Hawaii Ocean Time-series
HOT-342 Operational Cruise Plan

Cruise ID: KM 23-06
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

Marine Center phone number: (808) 956-0688
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Carolina Funkey Cell Number: (808)333-8608

Pre-Cruise Meeting: May 17th at 1300 via Zoom
Start pre-embarkation protocols (masking, social distancing): May 17th
COVID Testing: May 23rd 0830-0900, Pier 35
Loading: May 23rd at 0900, Pier 35.
Departure: May 24th at 0900 (**Science personnel at UHMC by 0800**).
Arrival: May 30th at 0800
Post-Cruise Meeting: May 31st at 1330 via Zoom

1.0 SCIENTIFIC OBJECTIVES

The objective of the cruise is to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Five stations will be occupied during the cruise:

1) Station 1, referred to as Station Kahe, is located at 21° 20.6'N, 158° 16.4'W and will be occupied on May 24th for about 3-4 hours.
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. This is the main HOT station and will be occupied May 25th – May 29st.
3) Station 52, the site of WHOTS-18 Mooring (anchor position 22° 40.021'N, 157° 57.078'W) will be occupied for about 3-4 hours on May 28th and 29th.
4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W and will be occupied on May 29th for about 2 hours.
5) Deep Moored Sediment Trap Site Recovery on May 29th at 22° 50.3'N, 157° 52.9'W and will be occupied for four hours.

1.1 SCIENTIFIC OPERATIONS

Station	Activities
Kahe (Sta. 1)	Weight Cast, Hyperpro cast, CTD cast (1000 m), Trace Metal CTD
ALOHA (Sta. 2)	Sediment traps, WireWalker, Primary productivity array, Gas array, Net tows, CTD operations, Trace Metal CTD casts
WHOTS mooring station (Sta. 52)	One CTD cast (yo-yo to 200 m), Hyperpro, Trace Metal CTD cast, surface instrument intercomparisons.
Kaena (Sta. 6)	One near-bottom CTD cast (~ 2400 m)

Underway/continuous	ADCP, thermosalinograph, fluorometry, meteorology, C-Star

2.0. 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
Ray Chang	Graduate Student	Stanford	TWN
Benjamin Duncan	OTG	UH	USA
Dan Fitzgerald	Research Associate	UH	USA
Rhea Foreman	Research Associate	UH	USA
Carolina Funkey	Research Associate	UH	USA
Cathy Garcia	Post Doc	UG	USA
Eric Grabowski	Research Associate	UH	USA
Charlie Kollman	Graduate Student	UGA	USA
Adam Larson	Graduate Student	Stanford	USA
Lauren Manck	Post Doc	UMT	USA
Christopher Marsay	Scientist	UGA	GBR
Emma Olson	Undergraduate	UH	USA
Fernando Carvalho Pacheco	Research Associate	UH	BRA
Mariah Ricci	Graduate Student	UGA	USA
Tully Rohrer	Research Associate	UH/SCOPE	USA
Dan Sadler	Research Associate	UH	USA
Payton Schwengel	Undergraduate	UH	USA
Miranda Seixas	Post Doc	UMT	USA
Eric Shimabukuro	Research Associate	UH	USA
Ryan Tabata	Research Associate	UH/SCOPE	USA
Blake Watkins	Marine Engineer	UH	USA
Trevor Young	OTG	UH	USA

3.0. SUMMARY SCHEDULE

17 May	Pre-cruise planning meeting 1300 hrs, via Zoom.
23 May	Equipment loading at 0900 hrs, Pier 35.
24 May	Depart from Pier 35 at 0900 hrs. **Science personnel to UHMC by 0800.**
24 May	Station 1 Kahe Pt. operations.
25-29 May	Station 2 ALOHA operations, Station 50 CTD yo-yo cast, Station 6 deep cast.
30 May	Arrive back to Pier 35.
31 May	Post-cruise meeting at 1330 hrs via Zoom

4.0. OPERATIONAL PLANS

4.1. Station Kahe (21°20.6'N, 158°16.4'W)

A 1300 lb. weight-test cast to 500 m will be conducted, **including testing of the emergency systems on the docking head of the Hawboldt LARS system.** These tests will include the Manual Anti-2 Block Test, the Auto with LARS Anti 2-block test, and the Auto with LARS switch malfunction test as described in previous cruise plans. A Hyperpro cast (Sect. 4.2.8), one CTD cast to 1000 m (4.2.5), and a Trace Metal CTD cast (4.5)

will be conducted at this location. The ship's A-frame, CTD winch, and TM winch will be needed for these operations. After the operations are satisfactorily completed, the ship shall proceed to Station ALOHA.

