HOT-181 Chief Scientist's Cruise Report
R/V Kilo Moana
May 25-29, 2006
Cruise ID: KM0614
Departed: May 25, 2006 at 0900 (HST)
Returned: May 29, 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: Kuhio Vellalos, 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 May 25 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 May 26 to 28.

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 the 4th day of the cruise 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 the 4th day of the cruise for about 30 minutes.

5) 1) An free vehicle baited camera system was to be deployed by J. Yeh in transit to Station ALOHA on May 25, at 21 54.1'N, 158 16.5'W, and retrieved at the end of the cruise, the deployment was to take 30 minutes, and the recovery operation 2.5 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 deploy the underwater camera, 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 shallow CTD casts (<200 m) to collect water for incubation experiments, and by an additional 100-m CTD cast. 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 May 27.

A plankton net was to be towed near noon and midnight for 30-min intervals on May 26 and 27 at Station ALOHA.

C. Mahaffey was to deploy her hand-held plankton net on May 26 and 28 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 operations at station ALOHA ended, the ship was to transit to Station 50 to conduct a 200-m CTD cast.

K. Hinze was to deploy two ARGO floats at station ALOHA after all operations were completed. After this, the ship was to transit to retrieve the benthic camera deployed early in the cruise.

The benthic camera deployed on May 25 was to be retrieved in the evening of May 28. After this recovery, 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 May 25, 27 and 28.

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 May 27 and 28, and in the early morning on May 28.

An Automated Trace Element Sampler (ATE) was to be deployed once on May 26.

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	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
Dan Sadler	Research Associate	UH

Blake Watkins Marine Engineer UH

PO group:

Suzanne Defelice Research Associate UH
Pierre Dutrieux Graduate Student UH
Paul Lethaby (Watch Leader) Research Associate UH
Fernando Santiago-Mandujano Chief Scientist (Res. Assoc.) UH
Justin Smith Undergraduate Student UH
Jefrey Snyder Marine Technician UH
Mingxi Yang Graduate Student UH
John Yeh Graduate Student UH

Others:

Marina Brandon Graduate Student UH
Stuart Donachie Scientist UH
Kurt Heinze Technician UW
Rex Malmstrom Scientist MIT
Matthew Sullivan Scientist MIT
Luke Thompson Scientist MIT

3. GENERAL SUMMARY

Operations during the cruise were conducted as scheduled, with minor schedule changes during the last day. The benthic camera deployed on the first day of the cruise could not be recovered as planned. The acoustic releases were contacted and triggered, but the camera remained at the bottom of the ocean.

One 1000-m CTD cast was conducted at Kahe station. Twelve 1000-m CTD casts, two deep casts, and four casts shallower than 200-m were conducted at Station ALOHA. One 100-m CTD cast and one 200-m cast were conducted respectively near the MOSEAN and WHOTS moorings (stations 51 and 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 northwestward.

K. Heinze deployed two ARGO floats at ALOHA Station.

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

C. Mahaffey deployed her hand-held plankton net on May 26 and 28.

The PRR and AC9/FRRf were deployed as scheduled.

The Automated Trace-Element Sampler was successfully used to collect one trace metal sample.

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

Winds were from the southeast at about 10-15 kt during most of the cruise,

turning to easterlies the last day of the cruise, with smooth seas.

We arrived back at Snug Harbor on May 29 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)

May 24, 2006; Loading Day

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

May 25, 2006

The ship departed from Snug harbor at 0900. Safety briefing by the Captain 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 conducted at 1030.

Arrived at Kahe Station at 1140. A 5000 lb on-board pull test on the CTD wire was conducted, followed by a weight cast (400 lb) to 1000 m, during which J. Snyder inspected the CTD wire.

The Profiling Reflectance Radiometer (PRR) was deployed at 1310

A 1000-m CTD cast was conducted at 1420. After the cast ended, the ship headed to deploy J. Yeh's benthic camera.

The benthic camera was deployed without incident at 1830 at 21 54.16'N, 158 15.41'W.

The ship arrived to Station ALOHA at 2330. The sediment traps array was deployed immediately.

May 26, 2006

Two 200-m and one 100-m CTD casts were conducted after the sediment traps deployment at Station ALOHA.

The gas array was deployed at 0500.

One deep CTD cast was conducted at 0520.

Five 1000-m CTD casts were conducted this day. The new ISUS was connected to

the CTD during the first two of these casts, but it gave a noisy signal during the second one, apparently due to a faulty cable. The ISUS continued being used but recording internally.

The ATE sampler was deployed at 1345.

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

C. Mahaffey deployed her net tow in the afternoon.

Southeasterlies at 10-15 kts, with smooth seas.

May 27, 2006

Seven 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 0700, at 22 50.12'N, 158 6.25'W, about 6 nm NW from ALOHA Station.

The primary productivity array was deployed at 0530 and recovered at 1920 at 22 48'N, 158 2.7'W, about 4 nm NW from ALOHA.

One PRR cast and one AC9/FRRf casts were conducted at noon time.

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

Southeasterly winds at 10-13 kts, with smooth seas and small swell.

May 28, 2006

One 200-m CTD casts was conducted at ALOHA before transit to retrieve the sediment traps. One 100-m and one 200-m CTD casts were conducted near the MOSEAN and WHOTS moorings respectively (Stations 51 and 50).

The sediment traps array was recovered at 0645 at 22 55.6'N, 158 13.16'W. The array drifted NW about 13 nm from ALOHA Station.

One AC9/FRRf cast was conducted at 0300, and two more consecutive casts were conducted at noon time.

C. Mahaffey deployed her hand held net at noon.

K. Heinze deployed two ARGO floats after all operations ended at Station ALOHA, at 1430

We arrived at 1930 to the site where J. Yeh's benthic camera was deployed, and recovery operations started at 1950. The acoustic releases were contacted and triggered several times, indicating full release, but the camera package never came to the surface. Upon leaving the site at 2300 the ranging of both releases indicated that they were still at the bottom.
The following equipment was lost:

Surface mast assembly and frame with the following components:
- Five Benthos floats

- Two 865-A Benthos releases
- One 3.34 Mpixel time lapse camera system and strobe (Scorpio Plus from Insite Pacific)
- One Novatech Beacon
- One Novatech xenon flasher

Easterly winds at 12-17 kt. Smooth seas.

May 29, 2006

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

Sub component programs:

Investigator:	Project/Institution:
Bob Bidigare	HPLC pigments/UH
Mike Landry	Zooplankton dynamics/UH
John Dore	CO2 dynamics/UH
Claire Mahaffey	Assessment of Nitrogen Fixation Rates/UH

Ancillary programs:

Investigator:	Project/Institution:
Charles Keeling	CO2 dynamics and intercalibration/SIO
Mark Abbott/Ricardo Letelier	Optical measurements/OSU
Paul Quay	DI13C and O isotopes/UW
Penny Chisholm	Prochlorococcus population dynamics/MIT
Matthew Church/Allison Fong	Diversity and activities of nitrogen-fixing microorganisms/UH
Zackary Johnson	Bacterial Chlorophyll containing organisms genetic diversity estimation/UH

Ancillary research during this cruise:

Investigator:	Project/Institution:
MIT Group/Penny Chisholm	Prochlorococcus population dynamics/MIT
Kurt Heinze/Steve Riser	ARGO float deployment/UW
John Yeh/Jeff Drazen	Depth Zonation in Benthopelagic Scavengers of the Hawaiian Slope/UH
Stuart Donachie	Marine fungi/UH