

Chief Scientist: J. DORE

Departed: June 12, 2001 at 0945 (HST)
Returned: June 16, 2001 at 0730
Vessel: R/V Ka'imikai-o-Kanaloa
Operator: University of Hawaii
Master of the Vessel: Captain Ross Barnes
Chief Scientist: John Dore
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 June 12 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 3 days from June 13 to June 15.

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 June 15 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 June 15 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, a net tow was 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 June 14: 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 on June 13 and 14 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 Profiling Reflectance Radiometer (PRR) was to be deployed for half-hour periods near noon time on June 12, 13 and 14. 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.

An in situ pump for C. Benitez-Nelson's experiments was to be deployed for 1.5 hr on June 13 and 14.

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
Fernando Santiago-Mandujano (Watch Leader)	Research Associate	UH

JGOFS group:

Karin Björkman	Research Associate	UH
Anne Gasc	Research Associate	UH
John Dore	Chief Scientist (Assoc. Res.)	UH
Lance Fujieki	Computer Specialist	UH
Paul Morris	Technician	UH
Dale Hebel	Research Associate	UH
Katsumasa Tanaka	Graduate Student	UH
Jennifer Brum	Technician	UH
Colleen Allen	Research Associate	UH

Ancillary projects:

Tom Gregory	Technician	UH (Benitez-Nelson)
Roberta Hamme	Graduate Student	UW (Emerson)
Laurie Juranek	Graduate Student	UW (Quay)

3. GENERAL SUMMARY

Operations were conducted as planned without major interruptions. Thirteen 1000-m CTD casts and two deep casts were obtained at Station ALOHA. One 1000-m CTD cast was obtained at Station Kahe and two at Station HALE-ALOHA. One 1000-m cast and one near-bottom cast (~2500

m) were obtained at Station Kaena.

The array of floating sediment traps, the oxygen array and the primary productivity array were all deployed and recovered without incident. None of the arrays drifted beyond the edge of the 6 nmi circle defining Station ALOHA. The sediment traps drifted southwest about 4 nmi from the center of the circle. The Argos satellite was unable to deliver positions for the oxygen array, perhaps due to the antenna in the buoy being too close to the water. The strobe on the primary productivity array appeared to have failed when recovered.

C. Allen and T. Gregory completed successfully 6 plankton net tows. The in situ pump was successfully deployed as planned, as well as the PRR. Aerosol measurements were not completed due to cloudy conditions at the specified satellite crossover times.

Winds were easterlies at 10-20 kt, with 3-6 ft swells.

The ADCP ran without interruption throughout the cruise, as well as the fluorometer, thermosalinograph, and the ship's anemometer. The ship's gyro had no problems during this cruise.

We arrived back at Snug Harbor on June 16 at about 0730. Off-loading of samples and some equipment took place immediately. The lab vans, incubators and 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.

The refrigerated circulator pump for our on-deck incubator system continues to experience problems when the ship's engines are on full, despite the improvements the Chief Engineer has made to the 220V power conditioning. This problem does not impact operations while on station at ALOHA, but prevents successful operation of the system during transits.

5. DAILY REPORT OF ACTIVITIES (HST)

June 8, 2001; Loading Day

Equipment loaded on this day. Tested CTD system.

June 12, 2001

The ship departed from Snug harbor at 0945, delayed by ship traffic in Honolulu Harbor. Fire and abandon ship drills were conducted at 1015,

followed by a short science meeting during which the cruise schedule was reviewed, and safety issues were discussed.

We arrived at Kahe station at 1230 and a weight cast (400 lb) to 1000m was conducted. At 1330 the Profiling Reflectance Radiometer (PRR) was deployed.

The CTD cast was conducted at 1400, after which the ship headed towards station ALOHA.

June 13, 2001

We arrived at station ALOHA at 0045 and proceeded to conduct a net tow, followed by the deployment of the sediment traps. The trap array was released at 0245. The first deep WOCE cast started at 0300 and was followed by the shallow WOCE cast, which initiated the 36-hr CTD cast period. A total of six 1000-m CTD casts were conducted this day.

One net tow was conducted at noon and two at night.

The PRR was deployed at 1230.

The in situ pump was deployed at 1500.

Winds were 20 kt easterlies and 4-6 ft seas.

June 14, 2001

Seven 1000-m CTD casts were conducted during this day, ending the 36-hr CTD cast period at 2000. A second deep cast was started at 2300.

The oxygen array was deployed at 0330.

The primary productivity array was deployed at 0530 and was retrieved at 1900. The array drifted some 2 nmi southwest from Station ALOHA. The strobe appeared to be malfunctioning upon retrieval.

Two net tows were conducted in the day and one at night.

The PRR was deployed at 1230.

The in situ pump was deployed at 1500.

Winds were easterlies 10-20 kt, 3-5 ft swells.

June 15, 2001

The second deep CTD cast that started at 2300 on 6/14 was completed by 0230.

The oxygen array was recovered at 0600. The array drifted about 3 nm southwest from Station ALOHA.

The sediment trap array was recovered at 0730. The array drifted about

4 nm southwest from Station ALOHA.

A 1000-m CTD cast was conducted at the HALE-ALOHA station at 1200. Being ahead of schedule, an additional 700 m cast was conducted in order to test a STAG oxygen sensor. Both oxygen traces looked good but with an offset of about 50 $\mu\text{mol/kg}$.

A CTD cast at Station Kaena began at 1820, but was stopped at 1088 dbar due to glitches in conductivity data. A new cable was installed and a second, near-bottom cast (~2500 m) was started at 1950 and completed at 2125.

Winds were easterlies 10-15 kt, 3-4 ft swells. There was a lot of rain during the morning hours but the afternoon was sunny.

June 16, 2001

Arrived at Snug Harbor at 0730 and off-loaded samples and some 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 Björkman	phosphorus cycling/UH
John Dore	N2 fixation, PIC, P15N/UH
Jennifer Brum	dissolved DNA, viruses/UH
Paul Morris	oxygen balance/UH