4.2. Station ALOHA (22°45'N, 158°W with 6 nm radius)

4.2.1. Upon arrival to Station ALOHA, the Sediment Trap Array (Sect 4.2.2) (*) will be deployed. Then the Wirewalker will be deployed (Sect. 4.2.3).

(*) NOTE: The deployment of all drifting array must be determined by observed local and forecasted currents to avoid possible entanglement with the WHOTS mooring.
Array tracking is facilitated through the SOEST Cruise and Drifter Tracks tool found at
http://hahana.soest.hawaii.edu/nowcast/loctable.html

4.2.2. Sediment trap array deployment

The floating sediment traps will be from the back of the deck through the A-frame and using the SeaMac winch. After deployment we request that the bridge verify that the radio transmitters are functioning and directionally correct. The Sediment Trap array will consist of one cross with 12 particle interceptor traps (PIT) at 150 m, and one cross above it with 4 traps. There will be two additional PIT traps at 125 m and 200 m.

The array will drift for about 70 hours before recovery. The array is equipped with 1 ARGOS satellite transmitter, 1 Novatech Iridium beacon, strobe lights, and a radio transmitter (see section 6.0 for transmitter IDs). Assistance from the bridge is requested in plotting the drift track of the array. We request the use of the ship's radio direction finder for locating the array before recovery. Blake Watkins will direct this deployment.

4.2.3. Wirewalker™ deployment

A Wirewalker (Del Mar Oceanographic) will then be deployed to take hydrographic and optical observations in the upper 400 m of the water column. The instrument is approximately 1.5 m long and 0.6 m wide and weighs approximately 30 kg. The instrument will be deployed on a wire with a 40 kg bottom weight and a surface buoy with strobe light and Pacific Gyre positioning system (See section 6.0 for transmitter IDs).

The Wirewalker will be deployed near to the Sediment Trap array so that the arrays drift in a similar direction. The instrument will stay in the water for approximately 70 hours. Deployment and recovery will be conducted from the back deck through the A-frame and using the SeaMac winch. Two ABs will be required to operate the A-frame and winch, respectively. Blake Watkins will direct this deployment.

4.2.4. Primary production experiment

Samples for the primary productivity experiment will be collected from the rosette. Before dawn (Sunrise 0448 hrs on May 26th), a free drifting incubation array will be deployed from the back of the deck thru the A-frame and using the SeaMac winch. The primary production incubation array will be deployed at a location within Station ALOHA to be determined by observed local and forecasted currents to avoid possible entanglement with the WHOTS mooring. Positions of the array will be emailed to argosfix@km.soest.hawaii.edu, password: argosfix. (See section 6.0 for Trasmitter IDs).

The array will be recovered around sunset (1810 hrs on May 26th). CTD operations shall continue after recovery. All radioactive waste generated by the experiment shall be returned to the University of Hawaii. Only qualified personnel shall handle radioactive material. Blake Watkins will direct this deployment.

After deployment of the Primary Production Array, the ship shall transit to the center of the station circle to conduct a bottom CTD cast, S2C4 (approximately 4740 m).

4.2.5. Water column measurements

Vertical profiles of temperature, conductivity and dissolved oxygen will be made with an instrument package consisting of a Sea-Bird CTD attached to a 24-place rosette with 12-liter sampling bottles. We will

need the ship's CTD winch and crane for these operations. Water samples for biogeochemical measurements will be collected on each cast. The cast after the deployment of the Primary Productivity Array shall be made to the near bottom (approximately 4740 m). Following this cast, a series of 1000-m casts shall be made continuously every three hours for a 36-hour period, ending with a second near-bottom cast. It is highly desired that this burst sampling be done without interruption, and we request the ship to maintain position within the study area for that period, and repositioning to the center of the Station before each cast whenever possible.

Whenever pumping of the ship's tanks is needed, it must be conducted outside the circle that defines station ALOHA (Sect. 1.0). To avoid disruptions in the schedule, this operation should be coordinated with the chief scientist or the watch leaders **(Carolina Funkey and Tully Rohrer)**.

