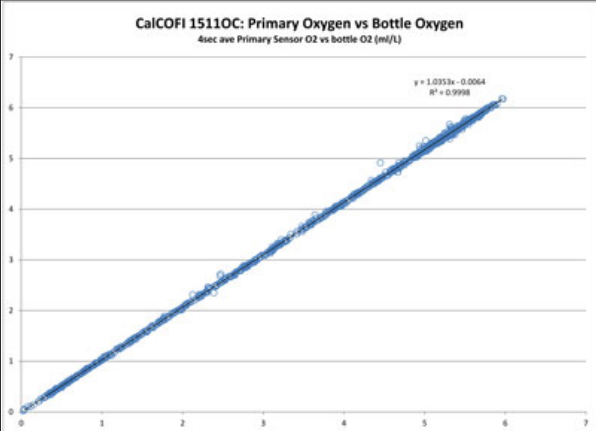
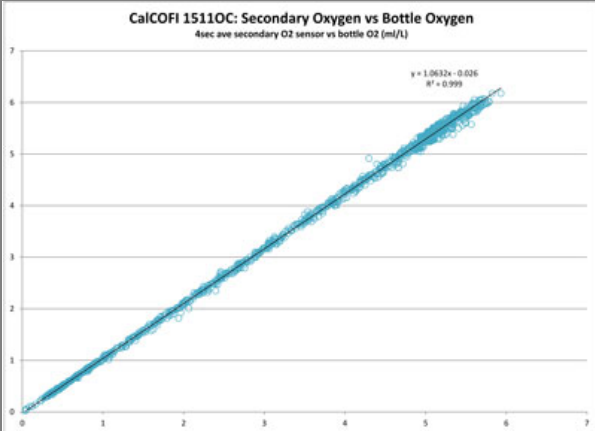
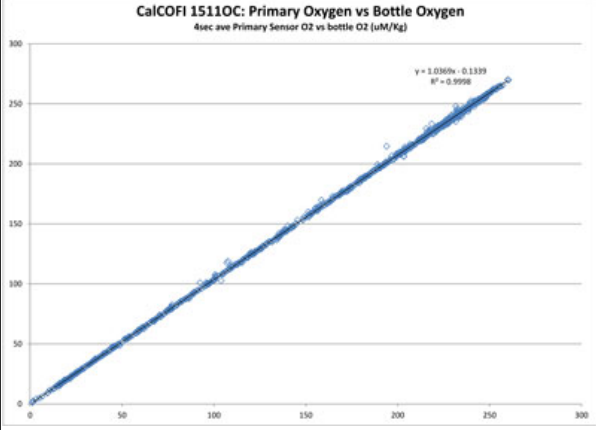
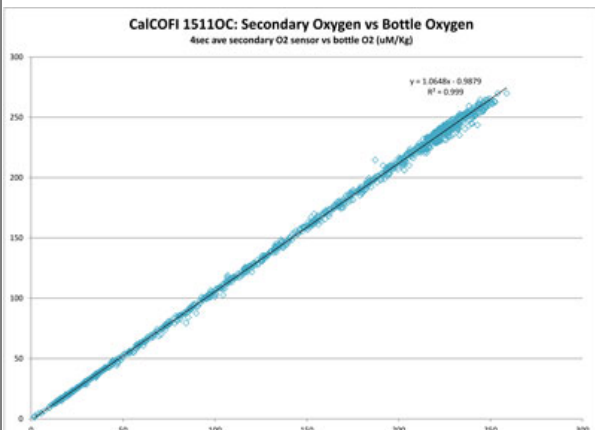
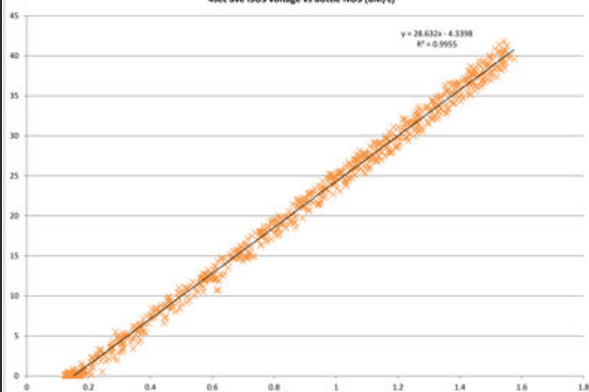


