

# CalCOFI 1604SH

## 1604SH CTD Final Processing (/cruises/2016-cruises/calcofi-1604sh/658-1604sh-ctd-final-processing.html)

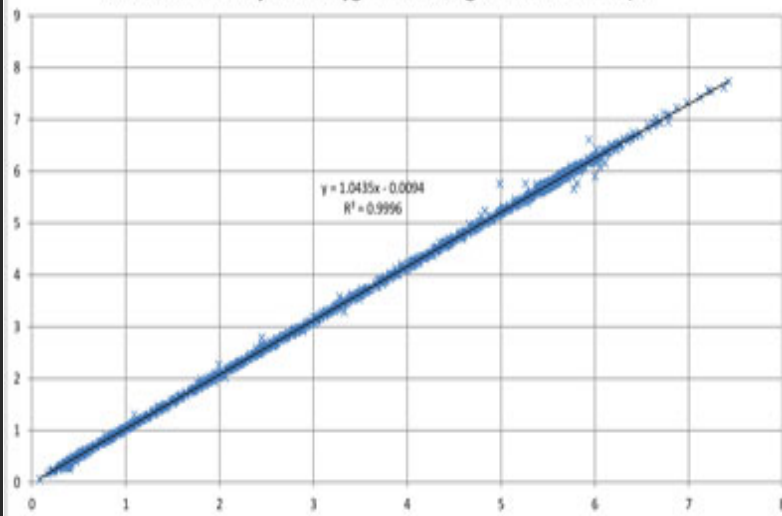
Parent Category: 2016 Cruises (/cruises/249-2016-cruises.html)

Category: CalCOFI 1604SH (/cruises/2016-cruises/calcofi-1604sh.html)

📅 Last Updated: 28 August 2017

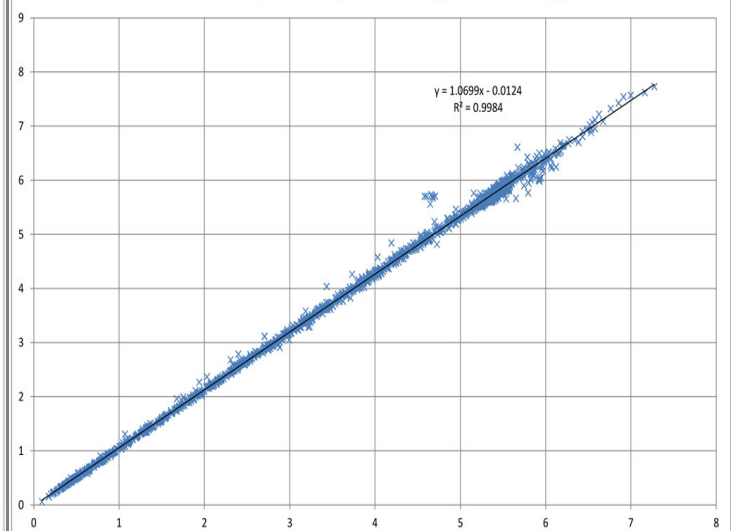
CTD Processing Summary CalCOFI 1604SH CTD Final Data		
Download 1604SH CTD raw cast files zipped ( <a href="http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDCast.zip">http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDCast.zip</a> )	Download 1604SH FinalQC CTD + bottle data ( <a href="http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDFinalQC.zip">http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDFinalQC.zip</a> )	
<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 and 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 will be generated and archived in the downloadable CTD+Bottle data files ( <a href="http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDFinalQC.zip">http://cappuccino.ucsd.edu/downloads/2016/20-1604SH_CTDFinalQC.zip</a> ). These plots are under the "csv-plots\Primary" & "csv-plots\Secondary" subdirectories.		
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)	-0.0011	0.0035
Oxygen ml/L (dual Seabird SBE43; 2° O2 Calib Off)	y = 1.0435x - 0.0094 R² = 0.9996	y = 1.0699x - 0.0124 R² = 0.9984
Oxygen umol/Kg (dual Seabird SBE43; 2° O2 Calib Off)	y = 1.045x - 0.3165 R² = 0.9996	y = 1.0715x - 0.4439 R² = 0.9984
Single sensors	Linear	Polynomial
Nitrate - ISUS 4sec ave voltage vs Bottle Nitrate (Satlantic MBARI-ISUS v2)	y = 30.332x - 1.062 R² = 0.9921	
Fluorometer - linear & polynomial regressions	y = 11.175x - 0.4098 R² = 0.829	y = 10.116x <sup>2</sup> + 6.6184x - 0.1787 R² = 0.8574