4.2.6. Lowered Acoustic Doppler Current Profiler (LADCP)

Due to the constraints of the OTG rosette, the LADCP will not be deployed on this cruise.

4.2.7. Gas Array deployment

A free drifting incubation array will be deployed the third day of the cruise at Station ALOHA. Samples for the gas array will be collected from station 2 CTD cast 10. The gas array will be deployed from the back of the deck thru the A-frame and using the SeaMac winch. The gas array will be deployed at a location within Station ALOHA to be determined by observed local and forecasted currents to avoid possible entanglement with the WHOTS mooring. The array is equipped with GPS transmitters, strobe lights and a radio transmitter (See Section 6.0 for transmitter IDs). Positions of the array will be emailed to argosfix@km.soest.hawaii.edu, password: argosfix. The ship will **not** need to keep within sight of the array until the time of the recovery, approximately 25 hours after its deployment. Assistance from the bridge is requested in plotting the drift track of the array. Blake Watkins will oversee this deployment.

4.2.8. Hyperpro

The Hyperpro is a profiling unit with one up-looking and one down-looking hyperspectral radiometer, a WET Labs ECO-BB2F triplet (measuring Chlorophyll-*a* fluorescence and backscattering in the blue and red wavelengths), temperature and conductivity sensors. This instrument also incorporates a ship mounted surface radiometer. Around 1400 on the first, third and fifth days, the Hyperpro will be deployed from the stern through a small block hung from the A-frame. The instrument is lowered and retrieved by hand. Each deployment will consist of two profiles and one yo-yo (5 x 20m) before the instrument is retrieved.

4.2.9. Underwater Vision Profiler (UVP)

The UVP will be installed on the OTG rosette inside the frame using clamps provided by HOT. This instrument will require a modified CTD deployment procedure in which the CTD/rosette is lowered into the water and allowed to soak for one minute before being deployed to 15m as rapidly as is safe for the winch. The instrument will only turn on if the average descent rate is >18 m/min. HOT will be responsible for maintaining this instrument before and after CTD casts.

4.2.10. Zooplankton Net Tows

A plankton net will be deployed from the stern and shall be towed for half-hour periods. Half-hour periods are scheduled around noon and midnight on the third, fourth and fifth days (see schedule) for a total of six slots. The A-frame and small capstan will be needed for this operation. Blake Watkins will direct these operations.

4.3 Gas Array, Sediment Trap Array, and WireWalker recovery

In the morning of May 28th, the ship shall transit for the recovery of the Gas Array. The A-frame and the Sea-Mac winch will be needed to retrieve the array. After the Gas Array is recovered, the ship shall transit to recover the floating sediment trap array. On completion of sediment trap array recovery, the ship shall transit to

recover the Wirewalker. Blake Watkins will oversee these operations. After the Wirewalker is recovered, the ship shall transit to Station 52.

4.4. Station 52 - WHOTS-18 Mooring

The anchor position of the WHOTS-18 mooring is 22° 40.021'N, 157° 57.078'W. The watch circle of the buoy is about 2 nautical miles. Generally, the buoy stays on the edge of the watch circle. The buoy can be detected via radar in good weather conditions but is harder to detect with larger sea states. Upon arrival at Station 52 on May 29th, one 200 m CTD yo-yo cast and ADCP intercomparisons will be conducted.

4.5. Trace Metal Clean Rosette

Vertical profiles between 0-600m will be conducted for trace metal analysis using a rosette package with autonomous Auto Fire Module. This mini-CTD rosette consists of a SeaBird CTD attached to a 12-place rosette with 8-liter Niskin sampling bottles. The rosette is approximately 5 ft x 5ft x 4 ft and weighs 355/565 lbs in air empty/full. We will deploy the CTD rosette using the W2 winch, delrin block and 1/4" Amsteel line using trace metal clean procedures from the stern of the vessel using the A-Frame. Eleanor Bates will oversee this operation. **We request the ship's personnel to contact us before doing any trash burning or any cooking that would disseminate smoke to the labs or working area**.

4.5.1. Be-7 Trace Metal Cast

On May 25th a hose will be attached to the Trace Metal Clean CTD and will be held at six depths in the upper 175 m while the deck board pump (120V) fills the tanks (6 x 160-gallon plastic tanks). Each depth will take approximately 30 minutes for a total of 3 hours. The hose reel will need to be set up on deck (43"x43") near the CTD.

