

HOT 336: Chief Scientist Report

Chief Scientist: Carolina Funkey

R/V *Kilo Moana*

May 25th- 29th, 2022

Cruise ID: KM 22-05

Vessel: R/V *Kilo Moana*, University of Hawaii

Master of the Vessel: Captain Jamie Leigh Gleber

Chief Scientist: Carolina Funkey, University of Hawaii

Marine Technicians: Trevor Young (lead), Jeff Koch

1.0 COVID-19 PREVENTION

Due to the current COVID-19 pandemic extra precautions were set in place before and during the cruise to prevent the spread of COVID-19 onboard. UNOLS has provided guidelines which were followed on this cruise. A few of the guidelines are found below. The extensive list can be found in the Pandemic Response Plan.

- All science party was vaccinated.
- All cruise participants self-isolated according to the HOT Risk Mitigation Plan before the cruise, including 5-day quarantines for visiting scientists flying from the mainland.
- All cruise participants were tested for COVID.

SCIENTIFIC OBJECTIVES

The cruise objective was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations.

A copy of the detailed cruise plan is available at:

https://hahana.soest.hawaii.edu/hot/crsplan/HOT_336_Operational_Cruise_plan.pdf

Science operations were planned for 3 stations, in the following order:

- 1) Station 1, referred to as Station Kahe, is located at 21° 20.6'N, 158° 16.4'W.
- 2) Station 2, referred to as Station ALOHA, is defined as a circle with a 6 nautical mile radius centered at 22° 45'N, 158°W.
- 3) Station 50, the site of WHOTS-17 Mooring (anchor position 22° 46.002'N 157° 53.958'W).

3.0. SCIENCE PERSONNEL

Participant	Title	Affiliation	Citizenship
Camille Adkison	Graduate Student	UH	USA
Eleanor Bates	Graduate Student	UH	USA
Karin Björkman	Research Specialist	UH	SWE
Brandon Brenes	Research Associate	UH	USA
Tim Burrell	Research Associate	UH/SCOPE	NZL
Dan Fitzgerald	Research Associate	UH	USA
Lance Frymire	Marine Technician	OTG-extra	USA
Carolina Funkey	Research Associate	UH	USA

Jacob Gunnarson	Graduate Student	UH	USA
Nick Hawco	Scientist	UH	USA
Jeff Koch	Marine Technician	OTG	USA
Charlie Kollman	Graduate Student	UGA	USA
Christopher Marsay	Scientist	UGA	GBR
Yuriy Mosiyenko	Engineer	Hawboldt	UKR
Daniel Ohnemus	Scientist	UGA	USA
Fernando Pacheco	Research Associate	UH	BRA
Mariah Ricci	Graduate Student	UGA	USA
Tully Rohrer	Research Associate	UH/SCOPE	USA
Dan Sadler	Research Associate	UH	USA
Fernando Santiago-Mandujano	Research Associate	UH	USA
Ryan Tabata	Research Associate	UH/SCOPE	USA
Blake Watkins	Marine Engineer	UH	USA
Trevor Young	Marine Technician	OTG	USA

4.0. GENERAL SUMMARY

Equipment loading was conducted on May 24th. Departure was on May 25th at 1010 (HST). At Station Kahe, the Hawboldt LARS passed the prescribed operational checks and weight cast. A Hyperpro cast, a Trace Metal CTD cast, and a 1000 m CTD cast were completed.

Upon arrival at Station ALOHA, the WireWalker and the sediment trap arrays were deployed southwest of the center of the station. A CTD cast was conducted to collect water for the primary productivity array, and subsequently the primary productivity array was deployed. A Hyperpro cast was also completed on the first full day at St. ALOHA. The gas array incubation was deployed on May 27th as scheduled and was recovered on March 28th. During recovery the gas array line was caught and took two hours to free the line, the array was successfully recovered. The other two arrays were recovered without any issues.

At Station ALOHA, two near-bottom CTD casts, twelve 1000 m CTD casts and one 2200 m CTD were completed, with the 36-hour burst sampling CTD schedule completed without interruption. One 4-cycle yoyo CTD cast one to 700 m and the other three to 200 m was completed near the WHOTS mooring (Station 50).

Six net tows for the core HOT zooplankton collection were completed successfully, three during the day and three during the night. Three total casts were conducted with the Trace Metal CTD using the W2 winch. A fourth Trace Metal CTD cast was scheduled for May 27th, but the niskin bottles did not close.

Due to delays in the schedule the Hyperpro cast was canceled on May 27th.

At the end of the cruise ancillary scientists from the University of Georgia came to collect samples for Be-7 profile, where they pumped seawater at different depths filling on deck-board barrels. They also collected size-fractionated particle profile using 4 in-situ McLane pumps. Both operations took a total of 6 hours and were successful despite the time constraints.

Winds were 5-20 kts from the east, and swell was 4-5 ft. The arrays generally moved in a SW direction and the longer-term arrays were recovered about 13 miles from the center of St. ALOHA.

5.0. R/V *Kilo Moana* OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V *Kilo Moana* continues to maintain very good ship support for our work. Captain Jamie Gleber and the ship's crew showed concern, and dedication to our scientific mission. Most of the ABs on this cruise were new, resulting in on-site training leading to a few delays in CTD deployment and array recoveries.

