

Chief Scientist: K BJORKMAN

Departed: October 21, 2001 at 0900 (HST)

Returned: October 26, 2001 at 0730

Vessel: R/V Ka'imikai-o-Kanaloa

Operator: University of Hawaii

Master of the Vessel: Captain Ross Barnes

Chief Scientist: Karin Björkman

STAG Electronics Technician: Steve Tottori

STAG Deck Operations: Dave Gravatt

1. SCIENTIFIC OBJECTIVES

The objective of this cruise was to continue building a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations were to be occupied during the cruise, in the following order:

1) Station 1, referred to as Station Kahe, is located at 21° 20.6'N, 158° 16.4'W and was to be occupied on October 21 for about 3 hours.

2) Station 2: ALOHA (A Long Term Oligotrophic Habitat Assessment) is defined as a circle with a 6 nautical mile radius centered at 22° 45'N, 158°W. This is the main HOT station and was to be occupied for 4 days from October 22 to October 25.

3) Station 8, referred to as HALE-ALOHA is the location of the deep ocean mooring (20° 20'N, 158° 10.6'W). It was to be occupied on October 25 for about 2 hours.

4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W was to be occupied on 25 October for about 4 hours.

A single CTD cast was to be conducted at Station 1 to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements. PRR and TSRB measurements were also to be made.

Upon arrival at Station ALOHA, net tows were to be conducted followed by the deployment of a free-drifting sediment trap array. After deployment, a full-depth CTD cast was to be conducted, followed by CTD casts at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection followed by another full-depth CTD cast. Two other free-drifting arrays were to be deployed on October 23: an oxygen balance experiment for 24 hours and a primary production experiment for 12 hours. Upon retrieval of the oxygen array a fourth free-floating array was to be deployed on October 24 for an additional 24 hours (B. Popp alkenone experiment). After the deployment of the

alkenone array the ship was to transit to recover the sediment trap array after which the ship should return to Sta ALOHA for additional sampling. Plankton net tows were to be conducted near noon and midnight, with additional surface tows in conjunction to these tows, on October 22 and 23 at Station ALOHA. In situ pumping was to be conducted in the afternoon for a period of 1.5 hours on October 22, 23 and 24. After the last in situ on pumping on October 24 two additional CTD casts were to be conducted, the second one to be a full-depth cast. PRR and TSRB deployments and recoveries were to be done around noon October 22 and 23.

After work at Station ALOHA was accomplished, and the alkenone array recovered at dawn on October 25, the ship was to transit to Station 8, to conduct one 1000-m CTD cast, after which the ship was to transit to station 6.

A near-bottom CTD cast (~2500 m) was to be conducted at Station 6 including salinity samples for calibration, after which the ship was to transit back to Snug Harbor.

The following instruments were to collect data throughout the cruise: a shipboard ADCP, a thermosalinograph and fluorometer, and an anemometer.

2. SCIENCE PERSONNEL

WOCE group:

Noel Larson	Research Associate	UH
Jeremiah Johnson (Watch Leader)	Research Associate	UH
Mark Valenciano	Electronics Technician	UH
Fernando Santiago-Mandujano (Watch Leader)	Research Associate	UH
Martin Orlando	Volunteer (WOCE)	UH

JGOFS group:

Karin Björkman (Chief Scientist)	Research Specialist	UH
Anne Gasc	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Paul Morris	Technician	UH
Tom Gregory	Research Associate	UH

Ancillary projects:

Brian Popp	Scientist	UH
Bryan Deschene	Graduate student	UH
Donielle Chittenden	Undergraduate student	UH
Cecelia Sheridan	Graduate Student	UH
Colleen Allen	Research Associate	UH

3. GENERAL SUMMARY

Operations were conducted as planned without any serious interruptions. Fourteen 1000-m CTD casts, two deep cast and two 200-m casts were

obtained at Station ALOHA. One 1000-m CTD cast was obtained at Station Kahe and one 1000-m CTD cast at Station HALE-ALOHA. One near-bottom cast (~2500-m) and one 1000-m cast were obtained at Station Kaena.

The array of floating sediment traps, the oxygen array, the primary productivity array and the alkenone array were all deployed and recovered without major incidents. All of the arrays drifted southwest ward. The sediment traps drifted about 9 nmi SW from the center of the circle.

C. Allen and C. Sheridan, successfully completed 9 plankton net tows, plus an additional 2 surface tows.

The dual in situ pumps were successfully deployed as planned.

PRR and TSRB measurements were successful on all deployments.

The ADCP ran without interruption throughout the cruise, as well as the fluorometer, thermosalinograph and the ship's anemometer.

We arrived back at Snug Harbor on October 26 at about 0730. A full off-load took place immediately.

4. R/V KA'IMIKAI-O-KANALOA, OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V Ka'imikai-o-Kanaloa and her crew continue to deliver excellent ship support for our work. The officers and crew were most helpful and accommodating. They showed enthusiasm and concern for our work and were very flexible in receiving changes in our operational schedule.

Technical support during this cruise was excellent. STAG personnel were available at any time to assist in our work and made things much easier for us.

5. DAILY REPORT OF ACTIVITIES (HST)

October 20, 2001; Loading Day

Equipment loaded on this day. Tested CTD system.

October 21, 2001

The ship departed from Snug harbor at 0900 on schedule. Fire and abandon ship drills were conducted at 0930, followed by a short science meeting during which the cruise schedule was reviewed, and safety issues were discussed.