4.6. McLane Pumps

After the Be-7 trace metal cast, one in-situ pump cast (which involves deployment, pumping at depth for 2-3hr, and recovery) takes 4-5hr to collect 500-1500L from 4-8 depths in the upper 1000m (with most pumps in the upper 300 m). The pumps have two flow-paths and can collect over multiple filter membranes.

4.7. Apex Argo profiler deployment

An Apex Argo profiler (D. Swift, UW) will be deployed on May 29th after all operations at Station ALOHA have been completed. The profiler will be deployed from the back deck with a rope, as the ship departs the Station to prevent running over the instrument. Blake Watkins will oversee this operation. Once the Apex profiler is deployed, the ship shall transit to Station Kaena.

4.7. Station Kaena (21° 50.8'N, 158° 21.8'W) *TBD*

A near-bottom CTD cast (~2500 m) will be conducted at this location in the evening of May 29th if we can arrive to St. Kaena before 10 pm. Once the CTD cast is complete, the ship shall return to Pier 35.

4.9. Acoustic Doppler Current Profiler

The ship's acoustic Doppler current profilers (ADCP) will be in operation during the duration of the cruise. The OTG technicians will oversee the ADCP system.

4.10. Thermosalinograph, Fluorometer and pCO_2

The ship's thermosalinograph, fluorometer and pCO_2 sampling the uncontaminated seawater supply system will be in operation during the duration of the cruise while the ship is outside of Honolulu Harbor. Salinity samples to calibrate the thermosalinograph will be taken from the intake hose at 4-hour intervals throughout the duration of the cruise by the science personnel. The ship's meteorological system shall be in operation throughout the cruise. Access to real-time underway data through the ship's network will be required. The OTG technicians will oversee the thermosalinograph, fluorometer, and meteorological suite operations.

4.11. SeaFlow and Inline C-Star Transmissometer

In addition to the continuous thermosalinograph and fluorometer sampling, the SeaFlow and an inline C-Star Transmissometer will sample continuously from the uncontaminated seawater supply system throughout the duration of the cruise while the ship is outside of Honolulu Harbor. Access to real-time underway data through the ship's network is required. The SCOPE Ops technicians and UH personnel will oversee these instruments and operations.

4.12. Deep Trap Recovery

On May 29th, the ship shall transit of the deep sediment trap anchor at moored location 22°50.9995' N, 157° 53.9923' W. Recovery of the sediment trap is expected to take approximately 2 hours, with return to the surface expected to take an hour. The array is equipped with a radio transmitter for location (channel 72: 156.625MHz), XEOS ID # 30930_151. B. Watkins will oversee this operation with 2 or 3 members of the science party. Two ABs will be required to operate the A-frame and winch respectively.

4.13. Seaglider 626 and 513 Deployment and Recovery

Seaglider 626 will be deployed on HOT 342. Seaglider 513 will be deployed and recovered on this cruise, weather-permitting. This glider has extremely sensitive and delicate microstructure profiling instruments on the top, therefore good weather conditions for deployment and recovery are a necessity. B. Watkins will oversee these operations and making the call whether the weather is favorable for deployment. SG513 Interrogate Freq: 15.0 kHz Reply Frequency 11.5 kHz. Seaglider Location information is auto sent to the KM email user: seaglider@km.soest.hawaii.edu

Procedures generally are as follows:

1) The Seaglider will be lowered in the water by using the ship's crane or winch combined with the ship's A-frame.
2) Once the glider is in the water, it should be confirmed that the vehicle is floating prior to complete release.
3) After release, the glider will perform a series of test dives, 25mins – 60mins, to make sure that the vehicle is communicating through Iridium Satellite system and that the sensors are working correctly.
4) The vessel can conduct other operations within the area while waiting for this initial feedback. Should the glider malfunction, the vehicle will need to be recovered. During operations, B. Watkins or SCOPE Team will be communicating via Iridium phone with the Seaglider pilot, Steve Poulos. The plan is for this Seaglider to start a 3 month mission. It can be tracked from the standard HOT navigational web site.
5) Other info: SG511 – acoustic pinger interrogate Freq: 12.5 kHz; acoustic pinger reply: 11.5 kHz and its associated backup ARGOS PTT Tag # - 90995. Note that this ARGOS Tag 90995 has abruptly stopped transmitting. If time permits and SG511 is nearby on the surface during daylight hours, we would like to request a "drive by" to see if the Tag is still mounted to the rudder.

