HOT-67: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT 67 Chief Scientist's Cruise Report
R/V Moana Wave
25-30 October 1995

Departed: October 25, 1995 at 0800 (HST)
Returned: October 30, 1995 at 0730
Vessel: R/V Moana Wave
Operator: University of Hawaii
Chief Scientist: Fernando Santiago-Mandujano
Master: Captain John Stahl
Deck Operations: Pierluigi Pozzi
Electronics Technicians: Will Hervig, Sharon Stahl

1. SCIENTIFIC OBJECTIVES

The primary objective of the cruise was to maintain the collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) station. The HOT station, also known as Station ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22o45'N, 158oW. Free- drifting sediment traps were planned for deployment for approximately 72 hours from the site to measure sedimentation rates of particulate matter. CTD casts at three hour intervals were planned to obtain temperature, salinity, dissolved oxygen, flash fluorescence and beam attenuation profiles. Water samples for analysis of dissolved nutrients, gases, and biomass were to be collected with the CTD casts. Another free-drifting array to conduct a primary production experiment was planned for a 12 hour deployment. Three other stations were planned to be occupied during this cruise; Kahe Point Station (21o20.6'N, 158o16.4'W), Kaena Point Station (21o50.76'N, 158o21.84'W), and Station 3 (23o25'N, 158oW). Two bottom moored inverted echo sounders (IES) were planned to be recovered at the Kaena and ALOHA Stations, and a third one to be deployed at the ALOHA Station. A moored sediment trap was planned to be recovered at the ALOHA station. Continuous ADCP measurements were to be made during the cruise, as well as thermosalinograph measurements. Other research objectives such as the collection of water samples for ancillary investigations and experiments were to be conducted as time permitted.

2. SCIENCE PERSONNEL

WOCE group:

Fernando Santiago-Mandujano	Chief Scientist	UH
Jefrey Snyder (Watch Leader)	Electronics Technician	UH
Molly Lucas	Research Assistant	UH
Mark Baird	Graduate Student	UH
Craig Nosse	Research Associate	UH

JGOFS group:		
Luis Tupas	Scientist (co-PI JGOFS)	UH
Ursula Maagard	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Terry Houlihan (Watch Leader)	Research Associate	UH
Daniel Sadler	Graduate Student	UH - T. Li
Chris Carrillo	Graduate Student	UH
Ancillary projects		
Chuck Stump	Scientist	UW - S. Emerson
Mike Mulroney	Technician	URI - R. Watts
Robert Miller	Graduate Student	UH - M. Landry
Mai Lopez	Scientist	SIO - M. Huntley
STAG		
Sharon Stahl	Technician	UH-UMC
Will Hervig	Technician	UH-UMC
Pierluigi Pozzi	Technician	UH-UMC

3. GENERAL SUMMARY

All the primary JGOFS and WOCE objectives were accomplished. All samples for ancillary projects were taken, and the ADCP and thermosalinograph were running without interruption throughout the cruise. Weather conditions were very favorable during the first three and a half days, allowing for the safe recovery of the Kaena Station IES, the deployment of the sediment trap array, the deployment and recovery of the primary production array, the completion of the 36-hour CTD burst sampling and two near-bottom CTD casts; and the recovery and deployment of the Station ALOHA IESs. Six dark bottles were lost from the primary production array. Chuck Stump attached his gas tension device-Seacat package on the sediment trap line, at about 15 m. Mike Mulroney suffered a minor accident after the IES deployment while retrieving the transducer from the side of the ship. He was pulling the cable a little fast, when the transducer came over the rail and onto his head, producing a small cut on his forehead that was readily treated on board. He reported no complications and the injury was healing by the end of the cruise. The Captain was notified and an incident report was filled.

With the weather deteriorating on the fourth day due to the appearance of a front, the conditions became less favorable for the recovery of the sediment trap array. The spar buoy broke in half during recovery and the bottom half went into the water together with the lead weight. The rest of the array was safely retrieved. The moored sediment trap was successfully recovered on the fifth day. Station 3 was also visited, and a near-bottom CTD cast was conducted. The optical plankton counter-CTD fish was towed from the ALOHA to the Kahe Station without any problem, although its CTD did not work correctly. The Station Kahe was occupied near the end of the cruise, and a CTD cast was obtained. The pylon failed to fire 8 of the 16 intended bottles during this cast. We arrived at Snug Harbor on October 30 at 0730 and immediately off-loaded.

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 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. The familiarity that the ship's and STAG personnel have acquired with our regular cruise activities made the work and interactions run in a smooth manner, which translated into a very efficient working relationship.

5. DAILY REPORT OF ACTIVITIES (HST)

October 20, 23 and 24, 1995; Loading Days

Part of the JGOFS and WOCE equipment was loaded and installed on October 20 to be ready for the SOEST open house. Tours to the R/V Moana Wave were given to the public on October 21 as part of the open house activities, and some of the HOT equipment and procedures were being shown to the people by JGOFS and WOCE personnel. The rest of the equipment was loaded, installed, secured and tested on October 23 and 24.

October 25, 1995

All hands arrived on ship at 0730. Ship departed at 0800. Fire and emergency drills conducted at 0845 followed by safety briefing by first mate. A short science personnel meeting followed, in which the schedule of activities was reviewed. Steamed directly towards Kaena Station to recover the IES. ADCP working correctly and set to bottom track mode in shallow waters. Thermosalinograph set to record data throughout the cruise. Favorable weather with 15 kt winds and calm seas 2-3 ft height. Arrived at Kaena Station at 1310. Jefrey and Mike started IES recovery procedures and located the IES at 1400. The IES was released, came to the surface at 1515, and was located by its radio signal. At 1530 the IES was retrieved and brought in on board. All the system seemed to be in good working conditions, including the strobe light. Steamed towards Station ALOHA and arrived at 2200 when the sediment trap deployment started. Deployed the array including Chuck Stump's Gas Tension Device-Seacat at 15 m. A one-bottle Go-flo cast was obtained for Chuck. Operations finished at 2345.

