

## HOT-140: Chief Scientist Report

Chief Scientist: D. SADLER

## HOT-140: Chief Scientist Report

Departed: October 5, 2002 at 0903 (HST)  
Returned: October 9 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: Gabe Foreman  
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 October 5 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 October 6 through October 8.
- 3) Station 8: HALE ALOHA is located at 22° 20' N, 158° 10.6' W. Station 8 was planned to be occupied on October 8 for about 2 hours.
- 4) Station 6: Located off Kahe Point at 21° 50.8' N, 158° 21.8' W. Station 6 was planned to be occupied on October 8 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 October 6 and 7. A floating primary production experiment was to be deployed and recovered on October 7. Following recovery of the sediment traps on October 8, 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 October 9 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

WOCE Group:

|   |                    |    |
|---|--------------------|----|
| Daniel Fitzgerald                             | Research Associate | UH |
| Fernando Santiago-Mandujano<br>(Watch Leader) | Research Associate | UH |
| Shimi Rii                                     | Research Associate | UH |
| Mark Valenciano                               | Research Associate | 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 |
| Jennifer Brum                   | Graduate Student    | UH |
| Melinda Simmons                 | Graduate Student    | UH |

Ancillary Investigators

|                   |                  |       |
|-------------------|------------------|-------|
| Benjamin Van Mooy | Graduate Student | UW    |
| Colleen Evans     | Graduate Student | UW    |
| Laurie Juranek    | Graduate Student | UW    |
| Erik Zinser       | Postdoc          | MIT   |
| Christina Preston | Scientist        | MBARI |

3. GENERAL SUMMARY

All operations at all stations were conducted as planned. Fourteen 1000 m and two 4800 m CTD casts were obtained at Station ALOHA. Single 1000 m casts were obtained at Station Kahe and Hale Aloha. A 2500 m CTD cast was completed at Kaena Point. Also, three PRR/TSRB cast were performed at Station ALOHA.

M. Simmons 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.

All ancillary work was completed and the ancillary investigators on board reported that they were very satisfied with the cruise.

We arrived back at Snug Harbor on October 9 at 0735. A 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 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)

October 4, 2002; Loading Day

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

October 5, 2002

The ship departed from Snug harbor at 0916. 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 1155 and immediately conducted a weight cast (400 lb) to 1000 m. The PRR and TSRB were completed followed by a 1000 m CTD cast. The ship departed Station Kahe at 1530 and proceeded to Station ALOHA.

October 6, 2002

We arrived at Station ALOHA at 0056 and immediately conducted a net tow. The sediment traps were deployed at 0245 followed by the deep WOCE cast to 4800 m. The 36 hour burst CTD sampling began at 0819 and continued throughout the day. Six 1000 m casts were completed. Two additional net tows were completed at 1335 and 2251.

October 7, 2002

Seven 1000 m CTD casts were completed. The primary production array was deployed at 0633 and recovered at 1846. Net tows were completed at 0200 and 1035. The PRR/TSRB optical packages were deployed at noon. Two AC-9/FRRf casts were conducted at 0516 and 1348.

October 8, 2002

A 4500 m deep CTD cast was completed at 0243 and the ship proceeded to the floating sediment trap array which was recovered at 0702. The ship returned to Station ALOHA where the ATE was deployed. Two CTD casts were conducted to provide water for ancillary investigators. The PRR/TSRB optical packages were deployed at noon followed by an AC-9/FRRf cast at 1252. The ship departed Station ALOHA at 1356 and transited to Station 8. We arrived at Station 8 at 1630 and conducted a 1000 m CTD cast at 1700. We departed Station 8 at 1804 and transited

to Station 6. Upon arrival at Station 6 at 2110, a 2500 m CTD cast was conducted. Station 6 was departed at 2320 and the ship proceeded to Honolulu Harbor.

October 9, 2002

We arrived at Snug Harbor at 0735. A full offload took place upon arrival.

WEATHER:

Below is the cruise bridge log description for HOT-140. 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 |
|----------------|------------|----------|----------|-------------|-------|--------|
| Sat. 5 October | 100, 18    | 100, 4   | 120, 3   | 29.82-29.94 | 77-88 | 7      |
| Sun. 6 October | 090, 18-22 | 090, 4-5 | 090, 6-8 | 29.82-29.97 | 76-82 | 4-8    |
| Mon. 7 October | 085, 16-21 | 085, 4   | 090, 6-7 | 29.93-29.99 | 76-83 | 3-8    |
| Tue. 8 October | 095, 18-21 | 095, 4-5 | 090, 5-6 | 29.90-29.98 | 76-82 | 2-7    |
| Wed. 9 October | 085, 10-19 | 085, 2-4 | 110, 3   | 29.90-29.93 | 76    | 2-3    |

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 Chishom                | Prochlorococcus population dynamics/MIT |
| Claudia Benitez-Nelson       | 234Th Particle Dynamics/SC              |

Others:

| Investigator:     | Project:                                     |
|-------------------|--|
| -----             | -----  |
| Benjamin Van Mooy | Phosphate uptake by marine microorganisms/UW |
| Laurie Juranek    | Primary Productivity with Oxygen Isotopes/UW |
| Christina Preston | Fosmid libraries from bacterioplankton/MBARI |