

## HOT-54: Chief Scientist Report

Chief Scientist: L. TUPAS

VESSEL: R/V Moana Wave, University of Hawaii

MASTER OF THE VESSEL: Captain Bob Hayes

CHIEF SCIENTIST: Dr. Louie Tupas, University of Hawaii

LOADING: June 16, 1994 Departure: June 17, 1994; 0900 HST

ARRIVAL: June 22, 1994; 0800 HST

### 1.0. SCIENTIFIC OBJECTIVES

The objective of the cruise is to maintain 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 22°45'N, 158°W. Free-drifting sediment traps will be deployed for approximately 72 hours from the site to measure sedimentation rates of particulate matter. CTD casts will be made at three hour intervals to obtain temperature, salinity, dissolved oxygen, flash fluorescence and beam attenuation profiles. Water samples will be collected with the CTD casts for analysis of dissolved nutrients, gases, and biomass. Another free-drifting array will be deployed to conduct a primary production experiment. Three other stations shall be occupied during this cruise; Kahe Point Station (21°20.6'N, 158°16.4'W), Kaena Point Station (21°50.76'N, 158°21.84'W), and Station 3 (23°25'N, 158°W). Inverted echo sounders (IES) shall be retrieved and deployed at Station ALOHA and Kaena Point Station. ADCP measurements will be made throughout the cruise. Other research objectives will be conducted as time permits.

### 2.0. SCIENCE PERSONNEL

WOCE Fred Bingham - UH Scientist  
WOCE Harald Lutz - UH Graduate Student  
WOCE Jeffrey Snyder - UH Technician  
WOCE Jason Killam - UH Student Assistant  
WOCE Richard Muller - UH Technician

JGOFS Luis Tupas - UH Scientist  
JGOFS Dale Hebel - UH Scientist  
JGOFS Terrence Houlihan - UH Technician  
JGOFS David Pence - UH Technician  
JGOFS James Christian - UH Graduate Student  
JGOFS John Dore - UH Graduate Student  
JGOFS Renate Scharek - UH Postdoc  
JGOFS Karen Casciotti - REU  
JGOFS Daniel Sadler - UH Graduate Student

Carbon Program Karen Selph - UH Graduate Student  
Zooplankton Program Paul Troy - UH Graduate Student  
Mike Mulroney - Visiting Scientist, Univ. of Rhode Island

### GENERAL SUMMARY:

All objectives of the JGOFS and WOCE programs were accomplished. Both IES units were recovered and two IES units were deployed during the cruise. Station 3 and the Kahuku transect were canceled to provide time for the IES search. All core samples were taken and the 36 hour CTD burst sampling period was maintained without interruption. All samples for ancillary projects were taken. Floating sediment trap and primary production arrays were successfully deployed and recovered. No samples were lost but one cycloac ball got detached during the sediment trap deployment period. The DSE winch was repaired on ship during loading day. A new CTD pylon was used on cruise. The continuous water sampler and water transfer system were deployed and recovered without incident. All plankton net tows using the capstan were successful. There were no major equipment failures and no injuries to personnel.

#### DAILY REPORT OF ACTIVITIES

June 16, 1994, Loading day

Loading activities commenced at Snug Harbor and at the University of Hawaii, Marine Sciences Building at 0800. One service vehicle was used to transport equipment from the university to the ship. At Snug Harbor, we used two small forklifts to transport our sea-going equipment from the raceway labs to the ship.

Note: The large forklift which we usually use to transport the laboratory and equipment container vans was unavailable for use. My understanding and observation of the situation was that the large forklift was being used to push the K-O-K away from the dock to protect a platform attached to the side of the ship. I had requested the use of the forklift for loading and unloading day. One of our personnel who requested its use was rudely turned away. I believe that the use of the forklift for that purpose was inappropriate and we had to devise other means to transport our container vans. What usually takes 1 person and 1 forklift now required 4 people, two forklifts and one flat bed truck to perform the task. The manner in which our personnel was treated was also inappropriate.

Aside from the equipment listed in our cruise planning document, STAG kept on board ship the capstan which we were to use to deploy the extra 500 meters of sediment trap line and for the zooplankton net tows. All deck equipment were properly loaded and secured. All laboratory equipment were properly loaded and secured. Several computer cases were stored in the raceway labs to provide space in the darkroom. Loading of equipment was accomplished at around 1800 hours. Lunch was provided to the science party at cost to the program.

June 17, Cruise Day 1, Departure Day

Assembly time at the ship was set at 0800. All personnel were on board at 0845. Departure was scheduled for 0900 but was delayed by 2 minutes to retrieve tarpaulins left at the raceway labs. Fire and abandon ship drills were conducted at 0930. The science party was briefed by the first mate, John Stahl, after which a science meeting was held.

