

HOT-234: Chief Scientist Report

Chief Scientist: Susan Curless

R/V Kilo Moana

August 27- September 1, 2011

Cruise ID: **KM 11-24**

Departed: August 29, 2011 at 1859 (HST)

Returned: September 1, 2011 at 1532 (HST)

Vessel: **R/V Kilo Moana**

Master of the Vessel: Captain Gray Drewry

OTG Marine Technicians: Trevor Goodman and Trevor Young

1. SCIENTIFIC OBJECTIVES

The objective of the cruise was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations were to 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 was to be occupied on the first day of the cruise for about 2 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 was to be occupied during the 2nd, 3rd, and 4th days of the cruise.
- 3) Station 52, the site of WHOTS-8 Mooring, approximate position 22°40.1572'N, 157°57.0225'W, was to be occupied on the 4th day of the cruise for about one hour.
- 4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W and was to be occupied on the 4th day of the cruise for approximately 3 hours.

Upon arrival to Station Kahe a 1000 lb. weight-test cast to 1000 m, one CTD cast to 1000 m, a Hyperpro cast and a hand lowered Niskin cast were to be conducted on the afternoon of August 27th. The single CTD cast was to be conducted to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements. After these operations were satisfactorily completed, the ship was to proceed to Station ALOHA.

Upon arrival to Station ALOHA, the free-drifting sediment trap array was to be deployed. The sediment trap array was to stay in the water for about 52 hours. This was to be followed by one shallow CTD cast to 200 m for various experiments and one 1000 m CTD cast for preparation of the Primary Productivity Array. These casts were to be followed by the deployment of the free-drifting Primary Productivity Array to incubate insitu for 12 hours. A full-depth (~4740 m) CTD cast was to be conducted after the deployment of the Primary Production Array, followed by 1000 m CTD casts at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection, ending with another full-depth CTD cast at 2300 on August 21th.

Another free-drifting array (Gas Array) was to be deployed for 24 hours for incubation experiments on August 29th. The Gas Array was to be recovered on August 30th.

A plankton net was to be towed between 1000-1400, and 2200-0200 for 30 minute intervals on August 29th and 30th at Station ALOHA.

The Hyperpro was to be deployed for a half-hour period near noon time on August 27th, 29th and 30th.

A package including a Wet Labs AC9, a Chelsea Fast Repetition Rate Fluorometer (FRRf), a SeaBird Seacat, and a LISST particle size and distribution analyzer was to be used to profile the upper 200 m at Station ALOHA around noon time on August 29th and 30th and in the early morning of August 30th.

After the 36 hour burst period of CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating Sediment Trap Array and the Gas Array on the morning of August 30th.

After recovering the arrays, the ship was to transit to Station 52 to conduct a one-hour 200 m CTD yo-yo cast. Once operations at Station 52 were complete, the ship was to re-position within Station ALOHA to conduct an ACS/AC9/FRRf/LISST cast, a Hyperpro cast, and one shallow 200 m CTD cast. Once the 200 m CTD cast was complete, an APEX float was to be deployed at Station ALOHA.

Once operations at Station ALOHA were complete, the ship was to transit to Station 6, referred to as Station Kaena where a near-bottom CTD cast (~2500 m) was to be conducted to collect salinity and chlorophyll samples for calibration.

After Station Kaena operations were complete, the ship was to transit back to Snug Harbor.

The following instruments were to collect data throughout the cruise: shipboard ADCP, thermosalinograph, $p\text{CO}_2$ system, underway fluorometer and the meteorological package.

