruise Participant	Title	Affiliation
BEACH group:		
Lucas Beversdorf	Graduate Student	UH
Susan Curless (Watch leader)	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Adriana Harlan	Technician	UH
Binglin Li	Graduate Student	UH
Dan Sadler	Research Associate	UH
Donn Viviani	Graduate Student	UH
Brett Updyke	Technician	UH
Blake Watkins	Marine Engineer	UH
PO group:		
Paul Lethaby	Research Associate	UH
Nancy Niklis	Undergraduate Student	UH

Nina Ribbat	Undergraduate Student	HPU
Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH
Justin Smith	Undergraduate Student	UH
Jefrey Snyder (Watch leader)	Marine Technician	UH
Lisa Tatsumi	Volunteer	UH

Others:

Joan Matsuzaki	School Teacher	CMORE
Kim Weersing	CMORE Educator	UH/CMORE
Tracy Campbell	Technician	UH/Rappe
Brandon Carter	Scientist	UC Santa Cruz/Zehr
Michael Plasker	Intern	Marine Advanced Technology Education Center (MATE)/OTG

3. GENERAL SUMMARY

Most of the operations during the cruise were conducted as planned. However, about three hours were lost upon arrival to ALOHA station because of problems with the CTD winch. As a consequence, the first two 200-m casts at station ALOHA and the deployment of the gas array were cancelled. Fortunately the CTD winch was fixed and we were able to continue CTD operations, unlike the previous HOT cruise in which CTD operations had to be cancelled early in the cruise because of winch problems.

One 1000-m CTD cast was conducted at Kahe station. Twelve 1000-m CTD casts and two deep casts were conducted at Station ALOHA. One one-hour 200-m CTD yo-yo cast, and one 200-m cast were conducted near the WHOTS mooring (station 52).

The array of floating sediment traps, and the primary productivity incubation array were deployed and recovered without problems. Both arrays drifted SSW.

The sediment traps mooring was successfully deployed on July 9.

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

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

The PRR was deployed three times at noon time.

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, with smooth seas during the majority of the cruise.

We arrived back at Snug Harbor on July 10 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)

July 5, 2007; Loading Day

The equipment was loaded during this day.

July 6, 2007

The ship departed from Snug harbor at 0900. Safety briefing conducted at 0945, followed by a science meeting in which cruise activities were briefly reviewed, and safety issues were addressed. Fire and abandon ship drills were conducted at 1030 for new personnel.

Arrived at Kahe Station at 1145. CTD wire weight cast (1,300 lb) to 500 m, during which J. Snyder inspected the CTD wire.

The Profiling Reflectance Radiometer (PRR) was deployed at 1245

A 1000-m CTD cast was conducted at 1315. After the cast ended, the ship headed to station ALOHA.

The ship arrived to Station ALOHA at 2250. Deployed sediment traps array at 2350.

July 7, 2007

Problems with the CTD-winch arised before starting the first CTD cast at ALOHA station. The winch was stuck and couldn't rotate. During testing of the winch, the wire jumped the traction control sheave. The cable, which was not damaged was put back on the sheave, the brake calipers were replaced and some adjustments were done to the winch.

Cancelled two 200-m CTD casts and the deployment of the gas array.

A weight cast was conducted at 0330 to test the CTD-winch repairs.

CTD operations continued with a 1000-m CTD cast at 0422.

One deep CTD cast was conducted at 0708.

A total of five 1000-m CTD casts were conducted this day.

An ATE sample was taken at 1230

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

Easterlies at 10-15 kt. A strong surface southward current of almost 1 kt was present, as indicated by the ADCP.

July 8, 2007

Seven 1000-m CTD casts were conducted on this day, and a second deep cast was conducted at 2308.

The primary productivity array was deployed at 0530, and recovered at 1945. The array drifted about 5 nm SSW from the center of ALOHA to 22 40'N, 158 1.87'W.

One AC9/FRRf cast was conducted at noon time.

One PRR cast was conducted at noon time.

One net tow was conducted near noon, and two at night.

Easterly winds at 15-18 kts.

July 9, 2007

One one-hour 200-m CTD yo-yo cast, and one 200-m cast were conducted near the WHOTS mooring (Station 52).

The sediment traps array was recovered at 0900 at 22 28.4'N, 158 9.4'W. The array drifted about 19 nm SSW from ALOHA Station.

One PRR cast was conducted at 1115.

One AC9/FRRf cast was conducted at 0300, and two more casts were conducted at 1145 and 1250 respectively at station ALOHA.

The deployment of the sediment traps mooring was conducted between 1500 and 1730. The anchor was dropped at 22 51.734'N, 157 55.006'W. A triangulation of the mooring position was conducted until 1940.

Easterly winds at 15-20 kt.

July 10, 2007

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/Carter	Diversity and activities of nitrogen-fixing microorganisms/UH
Various CMORE PI's	CMORE RNA/DNA sampling/UH
Kim Weersing/Joan Matsuzaki	CMORE Education Component/UH

Additional programs

Investigator:	Project/Institution:
Mike Rappe	Marine bacterioplankton community structure/UH
Edward Boyle	Trace metals