HOT-196: Chief Scientist Report

Chief Scientist: Paul Lethaby

HOT-196 Chief Scientist's Cruise Report
R/V Ka' imikai-O-Kanaloa
October 1 – 5, 2007

Cruise ID: KOK0713
Departed: October 1, 2007 at 0910 (HST)
Returned: October 5, 2007 at 0845 (HST)
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: Kuhio Vellalos and Elly Speicher

1. SCIENTIFIC OBJECTIVES

The objective of the cruise is to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations will 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 will be occupied on the first day of the cruise for about 2 hours.
2) Station 2, referred to as Station ALOHA is defined as a circle with a 6 nautical mile radius centered at 22° 45'N, 158°W. This is the main HOT station and will be occupied during the 2nd, 3rd, and 4th days of the cruise.
3) Station 52, is the site of the WHOTS Mooring, located at 22° 40.208'N, 157° 57.001'W will be occupied on the 4th day of the cruise for about 1 hour.
4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W will be occupied on the 4th day of the cruise for about 2 hours.

Upon arrival to Station Kahe a 400 lb. weight-test cast, one CTD cast to 1000 m, and a PRR cast was to be conducted at this location in the afternoon of October 1st. A hand deployed surface net tow was to be conducted off the stern during the CTD cast. The single CTD cast was to be conducted 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 were satisfactorily completed, the ship was to proceed 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 a shallow CTD cast to 200 m. A second CTD cast to 1000m was to collect water for the 12 hour incubation experiment which was to be deployed on the morning of October 2nd before sunrise. A full-depth CTD cast was to be conducted after the

deployment of the primary production array, 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 on October 3rd.

One free-drifting array (gas array) was to be deployed for 24 hours of incubation experiments on the morning of October 3rd.

A plankton net was to be towed near noon and midnight for 30-min intervals on October 2nd and 3rd at Station ALOHA. Additional hand deployed surface net tows were to be made throughout the cruise at opportune moments.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on October 1st, 3rd, and 4th.

A Wet Labs AC9, was to be used to profile the upper 200 m at Station ALOHA around noon time on October 3rd and 4th.

After CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating sediment trap array on the morning of October 4th. Following recovery of the sediment traps, the gas array was to be recovered en route back to Station ALOHA.

After arrival at ALOHA the light casts (PRR, AC9) were to be conducted and the ship was to transit to Station 52 (WHOTS) for a one hour 200-m Yo-Yo CTD cast.

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 back to Snug Harbor.

The following instrumentation were to collect data throughout the cruise: shipboard ADCP, underway thermosalinograph, fluorometer, and meteorological suite.

2. SCIENCE PERSONNEL

Cruise Participant	Title	Affiliation
BEACH group:		
Karin Björkman	Research Specialist	UH/BEACH
Susan Curless (Watch Leader)	Research Associate	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Adrianna Harlan	Research Associate	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Technician	UH/BEACH
Ken Doggett	Research Associate	UH/BEACH
PO group:		
Paul Lethaby	Chief Scientist – Res. Assoc.	UH/PO
Barbara Mayer	Volunteer	UH
Fernando Santiago-Mandujano(Watch Leader)	Research Associate	UH /PO
Justin Smith	Undergraduate Student	UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Ben Pittenger	Volunteer	UH
Others:		
Lucas Beversdorf	Graduate Student	UH
Elley Speicher	Marine Technician	OTG
Donn Viviani	Graduate Student	UH
Binglin Li	Graduate Student	UH
Misty Miller	Technician	UH/Rappé
Kuhio Vellalos	Marine Technician	OTG
Sam Wilson	Scientist	UH/CMORE

3. GENERAL SUMMARY

Most operations during the cruise were accomplished as planned. There were some slight delays due to the transit speed of the ship but this did not impact the schedule or the science adversely. The recovery of the glider was not accomplished as sea conditions prevented a safe launch of the small boat.