Technical support during this cruise was also very good. OTG personnel were available to assist in our work during the cruise. They were flexible and accommodating.

6.0. DAILY REPORT OF ACTIVITIES (HST)

Tuesday May 24, 2022

0900-1700: Mobilization/loading

Wednesday May 25, 2022

1010: Depart from Pier 35

1048: Fire and abandon ship drills

1237: Arrived at Station Kahe

1303-1337: LARS testing and Weight cast to 900 m

1404-1447: Hyperpro Cast (5 x 20 m yo-yos & 2 profile casts)

1459-1518: Trace metal cast

1542-1708: Kahe Station CTD Cast (S1C1)

1715: Transit to ALOHA Station

Thursday May 26, 2022

0045: Arrived to Station ALOHA

0056-0109: Deployment of the WireWalker (22° 41.974'N, 158° 1.045'W)

0130-0158: Deployment of the Sediment Trap Array (22° 42.956'N, 158° 0.674'W)

0219-0304: Primary Production Cast (S2C1)

0415-0443: Deployment of the Primary Production Array (22° 43.9348'N, 158° 00.3452'W)

0532-0925: PO Deep Cast (S2C2)

1000-1035: Trace Metal Cast #2

1109-1243: PO Shallow Cast (S2C3)

1302-1344: Net Tow

1345-1420: Hyperpro Cast (5 x 20 m yo-yos & 2 profile casts)

1429-1536: PCPN Cast (S2C4)

1545: Transit to pump ship tanks

1730 -1833: PPO4 Cast (S2C5)

1940-2000: Recovery of the Primary Production (22° 92.313'N, 158° 1.836' W)

2035 - 2148: BEACH Cast (S2C6)

2204- 2304: Net Tows (x2)

2305 -2420: Open Cast (ancillary science samples (S2C7))

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Friday May 27, 2022

0200-0301: Gas Array Cast (S2C8)
 0413-0434: Gas Array Deployment (22° 42.9036'N, 157° 59.7427'W)
 0456-0601: SCOPE DNA Cast (S2C9)
 0800-0922: PSi Cast (S2C10)
 0948-1017: Trace Metal Cast #3
 1049-1205: SCOPE DNA Cast (S2C11)
 1217-1319 - Net Tows (x2)
 1358-1511: ATP Cast (S2C12)
 1654-1743: Open Cast (ancillary science samples (S2C13), cast went to 2200 m)
 18:40: Transit to pump ship tanks
 19:40- 2025: Trace Metal Cast #4 (x 2 attempts, bottles did not close on either cast)
 2032-2211: HPLC Cast (S2C14)
 2224- 2250: Net Tow
 2336: Begin PO Deep Cast #2 (S2C15)

Saturday May 28, 2022

0255: End PO Deep Cast #2 (S2C15)
 0332-0519: Optics
 0525: Transit to Gas Array
 0641-0827: Gas Array Recovery (22° 39.4823'N, 158° 08.2602'W)
 0830: Transit to Sediment Traps
 0921-0945: Sediment Trap Recovery (22° 36.9987'N, 158° 10.2438'W)
 0949: Transfer to WireWalker
 1009-1023: WireWalker Recovery (22° 36.7457'N, 158° 11.7462'W)
 1025: Transit to WHOTS Station
 1240-1357: WHOTS Cast (S50C1)
 14017-1740: Be-7 Pumping - UGA (x7 depths)
 1753-2035: McLane Pumps - UGA (x4 depths)
 2100: Transit Pier 35

Sunday May 29, 2022

0748 – Arrive Pier 35, begin offload

HOT program sub-components:

Investigator	Project	Institution
Angelique White	Core Biogeochemistry	UH
Dave Karl	SCOPE-biogeochemistry	UH
John Dore	Biogeochemistry QA/QC	MSU
James Potemra	Hydrography	UH
Mike Landry	Zooplankton dynamics	SIO
Ricardo Letelier	Optical measurements	OSU
Ancillary programs:		
Matt Church	Diversity and activities of nitrogen-fixing microorganisms	UM/FLBS
Ed DeLong	SCOPE: DNA and Viral DNA collection	UH
Andrew Dickson	CO ₂ dynamics and intercalibration	SIO
Paul Quay	DI ¹³ C	UW
Dan Repeta	SCOPE: DOM collection	WHOI
Angelique White	SCOPE: C-STAR, UVP, IFCB	UH
Nicholas Hawco Eleanor Bates	Quantifying Iron Turnover in the Upper Ocean via Time-series Measurements at Station ALOHA	UH
Sonya Dyrman	Physiological ecology of diatom diazotroph associations using metatranscriptome samples.	LDEO
Debbie Lindell	Seasonal Virus Sampling	Technion
Cedric Fichot	Cycling of Carboxyl-Rich Alicyclic Molecules	BU
Roberta Hansman	¹⁴ C-DIC water collection for inter-lab comparison	WHOI
Dan Ohnemus	Hawaii Aerosol Time-Series: Quantifying marine dust deposition and composition in an oligotrophic gyre	UGA