HOT-80: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT-80 Chief Scientist's Cruise Report
R/V Moana Wave
16-20 February 1997

Departed: February 16, 1997 at 0900 (HST)
Returned: February 20, 1997 at 0730
Vessel: R/V Moana Wave
Operator: University of Hawaii
Master of the Vessel: Captain Robert Hayes
Chief Scientist: Fernando Santiago-Mandujano
STAG Electronics Technician: Steve Poulos
STAG Deck Operations: Luigi Pozzi

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 February 16 for about 3 hours.
2) Station 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 February 17 to February 19.
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 February 19 for about 5 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 February 18. A plankton net was to be deployed near noon and midnight on February 17 and February 18 at Station ALOHA. After work at Station ALOHA was accomplished, the ship was to transit to Station 8, where two CTD casts were to be conducted on February 19. After this the ship was to transit to recover the sediment trap array. Subsequently, a bio-optical instrument (OPC) was to be towed in a trajectory within the ALOHA circle before heading back to Snug harbor. The following instruments were to collect data throughout the cruise: a shipboard ADCP, a thermosalinograph, a on-board fluorometer 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
Matt Cochran	Student Assistant	UH
Jefrey Snyder	Electronics Technician	UH
Don Wright	Student Assistant	UH

JGOFS group:

Terrence Houlihan (Watch Leader)	Research Associate	UH
Dale Hebel	Scientist (co-PI JGOFS)	UH
Karin Bjorkman	Scientist	UH
Pat Driscoll	Research Associate	SIO
Lance Fujieki	Computer Specialist	UH
Daniel Sadler	Research Associate	UH

Ancillary projects:

Stephanie Christensen	Research Associate	UH - M. Landry
Mai Lopez	Scientist	SIO - M. Huntley

STAG

Steve Poulos	Electronics Technician	UH - UMC
Pierluigi Pozzi	Technician	UH - UMC

3. GENERAL SUMMARY

All the primary JGOFS and WOCE objectives were accomplished and all samples for ancillary projects were taken. Weather conditions were rough during the transit out to Station ALOHA but a safe deployment of the floating sediment traps was conducted upon arrival to Station ALOHA. The primary production array was deployed and recovered without problems and the sediment traps were also recovered without incident. The 36-hour CTD burst sampling was completed however the altimeter did not work during the cruise and post cruise processing has suggested that the CTD touched the bottom during the deep cast. No obvious effect on the CTD data was observed on board however a more detailed analysis of the data is being done to determine any effect on the CTD data. The Go-Flo hydrocast could only utilize 7 of the 8 bottles as the 8th bottle had a broken locking mechanism and could not be used. Consequently, water from the CTD cast had to be used for the 175 m bottles of the primary productivity array. The optical plankton counter-CTD package was successfully towed in a spiral trajectory within the ALOHA circle. A total of six plankton net tows were completed during the cruise. During the visit to Station 8 the ship accidentally drifted onto the HALE-ALOHA buoy hitting it with its starboard flank. There was no apparent damage on the buoy or its instruments.

The ADCP ran without interruption throughout the cruise but reset itself near the end of the cruise and began bottom tracking mode prematurely. The thermosalinograph ran continuously throughout the cruise as well as the on-board fluorometer and meteorological sensors.

We arrived at Snug Harbor on February 20 at 0730 and immediately off-loaded all deck and lab equipment as there was another cruise

scheduled to set sail soon after our cruise was completed.

4. DAILY REPORT OF ACTIVITIES (HST)

February 14, 1997; Loading Day

All equipment was loaded from Snug Harbor labs and UH. All electrical connections for the CTD and OPC were made and tested. Niskin bottles caps were assembled and checked. All instruments were installed, secured and tested. No problems were encountered.

February 16, 1997

Ship departed from Snug at 0900. Fire and abandon ship drills conducted at 0945. Kahe Station was occupied from 1045 to 1530. A 1000-m weight cast, a PRR (Profiler Reflectance Radiometer) cast and a 1000-m CTD cast were conducted in this station. Big swell encountered during transect to Station ALOHA. 15 kt winds from the northeast.

February 17, 1997

The floating array of sediment traps was deployed at station ALOHA at 0030 without difficulties and a net tow was conducted at 0100. A near-bottom cast was started at 0200 to end at 0530. The altimeter did not work so the pinger signal was used to determine the distance between the package and the bottom. The 36-hrs CTD sampling period started at 0800 with the shallow WOCE cast (s2c2). One of the casts (s2c7) had to be re-started after showing anomalous oxygen and salinity traces in the first 100 m. The CTD was retrieved and rinsed with fresh water and the plumbing drained to eliminate any possible fouling. Residuals of organic material were found on the CTD cable and on the CTD itself. The system worked fine afterwards.

One Niskin bottle spring was lost after the lanyard attaching it to the bottom cap broke, sending the spring flying away while the CTD was sitting on board. The spring was replaced.

Two net tows were conducted during the day at 1000 and 1300, and one at 2200.
Easterly winds between 15 and 20 kt.

February 18, 1997

The 36-hr CTD sampling period at station ALOHA ended at 2200 with cast 14. An extra 300 m cast was conducted at this station for HPLC analysis. The Wetlab fluorometer from Mai Lopez could not be included in the CTD package in this cast as planned. It was intended to calibrate her fluorometer against our CTD fluorometer, but the configuration and the cables available did not allow for both sensors to work together.

A hydrocast of seven Go-flo bottles was used at 0130 to collect water for the primary productivity array. One of the bottles that was to be used on an 8th level had its cocking mechanism broken and could not be used. Water from the CTD at 175 dbar was used instead. The primary productivity array was deployed at 0430 and retrieved at 1900.

One net tow was conducted at 0045 and another at 1000.
15 kt winds from the East.

February 19, 1997

Arrived at HALE-ALOHA station and conducted a 300-m CTD cast at 0300 and a 1000-m cast at 0500. Proceeded to retrieve the floating sediment traps array which had drifted south from ALOHA station and was about 45 min away from HALE-ALOHA. The array was retrieved at 0800.

Given that we were ahead of schedule and close to the HALE-ALOHA station, we decided to return to that station to do a PRR cast. Upon arrival, the ship passed upcurrent from the buoy and it started drifting towards it, hitting it with its starboard flank. The captain immediately managed to move the ship away from the buoy. There was no apparent damage on the buoy or its instruments. The captain explained afterwards that he tried to slow down the ship when it was close to the buoy to allow us for a close visual inspection of the sensors. It was then when the ship started drifting towards the buoy.

A PRR cast was conducted at HALE-ALOHA at 0945. Steve Poulos cleaned the radiometers on the A-frame. The ship remained downwind from the buoy between 0930 and 1030.

The OPC was deployed at HALE-ALOHA at 1030 and after transiting to the ALOHA station it began the planned spiral transect around the circle. The OPC was retrieved at 2030 and the ship headed back to Snug harbor.
15 to 20 kt winds from the East.

February 20, 1997

We arrived at Snug Harbor at 0730 and finished off-loading all deck and lab equipment by noon.

SUB COMPONENT PROGRAMS AND SPECIAL PROJECTS

C. Winn (UH)	DIC, pH, Alk., CO2
B. Bidigare (UH)	HPLC pigments
M. Landry (UH)	Zooplankton dynamics
M. Lopez (SIO)	Optical plankton counter
K. Bjorkman (UH)	Ectoenzymes
K. Bjorkman/D. Hebel (UH)	EOC

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. Keeling (SIO)	CO2 dynamics and intercalibration
P. Quay (UW)	DIC and 13C
C. Measures (UH)	Trace metals