

HOT-128: Chief Scientist Report

Chief Scientist: K. BJORKMAN

Departed: July 9, 2001 at 0900 (HST)
Returned: July 13, 2001 at 0730
Vessel: R/V Ka'imikai-o-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Robert Hayes
Chief Scientist: Karin Bjorkman
STAG Electronics Technician: Steve Poulos
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 July 9 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, 158W. This is the main HOT station and was to be occupied for 3 days from July 9 to July 12.

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 July 12 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 July 12 for about 2 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.

Upon arrival at Station ALOHA, the deployment of a free-drifting sediment trap array was to be conducted. 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 July 11: an oxygen balance experiment for 24 hours and a primary production experiment for 12 hours. A plankton net was to be deployed near noon and midnight, with additional surface tows in conjunction to these tows, on July 10 and 11 at Station ALOHA.

After work at Station ALOHA was accomplished, the ship was to transit to recover the sediment trap array. After the sediment traps were

recovered, 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.

A hand-held photometer belonging to J. Porter was to be used to make aerosol measurements near noon each day at times coinciding with satellite overpasses. Semi-continues aerosol measurements were to be collected by Y. Shinozuka (A. Clark) from instruments secured on the 03 deck.

An in situ pump for C. Benitez-Nelson's experiments was to be deployed for 1.5 hr on July 10 and 11.

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
Lal Ratnapala	Research Assistant	UH
Fedra Palacios	Volunteer	UH
Fernando Santiago-Mandujano (Watch Leader)	Research Associate	UH

JGOFS group:

Karin Bjorkman (Chief Scientist)	Research Specialist	UH
Anne Gasc	Research Associate	UH
Lance Fujieki	Computer Specialist	UH
Paul Morris	Technician	UH
Dale Hebel	Research Associate	UH
Ellen Schulz	REU Student	Harvard
Jennifer Brum	Technician	UH
Cecelia Sheridan	Graduate Student	UH
Michael Landry	Professor	UH
Anita Senderstrom	REU Student	UH

Ancillary projects:

Claudia Benitez-Nelson	Assistant Researcher	UH
Yohei Shinozuka	Graduate Student	UH

3. GENERAL SUMMARY

Operations were conducted as planned with some minor interruptions. Twelve 1000-m CTD casts and one deep cast were obtained at Station ALOHA. One 1000-m CTD cast was obtained at Station Kahe and one 2000-m CTD cast at Station HALE-ALOHA. One near-bottom cast (~2500 m) was obtained at Station Kaena.

The array of floating sediment traps, the oxygen array and the primary productivity array were all deployed and recovered without major incidents. All of the arrays drifted northwest ward fairly swiftly. The sediment traps drifted about 15 nmi from the center of the circle. The Argos satellite was unable to deliver positions for the oxygen array, even after modifications to the spar buoy to alleviate this problem since the last cruise (H127). The strobe on the primary productivity array was not activated on deployment.

M. Landry, C. Sheridan, A. Senderstrom and C. Benitez-Nelson completed successfully 5*2 plankton net tows, plus an additional 4 surface tows. The in situ pump was successfully deployed as planned. Aerosol measurements were completed as planned at the specified satellite crossover times.

Winds were easterlies at 20 kt, with 4-5 ft swells.

The ADCP ran without interruption throughout the cruise, as well as the fluorometer, and the ship's anemometer. The thermosalinograph's external temperature sensor did not function properly during the cruise despite attempts by S. Poulos to correct the problem.

We arrived back at Snug Harbor on July 13 at about 0730. Off-loading of samples and most of the equipment took place immediately. The lab van, incubators and some deck equipment were left on board for the next cruise.

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)

July 6, 2001; Loading Day

Equipment loaded on this day. Tested CTD system.

July 9, 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 1130 and a weight cast (400 lb) to 1000 m was conducted. The CTD cast was commenced at 1300, but problems arose with the temperature sensor and the cast was aborted, no bottles were fired. The sensor was replaced and the CTD cast was conducted at 1500,

after which the ship headed towards station ALOHA. At approximately 1700 a water pump for the cooling of the starboard engine failed. No spare pump was available onboard. New parts were machined to repair to pump. At approximately 2230 we were able to regain full speed.

July 10, 2001

We arrived at station ALOHA at 0245 and proceeded to deploy of the sediment traps. The additional experimental "up side down" traps (M. Landry, C. Sheridan), that were to be added to the sediment trap array, were incompatible with the crosses and these were not deployed. The trap array was released at 0330. The first deep WOCE cast started at 0400. The temperature and salinity sensors again had problems, but the cast was completed and sampled prior to being deemed "unusable" and to be repeated. The CTD and pumps were changed and the shallow WOCE cast was postponed to later in the cruise. At 1100 the first successful CTD deployment commenced, which initiated the 36-hr CTD cast period. A total of five 1000-m CTD casts were conducted this day.

Net tows were conducted before noon and at night.

The in situ pump was deployed at 1500.

Weather: cloudy

Wind: 105 t 21 kts. Sea state:4. Seas: 090 t 4 ft.

July 11, 2001

Six 1000-m CTD casts were conducted during this day. One cast had to be cancelled due to failure of the underwater CTD unit. The problems were solved by replacing the CTD. The 36-hour sampling period ended with the repeating of the WOCE deep cast CTD starting at 2300.

The oxygen array was deployed at 0330.

The primary productivity array was deployed at 0600 and was retrieved at 1850. The array drifted some 6 nmi northwest from Station ALOHA. The strobe may not have been turned on on deployment.

Net tows were conducted in the day and at night as yesterday.

The in situ pump was deployed at 1500.

Weather: cloudy

Wind: 090 t 20 kts. Sea state: 4. Seas: 090 t 5 ft.

July 12, 2001

The second WOCE CTD cast started at 0745.

Due to problems with the Argos positioning for the oxygen array, it was decided to approach it in the dark and retrieve at daybreak. The oxygen array was recovered at 0600. The array drifted about 10 nm northwest from Station ALOHA.

The sediment trap array was recovered at 1140. The array drifted about 15 nm northwest from Station ALOHA.

A 2000-m CTD cast was conducted at the HALE-ALOHA station at 1600. The 2000 m cast was conducted to test the plumbing and pumps together with the fluorometer to assess the reoccurring problems with the sensors.

A CTD cast at Station Kaena began at 2100. The new all ocean depth fluorometer was installed and tested.

Weather: ptly cloudy

Wind: 080 t 18 kts. Sea state: 4. Seas: 080 t 5 ft

July 13, 2001

Arrived at Snug Harbor at 0730 and off-loaded samples and most equipment. Lab vans, incubators and deck equipment were left aboard for the next cruise.

Sub component programs:

Investigator:	Project:
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Bob Bidigare	HPLC pigments/UH
Mike Landry	zooplankton dynamics/UH

Ancillary programs:

Investigator:	Project:
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Charles Keeling	CO2 dynamics and intercalibration/SIO
Paul Quay	DI13C and O isotopes/UW
Steve Emerson	O2, N2, Ar, Ne dynamics/UW
John Porter	aerosols/UH [not collected due to clouds]
Mark Abbott/Ricardo Letelier	optical measurements/OSU
Claudia Benitez-Nelson	P isotopes, thorium/UH
Peter J. LeB. Williams	oxygen balance/U Wales Bangor

Others:

Investigator:	Project:
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Dale Hebel	EOC production /UH
Karin Bjorkman	phosphorus cycling/UH
John Dore	N2 fixation, PIC, P15N/UH
Jennifer Brum	dissolved DNA, viruses/UH
Paul Morris	oxygen balance/UH