Hawaii Ocean Time-series
HOT-338 Cruise Plan

Cruise ID: KM 22-08
Vessel: R/V *Kilo Moana*, University of Hawaii
Master of the Vessel: Captain **Andrew Chen**
Chief Mate: Donn Pratt
Chief Scientist: Fernando Carvalho Pacheco, University of Hawaii
Marine Technicians: Jeff Koch (lead), Nick Mathews

Marine Center phone number: (808) 956-0688
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Fernando Carvalho Pacheco Cell Number: (808)4458275

Pre-Cruise Meeting: **July 22nd**, 2022, at 1330 via Zoom
COVID Antigen Testing**: July 27th**, 2022
Loading: **July 28th**, 2022 at 0900, Pier 35.
Departure**: July 29th**, 2022, at 0700 **Science personnel at UHMC**
: July 29th, 2022, at 0800 **Depart from Pier 35**

Arrival: **August 2nd**, 2022, at 0800
Post-Cruise Meeting: **August 3rd**, 2022, 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. Four stations will 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 will be occupied on July 29th, 2022, 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 from July 29th - August 2nd, 2022.
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 Aug 1st.
4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W, and the station will be occupied on August 1st for about 2 hours, if enough time.

1.1 SCIENTIFIC OPERATIONS

Station	Activities
Kahe (Sta. 1)	Weight Cast, Hyperpro cast, CTD cast (1000 m), Trace Metal CTD, Sarah's Net Tow.
ALOHA (Sta. 2)	Sediment traps, WireWalker, Primary productivity array, Gas array, Net tows, CTD operations, Optics casts, Trace Metal CTD casts, Net Trap, Scripps Plankton Camera (SPC), Sarah's Net Tow.
WHOTS mooring station (Sta. 52)	One CTD cast (yo-yo to 200 m), Hyperpro, Trace Metal CTD cast, surface instrument intercomparisons, Sarah's Net Tow.
Kaena (Sta. 6)	One near-bottom CTD cast (~ 2400 m)
Underway/continuous	ADCP, thermosalinograph, fluorometry, meteorology, SeaFlow,

C-Star**, IFCB(not installed on this cruise)**

2.0. SCIENCE PERSONNEL

Participant	Title	Affiliation	Citizenship
Alexandra MacFarland	Graduate Student	BU	USA
Ally Morris	Graduate Student	UH	USA
Blake Watkins	Marine Engineer	UH	USA
Brandon Brenes	Research Associate	UH	USA
Camille Adkison	Graduate Student	UH	USA
Carolina Funkey	Research Associate	UH	USA
Dan Sadler	Research Associate	UH	USA
Eric Shimabukuro	Graduate Student	UH/SCOPE	USA
Fernando Pacheco - Chief Scientist	Research Associate	UH	BRA
Fernando Santiago-Mandujano	Research Associate	UH	USA
James Harris III	Undergraduate student	UH	USA
Jeff Koch	Marine Technician	OTG	USA
*Jennifer Beatty	Graduate Student	UCS	USA
Max Gatlin	Undergraduate student	UH	USA
*Megha Rudresh	Graduate Student	UH	IND
Nicholas Hawco	Scientist	UH	USA
Nick Mathews	Marine Technician	OTG	USA
Ryan Tabata	Research Associate	UH/SCOPE	USA
Sarah Trubovitz	Post Doc	UCS	USA/CA
Syrena Whitner	Graduate Student	UH	USA

* Will not participate anymore.

3.0. SUMMARY SCHEDULE

22 July	Pre-cruise planning meeting 1330 hrs, via Zoom.
28 July	Equipment loading at 0900 hrs, Pier 35.
29 July	Depart from Pier 35 at 0800 hrs. **Science personnel to UHMC by 0700.**
29 July	Station 1 Kahe Pt. operations.
29 July – 1 Aug	Station 2 ALOHA operations, Station 52 CTD yo-yo cast, Station 6 deep cast.
2 August	Arrive back to Pier 35.
3 August	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.** A Hyperpro cast (Sect. 4.2.9), one CTD cast to 1000 m (4.2.6), a Trace Metal CTD cast (4.8), and a Net Tow will be conducted at this location. The ship's A-frame, CTD winch, and SeaMac winch will be needed for these operations. After the operations are satisfactorily completed, the ship shall proceed to Station ALOHA.

