HOT-119: Chief Scientist Report

Chief Scientist: D. HEBEL

HOT 119 Cruise Report
R/V Kaimikai O Kanaloa
16-20 Oct., 2000
HALE ALOHA Recovery
(HA8B)
14-15 Oct., 2000

Personnel List
HALE ALOHA Recovery

JGOFS group:		
Dale Hebel	Scientist (co-PI JGOFS)	UH
Lance Fujieki	Computer Specialist	UH
Terrance Houlihan	Volunteer (Chief Scientist)	MOBY
Chuck Stump	Scientist	UW
Matthew Erickson	Research Associate	UH
WOCE group:		
Mark Valenciano	Electronic Technician	UH

HOT 119:

JGOFS group:		
Dale Hebel	Chief Scientist (co-PI JGOFS)	UH
Lance Fujieki	Computer Specialist	UH
Colleen Allen	Research Associate	UH
Matt Church	Visiting Graduate Student	UH
Ann Gasc	Scientist	UH
Matthew Erickson	Research Associate	UH
Karin Bjorkman	Scientist	UH
Ursula Magaard	Research Associate	UH
WOCE group:		
Fernando Santiago-Mandujano*	Research Associate	UH
Lal Ratnapala	Graduate Assistant	UH
Mark Valenciano	Electronic Technician	UH
Jeremiah Johnson	Research Associate	UH
Javier Mendez-Nuarez	Volunteer	UH
Associated projects:		
Tom Gregory	Research Associate	UH
Chuck Stump	Scientist	UW
STAG:		
Steve Poulos	Electronic Technician	UH-UMC
Dave Gravatt	Deck Technician	UH-UMC

*Watch Leader

Events log (approximate HST):

Saturday, 14 Oct.

2300 Departed Snug Harbor

Sunday, 15 Oct.

0046 c/c 296 degrees for Kauai
0715 Sighted buoy
0750 All stop at buoy
0756 Transducer in the water
0808 Transducer on deck, no signal
0836 Avon in the water with R. Barnes and C. Gutzeit
0900 Both anemometers and antenna removed from buoy
0905 Tow line on buoy
0916 Tag lines on buoy
0922 Buoy on deck
0929 Avon on deck
1040 Recovery completed
1048 Underway course 117 T
2050 Arrived Snug Harbor, began offloading buoy and equipment

Monday, 16 Oct.

0900 Departed Snug Harbor
0930 Fire/abandon ship drill, science meeting
1150 Arrived Kahe Pt. (Sta. 1)
1205 Weight cast (1000 m)
1250 PRR/TSRB casts
1340 s1c1
1440 Departed Kahe

Tuesday, 17 Oct.

0000 Arrived Station ALOHA (Sta. 2)
0025 s2c1
0035 CTD on deck
0040 Net tow
0105 Net tow
0145 Began sediment trap deployment
0230 Completed sediment trap deployment (22° 44.47'N, 157° 59.17'W)
0350 s2c2 (WOCE deep)
0535 s2c2 retrieving from 4770 db
0720 s2c2 on deck
0910 s2c3 (WOCE shallow)
1010 Net tow
1040 Net tow
1120 PRR/TSRB cast
1200 s2c4
1305 Net tow
1335 Net tow
1400 in situ pumping
1520 s2c5
1805 s2c6

2105 s2c7
2210 Net tow
2250 Net tow

Wednesday, 18 Oct.
0005 s2c8
0100 Net tow
0150 Net tow
0205 G.O. cast (25&45m external closing)
0300 s2c9
0600 Deployed primary productivity array (22° 45.4'N, 157° 58.9'W)
0610 s2c10
0905 s2c11
1000 Net tow
1030 Net tow
1120 PRR-600/TSRB cast
1200 s2c12
1300 Net tow
1400 in situ pump
1500 s2c13
1800 Recovered PP array
1810 s2c14
2100 s2c15

Thursday, 19 Oct.
0000 s2c16 (WOCE deep-2)
0345 Transit sediment traps
0720 Recovered sediment traps (location ??)
1010 Arrive HALE ALOHA
1035 Transducer deployed and signal received from releases
1100 s8c1
1240 Transit Kaena Pt.
1750 s6c1
1840 CTD at 2490 m
1930 CTD on deck and began Honolulu transit

Friday 20 Oct.
0700 Arrived Snug Harbor

HALE ALOHA Recovery Narrative:

HOT 119 deja vu. It has not been more than 8 mos earlier that we were scheduled to go out on HOT 111. While loading we were informed by, D. Karl, that he suspected that our deep-sea mooring had broken free and was adrift. At that time we assessed the available information and determined that the buoy was indeed adrift and immediately planned a recovery operation. Unfortunately, the ship, which had just received an upgrade of the SCR engine drive system was experiencing difficulties. These difficulties translated into a stream of delays which encompassed the better part of a week with no immediate resolution. During this time we monitored the drift of our way-ward buoy via Argos positioning and devised a recovery plan that utilized the UNOLS ship R/V Thomas Thompson which had just completed operations in Hawaiian waters. In this regard HOT 119 began with a similar

scenario. Again we were mobilizing for a HOT cruise when we discovered that our buoy had broke free, and in a similar situation, the ship personnel had discovered a problem with the ship which would delay our departure (this time a hole in the hull). The repairs were forecasted at approx. 1 week, therefore we looked into an alternative recovery vessel. Due to the forecasted high sea-state these plans were rejected. Fortunately, the repairs proceeded ahead of schedule and it was determined that we could launch a recovery operation on the KOK before the official HOT cruise which had been rescheduled for 16-20 Oct. The recovery was scheduled for the 14-15 Oct. the weekend prior to the scheduled HOT cruise.