2. SCIENCE PERSONNEL

Participant	Title	Affiliation/HOT Group
Karin Björkman	Research Specialist	UH/BEACH
Susan Curless	Chief Scientist- Res. Assoc.	UH/BEACH
Lance Fujieki	Computer Specialist	UH/BEACH
Adriana Harlan	Research Associate	UH/BEACH
Shimi Rii	Graduate Student	UH/BEACH
Dan Sadler	Research Associate	UH/BEACH
Brett Updyke	Research Associate	UH/BEACH
Donn Viviani	Graduate Student	UH/BEACH
Blake Watkins	Marine Engineer	UH/BEACH
Sam Wilson	Postdoctoral Researcher	UH/CMORE
Cameron Fumar	Research Associate	UH/PO
Jefrey Snyder	Marine Technician	UH/PO
Craig Nosse	Research Associate	UH/PO
*Emily Crigler	Volunteer	PO
Brandon Carter	Research Specialist	UCSC
Anne Thompson	Postdoctoral Researcher	UCSC
Angel White	Assistant Professor	OSU
Katie Watkins-Brandt	Research Associate	OSU
Jim Foley	Marine Educator	UH/CMORE
Elizabeth Shaw	Teacher	Santa Cruz County Education Office
*Jim Cox	Teacher	Kapa'a Highschool
*Jo'el Nathansen	Teacher	Keaau Highschool
Trevor Goodman	Marine Technician	OTG
Trevor Young	Marine Technician	OTG

*Cruise participants that were not able to participate in the cruise due to the delayed departure and extension of cruise arrival time.

3. GENERAL SUMMARY

The departure of HOT 234 was delayed from 0800 August 27th to 1859 on August 29th due to a non-operational outboard motor on the RV *Kilo Moana*'s rescue boat. Having a working and reliable rescue boat is a Coast Guard requirement for the vessel to leave the harbor.

Ongoing troubleshooting and attempted repairs to the engine throughout the day of August 27th kept the science party aboard the vessel for the entire day in hope of an afternoon/evening departure. At 1653, the Chief Scientist met with Captain Drewry and the Port Operations Manager. The engine was still not operational and significantly more time was going to be needed for engine repairs. The science party was released from the vessel by the Captain at 1740 and a new departure time of 0800 on August 28th was set. Permission was granted by the Port Operations Manager and the following cruise Chief Scientist for an arrival of 0800 on September 1st to make up for the day lost pierside for engine repairs.

Overnight repairs to the rescue boat engine were not successful. Shortly after the arrival of the science party at 0700 on August 28th, they were released by the Captain (at 0815) and a new departure time of 0800 on August 29th was set, all hands on board by 0700.

Continued repair work throughout August 28th did result in a period of time when the rescue boat engine was working well (at 1015). After half an hour of testing the rescue boat in the harbor, mimicking maneuvers that would be used in a rescue situation (1045), Captain Drewry deemed the rescue boat operational and set a departure time of 1300. Captain Drewry called the crew back to the ship and asked the Chief Scientist to call the science party back to the ship. All parties were to be back on board the vessel by 1200.

Shortly before the crew and science personnel arrived, the rescue boat engine failed (1130). After a meeting between the mechanics, Chief Engineer, Captain, Port Operations Manager and Chief Scientist (1240), departure was delayed again to allow the mechanics further time for repairs. Science and crew members were again released from the ship by the Captain and departure was reset for 0800 on August 29th, all hands on board by 0700.

At 1417 on August 28th, Captain Drewry called the Chief Scientist to say that the mechanics had isolated a damaged part on the engine that needed to be replaced. After Captain Drewry discussed the damaged part availability with the Chief Engineer and Port Operations Manager, it was their conclusion was that the damaged part would be difficult to find on island and would probably have to be ordered from the mainland.

Even with the hope that the part could be located on island, procurement of the part would not be possible until sometime after 0800 on August 29th. Once the part was installed it would need to be properly tested which made a 0800 departure on August 29th highly unlikely. At 1600 on August 28th all science party members were called and e-mailed by the Chief Scientist with a status update. With an early morning departure unlikely, it was suggested that science personnel report to their land based job duties for the morning of August 29th, with the understanding that there was still a chance of departure later that day.

At 1654 an e-mail was sent from the Chief Scientist to the Captain and Port Operations Manager (copying the Lead PI of HOT) replying to their questions asked at the Marine Center about a cut off time for repairs and a minimum working time at ALOHA. The e-mail stated that a 54 hour minimum (22 hours of which are transit time) would be needed to meet enough HOT objectives (see Section 1) to warrant the human resources investment.

