

HOT 337: Chief Scientist Report

Chief Scientist: Carolina Funkey

R/V *Kilo Moana*

July 8th- 12th, 2022

Cruise ID: KM 22-07

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

Master of the Vessel: Captain Anthony Fitzgerald

Chief Scientist: Carolina Funkey, University of Hawaii

Marine Technicians: Lance Frymire (lead), Nick Mathews

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.
- All cruise participants were Antigen 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_337_Draft_Cruise_plan.pdf

Science operations were planned for 4 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).
- 4) Deep Moored Sediment Trap Mooring location (target position 22° 51'N, 157° 54'W).

3.0. SCIENCE PERSONNEL

Participant	Title	Affiliation	Citizenship
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
Jia Cashon	Undergraduate	UH	USA
Dan Fitzgerald	Research Associate	UH	USA
Lance Frymire	Marine Technician	OTG	USA
Carolina Funkey	Research Associate	UH	USA

HOT-337 Chief Scientist report

James Harris III	Undergraduate	UH	USA
Nick Mathews	Marine Technician	OTG	USA
Lani Musselman	Graduate Student	UH	USA
Emma Olson	Undergraduate	UH	USA
Fernando Pacheco	Research Associate	UH	BRA
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

4.0. GENERAL SUMMARY

Equipment loading was conducted on July 7th. Departure was on July 8th at 0940 (HST). At Station Kahe, the Hawboldt LARS passed the prescribed operational checks and weight cast. A Hyperpro cast (only 5x 20 m yo-yo were completed, the deep casts were aborted due to the line being entangled), 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 west 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. At sunset on July 9th the primary production array was supposed to be recovered but the array got caught on the propeller, which was still running, and it cut the line. The array was lost, the buoy was recovered. The gas array incubation was deployed on July 10th as scheduled and was recovered on July 11th. The other two arrays were recovered without any issues.

At Station ALOHA, two near-bottom CTD casts, thirteen 1000 m CTD casts were completed, with the 36-hour burst sampling CTD schedule completed without interruption. One 5-cycle yoyo CTD cast 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. Four total casts were conducted with the Trace Metal CTD using the W2 winch.

The cruise's final operation was the deployment of the Deep Moored Sediment Traps. Deployment of the mooring consisting of two McLane sediment traps went smoothly and was followed by an acoustic anchor survey. The coordinates for the anchor's final resting spot were calculated to be 22° 50.9995' N, 157° 53.9923' W.

Winds were 15-20 kts from the east, and swell was 5-8 ft. The arrays generally moved to the west and the longer-term arrays were recovered about 14 miles from the center of St. ALOHA.

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

The R/V *Kilo Moana* maintained good ship support for our work. OTG personnel were available and enthusiastic to assist in our work during the cruise.

6.0. DAILY REPORT OF ACTIVITIES (HST)

Thursday July 7, 2022

0900-1700: Mobilization/loading

Friday July 8, 2022

0941: Depart from Pier 35
 1100: Safety Meeting
 1220: Arrived at Station Kahe
 1243-1330: LARS testing and Weight cast to 900 m
 1337-1423: Hyperpro Cast (5 x 20 m yo-yos)
 1442-1456: Trace metal cast
 1508-1628: Kahe Station CTD Cast (S1C1)
 1640: Transit to ALOHA Station

Saturday July 9, 2022

0028: Arrived at Station ALOHA
 0039: Deployment of the WireWalker (22° 45.1603'N, 158° 3.2043' W)
 0120-0138: Deployment of the Sediment Trap Array (22° 45.1737 'N, 158° 2.168 'W)
 0205-0313: Primary Production Cast (S2C1)
 0410-0430: Deployment of the Primary Production Array (22° 45.0632'N, 158° 01.0565'W)
 0456-0849: PO Deep Cast (S2C2)
 0921-0946: Trace Metal Cast #2
 1054-1220: PO Shallow Cast (S2C3)
 1230-1320: Net Tow
 1337-1410: Hyperpro Cast (5 x 20 m yo-yos & 2 profile casts)
 1412-1527: PCPN Cast (S2C4)
 1540: Transit to pump ship tanks
 1716-1825: PPO4 Cast (S2C5)
 1930: Begin to recover the Primary Production Array (22° 46.2000'N, 158°3.9972' W)
 2014 - 2128: BEACH Cast (S2C6)
 2205- 2307: Net Tows (x2)
 2318 -0014: Open Cast (S2C7)

Sunday July 10, 2022

0159-0312: Gas Array Cast (S2C8)
 0413-0434: Gas Array Deployment (22° 46.1925'N, 158° 03.1476'W)
 0525-0648: SCOPE DNA Cast (S2C9)
 0753-0903: PSi Cast (S2C10)
 0921-0947: Trace Metal Cast #3
 1056-1203: SCOPE DNA Cast (S2C11)
 1225-1330 - Net Tows (x2)
 1354-1500: ATP Cast (S2C12)
 1703-1800: Open Cast (S2C13)
 1815: Transit to pump tanks
 1939- 1945: Trace Metal Cast #4
 1958-2109: HPLC Cast (S2C14)

HOT-337 Chief Scientist report

2203- 2230: Net Tow
2302-0235: PO Deep Cast #2 (S2C15)

Monday July 11, 2022

0315-0455: Optics
0505: Transit to Gas Array
0645-0711: Gas Array Recovery (22° 47.6399'N, 158° 08.9731'W)
0712: Transit to Sediment Traps
0755-0825: Sediment Trap Recovery (22° 48.5376'N, 158° 12.6773'W)
0830: Transfer to WireWalker
0850-0908: WireWalker Recovery (22° 46.9385'N, 158° 14.2328'W)
0911: Transit to WHOTS Station
1106-1234: WHOTS Cast (S50C1)
1249-1320: Hyperpro Cast (5 x 20 m yo-yos & 2 profile casts)
1621-1819: Deployment of the Deep Moored Sediment Traps (22° 50.9995' N, 157° 53.9923' W)
2047: Triangulate the position of the Mooring
2048: Transit to Pier 35

Tuesday July 12, 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 Dyhrman	Physiological ecology of diatom diazotroph associations using metatranscriptome samples.	LDEO
Robert Letscher	Transparent exopolymer and phytoplankton vertical migration as sources for preformed nitrate anomalies in the subtropical N. Pacific Ocean	UNH
Debbie Lindell	Seasonal Virus Sampling	Technion
Danielle Hull	QC seawater for S-Lab (nutrient lab)	UH