

Chief Scientist: F.SANTIAGO-MANDUJANO

HOT-163 Chief Scientist's Cruise Report
R/V Ka'Imikai-O-Kanaloa
September 27 - October 1, 2004

Cruise ID: KOK0422

Departed: September 27, 2004 at 0900 (HST)

Returned: October 1, 2004 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: Daniel Fitzgerald

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. Five 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 September 27 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 September 28 to September 30.

3) Station 50, is the site of the Ocean Reference Station Mooring, located at 22 45'N, 157 54'W was to be occupied on September 30 for about 1/2 hour.

4) Station 51, is the site of the MOSEAN Mooring, located at 22 45'N, 158 6'W was to be occupied on September 30 for about 1/2 hour.

5) 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 September 30 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 1000 m CTD cast was to be conducted to collect water for K. Bjorkman's experiment, followed by a net tow, and by the subsequent 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 September 29.

A plankton net was to be deployed near noon and midnight on September 28 and 29 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. 50 to conduct a 200-m CTD cast and then to return to Sta. ALOHA to continue light cast operations. At the end of these operations, the ship was to transit to Sta. 51 to conduct a 200-m CTD cast, 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) was to be deployed for half-hour periods near noon time on September 27, 29 and 30.

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 at noon time on September 29 and 30.

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

2. SCIENCE PERSONNEL

BEACH group:

Cruise Participant Title Affiliation

Karin Bjorkman Research Specialist UH
Tara Clemente (Watch Leader) Research Associate UH
Lance Fujieki Computer Specialist UH
Eric Grabowski Research Associate UH
Marcie Grabowski Graduate Student UH
Tom Gregory Research Associate UH
Cecelia Hannides Graduate Student UH
Dan Sadler Research Associate UH

PO group:

Jamie Becker Volunteer UH/M. Rappe
Carole Berini Volunteer HPU alumna
Maya Iriondo Research Assistant UH
Fernando Santiago-Mandujano Chief Scientist (Res. Assoc.) UH
Jefrey Snyder (Watch Leader) Electronics Technician UH

Others:

Leena Mahdi Graduate Student UH/S. Donachie

3. GENERAL SUMMARY

Operations during the cruise were conducted as planned, with minor delays in the schedule during the first 4 CTD casts at ALOHA Sta.

One 1000-m CTD cast was conducted at Kahe station. Fifteen 1000-m CTD casts and two deep casts (~4740 m) were conducted at Station ALOHA. Two 200-m CTD cast were conducted near the ORS and MOSEAN moorings (Stations 50 and 51) respectively. One deep cast (~2400 m) was conducted at station Kaena.

The array of floating sediment traps and the primary productivity incubation array were deployed and recovered without incidents. Both arrays drifted west.

C. Hannides completed successfully 6 plankton net tows.

The PRR and AC9/FRRf were deployed as planned.

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

Winds were easterlies of about 14 kt early in the cruise, increasing to 17 kt later in the cruise. A northward swell of about 7-8 ft persisted during the cruise.

We arrived back at Snug Harbor on October 1st 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)

September 26, 2004; Loading Day

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

September 27, 2004

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

Arrived to Kahe Station at 1155. A weight cast (400 lb) to 500 m was

conducted at 1200, during which J. Snyder inspected the CTD wire.

At 1225 the Profiling Reflectance Radiometer (PRR) was deployed.

A 1000-m CTD cast was started at 1257 and ended at 1409, after which the ship headed towards Station ALOHA.

Arrived at Station ALOHA at 2340 and conducted a 1000-m CTD cast starting at 2344.

September 28, 2004

After the 1000-m CTD cast, a net tow was conducted, followed by the deployment of the sediment traps array. The array was deployed 3 nm north from the center of ALOHA, to prevent it from drifting into the MOSEAN mooring.

The deep CTD/PO cast started at 0245 and ended at 0619. The altimeter failed near the bottom of the cast, but the Pinger was successfully used to determine the distance of the CTD from the bottom. This cast was followed by the shallow CTD/PO cast at 0856, which marked the beginning of the 36-hr CTD burst period. A total of six 1000-m CTD casts were conducted this day. The CTD pressure readout had intermittent failures during CTD casts, and was fixed by the Electronics Technician after cast 5 at ALOHA.

Two net tows were conducted between 1000 and 1400. One net tow was conducted at 2200.

Easterly winds up to 14 kt, with 7-8 ft swell from the north.

September 29, 2004

Seven 1000-m CTD casts were conducted on this day, which completed the 36-hr CTD burst period. A second deep cast followed. The altimeter's cable was replaced before the deep cast and it worked fine.

The primary productivity array was deployed at 0400, 2 nm NE from the center of ALOHA station, and recovered at sunset (1840), 4 nm NW from the center.

One PRR cast and one AC9/FRRf casts were conducted at noon time.

One net tow was conducted at night and one during the day

Easterly winds up to 14 kt, with northward swell of 7-8 ft.

September 30, 2004

The sediment trap array was retrieved at 0630, 11 nm NW from the center of station ALOHA.

One 200-dbar CTD casts was conducted at 0920 near the ORS mooring (Sta. 50), and another one at 1445 near the MOSEAN mooring (Sta. 51). One near-bottom cast was conducted at station Kaena at 2140.

One AC9/FRRf cast was conducted at 0300, and two more at noon time. One PRR cast was conducted at noon.

Easterly winds up to 17 kt, with northward swell of 7-8 ft.

October 1, 2004

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
Marcie Grabowski Controls on nitrogen fixation/UH
Karin Bjorkman Nutrient Enrichment/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

Ancillary research during this cruise:

Investigator: Project/Institution:

Stuart Donachie Antinfectives and Cytotoxins from Hawaiian
Marine Fungi and Yeasts/UH