HOT-211 Chief Scientist's Cruise Report
R/V Ka'Imikai-O-Kanaloa
May 26 - 30, 2009
Cruise ID: KOK0909
Departed: May 26, 2009 at 0900 (HST)
Returned: May 30, 2009 at 0800
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: Daniel Fitzgerald, Elly Speicher

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 the first cruise day 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 27 to 29.

3) Station 50, is the site of the WHOTS Mooring, located at 22° 46'N, 157° 53.83'W was to be occupied on the 4th day of the cruise for about 1 hour.

4) Two bottom moored sediment traps were to be deployed on the 4th day of the cruise at the northeastern edge of the ALOHA circle (22 51.75'N, 157 55.00'W).

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 to be followed by one 200 m CTD cast to collect water for incubation experiments, and one 1000-m CTD cast to collect water for the primary production array. This was to be followed by the deployment of the array with incubation experiments (primary production array) that was to be in the water for 12 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.

Another free-drifting array (gas array) was to be deployed for 24 hours for incubation experiments on May 28

A plankton net was to be towed near noon and midnight for 30-min intervals on May 27 and 28 at Station ALOHA.

After CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating sediment trap array and the gas array.

After recovering the arrays, the ship was to transit to Station 50 to conduct a one-hour 200-m CTD yo-yo cast

After station 50 was occupied, the ship was to transit to Sta. ALOHA to conduct a PRR cast, and

two AC9 casts, after which the ship was to transit to deploy the sediment trap moorings.

Two sediment trap moorings were to be deployed in the northeastern edge of the ALOHA circle, after which the ship was to transit back to Snug Harbor.

A trace metal sampler was to be deployed on May 28 to collect a trace metal clean surface seawater sample.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on May 26, 28 and 29. After the PRR, a Hyerpro was to be deployed also for half-hour periods on May 26 and 28.

A package including a Wet Labs AC9, and a SeaBird Seacat was to be used to profile the upper 200 m at Sta. ALOHA at noon time on May 28 and 29.

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

2. SCIENCE PERSONNEL

Cruise Participant	Title	Affiliation
Susan Curless	Research Associate	UH/BEACH
Eric Grabowski	Research Associate	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Binglin Li	Graduate Student	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Research Associate	UH/BEACH
Blake Watkins	Marine Engineer	UH/BEACH
Jay Wheeler	Research Associate	UH/BEACH
Ghizlane Ahrouch	Research Associate	UH/PO
Ian Hawkins	Research Associate	UH/PO
Paul Lethaby	Research Associate	UH/PO
Fernando Santiago-Mandujano	Chief Scientist - Res. Assoc.	UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Bert Wissig	Graduate Student	HPU/PO
Dan Fitzgerald	Marine Technician	OTG
Elly Speicher	Marine Technician	OTG

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned, with minor delays in the schedule due to computer failures. One PRR cast was canceled due to computer failure.
One 1000-m CTD cast was conducted at Kahe station. Twelve 1000-m CTD casts, one 200-m, one 100-m, and two deep casts were conducted at Station ALOHA. One 200-m CTD yo-yo cast was conducted near the WHOTS mooring (station 50).

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

Two near-bottom moorings with two sediment traps each were successfully deployed on the last day of the cruise.

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

The AC9 was deployed near noon on May 28 and 29.

The PRR was deployed two times near noon time. The Hyperpro was deployed two times.

A trace metal sample was taken (ATE).

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph system. There was no heading correction for the gyro, as the MAHRS was sent out for recalibration. This will affect the underway ADCP data, but not the on-station data.

The ship's A-frame performance was marginal due to a hydraulic fluid leak through a broken gasket. Nevertheless, it was possible to conduct the net tows, AC9, PRR and Hyperpro deployments with the A-frame, turning it on and off between operations. The two sediment trap mooring deployments were conducted using the ship's port crane.

Winds during the cruise were between 7 and 9 kt, from the NE, with smooth seas and clear skies the first and last days, and with light drizzle the second and part of the third day.