Following the incident on HOT-328, this and all future weight casts are to include the following tests of the Hawboldt system:

A. Manual Anti-2 Block Test

This test will verify that the control system will successfully prevent excessive tension spikes in the event that the operators were to accidentally pull the package into the docking head at full speed.

- Start the hydraulics and enable control from the belly pack.
- Position the test weight and the LARS docking head over the main deck, approximately in the landing area normally used for the rosette.
- Position the docking head approximately 10’ from the deck, and manually lower the test weight such that it is barely lifted off the deck
- Ensure the winch is in manual mode
- Ensure all personnel is clear of the area.
- Haul in with the CTD winch at full speed until the test weight compresses the springs completely. The test weight should immediately lower approximately 1.5’ and stop as the winch brakes apply.
- The tension can be viewed on the monitor in Lab 1, ensure the spike is below 5,000 lbs.
- Reset all alarms on the Local Console.

B. Auto with LARS Anti-2 Block Test

This test will verify that the control system will successfully prevent excessive tension spikes in the event that the operators were to forget to put the winch into Auto with LARS mode prior to moving the LARS.

- Start the hydraulics and enable control from the belly pack.
- Pick up the test weight with the LARS and position the LARS in the ‘Casting’ slew position with the knuckle pointing straight down, and the extension boom retracted.
- Ensure all personnel is clear of the area.
- If it isn’t already, pull the test weight up into the docking head, just so the springs start to compress.
- Turn the winch to manual mode.
- Knuckle out at full speed. The weight will get pulled into the docking head as the winch will not respond to LARS movement.
- Once the test weight is 2-blocked, the LARS will stop moving and the weight will remain fully 2 blocked.
- The tension can be viewed on the monitor in Lab 1, ensure the spike is below 5,000 lbs.
- Reset all alarms on the Local Console.

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

4.2.1. Upon arrival to Station ALOHA, the Wirewalker will be deployed (Sect. 4.2.2). Then the Sediment Trap Array (Sect 4.2.3) (*****) will be deployed. After these operations are completed, one 1000-m cast will be conducted to collect water for the Primary Production Array. Following this, the Primary Production array will be deployed (4.2.4). These operations will be followed by a near-bottom CTD cast and the start of the 36-hour water column observations at Station ALOHA.

(*) NOTE: The deployment of all drifting arrays 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. Wirewalker™ deployment

A Wirewalker (Del Mar Oceanographic) will 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 56 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.

4.2.3. Sediment trap array deployment

The floating sediment traps will be deployed 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 150m, and one cross above it with 4 traps. There will be an additional PIT trap at 175 m. The array will drift for about 56 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.

After array deployments conclude, one 1000 m CTD cast shall be conducted. Following these operations, the ship shall prepare to deploy the Primary Productivity Array.

4.2.4. Primary production experiment

Samples for the primary productivity experiment will be collected from the rosette. Before dawn (Sunrise 0603 hrs on July 30th), 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 at sunset (1914 hrs). 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, S2C2 (approximately 4708 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 4708m). 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 of time, 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 Dan Sadler)**.

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 8. 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, second and fourth 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. Optics

An optical package including a SeaBird Seacat with temperature, conductivity, and pressure sensors, a Wetlabs ECO triplet measuring backscatter, chlorophyll fluorescence, and CDOM fluorescence, and a LISST particle size and distribution analyzer will be deployed during the cruise. Each deployment will consist of three up and two down profiles to a target depth of 200 m at a constant speed of 10 m/min during both the downcast and upcast. An instrument soaking period at just below the surface will be required between the two profiles. The A-frame and capstan will be needed for this operation.

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 second, third, and fourth 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 August 1, after the optics cast has been completed, 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. **The port screw propeller should be secured during all recoveries to avoid entanglements!** 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° 57.018'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 August 1, one 200 m CTD yo-yo cast (Sect. 5.4.1), a Hyperpro cast, a Net Tow, 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. Nick Hawco 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**.

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

A near-bottom CTD cast (~2500 m) will be conducted at this location on the evening of August 1, if enough time.

4.8. 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.

4.9. Thermosalinograph, Fluorometer and pCO_2

The ship's thermosalinograph, fluorometer and pCO_2 sampling of 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.

4.9.1. SeaFlow, Imaging FlowCytobot (IFCB), 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 Imaging Flow CytoBot (IFCB) will not** be used on this cruise. The SCOPE Ops technicians and UH personnel will oversee these instruments and operations.