The e-mail also stated that back calculating from the agreed upon 0800 arrival September 1st made a departure at 0200 on August 30th the cut off time for repairs. The Chief Scientist then asked if there were any procedures in place that would prevent the ship from being able to depart in the middle of the HOT-234 Chief Scientist Report

night. An e-mail response from Captain Drewry directly to the Chief Scientist said that he would check with the UHMC office (as it would be their final call) but that when the rescue boat engine repairs were complete, he was willing to depart any time, day or night, and would make sure that pre-departure ship requirements were met to do so.

During the night of August 28th, the Lead PI of HOT sent an e-mail to Sandy Shor (copied on the e-mail were the Port Operations Manager, two Co-PI's of HOT and the Chief Scientist) requesting accommodation of a later (mid-day) arrival on September 1st. This e-mail also stated that a bare minimum time of ~55 hours would be needed to make departure worth the human resources investment.

The number of hours of active science time provided to the UHMC by the Chief Scientist and Lead PI of HOT was based on HOT 227 (November 2010). HOT 227 was a shortened (~54 hour) cruise re-scheduled to replace a cancelled (due to vessel mechanical failure) HOT cruise. HOT 227 was a good example of how much active science time was needed to generate enough data to make a shortened HOT cruise worth the personnel effort.

On August 29th at 0730, there had been no contact from mechanics on part availability on the mainland or on island. At 0853 Sandy Shor sent a reply to the e-mail from the Lead PI of HOT (copied on the message were the same parties listed on the original e-mail) saying that he was on his way to the Marine Center to talk with UHMC personnel about the rescue boat situation and would work with the Chief Scientist on getting a revised cruise schedule in place.

After the meeting between UHMC staff and Sandy Shor, the Chief Scientist met with Captain Drewry (at 1050) who explained that part had been located on the mainland, but the arrival time of the part would definitely put us out of range of the cut off time to make even a shortened HOT cruise happen. Captain Drewry said he was in the process of negotiating with the Coast Guard to obtain temporary permission for the rescue boat to have a non-IMO approved engine installed. At 1130 Captain Drewry told the ship's crew and the Chief Scientist that permission from the Coast Guard had been granted to move forward with the installation of a non-IMO approved engine on the rescue boat.

The Chief Scientist called Sandy Shor at 1145 to ask for an extended arrival time on Thursday September 1st. This was done in hope of increasing science time at Station ALOHA and also in hope of providing cruise departure and arrival information to ancillary cruise participants still hoping to participate on a shortened HOT cruise. At 1204 Sandy Shor returned the Chief Scientist's call and said that a late arrival time was okay with him, but how late would need to be negotiated with the Port Operations Manager and the Chief Scientist of the next cruise.

At 1215 the Chief Scientist talked with the Port Operations Manager about a late arrival on September 1st. The Chief Scientist for the HURL mapping cruise was consulted and a 1400 arrival time on September 1st was agreed upon by all parties.

After obtaining the later arrival time, the Chief Scientist called Captain Drewry (at 1300) to inform him of permission from the UHMC office for a 1400 arrival time on September 1st. Back calculating from the new arrival time then made the absolute departure time for a shortened 54 hour HOT cruise 0800 on August 30th.

At 1530, the Chief Scientist was informed by Captain Drewry that the Honda motor installation was going well, and testing of the engine in the harbor would happen within the hour. The Coast Guard had released certification authority to Captain Drewry who would have to submit in writing that the engine was working correctly and reliably before the vessel would be cleared to depart.

The rescue boat went in the water at 1545 with testing scheduled until 1622. The third mate and one of the mechanics were on board the rescue boat for the duration on the testing period.

At 1622 the rescue boat was deemed reliable and operational by Captain Drewry. Captain Drewry called the crew back to the ship and the science party was called and e-mailed by the Chief Scientist. Departure was set for 1900, all hands on board by 1800.