Prior to departure the ADCP failed during dockside tests and was not available for the cruise.

K. Doggett cut his left thumb on October 4th while sharpening a knife and received medical attention from the Captain.

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

The array of floating sediment traps, the gas array, and the primary productivity incubation array were successfully deployed and recovered. All arrays drifted SW.

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

The PRR was deployed three times at noon time.

The AC9 was deployed three times around noon, the later casts being back-to-back profiles.

The thermosalinograph, fluorometer, and the ship's meteorological instruments ran without interruption throughout the cruise.

Winds were easterlies between 20 and 25 kt, with occasional rain showers.

We arrived back at Snug Harbor on October 5th at 0845.

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

The R/V Ka'imikai-O-Kanoloa 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 28, 2007 – Loading Day

Heavy equipment, two laboratory vans and the blue equipment van were loaded during this day. The CTD wire was inspected and re-terminated by J. Synder.

October 1, 2007

The R/V Ka'imikai-O-Kanoloa departed Snug Harbor at 0815. Emergency and abandon ship drills were conducted at 0845 followed by a safety briefing and science meeting in which cruise activities were briefly reviewed and safety issues were re-emphasized.

Arrived at Kahe Station at 1100. CTD wire weight cast (400 lbs) to 500 m, during which J. Snyder inspected the CTD wire.

The Profiling Reflectance Radiometer (PRR) was deployed at 1215.

A 1000 m CTD cast was conducted at 1229. A hand deployed surface net tow was made from the stern during the CTD cast. The ship the headed for station ALOHA at 1340 after the successful completion of operations at KAHE.

October 2, 2007

Sediment traps were deployed at 22 41.73'N 157 55.57'W, 5 miles south east of the center at 0045.

Two 200 m CTD casts were conducted at 0133 and 0244 the later to collect water for the primary production array which was deployed at 2 45.82'N 157 54.29'W, 5 miles to the east of the center at 0507. The second CTD cast was scheduled to 1000m but due to time constraints was changed to 200m in order not to delay the deployment of the primary production array.

One deep cast to approximately 10 m off the bottom was conducted at 0543.

Five 1000 m CTD casts were conducted on this day as part of the 36hr burst period with the first cast beginning at 1100. The ATE sampler was deployed at 1330. Three net tows were conducted at 1000, 1230 and 2200.

The primary productivity array was recovered at 1833. The array drifted approximately 2.3 nm W from the deployment site to 22 45.66'N 157 56.72'W.

October 3, 2007

Seven 1000 m CTD casts were conducted on this day, and a second deep cast was conducted at 2303.

The gas array was deployed at 22 44.6'N 157 54.9'W 5 nautical miles to the east of the center at 0450.

One PRR cast was conducted at 1210.

An AC9 cast was conducted at 1240.

Two nighttime net tows were conducted at 0100 and 2200, and one daytime at 1000.

A series of hand deployed surface net tow were conducted at 1735.

October 4, 2007

The sediment trap array was recovered at 0645 at 22 40.58' N 158 10.05' W. The array drifted about 10 nm SW from ALOHA Station.

The gas array was recovered at 22.43.24' N 158 1.11' W at 0815.

One one-hour 200 m CTD yo-yo cast was conducted near the WHOTS mooring (Station 52) at 1007.

One PRR cast was conducted at 1200 followed by an AC9 cast at 1220.

Sea conditions prevented the safe launch of the small boat which resulted in the recovery of the glider being cancelled. The contingency plan was that the glider would be re-programmed to make it's way to inshore waters off the north shore of O'ahu where it could be picked up with a smaller vessel.

With additional time a second yo-yo cast was conducted at Station 52 to 200m at 1353.

One near bottom CTD cast was conducted at Kaena station at 2117

October 5, 2007

Arrived at Snug Harbor at 0845 for a 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
Various CMORE PI's	Microbial RNA/DNA collection/CMORE

Additional programs

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