Parent Category: 2015 Cruises (/cruises/2015-cruises.html)  
Category: CalCOFI 1511OC (/cruises/2015-cruises/calcofi-1511oc.html)  
Last Updated: 10 March 2017

CTD Processing Summary CalCOFI 1511OC CTD Final Data		
Download 1511OC CTD raw cast files zipped ( <a href="http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDCast.zip">http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDCast.zip</a> )  There was a 03Dec update to the raw cast files.		Download 1511OC FinalQC CTD + bottle data ( <a href="http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDFinalQC.zip">http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDFinalQC.zip</a> ) Note: near surface sensor data on casts 16 & 17 are bad. A faulty cable was replaced on cast 18. Also there were "pump off" issues at the start of casts 019-021.
<b>General CTD Notes</b> - data acquisition notes, logistics, processing - see below. <b>Please note that these regressions are generated from CTD vs final bottle data</b> after reprocessing with final bottle data. CTD temperatures and salinities do not usually change but oxygen, estimated chlorophyll-a, estimated nitrate may have changed significantly after point-checking. Questionable or mistrip bottle data are removed from these comparisons; questionable or bad CTD data may be visible on the CTD.csv plots but have been flagged with quality codes. For this cruise and future cruises, both primary & secondary sensor profiles vs bottle data have been generated and archived in the downloadable CTD+Bottle data files ( <a href="http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDFinalQC.zip">http://cappuccino.ucsd.edu/downloads/2015/20-1511OC_CTDFinalQC.zip</a> ). These plots are under the "csv-plot\Primary" & "csv-plot\Secondary" subdirectories; regression plots are in the metadata directory.  CTD sensor corrections derived by comparing CTD sensor data, 4sec average prior to bottle closure, to bottle samples		
Dual T, S, & O2	Primary Sensor	Secondary Sensor
Salinity offset (bottle - CTD salinity; > 350m only; Seabird SBE4)	-0.00235	0.00061
Oxygen ml/L (dual Seabird SBE43)	$y = 1.0353x - 0.0064$ $R^2 = 0.9998$	$y = 1.0632x - 0.026$ $R^2 = 0.999$
Oxygen umol/Kg (dual Seabird SBE43)	$y = 1.0369x - 0.1339$ $R^2 = 0.9998$	$y = 1.0648x - 0.9879$ $R^2 = 0.999$
Single sensors	Linear	Polynomial
Nitrate - ISUS 4sec ave voltage vs Bottle Nitrate (Satlantic MBARI-ISUS v2)	$y = 28.632x - 4.3398$ $R^2 = 0.9955$	Please note: the ISUS was rebuilt prior to this cruise so early data may display lamp "burn-in". Sta-corrected estimated nitrate should be good.
Fluorometer - linear & polynomial regressions	$y = 7.9809x - 0.2728$ $R^2 = 0.7837$	$y = 26.251x^2 + 1.9787x - 0.0356$ $R^2 = 0.829$
		
<a href="http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox1MLvsOxBML.jpg">http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox1MLvsOxBML.jpg</a>		<a href="http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox2MLvsOxBML.jpg">http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox2MLvsOxBML.jpg</a>
		
<a href="http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox1UMvsOxBUM.jpg">http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox1UMvsOxBUM.jpg</a>		<a href="http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox2UMvsOxBUM.jpg">http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_Ox2UMvsOxBUM.jpg</a>

CalCOFI 1511OC: ISUS Voltage vs Bottle Nitrate

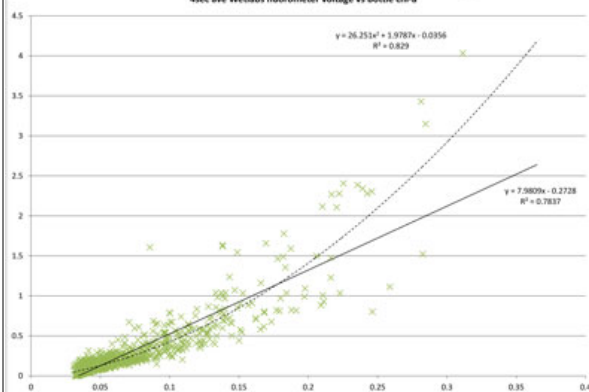
4sec ave ISUS voltage vs bottle NO3 (uM/L)



