

HOT-121: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT-121 Chief Scientist's Cruise Report

R/V Ka'Imikai O Kanaloa

December 18-22, 2000

Departed: December 18, 2000 at 0900 (HST)

Returned: December 22, 2000 at 0700

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: Steve Poulos

STAG Deck Operations: David 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. Four stations were to be occupied during the cruise, in the following order:

1) Station 1, referred to as Station Kahe, is located at 21o 20.6'N, 158o 16.4'W and was to be occupied on December 18 for about 3 hours.

2) Station 6, referred to as Station Kaena, is located off Kaena Point at 21o 50.8'N, 158o 21.8'W was to be occupied on December 21 for about 2 hours.

3) Station 2: ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22o 45'N, 158oW. This is the main HOT station and was to be occupied for 3 days from December 19 to December 21.

4) Station 8, referred to as HALE-ALOHA is the location of the deep ocean mooring (22o 27.5'N, 158o 7.9'W). It was to be occupied on December 21 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 short CTD cast (100 m) 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. Another free-drifting array was to be deployed for 12 hours for a primary production experiment on December 20. A plankton net was to be deployed near noon and midnight on December 19 and 20 at

Station ALOHA.

After work at Station ALOHA was accomplished, the ship was to transit to recover the sediment trap array. After the sediment traps were recovered, the ship was to transit to Station 8, to conduct one 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.

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:

Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH
Jeremiah Johnson (Watch Leader)	Research Associate	UH
Mark Valenciano	Electronics Technician	UH
Lal Ratnapala	Research Assistant	UH
Siang Chyn Lim	Student Volunteer	UH

JGOFS group:

Karin Bjorkman	Research Associate	UH
Ann Gasc	Research Associate	UH
Matt Church	Graduate Student	UH
John Dore (Watch Leader)	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Matthew Erickson	Research Associate	UH
Mya Breitbart	Graduate Student	UH

Ancillary projects:

Tom Gregory	Technician	UH
Karen Selph	Research Associate	UH - M. Landry
Roberta Hamme	Scientist	UW

3. GENERAL SUMMARY

Operations were conducted as planned without major interruptions. Twelve 1000-m CTD casts, one 100-m, and two deep casts were obtained at station ALOHA. One 1000-m CTD cast was obtained at each of stations Kahe and HALE-ALOHA. One near-bottom cast (~2500 m) was obtained at station 6. The CTD wire developed a kink near the package on the third day of the cruise and had to be reterminated.

The primary productivity array was deployed as planned on December 20, but its recovery was delayed until the next morning because it could not be found in the dark given that its strobe light was not working. The array of floating sediment traps was deployed and recovered without incidents. K. Selph and T. Gregory completed successfully 6 plankton net tows.

Weather conditions were favorable during the first two days of the cruise, with light winds and flat seas, but conditions deteriorated after the second day, with winds increasing to 20-25 kt and sea state 4, with large swells.

The ADCP ran without interruption throughout the cruise, as well as the fluorometer, and the ship's anemometer. The thermosalinograph external temperature sensor had problems and had to be replaced during the cruise, compromising about 6 hours of temperature data.

We arrived back at Snug Harbor on December 22 at 0700. Off-loading of samples and of the JGOFS van 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)

December 15, 2000; Loading Day

Equipment loaded on this day. CTD cable was reterminated by M. Valenciano.

December 18, 2000

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

Arrived to Kahe station at 1130 and a weight cast (400 lb) to 1000 m was conducted during which M. Valenciano inspected the CTD wire. At 1230 the Profiling Reflectance Radiometer (PRR) and Tethered Spectral Radiometric Buoy (TSRB) were deployed.

The CTD cast was conducted at 1330, after which the ship headed towards station ALOHA.

Winds were light and flat seas.

December 19, 2000

We arrived at station ALOHA at 0000 and proceeded to conduct a net tow, followed by a shallow CTD cast (100 m) to collect samples for M. Church. The the sediment traps were then deployed. The deep WOCE cast started at 0300 and was followed by the shallow WOCE cast, 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 at noon and two at night.

The PRR and TSRB were deployed at 1230.

Light winds and flat seas.

December 20, 2000

Six 1000-m CTD casts were conducted during this day, and a second deep cast was started at 2300. Errors were detected in the CTD data before cast 13 and one small kink was found in the CTD wire about 5 m from the package. M. Valenciano reterminated the wire after cutting about 20 m. The cast was conducted two hours after scheduled, and the following cast was rescheduled three hours after its original scheduled time.

The primary productivity array was deployed at 0630, but it could not be found in the evening because of the rough seas and because its strobe light was not working, its RDF was still transmitting. The array, which had drifted about 11 nm northwestward from the ALOHA station was recovered the following morning.

The thermosalinograph external temperature sensor (SN 031496) showed bad data and had to be replaced with SN 2078 by S. Poulos. External temperature data from 2000 (12/20) through 0200 (12/21) are not reliable.

One net tow was conducted at noon and one at night.

The PRR and TSRB were deployed at 1230.

Winds increased to 20-25 kt, sea state 4 and large swells.

December 21, 2000

The second deep CTD cast that started at 2300 on 12/20 was completed by 0300. This cast was conducted about 10 nm away from station ALOHA because we had to be near the primary productivity array that would be recovered early in the morning. The array was recovered between 0700 and 0735, after which we headed to recover the sediment traps. The sediment trap recovery was completed by 0915.

A 1000-m CTD cast was conducted at the HALE-ALOHA station at 1345.

A near-bottom cast (~2500 m) was conducted at 1800 at station 6. A two-hour bathymetry survey was conducted at 2000 near station 6.

December 22, 2000

Arrived at Snug Harbor at 0700. Off-loading of samples and JGOFS van took place immediately.

SUB COMPONENT PROGRAMS AND SPECIAL PROJECTS

B. Bidigare (UH)

HPLC pigments

M. Landry (UH)

Zooplankton community structure

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. Keeling (SIO)	CO2 dynamics and intercalibration
P. Quay (UW)	DIC and 13C
J. Porter (UH)	Aerosol and Ozone measurements
M. Abbot, R. Letelier (OSU)	Spectral measurements