

HOT-85: Chief Scientist Report

Chief Scientist: F. SANTIAGO-MANDUJANO

HOT-85 Chief Scientist's Cruise Report

R/V Moana Wave

7-11 July 1997

Departed: July 7, 1997 at 0900 (HST)

Returned: July 11, 1997 at 0730

Vessel: R/V Moana Wave

Operator: University of Hawaii

Master of the Vessel: Captain John Stahl

Chief Scientist: Fernando Santiago-Mandujano

STAG Electronics Technician: Steve Poulos

STAG Deck Operations: Pierluigi Pozzi

1. SCIENTIFIC OBJECTIVES

The objective of this cruise was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Three stations were to be occupied during the cruise, in the following order:

1) Station 1, referred to as Station Kahe, is located at 21o 20.6'N, 158o 16.4'W and was to be occupied on July 7 for about 3 hours.

2) Station ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22o 45'N, 158oW. This is the main HOT station and was to be occupied for 3 days from July 7 to July 10.

3) Station 8, is the location of the HALE-ALOHA buoy (22o 27.5'N, 158o 7.9'W). It was to be occupied on July 11 for about 2 hours.

A single CTD cast was to be conducted at Station 1 to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements.

Upon arrival at Station ALOHA, a free-drifting sediment trap array was to be deployed for 72 hours to measure sedimentation rates of particulate matter. After deployment, CTD casts at strict 3 hour intervals were to be conducted continuously for at least 36 hours for continuous and discrete data collection. The ship was to be requested to remain on station during this sampling period. Another free-drifting array was to be deployed for 12 hours for a primary production experiment on July 9. A plankton net was to be deployed near noon and midnight on July 8 and July 9 at Station ALOHA.

After work at Station ALOHA was accomplished, a bio-optical instrument (OPC) was to be towed in a trajectory within the ALOHA circle for at least 6 hours on July 10. After this, a bottom moored Inverted Echo Sounder (IES) located near the center of station ALOHA was to be

retrieved and another one was to be deployed at the same site. After this the ship was to transit to recover the sediment trap array. After the sediment traps were recovered, the ship was to transit to Station 8, to conduct one CTD cast on July 10, after which the ship was to transit back to Snug Harbor.

The following instruments were to collect data throughout the cruise: a shipboard ADCP, a thermosalinograph, a pCO₂ system, a fluorometer, the Licor light logger, and an array of meteorological instruments.

2. SCIENCE PERSONNEL

WOCE group:

Fernando Santiago-Mandujano	Res. Assoc. (Chief Scientist)	UH
Craig Nosse	Research Associate	UH
Jefrey Snyder (Watch Leader)	Electronics Technician	UH
Don Wright	Research Associate	UH

JGOFS group:

Dale Hebel (Watch Leader)	Ass't Specialist (co-PI JGOFS)	UH
Chris Carrillo	Graduate Assistant	UH
Besse Dawson	Visiting Teacher	
Stuart Donachie	Post-Doc	UH
Pat Driscoll	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Daniel Sadler	Research Associate	UH

Ancillary projects:

Stephanie Christensen	Research Associate	UH - M. Landry
Albert Calbet	Post-Doc	UH/Zooplankton
Mai Lopez	Scientist	SIO - M. Huntley
Beth Holmes	Post-Doc	UH/Methane isotopes

STAG

Steve Poulos	Electronics Technician	UH - UMC
Pierluigi Pozzi	Deck Technician	UH - UMC

3. GENERAL SUMMARY

All the primary JGOFS and WOCE objectives were accomplished and all samples for ancillary projects were taken, with the exception of the recovery of the IES.

The 36-hour CTD burst sampling was completed and thirteen 1000-m casts were obtained at station ALOHA in addition to the deep cast. Also one 1000-m CTD cast was obtained at each of the stations Kahe and Hale-ALOHA.

One 8-bottle go-flo cast was successfully obtained at station ALOHA, and the primary productivity array was deployed and recovered without problems. The array of floating sediment traps was also deployed and recovered without incidents. The sediment traps had drifted about 20 nm north-north-westward upon recovery. S. Christensen completed successfully four plankton net tows and A. Calbet conducted other four.

