HOT-199: Chief Scientist Report
Chief Scientist: Eric Grabowski
HOT-199 Chief Scientist's Cruise Report
R/V Kilo Moana
January 28-February 1, 2008
Cruise ID: KM0801
Departed: January 28, 2008 at 0900 (HST)
Returned: February 1, 2008 at 0730 (HST)
Vessel: R/V Kilo Moana
Operator: University of Hawaii
Master of the Vessel: Captain Brian Wehmeyer
Chief Scientist: Eric Grabowski
OTG Electronics/Deck Operations Technicians: Kuhio Vellalos and Tobin Chen

1. SCIENTIFIC OBJECTIVES

The objective of the cruise is to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations will be occupied during the cruise, in the following order:
1) Station 1, referred to as Station Kahe, is located at 21ø 20.6'N, 158ø 16.4'W and will be occupied on the first day of the cruise for about 2 hours.
2) Station 2, referred to as Station ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22ø 45'N, 158øW. This is the main HOT station and will be occupied during the 2nd, 3rd, and 4th days of the cruise.
3) Station 52, is the site of the WHOTS Mooring, located at 22ø 40.208'N, 157ø 57.001'W and will 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 21ø 50.8'N, 158ø 21.8'W will be occupied on the 4th day of the cruise for about 3 hours.

Upon arrival to Station Kahe a 1,300 lb. weight-test cast to 500 m, one CTD cast to 1000 m, and a PRR cast was to be conducted at this location in the afternoon of January 28th. The single CTD cast was to be conducted 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 were satisfactorily completed, the ship was to proceed 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 shallow CTD casts to 200 m and one 1000 m cast to collect water for the Primary Production Array. After this, the free-drifting primary productivity array was to be deployed for 12 hours. A full-depth CTD cast was to be conducted after the deployment of the primary prodcution array, 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 on January 30th.

Another free-drifting array (gas array) was to be deployed for 24 hours for incubation experiments on January 30th. The gas array was to be recovered at 0800 on January 31st.

A plankton net was to be towed near noon and midnight for 30-min intervals on January 29th and 30th at Station ALOHA.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour
periods near noon time on January 30th and 31st.

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 Station ALOHA around noon time on January 30th and 31st and in the early morning on January 31st.

After CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating sediment trap array and the gas array on January 31st.

After recovering the arrays, the ship was to transit back to Station ALOHA to conduct light casts (PRR, AC9/FRRf).

After operations at Station ALOHA ended, the ship was to transit to Station 52 to conduct a one-hour 200-m CTD yo-yo 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 and chlorophyll samples for calibration, after which the ship was to transit to the fuel pier (pier 30).

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

2. SCIENCE PERSONNEL

BEACH group:

Cruise Participant	Title	Affiliation
Eric Grabowski	Chief Scientist - Res. Assoc.	UH/BEACH
Susan Curless	Research Associate	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Dan Sadler	Research Associate	

UH/BEACH
Binglin Li Graduate Student
UH/BEACH
Donn Viviani Graduate Student
UH/BEACH
Brett Updyke Technician
UH/BEACH
Blake Watkins Marine Engineer
UH/BEACH
Sam Wilson Scientist
UH/CMORE
Tara Clemente Research Associate
UH/BEACH
Jay Wheeler Research Associate
UH/BEACH

PO group:

Paul Lethaby Research Associate
UH/PO
Christin Shacat Research Associate
UH/PO
Fernando Santiago-Mandujano Research Associate
UH/PO
Jefrey Snyder Marine Technician
UH/PO
Sachiko Yoshida Volunteer UH/PO
Erica Westly Volunteer UH/PO
Michael Lethaby Volunteer
UH/PO

Others:
Cynthia Peacock Research Associate
UW
Mark Brzezinski Professor UCSB
Janice Jones Technician
UCSB
Sara Yeo Technician
UH/HIMB
Caitlin Andre-Colton Observer
ONR
Joseph Mackes Observer ONR
Chris MacDonald Observer ONR
Tobin Chen Marine Technician
OTG
Kuhio Vellalos Marine Technician OTG

3. GENERAL SUMMARY

Most of the operations during the cruise were conducted as planned and only minor delays were experienced.