Operations cancelled, personnel changes, and personal days lost due to shortened cruise length:

- Sediment Trap Array
- Gas Array – traditional HOT array with 24 hour deployment and full profile of sample depths
- Phycocyanin CTD cast
- Second near bottom CTD cast at Station ALOHA
- Station Kahe Operations – Hyperpro cast, 1000 m CTD cast, 20 m niskin cast
- Station Kaena – Near Bottom CTD cast
- 200 m yo-yo CTD cast at WHOTS-8 Mooring Station
- Various ancillary scientist participant water requests (see last page for list of program components and cruise participant science that was compromised)
- STARS (teachers at sea program) participation decreased from three teachers to one teacher
- PO side of HOT lost a volunteer to staff their shift work due to cruise being delayed; a BEACH team member was substituted in place of the volunteer
- Two full days (August 27th and 28th) of personnel time was lost due to standby status of science party during engine repairs

Operations cancelled due to delays at sea while operating on shortened cruise plan:

- One AC9/FRRf cast
- One Hyperpro cast
- One night time net tow

Operations Completed on the Revised Cruise Plan for HOT 234:

One near bottom CTD casts, thirteen 1000 m, and one 200 m CTD casts were conducted at Station ALOHA.

The free floating primary production array and gas array were deployed and recovered successfully. Both arrays drifted to the northwest of the center of Station ALOHA.

The Gas Array deployed on this cruise contained only a set of method comparison samples on the 5m, 25m, and 45m cubes. Due to the shortened time on station the full depth profile of samples normally incubated for 24 hours insitu on regular HOT cruises was not able to be completed.

Five net tows for the core HOT zooplankton collection were completed, three during the day, and two during the night.

The Hyperpro was deployed and recovered successfully one time near noon.

The optical package ACS/AC9/FRRf/LISST was deployed two times during the cruise, once around noon and once in the early morning.

The ATE was successfully deployed and a trace metal free sample was collected.

The ADCP, fluorometer, and meteorological system ran without interruption during the cruise. The pCO₂ system was not operational during this cruise due to a software malfunction.

As on previous cruises, twists developed in the CTD wire just above the rosette. The CTD had to be detached from the wire several times throughout the cruise to eliminate the twists each time they occurred to prevent damage to the wire.

The Caley winch system malfunctioned during the near bottom CTD cast and the CTD package went into 'freefall' at 4400 m. The winch was emergency stopped by the AB on winch control after it fell approximately ~200 m at 78m/min.

Trouble with the level wind of the Caley winch was also experienced several times throughout the cruise. Failure of the level wind to properly wrap the wire when it got close to the end stop caused bad wire wraps on the drum. The CTD package had to be re-lowered during the up casts of nine (out of fifteen) CTD casts to clear bad wire wraps. This not only delayed CTD operations, but increased the chances of contamination of the water sample in niskin bottles that had already been closed.

Adjustments to the level wind by the engineers did not seem to fix the problem and an AB was put on 'wire watch' to communicate to the winch operator when bad wire wraps occurred and to then help clear them by manually adjust the level wind.

While the cruise was underway, the OTG Director called the ship to inform the scientists working in the OTG radiation van that the most recent swab test results indicated that there were multiple locations in the van contaminated with tritium.

Based on the date of the swab test report, the contamination was a result of use of the OTG radiation van by another science party on a different research vessel prior to the van being loaded aboard the RV *Kilo Moana* for use on HOT 234. The log of daily swipe tests from all users of the OTG Radiation Van prior to its use on the HOT cruise was not able to be located.

The pre-radiation work swipe tests conducted by the scientists (on the afternoon of 08-29-11) using the OTG radiation van were being counted when the phone call was received (morning of 08-30-11). The Director of OTG described areas of the laboratory van that had high levels of contamination and recommended immediate cleaning and re-swiping of these areas. The scientists did as recommended and added the additional swipes to the ones already being counted.

