HOT-208 Chief Scientist's Cruise Report
R/V Kilo Moana
January 19 - 23, 2009

Cruise ID: KM0902
Departed: January 19, 2009 at 0900 (HST)
Returned: January 23, 2009 at 0800
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Brian Wehmeyer
Chief Scientist: Fernando Santiago-Mandujano
OTG Electronics/Deck Operations Technicians: Daniel Fitzgerald, Tim McGovern,Vic Polidoro

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 January 20 to 22.

3) Station 50, is the site of the WHOTS Mooring, located at 22? 46'N, 157? 53.83'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 21? 50.8'N, 158? 21.8'W was to be occupied on the 4th day of the cruise for about 2 hours.

A Sea Glider was to be deployed upon arrival to Station Kahe.

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 to be followed by one 200 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 January 21

A plankton net was to be towed near noon and midnight for 30-min intervals
on January 21 and 22 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 50 to conduct
a one-hour 200-m CTD yo-yo cast

After station 50 was occupied, the ship was to transit to Sta. ALOHA to conduct
a PRR cast, and one AC9/FRRf cast, 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 trace metal sampler was to be deployed on January 21st to collect a trace
metal clean surface seawater sample.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour
periods near noon time on January 19, 21 and 22.

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 January 21 and 22, and
in the early morning on January 22.

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 Bjorkman	Research Specialist	UH/BEACH
Tara Clemente	Research Associate	UH/BEACH
Susan Curless	Research Associate	UH/BEACH
Ken Doggett	Research Associate	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Eric Grabowski	Research Associate	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Research Associate	UH/BEACH
Blake Watkins	Marine Engineer	UH/BEACH
Jay Wheeler	Research Associate	UH/BEACH
Sam Wilson	Scientist	UH/CMORE
Allyn Fetherolf	Graduate Student	UH/PO
Cameron Fumar	Undergrad Student	UH/PO
Paul Lethaby	Research Associate	UH/PO
Fernando Santiago-Mandujano	Chief Scientist - Res. Assoc.	UH/PO
Christin Shacat	Research Associate	UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Stephanie Wagenhauser	Undergrad Student	UH/PO
Jeff Krause	Scientist	UCSB
John Bullister	Scientist	PMEL
Dave Wisegarver	Technician	PMEL
Dan Fitzgerald	Marine Technician	OTG
Tim McGovern	Marine Technician	OTG
Vic Polidoro	Marine Technician	OTG

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned, with some delays in the schedule due to the large swell, which forced us to lower the CTD at a very low speed to prevent slack in the wire. Some of the 1000-m CTD casts took between 1.5 and 2 hr to complete. One of the 1000-m CTD casts during the 36-hr burst period had to be canceled, and another one had to be conducted to 500-m due to delays in the schedule. The CTD wire had to be reterminated once due to a bend in the wire.

One 1000-m CTD cast was conducted at Kahe station. Eleven 1000-m CTD casts, one 500-m, one 200-m, and two deep casts were conducted at Station ALOHA. Two 200-m CTD yo-yo casts were conducted near the WHOTS mooring (station 50), and one 2400-m CTD cast was conducted at Station Kaena.

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

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

The AC9/FRRf was deployed near noon on January 21. Unfortunately the instrument was unresponsive after this cast and could not be deployed for the rest of the cruise.

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.

Winds during the cruise were between 15 and 25 kt, from the SSW the first day, turning slowly

clockwise into easterlies. A current towards the SSW of about 20 cm/sec in the upper 100 m was present the first two days at station ALOHA. A swell of 5-15 ft was present during the cruise.

We arrived back at Snug Harbor on January 23 at 0800.

A scientist from UCSB (Janice Jones) was included as a participant in the original cruise plan, however she was not able to participate because she hurt her foot on board the R/V Kilo Moana as she was coming down from her bunk on the night prior to the cruise departure (January 18th). Captain Wehmeyer took her to the hospital, where she was treated and released. The Captain filed an incident report.

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)

January 16, 2009; Loading Day

The equipment was loaded on this day.

