HOT-78: Chief Scientist Report

Chief Scientist: D. Hebel

HOT 78 Cruise Report
R/V Moana Wave
9-13 Dec. 1996

Personnel List

HOT 78:

WOCE group:		
Jefrey Snyder*	Mar. Electronic Tech.	UH
Craig Nosse	Research Associate	UH
Molly Lucas	Graduate Student	UH
Fernando Santiago-Mandujano	Research Associate	UH
JGOFS group:		
Dale Hebel	Chief Scientist (co-PI JGOFS)	UH
Louie Tupas	Scientist (co-PI JGOFS)	UH
Angie Thomson	Graduate Student	UH
Pat Driscoll	Research Associate	SIO
Karin Bjorkman	Scientist	UH
Stuart Donachie	Scientist	UH
Tracy Donachie	Volunteer	
Kristi Hanson	Graduate Student	UH
Hongbin Liu	Graduate Student	UH
Hector Nolla	Research Associate	UH
Dan Sadler*	Research Associate	UH
Ancillary projects		
Mai Lopez	Scientist	SIO
STAG		
Sharon Stahl	Electronic Technician	UH-UMC
Luigi Pozzi	Deck Technician	UH-UMC

* Watch Leader

Itinerary (approximate local time):

Monday, 9 Dec.
- 0900 Departed Snug Harbor
- 1130 Arrived Kahe Pt. (Sta. 1)
- 1415 Departed Kahe
- 2330 Arrived Aloha (Sta. 2)

Tuesday, 10 Dec.
- 0100 Plankton net tow
- 0330 Completed sediment trap deployment (22 47.8N,157 59.3W)

0400 Completed Go-Flo cast (water for Angie's experiments)
0510 Arrived Aloha (center of circle), WOCE deep cast (s2c1)
0830 CTD on deck
0915 Sediment trap fix (22 48.0N, 157 58.9W)
1010 Began 36 hr "burst sampling" (s2c2)
1120 Plankton net tow
1220 PRR-600 cast
1300 s2c3
1410 Plankton net tow
1610 s2c4
1910 s2c5
2230 s2c6
2340 Plankton net tow

Wednesday, 11 Dec.

0120 s2c7
0230 Plankton net tow
0300 Go-Flo cast
0410 s2c8
0630 Deployed primary productivity array (22 45.3N, 157 51.9W(?))
0700 s2c9
1000 s2c10
1100 Plankton net tow
1220 PRR-600 cast
1300 s2c11
1600 s2c12
1830 Retrieved primary productivity array (22 45.3N, 158 00.1W)
1900 s2c13
2210 s2c14
2330 Completed "burst" sampling

Thursday, 12 Dec.

0100 Bathymetry survey of Hale ALOHA mooring site (22 25N, 158 10W)
0320 Survey completed
0610 Go-Flo cast (EOC experiments)
0840 Sediment trap recovery (22 47.0N, 158 00.1W)
1000 OPC deployed
1610 OPC recovered
1640 OPC deployed
1700 OPC recovered
1720 OPC deployed
1730 OPC recovered, began return transit

Friday, 13 Dec.

0700 Arrived Snug Harbor
1000 Completed offloading

Narrative:

HOT 78 was conducted 9-13 Dec. 1996 aboard the R/V Moana Wave with Capt. Stahl as Master. All over-the-side operations were completed and all samples collected. This was one of the few cruises, similar to HOT 66, where the trap array remained within the confines of the station boundary for most of the deployment period. It was also unusual with the drift track almost due north. In addition, we had experienced strong winds (20-50 mph) the week before the cruise and were fortunate the winds began to subside the day the cruise departed. At Station

ALOHA this resulted in a deep mixed layer (~100m) with relatively calm surface sea conditions. Although sea conditions continued to improve during most of the cruise the scheduled deployment of the optical plankton counter (OPC) at Station ALOHA, upon our arrival, was omitted due to rough sea conditions, however, the OPC was deployed at Station ALOHA during the final stages of operations.