One of the pre-radiation work swipes taken by the scientists from the inside of the laboratory van door came back with a count of 208 dmp. All other pre-radiation work swipes came back at background levels. The inside of the laboratory van door was on the list of sites the OTG Director recommended being cleaned and re-swiped. The second swipe of the inside of the laboratory van door (post cleaning process) came back at background levels as did all other locations recommended to cleaned and re-swiped. No evidence of tritium contamination transfer from the OTG radiation van to the vessel was found.

Winds were from the east throughout the cruise holding at 15-20 knots, with 5 ft seas and partly cloudy skies throughout the trip.

We arrived at Snug Harbor for a partial off-load on September 1st, at 1532 (HST). Total cruise time was 2 days, 20 hours and 17 minutes.

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

The R/V *Kilo Moana* continues to maintain good ship support for our work. Captain Drewry did a good job of keeping the Chief Scientist informed of progress on the rescue boat engine repairs. The Port Operations Manager was very helpful in rescheduling the cruise arrival time.

Technical support during this cruise was good. OTG personnel were not available for the pre-cruise planning meeting, but were available to assist in our work during the cruise.

5. DAILY REPORT OF ACTIVITIES (HST)

August 27, 2011

0650- Chief Scientist arrives at vessel; informed by Chief Mate that rescue boat engine is not working.

0710- Chief Scientist met with Captain Drewry; he has a call in to the mechanic who had previously worked on the engine.

- Engineers had discovered during pre-cruise check out of the boat during loading day (August 26th) that the engine was running rough and had been troubleshooting throughout the day. The fuel line was found to be faulty and during the replacement of the fuel line, the linkage between the carburetors was broken. The back-up engine was removed from storage and mounted on the boat. It was receiving power but not turning over. Further trouble shooting of that engine proceeded until 2200 on August 26th.

0830- Call back from the regular third party mechanic, suggestions to try were all things the engineers had already done. Mechanic not available to come to UHMC, does not work on Saturday. Friends of AB crew member with outboard engine repair shop called to look at engine.

0850- Science party briefing. Captain Drewry brought all science personnel up to date on small boat issues.

0930- Arrival of new third party mechanic.

0948- End of Science party briefing.

1044- Engine reported to be turning over, wire harness swap out with other engine.

1051- Testing small boat in harbor.

1140- Parts needed, mechanic went to his shop to get more parts and called another mechanic to come and help him. Two hours needed to work on suspected carburetor problem.

1235- Boat out of water and on trailer.

1259- Cleaning of carburetor did not work, possible re-build needed at mechanic's shop.

1359- Carburetors back from shop, installation.

1615- Testing boat in harbor. Engine still unreliable, running rough, when engine put in gear sometimes cuts out.

1653- Chief Scientist meeting with Captain Drewry and Port Operations Manager, mechanics want 2 more hours to work on engine, and then will change focus to attempting to make the other engine (with broken carburetor linkage) operational.

1740- Delay departure till 0800 August 28th, science and crew released, Port Operations Manager informs Chief Scientist that it is okay to plan on a late arrival to Snug Harbor, permission from HURL trip Chief Scientist Chris Kelley to arrive 0800 on Sept 1st granted.

August 28, 2011

0700- Captain Drewry says repairs did not go well, tests of engine at 0500 did not show reliability in engine performance. Talks with Sandy Shor and Port Operations Manager about potential to put Honda motor on and sail with that, but it is against Coast Guard Regulations to proceed with that plan. Must have IMO approved engine on an IMO boat.

0815- Release of science and crew, more time needed to work on boat, unknown amount of time to do so. All hands on board 0700 August 29th, departure set for 0800.

1000- Mechanics able to get engine idling well in shop with boat on trailer.

1015- Boat in water for testing, running well. Forceful driving and maneuvers associated with a rescue situation (rapid changes from forward to reverse motion) repeated and engine running well.

1045- Captain Drewry deems rescue boat operational and begins making preparations to get underway at 1300. Ship's crew called back to the ship by Captain, science party called back to the ship by Chief Scientist. All parties to be on board by 1200.