1604SH: Primary CTD Oxygen 4-sec avg vs Bottle O2 mL/L



(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-Ox1vsOxBmL.jpg>)

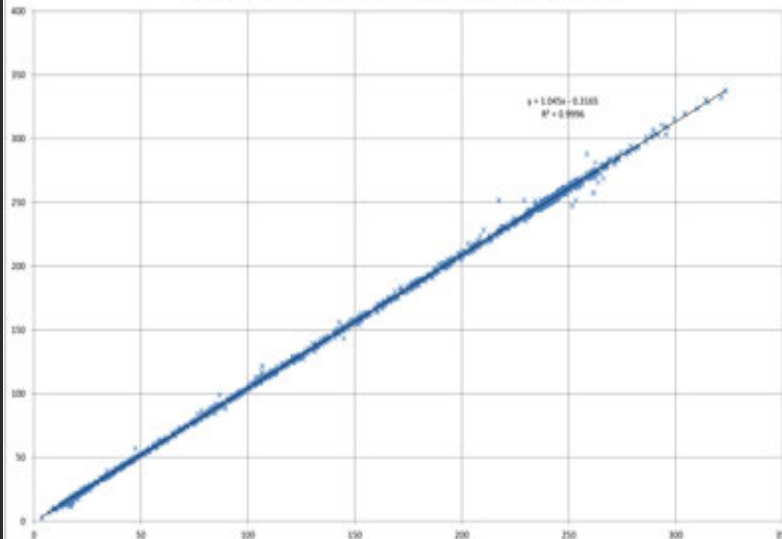
1604SH: Secondary CTD Oxygen 4-sec avg vs Bottle Oxygen mL/L



(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-Ox2vsOxBmL.jpg>)

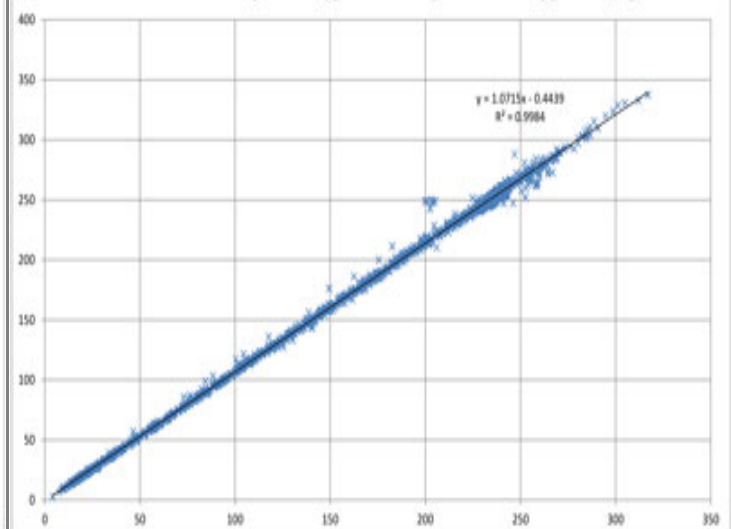
(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-Ox1vsOxBkg.jpg>)

1604SH: Primary CTD Oxygen 4-sec avg vs Bottle Oxygen uM/kg



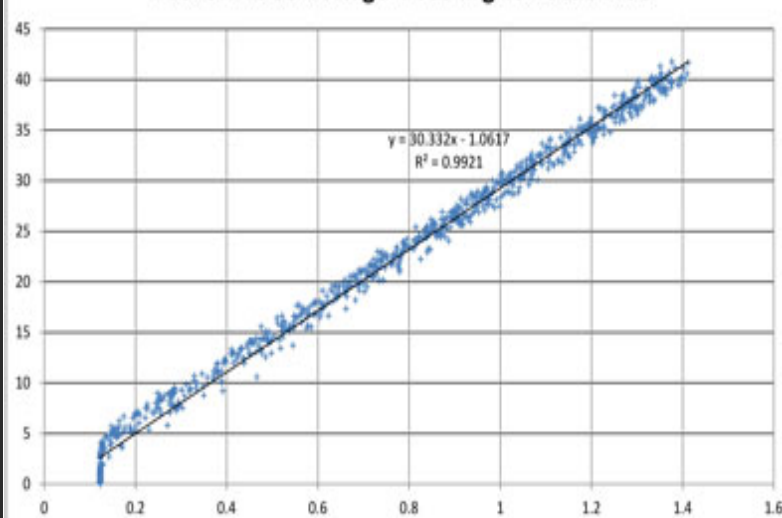
1604SH-Ox1vsOxBkg.jpg)

