

HOT-74: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT 74 Chief Scientist's Cruise Report

R/V Moana Wave

25-29 July 1996

Departed: July 25, 1996 at 0900 (HST)

Returned: July 29, 1996 at 0800

Vessel: R/V Moana Wave

Operator: University of Hawaii

Chief Scientist: Fernando Santiago-Mandujano

Master: Captain Robert Hayes

Deck Operations: Pierluigi Pozzi

Electronics Technician: Will Hervig

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 and flash fluorescence. 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. One other station was planned to be occupied during this cruise; Kahe Point Station (21o20.6'N, 158o16.4'W). Continuous ADCP as well as thermosalinograph measurements were to be made during the cruise. Other research objectives such as the collection of water samples for ancillary investigations and experiments, as well as the towing of an optical plankton counter 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
Craig Nosse	Research Associate	UH
Caroline Dumoulin	Visiting Graduate Student	UH
Shaun Johnston	Graduate Student	UH

JGOFS group:

Dale Hebel (Watch Leader)	Scientist (co-PI JGOFS)	UH
Lance Fudgeki	Computer Specialist	UH

Terry Houlihan	Research Associate	UH
Daniel Sadler	Graduate Student	UH
Scott Nunnery	Student	UH
Hussain Al-Mutairi	Graduate Student	UH - M. Landry

Ancillary projects

Mai Lopez	Scientist	SIO - M. Huntley
Bill Cottrell	Electronics Technician	Ashtech
Jeffrey Milder	REU Student	UH - B. Popp

STAG

Will Hervig	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 very favorable during the cruise. This allowed for a safe deployment and recovery of the floating sediment traps, the deployment and recovery of the primary production array and of the Go-flo hydrocast, the completion of the 36-hour CTD burst sampling including two deep casts; and the towing of the optical plankton counter-CTD package in a zig-zag trajectory within the ALOHA circle. Four of the eight bottles in the Go-flo hydrocast did not close properly, consequently water from the CTD cast had to be used for some of the bottles in the primary productivity array. The OPC had to be retrieved earlier than planned given that problems with the ship's engine would not allow us to achieve full speed in the way back to Honolulu. A total of eight plankton net tows were completed during the cruise, although two of them did not sample correctly due to problems during deployment.

The ADCP ran without interruption throughout the cruise, and was set to bottom track when the bottom depth was appropriate at the beginning and the near the end of the cruise. Bill Cottrell (Ashtech) collected test data with his GPS and the ship's Ashtech GPS during the cruise. The thermosalinograph worked continuously throughout the cruise. On the second day Will Hervig noticed high temperatures in the external temperature sensor data, which went back to normal after resetting the system. A preliminary look at the data shortly after the cruise indicated that the system malfunctioned and did not record data for about 5 hours before the end of the cruise.

We arrived at Snug Harbor on July 29 at 0730 and immediately off-loaded, however the majority of the deck and lab equipment remained onboard for the next 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 were very flexible in receiving changes in our operational schedule. Technical support during the cruise was also very good. STAG personnel were available at any time to assist in our work.

5. DAILY REPORT OF ACTIVITIES (HST)

July 24, 1996; 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.

July 25, 1996.

Ship departed at 0900. Fire and emergency drills conducted by the first mate at 1000. A short science personnel meeting followed in which the schedule of activities was reviewed and safety measures were stressed out. Thermosalinograph and ADCP working correctly. A 1000 m weight cast was conducted at 1145 upon arrival at Kahe Station, followed by a 150-m Profiler Reflectance Radiometer (PRR) cast at 1230. At 1300 a 1000-m CTD cast was conducted, after which we departed to the ALOHA Station. We arrived at ALOHA Station at about 2230 and started preparations for the floating sediment trap deployment.

The winds at Kahe Pt. were very light, less than 10 kt from the southwest. They reversed to easterlies and increased to about 15 kt after the ship passed Kaena Pt. at about 1600 in the transect to Station ALOHA.

July 26, 1996.

A floating array with two sediment traps was deployed by 0000, followed by a 30-min plankton net tow at 0100. Due to problems during deployment this tow did not collect material appropriately and had to be discharged. The WOCE deep cast started at 0315 and was completed at 0640, the altimeter did not work during this cast, so the pinger's signal was used to determine the distance between the CTD and the bottom. Samples from the IES were observed on the 12 Khz recorder during this cast. One PRR profile was done at 1200. Two 30-min plankton net tows were done during the day (1030 and 1330) and one more at night (2200). The 1330 net tow did not collect enough material as apparently the net turned over during deployment.

The 36-hour period started with the WOCE shallow cast at 0800, and by the end of the day a total of six (6) 1000-m CTD casts had been completed at station ALOHA. At about 1500, W. Hervig found that the thermosalinograph external temperature sensor was recording very high temperatures. The temperatures came back to normal after resetting the system at 1535.

Weather conditions were favorable. Winds from the east at 15 kt, and seas of 1-2 ft.

July 27, 1996.

Operations at station ALOHA continued as planned. The Go-flo hydrocast was deployed between 0100 and 0230. Four of the bottles did not close properly during this cast due to problems with the lanyards that had been replaced before the cruise. Consequently, water from the CTD cast Niskin bottles had to be used for some of the bottles in the primary productivity array. The primary productivity array was deployed without difficulty at 0430 and was retrieved at 1900. Two net tows were conducted at night at 0000 and 2200, and two during the day at 1000 and 1300. A PRR profile was obtained at 1200. Eight (8) CTD casts were completed during this day, making a total of 15 at the ALOHA station. The sediment traps ARGOS positions were received by e-mail and plotted. By 0620 the sediment traps array had drifted about 10 nm northeast from the ALOHA station.

Weather conditions continued being favorable. Winds were from the east at 10 kt, increasing to 15-20 kt during the last 10 hrs of the day. Seas were about 2-4 ft.

July 28, 1996.

Two more CTD casts were completed during the last day of the cruise. The first one was to 1000 m and the second was a deep cast. Again, the altimeter did not function during the deep cast.

The sediment traps drifted about 15 nm northeast from the ALOHA Station. The array was retrieved without difficulty between 1200 and 1240. The OPC was deployed at 1340 and retrieved at 1830 after following a zig-zag trajectory within the circle. The OPC had to be retrieved earlier than planned given that problems with the ship's engine would not allow us to achieve full speed in the way back to Honolulu.

Weather was favorable with easterly winds of 15-20 kt and seas 3-4 ft high.

July 29, 1996.

Arrived at Snug Harbor at 0730. Proceeded with unloading, however the majority of the deck and lab equipment remained onboard for the next cruise. Unloading completed by 1100.

ANCILLARY INVESTIGATIONS AND SPECIAL PROJECTS

M. Lopez	Optical Plankton counter
H. Al-Mutairi	Zooplankton dynamics
D. Sadler	DIC sampling
J. Milder	Carbon Isotopic Fractionation
B. Cottrell	Ashtech GPS

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. D. Keeling	CO2 isotopes
P. Quay	CO2 measurement

