

HOT-88: Chief Scientist Report

Chief Scientist: D. HEBEL

HOT 88 Cruise Report

R/V Moana Wave

3-7 Dec., 1997

Personnel List

HOT 88:

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
Louie Tupas*	Scientist	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
Markus Karner	Post-Doc	UH
Stephanie Christensen	Graduate Student	UH

Ancillary projects

Ken Smith	Scientist	SIO
Roberta Baldwin	Research Associate	SIO
Alfred Uhlman	Research Associate	SIO
Robert Glatts	Research Associate	SIO

STAG

Steve Poulos	Electronic Technician	UH-UMC
Dave Gravatt	Deck Technician	UH-UMC

* Watch Leader

Itinerary (approximate local time):

Wednesday, 3 December

0910	Departed Snug Harbor
0940	Fire and Abandon ship drill, science meeting

1150 Arrived Kahe Pt. (Sta. 1)
1210 PRR-600 cast
1310 slc1
1420 PRR-600 cast
1430 TSRB cast
1530 Practice rough water CTD deployment/retrieval
1610 Departed Kahe

Thursday, 4 December

0730 Arrived Aloha (Sta. 2)
0900 Arrived FVGR deployment site (22° 52' N, 158° W)
1130 Plankton net tow
1320 FVGR deployed
1440 s2c1
1800 s2c2
2100 s2c3
2220 Plankton net tow

Friday, 5 December

0000 s2c4
0120 Plankton net tow
0300 s2c5
0600 s2c6
0900 s2c7 canceled (CTD cable reterminated)
1040 Plankton net tow
1150 PRR-600 cast
1210 TSRB cast
1220 Plankton net tow
1240 Transit ROVER deployment site
1400 ROVER deployed
1510 s2c7
1910 s2c8 (WOCE deep cast)
2250 Plankton net tow

Saturday, 6 December

0200 s2c9
0650 Recovered FVGR (22° 51.5'N, 158° 01.0' W)
1000 s8c1
1150 PRR & TSRB casts
1230 Acoustic release operations
1420 Release code sent and verified using Scripps transducer and deckbox
1450 Hardhats spotted
1515 Began HALE ALOHA recovery
2000 Completed HALE ALOHA recovery
2010 Weight cast 1000 m (crush cup operation)
2050 Departed station 8

Sunday, 7 December

0700 Arrived Snug Harbor
1130 Completed offloading operations

Narrative:

HOT 88 was conducted aboard the R/V Moana Wave 3-7 December 1997. Captain Hayes was the master of the vessel and Dale Hebel chief scientist. There were a total of 19 participants in the scientific party composed of 4 WOCE, 9 JGOFS, 4 ancillary and 2 STAG. This was a two-segment cruise. The first segment of the cruise was to recover both the HALE ALOHA mooring and the bottom moored sediment traps and the second segment the routine HOT cruise. The first phase which was scheduled for two days was canceled by the chief scientist Terrance Houlihan on the first day due to high winds (gusts over 40 kts) and rough (unworkable by captains standard) seas. This cruise returned to Snug Harbor by 0800 hrs on 2 December. We departed Snug on 3 December for HOT 88, although the winds were predicted to remain high throughout the week. Due to the rough sea conditions we decided to delete the floating sediment trap and OPC operations. In addition to the regular HOT scientific contingency, we had four scientists aboard from SIO to deploy 2 benthic respirometers (FVGR & ROVER). Four stations were occupied during HOT 88, Kahe Pt. (sta. 1), Station ALOHA (sta. 2), FVGR/ROVER deployment site, and HALE ALOHA mooring location (sta. 8). CTD operations were conducted at stations 1, 2 & 8. Nine casts were conducted at Station ALOHA and one at stations 1 & 8. During the cruise all underway measurement systems (thermosalinograph, ADCP, meteorological instruments, pCO₂ and fluorometer) were operable and functioned normally except for a period when the feed water was turned off due to air in the lines from the rough seas on our outward transit. The seas were rough, throughout the cruise, with sustained winds 20-30 kts and gusts over 40 kts, swells 5-15 feet and mostly cloudy skies.

Daily Activities (HST)

21 Nov. 1997

Pre-cruise meeting MSB 315 at 1030 hrs.

28 Nov. 1997

Equipment for the Recovery cruise and most of the equipment for the HOT cruise were loaded and tested. The remaining equipment was loaded on Wed. 3 Dec.

3 Dec. 1997 (Wednesday)

All science personnel were aboard by 0830 hrs and the ship departed on schedule (~0900 hrs.), however due to channel traffic, we were delayed about 1/2 hr. Abandon ship, fire and science meeting was conducted about 1000 hrs. Arrived Kahe ~1200 hrs and conducted PRR cast, 1000 m CTD cast, TSRB cast and 4-5 practice rough weather CTD deployment/retrievals. It was found that the 2 tags using hooks and poles was preferable to the 3-man tag system outlined in the CTD deployment/retrieval protocols. Departed Kahe ~1630 hrs. The winds were blowing ~20 kts, seas ~3-5', and skies mostly cloudy.

