

HOT-62: Chief Scientist Report

Chief Scientist: D. HEBEL

HOT 62 Cruise Report

R/V Moana Wave

4-9 April, 1995

Personnel List:

WOCE group:

Jefrey Snyder (Watch Leader)	Electronics Technician	UH
JinChun Yuan	Research Associate	UH
Craig Nosse	Scientist	UH
Molly Lucas	Graduate Student	UH-M. Atkinson

JGOFS group:

Dale Hebel	Chief Scientist (co-PI JGOFS)	UH
David Pence	Research Associate	UH
Terry Houlihan (Watch Leader)	Research Associate	UH
Louie Tupas	Scientist(co-PI JGOFS)	UH
Dan Sadler	Graduate Student	UH-T. Li

Ancillary projects:

Chuck Stump	Scientist	UW-S. Emerson
Karen Selph	Graduate Student	UH-M. Landry
Gretchen Rollwagen	Graduate Student	UH-M. Landry
Bob Miller	Graduate Student	UH-M. Landry
Sue Vink	Scientist	UH-C.Measures
Ricardo Letelier	Scientist	OSU
Mai Lopez	Scientist	SIO-M. Huntley

STAG:

Steve Poulos	Electronic Technician	UH-UMC
Luigi Pozzi	Deck Technician	UH-UMC

Itinerary (approximate local time):

Tuesday, 4 April

0900 Departed Snug Harbor

1150 Arrived Kahe Pt. (Sta. 1-1)
1445 Departed Kahe
1830 Arrived Kaena Pt. (Sta 1-2)
2045 Departed Kaena Pt.

Wednesday, 5 April

0300 Arrived Aloha (Sta. 2) trap deployment site
0500 Completed sediment trap deployment
0600 Arrived Aloha (center of circle), WOCE deep cast
1100 Began 36 hr "burst sampling"
1230 Plankton net tow

Thursday, 6 April

0100 Plankton net tow
0330 Commenced Go-Flo cast
0545 Deployed primary productivity array
1300 Plankton net tow, PNF, TSRB
1900 Retrieved primary productivity array
2000 Pumped tanks
2100 Discovered compromised nutrient samples
2200 Plankton net tow

Friday, 7 April

0030 Completed "burst" sampling
0100 Plankton net tow
0400 Began ancillary work and repeated JGOFs and WOCE nutrient collections
1500 Began Optical Mooring Buoy deployment
2000 Completed triangulation
2130 Began equipment recovery operations

Saturday, 8 April

0600 Completed recovery operation
0900 Began sediment trap recovery
1300 Transit station ALOHA
1630 TSRB
1700 Deployed OPC

Sunday, 9 April

0600 Recovered OPC
0730 Arrived Snug Harbor
1000 Offloaded

Narrative:

HOT 62 was conducted 4-9 April, 1995 aboard the R/V Moana Wave with Capt. Hayes as Master. All over-the-side operations were completed and all samples collected although the nutrient samples collected at Kahe and Kaena are most likely compromised. Ricardo Letelier (OSU) deployed a moored optical buoy (MOB), followed by a dragging attempt to recover our lost equipment. The optical plankton counter (OPC) was deployed on the return leg.

We departed Snug Harbor 4 April 1995 at 0900 hrs. We were scheduled to leave at 0800 hrs but were delayed one hour while critical sample documentation and essential chemicals were delivered from UH. Once outside the mile buoy the First Mate (John Stahl) conducted the routine

fire and abandon ship drills. A short science meeting followed to delineate the cruise plan, watches, core work and ancillary projects. At Kahe we conducted a weight cast to 500m followed by a PNF and TSRB (tethered spectroradiometer buoy) cast and finally 1000 m CTD cast. All equipment operated properly with the exception of the TSRB. The problem was subsequently corrected. After all samples were collected we departed Kahe for Kaena Point. Upon arrival at station 6 (Kaena Point) a CTD cast to 2498 db was conducted with 15 bottles tripped for DO, Chla, and LLN samples.

Following the Kaena Point station we steamed to station ALOHA. Once on station we deployed the sediment traps and initiated CTD operations. The JGOFS spectroradiometer was slated for deployment on the trap line, however, the correct buoyancy components were not available and therefore the instrument was not deployed. Routine sampling ensued through the 36 hr burst sampling period until it was recognized (~2000 hrs 4 April 95), that the freezer top, where the nutrient samples were stored, had been left open. Upon closer examination it was determined that all samples were thawed and, at this point, it was not clear if they had ever been frozen. Due to time constraints we were unable to resample the Kahe Point and Kaena Point stations, therefore, these samples were not discarded. However, we were able to resample the standard JGOFS and WOCE shallow and deep nutrient samples. Subsequent measurements of the chest freezer temperature indicated that it could not attain a temperature low enough to freeze seawater samples. The day following the incident the temperature was 0.5 C and by the end of the cruise had climbed to 10 C.