January 19, 2009

The ship departed from Snug harbor at 0915, departure delayed because the tug boat was late to escort the ship. Safety briefing by the Captain conducted at 1000, followed by a brief science meeting. Fire and abandon ship drills were conducted at 1045 for all personnel.

Arrived at Kahe Station at 1200. A Sea Glider was deployed at 1215.

A CTD wire weight cast (1,300 lb) to 1000 m was conducted at 1230, during which J. Snyder inspected the CTD wire and winch.

The Profiling Reflectance Radiometer (PRR) was deployed at 1320

A 1000-m CTD cast was conducted at 1408. After the cast ended, and after confirming that the Sea Glider was working properly, the ship headed to station ALOHA.

The ship arrived to Station ALOHA at 2330.

January 20, 2009

Deployed sediment traps array at 0012.

Conducted one 200-m CTD cast at 0115 (s2c1).

Conducted one 1000-m CTD cast at 0228 (s2c2).

Transit to pump ship's tanks at 0345.

The primary production array was deployed at 0515.

One deep CTD cast was conducted at 0536 (s2c3).

Transit to pump ship's tanks at 0930.

Net tow conducted at 1030

1000-m CTD cast at 1148 (s2c4), start 36-hr CTD burst period.

1000-m CTD cast at 1429 (s2c5)

CTD cast scheduled for 1630 canceled due to time constraints

Transit to pump ship's tanks at 1630.

Primary production array recovered at 1830 at 22 41.31'N, 158 3.63'W.

1000-m CTD cast at 2000 (s2c6).

Net tow conducted at 2210

1000-m CTD cast at 2300 (s2c7).

Winds were 20-25 kt from SSW, with a large swell of 10-15 ft. A current towards the SSW of about 20 cm/sec was present in the upper 100 m at station ALOHA.

January 21, 2009

Net tow at 0110.

Transit to pump ship's tanks at 0150.

500-m CTD cast at 0240 (s2c8)

CTD wire was reterminated at 0400 due to a bend in the wire close to the rosette.

Deployment of gas array at 0450 (22 45.01'N, 158 0.02'W)

1000-m CTD cast at 0557 (s2c9).

1000-m CTD cast at 0831 (s2c10).

Transit to pump ship's tanks at 1016.

Net tow at 1120.

1000-m CTD cast at 1155 (s2c11).

Trace metal sample (ATE) at 1230. Sample taken during CTD cast.

PRR cast at 1250

AC9/FRRf cast at 1415

1000-m CTD cast at 1454 (s2c12)

1000-m CTD cast at 1815 (s2c13)

Transit to pump ship's tanks at 2013.

1000-m CTD cast at 2119 (s2c14)

Net tow at 2323

Winds were northeasterlies at 15-20 kt, with a persistent swell of 10-15 ft

January 22, 2009

Near-bottom CTD cast at 0038 (s2c15).

Canceled AC9/FRRf casts scheduled for 0300 and 1130, unable to communicate with the instrument.

The sediment traps array was recovered at 0700 at 22 33.61'N, 158 17.95'W.

The gas array was recovered at 0900 at 22 42.6'N, 158 3.03'W.

1.5-hr, 200-m CTD yo-yo cast near the WHOTS buoy conducted at 1100 (s50c1).

An visual inspection of the WHOTS buoy indicates that the starboard anemometer is not rotating as fast as the one on the port side, and seems to be damaged. A quick look at the real time data in the WHOI web site shows discrepancies between the data from these two instruments. The starboard anemometer may need to be repaired.
PRR cast conducted at 1300.

1-hr, 200-m CTD yo-yo cast near the WHOTS buoy conducted at 1500 (s50c2).
Near-bottom CTD cast at station Kaena (21? 50.8'N, 158? 21.8'W) at 2159 (s6c1).
Easterlies at about 15-19 kt.

January 23, 2009

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
Bullister/Wisegarver	CFC and SF6 tracer saturation levels in the water column/PMEL

Additional programs

Investigator:	Project/Institution:
Edward Boyle	Trace metals/MIT
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide/CMORE/UH