

HOT-174: Chief Scientist Report

Cruise ID: KM 05-17

Departed: Oct. 6, 2005 at 0900 (HST)

Returned: Oct. 11, 2005 at 0800

Vessel: R/V Kilo Moana

Operator: University of Hawaii

Master of the Vessel: Captain Rick Myer

Chief Scientist: Thomas K. Gregory

STAG Technicians: Gabe Foreman and 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 October 6 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 5th 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 5th day of the cruise for about 2 hours.
- 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 other experiments and assays. Optics work was to be performed on the second day of the cruise. The 36 hour period was to begin on the third day of the cruise.

Three free-drifting array 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 C. Mahaffey 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.

A Ramses optical profiler was to be deployed by L. Stal, J. Huisman and M. Stomp several times during the cruise.

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

Bjorkman, Karin	UH/BEACH	Research Specialist
Bullister, John	PMEL/PO	Scientist
Chung, Mung Fa	UH/PO	Volunteer
Church, Matthew	UH/BEACH	Research Oceanographer
Curless, Susan	UH/BEACH	Research Associate
Doggett, Ken	UH/BEACH	Research Associate
Foreman, Gabe	UH/STAG	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
Huisman, Jef	NIOO/BEACH	Scientist
Laney, Sam	OSU/BEACH	Graduate Student
Lethaby, Paul	UH/PO	Research Associate
Mahaffey, Claire	UH/BEACH	Scientist
McGovern, Tim	UH/STAG	Marine Technician
Rognstad, Mark	UH/HMRG	Engineer
Sadler, Dan	UH/BEACH	Research Associate
Santiago - Mandujano, Fernando	UH/PO	Research Associate
Shacat, Joseph	UH/PO	Research Associate
Smith, Justin	UH/PO	Volunteer
Stal, Lucas	NIOO/BEACH	Scientist
Stomp, Maayke	NIOO/BEACH	Scientist
Tottori, Steve	UH/PO	Electronics Technician
Watkins, Blake	UH/BEACH	Marine Engineer
Wisegarver, Dave	PMEL/PO	Research Associate

3. GENERAL SUMMARY

All objectives for HOT 174 were successfully completed. We were able to make use of the extra day given to us to perform experiments not possible within the scope of normal HOT cruises.

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 STAG 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.

5. DAILY REPORT OF ACTIVITIES (HST)

Oct. 5, 2005; Loading Day

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

Oct. 6, 2005

The ship departed from Snug harbor at 0900. We arrived at Station Kahe at 1140 and performed a weight cast, Ramses cast, PRR cast and then a 1000 m CTD cast after which we steamed to Station ALOHA.

We arrived at Station ALOHA at 2300 and immediately performed the first gas array cast.

Oct. 7, 2005

We performed three 200 m, one 700 m and three 1000 m CTD casts as scheduled.

The gas array was deployed at 0352

The ATE was deployed at 1025.

The Ramses was deployed at 0938 and 1620.

A PRR cast took place at 1158.

Back to back AC9/FRRF casts occurred at 1240 and 1342.

Oct. 8, 2005

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

The first deep cast was started at 0538 and the first 1000 m cast of the 36 hour period began at 1106.

The sediment trap array was deployed at 0124.

The gas array was recovered at 0407 and had drifted southwest.

The Ramses was deployed at 1239.

The PRR was deployed at 1302.

AC9/FRRf casts were conducted at 1335.

October 9, 2005

Seven 1000 m casts were conducted this day. The second deep cast was initiated at 2312

The primary production array was deployed at 0635, was recovered at 1901 and had drifted southwest.

C. Mahaffey performed a net tow at 0039 and 2141.

A Ramses cast was conducted at 1214

Oct. 10, 2005

During the second deep cast, a commercial fishing longline got wrapped around the CTD wire. We successfully recovered the package and freed the longline intact however this complication delayed recovery of the CTD.

One 500 m and one 200 m CTD cast were performed at MOSEAN, one 200 m cast was conducted at WHOTS and one 2500 m CTD cast was performed at Station Kaena.

The sediment trap array was recovered at 0718. The array drifted southwest.

AC9/FRRF casts were conducted at 0340 and 1104.

Oct. 11, 2005

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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Claire Mahaffey	Assessment of Nitrogen Fixation Rates/UH
Matthew Church	Bacterial production and dynamics/UH
Sam Laney	Optical characterization of photosynthetic parameters/OSU
Lucas Stal/Jef Huisman/Maayke Stomp	Plankton microbiology/optics
John Bullister	SF ₆ and CFC geochemistry/PMEL