Ship arrived at Kahe Point Station at 1130. Science operations conducted

were a weight cast to 500 meters, a PNF cast and a CTD cast to 1000 meters with the new pylon. The pylon appeared to be functioning properly on this cast. No problems with the conducting cable or CTD system was observed. Ship departed for Kaena Point Station at 1500.

At Kaena Point Station, a CTD cast to the near bottom was conducted. While the cast was taking place, Mike Mulroney proceeded to interrogate the IES. The IES was successfully located and the release code was transmitted after CTD cast was accomplished. After samples were taken the ship proceeded to retrieve the IES. IES was safely onboard at 2330 and the ship proceeded to Station ALOHA.

June 18, Cruise Day 2

Ship arrived at the center of Station ALOHA at 0530. A CTD cast to 200 meters was made to determine the position of the WTS instrument. Preparations for sediment trap deployment commenced at 0630 and deployment commenced at 0700 and was accomplished at 0930. The ship transited back to the center of Station ALOHA and attempts were made to locate the IES. The IES did not respond to the interrogation commands and its regular half-hour transmissions were not heard. A search pattern was designed by Mike Mulroney which was followed until 1300. I decided to commence with HOT core work at 1400 and assist Mike by transiting to different parts of the Station ALOHA to conduct transponder searches in between casts. We would continue moving from different positions with the ALOHA circle until the following day when the ship had to follow the deployed primary production array. CTD casts were conducted till the end of the day.

June 19, Cruise Day 3

Go-flo cast to collect water for the primary production experiment was successfully conducted at 1330. Deployment activities began at 0600. CTD casts were continued throughout the day. At 1930 the primary production array was retrieved. CTD casts continued throughout the night.

June 20, Cruise Day 4

CTD casts continued throughout the morning and afternoon. The 36 hour bursts sampling period was completed without interruption. At this point I had revised the cruise schedule to allow time for the IES search. This would mean cancellation of Station 3 and the ADCP transect to Kahuku. I scheduled a deep cast to end the ALOHA activities and proceed IES search and recovery. During the second to the last cast at 1800 we were located at the center of Station ALOHA and, Mike Mulroney transmitted the release code. A signal was received from the IES as the instrument was going up. As soon as the CTD was on deck, the ship proceeded with a search pattern to locate the IES. This search was made even more difficult because it was done at night and there was no flasher or VHF signal from the IES at the surface. We relied on our estimate of the currents (which we determined from the westerly transit of the sediment trap array) and the wind direction. We ran into the IES at around 2330 and the instrument was on deck at 2400.

June 21, Cruise Day 5

The last net tow was conducted at 0100 followed by the deep cast. The deep cast was accomplished and sampled by 0700. The ship then transited to the location of the sediment trap array and commenced recovery at 0900. Array recovery was completed at 1230. We started work with the CWS at 1300 and were finished at 2030. The deck was cleaned and secured the ship was underway for Honolulu by 2100.

#### June 22, Cruise Day 5, Arrival Day and Unloading

The ship was docked and secured at 0815. Unloading of the ship proceeded immediately. We had two service vehicles to transport equipment back to UH. We had the use of two small forklifts to transport our equipment to the raceway labs. All living and working areas were cleaned. We cleared the ship at 1200. All equipment and samples arrived at UH safely. No injuries to personnel.

Note: As was the case on loading day, the large forklift was unavailable for use for the same reason mentioned above. Again it took 4 people and two forklifts 2 hours to transport the container vans to the raceway lab. It was a waste of time and manpower and also took more risk to move the vans in that manner. I hope this problem is remedied before our next cruise.

#### ANCILLARY INVESTIGATIONS AND SPECIAL PROJECTS

1. Zooplankton project - K. Selph (M. Landry P.I.)
2. Hydrogen peroxide project - D. Pence
3. Nutrient preservation experiment - T. Houlihan, J. Dore
4. DIC sampling - D. Sadler (C. Winn, P.I.)
5. Bacterial exoenzyme experiment - J. Christian
6. Diatom sampling - R. Scharek
7. Dissolved nucleic acids - K. Casciotti
8. Calcite degradation experiments - P. Troy

#### SAMPLES TAKEN FOR OTHER INVESTIGATORS

1. DIC samples for C.D. Keeling, SIO-UCSD
2. DIC samples for P. Quay, UW
3. DIC calibration samples for C. Carillo, UH
4. Particulate samples for H. Thierstein, ATH Zurich
5. Particulate samples for R. Bidigare, UH Pigment project
6. Dissolved, particulate and sediment trap samples for G. Luther, U Delaware