The optical plankton counter-CTD package was successfully towed in a spiral trajectory in the ALOHA circle for five hours.

Weather conditions were rough during the cruise with 15-22 kt easterlies and 5-6 ft waves. In spite of the bad weather there was no major damage to the equipment. One microplankton net was ripped during a tow, and the Rosette took a couple of hits against the side of the ship during deployment and recovery without apparent consequences.

During the recovery of one of the CTD casts Pat Driscoll fell on the CTD cart when the CTD package swung while he was trying to hold it. Details of this are in the attached Incident Report, Mr. Driscoll was not injured during the incident.

The bottom moored IES that was to be recovered from station ALOHA failed to release and was not recovered. The acoustic release signal was sent from the ship and the IES started transmitting in release mode, but after waiting for several hours the IES was still at the bottom. Another IES was successfully deployed 4 nautical miles north of the center of ALOHA station.

The ADCP ran without interruption throughout the cruise, as well as the thermosalinograph, the pCO2 system, the Licor light logger, the fluorometer, and the meteorological sensors.

We arrived at Snug Harbor on July 11 at 0730 and immediately off-loaded all deck and lab equipment as there was another cruise scheduled to set sail after this 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 accommodating. They showed enthusiasm and concern for our work and were very flexible in receiving changes in our operational schedule.

During this cruise there were two winch operators apparently under training that were not familiar with our CTD launching and recovery procedures. This caused some misunderstandings between the winch and the CTD deck and console operators (see Incident Report). In order to prevent potential problems in future cruises resulting from miscommunications, we would like to be informed when new winch personnel will be on duty.

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 (HST)

July 2, 1997; Loading Day

This was the off-loading day for the previous ALOHA-Climax-2 (AC-2) cruise, therefore most of the equipment was already loaded on the ship. The IES and other minor equipment were loaded on this day.

July 7, 1997

Ship departed from Snug at 0900. Fire and abandon ship drills conducted at 0945. Arrived to Kahe Station at 1200 and conducted a PRR (Profiler Reflectance Radiometer) cast. It was not necessary to do a weight cast given that the CTD was used in the previous week's AC-2 cruise. A 1000-m CTD cast was conducted, during which the CTD remote pressure readout did not work due to configuration problems. The problem was solved after the cast.

After a rough ride to ALOHA station the array of floating sediment traps was deployed between 2330 and 0145 (July 8). The officers at the Bridge confirmed that the array's buoy was transmitting correctly.

Winds from the East of about 20 kts, 5 ft waves.

July 8, 1997

Plankton net tows for S. Christensen and A. Calbet started immediately after the sediment trap deployments. The microplankton net ripped, apparently during deployment because there was too much slack in the line. The net was replaced with the spare before the next tow. The deep CTD cast started at about 0400 after steaming back to the center of the circle. The 36-hour CTD sampling period started afterwards. There were slight delays in the schedule due to the bad weather. Two net tows were done at 1300 for S. Christensen and A. Calbet, and two more at 2200, but Mr. Calbet's tow did not sample correctly.

Easterlies of about 22 kt and 5-6 ft waves persisted throughout the day.

July 9, 1997

One net tow was conducted at 0130 for A. Calbet. The 8-bottle Go-flo cast was conducted at 0200 without any problems, all bottles sampled correctly. The primary productivity array was deployed at 0530 and recovered at 1930. A PRR cast was obtained at noon. The 36-hour CTD sampling period was completed as scheduled. S. Christensen did a last net tow at 1000, and A. Calbet did one at 2200.

During the recovery of cast 14 Pat Driscoll fell on the CTD cart when the CTD package swung while he was trying to hold it. The winch operator was lifting the package to reposition it on the cart while Mr. Driscoll's tag line was already loose. Mr. Driscoll was not injured (see Incident Report).

Easterlies of about 18 kt and seas of about 5 ft.

July 10, 1997

The OPC was deployed at 0030 after transiting outside the circle to pump the ship's tanks. The OPC worked correctly and was retrieved at 0800.

After the OPC work was completed operations to recover the bottom

moored IES started. After doing some ranging, the release signal was sent to the IES at 0910 but after waiting for more than one hour the IES was still at the bottom. At 1030 we decided to go to retrieve the floating sediment traps and come back later to check if the IES had released.

