HOT-185 Chief Scientist's Cruise Report
R/V Ka'Imikai-O-Kanaloa
September 14 - 18, 2006
Cruise ID: KOK 0608
Departed: September 14, 2006 at 0820 (HST)
Returned: September 18, 2006 at 0730
Vessel: R/V Ka'Imikai-O-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Ross Barnes
Chief Scientist: Paul Lethaby
OTG Electronics/Deck Operations Technicians: Steve Poulos, Tim McGovern

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 September 14 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 September 15-17.

3) Station 51, is the site of the MOSEAN Mooring, located at 22 45' N, 158 6' 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) 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 September 16.

A plankton net was to be towed near noon and midnight for 30-min intervals on September 15 and 16 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 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 September 14, 16 and 17.

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 September 16 and 17, and in the early morning on September 17.

An Automated Trace Element Sampler (ATE) was to be deployed once on September 15.

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 (Watch Leader)	Research Associate	UH
Ken Doggett	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Eric Grabowski (Watch Leader)	Research Associate	UH
Blake Watkins	Marine Engineer	UH
Doug White	Technician	UH

PO group:

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

Others:

Elizabeth Hambleton	Technician	UH

Steve Tottori Marine Technician UH

3. GENERAL SUMMARY

Nearly all objectives for HOT 185 were successfully completed. Communication problems with the ATE prevented its deployment. The AC9 had a weak MPAK battery and did not function. All other activities were completed.

One 1000-m CTD cast was conducted at Kahe station. Twelve 100-m CTD casts, two deep casts, and three 200-m casts were conducted at Station ALOHA. One 200-m cast was conducted near the MOSEAN mooring (station 51) and another 200-m cast was conducted near the WHOTS mooring (Station 50). One 2500-m cast was conducted at Kaena station.

The array of floating sediment traps, the gas array, and the primary productivity incubation array were deployed and recovered without incidents.

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

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

The PRR was deployed three times at noon.

The Automated Trace-Element Sampler was not deployed because communications with the instrument were not established.

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

Winds were southeasterlies between 10 and 20 kt during the cruise.

We arrived back at Snug Harbor on September 18 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)

September 13, 2006; Loading Day

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

September 14, 2006

The ship departed from Snug harbor at 0820. Fire and abandon ship drills conducted at 0900. Safety briefing by the First Mate was conducted at 0930, followed by a science meeting in which

cruise activities were briefly reviewed, and safety issues were addressed.

Arrived at Kahe Station at 1120. CTD wire weight cast (400 lb) to 500 m, during which J. Snyder inspected the CTD wire. The weight had to be brought back on board initially as the wire out counter was not functioning. The weight cast was restarted at 1140.

The Profiling Reflectance Radiometer (PRR) was deployed at 1200

A 1000-m CTD cast was conducted at 1335. After the cast ended, the ship headed to station ALOHA

The ship stopped en route to Station ALOHA at 1455 to deploy an antonymous glider. The glider began a test dive at 1720 and was back at the surface at 1805. Once the data quality had been confirmed from the glider pilot at UH the ship continued to Station ALOHA.

September 15, 2006

The ship arrived to Station ALOHA at 0000. The sediment traps array was deployed immediately with the spar being released at 0110.

One 200-m CTD cast was conducted before the gas array deployment. The gas array was deployed at 0500.

One dee CTD cast was conducted at 0725.

Five 100-m CTD casts were conducted this day.

The ATE sampler was not deployed because communication with the device could not be established.

Three net tows were conducted at 1000, 1220 and at 2200.

September 16, 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 0700, at 22 45.2'N, 158 6.8'W, about 6.2 nm W from ALOHA station.

The primary productivity array was deployed at 0545 and recovered at 1820 at 22 44.91'N, 158 1.29'W, about 5nm NNW from ALOHA.

One FRRf cast was conducted a 1300.

One PRR cast was conducted at noon time.

Three net tows were conducted at 0010 and 1000 and 2200.

September 17, 2006

One 1000-m CTD casts were conducted at ALOHA, and one 200-m CTD cast near the MOSEAN mooring (Station 51) and a second near the WHOTS mooring (Station 50).

The sediment traps array was recovered at 0615 at 22 46.3'N, 158
8.7'W.

The array drifted NW approximately 10 nm from ALOHA Station.

One PRR cast was conducted at 1200.

One FRRf cast was conducted at Station ALOHA at 1230.

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

September 18, 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
Elizabeth Hambleton/Mike Rappe:	Marine bacterioplankton community structure/UH