1130- During last 5 minutes of small boat testing, ground connection and spark was lost. Ground was repaired, still no spark. Troubleshooting spark problem, boat on trailer in shop.

1200- Science and crew arrive.

1240- Meeting with mechanics, POM, Captain Drewry, Chief Roy, and Chief Scientist: Unknown amount of time to troubleshoot no spark problem, can be one of three things, need time to isolate. All agreed that it does not make sense to have crew and science wait around again for a maybe departure. Release of crew and science, again. All hands on board at 0700 August 29th.

1330- Talked with POM, mechanics had isolated the part that was preventing the spark from being created, damaged beyond repair. Pulled same part off the other engine, it too was damaged beyond repair. Going to call manufacturer on mainland at 0300 August 29th for distributors list in HI. Call parts shops at 0800 if available on island.

1417- Talked with Captain Drewry via phone call, further thought by POM, Captain and Chief Roy is that part will most likely not be available on island, may have to order from mainland.

1600- Decision made to call/e-mail all science personnel to suggest that they report to land based work positions due to unlikely departure at 0800, still chance for departure.

1654- E-mail sent to POM and Captain Drewry stating at least 54 hours of time is needed for shortened cruise to be worth the effort. If 0800 Sept 1st is the arrival time at Snug, 0200 August 30th departure time is absolute cut off.

August 29, 2011

0730- No contact from mechanics on part availability on mainland or on island

0815- Trevor Young working on part to see if he can fix, Captain Drewry says even if he could fix it, it is already proven to be unreliable and could potentially only be deemed a fix if we were at sea.

0853- Sandy Shor e-mail; coming to Marine Center to talk with UHMC personnel about rescue boat situation.

1050- Met with Captain Drewry, calling Coast Guard to obtain temporary exempt status for rescue boat, put Honda on rescue boat. Engine part is on order, but part will not arrive in time for a shortened HOT cruise to depart. Captain Drewry is waiting for a call back from the Coast Guard with permission to proceed with Honda motor installation.

1130- Captain Drewry tells crew and Chief Scientist that permission from the Coast Guard has been granted for Honda motor installation on rescue boat. Weight of boat, weight of engine removed, and weight of engine being installed all need to conform to specs before installation approved. Coast Guard will need to test and certify the rescue boat operable once installation of Honda motor is complete.

1145- Chief Scientist called Sandy Shor to ask for late arrival time on Thursday September 1st to increase science time at Station ALOHA. This would provide necessary information for ancillary science to make decisions on staying for the potential shortened cruise, or departing and time to change flight schedules.

1204- Call back from Sandy, late arrival on Thursday okay with him. How late needs to be negotiated with Ross and Chris Kelley.

1215- Talked with POM about late arrival time on Sept 1st. He called Chris Kelley and all parties agreed on 1400 arrival time at Snug Harbor would be okay for the Kelley trip to mobilize in time for their departure at 0800 Sept 2nd. Kelley trip cannot be moved due to inspection of KM for its scheduled trip to Lau Basin.

1300- Called Captain Drewry to inform him of permission for 1400 arrival time on Sept 1st, making absolute departure time for 54 hour cruise 0800 on August 30th.

1530- Honda motor installation going well, testing of engine and boat in water within the hour.

1545- Small boat in water, testing scheduled till 1622.

1622- Boat deemed reliable and operational, plan to depart Snug Harbor 1900, science and crew on board by 1800.

1800- Science and crew on board

1900- Ship departs Snug Harbor

1945- Captain Drewry's briefing and small science meeting

August 30, 2011

0430- Arrive Station ALOHA

0447- Weight cast to 1000 m

0515- End of weight cast

0551- S2C1 200 m CTD cast

0635- End of cast

0640- Transit to pump ship's tanks

0750- S2C2 1000 m CTD cast

0910- End of cast

0920- ATE

0950- ATE on deck

1005- Net Tow

1035- End Net Tow

1040- Net Tow

1050- Captain asks Chief Scientist to look into rumors he heard about a spill in the OTG radiation van.

