1008NH CTD Data & Processing (/cruises/older-cruises/2010-cruises/calcofi-1008nh/694-1008nh-ctd-data-processing.html)

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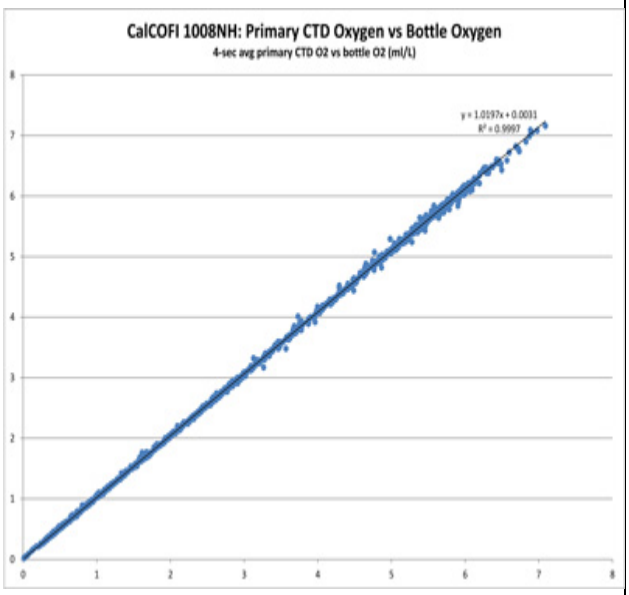
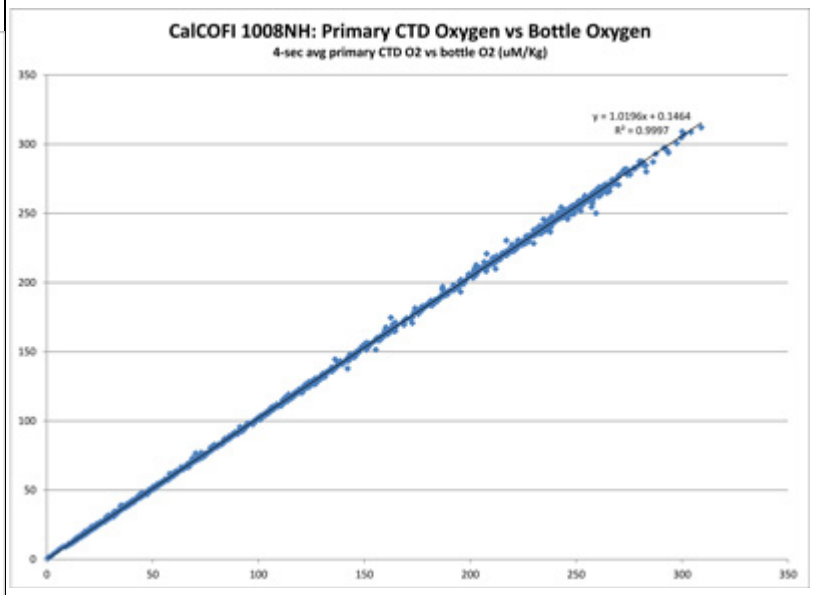
Last Updated: 17 January 2018

CTD Processing Summary CalCOFI 1008NH CTD Final Data (reformatted 01/2018 for QC columns & O2 uM/Kg)			
Download 1008NH CTD raw cast files zipped (http://cappuccino.ucsd.edu/downloads/2010/20-1008NH_CTDCast.zip)		Download 1008NH FinalQC CTD + bottle data (http://cappuccino.ucsd.edu/downloads/2010/20-1008NH_CTDFinalQC.zip)	
General CTD Notes - data acquisition cast notes, logistics, processing notes are listed below			
CTD sensor corrections derived by comparing 4 secs of CTD sensor data (prior to bottle closure) to bottle samples			
Dual T, S, & O2	Primary Sensor	Secondary Sensor	
Salinity offset (bottle - CTD salinity; > 350m only; Seabird SBE4)	-0.0104	0.0063	
Primary O2 sensor worked fine casts 001-075 Secondary O2 sensor response shifted between casts 017 & 019, separate regressions were derived and applied to each file group.[1]		Secondary O2 sensor: Casts 001-017	Secondary O2 sensor: Casts 019-075
Oxygen (ml/L; dual Seabird SBE43)	y = 1.0197x + 0.0031 R^2 = 0.9997	y = 1.1692x - 0.0733 R^2 = 0.9994	y = 1.0416x - 0.0377 R^2 = 0.9995
Oxygen (umol/Kg; dual Seabird SBE43)	y = 1.0196x + 0.1464 R^2 = 0.9997	y = 1.1692x - 3.1891 R^2 = 0.9995	y = 1.0416x - 1.637 R^2 = 0.9995
Single sensors			
Nitrate - ISUS 4sec ave voltage vs Bottle Nitrate (Satlantic MBARI-ISUS v2)	y = 29.89x - 2.2703 R^2 = 0.9601		

Fluorometer - linear & polynomial regressions	y = 4.2734x - 0.1511 R² = 0.7637	y = 1.7022x2 + 2.3715x + 0.0041 R² = 0.8073



(http://cappuccino.ucsd.edu/downloads/2010/1008NH/1008NH_Ox1MLvsOxBML.jpg)



