

HOT-177: Chief Scientist Report

Cruise ID: KM 06-01
Departed: Jan. 23, 2006 at 0900 (HST)
Returned: Jan. 27, 2006 at 0800
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Gray Drewry
Chief Scientist: Thomas K. Gregory
OTG Technicians: Tim McGovern and Dan Fitzgerald

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 the first day of the cruise 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, 158°W. This is the main HOT Station and was to be occupied for 3 days.
- 3) Station 51, is the site of the MOSEAN Mooring, is located at 22° 45'N, 158° 6'W and 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, is located at 22° 46.1'N, 157° 53.4'W and 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 and 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.

Upon arrival at Station ALOHA, we were to perform CTD casts to collect water for the gas array and other experiments and assays following the deployment of the sediment trap array. Optics work was to be performed on the second day of the cruise. The 36 hour period was to begin on the second day of the cruise.

Three free-drifting arrays were to be deployed on this HOT cruise including the gas array, primary productivity array and sediment trap array.

Phytoplankton net tows were to be conducted by B. Watkins on several occasions throughout the cruise.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on three 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 recover the floating sediment trap array. Following this operation, we were to perform CTD casts at both MOSEAN and WHOTS mooring and then transit to Station Kaena.

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

2. SCIENCE PERSONNEL

Appelgate, Bruce	UH/OTG	Director, OTG
Bjorkman, Karin	UH/BEACH	Research Specialist
Chee, Brian	UH/OTG	Computer Network Specialist
Curless, Susan	UH/BEACH	Research Associate
Defelice, Suzanne	UH/PO	Research Associate
Doggett, Ken	UH/BEACH	Research Associate
Fitzgerald, Dan	UH/OTG	Marine Technician
Fujieki, Lance	UH/BEACH	Computer Specialist
Grabowski, Eric	UH/BEACH	Research Associate
Gregory, Thomas	UH/BEACH	Chief Scientist
Harlan, Adriana	UH/BEACH	Research Associate
Lethaby, Paul	UH/PO	Research Associate
McGovern, Tim	UH/OTG	Marine Technician
Morton, Dan	UH/OTG	Computer Network Specialist
Sadler, Dan	UH/BEACH	Research Associate
Santiago - Mandujano, Fernando	UH/PO	Research Associate
Taylor, Keali'imanauoakeahi	UH/BEACH	Graduate Student
Uchikawa, Joji	UH/PO	Graduate Student
Watkins, Blake	UH/BEACH	Marine Engineer

3. GENERAL SUMMARY

Operations on this cruise were hampered by delays and equipment failures. The following is a list of problems and operations omitted and the reasons for the omission.

- No deep casts – insufficient time
- No operations at MOSEAN, Kahe or Kaena - insufficient time
- Did not get all six net tows – lost net and insufficient time
- No sediment trap array – insufficient deployment time available
- Abbreviated gas array sampling – insufficient time to collect water required
- Lost TSRB – tether to gas array parted
- Incomplete AC9/FRRF deployments – problems with instrumentation

4. R/V Kilo Moana, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Kilo Moana maintained the excellent ship support for our work we have come to expect from other vessels in the UNOLS fleet. The officers, crew and OTG technicians were most helpful and accommodating. They showed enthusiasm and concern for our work and were very flexible in receiving changes in our operational schedule. That said, the issue regarding the load testing of the CTD wire was frustrating. Precious cruise time was wasted in the transit back to Waianae to retrieve the dynamometer. This delay could have been avoided with thorough planning by OTG staff.

5. DAILY REPORT OF ACTIVITIES (HST)

Jan. 20, 2006; Loading Day

Equipment loaded during this day.

Jan. 23, 2006

The ship departed from Snug harbor at 0900. We began Station Kahe operations around noon with a load test on the wire instead of our usual weight cast. The wire broke thus failing the load test. We conducted a PRR cast and then began transit for Station ALOHA. Station Kahe will be completed if time allows at the end of the cruise.

The CTD wire was reterminated and tested multiple times. To briefly summarize, the wire failed repeatedly. Problems with the winch wire tensiometer were noted: it was unknown whether the tensiometer was giving correct readings and the unit of measurement (pounds or kilograms) was also in question. It was decided to return to Waianae boat harbor to retrieve the OTG dynamometer so a proper test of the wire could be conducted.

The ship encountered engine problems in the evening of this day. These problems caused a further delay of about three hours.

Jan. 24, 2006

We left Waianae harbor at around 0530 with the dynamometer aboard bound for Station ALOHA. Tests of the CTD wire using the dynamometer showed that the wire was adequate for our purposes. It withstood a 4700 lb. static load for four minutes. These tests also showed that the winch tensiometer was underestimating the load by a factor of three.

We arrived at Station ALOHA at 1300 and immediately performed a net tow. The net was lost due to a line failure. A spare net is aboard and will be used for subsequent net tows.

The first 1000 m cast began at 1620. Communication problems with the CTD package resulted in further delays in our CTD cast schedule. Our next cast of the cruise was initiated at 2130.

B. Watkins successfully performed plankton net tows at 2324.

Jan. 25, 2005

Eight 1000 m CTD casts were conducted on this day.

The gas array was deployed at 0138. Incubations are abbreviated: no oxygen samples deployed and the deeper three nitrogen depths have two instead of the usual four replicates. The TSRB was deployed with this array.

The primary production array was deployed at 0617 and recovered at 1854.

The PRR was deployed at 1237.

The ATE was deployed at 0930.

B. Watkins performed plankton net tows at 1020, 1301 and 2210.

Jan. 26, 2006

Four 1000 m casts were conducted this day at Station ALOHA. One 1000 m cast was performed at the WHOTS mooring.

The gas array was recovered at 0225. The TSRB had parted from the rest of the array and was lost.

The PRR was deployed at 1235.

AC9/FRRf casts were conducted at 1309 and 1415.

Jan. 27, 2006

Arrived at Snug Harbor at 0800 and completed a full offload.

Sub component programs:

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

Ancillary programs:

Investigator:	Project/Institution:
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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:
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Stuart Donachie/Mana Taylor	Marine fungi/UH