HOT-171: Chief Scientist Report

Cruise ID: TUIM09MV
Departed: July 15, 2005 at 0900 (HST)
Returned: July 19, 2005 at 0800
Vessel: R/V Melville
Operator: University of California, San Diego
Master of the Vessel: Captain Chris Curl
Chief Scientist: Thomas K. Gregory
Resident Marine Technician: Cambria Colt

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 July 15 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.

3) Station ST-12 is the site of the sediment trap mooring, is located at 22º 50.5’N, 157º 52.2’W and will be occupied on the 4th day of the cruise for about 4 hours.

4) Station 51, is the site of the MOSEAN Mooring, is located at 22º 45'N, 158º 6’W and will 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 21º 50.8'N, 158º 21.8'W and will 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.

Upon arrival at Station ALOHA, the free-drifting sediment trap array was to be deployed, followed by two 200 m CTD casts to collect water for the gas array and then the first deep cast. The sediment trap array was to stay in the water for about 52 hours, and the gas array for about 24 hours. After this, 1000-m CTD casts at strict 3 hour intervals would follow 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 primary productivity experiments on July 17.

A sediment trap mooring was to be deployed on July 18.

A hand-held plankton net was to be deployed for 20-min intervals several times during the cruise by C. Mahaffey.

Zooplankton net tows were to be conducted by C. Hannides on six occasions; three near midnight and three near noontime.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on two days.

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 on four separate occasions including one nighttime and three daytime casts.

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

After recovering the floating sediment traps, the ship was to transit to Sta. 51 to conduct a 200-m CTD cast followed by a return to Station ALOHA for optics work and then finally to Station Kaena for a near-bottom CTD cast.

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

2. SCIENCE PERSONNEL

Cruise Participant	**Affiliation**	**Title**
Alvarez, Victoria	UH/PO	Volunteer
Beversdorf, Lucas	UH/BEACH	Graduate Student
Bjorkman, Karin	UH/BEACH	Research Specialist
Church, Matthew	UH/BEACH	Research Oceanographer
Clemente, Tara	UH/BEACH	Research Associate
Curless, Susan	UH/BEACH	Research Associate
Fong, Allison	UH/BEACH	Graduate Student
Fujieki, Lance	UH/BEACH	Computer Specialist
Grabowski, Eric	UH/BEACH	Research Associate
Gregory, Thomas	UH/BEACH	Chief Scientist
Hannides, Cecelia	UH/BEACH	Graduate Student
Hannides, Angelos	UH/BEACH	Graduate Student
Harlan, Adriana	UH/BEACH	Technician
Jachowski, Nicholas	UH/BEACH	Volunteer
Kilpatrick, Thomas	UH/PO	Volunteer
Lethaby, Paul	UH/PO	Research Associate
Mahaffey, Claire	UH/BEACH	Postdoctoral Researcher
Mahdi, Leena	UH/BEACH	Scientist
Mitchell, James	UH/BEACH	Scientist
Sadler, Dan	UH/BEACH	Chief Scientist
Santiago - Mandujano, Fernando	UH/PO	Research Associate
Shacat, Joseph	UH/PO	Research Associate
Valenciano, Mark	UH/PO	Electronics Technician
Watkins, Blake	UH/BEACH	Marine Engineer
Watkins, Jonathan	JSU/BEACH	Graduate Student

3. GENERAL SUMMARY

Most objectives for HOT 171 were successfully completed. We were unable to complete any PRR casts due to a problem with the communication cable. The CTD cast schedule at Station ALOHA had to be rearranged due to a problem with the pressure sensor on the primary CTD and the need to deploy the gas array in a timely fashion. All CTD casts planned for Station ALOHA were conducted as planned albeit in a different order except for the second deep cast which was cancelled. We did not do a cast at Station Kaena.

4. R/V MELVILLE, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Melville maintained the excellent ship support for our work we have come to expect from other vessels in the UNOLS fleet. The officers, crew and Resident Marine Technician were most helpful and accommodating. They showed enthusiasm and concern for our work and were very flexible in receiving changes in our operational schedule.

5. DAILY REPORT OF ACTIVITIES (HST)

July 14, 2005; Loading Day

Equipment loaded during this day. CTD wire was re-terminated and CTD system tested.

July 15, 2005

The ship departed from Snug harbor at 0900. We arrived at Station Kahe at 1200. No weight was available for our usual weight cast so a tension test to 1200 lbs. was performed on deck. A 1000 m CTD cast was performed after which we steamed to Station ALOHA.

We arrived at Station ALOHA at 2230 and began preparations for our floating sediment trap array deployment.

July 16, 2005

The sediment trap array was deployed at 0010 after which we started the first of two casts to collect water for the gas array.

C. Mahaffey conducted a net tow at 0605.

C. Hannides conducted net tows at 0137, 1015 and 1307.

The gas array was deployed at 0600

Problems with the pressure sensor on the CTD were experienced on the first deep cast. The package was recovered and the spare CTD was installed which worked fine. This incident, combined with the need to deploy the gas array at dawn, necessitated the postponement of the PO deep and shallow casts to the end of the cruise. Other casts were rearranged to accommodate sampling needs.

Two 200 m casts, six 1000 m casts and one aborted deep cast were performed this day.

One AC9/FRRf cast was conducted at 2222.

July 17, 2005

Six 1000 m and one 4800 m CTD casts were conducted on this day.

The primary production array was deployed at 0606, was recovered at 2005 and had drifted northwest.

The gas array was recovered at 0725 and had drifted northwest.

C. Hannides conducted net tows at 0142, 1017, and 1400.

AC9/FRRf casts were conducted at 1231.

July 18, 2005

One 200 m cast was performed at Station 51.

The deep moored sediment trap was deployed at 0551 near 22º 49.637, 158º 05.365.

AC9/FRRf casts were conducted at 1330 and 1435.

The sediment trap array was recovered at 0650. The array drifted northwest.

C. Hannides conducted net tows at 0142 and 1448.

C. Mahaffey conducted a net tow at 0601.

July 19, 2005

Arrived at Snug Harbor at 1030 and completed a full offload.

Sub component programs:

Investigator:	Project/Institution:
Bob Bidigare	HPLC pigments/UH
Mike Landry	Zooplankton dynamics/UH
John Dore	CO2 dynamics/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

Ancillary research during this cruise:

Investigator:	Project/Institution:
Claire Mahaffey	Assessment of Nitrogen Fixation Rates/UH
Matthew Church	Bacterial production and dynamics/UH
Stuart Donachie	Marine Fungi/UH