HOT-98: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT-98 Chief Scientist's Cruise Report
R/V Moana Wave
17-21 October 1998

Departed: October 17, 1998 at 1000 (HST)
Returned: October 21, 1998 at 0030
Vessel: R/V Moana Wave
Operator: University of Hawaii
Master of the Vessel: Captain John Stahl
Chief Scientist: Fernando Santiago-Mandujano
STAG Electronics Technician: Wilhelm Hervig
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. Three 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 October 17 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 22o 45'N, 158oW. This is the main HOT station and was to be occupied for 3 days from October 17 to October 20.

3) Station 8, is the location of the HALE-ALOHA buoy (22o 27.5'N, 158o 7.9'W). It was to be occupied on October 20 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 free-drifting sediment trap array was to be deployed for 72 hours to measure sedimentation rates of particulate matter. 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. The ship was to be requested to remain on station during this sampling period. Another free-drifting array was to be deployed for 12 hours for a primary production experiment on October 19. A plankton net was to be deployed near noon and midnight on October 18 and October 19 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 on October 20, 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, a pCO2 system, a fluorometer, the Licor light logger, and an array of meteorological instruments.

2. SCIENCE PERSONNEL

WOCE group:

Fernando Santiago-Mandujano	Chief Scientist (Res. Assoc.)	UH
Craig Nosse (Watch Leader)	Research Associate	UH
Mark Valenciano	Electronics Technician	UH
Don Wright	Research Associate	UH

JGOFS group:

Dale Hebel (Watch Leader)	Ass't Specialist (co-PI JGOFS)	UH
Karin Bjorkman	Research Associate	UH
Terrence Houlihan	Research Associate	UH
Markus Karner	Post-Doc	UH
Louie Tupas	Scientist (co-PI JGOFS)	UH
Lance Fujieki	Computer Specialist	UH
Daniel Sadler	Research Associate	UH

Ancillary projects:

Scott Nunnery	Research Associate	UH - M. Landry
Albert Calbet	Post-Doc	UH/Zooplankton
Nathaniel Ostrom	Scientist	Michigan State University
Jim Falter	Graduate Student	UH

3. GENERAL SUMMARY

All the primary JGOFS and WOCE objectives were accomplished and all samples for ancillary projects were taken.

The 36-hour CTD burst sampling was completed and fourteen 1000-m casts were obtained at station ALOHA in addition to two deep cast. Also one 1000-m CTD cast was obtained at each of the stations Kahe and HALE-ALOHA.

One 8-bottle go-flo cast was successfully obtained at station ALOHA, and the primary productivity array was deployed and recovered without problems. The array of floating sediment traps was also deployed and recovered without incidents; the sediment traps had drifted about 34 nm south-west upon recovery. S. Nunnery and A. Calbet completed successfully 6 plankton net tows.

Weather conditions during the cruise were favorable to conduct all deck operations without problems. There were 10-20 kt easterlies and 3-5 ft waves.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, the pCO2 system, the Licor light logger, the fluorometer, and the meteorological sensors.

The signal from the Inverted Echo Sounder (IES) located at the center of the ALOHA station was detected on the 12 kHz PDR.

We arrived back at Snug Harbor on October 21 at 0030. Off-loading of all deck and lab equipment was completed by noon, as there was another cruise scheduled to set sail after this cruise.

4. R/V MOANA WAVE, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Moana Wave 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)

October 16, 1998; Loading Day

Most of the deck equipment such as vans and winches had not been off-loaded from the previous HOT-97 cruise because there were no other cruises before this one. Only minor equipment and materials needed to be loaded by the JGOFS group and ancillary investigators. The WOCE group conducted a full equipment load. M. Valenciano inspected the CTD cable termination and decided that it was not necessary to do a retermination.

October 17, 1998

Ship departed from Snug harbor at 1000. Fire and abandon ship drills conducted at 1030, followed by a short science meeting during which the cruise schedule was reviewed, and safety issues were addressed.

Arrived to Kahe station at 1300 and started Profiling Reflectance Radiometer (PRR) and Tethered Spectral Radiometric Buoy (TSRB) deployments.

A weight cast (400 lb) to 1000 m was conducted at 1340, during which M. Valenciano inspected the CTD wire. A 1000-m CTD cast followed at 1500.

Departed to station ALOHA at 1700.

Winds from the east of 20 kt, with 3-5 feet waves. Sea state 3.

October 18, 1998.

Arrived at station ALOHA at 0120.

A net tow was done at 0138, followed by the deployment of the floating sediment traps. Transited back to station ALOHA at 0215 to begin the CTD deep cast.

The IES was detected on the 12 Khz PDR at 0300.

The near-bottom CTD cast was conducted without any problem, followed by the shallow WOCE cast. This cast began the 36-hour period of CTD casts at 3-hour intervals. A total of six 1000-m casts were completed this day at the ALOHA station.

The PRR and TSRB were deployed at 1315.

Three more net tows were successfully completed at 1015, 1330, and 2200.

20 kt winds from the east decreasing to 10 kt in the last 12 hours of the day, 4 feet waves, sea state 3.

October 19, 1998

The 36-hour period of CTD casts at ALOHA ended at 2200. A total of thirteen shallow (1000-m) and one near-bottom cast had been conducted at this station.

A go-flo cast was obtained at 0200. The primary productivity array was deployed at 0530, and retrieved at 1800.

The PRR and TSRB were deployed at 1315.

A net tow was obtained at 0100 and another one at 1330.

Sediment trap satellite positions were received by e-mail, indicating that the traps have drifted southwest outside of the circle.

10 kt winds from the east, 3 feet waves, sea state 3.

October 20, 1998

A second near-bottom cast at ALOHA was conducted at 0200, after the ship returned from pumping tanks outside the circle.

The PRR and TSRB were deployed at 1400.

The array of sediment traps was successfully retrieved at 1100. The traps had drifted about 34 mn southwest of station ALOHA.

Cruise operations ended with a 1000-m CTD cast at the HALE-ALOHA station at 1430, after which the ship headed back to Oahu at 1600.

10 kt winds from the east, 3 feet waves, sea state 3.

October 21, 1998

We arrived at Snug Harbor at 0030. All the deck and lab equipment was offloaded and labs were cleaned by noon.

SUB COMPONENT PROGRAMS AND SPECIAL PROJECTS

B. Bidigare (UH)	HPLC pigments
M. Landry (UH)	Zooplankton community structure
A. Calbet (UH)	Zooplankton dynamics
N. Ostrom (Michigan State)	Nitrous oxide production
J. Falter (UH)	Nitrous oxide production
K. Bjorkman (UH)	Phosphorus dynamics
M. Karner (UH)	Bacterial fluorescence probes
D. Hebel (UH)	Organic matter exudates
L. Tupas (UH)	Primary production intercomparison

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. Keeling (SIO)	CO2 dynamics and intercalibration
P. Quay (UW)	DIC and 13C
E. Boyle (MIT)	Trace metals
E. Laws (UH)	Surface seawater
A. Malahoff (UH)	Surface seawater
J. Porter (UH)	Aerosol and Ozone measurements
B. Popp (UH)	Nitrous oxide
M. Abbot (OSU)	Spectral measurements