The traps drifted about 20 nm north-north-westward from the ALOHA station. The recovery of the traps took place without any problems between 1215 and 1315 after which we headed back to the location of the IES.

At 1530 we found that the IES was still transmitting in release mode (4-sec period) from its original position at the bottom. We proceeded to move 4 nautical miles north from ALOHA station to deploy the second IES. The second IES was deployed at 1615 and we received its data transmission signal in the 10 Khz receiver at 1630. We headed back to the location of the first IES for a final check but it was still transmitting from the bottom. We started the transit to Station 8, Hale-ALOHA, where we arrived at 1845. During transit we had a steak and lobster dinner to celebrate Jeffrey Snyder's last cruise. Mr. Snyder had been working with us since the beginning of the program.

The ship passed close to the Hale-ALOHA buoy and a visual inspection indicated that the buoy and instruments were apparently in good conditions. The last CTD cast of the cruise was conducted downwind and downcurrent from the buoy at 1920 after which we headed back to Snug Harbor.

Easterlies of 15 kt and 5 ft waves.

July 11, 1997

We arrived at Snug Harbor at 0730 and proceeded to off-load all the deck and lab equipment and to clean the labs. We finished off-loading by noon.

SUB COMPONENT PROGRAMS AND SPECIAL PROJECTS

C. Winn (UH)	DIC, pH, Alk., CO2
B. Bidigare (UH)	HPLC pigments
M. Landry (UH)	Zooplankton dynamics
M. Lopez (SIO)	Optical plankton counter
B. Holmes	Methane isotopes
A. Calbet	Zooplankton

SAMPLES TAKEN FOR OTHER INVESTIGATORS

C. Keeling (SIO)	CO2 dynamics and intercalibration
P. Quay (UW)	DIC and 13C
E. Boyle	Trace metals

HOT-85 Cruise Incident Report

July 7-11, 1997.

R/V Moana Wave

Fernando Santiago-Mandujano (Chief Scientist).

An incident occurred on July 9 at 2100 during the recovery of the last CTD cast at Station ALOHA. The deck boss was Lance Fujieki and the line taggers were Pat Driscoll on the fore side of the CTD cart and Chris Carrillo on the aft side.

The CTD package was already on board sitting on the cart when the deck boss gave the order to the winch operator to lift the package to reposition it because it was off centered on the cart. At this point the fore tag line was already loose, and when the package was lifted the ship took a roll and the package swung towards starboard. Mr. Driscoll was pulled in the same direction and fell on the cart while holding the Rosette trying to control the swinging package. The package was eventually controlled by the rest of the deck personnel and placed safely on the cart. Mr. Driscoll was not injured during the event.

In addition, before this incident the package had been brought out of the water without clearance from the bridge and the CTD lab right after the last bottle was fired. This happened because during recovery the deck boss gave the signal to the winch operator to bring the package on board, and the winch operator followed the order without consulting the bridge and CTD lab first. This mistake was inconsequential.

A combination of factors contributed to the above incidents, mainly the bad weather, the instructions from the deck boss, and the fact that the winch operator was a 'new' person not familiar with our procedures. There was another winch operator during this cruise that was also 'new', and during one of the casts when he was on duty the package hit the side of the ship a couple of times during deployment. This occurred because he lowered the package too slowly while the ship was rolling.

The following are some recommendations to prevent potential accidents in future cruises that could be caused by the factors outlined above.

The deck boss should be fully trained before attempting to conduct CTD deck operations on his/her own. Training should take place at Kahe Station or at ALOHA during calm weather and under close supervision from a experienced person. At this point Lance Fujieki should still be considered under training.

When the weather is rough, an experienced person should conduct the CTD deck operations.

The instructions about CTD deployment and recovery should be updated to emphasize the fact that the deck boss must ensure that there is clearance from the bridge and the CTD lab before attempting any CTD deployment or recovery. All science personnel involved in CTD deck operations during the cruise must read these instructions.

We would like to be notified in advance by the bridge whenever non-regular personnel will be conducting winch operations during a cruise. When a 'new' winch operator is on duty, the deck boss and the CTD console operator should take extra precautions to ensure that the instructions

and communications are clear, and that the person has a prior briefing about the CTD procedures.