1604SH: Secondary CTD Oxygen 4-sec avg vs Bottle Oxygen uM/kg



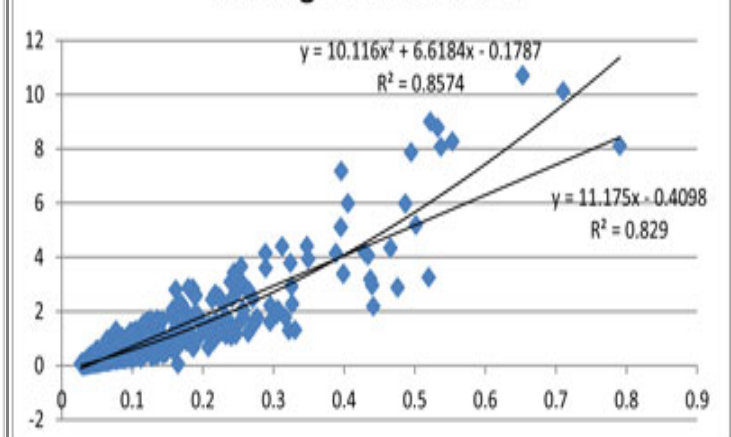
(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-Ox2vsOxBkg.jpg>)

1604SH: ISUS Voltage 4-sec avg vs Bottle NO3



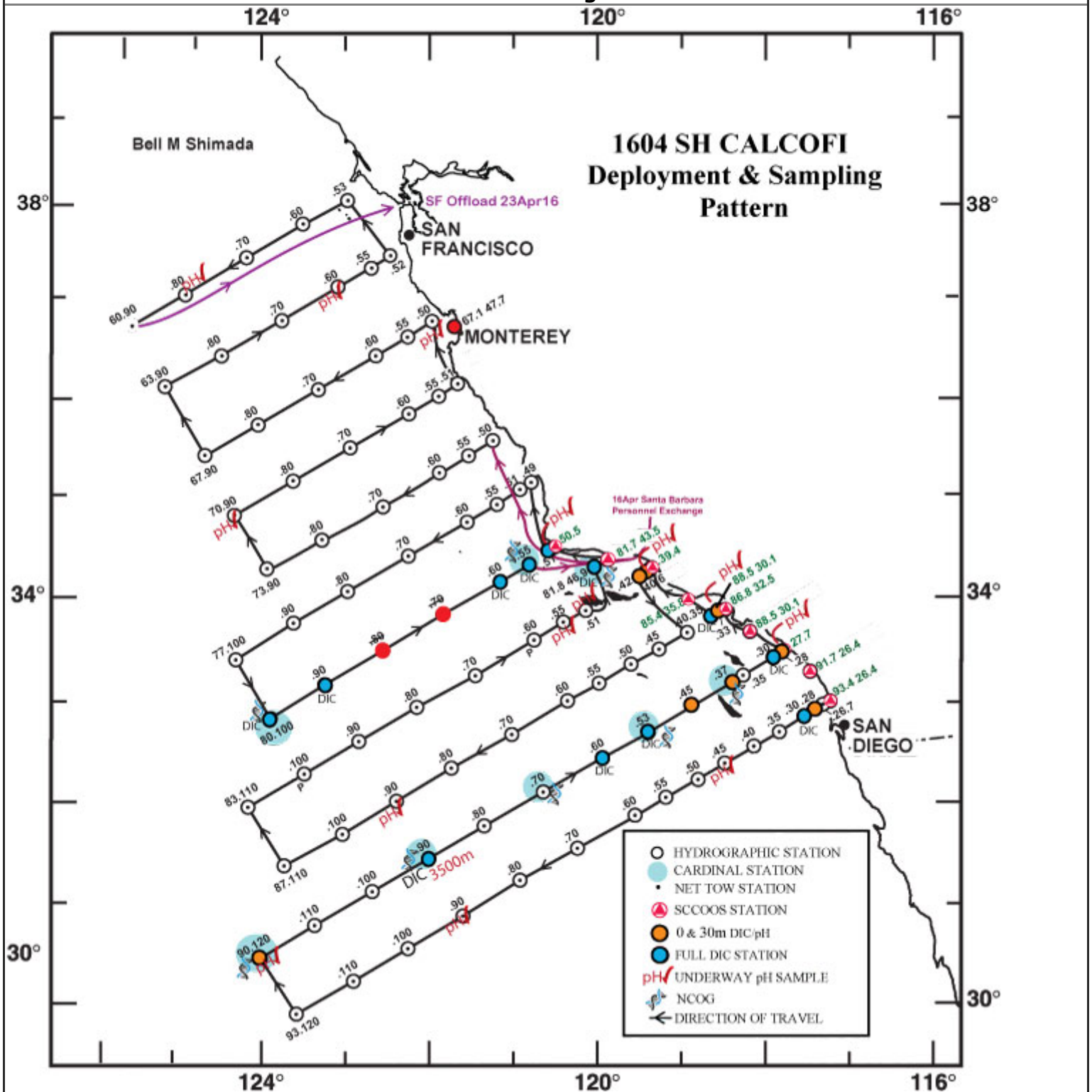
(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-ISUSVSNO3.jpg>)

