Hawaii Ocean Time-series
HOT-322 Cruise Plan

Cruise ID: KM 20-10
Vessel: R/V *Kilo Moana*, University of Hawaii
Master of the Vessel: Captain David Martin
Chief Scientist: Dan Sadler, University of Hawaii
Marine Technicians: Julianna Diehl, Lance Frymire

Marine Center phone number: (808) 956-0688,
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Dan Sadler's Cell Number: (808) 393-6298

Pre-Cruise Meeting: August 18, at 1330 on Blue Jeans
Loading: August 28 at 0900, Pier 35
Departure: August 28 at 1400
Arrival: September 6 at 0800
Post-Cruise Meeting: September 9 at 1330 on Blue Jeans

1.0 COVID-19 PREVENTION

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

- Sailing with a minimum science party, (12 scientist).
- All cruise participants will self-isolate according to the HOT Risk Mitigation Plan (August 12nd – August 27th) before the cruise.
- All cruise participants will be tested for COVID-19 two days before the cruise (August 12th, August 26th).

During the cruise all participants will:

- wear face masks
- maintain a distance of 6 ft. when possible
- properly disinfection of all workspaces often
- remain in their staterooms as much as possible during non-work hours

2.0 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 August 28th 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 Septmber 1st – September 5th.

3) Station 52, the site of WHOTS-16 Mooring (anchor position 22° 40.01'N 157° 56.96'W) will be occupied for about 3-4 hours on September 5th.
4) Six Stations (20, 21, 22, 23, 24, 25) will be occupied on a transit beginning at 21° 45'N 159° 00'W northward to 23° 45'N 159° 00'W. The exact locations will be determined en route.

2.1 SCIENTIFIC OPERATIONS

Station	Activities
Kahe (Sta. 1)	Weight Cast, HyperPro cast, CTD cast (1000 m)
ALOHA (Sta. 2)	Sediment traps, Gas array, Wirewalker, Net tows, CTD operations, Primary productivity measurements, Optics casts, Misc. experiments
WHOTS mooring station (Sta. 52)	One CTD cast (yo-yo to 200 m) subsurface instrument intercomparison
Underway/continuous	ADCP, thermosalinograph, fluorometry, meteorology, SeaFlow, C-Star, Imaging FlowCytobot (IFCB)
Bloom Survey	Underway CTD, CTD operations, Primary productivity array deployment, nighttime optics casts

3.0 SCIENCE PERSONNEL

Participant	**Title**	**Affiliation**	**Citizenship**
Karin Björkman	Scientist	UH	SWE
Brandon Brenes	Research Assistant	UH	USA
Tim Burrell	Research Associate	UH/SCOPE	NZL
Mathieu Caffin	Post-Doc	UH	FRA
Julianna Diehl	Marine Technician	OTG	USA
Mathilde Dugenne	Post-Doc	UH	FRA
Dan Fitzgerald	Research Associate	UH	USA
Lance Frymire	Marine Technician	OTG	USA
Lucie Knor	Graduate Student	UH	DEU
Fernando Pacheco	Research Associate	UH	BRA
Tully Rohrer	Research Associate	UH/SCOPE	USA
Dan Sadler-Chief Sci	Research Associate	UH	USA
Ryan Tabata	Research Associate	UH/SCOPE	USA
Blake Watkins	Marine Engineer	UH	USA

4.0 SUMMARY SCHEDULE

18 August	Pre-cruise planning meeting 1330 on Blue Jeans
28 August	Loading 0900
28 August	Depart from Pier 35 at 1400 hrs.
28 August	Station 1 Kahe Pt. operations.
28-31 August	Bloom Survey and operations.
1-5 September	Station 2 ALOHA operations, Station 52 CTD yo-yo cast.
6 September	Arrive back to Pier 35.
9 September	Post-cruise meeting at 1330 on Blue Jeans

5.0 OPERATIONAL PLANS

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

A 1300 lb. weight-test cast to 500 m, a Hyperpro cast (Sect. 5.2.8), one CTD cast to 1000 m (5.2.5). After the operations are satisfactorily completed, the ship shall proceed to the beginning of the transit survey (21° 45.00'N 159° 00.00'W).

