HOT-201: Chief Scientist Report
Chief Scientist: Fernando Santiago-Mandujano
HOT-201 Chief Scientist's Cruise Report
R/V Kilo Moana
May 26-May 30, 2008

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Cruise ID: KM0806
Departed: May 26, 2008 at 0900 (HST)
Returned: May 30, 2008 at 0800
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Richard L Meyer
Chief Scientist: Fernando Santiago-Mandujano
OTG Electronics/Deck Operations Technicians: Elly Speicher, Tobin Chen

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 52, is the site of the WHOTS Mooring, located at 22 40.208'N, 157 57.001'W was to 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 21Â° 50.8'N, 158Â° 21.8'W 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. 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 followed by one 350 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 52 to conduct a one-hour 200-m CTD yo-yo cast

After station 52 was occupied, the ship was to transit to Sta. ALOHA to conduct a PRR cast, and two consecutive AC9/FRRf casts.

After the light casts, the water pump/winch system was to be tested at station ALOHA, after which the ship was to transit to station 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.

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

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 at noon time on May 28 and 29, and in the early morning on May 29.

The following instruments were to collect data throughout the cruise: shipboard ADCP, thermosalinograph, pCO2 system, and two anemometers.

2. SCIENCE PERSONNEL

Cruise Participant	Title	Affiliation
Karin BjÃ¶rkman	Research Specialist	UH/BEACH
Tara Clemente	Research Associate	UH/BEACH
Susan Curless	Research Associate	UH/BEACH
Solange Duhamel	Postdoc	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Technician	UH/BEACH
Sam Wilson	Scientist	UH/CMORE
Jesse Yonover	Undergrad Student	U Colorado
Paul Lethaby	Research Associate	UH/PO
Christin Shacat	Research Associate	UH/PO
Fernando Santiago-Mandujano	Chief Scientist â	Res. Assoc. UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Sarah Yasui	Undergrad Student	UH/PO
Darin Hayakawa	Technician	UH/Rappe

Rick Dubieilh Technician Nav Sea
Tobin Chen Marine Technician OTG
Elly Speicher Marine Technician OTG

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned.

One 1000-m CTD cast was conducted at Kahe station. Fourteen 1000-m CTD casts, one 350-m, and two deep casts were conducted at Station ALOHA. One 200-m CTD yo-yo cast was conducted near the WHOTS mooring (station 52).

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

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

The AC9/FRRf was deployed near noon two times, and one time at night.

The PRR was deployed three times near noon time.

A trace metal sample was taken (ATE).

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph and pCO2 system. One of the ship's anemometers had problems during the cruise and it was giving erratic wind direction measurements.

Winds were from ESE between 12 and 18 kt during most of the cruise, decaying to 10 kt on the last day. A westward current prevailed during the cruise with maximum speeds of up to 30 cm/s at 100 m.

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

4. R/V KILO MOANA, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Kilo Moana 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)

May 25, 2008; Loading Day

The equipment was loaded during this day. The CTD wire was reterminated.

May 26, 2008

The ship departed from Snug harbor at 0910. Safety briefing conducted at 0940, followed by a science meeting in which cruise activities were briefly reviewed, and safety issues were addressed. Fire and abandon ship drills were conducted at 1030 for all personnel.

Arrived at Kahe Station at 1200. CTD wire weight cast (1,300 lb) to 500 m, during which J. Snyder inspected the CTD wire.

The Profiling Reflectance Radiometer (PRR) was deployed at 1250

A 1000-m CTD cast was conducted at 1315. After the cast ended, the ship headed to station ALOHA.

The ship arrived to Station ALOHA at 2250. Deployed sediment traps array.

May 27, 2008

Conducted one 350-m CTD cast at 0000 (s2c1).

Conducted one 1000-m CTD cast at 0130 (s2c2).

The primary production array was deployed at 0400.

One deep CTD cast was conducted at 0454 (s2c3).

Bucket sample for microbial cultivation experiment by D. Hayakawa taken at 0900.

Net tow conducted at 1000

1000-m CTD cast at 1058 (s2c4).

Net tow conducted at 1340

1000-m CTD cast at 1420 (s2c5)

1000-m CTD cast at 1700 (s2c6).

Primary production array recovered at 1920. The array drifted 5 nm west

1000-m CTD cast at 2000 (s2c7).

Net tow conducted at 2215

1000-m CTD cast at 2250 (s2c8).

Winds were from ESE at 12-16 kt, with smooth seas. A westward current in the upper 200 m was present, with maximum values of up to 25 cm/s at about 100 m.

May 28, 2008

Net tow at 0100.

1000-m CTD cast at 0200 (s2c9)

Deployment of gas array at 0430

1000-m CTD cast at 0520 (s2c10).

1000-m CTD cast at 0800 (s2c11).

Trace metal sample (ATE) at 0930.

Net tow at 1000.

1000-m CTD cast at 1056 (s2c12).

PRR cast at 1213

AC9/FRRf cast at 1245

1000-m CTD cast at 1356 (s2c13)

1000-m CTD cast at 1700 (s2c14)

1000-m CTD cast at 2004 (s2c15)

Net tow at 2219

Near-bottom CTD cast at 2306 (s2c16).

Winds from ESE at 12-16 kt, with smooth seas. A westward current in the upper 200 m was present, with values of up to 25 cm/s at about 100 m.

May 29, 2008

AC9/FRRf cast at 0300

The sediment traps array was recovered at 0520 at 22 52.4'N, 158 11.16'W. The array drifted about 13 nm NW from ALOHA Station.

The gas array was recovered at 0700 at 22 45.8'N 158 5.6'W. The array drifted about 5.6 nm NW from ALOHA.

200-m CTD yo-yo cast near the WHOTS buoy (located inside the ALOHA circle) (s52c1).

AC9/FRRf cast conducted at 1022.

AC9/FRRf cast conducted at 1120.

PRR cast conducted at 1240.

The water pump/winch system was successfully tested at 1300

Near-bottom CTD cast at station Kaena at 1920 (s6c1).

Easterlies at about 10 kt with smooth seas. A westward current has been present with maximum speeds of up to 30 cm/s at 100 m.

May 30, 2008

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:
Mike Rappe	Marine bacterioplankton community structure/UH
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide/CMORE/UH
Rachel Foster/Zehr	Diversity and activities of nitrogen-fixing microorganisms/UCSC
Solange Duhamel	Determination of alkaline phosphatase activity at bulk and single cell levels

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