We arrived at Kahe station at 1200 and a weight cast (400 lb) to 1000 m was conducted. The PRR and TSRB were deployed at 1240 and both worked without problems. The CTD cast was commenced at 1330 and ended at 1425. Some bottles were leaking on retrieval. The Seapoint fluorometer (SN 2383) was used and appears to be very sensitive relative to the

Seatech fluorometer used previously. After station 1 had been sampled we commenced our transit to Sta ALOHA. Due to high seas our speed was reduced to 7-8 knots.

October 22, 2001

We arrived at station ALOHA at 0145. Due to the late arrival the scheduled net tows were cancelled and we instead proceeded to deploy of the sediment traps. The traps were released at 0255 and the first deep WOCE cast started at 0310. At 0800 the 36-hr CTD cast period started. A total of six 1000-m CTD casts were conducted this day. The Seapoint fluorometer failed on the upcast of s2c3 and was exchanged for the Seatech instrument was mounted for cast s2c4 and appeared to be working satisfactory. The exact problem with the Seapoint fluorometer was not diagnosed at this time. Continued to have problems with leaking bottles, sometimes to the point where sampling was compromised.

Net tows were conducted prior to, and after noon as well as at night. There appeared to be a lot of material in the nets (Trichodesmium sp among others).

PRR and TSRB cast went as scheduled without problems.

The in situ pumps were deployed at 1500 and recovered at 1655.

October 23, 2001

Seven 1000-m and one 200-m CTD casts were conducted during this day. The 36-hour burst-sampling period ended with cast 14. Bottles continued to leak. The top o-ring and cap replaced on one bottle.

The oxygen array was deployed at 0330, an hour earlier than originally scheduled, without problems.

The primary productivity array was deployed at 0630 and was recovered at 1800. One set of net tows was conducted in the day and one at night. The 1300 tows were cancelled.

PRR and TSRB cast went as scheduled without problems.

The in situ pumps were deployed at 1500 and recovered 1630.

October 24, 2001

A second shallow cast (200m) was conducted at 0100 for the B. Popp experiment.

The alkenone array was deployed at 0400. The oxygen array was recovered at 0615. The sediment trap array was recovered at 0900. The array drifted about 9 nm southwest from Station ALOHA.

The in situ pumps were deployed at 1500 and recovered at 1730.

One CTD cast to 1000 m (#17) was conducted followed by the second WOCE deep cast at 2000 hours. The Seatech fluorometer was exchanged for the

Seapoint (SN 2384) at s2c17 for additional calibrations of this instrument. The SeaPoint was then used throughout the rest of the cruise and worked satisfactory.

There was a small flooding of the wet lab around 1400 due to an engine room valve accidentally being shut. Clean water entered the wet lab through the floor drain. The problem was rectified immediately after discovery and the water spill cleaned up.

October 25,

The alkenone array was recovered at dawn without problems after which we steamed to sta 8.

A 1000-m CTD cast was conducted at HALE-ALOHA (sta 8) at 1100.

Station Kaena was occupied from 1700 to 2100 for two CTD casts. The second Seapoint instrument (SN 2383) was tested on both casts and again failed as earlier in the cruise. This instrument will be sent back to the manufacturer for inspection. The last cast was to test the bottle failure rate when the o-rings had been greased with silicon relative to untreated o-rings, since leaking bottles had been a persisting problem during the cruise. The procedure reduced the number of leaking bottles. Mark Valenciano is working on a solution that will not compromise the water samples. The bottles and o-rings will be cleaned from silicon before HOT 132.

There were complaints about the noise level apparently generated by the compressor of the air conditioning unit in the Rock lab. The chief engineer was notified and will try to rectify the problem until HOT 132. However, time constrains between cruises may not allow for these repairs by then.

October 26,

Arrived at Snug Harbor at 0730 and a full off-load was done.

6. WEATHER

Below is the cruise bridge log description for HOT 131. Wind and sea directions are in degrees, wind speed in knots, seas in Beaufort, swells in feet, barometer in inches Hg, temp in Deg. F (dry bulb), clouds in tenths.

Date	Wind	Sea	Swell	Barometer	Temp	Clouds
Sun 21, Oct.	070, 15-22	070, 3-4	065-100, 6-8	29.93-30.00	76-86	2-4
Mon 22, Oct.	065-080, 15-20	065-080, 3-4	030-080, 4-8	29.94-30.02	74-81	2-5 (showers)
Tue 23, Oct.	015-090, 9-15	015-090, 2-3	020-070, 3-5	29.88-29.96	75-81	3-7
Wed 24, Oct.	120-140, 4-10	120-171, 1-2	040-060, 4-5	29.86-29.95	75-84	1-7
Thu 25, Oct.	090-140, 8-14	090-140, 2-3	030-080, 3-4	29.91-30.01	77-81	6-10

Sub component programs:

Investigator:

Bob Bidigare
Mike Landry
John Dore

Project:

HPLC pigments/UH
zooplankton dynamics/UH
CO2 dynamics/UH

Ancillary programs:

Investigator:

Charles Keeling
Paul Quay
Steve Emerson
Mark Abbott/Ricardo Letelier
Claudia Benitez-Nelson
Peter J. LeB. Williams

Project:

CO2 dynamics and intercalibration/SIO
DI13C and O isotopes/UW
O2, N2, Ar, Ne dynamics/UW
optical measurements/OSU
P isotopes, thorium/UH
oxygen balance/U Wales Bangor, UK

Others:

Investigator:

Dale Hebel
Karin Björkman
John Dore
Paul Morris

Project:

EOC production /UH
phosphorus cycling/UH
N2 fixation, PIC, P15N/UH
oxygen balance/UH