5.2. Bloom Survey

A survey will be conducted north along 159°W from approximately 21° 45'N to 22° 45'N. The underway CTD will be deployed along while transiting at 8 knots. Once we reach the end of the survey track, locations will be selected along the route for Stations 20-25. The ship will return to these stations for CTD operations, night-time optics casts, a Hyperpro deployment, and the deployment of a primary production array. Once completed, the ship will transit to St. ALOHA

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

5.3.1. Upon arrival to Station ALOHA, the Wirewalker will be deployed (Sect. 5.2.2). Once the Wirewalker is deployed, the Sediment Traps will be deployed (Sect. 5.2.3). Once the Sediment Traps are deployed, the IRSC Sediment Traps will be deployed (Sect. 5.2.4). After these operations are completed, a hand net tow will be performed followed by 2 CTD casts. One 1000-m cast will be conducted to collect water for the Primary Production Array. Following this, the Primary Production array will be deployed (5.2.4). A near-bottom CTD cast and the start of the 36-hour water column observations at Station ALOHA will begin on September 2nd.

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

5.3.2. Wirewalker™ deployment

Upon arrival to Station ALOHA 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 a satellite position transmitter. (See section 7.0 for transmitter ID #'s).

The Wirewalker 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 instrument will stay in the water for approximately168 hours. Deployment and recovery will be conducted from the back deck through the A-frame and using the SeaMac winch, each operation will take 30 to 60 min. Two ABs will be required to operate the A-frame and winch respectively. B. Watkins will be in charge of this deployment.

After deployment of the Wirewalker, the ship shall prepare to deploy the sediment trap array.

5.3.3. Sediment trap array deployment

The floating sediment traps will be deployed in close proximity to the Wirewalker, so the two arrays drift in a similar direction. The array will be deployed from the back of the deck thru 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 two crosses with 12 particle interceptor traps (PIT) at 150m.

The array will drift for about 168 hours before recovery. The array is equipped with a satellite position transmitter. strobe lights, and a radio transmitter (See section 7.0 for transmitter ID #'s). 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. B. Watkins will be in charge of this deployment.

5.3.3. IRSC Sediment trap array deployment

The IRSC sediment traps will be deployed in close proximity to the Sediment Trap, so the two arrays drift in a similar direction. The array will be deployed from the back of the deck thru 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 IRSC array will consist of three indented rotating sphere traps on a custom frame at 150m.

The array will drift for about 168 hours before recovery. The array is equipped with a satellite position transmitter. strobe lights, and a radio transmitter (See section 7.0 for transmitter ID #'s). 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. B. Watkins will be in charge of this deployment

5.3.4. Primary production experiment

Samples for the primary productivity experiment will be collected from the rosette. Before dawn (Sunrise 0614 hrs on August 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. The array is equipped with a satellite position transmitter. strobe lights, and a radio transmitter (See section 7.0 for transmitter ID #'s). The **ship shall keep within site of the array** while performing CTD operations for the last 6 hours of the approximately12-hour time the array will be in the water unless the array drifts outside of the ALOHA circle. If the array drifts out of the circle, the ship should return inside the circle to conduct CTD casts, and the monitoring of the array will be coordinated with the watch leader. The array will be recovered just at sunset (1851 hrs). All radioactive waste generated by the experiment shall be returned to the University of Hawaii. Only qualified personnel shall handle radioactive material. B. Watkins will be in charge of this deployment.

After deployment of the Primary Production Array, the ship shall transit to the center of the station circle to conduct a CTD cast, S2C4 (approximately 1000 m).

5.3.5. 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 Bullister sampling bottles. We will need the ship's CTD winch and A-frame for these operations. Water samples for biogeochemical measurements will be collected on each cast. On August 31st the first near-bottom cast (approximately 4740 m) shall be made. Following this cast, a series of 1000-m casts shall be made continuously every 3 hours for a 36-hour period, ending with a second near-bottom cast. An underwater vision profiler (UVP) is mounted on the internal frame for imaging of particle concentration and size.