-Swipe tests were conducted in the OTG Radiation Van by Katie Watkins-Brandt before any radioisotope use for the HOT cruise began. They were taken the afternoon of 08-29-11 and only 14C was to be used in the OTG radiation van during the HOT cruise.

While these swipes were being counted, (morning of August 30th) Dan Fitzgerald, Director of OTG, contacted the ship via satellite telephone with the results of a recent swab test of the OTG radiation van that showed significant tritium contamination of the van from its prior use aboard a cruise on the RV KOK. The report referred to in the telephone call was circulated to the Captain and ship's crew under the 'right to know' policy.

Katie immediately cleaned and re-swiped the areas that Dan listed from the report and added them to the pre-radiation work swipes being counted. These were areas inside the van on the lab benches, the inside of the van doors, and the floor of the van. The deck of the ship outside the van door was also swiped to rule out spread of radioactivity around the vessel.

One of the pre-radiation work swipes (from the inside of the lab van door) came back with a count of ~208 dmp. The second swipe taken from the inside of the door (after cleaning process) came back with background level counts. All of the other swipes from locations in the laboratory van were at background levels.

No evidence of tritium contamination from the van onto the vessel was found. The Captain asked the Chief Scientist to send an e-mail to him stating the above so that he could forward it to the crew and set people's minds at ease.

1110- End Net Tow

1111- S2C3 1000 m CTD cast

1208- At 205 dbar, package had to go back down to adjust level wind

1218- Cable winding issue resolved

1236- End of cast

1245- Transit to pump ship's tanks

-Tanks filled quickly due to flow through instrumentation being used in a sink that did not allow drainage flow to be diverted overboard. Optics casts were cancelled to allow time for pumping the tanks and to keep the burst CTD period intact.

1353- S2C4 1000 m CTD cast

1452- Level wind issues on up cast, package sent down to 222 dbar to clear

1455- Level wind issue resolved, package on way back up

1532- End of cast

1651- S2C5 1000 m CTD cast

1759- Level wind issues at 223 dbar

1822- End of cast

1830- Transit to pump tanks

HOT-234 Chief Scientist Report

1950- S2C6 1000 m CTD cast
2123- End of cast
2200- Net tow
2230- End net tow
2250- S2C7 1000 m CTD cast
2344- Level wind issues at 210 dbar on up cast
2248- T, S, O₂ sensor drop out at 200 dbar on up cast. Bad signal in primary and secondary sensors; restored at 175 dbar.

August 31, 2011

0018- End of cast
0030- Net Tow
0100- End net tow
0157- Method Comparison Gas Array Deployment 22° 45.523'N 157° 59.012'W
0217- S2C8 1000 m CTD cast
0306- Level wind issue at 220 dbar on up cast. Heave compensation off, manual wind of wire to bring package on deck
0330- End of cast
0345- AC9/FRRf
0430- AC9 on deck
0455- Begin PP array deployment
0510- Array released 22° 43.590'N 157° 58.683'W
0520- S2C9 1000 m CTD cast
0545- Package stopped at 300 dbar to look at sensor traces
0645- Bad fluorometer trace
0656- End of cast, ISUS looked noisy.
0705- Transit to pump tanks
0808- S2C10 1000 m CTD cast, fluorometer drop out at 340-125 dbar of up cast, ISUS noisy.
0920- End of cast
1002- Net tow
1030- End net tow
1052- S2C11 1000 m CTD cast - traces look normal.
1213- End of cast
1226- Hyperpro
1241- End Hyperpro
1312- AC9/FRRf
1346- AC9/FRRf out of the water
1402- S2C12 1000 m CTD cast
1503- O₂ glitch, noisy Salinity @450 dbar of up cast
1505- All stop at 210 dbar of up cast to fix bad wire wraps on winch
1530- End of cast
1540- Hand net tow
1553- Transit to pump tanks
1708- S2C13 1000 m CTD cast
1758- Slow winch speed at 238 dbar of up cast due to bad wire wraps
1818- End of cast
1848- PP array recovered 22° 46.544'N 158° 3.949'W
1954- S2C14 1000m CTD cast
2057- Stop at 210 dbar of up cast due to poor wire wraps on the winch
2100- Captain finds Chief Scientist and says he needs another hour prior to arrival at the Sea Buoy for gear testing. After double checking transit times with the bridge, Captain and Chief Scientist agree on a
HOT-234 Chief Scientist Report

0230 departure time from Station ALOHA. Chief Scientist cancels a night time net tow to obtain the extra 30 minutes needed to depart station earlier than planned.