October 26, 1995

Operations conducted under calm seas, 2-3 ft height. Winds were less than 8 kt. A weight cast was done between 0000 and 0100, after which the WOCE deep cast started at 0130. The cast reached up to 4807 dbar, 6 m off the bottom, and it ended at 0525. The 36-hour CTD burst period started at 0700 and CTD casts continued at 3 hour intervals. Some twists in the CTD wire developed, despite Jefrey's procedures of re-balancing the Rosette. Three 30-min net tows were conducted at 1100, 1400 and 2300 hrs.

October 27, 1995

Very favorable weather, with winds between 2 and 5 kt and the sea surface almost flat. The 36-hour CTD burst sampling continued and ended at 2000. The JGOFS Go-flo cast was obtained at 0300. The primary production array was deployed at 0500 and retrieved at 1800. Six dark bottles were lost from two levels, only the mesh containers were recovered. After the 36-hour burst sampling, the ship went out of the circle to pump tanks. The ship returned to the center of the circle and one more 1000-m CTD cast was obtained at 2300. Two net tows were conducted at 1100 and 2230. Mike and Jefrey spent most of the day sorting out some problems with the configuration and electronics of the IES to be deployed. There was a 15-min swim call from the Captain at 1430.

October 28, 1995

One net tow was conducted at 0100, and one deep CTD cast, 4 m off the bottom was obtained from 0300 to 0620. The Station ALOHA IES's recovery and deployment were completed without any problem, under relatively calm weather conditions. The IES was detected at about 0700, released at 0737, and left the bottom at 0801. The IES reached the surface at 0912 and was retrieved at 0930. The whole package seemed to be in good working conditions. The other IES was deployed at 1000 and reached the bottom at 1100. Deployment coordinates 22o45.006'N, 158o00.007'W. Mike Mulroney had a minor accident after the deployment while retrieving the transducer from the side of the ship at about 1120. He suffered a small cut on his forehead which was readily treated. After the IES operations were completed we headed south to recover the sediment trap array. The array drifted south, to the edge of the circle. As the weather deteriorated due to the appearance of a front, the conditions became less favorable for the recovery of the array. A one-bottle Go-flo cast was conducted prior to the recovery at about 1200. The recovery was conducted under the rain, with waves reaching 10-12 ft height and winds of about 10 kt. The spar buoy broke in half during retrieval. The buoy was hanging from the crane, when a big wave moved the ship, smashing the middle of the buoy against the edge of the ship breaking it in half. The bottom part of the buoy was lost. The rest of the equipment was retrieved safely. Recovery operations ended at 1400. Since the operations were completed 3 hours ahead of schedule, an additional 1000-m CTD cast was conducted at Station ALOHA to test the conductivity sensors. Conductivity sensor #679 was replaced by #527 prior to the cast which started at 1630 and ended at 1718, after which the ship headed towards Station 3. The bucket thermometer used for meteorological observations broke when the bucket hit the side of the ship while measuring sea surface temperature. The broken thermometer was stored in the lab freezer for its future disposal.

October 29, 1995

Arrived at Station 3 and a near-bottom cast was conducted from 0030 to 0420, after which the ship headed towards the place where the sediment trap mooring was located. The moored sediment trap was recovered without any problem, under mild weather conditions. We arrived at the site at about 0900. The mooring was released at 0930, reaching the surface at 1030. Retrieving operations started and the mooring was on board at 1200. Operations were successfully completed by 1300. Deployed

the OPC-CTD fish at 1330 and started a zigzag trajectory within the circle, after this, at about 1630 we headed towards Station Kahe towing the fish at about 8 kt. The fish's CTD seemed not to be working correctly.

October 30, 1995

Started CTD cast at Kahe Station at 0300. After firing 6 bottles the pylon wouldn't respond to the firing command from the computer. Using the manual switch we were able to give back the control to the computer and were able to continue firing the bottles. Only 8 out of the expected 16 bottles closed (bottles 1-6 and 11-12). After sampling we headed towards Snug Harbor at about 0445. Sharon Stahl turned ADCP to bottom track mode when in range. Arrived at Snug Harbor at 0730. Commenced off loading, all equipment and personnel cleared from the ship at 1200.

ANCILLARY INVESTIGATIONS AND SPECIAL PROJECTS

Mai Lopez	Optical Plankton counter
Robert Miller	Zooplankton dynamics
Chuck Stump	Oxygen/Argon/Helium measurements
	NO3 measurements (Gas Tension Device)
Mike Mulroney	Inverted Echo Sounder
Dan Sadler	DIC sampling

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. D. Keeling	CO2 isotopes
P. Quay	CO2 measurement
H. Thierstein	Microscopy

Mike Mulroney's Incident Report

Accident summary pertaining to a small cut on the left forehead of Mike Mulroney on October 28 1995.

I was taking in the 8012 transducer from the stb. side at about 11:00 and coiling it into a container on the deck. It was raining so I was moving a little faster, my head was below the rail as I was pulling the cable and coiling it into the box. I lost track of where the transducer was and pulled it over the rail on to my head which put a small cut on my forehead. I saw no stars or flashing lights just a little blood.

Addendum. The Captain was notified about the incident and first-aid procedures were administered. The cut was cleaned with soap and hydrogen peroxide and it soon stopped bleeding. Only a small band-aid was applied on the cut, which was healing by the end of the cruise without apparent complications.

Fernando S-Mandujano.