CalCOFI 1604SH: Fluometer Voltage 4-sec avg vs Bottle Chl-a



(<http://cappuccino.ucsd.edu/downloads/2016/1604SH/20-1604SH-FIVvsChla.jpg>)

**General notes: These are cast & final CTD Processing Notes from 1604SH cruise**



**CalCOFI 1604SH General Cruise & Cast Notes:**

**Stations and Station Order:** this cruise occupied 101.5 stations: 93.5 standard & 9 SCCOOS (0.5 station was sta 60.90 net-tow only station). The station order was standard south-north, west-east-west with a few changes between Lines 86.7 <> 83.3 and 76.7 <> 80.0 due to Navy operations. After 86.7 35, we sailed north to SCCOOS sta 85.4-35.8 & 83.3-39.4 then did 83.3-40.6 & 83.3-42.0 before returning to Line 86.7, sta 86.7-45.0. We occupied all stations on Line 86.7 out to sta 110.0, sailed north to Line 83.3 then continued station ops eastward till 83.3-51.0. Sailing between the islands to Santa Barbara Basin sta 81.8-46.9 and SCCOOS 81.7-43.5. Additional Navy operations required us to postpone sta operations on Line 80.0 west of sta 55.0 so after 80.0-51.0, we continued north to Line 76.7. Heading west till sta 100.0 then south back

to Line 80.0 and shoreward. Unfortunately, bad weather cancelled cardinal stas 80.0-80.0 & 80.0-70.0. After completing 80.0-55.0, finishing the southern 75-sta pattern, most of SIO-CalCOFI personnel were dropped off in Santa Barbara. After which RV Shimada sailed north to Line 73.3 and the CTD-rosette seawater sampling was reduced from 24 to 12 bottles. Lines 73.3, 70.0, 66.7, 63.3, & 60.0 were completed in scheduled sequence. Weather kicked up again and on sta 60.90 only net tows were performed, no CTD-rosette deployment.

RV Shimada pulled into San Francisco Pier 30/32 at 0800 23 Apr 2016 for packing and offload by all participants including SIO-CalCOFI personnel who disembarked on 16 Apr in Santa Barbara.

### **CTD General Notes and Problems:**

The CTD configuration throughout the cruise was standard: Seabird 911+ (new pressure case since 1501) with dual T, C, O<sub>2</sub>, & pumps; Wetlabs C-Star 25cm transmissometer; Biospherical QSP200L PAR; Datasonics/Benthos Altimeter; WET Labs ECO-AFL/FL; Seabird SBE 18 pH; Satlantic ISUS v2, new lamp AND spectrophotometer (since 1511OC) & Wetlabs (custom) batteries. Please refer to the xmlcon files or cruise prospectus for additional info & metadata. There were no sensor failures or exchanges this cruise - all pairs of like sensor agreed well. A brand new SBE18 Oxygen sensor was deployed as primary oxygen sensor. RV Shimada's termination was used and worked throughout the cruise. About midway through the cruise, the cable-grip was moved up the wire to reduce the wear-tear on the exposed conductive core, moving in down onto the fish instead of by the shackle.

