

HAWAII OCEAN TIME-SERIES
HOT- 141 General Cruise Plan

VESSEL: R/V Wecoma, Oregon State University
CRUISE ID: W0210A
MASTER OF THE VESSEL: Captain Danny Arnsdorf
CHIEF SCIENTIST: Thomas Gregory, University of Hawaii
Marine Technician: Daryl Swensen
Load: October 31, 2002 0900 HST
Departure: November 2, 2002; 0900 HST
Return: November 6, 2002; 0900 HST

1.0. SCIENTIFIC OBJECTIVES

The objective of HOT 141 is to maintain collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) Station ALOHA, our near shore station Kahe Point, and Kaena Pt. station. Kahe Point (21°20.6'N, 158°16.4'W) is occupied enroute to Station ALOHA to test equipment and collect near shore data. Station ALOHA is defined as a circle with a 6 nautical mile radius centered at 22°45'N, 158°W. Kaena Point station (21°50.8'N, 158°21.8'W), will be occupied on the return transit to Honolulu.

1.1 SCIENTIFIC OPERATIONS

<u>Station</u>	<u>Activities</u>
Underway/continuous	ADCP, thermosalinograph, fluorometry, meteorology
Kahe (sta. 1)	Weight Cast, PRR/TSRB cast, CTD cast
ALOHA (sta. 2)	Sediment traps, net tows, CTD op's, PRR/TSRB and AC9/FRRF casts, primary productivity measurements, misc experiments
Kaena Pt. (sta. 6)	CTD op's (2500 m)

2.0. SCIENCE PERSONNEL

Brum, Jennifer	UH/JGOFS
Clemente, Tara	UH/JGOFS
Fitzgerald, Daniel	UH/PO
Fujieki, Lance	UH/JGOFS
Gasc, Anne	UH/JGOFS
Gregory, Tom (Chief Scientist)	UH/JGOFS
Morris, Paul	UH/JGOFS
Rii, Shimi	UH/PO
Sadler, Dan	UH/JGOFS
Santiago-Mandujano, Fernando	UH/PO
Sheridan, Cecelia	UH/JGOFS
Valenciano, Mark	UH/PO

3.0. SUMMARY SCHEDULE

28 October	Pre-cruise meeting
31 October	Load HOT 141 starting at 0900 hrs
2 November	Depart HOT 141 at 0900 hrs
2 November	Station 1 Kahe Pt. operations
3-5 November	Station ALOHA operations
5 November	Sediment trap, station 8 & 6 CTD ops.
6 November	ETA 0900 hrs, full offload

4.0. OPERATIONAL PLANS

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

Operations at Kahe station include an initial weight cast to 1000 m, followed by simultaneous floating TSRB and hand-lowered light cast (PRR-600); and CTD cast to 1000 m. After all operations have been completed the ship shall proceed to Sta. ALOHA.

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

Upon arrival at Station ALOHA a net tow will be conducted, followed by deployment of the floating sediment traps. After the trap deployment CTD operations will begin. As usual the first cast will be to near-bottom, followed by the 36 hr, 3 hr interval “burst” sampling. Interspersed in this time frame are PRR/TSRB casts, primary production cast/array deployment/retrieval, additional plankton net tows, and misc. experiments. Our final activity at this station will be an AC-9/FRRf cast.

4.2.1. Plankton net tows

A series of plankton net tows will be conducted off the starboard side. We request the use of the ship's hydro winch and CTD A-frame for these operations. Hour periods are scheduled at around noon and midnight (see day-hour schedule) in excess of the six required in the event of equipment problems and/or rough sea conditions.

4.2.2. Floating Sediment Trap deployment

The floating sediment traps will be deployed from the center of Station ALOHA. The array will be deployed from the starboard side using the ship's main crane and the JGOFS DSE winch. Power requirement for the winch is 440 VAC, three phase at 10 amps. After deployment we would like to return to the center of Station ALOHA and commence with CTD operations.

The array will drift for approximately 55 hours before recovery. The array is equipped with 2 ARGOS satellite transmitters (platform # 01325 & 01833), 2 strobe lights, and 2 radio transmitters (channel 74, 156.725 MHz). Daily positions of the array shall be transmitted by email directly to the ship. 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.