([http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC\\_ISUSVsNO3.jpg](http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_ISUSVsNO3.jpg))

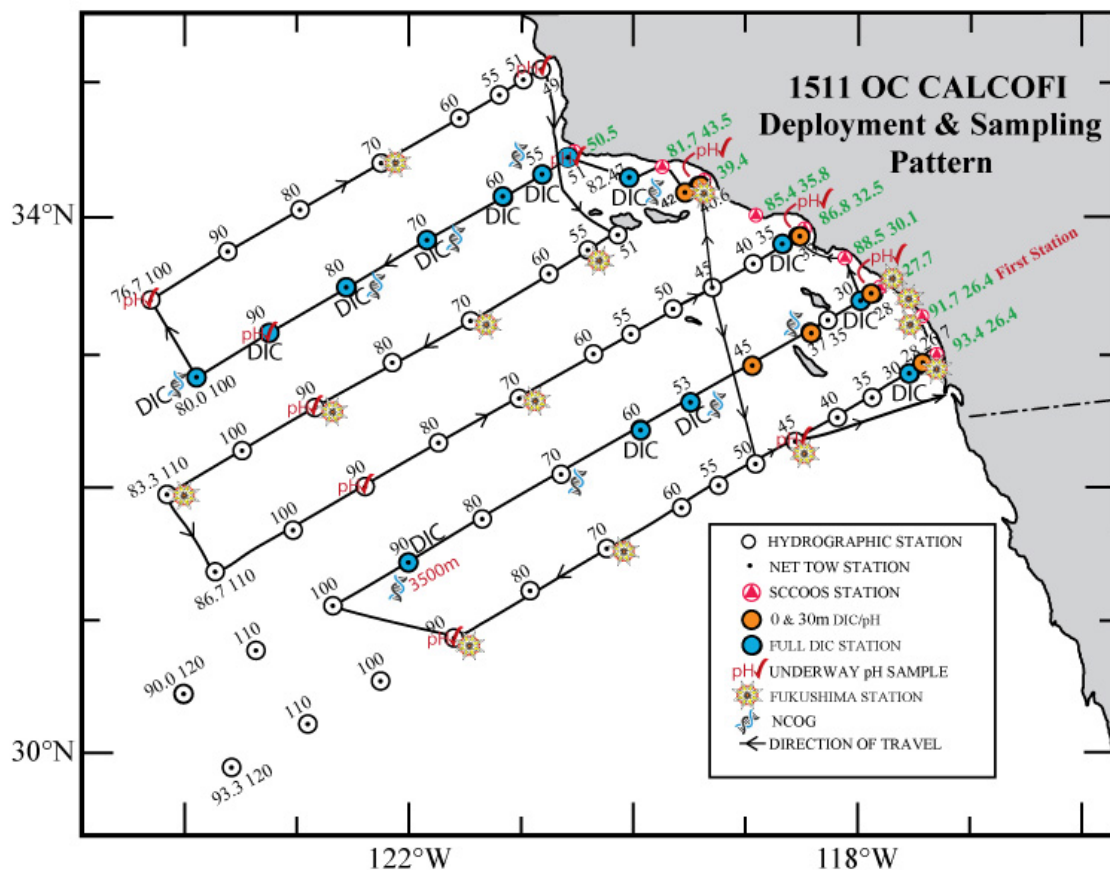
CalCOFI 1511OC: Fluorometer Voltage vs Bottle Chlorophyll-a

4sec ave WetLabs fluorometer voltage vs bottle chl-a



([http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC\\_FIVvsChla.jpg](http://cappuccino.ucsd.edu/downloads/2015/1511OC/1511OC_FIVvsChla.jpg))

## General notes: These are cast & final CTD Processing Notes from 1511OC cruise



## CalCOFI 1511OC General Cruise & Cast Notes:

**Stations and Station Order:** this cruise occupied 68 stations: 60 standard, & 8 SCCOOS. The station order was significantly influenced by bad weather which was prevalent throughout the cruise. Five stations, three on line 93.3 and two on line 90.0, were dropped completely: 93.3 100 110 120 & 90.0 120 110 - see map above. The stations were reordered to allow station work to continue, maximizing ship-time utilization.