We departed Snug Harbor 9 Dec. 1996 at 0900 hrs. Once outside the mile buoy the first mate (Ross Barnes) conducted the routine fire and abandon ship drills. A short science meeting followed to delineate the cruise plan, watches, core work and ancillary projects by the chief scientist. At Kahe we conducted a weight cast to 1000m followed by a PRR cast and the usual 1000 m CTD cast. All equipment operated properly.

Immediately after the CTD arrived on deck we began our transit to Station ALOHA. Winds, the previous week were strong gusting up to 30 mph with gusts to 50 over the weekend. Although it was a bumpy ride the sea conditions were better than expected since the winds had begun to subside the morning of our departure. Once on station we conducted a net tow, floating sediment trap deployment and a shallow Go-Flo cast to collect water for Angie Thomson's experiments. We had anticipated deploying the OPC for a short period during our inital occupation of Station ALOHA, however, captain Stahl decided sea conditions were not favorable. Following the Go-Flo cast the sediment traps were deployed and CTD operations initiated. Routine sampling ensued during the 36 hrs of burst sampling and all core samples were collected. In addition to the core samples two casts for H2O2 were conducted at approximately dawn and dusk and sample profiles collected for particulate silica and particulate inorganic carbon.

Following the 36 hr "burst" sampling we steamed to the site of the proposed Hale ALOHA surface mooring and conducted a bathymetry survey of the area. Following the survey we returned to the latest Argos trap position which were still within the circle and began recovery operations. The last operation on station was the OPC which was deployed within the Station ALOHA circle and a grid pattern run until it was necessary to begin our return transit. Unfortunately, CTD problems shortened the deployment period to approximately 4 hrs.

We arrived Snug Harbor 0700 hrs on 13 Dec. 1996 and concluded offloading operations by approximately 1000 hrs.

Weather:

HOT 78:

The weather was mostly sunny with winds and seas typical of station ALOHA at this time of year. 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, sea

in Beauford force, and swell in feet.

Day	Date	Wind	Sea	Swell	Barometer	Temp	Clouds
Mon	9 Dec.	020-060,10-25	020-060,3-4	030-340,6-8	30.06-30.14	72-77	3-9
Tues	10 Dec.	030-050,17-20	030-050,3-5	030-040,5-7	30.05-30.14	71-77	0-7
Wed	11 Dec.	045-060,17-20	045-060,3-5	030,5	30.03-30.11	71-77	2-9
Thur	12 Dec.	050-120,10-20	050-120,3-4	030,4-5	29.92-30.05	68-71	2-9
Fri*	13 Dec.	030, 6	030,2	130,3	29.88-29.90	69-70	0-3

*Only two entries (0200 & 0600 hrs)

Equipment and methods:

All standard equipment used on HOT 78 functioned properly with the exception of the altimeter on the WOCE deep cast and the OPC CTD component which failed after ~4 hrs of deployment. Repeated efforts to solve the problem were futile. No equipment was lost but the sediment trap spar buoy parted at one of the old joints. This was repaired at sea.

Sub component programs:

Investigator:	Project:
Christopher Winn (UH)	DIC, pH, Alk., pCO2
Bob Bidigare (UH)	HPLC pigments
Michael Landry (UH)	Zooplankton dynamics

Ancillary programs:

Investigator:	Project:
Chris Measures	Trace metal studies
Charles Keeling (SIO)	CO2 dynamics and intercalibration
Paul Quay (UW)	DIC and 13C

Students:

Hongbin Liu/Hector Nolla	Diel studies of picoplankton cell division and N or P limitation
Kristi Hanson	14C uptake into biomarker, dilution exp’s, large volume filtrations, DI13C samples

Others:

Mark Huntley/Mai Lopez	Optical plankton counting
Dale Hebel	BATS sediment trap protocols, DOC intercomparison samples, EOC experiments, wtr. col. PIC

Stuart Donachie	Ectoenzyme activities
Karin Bjorkman	Ectoenzyme phosphatase activities
Angie Thomson	Phosphorus dynamics time-course