The primary SBE32 carousel was serviced prior to this cruise and triggers which repeatedly mistripped last cruise were rebuilt. This resulted in a significant reduction of trigger misfires this cruise. Other than lanyard rigging problems, only one obvious trigger misfire was obvious. Will plan on repeating this service technique before the next cruise.

**Logistics:** CalCOFI 1604SH was on NOAA R/V Bell M Shimada. We had two scheduled days to load and setup although our departure delay gave us an extra day. RV Shimada sailed from San Diego 01 April 2016, two days later than schedule due to ship repair. Acoustics calibration was done dock-side so we did not anchor in San Diego Bay 01 Apr. Station work on sta 93.3 26.7 started before noon and all systems worked without issue.

RV Shimada's two-conductor termination was used with SIO-CalCOFI's 911+ CTD, deck unit, new primary CTD blade computer running Windows 7, depth-readout box, and SIO-CalCOFI's 24-bottle rosette. There were no issues with the conductive wire. Some scientific computers were connected to both the SIO data network and ship's network for internet access. Both the CESL sample log tablet and CELog event tablet performed more reliably when hard-wired to the data network. A wifi connection worked fine on the salt computer since hardwire connection was not available. All over the side deployments were coordinated by the Survey Techs, Scott & Kathryn, and deck crew. Scientists and volunteers sampled the rosette after it was retrieved by deck crew. CTD was deployed on the forward winch and nets on the aft winch, reverse of the RV Reuben Lasker deck ops.

SIO-CalCOFI CTD PC & deck unit were interfaced with R/V Shimada's monitor; SIO supplied the keyboard, mouse, sea cable, & 9-pin to deck unit NMEA GPS adapter. Our remote-depth readout connected to the deck unit was installed into the winch shack by the ET Josh. The remote depth readout was off by 2m and may need to be reprogrammed - this was attempted at sea but the program will not run on Windows(!).

RV Shimada does not have a Knudsen 3 or 12kHz echosounder to find the bottom depth. The EK60 system was interrupted from its normal 750m range when necessary.

The SBE32 carousel was rebuilt before the cruise and work very reliably. There was only one obvious carousel mistrip, other mistrips are attributed to lanyard issues not triggers.

### **Update 6/30/2017:**

Cast 001 - 007 original xmlcon files had incorrect secondary oxygen coefficients. Also, it was discovered the 2015 service of the CTD pressure sensor resulting in new pressure coefficients had not been applied. So on cast 026, the pressure coefficients were imported. All previous xmlcon files (001-025) were replaced by cast 026 xmlcon, relabeled to match the cast number. The pressure data calculated using the old coefficients were compared to pressure data using the new coefficients

and the difference was barely perceptible ie calibration had changed very little.

Still we prefer to use the latest coefficients so these were applied to earlier casts. It did not change the bottle stop depths or deck pressure significantly.

### Cast Notes:

Cast 001 - 007: secondary oxygen sensor serial number and coefficients were wrong initially; all data fixed and xmlcons corrected.

Cast 001 - Messing with the rigging of the conductive wire near bottle #4 precast caused two issues: bottle #4 bottom cap was not open (seen closed during deployment) so bottle #5 was closed at 28m. ISUS battery was not plugged in so no ISUS data.

Cast 002 - RV Shimada Captain did not want to go shallower than 30m so 20m SCCOOS station was at 30m

cast 005 - bottle #16 bottom cap ajar

Cast 006 - bottle #11 100m leaky, replaced after cast

Cast 008 - noticable upcast O2 hysteresis

Cast 009 - bottle #8 170m bottom cap ajar

Cast 017 - deep chl max ~130m; secchi depth 26m; deepest prodo bottle depth 91m

Cast 018 - unusual salinity stratification ~100-150m; deep chl max again ~127m

Cast 021 - early prodo station so nets first then ran back to sta; moderate seas with big swell, sunny

Cast 025 - Calm, overcast; Mola Molas and Velellas (Mola eating Velella)

Cast 031 - nets-first early prodo again, ~0.58nm off station which we thought was fine but much deeper ~200m instead of ~70m; altimeter reading not stable till ~190m (slope?)

