HOT-143: Chief Scientist Report

Chief Scientist: T. GREGORY

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CRUISE ID: KM0211
Departed: Dec. 17, 2002 at 0800 (HST)
Returned: Dec. 21, 2002 at 1430 (HST)
Vessel: R/V KILO MOANA
Operator: University of Hawaii
Master of the Vessel: Captain Phil Smith
Chief Scientist: Thomas Gregory
STAG Electronics Technician: Tim McGovern
STAG Deck Technician: Dave Gravatt

1. SCIENTIFIC OBJECTIVES

The objective of this cruise was to continue building a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Three 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 Dec. 17 for about 3 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 from Dec. 18 to Dec. 20.

3) 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 Dec. 20 for about 4 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. PRR and TSRB measurements were also to be made.

Upon arrival at Station ALOHA, the deployment of a free-drifting sediment trap array was to be conducted. After deployment, a full-depth CTD cast was to be conducted followed by CTD casts at strict 3-hour intervals for at least 36 hours for continuous and discrete data collection followed by another full-depth CTD cast. The primary production array was to be deployed on Dec. 19 for 12 hours. PRR, TSRB and AC-9/FRRf operations were to be done around noon Dec. 19 and 20 and a nighttime AC-9/FRRf cast was to be executed at 0300 on Dec. 20. The drifting sediment trap array was to be recovered near dawn and the ATE sampler was to be deployed just before noon on Dec. 20.

Following Station ALOHA operations, the ship was to transit to Station 6. 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 perform multibeam mapping operations off the west side of Oahu before returning to Snug Harbor.

The following instruments were to collect data throughout the cruise: a thermosalinograph, fluorometer, and an anemometer.

2. SCIENCE PERSONNEL

PO Group:		
Shimi Rii	Research Associate	UH
Daniel Fitzgerald	Research Associate	UH
Mark Valenciano	Electronics Technician	UH
Fernando Santiago-Mandujano	Research Associate	UH
Steve Johnson	Volunteer	UH
Ivaleen Unterwiser	Volunteer	UH
JGOFS Group:		
Thomas Gregory (Chief Scientist)	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Paul Morris (Watch Leader)	Technician	UH
Tara Clemente	Research Associate	UH
Dan Sadler	Research Associate	UH
Anne Gasc (Watch Leader)	Research Associate	UH
Valerie Franck	Scientist	UH

3. GENERAL SUMMARY

All operations at Stations Kahe and ALOHA were conducted as planned. Thirteen 1000 m and two 4800 m CTD casts were completed at Station ALOHA. One 1000 m cast at Station Kahe and one 2500 m cast at Station Kaena were obtained. Both free-floating arrays were deployed and recovered without incident. All optics operations were conducted as planned.

Weather conditions were favorable throughout the cruise.

The thermosalinograph and the ship's anemometer ran without interruption throughout the cruise. However, the external temperature sensor may have a problem as it was indicating higher temperatures than the sea surface temperatures measured by bucket thermometer; this problem was also noted during HOT 142. Also, the fluorometer did not log data properly. This seems to be a software problem and will be remedied for our next cruise on the KILO MOANA.

We arrived back at Snug Harbor on December 21 at around 1430. A complete off-load took place immediately.

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

The R/V KILO MOANA and her crew delivered exceptional ship support for our work. The officers and crew were most helpful and accommodating and are to be commended for maintaining high standards. 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)

December 16, 2002; Loading Day

Equipment loaded on this day. The CTD was terminated and tested.

December 17, 2002

The ship departed from Snug harbor at 0800. A short science meeting was held at 0930 during which the cruise schedule was reviewed and safety issues were discussed. Fire and abandon ship drills were conducted at 1000.

We arrived at Station Kahe at 1200 and immediately conducted a weight cast (400 lbs.) to 1000 m during which M. Valenciano inspected the CTD wire. This was followed by PRR and TSRB operations and then a 1000 m CTD cast. The package was back on deck at 1525 and we then began transit to Station ALOHA.

December 18, 2002

We arrived at Station ALOHA on schedule and immediately deployed the sediment trap array. The deep PO cast started at 0153 and was back on deck at 0522. Following the deep cast we performed the shallow PO cast, which initiated the 36-hr CTD cast period. We conducted six 1000 m casts this day.

December 19, 2002

Six 1000 m CTD casts were conducted this day.

On cast 9 (begun at 0453), the package hit the transom of the ship in the beginning of the cast, bending the bail of the rosette. This incident was the result of a poorly designed CTD crane system exacerbated by a combination of poor visibility, ship motion and wave action. This occurrence further underscores the importance of replacing the current CTD crane system before the next HOT cruise. The instrumentation was not affected and all Nisken bottles seemed unscathed so the cast was conducted without further interruption.

The PRR and TSRB were deployed at 1200. One AC-9/FRRf cast was conducted at 1245.

During the AC-9 cast, the mate on watch lost visual contact with the primary productivity array which had been deployed at 0630 this morning. The array was located at around 1600 and was recovered at

1650. This incident forced the postponement of cast 12 (ATP, had been scheduled for 1400) and the cancellation of cast 13 (open, had been scheduled for 1730). Cast 12 was initiated at 1721 and the next cast (HPLC, now called cast 13) was begun at 2000 as scheduled.

The deep cast was deployed at 2258.

December 20, 2002

The deep cast was recovered at 0224.

The sediment trap array was recovered at around 0800. The array had drifted to the southwest. Upon recovery we noticed that three of the four samples from 165 m had been compromised. Of these three, one had been lost, one was missing its bottom cap and one was askew in the holder. It seems that the 165 m traps were damaged during deployment while the 150 m trap was being assembled. This is a problem unique to trap deployments on the R/V KILO MOANA because of the high back deck. We have not experienced this problem on other ships because the 165 m traps are safely in the water when the 150 m traps are being assembled. Corrective measures will be researched and implemented on the next cruise aboard this vessel. After the sediment trap array had been recovered we steamed back to Station ALOHA.

Upon arrival at Station ALOHA, the ATE sampler was deployed at 1100.

The PRR and TSRB were deployed at 1200 and AC-9/FRRf casts were performed at 0300, 1300, and 1400.

We conducted a 2500 m cast at Station Kaena. This cast was recovered at 2150 at which time we began transit to Oahu's west side for multibeam mapping operations.

December 21, 2002

We made several multibeam mapping passes off the west side of Oahu this morning.

We arrived at Snug Harbor at around 1430. A full offload took place immediately.

Sub component programs:

Investigator:	Project:
Bob Bidigare	HPLC pigments/UH
Mike Landry	zooplankton dynamics/UH
John Dore	CO2 dynamics/UH

Ancillary programs:

Investigator:	Project:

Charles Keeling	CO2 dynamics and intercalibration/SIO
Mark Abbott/Ricardo Letelier	optical measurements/OSU
Penny Chisholm/Erik Zinser	Prochlorococcus ecotype dynamics/MIT