4.9.2. HiVol Air Sampler

A High-Volume Air Sampler (HiVol – 120 VAC, 60Hz) will be installed on the port bow to sample a known volume of ambient air at a constant flow rate throughout the duration of the cruise while the ship is outside of Honolulu Harbor. The **OTG** technicians and **Alexandra MacFarland** will install and oversee the instrument.

4.10. Scripps Plankton Camera (SPC)

An optical Plankton Camera package belonging to colleagues at Scripps University will be deployed four times during the cruise, twice in the day and twice at night. This will be deployed using the 400m shot line (or sediment traps line) and the SeaMac winch (TBD). The camera is deployed to 200-300 m, and deployments are typically around 30 minutes in the water**.** The **OTG** technicians and **Sarah Trubovitz** will oversee the instrument and the operation.

4.11. Sarah Net Tow

A plankton net will be deployed from the stern and shall be towed for about 15-30 minutes while the ship is moving very slowly (<1 knot). The A-frame and the small capstan or just a hand line will be needed for this operation. Half-hour periods are scheduled around 1500 on the first day; at 1600 on the second day; at 1300 and 2200 on the third day. As time allows, few samples from 150-300 (or deeper, if possible) are scheduled around 0000 and 0700 on the third day; and at around 1300 on the last day. The trace metal winch, delrin block and the SCOPE grey/silver 1/4" line be required for deeper operations. The grey line will be spooled on/off on top of the red trace metal line for each net tow. The **OTG** technicians and **Sarah Trubovitz** will direct these operations.

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, one 10x8 ft. equipment van (PO) for equipment and spare storage, 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. 3x Bib Blue Incubators (02 Deck)

5.2. 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 one 20 ft van **(#23)**
7. Space on upper 01 deck starboard side for trace metal 20 ft van (**#581**)
8. Space on upper deck port bow for one **HiVol Air Sampler**
9. Space on 02 deck for 3 incubators
10. Space on 02 deck for 4 Armbrust incubators
11. Space on deck for ~6 deck baskets of array gear
12. Space for the settling column instrument (SASSY)
13. Small capstan (~ 10 m/min)
14. SeaMac Winch
15. W2 winch
16. Radio direction finder
17. Hand-held VHF transceivers
18. Shackles, sheaves, hooks and lines
19. Precision depth recorder
20. Shipboard Acoustic Doppler Current Profiler
21. Thermosalinograph, pCO_2 system, and Fluorometer
22. Meteorological suite
23. Grappling hooks and line
24. Navlink2 PC or equivalent
25. Running fresh water and seawater, hoses
26. Uncontaminated seawater supply
27. Source of compressed air for Trace Metal pump
28. -80°C Freezer
29. 4°C Refrigerator and -20°C Freezer
30. Distilled, deionized water system
31. Email system
32. GPS system
33. 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.
34. OTG's 24-place rosette, and 24 12-l water sampling bottles (**to be used as primary system**)
35. ~1300 lb weight
36. Remote CTD dbar pressure display in the winch operator area.
37. Monitor in CTD Lab displaying ship coordinates, bottom depth and GMT.
38. OTG's transmissometer
39. OTG's altimeter
40. Trace metal free block
41. 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	267		CH.74 (156.475 MHz)
Gas Array (GA)	08	267		CH.74 (156.475 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 338 CTD CASTS** **Date: July 28-Aug 2, 2022**

