HOT-144: Chief Scientist Report

Chief Scientist: D. SADLER

CRUISE ID: KOK0301
Departed: January 15, 2003 at 0903 (HST)
Returned: January 19 at 0735 (HST)
Vessel: R/V Ka'imikai-o-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Ross Barnes
Chief Scientist: Dan Sadler
STAG Electronics Technician: Steve Poulos
STAG Deck Operations: 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 January 15 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 January 16 though January 18.

3) Station 6: Located off Kahe Point at 21° 50.8' N, 158° 21.8' W. Station 6 was planned to be occupied on January 18 for about 3 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 floating sediment trap array was to be deployed. A full-depth CTD cast was to be conducted followed by CTD casts at 3-hour intervals for 36 hours of continuous and discrete data collection. Plankton net tows were to be conducted near noon and midnight on January 16 and 17. A floating primary production experiment was to be deployed and recovered on January 17. Following recovery of the sediment traps on January 18, the ship was scheduled to return to Station ALOHA for trace metal and optical casts. Once work was completed at Station ALOHA, the ship was to transit to Station 8 for a single 1000 m CTD cast then to Station 6 for a single 2500 m cast. The ship was scheduled to return to SNUG Harbor at 0800 on January 19 and unload. The following instruments were to collect data throughout the cruise: a shipboard ADCP, a thermosalinograph, a fluorometer and an anemometer.

## 2. SCIENCE PERSONNEL

| | | |
|---|---|---|
| **PO Group:** | | |
| Daniel Fitzgerald | Research Associate | UH |
| Fernando Santiago-Mandujano (Watch Leader) | Research Associate | UH |
| Shimi Rii | Research Associate | UH |
| Mark Valenciano | Electronics Technician | UH |
| **JGOFS Group:** | | |
| Thomas Gregory | Research Associate | UH |
| Anne Gasc | Research Associate | UH |
| Lance Fujieki | Computer Specialist | UH |
| Tara Clemente (Watch Leader) | Research Associate | UH |
| Daniel Sadler (Chief Scientist) | Research Associate | UH |
| Karin Björkman | Scientist | UH |
| Cecelia Sheridan | Graduate Student | UH |
| Randy Naish | Volunteer | HI |
| **STAG Group:** | | |
| Dave Gravatt | | |
| Steve Poulos | | |

## 3. GENERAL SUMMARY

All operations at all stations were conducted as planned with the two exceptions noted below. Twelve 1000 m and two 4800 m CTD casts were obtained at Station ALOHA. A single 1000 m casts was obtained at Station Kahe. A 2500 m CTD cast was completed at Kaena Point. Also, three PRR/TSRB cast were performed at Station ALOHA. Due to strong winds and high seas, the sediment trap deployment was cancelled. A slow transit also caused cancellation of an open 1000 m CTD cast.

C. Sheridan successfully completed six plankton net tows.

Strong winds and high seas made for a slow transit to Station ALOHA. Once on station, the R/V KOK provided a stable platform for science. Credit for the successful cruise was due in large to the experience and professional seamanship exhibited by the officers and crew o the R/V KOK.

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

All ancillary work was completed.

We arrived back at Snug Harbor on January 19 at 0800. A complete off-load took place immediately.

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

The R/V Ka'imikai-o-Kanaloa and her crew delivered excellent ship support for our work. Despite the rough conditions, 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.

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)

January 14, 2003; Loading Day

Equipment loaded on this day. The CTD cable was re-terminated, followed by a test of the CTD system.

January 15, 2003

The ship departed from Snug harbor at 0900. Fire and abandon ship drills were conducted followed by a science meeting to review the objectives and schedule for the cruise. We arrived at Station Kahe at 1252 and immediately deployed the PRR and TSRB. A weight cast (400 lb) to 1000 m preceded a 1000 m CTD cast. The ship departed Station Kahe at 1710 and proceeded to Station ALOHA.

January 16, 2003

We arrived at Station ALOHA at 0500. Because of the rough conditions, sediment trap deployment was postponed until daybreak and we proceeded with the deep CTD cast to 4800 m. A net tow was conducted at 0956. The 36 hour burst CTD sampling began at 0819 and continued throughout the day. Five 1000 m casts were completed. Additional net tows were completed at 1335, 1358 and 2225. At daybreak, it was determined that deployment of the sediment trap array was possible but a successful recovery was questionable. Since the weather was forcast to be rough at the end of the cruise, we decided to cancel the sediment trap deloyment.

January 17, 2003

Seven 1000 m CTD casts were completed. The primary production array was deployed at 0621 and recovered at 1739. Net tows were completed at 0107, 0301 and 1045. The PRR/TSRB optical packages were deployed at noon. An AC-9/FRRf casts was conducted at 1303. At 1300, the CTD cable was reterminated due to a kink on the cable near the CTD, caused by excessive ship's motion.

January 18, 2003

A 4500 m deep CTD cast was completed at 0222. At 1017 the Automated Trace Metal (ATE) sampler was deployed. The PRR/TSRB optical packages were deployed at 1105 followed by an AC-9/FRRf casts at 1142 and 1254. The ship departed Station ALOHA at 1405 and transited to Station 6. We arrived at Station 6 at 1925 and conducted a 2500 m CTD cast at 1939. We departed Station 6 at 2136 proceeded to Honolulu Harbor.

January 19, 2003

We arrived at Snug Harbor at 0800. A full offload took place upon arrival.

WEATHER:

Below is the cruise bridge log description for HOT 144. Wind and sea directions are in degrees, wind speed in knots, seas in Beaufort scale, swells in feet, barometer in inches Hg, temp in F (dry bulb), clouds in tenths.

| Date | Wind | Sea | Swell | Barometer | Temp | Clouds |
|---|---|---|---|---|---|---|
| Wed. 15 January | 300, 25-40 | 300, 6-7 | 270, 10-15 | 29.80-29.86 | 70-77 | 3-10 |
| Thu. 16 January | 320, 8-30 | 320, 3-7 | 315, 13-15 | 29.87-29.95 | 62-76 | 2-7 |
| Fri. 17 January | 220, 14-28 | 220, 3-5 | 310, 8-12 | 29.76-29.88 | 67-74 | 1-9 |
| Sat. 18 January | 230, 12-26 | 235, 4-6 | 310, 8-10 | 29.77-29.86 | 72-74 | 2-9 |
| Sun. 19 January | 330, 11 | 330, 3 | 320, 3 | 29.87 | 72 | 10 |

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 |
| Paul Quay | DI13C and O isotopes/UW |
| Mark Abbott/Ricardo Letelier | Optical measurements/OSU |
| Sally Chisholm | Prochlorococcus population dynamics/MIT |