HOT-151: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT-151 Chief Scientist's Cruise Report
R/V Ka'Imikai-O-Kanaloa
August 19-23, 2003

Cruise ID: KOK0313
Departed: August 19, 2003 at 0900 (HST)
Returned: August 23, 2003 at 0730
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/Deck Operations: Steve Poulos

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. 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 August 19 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, 158W. This is the main HOT Station and was to be occupied for 3 days from August 20 to August 22.

3) 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 August 22 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, a net tow was to be conducted, followed by the deployment of a free-drifting sediment trap array. 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.

One free-drifting array was to be deployed for 12 hours for incubation experiments on August 21.

A plankton net was to be deployed near noon and midnight on August 20 and 21 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 return to Sta. ALOHA to continue light cast operations, after which 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) and a Tethered Spectral Radiometer Buoy (TSRB) were to be deployed for half-hour periods near noon time on August 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 for one-hour periods on August 21 and 22.

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

2. SCIENCE PERSONNEL

JGOFS group:

Tara Clemente (Watch Leader)	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Eric Grabowski (Watch Leader)	Research Associate	UH
Tom Gregory	Research Associate	UH
Dan Sadler	Research Associate	UH
Cecelia Sheridan	Graduate Student	UH
Joji Uchikawa	Graduate Student	UH
Blake Watkins	Marine Engineer	UH

PO group:

Santiago Andrioni	Undergraduate Student	HPU
Carolyn Berger	Undergraduate Student	UH
Daniel Fitzgerald	Research Associate	UH
Maya Iriondo	Graduate Student	UH
Colleen McGee	Undergraduate Student	HPU
Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH
Mark Valenciano	Electronics Technician	UH

Others:

Laurie Juranek	Graduate Student	UW

3. GENERAL SUMMARY

Operations were conducted as planned, with a minor delay arriving at Station ALOHA due to rough seas.

Fourteen 1000-m CTD casts, two deep casts (~4740 m) and one shallow cast (300-m) were conducted at Station ALOHA. One 1000-m CTD casts was conducted at station Kahe. One near-bottom cast (~2500 m) was conducted at Station 6.

The array of floating sediment traps and the incubation array were deployed without incidents. The incubation array was recovered without any problems, but during the sediment trap recovery, part of the array, including the sediment trap with sampling bottles was lost at sea. Both arrays drifted northward at a significant rate.

C. Sheridan completed successfully 6 plankton net tows.

The PRR, TSRB and AC9/FRRf were deployed as planned, but the TSRB was lost on August 21, when it drifted under the ship and was caught around the propeller's shaft.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, fluorometer, and the ship's two anemometers. The ADCP data showed a 1 kt NNE current in the upper 200 m at Station ALOHA that persisted throughout the cruise.

Winds were easterlies at 20-25 kt, and sea state 4-5.

We arrived back at Snug Harbor on August 23 at 0730. 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)

August 18, 2003; Loading Day

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

August 19, 2003

The ship departed from Snug harbor at 0900. Fire and abandon ship drills conducted at 0930, followed by a short science meeting during which some of the cruise activities were briefly reviewed, and safety issues were addressed.

Arrived to Kahe Station at 1145 and a weight cast (400 lb) to 1000 m was conducted at 1200, during which M. Valenciano inspected the CTD wire. At 1300 the Profiling Reflectance Radiometer (PRR) and Tethered Spectral Radiometer Buoy (TSRB) were deployed.

A 1000-m CTD cast was started at 1400 and ended at 1500, after which the ship headed towards Station ALOHA. The transit to ALOHA was slower than expected due to rough seas.

Winds were easterlies at 22 kt. Sea state 4-5.

August 20, 2003

Arrived at Station ALOHA at 0100, and proceeded to deploy the sediment traps, inmediately followed by the deep PO cast, which started at 0300 and ended at 0615 without any problems. This cast was followed by the shallow PO cast at 0800, which started the 36-hr CTD cast period. A total of six 1000-m CTD casts were conducted this day.

Two net tows were conducted between 1000 and 1400 on August 20. Three net tows were conducted between 2200, August 20, and 0200, August 21.

Winds were 20-25 kt easterlies, and sea state 5.

August 21, 2003

Seven 1000-m CTD casts were conducted during this day, ending the 36-hr CTD cast burst period at 2100. This was followed by a 300-m CTD cast, and by the second deep cast which started at 2330.

The primary productivity array was deployed at 0620, and was retrieved at 1900. The array drifted 10.5 nm NNE of the center of ALOHA Sta.

One net tow was conducted at 1000.

PRR and TSRB were deployed at 1200. During deployment, the TSRB unexpectedly drifted under the ship and got tangled forward and aft of the propeller. Due to the sea conditions, the captain deemed it unsafe to send a diver to untangle the buoy, and decided to cut the wire and let the TSRB to untangle itself. The TSRB was not seen to come to the surface.

Winds were easterlies at 20 kt, and sea state 4.

August 22, 2003

The second deep CTD cast that started at 2330 on August 21 was completed by 0220.

The floating sediment trap array recovery started at 0640. The array drifted 25 nm north from the center of Station ALOHA. During recovery, the array's rope broke, and part of the array including the sediment traps, two plastic floating spheres and the bottom weight went to the bottom. The rope broke at a section that was worn out apparently by rubbing against one of the plastic spheres. The sediment traps lost at sea included one sediment trap cross and 12 sampling cylinders.

One AC9/FRRf cast was conducted at 0300, and two more between 1200 and 1400 at ALOHA Sta. PRR measurements were also conducted at 1100 at ALOHA.

A near-bottom cast (~2500 m) was conducted at 2100 at Station Kaena (Stn. 6), after which the ship headed back to Snug harbor.

Winds were easterlies at 15-20 kt and sea state 4.

August 23, 2003

Arrived at Snug Harbor at 0730. 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
Sally Chisholm	Prochlorococcus population dynamics/MIT