

HOT-72: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT 72 Chief Scientist's Cruise Report

R/V Moana Wave

20-24 May 1996

Departed: May 20, 1996 at 0830 (HST)

Returned: May 24, 1996 at 0800

Vessel: R/V Moana Wave

Operator: University of Hawaii

Chief Scientist: Fernando Santiago-Mandujano

Master: Captain John Stahl

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. Two other stations were planned to be occupied during this cruise; Kahe Point Station (21o20.6'N, 158o16.4'W), and Station 3 (23o25'N, 158oW). 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 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 Bishop	Electronics Technician	Seabird
Craig Nosse	Research Associate	UH

JGOFS group:

Luis Tupas	Scientist (co-PI JGOFS)	UH
Dale Hebel (Watch Leader)	Scientist (co-PI JGOFS)	UH
Don Wright	Student	UH
Lance Fujieki	Computer Specialist	UH

Terry Houlihan	Research Associate	UH
Daniel Sadler	Graduate Student	UH
Albert Colman	Graduate Student	UH
John Rooney	Graduate Student	UH - M. Landry

Ancillary projects

Mai Lopez	Scientist	SIO - M. Huntley
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STAG

Will Hervig	Technician	UH-UMC
Pierluigi Pozzi	Technician	UH-UMC

3. GENERAL SUMMARY

All the primary JGOFS and WOCE objectives were accomplished despite the fact that the ship had to return to Oahu in an emergency basis to seek treatment for Terry Houlihan, who suffered a serious cut in his hand during the first day of the cruise at the Station ALOHA. All cruise activities were rescheduled to compensate for the 14 hours spent to return to Oahu and back to the ALOHA station. Consequently the sediment traps deployment time was reduced to 46 hours, and the visit to Station 3 was cancelled.

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 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 the deep cast; and the towing of the optical plankton counter-CTD package in a zig-zag trajectory within the ALOHA circle. The CTD in the OPC package did not transmit data during this towing due to problems with the bulk connector. A total of six (6) net tows were completed, although the flow-meter malfunctioned during one of the night tows.

The ADCP was running without interruption throughout the cruise, but the Ashtech GPS that provides its primary heading information stopped working on the second day, and the problem went unnoticed for the rest of the cruise. The thermosalinograph did not transmit data for about 20 hours early in the cruise. The sensor connectors got unplugged and the problem was not detected until the second day of the cruise. Also, the thermosalinograph apparently malfunctioned during the transect from ALOHA to Snug harbor yielding very low salinities.

We arrived at Snug Harbor on May 24 at 0800 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 this cruise was good. STAG personnel were available at any time to assist in our work.

5. DAILY REPORT OF ACTIVITIES (HST)

May 17, 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.

May 20, 1996.

All hands arrived on ship at 0800. Ship departed at 0930, delayed 30 min due to ship traffic. 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. Prior to the cruise, all the Niskin bottle lanyards were replaced, thus before arriving to Kahe St. at 1120, the CTD was lowered to 20-m and all the bottles were fired to check for any bottle leakages. At 1230, upon arrival at Kahe St. a 750 m weight cast was conducted followed by a 1000 m CTD cast. Departed to ALOHA Station at 1400.

We arrived at ALOHA Station at about 2330. At 2345, while preparing to deploy the sediment traps, Terry Houlihan suffered a cut in his hand when trying to dispose the broken glass pieces of a Benthos floater sphere overboard. The glass pieces were inside the floater's plastic hard cover and a piece of glass fell on the upper part of Terry's right hand, between the thumb and the wrist producing a deep cut 4 cm long. Bleeding stopped shortly after applying pressure on the wound. He could move his thumb but complained of numbness. The captain cleaned the wound and applied butterfly bandages to close it. Since the wound required further treatment, and since a helicopter evacuation would probably not take place until daylight, we decided to stop all operations and head back to Oahu to drop Terry off at a convenient place for treatment. We arrived in front of Kaneohe bay at 0700 (5/21/96) and Terry was transported to the Heeia Kea small boat harbor in the Zodiac boat. Stanley Winslow (Marine Center) was contacted by cellular phone and made arrangements for pick up on land. Dave Karl was also communicated of the situation by phone. After evacuation we headed back to the ALOHA station to continue operations. An incident report was completed by the Captain.

May 21, 1996.

A short science meeting was conducted at 1230, in which the captain stressed out safety in view of Terry's accident. The meeting continued with the review of the new cruise schedule. Lance Fujieki was transferred to the night watch to compensate for Terry's absence. We arrived at Station ALOHA at 1430.

Sediment trap deployment started immediately upon arrival at station ALOHA and was completed at 1545. The 36-hour period of

CTD casts began at 1600. The schedule was rearranged to have the WOCE deep cast at the end of the 36-hour period, right after the shallow WOCE cast, and the visit to Station 3 was cancelled. Surface water was pumped and filtered for phosphorus during casts 1 and 2 by A. Colman. A plankton net tow was conducted at 2300. Three (3) 1000-m casts had been conducted at station ALOHA by the end of the day. The thermosalinograph sensors connector came detached and did not transmit data for about 20 hrs. The problem was detected and fixed at about 2200. Weather was favorable with 10 kt winds from the east, and 2-3 ft waves.

May 22, 1996.

Operations at station ALOHA continued as planned. The Go-flo hydrocast was deployed at 0200. The deepest bottle did not close. The primary productivity array was deployed without difficulties at 0500 and recovered at 1900. Two plankton net tows were conducted during the day at 1100 and 1230 and one at night at 2300. By the end of the day there were eight (8) CTD casts completed. The sediment traps positions were not received by e-mail, thus a FAX was sent to Dave Karl requesting them and he FAXed them to us. By 0900 the traps had drifted westward to the edge of the circle. The weather continued being favorable, with winds from the southeast at 12 kt, and 2-3 ft waves.

May 23, 1996.

The 36 hours period at station ALOHA ended with the shallow WOCE cast at 0400 (cast 13), followed by the WOCE deep cast. The altimeter worked correctly and the cast reached 5 m off the bottom. A plot of the potential temperature near the bottom from this and the deep cast from the previous cruise indicate that a cold event starts to develop.

Sediment trap ARGOS positions were received via e-mail and in a FAX from D. Karl. At 1130 we began the transit to the location of the traps, started the recovery at 1230 and ended at 1330. The recovery was conducted without difficulties. The OPC/CTD package was deployed at 1415 and retrieved at 2130 after following a zig-zag trajectory within the circle. The OPC worked correctly, but its CTD stopped transmitting shortly after deployment due to a failure in the bulk connector discovered after recovery. After retrieving the OPC we headed back to Honolulu. The thermosalinograph apparently malfunctioned during the transect to Honolulu. The salinities were below normal even after increasing the flow through the plumbing to try to solve the problem. One net tow was conducted at night at 0100, and another one during the day at 1015. Surface water was pumped and filtered for phosphorus during the deep cast by A. Colman. Winds were of about 10 kt from the east, and 1-2 ft waves.

May 24, 1996.

Arrived at Snug Harbor at 0800. Proceeded with unloading however the majority of the deck and lab equipment remained onboard for the next cruise. Unloading completed at 1100.

ANCILLARY INVESTIGATIONS AND SPECIAL PROJECTS

M. Lopez	Optical Plankton counter
J. Rooney	Zooplankton dynamics
D. Sadler	DIC sampling
A. Colman	Phosphorus experiments

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. D. Keeling	CO ₂ isotopes
P. Quay	CO ₂ measurement
H. Thierstein	Microscopy