Whenever pumping of the ship's tanks is needed, it must be conducted outside the circle that defines station ALOHA (Sect. 2.0). To avoid disruptions in the schedule, this operation should be coordinated with the chief scientist or the watch leaders **(Dan Fitzgerald and Tully Rohrer)**.

5.3.6. Lowered Acoustic Doppler Current Profiler

The HOT rosette configuration includes a Teledyne Workhorse Mariner Model 600 kHz lowered-ADCP (LADCP) for current measurements on down- and up-cast. The LADCP, operating in single ping mode, will record measurements internally at a rate of 4 Hz. These measurements will then be downloaded after each cast via an RS232-to-ethernet connection. This will require direct connection to the ADCP after each cast, with data download before the next cast.

5.3.7. Gas Array deployment

A free drifting incubation array will be deployed the fourth day of the cruise at Station ALOHA. Samples for the gas array will be collected from Station 2 CTD cast 12. The gas array will be deployed from the back of the deck thru the A-frame and using the SeaMac winch. The gas array 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 a satellite position transmitter. strobe lights, and a radio transmitter (See section 7.0 for transmitter ID #'s) . 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. B. Watkins will be in charge of this deployment.

5.3.8. 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.

5.3.9. Optics

An optical package including a SeaBird Seacat with temperature, conductivity, and pressure sensors, a Wetlabs ECO triplet measuring g 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.

5.3.10. 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. B. Watkins will be in charge of these operations.

5.3.11. Hand Net Tow

A handheld plankton net (50 μm mesh) will be deployed from the stern and shall be towed for 20-30 minutes. The vessel will need to move ~ 0.5 knots. These tows are scheduled around noon and midnight on the second, third, fourth and fifth days (see schedule) for a total of eight slots. R. Tabata will be in charge of these operations.

5.4. Gas Array, Sediment Trap, WireWalker and IRSC Sediment Trap recovery

In the morning of September 5th, 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 sediment trap array. After the Wirewalker is recovered, the IRSC sediment traps will be recovered. The ship shall transit to Station 52. In the morning of September 5th, the ship shall transit to recover the Wirewalker. On completion of the Wirewalker recovery, the ship shall transit to the floating sediment trap array. On completion of the Sediment Trap recovery, the ship shall transit to the IRSC sediment trap array and recover it. B. Watkins will be in charge of these operations.

5.5. Station 52 - WHOTS-16 Mooring

The anchor position of the WHOTS-16 mooring is 22° 40.01'N 157° 56.96'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 Sept 5th a HyperPro cast, one 200 m CTD yo-yo cast and ADCP inter comparisons will be conducted.

5.5.1. CTD yo-yo cast (subsurface instrument intercomparison)

One 200-m CTD yo-yo cast with at least 5 full cycles will be conducted near the WHOTS mooring on September 5th for subsurface instrument intercomparison. This cast should be conducted downwind, down current, and about 200 m from the mooring.

5.6. 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 be in charge of the ADCP system.

5.7. 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 be in charge of the thermosalinograph, Fluorometer, and meteorological suite operations.

5.8. SeaFlow, Inline C-Star Transmissometer and Imaging FlowCytobot (IFCB)

In addition to the continuous thermosalinograph and fluorometer sampling, the SeaFlow, an inline C-Star Transmissometer, and the IFCB 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 ships network is required. The SCOPEOps technicians and UH personnel will be in charge of these instruments and operations.

5.9 Seaglider Operations

Weather permitting, one seaglider, sg148 (ARGOS ID# 90996??), will be deployed along the bloom survey track for a 3 month mission to track the recent plankton/Chl A bloom transiting between the warm & cold water filaments in the region, primarily to the West of Stn ALOHA. Throughout the cruise it will be diving and profiling and possibly or eventually transiting into the Stn. ALOHA watch circle boundary.