2120- End of cast

2228- Gas Array Recovered 22° 48.481'N 158° 6.482'W

2245- APEX Float deployed 22° 48.397'N 158° 6.245'W

2248- Chief Scientist calls Captain in stateroom to inform him that delays with the winch level wind and array recovery have pushed back operations and the deep CTD cast will still be in the water at 0230, the newly scheduled departure time. Permission from Captain was granted to proceed with the near bottom CTD cast (despite time constraints).

2334- S2C15 Near Bottom CTD cast

September 1, 2011

0102- Winch in free fall at 4400 dbar of down cast and was emergency stopped by winch operator; speed was 78 m/min

0105- Captain and Chief Engineer alerted to winch free fall

0118- Package on way back down again, slowly (20 m/min) no heave comp

0141- Package 10 m off the bottom, 4804 dbar. 22° 45.024'N 158° 0.067'W

0157- Up cast speeds holding at 30m/min, no heave compensation

0200- Bad wire wraps at 4300 dbar of up cast

0231- Bad wire wraps at 3330 dbar of up cast

0302- Bad wire wraps at 2312 dbar of up cast

0408- End of S2C15

0412- Transit to Snug Harbor

0730- Stopped for test weight cast

0830- Underway for Snug Harbor

1532- Arrive Snug Harbor, total cruise time = 2 days, 20 hours, and 17 minutes.

HOT program sub-components:

Investigator	Project	Institution
*Matt Church	Core Biogeochemistry	UH
Dave Karl		
Bob Bidigare		
*Roger Lukas	Hydrography	UH
*Mike Landry	Zooplankton dynamics	SIO
*Ricardo Letelier	Optical measurements	OSU
Ancillary programs:		
Charles Keeling	CO ₂ dynamics and intercalibration	SIO
Paul Quay	DI ¹³ C	SIO
*Matt Church	Diversity and activities of nitrogen-fixing microorganisms	UH
Various CMORE PI's	Microbial RNA/DNA collection	UH/CMORE
Additional programs:		
Dave Karl (via Sam Wilson)	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide	UH/Moore
Matt Church (via Shimi Rii)	Investigation of temporal changes in picoeukaryote diversity at Station ALOHA	UH
Matt Church (via Donn Viviani)	Bacterial production and EOC at Station ALOHA	UH
Henrieta Dulaiova and Ken Buesseler	Japanese radionuclide release sampling	UH
Matt Church/Dave Karl (via Sam Wilson)	Nitrogen Fixation methodology comparison	UH
*Dave Karl (via Jim Foley)	Science Teachers Aboard Research Ships (STARS)	UH
*Angel White (via Katie Watkins-Brandt)	Size fractionated rates of primary productivity and flow through LISST and ACS optics.	OSU
*John Zehr (via Anne Thompson and Brandon Carter)	UCYN-A ecology	UCSC
Grieg Steward (via Elisha Wood-Charlson)	Diversity of cyanophage tail fiber genes	UH
Grieg Steward (via Chris Schwarz)	Viral Concentrates from 75 m and 125 m water	UH
Ed Laws (via Scott Grant)	Surface seawater collection for making media	UH
Dave Karl (via Mariona Segura Noguera)	Nitrite profile at Station ALOHA and cell specific elemental stoichiometry of trichomes	UH
Karin Björkman)	ATP hydrolysis in seawater	UH

*Denotes HOT program sub-components, ancillary programs and additional programs that were compromised due to decreased amount of science time at Station ALOHA.