Although 70 CTD casts were performed, two casts were replicates of casts done earlier in the cruise. During rough weather, nets were not deployed on stations 93.3 45 or 86.7 45. These missing tows were recovered during the transit home. But since there was a gap of several days between the original CTD cast and the recovered net tows. New CTD casts/profiles were done on both stations but without seawater sample collection. The CTD profile-only casts were casts 068 (86.7 45) & 070 (93.3 45). Cast 069, station 93.3 50, was also missed earlier in the cruise because of bad weather and occupied during the transit home. This was a complete station with CTD profiles, bottle-samples, and all net tows. It should also be noted that cast 070, the last station was CTD profile-only. There was a deck unit failure at ~440m of the downcast which was not repaired or retried. Cast 070 was sta 93.3 45 which had a complete CTD cast earlier in the cruise. This partial cast was deep enough for NOAA Fisheries to compare to the net tows.

The Pt Dume SCCOOS station at 85.4 35.8 was not occupied since we transited from 86.7 45.0 north during rough seas. Significant ship-time would have been required to pick it up later.

## CTD General Notes and Problems:

The CTD configuration throughout the cruise was standard: Seabird 911+ (new pressure case since 1501) with dual T, C, O2, & pumps; Wetlabs C-Star 25cm transmissometer; Biospherical QSP200L PAR; Datasonics/Benthos Altimeter; WET Labs ECO-AFL/FL; Seabird SBE 18 pH, fresh from Seabird so pH data should be useable; Satlantic ISUS v2, new lamp AND spectrophotometer (\$6600) & Wetlabs (custom) batteries. Please refer to the xmlcon files or cruise prospectus for additional info & metadata. Other than the failure of the pump/conductivity cable on casts 16 & 17 and the primary oxygen sensor on casts 19-21, all the sensors worked well. Even with the new cable on the C-Star transmissometer, on the 3500m deep cast, the transmissometer data acquisition stopped at 2010m. The low voltage spikes reoccurred repeatedly at depths below 400m on all subsequent downcasts. The Satlantic ISUS nitrate sensor lamp and spectrophotometer were replaced prior to this cruise, just barely arriving in time to make the Newport-bound semi. Preliminary data look good when plotted versus bottle NO3 data. The ISUS was mounted vertically, with optics pointing down.

There was a gradual failure of the primary conductivity sensor cable starting at station #16, 90.80, after the 3500m deep cast (#15). This gradual failure was not easily detected because the conductivity value looked fine onscreen when displayed at 1sec. But an interruption of primary conductivity causes the pumps to shut off. During the 10m-2min precast soak, the pumps came on but when brought back to surface to start the cast, the pumps shut off. This problem was not identified until cast #18, when the pumps switching off was detected by DMW & JRW. JRW servicing the pump cables appeared to fix the problem but it reappeared on cast #19. It took several launch and recoveries before the bad conductivity cable was finally pinpointed as the reason for the pumps shutting down.

On cast 16, the pumps stayed on after ~34m on the downcast then shut off at ~5.7m on the upcast. On cast 17, the pumps did not come on till ~53m on the downcast but stayed on till landing on deck. Cast 18 was good and cast 19 was delayed by ~4.5hrs while troubleshooting was performed. There were some issues with the backup oxygen sensor installed during troubleshooting on the following casts, 19, 20, & 21. The problem was cured pre-cast 22 by re-installing the original primary oxygen sensor. Please use bottle data or secondary CTD oxygen sensor data on casts 19-21.