When the ship arrives at a suitable deployment area, approximately 30-60 minutes will be needed to deploy the sea glider using the ship's crane or winch combo ship's A-frame. Once the glider is in the water (and confirmed to be floating prior to release), it will be released and the vessel is free to stand off until confirmation after a couple of dives that the Seaglider is communicating correctly and the data returned looks reasonable. The vessel can conduct ops or CTD operations within the area while waiting for this initial feedback. If the captain knows "it is" or "will be too rough" to use a dog catcher or to attempt to recover soon after deployment, the deployment will be cancelled. Blake Watkins will be in charge of the deployment operation. During deployment, Blake will be in communication via Iridium phone with the Seaglider pilot (Steve Poulos) on land. After it is deployed, the glider will perform a series of test dives and the command center will determine the status of the glider and its sensors. Should the glider malfunction, recovery of the glider via small boat or by wire noose may become necessary during daylight hours. Recovery operations would be performed at the Captain's discretion and only if the glider has a malfunction. Its GPS position information can be auto emailed from " sdrifter@soest.hawaii.edu" to an email address given to the pilot ahead of time, or can be found on the seaglider website: http://hahana.soest.hawaii.edu/seagliders/history148.html or http://hahana.soest.hawaii.edu/hot/trackmap/TrackMap.html It is requested that the ship's GPS position be broadcast every 30mins by email to sdrifter@soest.hawaii.edu prior to and during the seaglider deployment and can be less frequent, if necessary, to every 60mins after the seaglider's successful deployment. If recovery is necessary, then it is requested that the ship's position be broadcast as frequently as 10mins.

6.0 EQUIPMENT

6.1. The HOT science party shall be bringing the following

1. Seabird CTD system, all sensors, deck boxes and computer CTD acquisition systems
2. Rosette and 24 12L Bullister sampling bottles, and all associated spare parts
3. Lowered Acoustic Doppler Current Profiler (LADCP)
4. One 20 ft. laboratory van (#23) with assorted equipment for radioisotope and general use, and one 10x8 ft. equipment van (PO) for equipment and spare storage.
5. Distilled, deionized water and all required chemicals and isotopes
6. Large vacuum waste containers
7. Liquid nitrogen dewars
8. Drifting sediment trap array with strobe lights, satellite and radio transmitters, floats, weights, line, sediment traps and crosses.
9. Drifting primary production array with strobe lights, satellite and radio transmitters, floats, weights, line primary production bottles and spreader bars.
10. Drifting gas array with strobe lights, satellite and radio transmitters, floats, weights, line, 4 L bottles and short mounting bars.
11. Drifting Wirewalker™ array with surface buoy, strobe lights, satellite transmitters, floats, weights, 400m and cable.
12. Oxygen titration system
13. Plankton nets and towing lines
14. Desktop and laptop personal computers
15. Assorted tools
16. All required sampling bottles
17. Pertinent MSDS
18. Wirewalker™
19. SeaFlow
20. Inline C-Star Transmissometer
21. Imaging FlowCytobot (IFCB)
22. McLane Pump x2
23. Deck Incubator
24. 2 x Caron incubators
25. Underway CTD

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

1. A-frame
2. A-frame block assembly
3. CTD winch (LARS system)
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 02 deck for McLane Pump
8. Space on deck for ~4 deck baskets of array gear
9. Small capstan (~ 10 m/min)
10. SeaMac Winch

11. Radio direction finder
12. Hand-held VHF transceivers
13. Shackles, sheaves, hooks and lines
14. Precision depth recorder
15. Shipboard Acoustic Doppler Current Profiler
16. Thermosalinograph, pCO_2 system, and Fluorometer
17. Meteorological suite
18. Grappling hooks and line
19. Navlink2 PC or equivalent
20. Running fresh water and seawater, hoses
21. Uncontaminated seawater supply
22. Source of compressed air for Trace Metal pump
23. -80°C Freezer
24. 4°C Refrigerator and -20°C Freezer
25. Distilled, deionized water system
26. Electronic mail system
27. GPS system
28. Underway/on-station data acquisition system for meteorological instruments, ADCP, thermosalinograph, fluorometer, SeaFlow, inline C-Star transmissometer and IFCB and access to real-time data through the network.
29. OTG's 24-place rosette, and 24 12-l water sampling bottles (to be used as spare)
30. ~1300 lb weight
31. Remote CTD dbar pressure display in the winch operator area.
32. Monitor in CTD Lab displaying ship coordinates, bottom depth and GMT.
33. OTG's transmissometer (preferably SN 1366)
34. Pedestal for underway CTD.