4.14. Video Plankton Recorder (VPR) Cast

A digital autonomous Video Plankton Recorder (VPR) will be deployed multiple times during the cruise. Tow speed 1.5 knots, payout/recovery speed 30 meters per minute using the SeaMac winch. The system should be continuously oscillated between the surface and the maximum line out depth. The orange synthetic Dyneema line shall be used for this deployment. Deployments should be at least 45 minutes in the water.

4.15. Net Trap Array

Following the deployments of the sediment trap array and WireWalker, the Net Trap array will be deployed. A free-floating net trap (similar to a plankton net, with a frame) will be deployed in a vertical orientation at a depth of 175m for about 14hrs before recovery. The array will be deployed from A-frame using the SeaMac winch. The trap diameter is 1 m with a mesh size for the net of 55 um (and the cod-end is 55 um). The net trap is attached to the surface with floats and is equipped with an ARGOS satellite transmitter (platform

#’s: 3028, 60482), strobe lights and a radio transmitter (channel 72: 156.425 MHz). Prior to recovery, a pinger is hung over the side of the ship to communicate and close the trap. Once the trap is closed it can then be recovered. Daily positions of the array shall be transmitted by email directly to the ship (argosfix@km.soest.hawaii.edu, password: argosfix), therefore the ship will not need to keep within site of the array until the time of the recovery. Assistance from the bridge is requested in plotting the drift track of the array. We request the use of the ship's radio direction finder for locating the array before recovery.

5.0 EQUIPMENT

5.1. The HOT science party shall be bringing the following:

1. Seabird CTD system, all sensors, deck boxes and computer CTD acquisition systems
2. One 20 ft. laboratory van (#23) with assorted equipment for radioisotope and general use, the OTG Rad Van, and one trace metal 20 ft van (#581).
3. Distilled, deionized water and all required chemicals and isotopes
4. Large vacuum waste containers
5. Liquid nitrogen dewars
6. Drifting sediment trap array with strobe lights, satellite and radio transmitters, floats, weights, line, sediment traps and crosses.
7. Drifting primary production array with strobe lights, satellite and radio transmitters, floats, weights, line primary production bottles and spreader bars.
8. Drifting gas array with strobe lights, satellite and radio transmitters, floats, weights, line, 4 L bottles and short mounting bars.
9. Drifting Wirewalker™ array with surface buoy, strobe lights, satellite transmitters, floats, weights, 400m and cable.
10. Oxygen titration system
11. Plankton nets and towing lines
12. Desktop and laptop personal computers
13. Assorted tools
14. All required sampling bottles
15. Pertinent MSDS
16. Wirewalker™
17. SeaFlow
18. Inline C-Star Transmissometer
19. Trace metal clean rosette with 8L Niskin bottles and programmable CTD
20. Underwater Vision Profiler (UVP)
21. Two incubator, baby blue, stored on 02 Deck
22. Hose Reel (43” x 43”)
23. 6 x 160-gallon plastic tanks (3’ diameter)
24. 4 McLane Pumps (32” x15” footprint, total13 sq feet)
25. 3 Caron incubators

2. We will need the use of the following ship's equipment:

1. A-frame
2. A-frame block assembly
3. CTD winch
4. Electric power
   -440/480 VAC, 3 phase 60Hz, 60amp for winches
   -208 VAC single phase at 60 amps for lab vans
5. Space on upper 01 deck port side for one 10 ft van **(Equipment van)**
6. Space on upper 01 deck port side for OTG Rad Van