4.2.3. Water column measurements

Vertical profiles of temperature, conductivity and dissolved oxygen will be made with an instrument package consisting of a Seabird CTD attached to a 24-place rosette with 12 liter sampling bottles. The ship's trawl winch and A-frame will be used for this operation. Water samples for biogeochemical measurements will also be collected on each cast. The first cast shall be made to the near bottom (approximately 4800 m). Following this cast, a series of casts shall be made continuously every 3 hours for a 36-hour period, after which a second full-depth cast will be conducted. 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, repositioning to the center of the Station before each cast whenever possible.

4.2.4. Primary production experiment

Samples for the primary productivity experiment will be collected from the rosette (cast 8). Just before dawn (sunrise 0637 hrs) on Nov. 4, a second free drifting array with incubation samples will be deployed from the starboard side. We request the use of the main crane for this operation. The array is equipped with a strobe light and a radio transmitter (channel 72, 156.625 MHz). The ship shall keep within sight of the array while performing CTD operations for the approximately 12 hour duration the array will be in the water. The array will be recovered around sunset (1754 hrs). CTD operations shall continue after the recovery.

4.2.5. Profiling Reflectance Radiometer (PRR) and Tethered Spectral Radiometric Buoy (TSRB)

Around noon on several days a profiling reflectance radiometer will be deployed from the main deck using the main crane. The floating tethered spectral radiometric buoy will be deployed from the stern at the same time as the PRR cast to obtain simultaneous data streams.

4.2.6. AC9/FRRf

An optical package containing the AC9 and the Fast Repetition Rate Fluorometer (FRRf) will be deployed between 2 and 4 times during the cruise. The package will be deployed to a depth of up to 300 m at a steady wire speed of 10 m/s during the downcast and upcast. We request the use of the ship's hydro winch and CTD A-frame for these deployments.

4.2.7 ATE

An automated trace element sampler will be deployed on the fourth day of the cruise. This instrument is hand-lowered over the side. It is important that this deployment take place at St. ALOHA as soon as we return from recovering the sediment traps.

4.3. Floating Arrays

After the AC-9/FRRf cast on the fourth morning of the cruise has been completed we shall transit for the recovery of the sediment trap array. We will retrieve the sediment trap array at daybreak. The ship's main crane will be needed for this operation. Once recovery is completed we will transit back to St. ALOHA.

4.4 Kaena Point (Station 6)

The final station will be station 6, Kaena Point (21°50.8'N, 158°21.8'W), on the return transit. Here a near-bottom (~2500 m) CTD cast will be conducted before returning to Snug Harbor.

5.0 EQUIPMENT

5.1 The HOT science party shall bring the following:

1. Sea-Bird CTD system, all sensors, deck boxes and computer CTD acquisition systems.
2. 24-place rosette with 12-l water sampling bottles, all spare parts
3. One laboratory van with assorted laboratory equipment for radioisotope and sample processing work.
4. All required sampling bottles
5. Distilled, deionized water and all required chemicals and isotopes
6. Storage van with assorted equipment.
7. Large vacuum waste containers

8. Liquid nitrogen dewars
9. Drifting sediment trap array with strobe lights, satellite and radio transmitters, floats, weights, spar buoy
10. Drifting primary productivity array with strobe light, radio transmitter, floats, weights, polypro. line, spar buoy etc.
11. Plankton nets
12. Dissolved oxygen measurement system
13. Desktop and laptop personal computers
14. PRR/TSRB, AC-9, FRRf & other optical measuring instruments
15. Deck incubation system
16. Pertinent MSDS
17. DSE winch

