

HOT-86: Chief Scientist Report

Chief Scientist: D. HEBEL

HOT 86 Cruise Report  
R/V Moana Wave  
31 July - 4 August 1997

Personnel List

HOT 86:

WOCE group:

Fernando santiago-Mandujano	Research Associate	UH
Craig Nosse*	Research Associate	UH
Hans Ramm	Research Associate	UH
Don Wright	Research Associate	UH

JGOFS group:

Dale Hebel	Chief Scientist (co-PI JGOFS)	UH
Karin Bjorkman	Visiting Graduate Student	UH
Dan Sadler	Research Associate	UH
Chris Carrillo	Graduate Student	UH
Stuart Donachie	Post-Doc	UH
Terrence Houlihan*	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Pat Driscoll	Research Associate	UH

Ancillary projects

Chuck Stump	Scientist	UW
Rebecca Scheinberg	Graduate Student	UH
Albert Calbet	Post-Doc	UH
Marian Westley	Graduate Student	UH

STAG

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

\* Watch Leader

Itinerary (approximate local time):

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Thursday, 31 July

0800	Departed Snug Harbor
0830	Fire and Abandon ship drill
1045	Arrived Kahe Pt. (Sta. 1)
1050	Weight cast (1000m)

1150 PRR-600 cast  
1235 slc1  
1445 Departed Kahe  
2255 Arrived Aloha (Sta. 2)  
2340 Began sediment trap deployment

Friday, 1 August

0025 Completed sediment trap deployment (22 45.4N,158 00.8W)  
0048 Plankton net tow  
0115 Plankton net tow  
0240 IES recovery operation  
0510 Winch all stop (6850 m); first pass  
0560 Retrieving wire  
0700 Winch all stop (4500 m)  
0820 Winch all stop (6526); second pass  
0900 Retrieving wire  
0950 Winch all stop (4500 m)  
1110 Winch all stop (6613); third pass  
1130 Retrieving wire  
1400 First weight onboard  
1510 Last weight onboard; first report of capstan slow speed problem  
1810 Began 36 hr "burst sampling" (s2c1)  
2100 s2c2  
2240 Plankton tow aborted, capstan problem

Saturday, 2 August

0000 s2c3  
0125 Go-Flo cast  
0310 s2c4  
0510 Deployed primary productivity array (22 45.1N, 158 00.0W)  
0600 s2c5  
0700 PP array radio transmitter signal lost  
0900 s2c6  
1200 s2c7  
1315 PRR-600 cast  
1345 Plankton net tow  
1500 s2c8  
1620 Plankton net tow  
1800 s2c9  
1940 Retrieved primary productivity array (22 46.4N, 158 05.7W)  
2100 s2c10

Sunday, 3 August

0005 s2c11  
0300 s2c12  
0550 s2c13 (WOCE deep cast)  
0920 Departed Sta. ALOHA  
1210 Sediment trap recovery (22 47.6N, 158 22.2W)  
1635 s8c1  
1800 OPC deployed

Monday, 4 August

0415 OPC recovered  
0710 Arrived Snug Harbor  
1130 Completed offloading operations

Narrative:

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HOT 86 was conducted aboard the R/V Moana Wave 31 July to 4 August 1997. Captain Stahl was the master of the vessel and Dale Hebel chief scientist. There were a total of 18 participants in the scientific party composed of 4 WOCE, 8 JGOFS, 4 ancillary and 2 STAG. This was not a routine cruise in the respect that the WOCE group wanted to conduct an IES recovery operation at the beginning of the cruise to allow enough time to identify if the IES dragging operation was successful in the event the IES was dislodged and floated to the surface some time later. This necessitated the initial cancellation of the OPC operations, although, there was the contingency that if there was time the operation would be conducted utilizing JGOFS personnel. Three stations were occupied during HOT 86 at Kahe Pt. (sta. 1), Station ALOHA (sta. 2), and the surface mooring location (sta. 8). All scheduled operations were completed with the exception of 2 (?) nets tows due to intermittent problems with the capstan. All Core samples were collected in addition to an approximate 12 hr IES dragging operation in an attempt to recover the IES which did not surface on HOT 85. Unfortunately, the IES recovery operation was unsuccessful.

During the cruise all underway measurement systems (thermosalinograph, ADCP, meteorological instruments, pCO<sub>2</sub> and fluorometer) were operable and functioned normally. Experiments on EOC, ectoenzymes and phosphorus cycling were performed as well as towing of the OPC from the mooring site (station 8) to off the leeward coast of Oahu. The weather was moderate with ~ 20 kt Trades, swells 3-6 feet and skies mostly cloudy.

Daily Activities (HST)

28 July 1997

Pre-cruise meeting MSB 315 at 1100 hrs.

30 July 1997

All equipment and supplies were loaded on the R/V Moana Wave, assembled, and tested (is this correct?).

31 July 1997

All science personnel were aboard by 0730 hrs and the ship departed on schedule (0800 hrs.). Completed all work at station Kahe without problems. We did the usual weight cast to 1000 m, PRR cast, and 1000 m CTD cast. Chris Carrillo request two bottles for his experiments and Chuck Stump collected some inter-comparison oxygen and salt (?) samples. Prior to arriving at Kahe the fire/abandon ship drill was conducted by first mate Ross Barnes followed by a science meeting. At the meeting we covered the usual operational plans and reintroduced the updated CTD protocols, which were made available for personnel to read. We departed Kahe ~1430 hrs. There was a south wind blowing causing small white caps and a moderate south swell. Skies were

generally clear but hazy.