7. Space on upper 01 deck starboard side for trace metal 20 ft van (**#581**)
8. Space on 02 deck for two incubators
9. Space on deck for ~4 deck baskets of array gear
10. Space on deck to secure 6x160-gallon plastic tanks
11. Small capstan (~ 10 m/min)
12. SeaMac Winch
13. W2 winch
14. Radio direction finder
15. Hand-held VHF transceivers
16. Shackles, sheaves, hooks and lines
17. Precision depth recorder
18. Shipboard Acoustic Doppler Current Profiler
19. Thermosalinograph, pCO_2 system, and Fluorometer
20. Meteorological suite
21. Grappling hooks and line
22. Navlink2 PC or equivalent
23. Running fresh water and seawater, hoses
24. Uncontaminated seawater supply
25. Source of compressed air for Trace Metal pump
26. -80°C Freezer
27. 4°C Refrigerator and -20°C Freezer
28. Distilled, deionized water system
29. Email system
30. GPS system
31. Underway/on-station data acquisition system for meteorological instruments, ADCP, thermosalinograph, fluorometer, SeaFlow, and inline C-Star transmissometer and access to real-time data through the network.
32. OTG's 24-place rosette, and 24 12-l water sampling bottles (**to be used as primary system**)
33. ~1300 lb weight
34. Remote CTD dbar pressure display in the winch operator area.
35. Monitor in CTD Lab displaying ship coordinates, bottom depth and GMT.
36. OTG's transmissometer
37. OTG's altimeter
38. Trace metal free block
39. Amsteel Line (1/4") for trace metal clean work

6.0 Satellite Position Transmitters Summary

Array Name	RockBlock ID	XEOS ID	Argos ID	Radio Frequency
Sediment Trap (ST)	06	268		CH.68 (156.425 MHz)
WireWalker (WW)		77 and 80		
Primary Production (PP)	08	266		CH.74 (156.725 MHz)
Gas Array (GA)	08	266		CH.74 (156.725 MHz)

NOTE: Array tracking is facilitated through the SOEST Cruise and Drifter Tracks tool found at http://hahana.soest.hawaii.edu/nowcast/loctable.html

Ship: R/V *Kilo Moana* **HOT 342 CTD CASTS** **Date: May 24-30, 2023**

Cast		Samples	#Bottles
Kahe Pt.			
s1c1	1000 m	O_2, Temp, DIC/Alk, pH, Nuts, LLN, LLP, Chl a, Salts	15
Station ALOHA			
s2c1	200 m	**AL**(1@ 5, 25, 100, 150, 200)	5
s2c2	600 m	**CG** (2@150,175,200,250,300,350,375,400,450,500,550,600)	24
s2c3	1000 m	Primary Production (3@ 5, 25, 45, 75, 100, 125, 150, 175) Chl a, FCM, DIC, Salts	24
s2c4	4740 m (PO-1)	O_2, Temp, DOC, DIC/Alk, pH, Ref Si, Nuts, Salts	24
s2c5	1000 m (PO-2)	O_2, Temp, DOC, DIC/Alk, pH, Nuts, Ref Si, Salts	24
s2c6	1000 m	PC/PN, **DL** (pb@5,25,45,75,100,125,150,175), **EG** (pb@5, 25,45,75,100,125,150,175,200,350), Salts	22
s2c7	1000 m	PPO4, SCOPE DNA (1@100,125,150,175) **RF**(1@ 130, 135, 140, 145, 155, 165) Salts	24
s2c8	1000 m (BEACH)	O_2, Temp, DIC/Alk, pH, Nuts, LLN, LLP, DOC, Keeling, Quay, Salts	23
s2c9	1000 m	Open, **RF**(1@ 5m interval: 100-200), Salts	23
s2c10	1000 m	Gas Array (3@5,25,45,75,100,125), Salts	20
s2c11	1000 m	SCOPE DNA (1@5,25,45,75), **RF**(1@130,135,140,145,150,155,160,165), **MC** (1@5, 25, 45, 75, 100, 125, 150, 175), Salts	22
s2c12	1000 m	PSi, **RF**(1@110,115,120,130,135,140,145,155,160,165,170, 200) Salts	22
s2c13	1000 m	SCOPE DNA (1@300,400,500,770), **PO**(7@1020), Salts	13
s2c14	1000 m	ATP, **SD** (6@20-25(Mixed Layer), Salts	17
s2c15	1000 m	**EG** (high-res@ 25-200m), Salts	24
s2c16	1000 m	HPLC, SCOPE DNA (1@200,225,250,275), Chl a, Salts	18
s2c17	4740 m (PO-3)	Oxygen, SCOPE DNA(1@1000,2000,3000,4000) **NH** (1@ 5,100,300,750,1500,3000,4500)	19
s2c18	200m	**EG** (high-res@ 25-200m), Salts	24
WHOTS Mooring			
s52c1	200 m yo-yo	DIC/TA(1@5), **KM**(1@ 5, MLD, DCM),**RF**(6@5)	10
Kaena			
s6c1	2400 m	Chl a, Salts	13