One 500 m weight cast was performed with a 1,300 lb. weight and one 1000-m CTD cast was conducted at Station Kahe (1). Two near-bottom deep casts, thirteen 1000-m CTD casts, and

one 200-m casts were conducted at Station ALOHA (2). Two different one hour 200 m yo-yo cast were conducted near the WHOTS mooring (Station 52).

The array of floating sediment traps, the gas array, and the primary production array were deployed and recovered without any major incidents.
As the primary production array was released, the release hook shot up and hit the light pole which stopped the light and the radio transmitter from working. The ship took a position of the array and then proceeded to the center of the circle for the first PO deep cast. After, the ship found the array and stayed within sight of the array for the duration of the experiment. The array was recovered earlier than planned at 1700hrs to avoid loosing it in the dark.
All of the arrays drifted to the SW of ALOHA.
Primary Production Array - 3.9nm; 22 42.402N 158 3.227W
Gas Array - 6nm; 22 38.393W 158 6.301W
Sediment Trap Array - 11nm; 22 37.782 158 11.623

Six net tows were completed, three were conducted at night, and three during the day.

The AC9/FRRf was deployed around noon three times, and the FRRf was deployed one time at night. The flash card, in the MPAK data logger, won't reformat so there was limited space for more data. Only the FRRf was turned on for the night cast to save room for the back to back AC9/FRRf day time casts.

The PRR was deployed three times around noon.

A trace metal sampler (ATE) was deployed once. Upon recovery an air bubble was noticed in the sample bottle. This is an indication that the instrumentation may not have worked properly. To check this, the instrument was hooked back up to the computer. The ATE and computer could not communicate with one another. The computer and the ATE did communicate before deployment. As a result no ATE sample was taken on HOT-199.

The ADCP ran without interruption throughout the cruise, although a new bug popped up in the automated processing of the OS38 data. The data will need to be reprocessed.

The thermosalinograph did not run properly for about 16 hours starting on January 29th. Fresh water was found leaking into the intake of the thermosalinogrph. The problem was fixed by disconnecting the fresh water intake. After, the thermosalinograph ran without interruption for the remainder of the cruise.

The pCO2 system and the two anemometers ran without interruption throughout the cruise.

While OTG was troublshooting a problem with the timeserver,

the cable connecting the meteorological tower to the local and main logging machines was disconnected on Jday-030@02:09:30 to 06:49:31. For this four hour, thirty-nine minutes no meteorlogical data was recorded.

Winds were from the northeast between 20-27 knots during the course of the cruise with swells between 6-12ft.

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

The R/V Kilo Moana continues to maintain excellent ship support for our work.

The Captain and crew were most helpful and accommodating throughout the cruise. They were very flexible in receiving changes to our operational schedule. Throughout our cruise, the entire crew showed enthusiasm, concern, and dedication to our scientific mission.

Technical support during this cruise was excellent. OTG personnel were available at any time to assist in our work and helped keep operations running smoothly.

5. DAILY REPORT OF ACTIVITIES (HST)

January 25, 2008 - Loading Day

0900 - Heavy equipment, the blue storage van and all hand carried gear was loaded during this day.

CTD wire was reterminated.

January 28, 2008

Departed Snug harbor at 0900hrs
Science and Safety meeting at 0945hrs
Fire and boat drill at 1040hrs, all science personnel attended. All of the new personnel proceeded to the life rafts where the chief mate explained the proper way to deploy the life rafts.
Arrived station Kahe at 1130hrs, conducted a weight cast at 1140hrs, PRR at 1230hrs and a 1400-m CTD cast at 1300hrs.
Underway to station ALOHA at 1500hrs
Arrived station ALOHA at 2245hrs

