

HOT-190 Chief Scientist's Cruise Report

R/V Kilo Moana

March 19-23, 2007

Cruise ID: KOK0706

Departed: March 19, 2007 at 0800 (HST)

Returned: March 23, 2007 at 0730

Vessel: R/V Ka'imikai-O-Kanaloa

Operator: University of Hawaii

Master of the Vessel: Captain Ross Barnes

Chief Scientist: Fernando Santiago-Mandujano

OTG Electronics/Deck Operations Technicians: Kuhio Velallos, Steven Tottori

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. Six 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 March 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 March 20 to 22.

3) Station 51, is the site of the MOSEAN Mooring, located at 22 45'N, 158 6' W was to be occupied on March 22 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 March 22 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.

6) An underwater bottom camera was to be deployed in transit to Station ALOHA, at 21 42.89'N, 158 20'W, and retrieved at the end of the cruise on March 22, the deployment would take 30 minutes, and the recovery operation would take approximately 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. 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 three 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 March 21.

A plankton net was to be towed near noon and midnight for 30-min intervals on March 20 and 21 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. 51 to conduct a 200-m CTD cast, and then transit to Sta. 50 to conduct another 200-m CTD cast. After these operations the ship was to transit back to Station ALOHA to conduct 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 recover the underwater camera.

The underwater camera acoustic releases were to be fired using the ship's hydrophone, and the underwater camera was to be recovered. 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 March 19, 21 and 22.

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 March 21 and 22, and in the early morning on March 22.

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
Ken Doggett (Watch Leader) Research Associate UH
Lance Fujieki Computer Specialist UH
Eric Grabowski Research Associate UH
Adriana Harlan Technician UH
Binglin Li Graduate Student UH
Claire Mahaffey Research Specialist UH
Dan Sadler (Watch Leader) Research Associate UH
Donn Viviani Graduate Student UH
Blake Watkins Marine Engineer UH

PO group:

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

Others:

Scott Oberg School Teacher C-MORE

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned, with some delays due to the transit time to recover the drifting arrays, which drifted farther than expected with a strong southwestward current. The CTD cast near the MOSEAN mooring, and the cast at Kaena station were cancelled to compensate for the delays.

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

The array of floating sediment traps, the gas array, and the primary productivity incubation array were deployed and recovered. The sediment trap samples were compromised because of the steep angle of the line during recovery, which resulted in the samples being dumped out and flushed by surface sea water. All arrays drifted SW.

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

The AC9/FRRf was deployed at noon two times, and one time at night. The AC9 seemed to have malfunctioned during the casts taken on March 22.

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 occasional rain on the night of March 21, and on March 22.

John Yeh deployed and recovered his benthic camera without problems.

We arrived back at Snug Harbor on March 23 at 0730.

4. R/V KA'IMIKAI-O-KANALOA, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Ka'Imikai-O-Kanaloa 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)

March 16, 2007; Loading Day

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

March 19, 2007

The ship departed from Snug harbor at 0800. Fire and abandon ship drills conducted at 0845, followed by a safety briefing by the first mate. A science meeting followed in which cruise activities were briefly reviewed, and safety issues were addressed.

Arrived at Kahe Station at 1115. 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 1215

A 1020-m CTD cast was conducted at 1230. After the cast ended, the ship headed to station ALOHA.

Deployed J. Yeh's benthic camera at 1443 en route to Station ALOHA.

March 20, 2007

The ship arrived to Station ALOHA at 0202, late due to rough seas and a strong current. Deployed sediment traps array.

Three 200-m CTD cast were conducted after the sediment traps deployment, and before the gas array deployment.

The gas array was deployed at 0550.

One deep CTD cast was conducted at 0606.

Five 1000-m CTD casts were conducted this day.

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

Easterlies at 10-15 kt.

March 21, 2007

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 2322.

The gas array was recovered at 0750, at 22 40.16'N, 158 14.19'W, about 14 nm SW from ALOHA Station.

The primary productivity array was deployed at 0540, and recovered

at 1900. The array drifted about 8 nm SW from the center of ALOHA to 22 41.8'N, 158 8.3'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 15-20 kts. Raining sporadically.

March 22, 2007

One 200-m CTD casts was conducted near the WHOTS mooring (Station 50).

The sediment traps array was recovered at 0900 at 22 39.8'N, 158 28.3'W. The array drifted SW about 27 nm from ALOHA Station. The sampling cylinders were almost emptied during recovery due to the steep angle in the array's line.

One PRR cast was conducted at 1210.

One AC9/FRRf cast was conducted at 0400, the AC9 yielded no data on recovery. One more cast was conducted near noon time at Station ALOHA, but no AC9 data was recovered either. The FRRF worked as expected.

John Yeh's benthic camera was recovered at 2300.

Easterly winds at 15-20 kt, with occasional heavy rain.

March 23, 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 Diversity and activities of nitrogen-fixing microorganisms/UH
Barbara Bruno C-MORE Education Component/UH

Additional programs

Investigator: Project/Institution:

Mike Rappe Marine bacterioplankton community
structure/UH
Edward Boyle Trace metals

Ancillary research during this cruise:

Investigator: Project/Institution:

John Yeh/Jeff Drazen Depth Zonation in Benthopelagic Scavengers
of the Hawaiian Slope/UH