Cast 032 - SCCOOS 88.5 30.1 at 20m

Cast 038 - ISUS battery not connected, no ISUS data

Cast 039 - new ISUS battery installed

Cast 040 - Santa Monica Basin prodo station, only two bottles available for sampling below 515m; light rain

Cast 044 - bottles 14 & 15 had #14 lanyard stuck in the top of the bottles; bottom lanyard clip from #14 inside #15 so probably not rigged

Cast 045 - computer network issue pre-cast, short delay; new winch operator training - CTD held at ~4m on downcast for ~2mins during downcast startup

Cast 049 - unusual salinity & temperature features between ~30-150m; prodo bottles hit chl max; bluewater & sunny

Cast 053 - calculated 6m bottle spacing around 100m changed so an extra bottle at the chl max for NCOG could be sampled

Cast 054 - "interesting" salt & O2 features between ~50-250m

Cast 055 - fluorometer is spikey

Cast 056 - fluorometer is spikey at depth, most likely noise, not real

Cast 058 - pr offset -0.05; Santa Barbara Basin prodo cast, only two bottles available to sample below 515m; fluorometer still spikey after cable servicing; deep NO3 and O2 higher than 500m, basin must have flushed recently

Cast 064 - rough morning

Cast 065 - rough, sunny, windy prodo station

Cast 069 - moderate seas, overcast, big rolls, prodo sta

Cast 070 - ADK training on CTD console

Cast 072 - sta 80.60 pretty rough conditions but doable - sta 80.80 & 80.70 cancelled due to conditions being too rough

Cast 073 - last standard 75-sta pattern station (73 of 75 stations completed)

Cast 074 - on line 73.3, after finishing line 80 near coast; switched to 12-bottle rosette configuration, table-driven; DMW still onboard, most SIO-CalCOFI disembarked

Cast 077 - pH & PAR caps left on - no data; bottle #2 mistripped, bottom cap ajar

Cast 078 - bottle #10 didn't seal properly, leaking

Cast 081 - bottle #10 replaced pre-cast, unreliable

Cast 083 - soapy grey water flowing off deck during the cast

Cast 086 - hdr mislabeled 76.7 50.0 instead of 66.7 50.0; fixed; extra surface bottle markers in mrk file, only 12 bottles sampled

Cast 087 - hdr mislabeled 76.7 55.0 instead of 66.7 55.0; fixed; extra surface bottle markers in mrk file, only 12 bottles sampled

Cast 088 - hdr mislabeled 76.7 60.0 instead of 66.7 60.0; fixed

Cast 090 - ISUS battery not plugged in, no ISUS data; battery terminal fried - replaced battery postcast with new one;; extra surface bottle markers in mrk file, only 12 bottles sampled

Cast 099 - wire angle changing a lot, current?, CTD bottle target depths adjusted repeatedly

**File notes:**

Seasoft-generated asc-hdr files were not renamed to YY-YYLLLLSSSS\_###d or u.asc & .hdr. Voltages were not relabeled. This practice makes it difficult to reprocess & merge with bottle data if necessary. **Update 6/30/2017:** Files and voltage headers renamed. Both renamed and original files available.

**Mislabeled found and corrected:**

Cast 086 was initially mislabeled as sta 76.7 50.0 but hex editor corrected to 66.7 50.0

Cast 087 was initially mislabeled as sta 76.7 55.0 but hex editor corrected to 66.7 55.0

Cast 088 was initially mislabeled as sta 76.7 60.0 but hex editor corrected to 66.7 60.0

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**Bad samples or mistrips 6/30/2017:**

Salt run for stas 036-039 had a bad sample count (29, should be 28), salts rerun and sta.csvs repopulated.

Cast 010 bottle #6 230m questionable NO3 (duplicate of #5?)

Cast 015 CTD upcast & downcast between 50-100m different - looks real

Cast 049 bottle #16 67m bad bottle salt, flagged

Cast 052 bottle #10 120m bad bottle salt, flagged

Cast 072 bottle #10 120m mistrip - all samples bad, flagged

Cast 073 bottle #17 30m bad bottle salt, flagged