HOT-46: Chief Scientist Report

Chief Scientist: D. HEBEL

HOT 46 Cruise Report
R/V Wecoma
12-17 April 1993

Personnel List:

Dale Hebel	Chief Scientist	UH
WOCE group:		
Jeff Snyder	Technician	UH
Rich Muller	Technician	UH
Sophia Asghar	Graduate Student	UH
Hongbin Liu	Graduate Student	UH
John Bower	Graduate Student	UH
JGOFS group:		
Louie Tupas	Scientist	UH
Ursula Magaard	Technician	UH
Ricardo Letelier	Graduate Student	UH
Dan Sadler	Graduate Student	UH
Ancillary projects:		
Hongbin Liu	Graduate Student	UH - L. Campbell
Maureen Keller	Scientist	Bigelow Labs - B. Bidigare
Mikel Latasa	Graduate Student	UH - B. Bidigare
Charles Holloway	Graduate Student	UH - J. Cowen
John Bower	Graduate Student	UH - D. Young
Naeem Ahmed	Scientist	NIO

Itinerary (approximate local time):

Monday, 12 April
- 1015 Departed Snug Harbor
- 1330 Arrived Kahe Pt. (Sta. 1)
- 1630 Departed Kahe

Tuesday, 13 April
- 0200 Arrived Aloha (Sta. 2) trap deployment site
- 0400 Completed sediment trap array deployment
- 0500 Arrived Aloha (center of circle), began CTD time series
- 0600 First winch problem
- 1130 First cable problem
- 1530 Winch problem resolved
- 1900 Wire problems persist

Wednesday, 14 April
0200 Commenced Go-Flo cast
0300 Aborted Go-Flo cast
1800 Wire problem resolved
Thursday, 15 April
0200 Commenced second Go Flo primary productivity cast
0400 Continued with 3 hr interval CTD casts
0630 Deployed primary productivity array
1900 Retrieved primary productivity array
Friday, 16 April
0700 Completed Sta. 2 CTD operations
0900 Commenced dive operations
1130 Completed dive operations
1200 Conducted PNF cast and net tows
1300 Departed station ALOHA
1530 Recovered sediment traps
Saturday, 17 April
0700 Arrived Snug Harbor

Narrative:

HOT 46 was conducted 12-17 April 1993 aboard the R/V Wecoma (full 5 days at sea) with Capt. Doyle as Master. HOT 46 was not the typical Hawaii Ocean Time-series cruise due to persistent equipment problems on 13-14 April 1993. These were primarily associated with the winch and conducting cable although we also experienced problems during the primary productivity cast with HOT-JGOFS equipment. Additional, short term problems were also experienced with the CTD pylon, fluorometer transmissometer signal, leaking Niskin bottles, hung up Niskin lanyards, broken CTD frame weld, and minor CTD software problems. In spite of the recurring problems all "core" samples were collected due to the combined efforts of the scientific personnel and cooperative support of the ships crew. However, we did lose valuable time which resulted in aborting 2 blue water dives and the second WOCE deep cast. Oddly, we did not experience any equipment problems at our shake-down station (Kahe Pt.). Here we conducted a weight cast to 500 m followed by a PNF cast and 1000 m CTD cast. All equipment functioned properly and all Kahe Pt. samples were collected. In addition, we hosted a visiting Pakistani scientist Mr. Naeem Ahmed from the National Institute of Oceanography. His objective was to observe overall operations in preparation for upcoming Arabian Sea work.

We departed Kahe Pt. on schedule and steamed to the trap drop-off point. Upon arrival the ADCP indicated a 10-20 cm/sec northeast current between 100-300 m. The current was opposite in direction but similar in magnitude from 0-100m. We decided to move to 158 04' W along the same latitude line assuming the traps would track northeast as in HOT 45 (this assumption proved false, the traps drifted almost due west). Following deployment we steamed to the center of station ALOHA and began the WOCE deep cast. The first equipment problems developed during this cast. According to the cruise log the winch stopped 3 times on the downcast and 4 times on the upcast and took a

total of 6 hrs to complete. At the beginning of my shift I spoke with Jeff and he felt the problem was possibly a mismatch between the motor and gears causing the motor to overspeed on the decent and overheat on the ascent. Each time the motor overheated it would take ~15 min. to cool thereby resetting the thermocouple I spoke with the el

The twist in the cable persisted causing the cable to kink when the load was applied. This resulted in 3 terminations and removal of approx. ~70 m (?) of cable over the following 24 hr period. At this time we switched to a one conductor cable configuration so we could use the Wecoma's CTD swivel. This solved the problem. Due to the inability to maintain the 3 hr CTD cast interval we extended CTD operations until 0700 hrs on 16 April 1993 (an additional 36 hrs from the point of swivel installation).

Another problem which did not involve ship equipment materialized during the primary productivity cast. We recently repainted the DSE winch and installed new Kevlar line. Although the Go Flo bottles were tested on the new line the Teflon messengers were not. During the cast it was found that the messenger groove was too narrow for the new line. Therefore, the cast was aborted and rescheduled for the following night allowing us an opportunity to enlarge the grooves. This was done in the ships machine shop and the cast and subsequent in situ incubation completed without incident on 15 April 1993..

Following CTD operations 2 blue water dives were conducted in addition to the daily midday PNF cast followed by a short surface net tow. We departed station ALOHA at approx. 1300 hrs on 16 April 1993 located and retrieved the sediment traps returning to Snug Harbor by 0700 hrs 17 April 1993. Off loading was conducted immediately and completed by 1100 hrs.

Weather:

The weather was good throughout the cruise with light-moderate trades (10-20 kts), mostly sunny skies and 2-3 m seas.

Equipment and methods:

All equipment used on HOT 46 was standard for past HOT cruises. However, persistent winch and cable problems plagued a significant portion of the cruise. The only equipment lost was one Niskin spring and one (?) broken end cap handle..

Ancillary programs:

Investigator:	Project:
Charles Keeling (SIO)	CO2 dynamics and inter calibration
Lisa Campbell (UH)	Picoplankton studies
Maureen Keller (Bigelow Labs)	Phytoplankton pigment studies
Students:	
Ricardo Letelier	Tricodesmium studies
Dan Sadler	Time series pH measurements
John Bower	Squid population studies
Chuck Holloway	Th-U disequilibria and marine snow dynamics
Mikel Latasa	Phytoplankton pigment distributions
Jinchun Yuan	Trace metal studies
Others:	
Ted Walsh (Prj Mgr Anly Svc)	Seawater diluent collection
Taro Takahashi	pCO2 inter calibration (C. Winn P.I.)