HOT-202: Chief Scientist Report

Chief Scientist: Susan Curless

R/V Kilo Moana

June 24-28, 2008

Cruise ID: KM0811
Departed: June 24, 2008 at 0854 (HST)
Returned: June 28, 2008 at 1450 (HST)
Vessel: ***R/V Kilo Moana***
Operator: University of Hawaii
Master of the Vessel: Captain Brian Wehmeyer
Chief Scientist: Susan Curless
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 21° 20.6'N, 158° 16.4'W and will be occupied on the first day of the cruise for about 2.5 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 22° 45'N, 158°W. This is the main HOT station and will be occupied during the 2nd, 3rd, and 4th days of the cruise.
3) Station 50, is the site of the WHOTS Mooring, located at 22° 46'N, 157° 53.83'W and will be occupied on the 4th day of the cruise for about 2 hours.
4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 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, one Go-Flo cast to 20m, and a PRR cast were to be conducted at this location on the afternoon of June 24th. 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 cast to 350 m, one 1000 m cast to collect water for the Primary Production Array. This was followed by the deployment of the free-drifting primary productivity array to incubate insitu 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 June 27th.

Another free-drifting array (gas array) was to be deployed for 24 hours for incubation experiments on June 26th. The gas array was to be recovered at 0800 on June 27th.

A plankton net was to be towed near noon and midnight for 30-min intervals on June 25th and June 26th at Station ALOHA.

A hand held plankton net was to be deployed in the afternoon of June 25th for 15-20 minutes to sample surface waters.

A trace metal sampler was to be deployed on June 25th 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 June 24th, 26th, 27th.

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 June 26th and in the early morning and around noon on June 27th.

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 June 27th.

After recovering the arrays, the ship was to transit to Station 50 to conduct a one-hour 200m CTD yo-yo cast after which the ship was to re-position within Station ALOHA to conduct light casts (one PRR cast, and two AC9/FRRf casts).

After the light cast operations were complete, the ship was to re-position at Station 50 to conduct another one-hour 200-m CTD yo-yo cast. Once the second yo-yo cast was complete, the ship was to transit to Station Kaena.

A near-bottom CTD cast (~2500 m) was to be conducted at Station 6, Station Kaena, including salinity samples for calibration, after which the ship was to transit to Pearl Harbor for fueling. Once fueling was complete, the ship was to transit back to Snug Harbor.

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

2. SCIENCE PERSONNEL

Cruise Participant	Title	Affiliation
Susan Curless	Chief Scientist – Res. Assoc.	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Eric Grabowski	Research Associate	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Binglin Li	Graduate Student	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Technician	UH/BEACH
Donn Viviani	Graduate Student	UH/BEACH
Blake Watkins	Marine Engineer	UH/BEACH
Sam Wilson	Scientist	UH/CMORE
Jay Wheeler	Research Associate	UH/BEACH
Jesse Yonover	Undergraduate Student	U Colorado
Paul Lethaby	Research Associate	UH/PO
Christin Shacat	Research Associate	UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Sarah Yasui	Undergraduate Student	UH/PO
Amanda Vinson	Volunteer	UH/PO
Michael Gray	Volunteer	UH/PO
Janice Jones	Technician	UCSB
John Bullister	Scientist	PMEL
David Wisegarver	Scientist	PMEL
Courtney Daniels	Intern/Graduate Student	UH/CMORE
Scott LaChance	Teacher	UH/CMORE
Kim Weersing	CMORE Educator	UH/CMORE
Kate Achilles	CMORE Educator	UH/CMORE
Norman de los Santos	Teacher	UH/CMORE
Kuhio Vellalos	Marine Technician	OTG
Tobin Chen	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, one 1000-m CTD cast, and one 20m Go-Flo cast were conducted at Station Kahe (1). Two near-bottom deep casts, thirteen 1000m CTD casts, and one 350m cast were conducted at Station ALOHA (2). Two one hour 200m yo-yo casts were conducted near the WHOTS mooring (Station 50). One near bottom cast was conducted at Station Kaena (6).