7.0 Satellite Position Transmitters Summary

Array Name	RockBlock ID	XEOS ID	Argos ID	Radio Frequency
Sediment Trap (ST)	06	268 and 78		CH.69 (156.475 MHz)
WireWalker (WW)		77 and 80		
IRSC Traps (IRSC)	03	266 and 81		
Primary Production (PP)	05	267 and 79		CH.73 (156.675 MHz)
Gas Array (GA)	05	267 and 79		CH.73 (156.675 MHz)
Seaglider 148			90996	

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 322 CTD CASTS** **Date: AUG 28 – SEP 6, 2020**

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	KB, DCM High Resolution Sampling	24
S2C2	1000 m	KB(10@25), SCOPE DNA(1@300,400,500,770), MD(1@700),salts KB(1@25,pc/pn)	18
s2c3	1000 m	Primary Production (3@ 5, 25, 45, 75, 100, 125, 150, 2@ 175) Chl a, FCM, and O2(1@15), DIC, Salts	24
S2c4	1000 m	KB(10@25), KB(1@25,pc/pn), Salts	13
s2c5	1000 m	SCOPE DNA (1@200,225,250,275), DH(3@250), KB(1@25,pc/pn), Salts KB(1@25,pc/pn)	10
s2c6	4740 m (PO-1)	O_2, Temp, DOC, DIC/Alk, pH, Ref Si, Nuts, Salts	24
s2c7	1000 m (PO-2)	O_2, Temp, DOC, DIC/Alk, pH, Ref Si, Nuts, Salts	24
s2c8	1000 m	PC/PN, SCOPE DNA (1@5,25,45,75), KB(1@25,pc/pn), Salts	18
s2c9	1000 m	PPO4, O2(1@15), KB(1@25,pc/pn), Salts	16
s2c10	1000 m (BEACH)	O_2, Temp, DIC/Alk, pH, Nuts, LLN, LLP, DOC, Keeling, Quay, Salts	23
s2c11	1000 m	SCOPE DNA (1@,100,125,150,175), KB(3@7m), KB(1@25,pc/pn), Salts	10
s2c12	1000 m	Gas Array (3@5,25,45,75,100,125), KB(1@25,pc/pn), Salts	21
s2c13	1000 m	MC DNA (1@5, 25, 45, 75, 100, 125, 150, 175), O2(1@15), Salts KB(1@25,pc/pn)	13
s2c14	1000 m	PSi, KB(1@25,pc/pn), Salts	11
s2c15	1000 m	Open, KB(1@25,pc/pn), Salts	3
s2c16	1000 m	ATP, SD(6@ML), KB(1@25,pc/pn), Salts	18
s2c17	1000 m 3	O2(1@15), KB(3@7m), KB(1@25,pc/pn), Salts	7
s2c18	1000 m	HPLC, Chl a, KB(1@25,pc/pn), Salts	15
s2c19	4740 m (PO-3)	Oxygen, SCOPE DNA(1@1000,2000,3000,4000), DH(3@4000) KB (1@2000, 2500, 3000, 3500, 4000, 4500, Deepest), Salts KB(1@25,pc/pn)	22
s2c20	1000 m	AC (3@50,100), Salts	7
WHOTS Mooring			
s52c1	200 m yo-yo	DIC/TA(1@5), SCOPE Zher (1@ 25), KB(3@7m)	5

Transit Stations

s20c1	1000 m	Primary Production (3@ 5, 25, 45, 75, 100, 125, 150, 2@ 175) Chl a, FCM, DIC, Salts	24
S20c2	1000 m	Chla, Nuts, HPLC, PC/PN, PPO4, Psi, ATP, Salts	22
S21c1	1000 m	Open, Salts	3
S21c2	1000 m	Chla, Nuts, HPLC, PC/PN, PPO4, Psi, ATP, Salts	22
S22c1	1000 m	Chla, Nuts, HPLC, PC/PN, PPO4, Psi, ATP, Salts	22
S23c1	1000 m	Open, Salts	3
S24c1	1000 m	Open, Salts	3
S25c1	1000 m	Open, Salts	3

