HOT-176: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO
HOT-176 Chief Scientist's Cruise Report
R/V Ka'Imikai-O-Kanaloa
December 11 - 16, 2005

Cruise ID: KOK0518
Departed: December 11, 2005 at 0900 (HST)
Returned: December 16, 2005 at 0800
Vessel: R/V Ka'Imikai-O-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Ross Barnes
Chief Scientist: Fernando Santiago-Mandujano
STAG Electronics Technician: Steve Poulos
STAG Deck Operations: Dave Gravatt

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 December 11 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 December 12 to 14.

3) Station 51, is the site of the MOSEAN Mooring, located at 22 45'N, 158 6'W and was to be occupied on the 4th day of the cruise for about 30 minutes.

4) Station 50, is the site of the Ocean Reference Station Mooring, located at 22 46.1'N, 157 53.4'W was to be occupied on the 4th day of the cruise for about 30 minutes.

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 5th 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.

Upon arrival at Station ALOHA, operations were to start with the deployment of a free-drifting sediment trap array. After deployment, two 200-m casts were to be conducted to collect water for the gas array. The gas array was to be deployed afterwards, followed by a full-depth CTD cast, after which CTD casts were to start at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection, followed by another full-depth CTD cast.

One free-drifting array (gas array) was to be deployed for 24 hours for incubation experiments on December 12.

One free-drifting array was to be deployed for 12 hours for incubation experiments on December 13.

A plankton net was to be deployed near noon and midnight on December 12 and 13 at Station ALOHA.

After CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating sediment trap array. After recovering the sediment traps, the ship was to transit to Sta. 51 to conduct a 200-m CTD cast and then to return to Sta. ALOHA to continue CTD and light cast operations, after which the ship was to transit to Sta. 50 to conduct a 200-m CTD cast.

After operations ended at Station ALOHA and adjacent stations, dragging operations were to be conducted for about 24-hr at Station ALOHA to try to recover the CTD/Rosette package that sank to the bottom when the CTD cable broke during the previous HOT-175 cruise.

At the end of these 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 transit back to Snug Harbor.

A Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on December 11, 12 and 14.

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

2. SCIENCE PERSONNEL

BEACH group:

Cruise Participant	Title	Affiliation
Karin Bjorkman	Research Specialist	UH
Susan Curless	Research Associate	UH/
Ken Doggett	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Tom Gregory	Research Associate	UH
Adriana Harlan	Technician	UH
Dan Sadler	Research Associate	UH
Blake Watkins	Marine Engineer	UH

PO group:

Suzanne Defelice	Research Associate	UH
Paul Lethaby	Research Associate	UH
Laurie Menviel	Graduate Student	UH
Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned.

One 1000-m CTD cast was conducted at Kahe station. Twelve 1000-m CTD casts, two 200-m, and two deep casts (~4740 m) were conducted at Station ALOHA. Two 200-m CTD casts were conducted near the WHOTS mooring (Sta. 50), and near the MOSEAN mooring (Sta. 51) respectively.

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

Two plankton net tows were conducted during the day, and two at night.

The PRR was deployed as planned.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, and the ship's two anemometers.

Winds were easterlies of about 20-25 kt during the cruise, decreasing to near zero the last day of the cruise.

We arrived back at Snug Harbor on December 16 at 0800. Full off-load took place immediately.

4. R/V KA'IMIKAI O KANALOA, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Ka'Imikai O Kanaloa 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. STAG personnel were available at any time to assist in our work and made things much easier for us.

5. DAILY REPORT OF ACTIVITIES (HST)

December 9, 2005; Loading Day

Equipment loaded during the afternoon on this day. CTD wire was re-terminated and CTD system tested.

December 11, 2005

The ship departed from Snug harbor at 0930. Fire and abandon ship drills were conducted at 1045, followed by a science meeting during which cruise activities were briefly reviewed, and safety issues were addressed.

Arrived to Kahe Station at 1220. A weight cast (400 lb) to 500 m was conducted.

At 1300 the Profiling Reflectance Radiometer (PRR) was deployed.

A 1000-m CTD cast was conducted at 1340. After the cast ended, the ship headed towards Station ALOHA.

December 12, 2005

Arrived at Station ALOHA at 0020 and deployed the sediment traps array. The array was deployed 2 nm west from the center of ALOHA.

Two 200-m CTD casts were conducted at 0200 and 0300.

The gas array was deployed at 0600.

The deep CTD/PO cast started at 0615 and ended at 0930. This cast was followed by the shallow CTD/PO cast at 1100, which marked the beginning of the 36-hr CTD burst period. A total of five 1000-m CTD casts were conducted this day as part of the CTD burst period.

One net tow was conducted at 1000 and one at 2200.

The PRR was deployed at 1230.

Easterly winds between 15 and 20 kt.

December 13, 2005

Seven 1000-m CTD casts were conducted on this day, followed by a second deep cast, which completed the 36-hr CTD burst period.

The Gas array was recovered at 0730. The array drifted 9 nm West of the center of Station ALOHA.

The primary productivity array was deployed at 0600, and recovered at 18:00, the array drifted 1 nm NW from the center of ALOHA Sta.

One net tow was conducted during the day (1000) and one at night (2200).

The ATE sample was taken at 0915

Easterly winds 20 kt.

December 14, 2005

The sediment traps array was recovered at 0700, about 18 nm west from ALOHA Station.

One additional 1000-m CTD cast was conducted at ALOHA Sta. One 200-m CTD cast was conducted near the MOSEAN mooring (Sta 51), and another one near the WHOTS mooring (Sta 50).

One PRR cast was conducted at 1115.

Dragging operations to try to recover the CTD lost during HOT-175 started at 1400 and continued throughout the night.

Easterly winds at about 15-20 kt.

December 15, 2005

Dragging operations continued throughout the day until 1745. Nothing was recovered.

Winds decreased to near zero.

December 16, 2005

Arrived at Snug Harbor at 0800. Full off-load took place immediately.
Sub component programs:

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

Ancillary programs:

Investigator:	Project/Institution:
Charles Keeling	CO2 dynamics and intercalibration/SIO
Mark Abbott/Ricardo Letelier	Optical measurements/OSU
Paul Quay	DI13C and O isotopes/UW
Penny Chisholm	Prochlorococcus population dynamics/MIT
Matthew Church/Allison Fong	Diversity and activities of nitrogen-fixing microorganisms/UH