HOT-31: Chief Scientist Report

Chief Scientist: E. FIRING

Personnel List:

Eric Firing	Chief Scientist	UH
WOCE group:		
Jefrey J. Snyder	Technician	UH
Patrick C. Caldwell	Technician	NODC
Sheryl A. McCarthy	Student	UH
GOFS group:		
Dale V. W. Hebel	Research Assoc.	UH
Omar Calvario-Martinez	Scientist	ICMyL-UNAM (Mexico)
Daniel W. Sadler	Student	UH
Luis M. Tupas	Post-Doc	UH
Christopher J. Carrillo	Technician	UH
Terrence Houlihan	Technician	UH
James R. Christian	Student	UH
John E. Dore	Student	UH
Ricardo M. Letelier	Student	UH
Mike Landry's group:		
John Constantinou	Student	UH
Julie D. Kirshtein	Technician	UH
OSU Marine Tech:		
Brian Wendler		

Itinerary (local times):

Saturday, Oct. 19
   1000 left Snug Harbor for fuel pier
   1327 left fuel pier
   1618 arrived at Kahe Pt. Station, 21-20.62N, 158-16.45W
   2230 left Kahe Pt.
Sunday, Oct. 20
   0517 arrived at Aloha center position
Wednesday, Oct. 23
   1028 recovered the sediment traps about 8 miles NE of
        Aloha
   1350 arrived at station 3, 23-25.0N, 158-00.0W
Thursday, Oct. 24
   0010 station 4, 21-57.8N, 157-59.9W
   0340 station 5, 21-46.64N, 158-00.0W
   0510 left station 5 for Snug Harbor
   1010 arrived at Snug Harbor

Narrative:

After a delay of about 3 hours for fueling and another half hour to retrieve a missing piece of equipment (the 12-place rosette), the ship got underway. The Kahe point station took over 6 hours because of problems with the CTD and with the level wind on the winch. The latter was fixed on the way to Aloha.

Work at Aloha proceeded at a good pace with no major problems. After the WOCE and GOFS casts had been completed, the CTD was moved to the 12-place rosette and 4 LADCP casts were made: 1 to 4600 m and 3 to 2000 m. Good data quality was obtained on all.

The sediment traps drifted north and east, consistent with the prevailing currents measured with the shipboard ADCP. The spar buoy was sighted before dawn and recovered after breakfast. The recovery was delayed by an hour for discussion of recovery strategy with the Wecoma's bosun and the Marine Tech, but otherwise proceeded well. The traps were in the water more than 72 hours.

A new element was added on this cruise: CTD stations on 158W at 23-25N, 21-57.8N, and 21-46.6N. The first of these, station 3, is 40 miles north of Aloha. Station 4 is about 10 miles offshore of the 400-m isobath at Kahuku, and station 5 is near that isobath. Each of these stations was conducted with the 24-place rosette and with sampling like that at Kahe Pt. The 100-mile section to Kahuku on 158W was filled in with T-7 XBTs at 10-mile intervals from station 3 to 22-35N, and at 5-mile intervals from there to 21-50N. Including one failure, this required 16 probes (15 T-7 and 1 T-4). The last probe was launched slightly later than intended and hit bottom at 500 m; a T-4 would have sufficed.

After leaving station 5, the ship proceeded along the North Shore approximately following the 300-m isobath so as to provide bottom-track calibration of the shipboard ADCP and gyrocompass. This causes a negligible lengthening of the cruise track.

Wecoma returned at unusually high speed in order to arrive close to 10AM. This should not be necessary on future cruises, given that the fueling and Kahe Pt. delays can be avoided.

Weather:

Weather was good throughout the cruise. Winds were light easterlies for the first part and increased to moderate east-northeasterlies at the end. On the last day we felt a swell from stronger trades to the northeast of us. There were only a few brief showers.

Equipment and methods:

The CTD was equipped with Marlin Atkinson's Morita O2 sensor for the first time. At Marlin's request, the CTD was therefore kept powered up almost continuously, and an effort was made to keep the Morita flushed with seawater and the rest of the Seabird plumbing flushed with freshwater. However, because of leaks in the plumbing, sensors were frequently exposed to air. Improved flushing systems and/or better plumbing will be needed in the future if the sensors are to be kept wet at all times.

The CTD was deployed using the Wecoma's non-articulated crane. This was a somewhat slow and awkward procedure, although it improved during the cruise as the crew became more practiced. Still, it seems inferior to using an A-frame. A light A-frame is available here, and we may want to consider using it in the future. With the crane, we needed two people on CTD tag lines, one on a tag line for the headache ball, and typically one more to handle the CTD wire and give signals. The latter is probably not essential and could be replaced by one of the tag line handlers, but still it seems that crane deployment requires more deck hands than using an A-frame. Also, the whip is typically much longer, and there is great latitude for the package to swing around from the time it leaves the deck to the time it hits the water. In bad weather this could become a serious problem.

The wire on the Wecoma's winch was moderately rusty on the top wrap. With full agreement from the ship's engineers and the Marine Tech, 100 m was cut off before the wire was terminated. Toward the bottom of the deep WOCE cast, the wire was absolutely pristine: new and shiny. This was the first time that part of the wire had been used. The wire as a whole is in excellent condition.

The shipboard ADCP was the standard VM-150 on the Wecoma. For navigation I brought my own MX4200 receiver, and mounted the antenna on a pole clamped to a stanchion on the 01 deck, port side, above the aft end of the dry lab. This worked very well.

One potential problem arose during the recovery of the sediment trap spar buoy. At the bosun's direction, the top of the spar was held down while it was hoisted with the bridle. It bent alarmingly under its own weight, but did not break. This can be avoided in the future by making the recovery plans with the bosun and Marine Tech earlier, and letting them know that the spar is not built for this kind of handling.

Another tense moment was when the spar was lifted by the grapnel (supplied by the Wecoma) and one of the three polypro strands of the grapnel line broke. The failure was due to melting of the strand at the splice when the loose end of the strand was heat-sealed.

One Happy Hooker was broken. These are essential for safe and efficient recovery of the CTD on the Wecoma. The plastic ones are not very strong, so we should simply ensure that we have an adequate supply on hand.

Tag lines supplied by the ship were plentiful but not very good quality. I suggest that WOCE/GOFS invest in a good set of our own tag lines.

Ancillary programs:

Investigator	Project
Marlin Atkinson	Test of a new oxygen sensor
Omar Calvario-Martinez	Dissolved oxygen as measure of primary productivity

Mike Landry

Tests prior to equatorial JGOFS cruise

student samples: John Dore, Jim Christian, Ricardo Letelier