With the completion of the core and ancillary work at station ALOHA we steamed NNE (~050 T) just outside the ALOHA circle and surveyed the bottom topography for the proper bathymetry and relief for the deployment of the MOB. Having found the correct locale and being careful to avoid phone cables we backtracked the required distance to ascertain the placement of the mooring in the correct location. Following deployment (~2 hrs; 22 50.87 N, 157 55.55 W anchor away location) we fixed the position by triangulation before departing to the lost equipment position. Although a position was derived (?N, ?W), one of the 3 points was less than ideal resulting in a relatively imprecise, but hopefully, reasonably accurate determination.

With the realization that the core nutrient samples would have to be resampled the equipment recovery operation was tentatively scrubbed. However, expedient use of CTD sampling depths and time resulted in the collection of a full sample set within a time frame which still permitted an equipment recovery attempt. It has become a realization that no extra time is available on our HOT cruises. This is especially true with upcoming cruises and therefore the current, yet limited, time frame was viewed as an opportunity to learn and better yet possibly succeed at a most improbable task. One of the two goals was achieved. We did learn that the configured dredging array would remain on the bottom when underway and we did learn that the terminal grapnel hook was effective. We managed to hook something on the bottom that effectively protracted the operation for a period of hours over that initially intended. The substance of the connection was so great that it literally pulled the ship backwards allowing winch speeds of only 0-10 m/min with associate tensions of 10-14K lbs with the main engines

decluthed. PDR recordings revealed a varied bottom relief grading from flat to a ridge-like structure where contact was made. This was in a vicinity which was past the most probable point of contact for the lost equipment.

After the unsuccessful recovery attempt we steamed to the vicinity of the sediment traps which were located and recovered without incident. Following the recovery we conducted the AC-3 test cast and collected samples for <202 um suspended matter (TSM), outside the circle confines. The data of the AC-3 test cast which profiled to 2000 m have not been processed but the initial response from Jeffrey was unfavorable. The deployment of the OPC was scheduled to begin at the trap recovery site and proceed to just outside Honolulu Harbor. However, a request from the scientist in charge (Mai Lopez), altered the plan to return to station ALOHA, transit the diameter of the circle along 158 then change course for Snug Harbor. The OPC was towed between 8-8.5 kts and retrieved south of Barbers Point. We arrived at Snug Harbor 9 April @ 0730 hrs and since we were the next science group to use the ship offloaded only the handcarried equipment, samples and other essential equipment by 1000 hrs.

Weather:

The weather was mostly overcast with moderate to high winds and low to moderate seas. Below is listed the cruise log bridge descriptions and the various values represent the range for that day. Under wind, sea and swell there will be two designations, the first is the direction (in degrees), the second for wind is in kts, for sea in Beauford force, for swell in feet, and clouds in tenths.

Day	Date	Wind	Sea	Swell	Clouds
Tuesday	4 April	045-055, 20-28	045-055, 3-4	000-030, 3-8	3-8
Wednesday	5 April	050-070, 24-28	050-070, 3-4	030-060, 6-8	7-10
Thursday	6 April	050-070, 14-22	050-070, 2-3	060, 4-8	8-10
Friday	7 April	070-115, 15-25	070-115, 3-4	070-090, 5-6	3-10
Saturday	8 April	110-165, 5-20	110-165, 1-3	090-130, 3-6	3-7
Sunday*	9 April	150, 7	150,1	130, 2-3	2-7

*Only two entries

Equipment and methods:

All standard equipment used on HOT 62 functioned properly. No equipment was lost, however, one primary productivity sample bottle at 125 m (3L1) was lost. The initial deployment of the TSRB was problematic but was subsequently repaired. One of the tangs on the

terminal grapnel was bent out during the dragging operation. This was a piece of STAG equipment.

Sub component programs:

Investigator:

Telu Yuan-Hui Li (UH)
Bob Bidigare (UH)
Michael Landry (UH)

Project:

DIC, pH, Alk., pCO2
HPLC pigments
Zooplankton dynamics

Ancillary programs:

Investigator:

Chris Measures
Steve Emerson
Charles Keeling (SIO)
Paul Quay (UW)
Hans Thierstein (Zurich)
George Luther (UD)

Project:

Trace metal studies
Oxygen/Argon/Helium measurements
CO2 dynamics and inter calibration
DIC and 13C
Calcareous plankton dynamics
Iodine speciation

Students:

Bob Miller
Gretchen Rollwagen

Zooplankton sampling training
Zooplankton sampling training

Others:

Ricardo Letelier (OSU)
Mark Huntley/Mai Lopez

Optical oceanography
Optical plankton counting