January 29, 2008

The sediment trap array was deployed at 0018hrs. The array was deployed 2 nautical miles north of the center at the location of 22 47.024N, 158 0.011W.
One 200-m CTD cast was conducted in the early morning. This was followed by a 1000-m CTD cast to collect water for the primary productivity experiment.
The primary production array was deployed at 0515hrs at the

location of 22 46.0139N, 157 0.123W. As the array was released, the release hook shot up and hit the light pole which stopped the light and the radio transmitter from working. The ship took a position of the array and then proceeded to the center of the circle for the first PO deep cast.
At 0550hrs a near-bottom PO/CTD cast was conducted. After, the ship regained sight of the primary production array and then proceeded outside of the circle to pump tanks. The ship returned back in the circle for a net tow and got within sight of the primary production array. Until the recovery of the array the ship will keep it insight. The recovery has been moved to 1700.
The 36hr burst period started at 1150hrs with a 1000-m CTD cast. The second CTD cast of the period started at 1430hrs. The ISUS was installed in the rosette and connected before the first CTD cast of the 36hr period. The ISUS will be removed for the second deep cast. A total of five 1000-m CTD casts were conducted on this day.
Three net tows were conducted at 1115hrs, 1350hrs and 2200hrs by Blake Watkins.
The primary production array was recovered at 1700hrs. The array drifted about 3.9 nautical miles SW from the center of station ALOHA at the location of 22 42.402N 158 3.227W.
Due to time constraints the ATE was rescheduled for 0700hrs on January 30th.
Weather conditions observed at 1500; winds from the NE at 23 knots, seas 8-10ft, cloud cover around 4/8.

January 30, 2008

The gas array was deployed at 0445hrs at the location of 22 43.519N 158 1.867W
The ATE was deployed at 0930hrs. Upon recovery an air bubble was noticed in the sample bottle. This is an indication that the instrumentation may not have worked properly. To check this, the instrument was hooked back up to the computer. The ATE and computer could not communicate with one another. The computer and the ATE did communicate before deployment.
One PRR cast was conducted at 1215hrs.
One AC-9/FRRf cast was conducted after the PRR cast at 1250hrs. The flash card, in the MPAK data logger, won't reformat so there is limited space for more data. There are three more casts scheduled. We will only turn on the FRRf for tomorrow mornings cast and then try to capture all the data for the two back to back casts in the afternoon.
Seven more 1000-m CTD casts were conducted as part of the 36hr burst period before ending the burst period with a second deep cast at station ALOHA at 2300hrs.
Three net tows were conducted at 0112hrs, 1000hrs, and 2200hrs by Blake Watkins.
Weather conditions observed at 1430hrs; winds from the ENE at 20 knots, seas 6-8ft and cloud cover 2/8.

January 31, 2008

The sediment trap array was recovered at 0600hrs after drifting 11nm to the SW from the center of ALOHA. The array was recovered at 22 37.782 158 11.623.
The gas array was recovered at 0700hrs after drifting 6nm to the SW from the center of ALOHA. The array was recovered at 22 38.393W 158 6.301W.
Two 200-m yo-yo CTD casts were conducted for an hour each near the WHOTS mooring at 0900hrs and 1330hrs.
One PRR cast was conducted at station ALOHA at 1100hrs.
One FRRf cast was conducted at 0315hrs. Two AC-9/FRRf casts were conducted at 1130hrs and 1220hrs.
One near-bottom CTD cast (~2500 m) was conducted at Station Kaena
Weather conditions at 1500; winds from the NNE at 27 knots, seas 6-8ft and cloud cover 4/8.

February 1, 2008

0700 - Sea buoy
0730 - Tied up at Fueling Pier (P.30)

February 4, 2008

0900 - Offload
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	Diversity and activities of nitrogen-fixing microorganisms/UH
Various CMORE PI's	Microbial RNA/DNA

collection/CMORE
Mark Brzezinski Silica production and
dissolution rate measurements/UCSB

Additional programs

Investigator:	Project/Institution:
Edward Boyle	Trace metals
Dana Swift/Steve Riser	ARGO float/UW
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide/CMORE/UH