HOT-24: Chief Scientist Report

Chief Scientist: D. KARL

Personnel List

David M. Karl, Chief Scientist
Dale Hebel
Ricardo Letelier
John Dore
Terrence Houlihan
Marc Rosen
Luigi Possi
Jef Snyder
Toshiaki Shinoda
Chris Sabine
Fernando Santiago-Mandujano
Dan Sadler

Summary

A summary of some of the problems during Hot-24 aboard the Alpha Helix. This cruise was performed in near gale force conditions, 18 ft. seas and 30 Knt. Winds. As a result, only a fraction of the usual Hot data was obtained. It can be said here that it was fortunate that nobody was hurt and little equipment damage occurred.

No operations were performed at night. This was requested the first night by the scientific watch due to the apprehension of water sampling on the rear deck and the safety of personnel during CTD recoveries. The second night operations were going somewhat smoother and it was agreed upon by the scientific party to attempt working through the night, however, the captain secured all operations on the back deck after witnessing his first recovery (one of the better ones) due to safety reasons.

A total of 7 hydrography casts were made including the deep cast down to 4500 meters. Duplicate salinity samples were taken on 3 casts for lab intercomparison. XBT measurements were made on the transit back with little problems. Meteorological observations were made as perusal.

Here is a cast by cast summary of the CTD casts.

Kahe point;

Winch failed at 1000 meters during weight cast, one of the hydraulic hoses blew. Fortunately, ships crew was able to repair it and retrieve the weight. It was decided at this time to use the Alpha Helix winch with the single conductor. The change over was to be performed during transit to station ALOHA, this took about 6 hours.

Station 2 cast 1;

Rosette landed hard on deck during recovery. It was noticed that during the 1000 meter cast that it was difficult to maintain a minimum of 200 lbs. of tension during decent at a rate of 30 meters/minute. It was decided to add an additional 200 lbs. of lead on to the rosette.

Station 2 cast 2;

Rosette hit side of ship and A frame violently several times during recovery. Several bottle spigots were broken of
f but no other damage.

Station 2 casts 3 and 4;

No problems.

Station 2 casts 5;

Lost CTD signal at 1000 meters. This happened when bridge meandered ship to reduce the 400 meter wire angle. The cast was being performed with following seas and the ship sailing down wind at approximetely 4 knots. Without any advice or consultation from the CTD lab the bridge decided to turn the ship into head seas to try and reduce the wire angle. This caused the CTD to start descending over 60 meters/minute. I believe the rosette started tumbling at this point and this put stress on the conductor where it comes out of the hydro cable and is taped to the rosette frame causing the conductor break.

Station 2 cast 6;

Bad salinity spiking caused by exhaust plumbing being torn from the tie wrap fastener and kinking, allowing little water to flow. Oxygen is also noisy. This plumbing malfunction has never happened before. I believe the problem occurred during the deployment of the rosette with the ship traveling too fast, thereby causing the package to "skip" across the water surface. I taped the plumbing more securely to the rosette frame for the next cast.

Station 2 cast 7;

Deep cast. Again salinity spiking, this time more severe, but no oxygen spiking. This may be a problem with the conductivity cell. I inspected the cell after the cast but found no apparent problems with it. I recommend sending it to Sea Bird for inspection and a calibration. Upon recovery, three bad kinks were in the sea cable about three meters above the rosette. I believer this was caused by the package being passed by the sea cable then pulling tight. CTD signal was maintained during entire cast.

Recommendations for WOCE hydrographic sampling aboard the Alpha Helix.

1) Not attempting any CTD casts in 25 knots or more of wind due to the station keeping abilities of the Alpha Helix. Also seas of 15 feet or more makes it unsafe for work off the fantail.

2) A safer, more stable way to deploy and recover the rosette off the fan tail, perhaps like the way SIO does with hanging a weight below the package. I believe we have all the hardware available to do this. This will also allow the package to be wheeled off the fantail as much as possible.

3) The use of the WOCE hydrographic winch. I believe that the weight of the 7/16 cable may be too much for our applications, unless we put much more additional weight on our package.

4) Training of ship crew and brdige so they can adapt to our needs.

5) XBT's off of the 02 deck. Waves washing into the fantail can be up to your waist, making for a dangerous situation. Also using the shipboard thermosalinograph for the SST measurements during XBT's.