

# HOT-120: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

## HOT-120 Chief Scientist's Cruise Report

R/V Ka'Imikai O Kanaloa

November 28 - December 2, 2000

Departed: November 28, 2000 at 0900 (HST)

Returned: December 2, 2000 at 0700

Vessel: R/V Ka'Imikai O Kanaloa

Operator: University of Hawaii

Master of the Vessel: Captain Robert Hayes

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 November 28 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 November 28 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 November 28 to December 1st.

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 1st 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.

A near-bottom CTD cast (~2500 m) was to be conducted at Station 6 including salinity samples for calibration.

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, CTD casts at strict 3 hour intervals were to be conducted continuously for at least 36 hours for continuous and

discrete data collection. Another free-drifting array was to be deployed for 12 hours for a primary production experiment on November 30. A plankton net was to be deployed near noon and midnight on November 29 and 30 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 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
Martin Orlando	Student Volunteer	HPU

### JGOFS group:

Karin Bjorkman	Research Associate	UH
Ann Gasc	Research Associate	UH
Matt Church	Graduate Student	UH
Dale Hebel	Scientist (co-PI JGOFS)	UH
John Dore (Watch Leader)	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Matthew Erickson	Research Associate	UH

### Ancillary projects:

Claudia Benitez-Nelson	Post-Doc	UH
Colleen Allen	Research Associate	UH - M. Landry
Chuck Stump	Scientist	UW

## 3. GENERAL SUMMARY

Operations were conducted as planned without major interruptions. Fifteen 1000-m CTD casts 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. Both deep casts at ALOHA indicated the presence of a "cold event" with near-bottom potential temperatures reaching 1.089 C.

The primary productivity array was deployed and recovered without problems. The array of floating sediment traps was deployed without incidents, but the recovery was delayed when the array's line got tangled on the ship's propellers (although the engine was not engaged). One of the crew members had to swim under the ship using SCUBA gear to untangle the line.

C. Allen and C. Benitez-Nelson completed successfully 6 plankton net tows.

Weather conditions during the cruise were rough at the beginning, but improved considerably after the first day with winds less than 5 kt and flat seas.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, the fluorometer, and the ship's anemometer. The thermosalinograph recorded noisy salinity data during the transit to station ALOHA, apparently due to bubbles introduced in the system because of the rough ride.

We arrived back at Snug Harbor on December 2 at 0700. Off-loading 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)

November 27, 2000; Loading Day

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

November 28, 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 1200 and a weight cast (400 lb) to 1000 m was conducted during which M. Valenciano inspected the CTD wire. At 1300 the Profiling Reflectance Radiometer (PRR) and Tethered Spectral Radiometric Buoy (TSRB) were deployed. The primary productivity buoy was deployed briefly for testing after some repairs.

The CTD cast was conducted at 1355, after which the ship transited to station 6, where a near-bottom cast (~2500 m) was conducted at 1820. The ship then headed towards station ALOHA. The thermosalinograph recorded noisy data during the transit to ALOHA, probably due to bubbles introduced in the system because of the rough ride.

November 29, 2000

We arrived at station ALOHA at 0200 and proceeded to conduct a shallow CTD cast (100 m) to collect samples for M. Church, followed by the

deployment of the sediment traps. The deep WOCE cast started at 0500 and was followed by the shallow WOCE cast, which started the 36-hr CTD cast period. The deep cast indicated the presence of a "cold event", with near-bottom potential temperatures reaching 1.089 C. A total of five 1000-m CTD casts were conducted this day.

Two net tows were conducted at noon and one at night.

The PRR and TSRB were deployed at 1230.

Winds decreased to about 6 kt by the end of the day.

November 30, 2000

Operations continued as scheduled. Eight 1000-m CTD casts and one 200-m cast were conducted during this day. A hydrocast with two GO bottles was conducted at 0330 before the primary productivity array deployment (0600). The array was recovered at 1800.

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

The PRR and TSRB were deployed at 1230.

Winds decreased to 5 kt with flat seas.

December 1st, 2000

A second deep CTD cast was conducted at 0200, after which we headed to recover the sediment traps.

Sediment traps retrieval started at 0800, but during recovery the line separating the yellow from the pink floats got tangled around the propeller (the ship's engine was not engaged) preventing the recovery. Given the calm sea conditions, one of the crew members was able to swim under the ship wearing SCUBA equipment to untangle the line. The recovery was completed without incidents afterwards.

A 1000-m CTD cast was conducted at the HALE-ALOHA station at 1500.

December 2nd, 2000

We arrived at Snug Harbor at 0700. Off-loading 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