**Logistics:** CalCOFI 1511OC was CalCOFI's second cruise on OSU R/V Oceanus. Two-day loading and setup were performed at OSU's ship facilities in Newport, Oregon. CalCOFI techs transported gear in bins to 10th Ave Marine Terminal Oct 19th, loaded the gear onto a semi-truck Oct 21st, flew to Portland and drove to Newport Oct 22nd. The truck arrived, and was met and offloaded Oct 23rd at OSU Ship Operations pier. Since we sailed in July, loading and setup was fast although martech Daryl was sorely missed. RV Oceanus' two-conductor termination, deck unit, CTD computer, and depth-readout box were used with SIO-CalCOFI's 24-bottle CTD-Rosette. There were no issues with the conductive wire. The previous problem with the CTD continuity interruption during hydro winch (CTD winch 2) operations was not tested. One new (to CalCOFI) AB, Patrick, was on this cruise, was extremely helpful, and performed all ops well considering the weather. AB's Doug and Mark, both who sailed with use in July, were the other watch-standers. The new martech, Andrew, was helpful but trouble-shooting ship-related issues like the phone system and not out on deck much. Also his continual rebooting of the ship's DNS router caused reoccurring networking issues with the GPS-Event Log, sample log to dataserver, data acquisition workstations to data server. Revisions of SIO-CalCOFI software is deemed necessary to improve reliability. Also running our own independent data subnet will be reimplemented on RVs Lasker, Shimada, and Sally Ride.

Note: SIO-CalCOFI CTD-Rosette was running on R/V Oceanus CTD system - deck unit, dual-screen computer, remote-depth readout via serial com port, GPS via serial com port. Seasave data acquisition had to be restarted often to handshake properly with GPS NMEA or else it would timeout. This was the only issue, other than going offline when the 2nd winch was operating, noticed with the Oceanus deck unit hosting our 911+. Our seasave screen display configuration was used and coefficients were imported.

RV Oceanus prefers to keep the Knudsen 12kHz echosounder on at all times while at sea, continually mapping the bottom depth.

#### Cast Notes:

Please note that oxygen values on casts 16-21 have issues. Secondary upcast oxygens may be best but refer to the CTD oxygen data quality code. Values derived from bad or questionable oxygen sensor data have been deleted.

Cast 01 - 02: no issues reported on Console Ops.

Cast 03 - trigger #1 lanyard released but did not throw all the way, no seawater from 58m; trigger serviced post-cast

Cast 04 - 93.3 28.0: deck unit powered on at surface (scrambling, back-to-back stations); soaked for 4mins before returning to surface and data acquisition started.

Cast 08 - 93.3 45.0 rough seas already; CTD okay but nets cancelled

Cast 09 - sta 93.3 55 - sta 93.3 50 was bypassed after sea conditions were assessed and determined too rough

Cast 11 - ISUS not charged between stations, sensor worked fine; moderate seas

Cast 12 - JRW/JLW split watch cast - extra marker at 87m, deleted before backed up

Stations 93.3 100, 110, 120 & 90.0 120, 110 dropped because bad weather was forecast

Cast 15 - sta 90.90 weather calm; 3500m deep cast: no PAR, pH or ISUS data - sensors removed due to pressure ratings. At 2010m downcast transmissometer went out - came back at ~600m on upcast. CESL tablet was switched and misconfigured, writing to 1507. Lots of market and Humboldt squid around the CTD boom during the cast.

\*Cast 16 - large spikes noted and "9000" surface salinity noted by JLW on console ops. Dololids prevalent and suspected of biofouling. \*pump off problem rears its ugly head but is not recognized

\*Cast 17 - DMW noted "clogged CTD suspected or connectors need regreasing". \* pumps off problem not identified

\*Cast 18 - DMW mentioned spikeyness at the 1600 watch change; CTD recovered and pump connectors serviced, CTD redeployed and worked fine the whole cast. Pump problem identified and "fixed" (but only temporarily).

\*Cast 19 - JRW deployed and redeployed the CTD, experiencing the same pumps-on then off issues seem on cast 18. Pump cables regreased & serviced - redeployed; replaced pump cable - redeployed; (pumps tested in bucket - working fine on deck); primary pump replaced - redeployed; (vertical nets tows done while waiting); primary-only rigged - redeployed; Oceanus pump attached (single only) - redeployed; FINALLY a complete failure of primary conductivity, noticed a value of -99 in conductivity not previously seen, replaced the primary conductivity sensor - redeployed - still the pumps went off(!); replaced primary conductivity cable - redeployed - WORKED! Tried to undo all that I had undone so only the conductivity cable was different. But kept the replacement primary conductivity sensor on. But primary O2 sensor SN 1590 reading really low - coefficients misconfigured - fixed post-cast; still bad - possible plumbing disconnect during troubleshooting, use secondary sensor data.