5.2 We will need from the ship the following:

1. Main crane
2. A-frame block assembly
3. Trawl winch with conducting wire for CTD
4. Electric power for winches, vans, and incubators
5. Radio direction finder
6. Empty freezer and refrigerator in wet lab
7. Space on the main deck for 1 labvan
8. Space on 01 deck for 1 equipment van
9. Hand-held VHF transceivers
10. Precision depth recorder
11. Shackles, hooks and lines
12. Shipboard Acoustic Doppler Current Profiler
13. Space on the 01 deck for incubator
14. Underway/on-station data acquisition system for meteorological instruments, ADCP, thermosalinograph, fluorometer
15. Grappling hooks and line
16. Running fresh water and seawater hoses
17. Electronic mail system
18. GPS system
19. Navlink2 PC or equivalent
20. Uncontaminated seawater supply
21. Hydro winch for net tows and optical casts

SHIP R/V WECOMA HOT 141 DATE 2-6 Nov., 2002

TIME	Sat. 11/2	Sun. 11/3	Mon. 11/4	Tues. 11/5	Wed. 11/6
0000		Arrive ALOHA Net tow			
0100		Deploy sed. traps	Net tow		
0200		S2C1 PO-1	S2C8 PP		
0300				AC9-FRRf	
0400				Transit sed traps	
0500			S2C9 Open		
0600			Deploy PP array Log PRR Light		
0700				Recover sed traps	
0800	On Board	S2C2 PO-2 (start 36 hrs)	S2C10 PSi		
0900	Depart Snug Log Licor light				Arrive Snug
1000		Net tow	Net tow	Transit ALOHA	
1100		S2C3 MIT	S2C11 Open	ATE	
1200	Arrive Kahe Weight cast		PRR/TSRB AC9-FRRf	PRR/TSRB AC9-FRRf	
1300	PRR/TSRB	Net tow	Net tow	AC9-FRRf	
1400	S1C1 (Kahe)	S2C4 P.PO4	S2C12 ATP		
1500	Transit ALOHA			Transit sta. 6	
1600					
1700		S2C5 PC/PN	S2C13 Thorium		
1800			Recover PP array End PRR Light		
1900					
2000		S2C6 JGOFS-2	S2C14 HPLC (end 36 hrs)		
2100					
2200		Net tow	Net tow	S6C1 (Kaena)	
2300		S2C7 PE	S2C15 PO-3	Transit Snug	

Sunrise 0637

Sunset 1754 Nov. 4, 2002

HOT-141 Watch Schedule

0300-1500

F. Santiago-Mandujano - Watch Leader

M. Valenciano

T. Gregory (Chief Scientist)

L. Fujieki

A. Gasc

1500-0300

P. Morris – Watch Leader

D. Sadler

T. Clemente

D. Fitzgerald

S. Rii

At-large

C. Sheridan

J. Brum

2 - 6 Nov., 2002
Ship: R/V *Wecoma*

HOT 1341
CTD CASTS

Cast	Samples	#Bottles
<u>Kahe Pt.</u>		
s1c1 1000 m	O ₂ , Temp, DIC/Alk, Nuts, Chl a, LLN, LLPO ₄ , DOC, FCM, Salts,	16
<u>Station ALOHA</u>		
s2c1 4800 m (PO-1)	O ₂ , Temp, DOC, DIC/Alk, Nuts, Salts	24
s2c2 1000 m (PO-2)	O ₂ , Temp, Nuts, DIC/Alk, Quay, DOC, Salts	24
s2c3 1000 m	MIT, Salts,	14
s2c4 1000 m	PPO ₄ , Salts	14
s2c5 1000 m	PC/PN, Salts	14
s2c6 1000 m (JGOFS-2)	O ₂ , Temp, DIC/Alk, Nuts, LLN, LLP, DOC, Keeling, Quay, Salts	19
s2c7 1000 m	PE, Salts,	14
s2c8 1000 m	Primary Productivity, Chl a, FCM, Salts	22
s2c9 1000 m	Salts,	8
s2c10 1000 m	PSi, Salts	10
s2c11 1000 m	Salts, JB (8)	12
s2c12 1000 m	ATP, Salts	11
s2c13 1000 m	Thorium, Salts	17
s2c14 1000 m	HPLC, Chl a, Salts	14
s2c15 4800 m (PO-3)	O ₂ , Temp, Salts, Thorium, WOCE, JB (3)	17
<u>Kaena Point</u>		
Sta 6 2500 m	Open, Chl a Salts	13