We arrived back at Snug Harbor on May 30 at 0800.

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. They were very helpful in assisting the science party during the equipment loading.

Technical support during this cruise was excellent. OTG personnel were available at any time during the cruise to assist in our work and made things much easier for us. OTG personnel were not available during loading due to schedule conflicts, but the ship's crew were able to assist us with the loading operations.

5. DAILY REPORT OF ACTIVITIES (HST)

May 22, 2009; Loading Day

The equipment was loaded on this day.

26 May 2009

Hour (HST) Activity
0900 Departed from Snug harbor
0930 Abandon ship and fire drills, followed by safety briefing and science meeting
1200 Arrived at Kahe Station. 400 lb weight cast to 500 m
1300 PRR cast
1330 Hyperpro cast
1440 Station 1 Cast 1, 1000-m CTD cast. Problems with acquisition computer. Switched to backup computer and completed cast.

27 May 2009

Hour (HST) Activity
0145 Arrived at ALOHA station
0237 Deployed sediment traps at 22 42.12'N, 158 0.75'W
0311 Station 2 cast 1, 200-m CTD cast
0500 Deployed primary productivity array at 22 43'N, 158 0.2'W
0522 Station 2 cast 2 100-m CTD cast

0620 Station 2 cast 3, deep CTD cast
1015 Net tow
1140 Station 2 cast 4, 1000-m CTD cast
1345 Net tow
1431 Station 2 cast 5, 1000-m CTD cast
1655 Station 2 cast 6, 1000-m CTD cast
1900 Recovered primary productivity array at 22 41.7'N, 158 2.09'W
2006 Station 2 cast 7, 1000-m CTD cast
2200 Net tow
2300 Station 2 cast 8, 1000-m CTD cast

28 May 2009

0100 Net tow
0205 Station 2 cast 9, 1000-m CTD cast
0420 Deployed Gas array at 22 43.64'N, 158 0.08'W
0450 Station 2 cast 10, 1000-m CTD cast
0700 ATE sample taken
0756 Station 2 cast 11, 1000-m CTD cast
1015 Net tow
1100 Station 2 cast 12, 1000-m CTD cast
1220 PRR cast after two unsuccessful attempts, during the first one the PRR drifted away from the ship due to a surface current, and during the second the PRR tilted from its vertical position.
1310 Hyperpro cast
1345 AC9 cast
1435 Station 2 cast 13, 1000-m CTD cast
1700 Station 2 cast 14, 1000-m CTD cast
1808 Transit to pump ship's tanks
2004 Station 2 cast 15, 1000-m CTD cast
2200 Net tow
2300 Station 2 cast 16, deep CTD cast

Winds from NNE at 7 Kt with clear sky and smooth seas.

29 May 2009

0440 Recovered sediment traps array at 22 37.6'N, 158 5.28'W
0600 Recovered Gas array at 22 40.0'N, 158 3.06'W
0830 Station 50 cast 1, 200-m CTD yo-yo cast, 200-m from WHOTS buoy
1005 AC9 cast
1100 AC9 cast
1237 PRR's computer crashed before PRR cast. Unable to conduct cast.
1438 Deployed Sediment Traps Mooring #14, 22 51.744'N, 157 55.12'W
1602 Deployed Sediment Traps Mooring #15, 22 51.801'N, 157 53.319'W

Easterly winds at 9 Kt.

May 30, 2009

Arrived at Snug Harbor at 0800. 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
Mark Brzeznski	Silica production and dissolution rate measurments/UCSB

Additional programs

Investigator:	Project/Institution:
Edward Boyle	Trace metals/MIT
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide/CMORE/UH

Additional sampling during this cruise

Investigator:	Project/Institution:
Kristen Fogaren/Eric DeCarlo	Kilo Nalu Nearshore Reef Observatory Project/UH
Solange Duhamel	The role of alkaline phosphatase activity in DOP utilisation in the NPSG/CMORE/UH
Huei-Ting Lin/James Cowen	Subseafloor biosphere project/UH