

HOT 347: Chief Scientist Report

Chief Scientist: Carolina Funkey

R/V *Kilo Moana*

November 27- December 1, 2023

Cruise ID: KM 23-19

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

Master of the Vessel: Captain David Martin

Chief Scientist: Carolina Funkey, University of Hawaii

Marine Technicians: Trevor Young, Benjamin Duncan

1.0 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_347_Cruise_plan_Operational_112123.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-19 Mooring (anchor position 22° 46.002'N, 157° 53.958'W).
- 4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W.

3.0. SCIENCE PERSONNEL

Participant	Title	Affiliation	Citizenship
Daphne Bailey	Undergraduate Student	UH	USA
Emily Bowden	Graduate Student	UTK	USA
Karin Björkman	Scientist	UH	SWE
Madeline Davis	Graduate Student	UH	USA
Brandon Brenes	Graduate Student	UH	USA
Mattia De Fieno	Research Assistant	UH	USA
Dan Fitzgerald	Research Associate	UH	USA
Carolina Funkey	Chief Scientist	UH	USA
Timothy Kinzler	Undergraduate Student	UH	USA
Emma Holloway	Undergraduate Student	UH	USA
Katie McCullough	Undergraduate Student	UTK	USA
Paige Oliver	Undergraduate Student	UH	USA
Fernando Carvalho Pacheco	Research Associate	UH	BRA
Dan Sadler	Research Associate	UH	USA
Landon Schumaker	Undergraduate Student	UH	USA
Merritt Shepherd	Research Assistant	UH	USA
Ian Robertson	UH Staff	UH	USA
Tully Rohrer	Research Associate	UH	USA
Blake Watkins	Marine Engineer	UH	USA
Erik Zinser	Scientist	UTK	USA

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Ben Duncan	OTG	UH	USA
Trevor Young	OTG	UH	USA

4.0. GENERAL SUMMARY

The cruise departed from Pier 35 at 0850. We arrived at Kahe at 1150 and completed a weight cast, the HyperPro casts, a CTD cast.

We arrived at station ALOHA around 2300 on November 27th. Once at station we deployed the sediment trap 3 miles west from center and did a shallow cast to collect water for the University of Tennessee group.

The primary production array was deployed 2 miles west from center at dawn and drifted around the center of St ALOHA and recovered at dusk of the same day on November 28th. The gas array was deployed 3.5 miles south from center at dawn on November 29th and drifted 7 miles southeast and was recovered on the next day on November 30th before dawn.

One 1000 m CTD cast was completed at Station Kahe. At Station ALOHA, two near bottom CTD casts, twelve 1000 m CTD casts, and one shallow cast to the mixed layer depth. One 5 cycle yoyo CTD cast to 200 m was completed near the WHOTS mooring (Station 50). A near bottom CTD cast was completed at Station Kaena.

Six net tows for the core HOT zooplankton collection were completed successfully: three during the day and three during the night.

HyperPro casts were completed at Station Kahe and Station ALOHA.

We had a total of four Video Plankton Recorder Casts. All four casts went down to 400 meters once. The second cast on November 29th had an additional 200-m cast and the VPR on November 30th had an additional 400-meter cast.

The ADCP, underway fluorometer, transmissometer and the ship's meteorological suite ran without interruption during the cruise.

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

The R/V *Kilo Moana* continues to maintain good ship support for our work.

Captain David Martin's excellent maneuvering skills of the vessel allowed for easy and short recovery times of all the arrays that were deployed on this cruise. The ship's crew showed flexibility, concern, and dedication to our scientific mission. The new capstan, which we use for the net tows, was used for the first time, and worked without any issues.

Technical support during this cruise was great. OTG personnel were great communicators which helped us stick to the planned schedule. They were available to assist us in our work during the cruise.

6.0. DAILY REPORT OF ACTIVITIES (HST)

November 27, 2023

- 0850: Depart from Pier 35
- 0920: Safety Briefing Drills
- 1130: Arrived at Kahe Station
- 1145-1217: Weight Cast
- 1224-1257: Hyperpro Cast (5 x 20 m, 2xprofiles)
- 1306-1406: Kahe Cast (S1C1)
- 1440: Transit to Station ALOHA
- 2240: Arrived at Station ALOHA
- 2252-2312: Sediment Trap Deployment (22° 44.943'N, 158° 3.238'W)
- 2358-0025: Cast 1-mixed layer depth (S2C1)

November 28, 2023

- 0207-0310: Primary Production Cast (S2C2)
- 0415-0437: Primary Production Deployment (22° 45.0159'N, 158° 01.9858'W)
- 0517-0849: PO Deep Cast (S2C3)
- 1054-1221: PO Shallow Cast (S2C4)
- 1241-1302: Net Tow 22° 44.9873'N 157° 59.9551'W
- 1321-1406: Hyperpro Cast (5 x 20 m, 2x profiles)
- 1411-1519: PC/PN Cast (S2C5)
- 1634-1732: PPO4 Cast (S2C6)
- 1816-1833: Recover the Primary Production (22° 44.273'N, 158° 0.513'W)
- 2017-2126: BEACH Cast (S2C7)
- 2201-2250: New Tow x 2
- 2259-2354: Open Cast (C2C8)

November 29, 2023

- 0010-0115: VPR Cast #1 (400 m)
- 0158-0304: Gas Array Cast (S2C9)
- 0408-0430: Gas Array Deployment (22° 40.8599'N, 158° 00.4358'W)
- 0451- 0540: Open Cast (S2C10)
- 0753-0853: PSi Cast (S2C11)
- 1048-1144: Open Cast (S2C12)
- 1203-1249: Net Tow x2
- 1353-1452: ATP Cast (S2C13)
- 1507-1611: VPR Cast #2 (400 m & 200 m)
- 1703-1756: Open Cast (S2C14)
- 2002-2101: HPLC Cast (S2C15)
- 2203-2224: Net Tow x1
- 2257- 0229: PO Deep Cast #2 (S2C16)

November 30, 2023

- 0244-0334: VPR Cast #3 (400 m)
- 0429-0453: Gas Array Recovery (22° 38.9574'N, 157° 56.306'W)
- 0548-0609: Sediment Trap Recovery (22° 43.4770'N, 158° 01.4163'W)
- 0820-0913: WHOTS Cast (S50C1)
- 1021-1145: VPR Cast #4 (400m x2)
- 1232-1303: Hyperpro (5 x 20 m, 2x profiles)
- 1350: Transit to Station Kaena
- 19:13 Arrive to Kaena
- 1921-2125: Kaena Cast (S6C1)
- 2135: Transit to Pier 35

December 1, 2023

- 0932: Arrive at Pier 35

HOT program sub-components:

Investigator	Project	Institution
Angelicque White	Core Biogeochemistry	UH
Dave Karl	Biogeochemistry	UH
John Dore	Biogeochemistry QA/QC	MSU
James Potemra	Hydrography	UH
Mike Landry	Zooplankton dynamics	SIO
Ricardo Letelier	Optical measurements	OSU

Ancillary programs:

Angelicque White	C-Star, UVP, VPR, IFCB	UH
Andrew Dickson	CO ₂ dynamics and intercalibration	SIO
Paul Quay	DI ¹³ C	UW
Debbie Lindell	Seasonal Virus Sampling	Technion
Kelsey McBeain	Water collection for media	UH
Erik Zinser Katie McCullough Emily Bowden	Impact of Hydrogen peroxide on microbial community	UTK
Madeline Davis Daphne Bailey HOT 347 Chief Scientist report	Nutrient Analysis: Freezing/ Thawing of Si	UH