

## HOT-60: Chief Scientist Report

Chief Scientist: L. TUPAS

Loading: February 3, 1995

Departed: February 4, 1995 at 0900

Returned: February 9, 1995 at 1130

Vessel: R/V Moana Wave

Operator: University of Hawaii

Chief Scientist: Dr. Louie Tupas

Master: Captain Robert Hayes

Deck Operations: Mr. Luigi Pozzi

Electronics Technician: Ms. 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 22°45'N, 158°W. 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 (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). The secondary objective of the cruise was to deploy a moored sediment trap array at about 23°N, 158°W. A towed optical plankton counter (OPC) was planned for use whenever the ship was in transit between stations. ADCP measurements will be made throughout the cruise. 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

Dale Hebel - UH, JGOFS

Luis Tupas - UH, JGOFS

David Pence - UH, JGOFS

Terrence Houlihan - UH, JGOFS

Lance Fujieki - UH, JGOFS

Renate Scharek - UH, JGOFS

Fernando Santiago-Mandujano - UH, WOCE

Jefrey Snyder - UH, WOCE

Craig Nosse - UH, WOCE Patrick

Goda - UH, WOCE Jinchun Yuan - UH, WOCE

Daniel Sadler - UH, Carbon Project

Karen Selph - UH, Zooplankton Project  
Suzanna Vink - UH, Trace Metal Project  
Rebecca Reitmeyer - UH, Trace Metal Project  
Steven Emerson - U. Washington, Gas Tracers  
Mark Huntley - SIO, OPC/ADCP

### 3. GENERAL SUMMARY

All objectives of the JGOFS and WOCE programs were accomplished despite losing one-day of work due to CTD winch problems and inclement weather. Only Stations Kahe, Kaena and ALOHA were occupied. All core samples were taken but the 36 hour CTD burst sampling period was disrupted for 24 hours after the first 12 hours of sampling. All samples for ancillary projects were taken. Floating sediment trap and primary production arrays were successfully deployed and recovered, no samples were lost during the in-situ incubation. Aside from the CTD winch, there were no other equipment failures. The optical plankton counter was towed from Stations Kahe to Kaena without any problem. The moored sediment trap array was deployed as the last scientific activity of the cruise. Deployment went smoothly until it was time to release the anchor. The bridge informed the science group that we were near a telephone line and wanted the ship to move a little before releasing the anchor. The ship moved was moving at about 1.5 knots for approximately 10 minutes before the chief scientist decided to drop the anchor. While obtaining the slant ranges for the mooring, it was noticed that the surface VHF transmitter was still functioning (a.k.a., the surface float had not submerged). After locating the source of the signal it was discovered that 3/4 of the array was on the surface. The science group then proceeded to retrieve the array and plans to recover the remaining 1/4 on another cruise. All work was accomplished at 2300 and because of the delay it was imperative that the ship return to Snug Harbor with utmost haste. Because of this, the optical plankton counter was not towed during the return leg. We arrived at Snug Harbor on February 9 at 1130.

### 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. Even as the program continues to expand its range of activities, the ship is still able to accommodate our operational demands. 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

February 3, 1995; Loading Day

Although Feb. 3 was the main loading day, preparations for the ship began as early as Feb. 1st. The ship returned to port from its previous cruise on Feb. 1 and STAG requested that out laboratory and equipment

vans be brought to the dock for loading. Aside from the vans, the anchor weight for the mooring as well as the optical plankton counter (v-fin) was also loaded on ship that day. On Feb. 2 the conducting cable for the v- fin was spooled onto the Markey winch and the unit was tested.

February 4, 1995

All hands arrived on ship at 0830. Ship departed at 0900. Fire and emergency drills conducted at 0945 followed by safety briefing by first mate. Arrived Kahe Point Station at 1130. Conducted weight cast, PNF cast and 1000 m CTD cast. All operations and sampling accomplished by 1400. Transit to Station Kaena. Arrive Station Kaena at 1715. Conduct CTD to near bottom, completed at 1915, slowly started transit to Station ALOHA while sampling. Encountered moderate showers and moderate seas during transit, heavy overcast.

February 5, 1995

Retriev OPC at 0430. Transit to center of station and commenced with sediment trap array deployment at 0500, finished deployment at 0630. Transit to center of station and commenced WOCE deep cast at 0700. Net tow at 1130, PNF cast at 1200. CTD burst sampling commenced at 1330. CTD casts maintained at 3 hour intervals. Weather and sea conditions becoming increasingly rough

February 6, 1995

CTD winch problems during the upcast at 0030. Package is just below the surface. Port crane is used to retrieve the package. Winch under repair. Science operations are suspended due to rough sea conditions. Winch testing commenced at 1830 with weight cast. Science operations resume at 200 with CTD cast.

February 7, 1995

Go-Flo cast conducted at 0145, finished at 0300. Primary production array deployment commenced at 0600, accomplished at 0630. Burst sampling continued at 3 hour intervals. CTD winch problems again at 0800. Go-Flo cast conducted while winch is unde repair. Zooplankton tow and PNF cast conducted at noon. CTD worked continues with cast at 1300. Continue casts at 3 hour intervals. Net tow at midnight. Proceeding to sediment trap array site.

February 8, 1995

Sediment trap recovery commenced at 0330, accomplished at 0500. Proceeding to location of sediment trap morring site. Begin mooring deployment operations at 0900. Mooring anchor was about to be released when the bridge called to inform us that we had drifted near a telephone cable. Chief scientist checks the location of the array with the captain and decides to wait while the ship drifts further away from the telephone cable. After about 10 minutes the anchor is released at 1415. Transponder in the water to take slant ranges. OPC is deployed but is immediately recovered when it was found that the array did not sink. the Top 3/4 of the array is sighted at 1800 and recovery

operations begin at at 1630. Recovery operations completed at 2300.  
Proceeding to Snug.

February 9, 1995

In transit to Snug. Arrive at 1130. Commenced off loading, all  
equipment and personnel cleared from ship at 1700.

#### ANCILLARY INVESTIGATIONS AND SPECIAL PROJECTS

1. Zooplankton sampling - K. Selph
2. Trace metal sampling and analysis - S. Vink, R. Reitmeyer
3.  $^{15}\text{N}$ - $\text{NO}_3$  uptake experiments - L. Tupas, S. Emerson
4. DIC sampling - D. Sadler
5. Ar/He sampling - S. Emerson
6. Optical Plankton counts - M. Huntley

#### SAMPLES TAKEN FOR OTHER INVESTIGATORS

1. DIC samples for C.D. Keeling, SIO-UCSD
2. DIC samples for P. Quay, UW
3. Silica samples for H. Thierstein, Zurich
4. Pigment samples for R. Bidigare
5. Iodine samples for G. Luther