

Chief Scientist: T. GREGORY

Departed: May 19, 2002 at 0900 (HST)
Returned: May 23 at 0718 (HST)
Vessel: R/V Ka'imikai-o-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Ross Barnes
Chief Scientist: Thomas Gregory
STAG Electronics Technician: Tim McGovern
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. 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 May 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, 158°W. This is the main HOT station and was to be occupied for 3 days from May 20 to May 22.
- 3) Station 8, referred to as HALE-ALOHA, is the location of our deep ocean mooring (20° 20'N, 158° 10.6'W). The mooring is no longer deployed. It was to be occupied on May 22 for about 2 hours.
- 4) 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 May 22 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, net tows were 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. Two other free-drifting arrays were to be deployed on May 21: an oxygen balance experiment for 24 hours and a primary production experiment for 12 hours. Plankton net tows were to be conducted near noon and midnight on May 20 and 21 at Station ALOHA. PRR, TSRB and AC-9 operations were to be done around noon May 20 and 21. The final operation at Station ALOHA was to be the recovery of the drifting sediment trap array.

Following Station ALOHA operations, the ship was to transit to Station 8 to conduct one 1000 m CTD cast and then 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.

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

2. SCIENCE PERSONNEL

WOCE Group:

| | | |
|-----------------------------|------------------------|----|
| Noel Larson (Watch Leader) | Research Associate | UH |
| Daniel Fitzgerald | Research Associate | UH |
| Mark Valenciano | Electronics Technician | UH |
| Fernando Santiago-Mandujano | Research Associate | UH |

JGOFS Group:

| | | |
|----------------------------------|---------------------|----|
| Thomas Gregory (Chief Scientist) | Research Associate | UH |
| Karin Björkman | Research Specialist | UH |
| Anne Gasc | Research Associate | UH |
| Lance Fujieki | Computer Specialist | UH |
| Paul Morris | Technician | UH |
| Tara Clemente (Watch Leader) | Research Associate | UH |
| Cecilia Sheridan | Graduate Student | UH |
| Matt Church | Graduate Student | UH |
| Dan Sadler | Research Associate | UH |

Ancillary Projects:

| | | |
|--------------------|--------------------|-----|
| Francois Baratange | Research Associate | OSU |
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3. GENERAL SUMMARY

All operations at Stations ALOHA, HALE ALOHA and Kaena were conducted as planned. However, the 1000 m cast at Station Kahe was aborted at around 250 m due to problems with CTD sensors. The package was reterminated and performed well the rest of the cruise. A 1000 m cast was performed at Station Kahe at the end of the cruise however the oxygen sampling scheme was abbreviated so that oxygen titrations would be finished upon arrival at Snug. Thirteen 1000 m and two 4800 m CTD casts were obtained at Station ALOHA. One 1000 m cast and one 2500 m cast were obtained at Stations HALE-ALOHA and Kaena, respectively. All free-floating arrays were deployed and recovered without incident.

C. Sheridan successfully completed six plankton net tows.

Weather conditions were favorable throughout the cruise.

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

We arrived back at Snug Harbor on May 23 at around 0730. A partial 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 continue to deliver excellent 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.

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)

May 17, 2002; Loading Day

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

May 19, 2002

The ship departed from Snug harbor at 0900. Fire and abandon ship drills were conducted at 0939, followed by a short science meeting during which the cruise schedule was reviewed and safety issues were discussed.

We arrived at Station Kahe at 1155 and immediately conducted a weight cast (400 lb) to 1000 m. Next we deployed and recovered the PRR and TSRB. A 1000 m CTD cast was begun at 1444 however there were problems with the CTD sensors so the cast was aborted. The package was back on deck at 1520. We decided to forego the Kahe cast for the time being so that we could arrive at Station ALOHA on schedule. The CTD package was reterminated during transit then was successfully tested during two shallow casts (240 and 500 m) near Station Kaena.

May 20, 2002

We arrived at Station ALOHA at 0040 and immediately performed a net tow followed by deployment of the sediment trap array. The deep WOCE cast started at 0244 followed by the shallow WOCE cast, which initiated the 36-hr CTD cast period. We conducted six 1000 m casts this day.

Net tows were conducted at 0055, 1000, 1320 and 2204.

The PRR and TSRB were deployed at 1200. The AC-9 was deployed at 1246.

May 21, 2002

Seven 1000 m CTD casts were conducted this day. The second deep cast was begun at 2300.

Net tows were performed at 0029 and 1001.

The PRR and TSRB were deployed at 1230. Three AC-9 casts were conducted between 1236 and 1351.

The oxygen array was deployed at 0333. The primary production array was deployed at 0624 and recovered at 1912.

May 22, 2002

The deep cast was recovered at 0212 after which we steamed to the oxygen array and prepared for a recovery at dawn.

The oxygen array was recovered at 0600 and the sediment trap array was recovered at around 0745. Both arrays had drifted to the northwest. After the sediment trap array had been recovered we steamed to Station HALE ALOHA.

We conducted a 1000 m cast at Station HALE ALOHA then transited to Station Kaena. A 2500 m cast was successfully performed at Station Kaena. This cast was recovered at 1657 at which time we began transit to Station Kahe. Our cast at Station Kahe was completed at 2200 at which time we began steaming for Snug Harbor.

May 23, 2002

Arrived at Snug Harbor at 0718. A full offload took place immediately.

WEATHER:

Below is the cruise bridge log description for HOT 137. 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 |
|----------------|----------------|--------------|------------|-------------|-------|--------|
| Sun. 19 May | 085, 22-24 | 085, 4-5 | 70-80, 5-8 | 30.00-30.06 | 75-82 | 4 |
| Mon. 20 May | 100-130, 16-20 | 100-120, 3-4 | 100, 3-6 | 30.04-30.10 | 73-80 | 3-9 |
| Tues. 21 May | 120-170, 10-18 | 115-170, 2-4 | 120, 3 | 30.00-30.04 | 75-85 | 2-5 |
| Wed. 22 May | 060-210, 3-10 | 060-210, 1-2 | 70-120, 3 | 29.98-30.04 | 75-86 | 1-3 |
| Thurs. 23, May | 135, 5 | 135, 1 | 220, 1 | 30.01-30.03 | 72-76 | 0-2 |

Sub component programs:

Investigator:

Project:

Bob Bidigare
Mike Landry
John Dore

HPLC pigments/UH
zooplankton dynamics/UH
CO2 dynamics/UH

Ancillary programs:

Investigator:

Project:

Charles Keeling
Paul Quay
Mark Abbott/Ricardo Letelier
Peter Williams/Paul Morris

CO2 dynamics and intercalibration/SIO
DI13C and O isotopes/UW
optical measurements/OSU
oxygen balance/U Wales Bangor, UK

Others:

Investigator:

Project:

Karin Björkman
Matt Church

phosphorus cycling/UH
bacterial production/UH