MC=Matt Church**, SD** = Sonya Dyhrman, **RF**= Rhea Foreman**, CG**= Cathy Garcia**, EG**= Eric Grabowski, **NH**= Nick Hawco, **AL**= Adam Larson, **DL** = Debbie Lindell, **KM**= Kelsey McBeain,

Ship: R/V *Kilo Moana* HOT 342 Date: May 24 – 30, 2023

TIME	Wednedsay 5/24	Thursday 5/25	Friday 5/26	Saturday 5/27	Sunday 5/28
0000		Deploy WireWalker	Transit to Pump Tanks		
0100		Deploy Net Trap 1 Deploy Sed Traps			
0200		S2C1 200m cast	S2C3 PP	S2C10 Gas Array	
0300					VPR Cast #2
0400		UGA– Be-7 Pumping	Deploy PP Array	Deploy Gas Array	Pump Tanks Incinerator
0500			S2C4 PO-1 (Deep)	S2C11 Open	Transit Gas Array
0600				Transit to pump tanks Incinerator	Recover Gas Array
0700					Transit Sed Traps
0800	All Sci. Aboard	Sea glider Deployments		S2C12 PSi	Recover Sed Traps
0900	Depart Pier 35	S2C2 Sea glider cast			Transit WireWalker
1000		Trace Metal # 3 LM	Trace Metal # 6 DR	Trace Metal # 7 EB	Recover WireWalker
1100		VPR Cast # 1	S2C5 PO-2 (Begin 36 hr)	S2C13 Open	Transit to ALOHA
1200	Arrive Kahe Weight Cast		Net Tow	Net Tow Net Tow	Hyperpro
1300	Hyperpro	Trace Metal # 4 LM	Hyperpro		Net Tow S2C18 High Res
1400	S1C1 Kahe	Transit to Pump Tanks	S2C6 PC/PN	S2C14 ATP	Trace Metal Net Tow-EB1
1500	Trace Metal #1 EO				Transit to Net Trap
1600	Trace Metal # 2 EB Transit to ALOHA	Recover Net Trap 1	Transit to Pump Tanks	Deploy Net Trap 2	Recover Net Trap 2
1700			S2C7 PPO4	S2C15 High Res	
1800		UGA– McLane Pumps1	Transit to PP array		Pump tanks Incinerator
1900			Recover PP array	Pump Tanks	Trace Metal # 8 EB
2000			S2C8 BEACH	S2C16 HPLC	UGA- McLane Pumps 2
2100					
2200	Pump Tanks		Net Tow Net Tow	Net Tow	
2300	Arrive ALOHA	Trace Metal # 5 EB	S2C9 Open	S2C17 PO-3 (Deep) (end 36 hours)	

May 28th: Sunrise 0448, Sunset 1810

TIME	Monday 5/29	Tuesday 5/30
0000		
0100		
0200	Transit to WHOTS	
0300	S52C1 WHOTS	
0400	Transit to Seaglider	
0500	Transit to pump tanks Incinerator	
0600	Recover Seaglider	
0700		
0800	Transit to Deep Sediment Trap	Arrive to Pier 35
0900	Recover Deep Sediment Trap	
1000		
1100		
1200		
1300	VPR Cast #3	
1400	Trace Metal Net Tow-EB2	
1500		
1600	Apex Profiler Deployment	
1700	Transit to Kaena	
1800		
1900		
2000		
2100		
2200	S6C1 Kaena	
2300		

6.0 HOT-342 Watch Schedule

0300-1500

Dan Fitzgerald
Carolina Funkey- Chief Scientist, Watch Leader
Emma Olson
Fernando Carvalho Pacheco – Console
Dan Sadler – Water Boss

1500-0300

Camille Adkison
Karin Björkman – Water Boss
Brandon Brenes
Tully Rohrer – Console, Watch Leader
Payton Schwengel
Eric Shimabukuro

At Large

Eleanor Bates
Rhea Foreman
Cathy Garcia
Eric Grabowski
Charlie Kollman
Adam Larson
Lauren Manck
Chris Marsay
Dan Ohnemus
Miranda Seixa
Blake Watkins
Ryan Tabata

OTG

Benjamin Duncan
Trevor Young (lead)