4 Dec. 1997 (Thursday)

We reached the circle center of ALOHA (~0730 hrs HST), after steaming most of the night between 4-6 kts. The seas were very confused and the wind was blowing an average 30 kts with higher gusts. Ken Smith thought he would be able to deploy the FVGR at the proposed location 7nm north of the circle center. We headed to that local to assess the situation. The feed water for the uncontaminated flow-thru system was turned off 3 Dec. at ~1900 hrs due to air in the system because of the rough sea conditions.

After arriving on station the captain decided there would be no over-the-side work at this time. The captain expected the sea and wind conditions to remain the same through Friday. About an hour or two after the captain decided there would be no over-the-side operations he held a meeting with myself, Ken Smith and Dave Gravatt to discuss the potential deployment/retrieval of the FVGR. He emphasized that if Ken wanted to deploy the vehicle that he could not guarantee it could be recovered and the decision to deploy would be up to Ken. Ken decided to deploy the vehicle. Prior to the FVGR deployment Stephanie did a net tow and one later that night. Observation, if net tows can be conducted successfully then CTD and other over-the-side operations are usually possible.

Following the FVGR deployment, which went without incident, we steamed back to the center of the circle and began CTD operations.

5 Dec. 1997 (Friday)

At the end of the day on Friday we had completed JGOFS 1&2, HPLC, PC/PN, PPO4, N20/CH4, PSi, ATP and WOCE 1&2 CTD casts, 4 net tows, 2 PRR/TSRB casts, and deployment of the ROVER. The FVGR was programmed to release at 0500 hrs 6 Dec. and surface by 0700 hrs. The winds on Friday abated somewhat and were blowing 20-30 kts but a real blessing was the confused seas, which have resulted from what appears to be two different swell directions. The result was that the seas were not as large as they probably would have been allowing us to continue with our work.

During the 3 hr CTD deployment phase the casts had been going normally but before deploying the CTD for the ATP cast a kink in the cable was discovered (by John Stahl, winch operator and first mate), and the cable reterminated after inspection by the watch leader (FSM).

6 Dec. 1997 (Saturday) After completing the ATP cast sample collection and CTD work at Station ALOHA was concluded. We proceeded to the deployment site of the FVGR, which was set to release at 0500 hrs and was expected to surface at 0700 hrs.

Sometime after our arrival 0600-0645 hrs the bridge had the package in sight and was making its retrieval approach at ~0700 hrs. The recovery went smoothly and by 0730 hrs we were underway heading for HALE ALOHA. Upon arrival (~1030 hrs), we did a CTD cast, PRR/TSRB cast, released the array and recovered the mooring. During the recovery winds were variable 15-25 (average ~20 kts) out of the NE, skies mostly cloudy, and seas ~10'.

Weather

The skies were almost always cloudy with high winds and confused seas. 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
Wed. 3 Dec.	035-080, 16-38	040-080, 3-6	040-060, 3-6	30.04-30.12	72-77	6-9
Thurs. 4 Dec.	050-065, 25-36	050-065, 4-6	050-070, 10-15	30.11-30.20	71-72	7-10
Fri. 5 Dec.	050-065, 25-36	050-065, 4-6	050-070, 10-15	30.11-30.16	71-72	6-10
Sat. 6 Dec.	040-060, 22-30	040-060, 4	050, 8-10	30.07-30.11	70-77	6-8
Sun. 7 Dec.*	060, 13	060, 2	050, 4	30.00	73	3

*Only one entry (0200 hrs)

Equipment and methods:

Due to rough seas and the recovery of the HALE ALOHA mooring the three hour burst sampling was restricted to ~25 hrs. All samples were collected except for H2O2. Keeling's DIC bottles were not aboard however samples were collected for him in our DIC bottles. Again, due to the rough seas the primary production and floating sediment trap experiments were canceled. The OPC was also canceled to allow time for the mooring recovery.

Sub component programs:

Investigator:

Project:

Christopher Winn (UH)
Bob Bidigare (UH)
Michael Landry (UH)

DIC, pH, Alk., pCO₂/UH
HPLC pigments/UH
Zooplankton dynamics/UH

Ancillary programs:

Investigator:

Project:

Charles Keeling (SIO)
Paul Quay (UW)
Ed Boyle

CO₂ dynamics andintercalibration/SIO
DIC and 13C/UW
trace metals/MIT

Students:

Chris Carrillo

Community respirationexperiments/UH

Others:

Stuart Donachie

Ectoenzyme activities/UH

Markus Karner

Microbial fluorescence probes/UH