The array of floating sediment traps, the gas array, and the primary production array were deployed and recovered without any major incidents.
All of the arrays drifted NW of the center of Station ALOHA.

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 one time at night.

The PRR was deployed three times around noon.

A trace metal sample was taken (ATE).

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, underway fluorometer, the ship's two anemometers. The pCO2 system experienced a salt blockage that decreased the flow rate through the system. This issue was fixed by D.Sadler.

Winds were from the east between 10-15 knots during the course of the cruise with smooth seas between 5-7ft.

We arrived at Pearl Harbor for fueling at 0820 on June 28th, and arrived at Snug Harbor for offloading on June 28th, at 1450 (HST).

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)

June 23th, 2008 – Loading Day

0900 – Cruise equipment was loaded this day.

June 24th, 2008

0900- depart snug harbor
0940- science party safety meeting

1045- fire drill and abandon ship drill
1145- arrive at Station Kahe
1157- weight cast to 500m
1235- PRR cast
1312- Kahe Cast
1430- end Kahe cast
1445- go-flo cast for CMORE education group
1500- transit to Station ALOHA
2240- arrive at Station ALOHA -positioned ship 1.5nm north of the center for sediment trap deployment.
2345- deployment of the sediment traps 22 46.65'N 158 0.013'W

June 25th, 2008

0012- S2C1
0137- Primary production cast
0400- deployment of the primary production array 22 46.186'N 157 59.923'W
0503- start of the deep cast
0857- end of the deep cast
0905- transit to pump ship's tanks
1000- net tow
1124- S2C4
1257- net tow
1330- hand net tow for CMORE education group
1400- S2C5
1509- transit to pump ship's tanks
1656- S2C6
1922- Recovery of Primary Production Array 22 51.048'N 158 2.015'W The array traveled ~5.2nm NNW from the deployment site.
2000- S2C7 BEACH cast
2100- transit to pump ship's tanks
2200- net tow
2300- S2C8

Weather conditions at Station ALOHA are 15kt winds from the east with 3-5ft seas under a cloudy sky.

June 26th, 2008

0020- net tow
0200- S2C9 Gas Array water collection
0433- Gas Array Deployed 22 46.014'N 157 59.916'W
0500- S2C10
0615- transit to pump ship's tanks
0802- S2C11
0914- ATE

1010- net tow
1101- S2C12
1207- PRR
1234- AC9/FRRF
1402- S2C13
1503- transit to pump ship's tanks
1651- S2C14
1954- S2C15
2232- Net Tow -delayed deployment due to ship maneuvers to avoid a sailboat
2326- S2C16 -Second Deep Cast

Weather conditions at Station ALOHA are 15kt winds from the east with 4-6ft seas under a 3/8 cloud covered sky.

June 27th, 2008

0317- end of deep cast
0324- AC9/FRRF
0639- Sediment Trap Recovery 22 59.072'N 158 11.397'W
0730- Begin gas array recovery 22 55.50'N 158 04.75'W
0800- gas array recovery completed
1006- S50C1 yo-yo 6 cycles completed
1114- PRR cast
1134- AC9/FRRF cast
1238- AC9/FRRF cast
1354- S50C2 yo-yo 5 cycles completed
2110- arrive Station Kaena
2125- S6C1
2340- Transit to Pearl Harbor

Weather conditions at Station ALOHA are 15kt winds from the east with 5-7ft seas under a cloudy sky.

June 28th, 2008

0820- Tied up at Pearl Harbor Fuel Pier
1214- Transit to Snug Harbor
1450- Tied up at Snug Harbor for full 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
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
Bullister/Wisegarver	CFC and SF6 tracer saturation levels in the water column/PMEL
Mark Brzeznski	Silica production and dissolution rate measurments/UCSB

Additional programs:

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