The recovery operation (HA8B) departed on Saturday night to arrive off the southeaster side of Kaui in the early morning to intercept the drifting buoy. Although the seas were forecast in the 18' range, upon arrival we found 4-6' seas although the winds were steadily increasing from less than 20 kts to upwards of 30 kts. During this period the captain launched a small boat operation to remove valuable instrumentation from the superstructure of the buoy and secure the buoy for retrieval. This action, in addition to the skilled abilities of STAG deck technician Dave Gravatt resulted in a near perfect retrieval. Additional deck support was provided by Terrance Houlihan , whom had recently transferred to another project and Chuck Stump from the Univ. of Washington Seattle. Through these efforts we were able to recover all instrumentation with the exception of 2 Seatcats below the point where the cable separated. Unfortunately, the MBARI nitrate analyzers and OSU optical buoy where badly damaged.

Upon retrieval it was apparent that the mooring line had severed at approximately 560 m where an instrument was mounted on the 5/16 plastic jacketed steel cable. At the time of retrieval it appeared that in the area where the cable parted the upper Seacat and thermistor (?) slid down the cable (more likely pulled down) to the location of the lower Seacat. At the location of the lower Seacat the cable was tightly twisted around the mounting bracket and it was here that the cable parted. Later at UH microscopic examination of the area where the cable parted suggested that the parting was not the result of an episodic event (although we did find leader material and components which appeared to be from a long-line array on the retrieved mooring line). Rather, abrasion of the cable. At this time, I understand that the severed section of the cable has been sent out for professional examination. Following the recovery we returned to Snug Harbor and offloaded equipment that night in preparation for the followi

HOT 119 Narrative:

The following morning HOT 119 departed aboard the R/V Kaimikai O Kanaloa (KOK). Captain Hayes was the master of the vessel and Dale Hebel chief scientist. There was a total of 17 participants in the scientific party composed of 5 WOCE, 8 JGOFS, 2 ancillary investigators and 2 STAG. We departed Snug on 16 Oct., occupying stations at Kahe Pt. (sta. 1), Station ALOHA (sta. 2), HALE ALOHA (sta. 8) and Kaena Pt. (sta. 6). All scheduled work was completed and all samples collected. CTD operations were conducted at stations 1, 2, 8 and 6. One ~1000 m CTD cast was conducted at stations 1&8; 1 <250m, 14 ~1000 m, and 2 ~4800 m CTD casts at Station ALOHA; one ~2500m CTD cast at Kaena Pt.

(sta.6). Other over-the-side operations included 3 light casts, 13 net tows, 2 in situ pumping operations, 1 G.O. cast, floating sediment traps and primary productivity array. All operations were routine with the exception of an external closing General Oceanics bottle primary productivity experiment and addition of sta. 6. The underway/continuous thermosalinograph, ADCP, and fluorometer were operable and functioned properly. WOCE met. Obs and limited ship met. data were collected as well as aerosol measurements. Overall the weather was partly cloudy with

At Sta. ALOHA the day-day cruise schedule was similar to a generic HOT cruise (eg., see HOT 111 cruise report). However on HOT 119 we occupied sta. 8 (HALE ALOHA) even though our mooring was absent marking a change in protocol to include sta. 8 as a regular station to assess short spacial variability and again occupied sta. 6 (Kaena Pt.) on the return leg.

Weather
HALE ALOHA Recovery (Oct. 15) & HOT 119 (Oct. 16-20):

The weather was mostly cloudy skies with moderate seas and wind. Below is listed the cruise bridge log descriptions and the various values representing 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, barometer in inches of Hg, temp °F (dry bulb) and clouds in tenths.

Day/Date	Wind	Sea	Swell	Barometer	Temp	Clouds
Sun 15 Oct.	030-090,10-25	030-090,2-4	000-330,3-4	29.92-30.02	77-80	5-9
Mon 16 Oct.	070-090,4-24	070-090,2-4	070-110,2-8	29.90-29.98	77-88	5-8
Tues 17 Oct.	090-100,17-19	090-100,3	090,3-4	29.94-30.01	75-83	4-8
Wed 18 Oct.	060-100,15-20	060-100,3	090/330,4	29.94-30.04	74-82	6-9
Thur 19 Oct.	070-090,13-24	070-090,3-4	090,4-6	29.95-30.04	76-81	3-9
Fri. 20 Oct.*	080-100,20-22	080-100,3-4	120-130,3-4	29.98-30.00	72-73	2-5

*Two entries (0200 & 0600 hrs)

Equipment and methods: All standard equipment functioned properly and all methodology was standard. This was the first cruise to use the new CTD winch wire. The wire was lubricated during the second WOCE deep cast. Also, the acoustic releases were successfully interrogated at the HALE ALOHA site.

Sub component programs:

Investigator:	Project:
Bob Bidigare	HPLC pigments/UH
Michael Landry	zooplankton dynamics/UH

Ancillary programs:

Investigator:	Project:
Charles Keeling	CO2 dynamics and intercalibration/SIO
Paul Quay	DIC and 13C/UW
Steve Emerson	O2, N2, Ar, dynamics
John Porter	aerosols/UH
Abbott/Letelier	optical measurements/OSU
Claudia Benitz-Nelson	phosphorus isotopes, Th234/UH
Students:	
Matt Church	DOC, Archea dynamics/UH
Others:	
Hebel, Dore, Karl	EOC, 1° prod. comparison/UH
Karin Bjorkman	phosphorus experiments/UH
John Dore	phycoerythrin distributions, nitrification rates/UH

Notable events:

1. Addition of sta. 6
2. First cruise to use new CTD wire
3. Lubrication of new CTD wire
4. Interrogation of HA acoustic releases
5. Recovery of drifting HALE ALOHA buoy and instrumentation