Cast 20 - continual issues with primary oxygen SN 1590, use secondary sensor data first although primary T & S look okay.

Cast 21 - continual issues with primary oxygen, use secondary sensor data first although primary T & S look okay.

Cast 22 - primary oxygen switched back to SN 0680; backup SN 1590 removed; primary oxygen profile looks good again. Winds gusting to 33kts and rainy at start of station (during prep), down to 19kts at end of cast - squall?

Cast 28 - bottle #6 mistripped, sent back down to 19m

Cast 30 - Santa Monica Basin, ~740m, CTD to 730m; transmissometer dropped out at 410m on downcast

Cast 31 - no upcast data, data acquisition started at terminal depth; extremely rough conditions (worse than 93.50) but CTD deployed, down slow, recovered; AB Mark on winch nervous so Martech Andrew helped recover manning center line. Heading shoreward to calmer seas post-cast.

Cast 32 - 83.3 39.4, ISUS not plugged in, connector seems okay - retrieved and cleaned by JLW, no ISUS data

Cast 33 - 34 - no ISUS data, faulty battery connector since SCCOOS cast 32

Cast 35 - new battery (C) installed by DMW, ISUS working.

Cast 36 - 81.8 46.9 Santa Barbara Basin station; moderate-rough seas, wind 23+kts gusts to 29Kts, 6-7ft waves

Cast 38 - ISUS battery not connected, connector eroded away; new battery installed post-cast by DMW. JRW repaired the bad connectors on both batteries - installed new integrated battery pack into case.

Cast 39 - CTD sent back down to get missed 230m bottle, yo-yo'd on upcast

Cast 43 - no nav file created so one was built post-cast from mrk bottle 1

Cast 44 - deck pr getting high so -0.100 added to offset; phone system offline, using radios, Andrew is fixing it & rebooting DNS

Cast 48 - cleaned trigger #6 pre-cast - sticky; up & downcast different - internal wave?; transmissometer worked till ~504m downcast

Cast 49 - transmissometer dropped between 470-515m; missed the 100m bottle so after 85m bottle, the CTD returned to 100m; bottle 11 = 85m bottle 12 = 100m

Cast 53 - network offline after station ie Andrew installing new power supply/UPS

Cast 54 - light rain

Cast 58 - pr spike seen by Mark at 25m on upcast - spiked to 125m, seems okay; squid; 60m mixed layer

Cast 61 - 4m swell; extra marker @#8/170m; edited before backed-up

Cast 65 - yo-yo'd twice (fatigue setting in?) missed 440m bottle so went down after 380m bottle closure then bypassed 320m to 270m but went back down without bottle trip so no change except bottles 2 & 3 are inverted.

Cast 66 - lanyard #11 stuck in lid of #12; all samples except O2s drawn from bottom valve

Cast 68 - sta 86.7 45 reoccupied for nets, CTD profile only to provide net tow-related profile; no bottles closed or samples collected

Cast 69 - sta 93.3 50 missed due to bad weather, picked up several days later; complete station

Cast 70 - sta 93.3 45 reoccupied for nets, CTD profile only. Power surge or ??? caused bottle #4 trip on-screen (no mouse clicked), upon recovery bottle #17 was closed (?). Also something caused the deck unit fuse to blow at 440m on downcast, cast was aborted but data from 0-440m was saved, plots printed and archived. Blown fuse was not discovered until later, by Andrew. Will check out our 911+ & deck unit at SIO prior to 1601RL.

#### **File notes:**

##### **08Mar2017 update to 20-1511OC\_CTDFinalQC.zip file:**

Seasoft-generated asc-hdr files are available renamed to 20-1511OC\_LLLLSSSS\_###d or u.asc & .hdr. Voltages in the .asc files were also relabeled. Since this makes it difficult to reprocess & merge with bottle data if necessary, the original .asc, .hdr, & .btl have also been archived. Their voltage header labels have not been changed so refer to the corresponding .hdr file for sensor configuration. This cruise did not have any sensors rearranged.

#### **Mislabeled found and corrected:**

No stations are believed to have been mislabeled in the header.

04Dec2015