Underway

MC=Matt Church, **KB** =Karin Björkman, **DH**=Danielle Hull
AC=Allison Coe, **SD**=Sonya Dyhrman, **MD**=Mathilde Dugenne

Ship: R/V *Kilo Moana* HOT 322 Date: August 28 – September 6 2020

TIME	August 28	August 29	August 30	August 31	September 1
0000			Finish Underway CTD Survey	S23C1 (open)	
0100			optics		Pump Tanks Incinerator
0200			S20C1 PP2		
0300		Begin Underway CTD Survey		S24C1 (open)	
0400			Deploy PP2		
0500					
0600			S20C2	S25C1 (open)	Arrive to ALOHA
0700			Deploy Seaglider		Deploy WireWalker
0800				Underway CTD Survey to ALOHA	Deploy Sed Trap
0900	Loading		S21C1 (open)		Deploy IRS Traps
1000					
1100					
1200			Hyperpro		Hand Net Tow
1300					S2C1 KB HR
1400	Depart Pier 35		S21C2		
1500	Boat Drill				
1600					
1700			Transit to pump tanks Incinerator		
1800	Arrive Kahe Weight Cast				Pump Tanks Incinerator
1900			Recover PP2		S2C2 KB dusk DNA100.125,150...
2000	S1C1 Kahe		optics		
2100	Transit to Survey Track		S22C1		
2200					Hand Net Tow
2300					

August 30th: Sunrise 0614, Sunset 1850

Ship: R/V *Kilo Moana* HOT 322 Date: August 28 – September 6, 2020

TIME	September 2	September 3	September 4	September 5	September 6
0000	Transit to pump tanks Incinerator	Optics			
0100		Transit to pump tanks Incinerator	Transit to pump tanks. Incinerator	Transit to pump tanks Incinerator	
0200	S2C3 PP		S2C12 Gas Array		
0300		S2C6 PO-1(Deep)			
0400	Deploy PP Array		Deploy Gas Array	Recover Gas Array	
0500	S2C4 KB dawn		S2C13 Open		
0600				Recover Sediment Traps	
0700					
0800	S2C5		S2C14 PSi	Recover Wirewalker	Arrive Pier 35
0900					
1000				Recover IRSC Traps	
1100		S2C7 PO-2 (Begin 36 hr)	S2C15 Open		
1200	Net Tow Hand Net Tow	Net Tow	Net Tow Hand Net Tow	S52C1 WHOTS	
1300	HyperPro			HyperPro	
1400		S2C8 PC/PN	S2C16 ATP		
1500					
1600	Transit to pump tanks Incinerator				
1700		S2C9 PPO4	S2C17 Open	Pump Tanks Incinerator	
1800	Transit to PP array		Transit to pump tanks Incinerator		
1900	Recover PP array				
2000		S2C10 BEACH	S2C18 HPLC	S2C20 Coe	
2100		Transit to pump tanks Incinerator		Transit to Honolulu	
2200	Net Tow Net Tow	Net Tow	Hand Net Tow		
2300	Hand Net Tow	S2C11 Open	S2C19 PO-3 (Deep) (end 36 hours)		

September 2nd: Sunrise 0615, Sunset 1847

8.0 HOT-322 Watch Schedule

0300-1500

Dan Fitzgerald – Watch Leader, Tag
Dan Sadler – Water Boss, Chief Scientist, Alt Tag
Ryan Tabata - Tag
Fernando Pacheco- Console

1500-0300

Karin Björkman – Water Boss
Brandon Brenes- Tag
Lucie Knor- Console
Tully Rohrer – Watch Leader, Tag

At Large

Tim Burrell- Alt Tag
Blake Watkins
Mathieu Caffin
Mathilde Dugenne

OTG

Julianna Diehl (lead)
Lance Frymire