Cast		Samples	#Bottles
Kahe Pt.			
s1c1	1000 m	O_2, Temp, DIC/Alk, pH, Nuts, LLN, LLP, Chl a, Salts	15
Station ALOHA			
s2c1	1000 m	Primary Production (3@ 5, 25, 45, 75, 100, 125, 150, 175) Chl a, FCM, DIC, Salts	24
s2c2	4740 m (PO-1)	O_2, Temp, DOC, DIC/Alk, pH, Ref Si, Nuts, Salts	24
s2c3	1000 m (PO-2)	O_2, Temp, DOC, DIC/Alk, pH, Nuts, Ref Si, Salts	24
s2c4	1000 m	PC/PN, Salts	19
s2c5	1000 m	Salts	18
s2c6	1000 m (BEACH)	O_2, Temp, DIC/Alk, pH, Nuts, LLN, LLP, DOC, Keeling, Quay, **RF** (pb@ all depths), Salts	23
s2c7	1000 m	**SW**(1@25, 150), Salts, PPO4,	5
s2c8	1000 m	Gas Array (3@5,25,45,75,100,125), Salts	20
s2c9	1000 m	SCOPE DNA (1@5,25,45,75), Salts **MC** (1@5, 25, 45, 75, 100, 125, 150, 175), Salts	14
s2c10	1000 m	SCOPE DNA (1@200,225,275,300,400,500,770), PCPN, Salts	17
s2c11	1000 m	SCOPE DNA (1@100,125,150,175), Salts, PPO4	6
s2c12	1000 m	ATP, **SD** (6@20-25(Mixed Layer), Salts **DL** (pb@5,25,45,75,100,125,150,175),	18
s2c13	1000 m	**TL** (1@20,60,150,250,500,750,1000), Salt	8
s2c14	1000 m	HPLC, Chl a, Salts	14
s2c15	4740 m (PO-3)	Oxygen, SCOPE DNA(1@1000,2000,3000,4000), **SW**(1@2000) **TL**(1@1500, 2000, 3000)	17
WHOTS Mooring			
s52c1	200 m yo-yo	**KM**(1@5, Mixed Layer,DCM)	3
Kaena			
s6c1	2400 m	Chl a, Salts	13

MC=Matt Church**, SW**=Syrena Whitner, **KM**=Kelsey-Ann McBeain
DL = Debbie Lindell, **RF**= Rhea Foreman, **SD** = Sonya Dyhrman
TL= Tira Lin

Ship: R/V *Kilo Moana* HOT 338 Date: July 29 - Aug 2, 2022

TIME	Friday 7/29	Saturday 7/30	Sunday 7/31	Monday 8/1	Tuesday 8/2
0000		Deploy WireWalker	Sarah's Net Tow		
0100		Deploy Sed Traps			
0200		S2C1 PP	S2C8 Gas Array		
0300				Optics	
0400		Deploy PP Array	Deploy Gas Array		
0500		S2C2 PO-1 (Deep)	S2C9 Open	Transit Gas Array	
0600			Transit to pump tanks Incinerator	Recover Gas Array Transit Sed Traps	
0700	All Sci. Aboard		Sarah's Net Tow	Recover Sed Traps	
0800	Depart Pier 35		S2C10 PSi	Transit WireWalker	Arrive Pier 35
0900		Trace Metal Cast 2	Sarah's net tow	Recover WireWalker	
1000		S. Plankton Camera 1		Transit Station 52	
1100	Arrive Kahe Weight Cast	S2C3 PO-2 (Begin 36 hr)	S2C11 PPO4		
1200	Hyperpro	Net Tow -	Net Tow Net Tow		
1300	S1C1 Kahe	Hyperpro		Hyperpro	
1400	Trace Metal Cast 1 Sarah's Net Tow	S2C4 PC/PN	S2C12 ATP	S52C1 WHOTS	
1500		Transit to Pump Tanks	Sarah's Net Tow	S.Plankton Camera 2 Sarah's Net Tow	
1600	Transit to ALOHA	S2C5 PC/PN			
1700			S2C13 Open		
1800		Transit to PP array	Pump Tanks		
1900		Recover PP array	Trace Metal Cast 3		
2000		S2C6 BEACH	S2C14 HPLC	S6C1 Kaena (TBD)	
2100			Sarah's net tow		
2200	Pump Tanks	Net Tow Net Tow	Net Tow	Transit to Pier 35	
2300	Arrive ALOHA	S2C7 Open	S2C15 PO-3 (Deep) (end 36 hours)		

July 30th: Sunrise 0603, Sunset 1914

6.0 HOT-338 Watch Schedule

0300-1500

Brandon Brenes - Water Boss
Carolina Funkey - Watch Leader
Fernando Pacheco - Chief Scientist, Console
Camille Adkison
Ally Morris (Volunteer)

1500-0300

Eric Shimabukuro
Dan Sadler – Watch Leader, Water Boss
Fernando Santiago-Mandujano – Console
James Harris
Max Gatlin (Volunteer)

0900-2100

Syrena Whitner

At Large

Blake Watkins
Nick Hawco
Ryan Tabata
Alexandra MacFarland
Sarah Trubovitz

OTG

Jeff Koch (lead)
Nick Mathews