We arrived Station Aloha ~2200 hrs. The sediment traps and associated samples (Chris Carrillo) were deployed without problems followed by two net tows. The IES recovery operation was started ~0200 hrs and the complete array deployed ~ 0500 hrs (?) without problems. The dragging operation progressed as planned and without problems. The winds were Trades at ~15 kts, the seas choppy with small white caps, swell 4-6 ft and skies clear. All underway systems are functioned normally.

1 August 1997

Although the IES recovery was unsuccessful the operation went smoothly. We did experience a problem with the capstan when the low speed control was lost. Bob Kerr (chief engineer), took a look and found no obvious problem, however, the unit began to work properly for no apparent reason. Unfortunately, the problem reappeared during the night net tow and, as I understand, these operations were aborted (?).

We have begun the 36 hr 3 hr interval "burst" sampling mode. The series began with the JGOFS 1 cast instead of the usual WOCE deep cast (WOCE-1). At this point, Chuck Stump has collected most of his samples and both Stuart and Karin have collected water for their experiments and the PP array has been deployed although we just lost the RDF signal.

Winds continue to be Trades at about 20 kts, seas 4-6' and skies mostly cloudy.

2 August 1997

CTD operations are continuing normally. The go-flo cast was successful and the PP array deployed without incident although the RDF quit working shortly after deployment.

The 1030 hr net tows were aborted since the capstan was still inoperable and the 1330 hr net tows were attempted using the starboard tigger winch in place of the capstan. Letting the net out was no problem but during the ascent the continuous tigger operation drained the air tank and almost killed the engine. At this point we arranged a block assembly and used the DSE winch to haul in the net.

The PP array was retrieved without incident. The next net tow was scheduled for 2200 hrs and I understand that this was aborted due to a problem with the DSE winch. Apparently, the brake would not disengage properly (we have experienced this before). I am not clear if this problem occurred immediately or during the retrieval, in which case, the net would have had to have been retrieved somehow and therefore samples collected? There is a net tow written in on the schedule at 2230 hrs and no indication if this worked and if so how it was done (?).

3 August 1997

The net tow scheduled for 0030 hrs was aborted. CTD operations continue without problems. We have completed the WOCE-2 cast (shallow cast) and have moved to the new IES location. The IES is functioning normally and we are now doing the WOCE-1 (deep cast). The winds are

blowing Trades and have dropped to about 15 kts, seas are 2-4' with a light chop and skies are mostly clear.

Our arrival at Snug Harbor is slated for 0800 hrs 4 August 1997. We still need to retrieve/process the sediment traps which are drifting almost due west, tow the OPC, and do our final 1000 m cast at HALE ALOHA. At this point, all samples have been collected (except for the net tow samples) and it is anticipated that we will have no difficulty with the remainder although due to the time frame of the WOCE casts it is uncertain if all the oxygen samples will be analyzed before our scheduled docking. If not we will complete these at UH.

4 August 1997

After the station 8 (HALE ALOHA) CTD cast we deployed the OPC and completed two vertical profiles before towing the instrument at 8 kts on the return transit to Snug Harbor. We retrieved the OPC somewhere off the leeward coast of Oahu. We arrived at Snug Harbor 0700 hrs and completed offloading operations by 1130 hrs.

Weather

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HOT 86:

The weather was mostly cloudy with winds and seas typical of station ALOHA at this time of year. Below is listed the cruise bridge log 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, barometer in inches of Hg, temp C (dry bulb) and clouds in tenths.

Day Date	Wind	Sea	Swell	Barometer	Temp	Clouds
Thurs 31 July	var-130, 1-21	060-130, 1-4	060-150, 3-6	29.98-30.04	77-88	2-9
Fri 1 Aug.	085-100, 5-10	120-100, 3-4	120-130, 5-6	30.03-30.10	74-76	3-7
Sat 2 Aug.	070-085, 20-28	070-080, 3-4	110,120, 6	30.02-30.08	76-82	1-10
Sun 3 Aug.	065-090, 16-20	065-090, 3-4	090-110, 3-6	29.95-30.06	77-81	5-9
Mon* 4 Aug	060-100, 10-14	060-100, 2	100-160, 3	29.94	76-77	1-5

\*Only two entries (0200 & 0600 hrs)

Equipment and methods:

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With the exception of the initial capstan problems all standard equipment functioned properly.

Sub component programs:

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Investigator:

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Project:

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Christopher Winn (UH)

DIC, pH, Alk., pCO2/UH

Bob Bidigare (UH)  
Michael Landry (UH)

HPLC pigments/UH  
Zooplankton dynamics/UH

Ancillary programs:

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Investigator:

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Charles Keeling (SIO)  
Paul Quay (UW)  
Ed Boyle  
Bill Jenkins  
Steve Emerson  
others ???

Project:

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CO2 dynamics and intercalibration/SIO  
DIC and 13C/UW  
trace metals/MIT  
helium distributions/MIT  
oxygen, argon, nitrogen dynamics/UW

Students:

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Others:

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Mark Huntley/Mai Lopez  
Stuart Donachie  
Karin Bjorkman  
Dale Hebel  
others ???

Optical plankton counting/SIO  
Ectoenzyme activities/UH  
PO4 dynamics experiments/UH  
EOC distribution/UH