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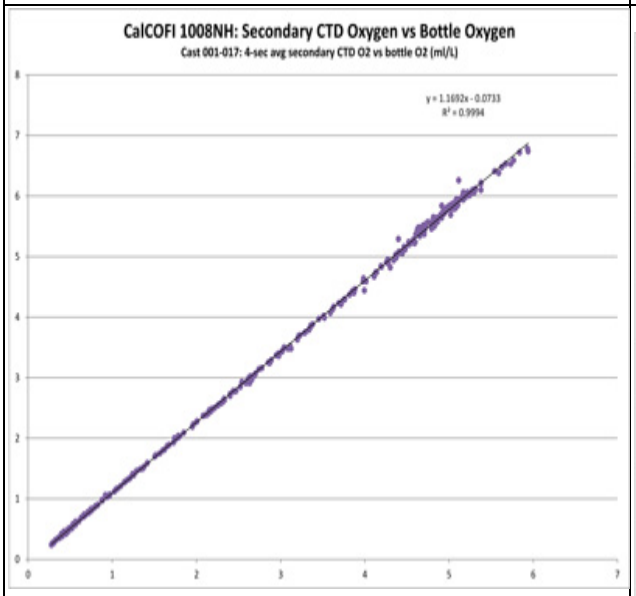

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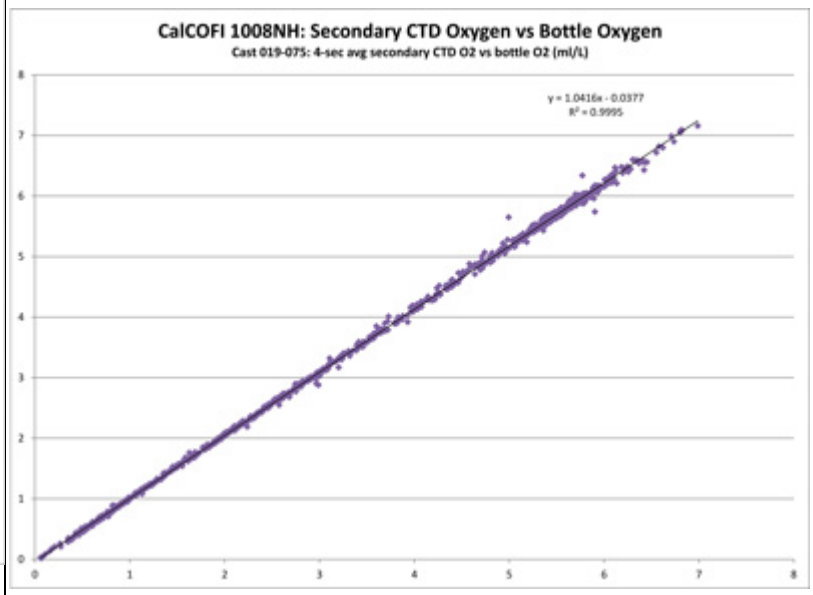

(http://cappuccino.ucsd.edu/downloads/2010/1008NH/1008NH_Ox2MLvsOxBML_019-075.jpg)

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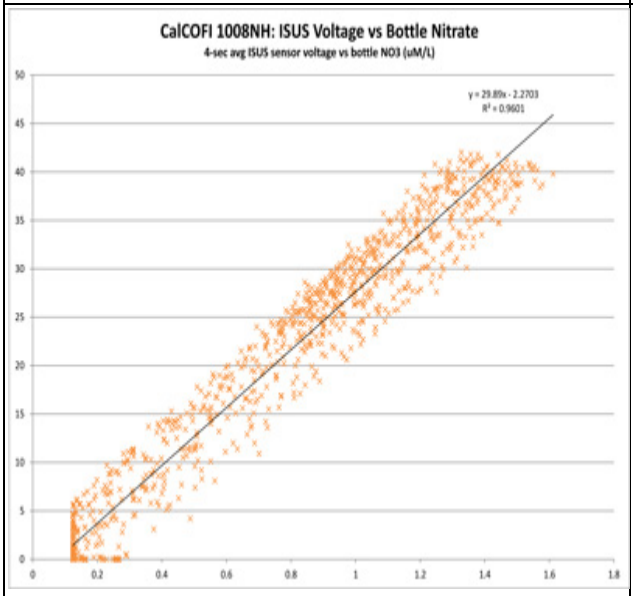

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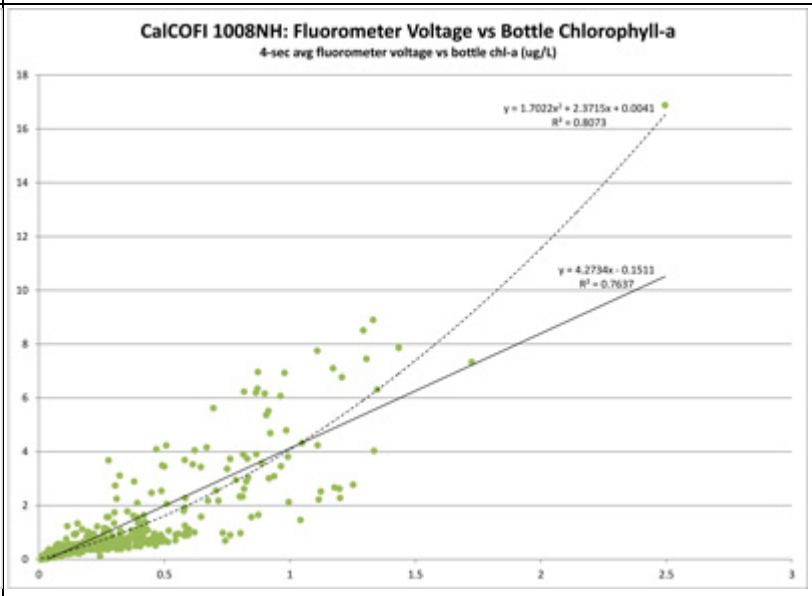

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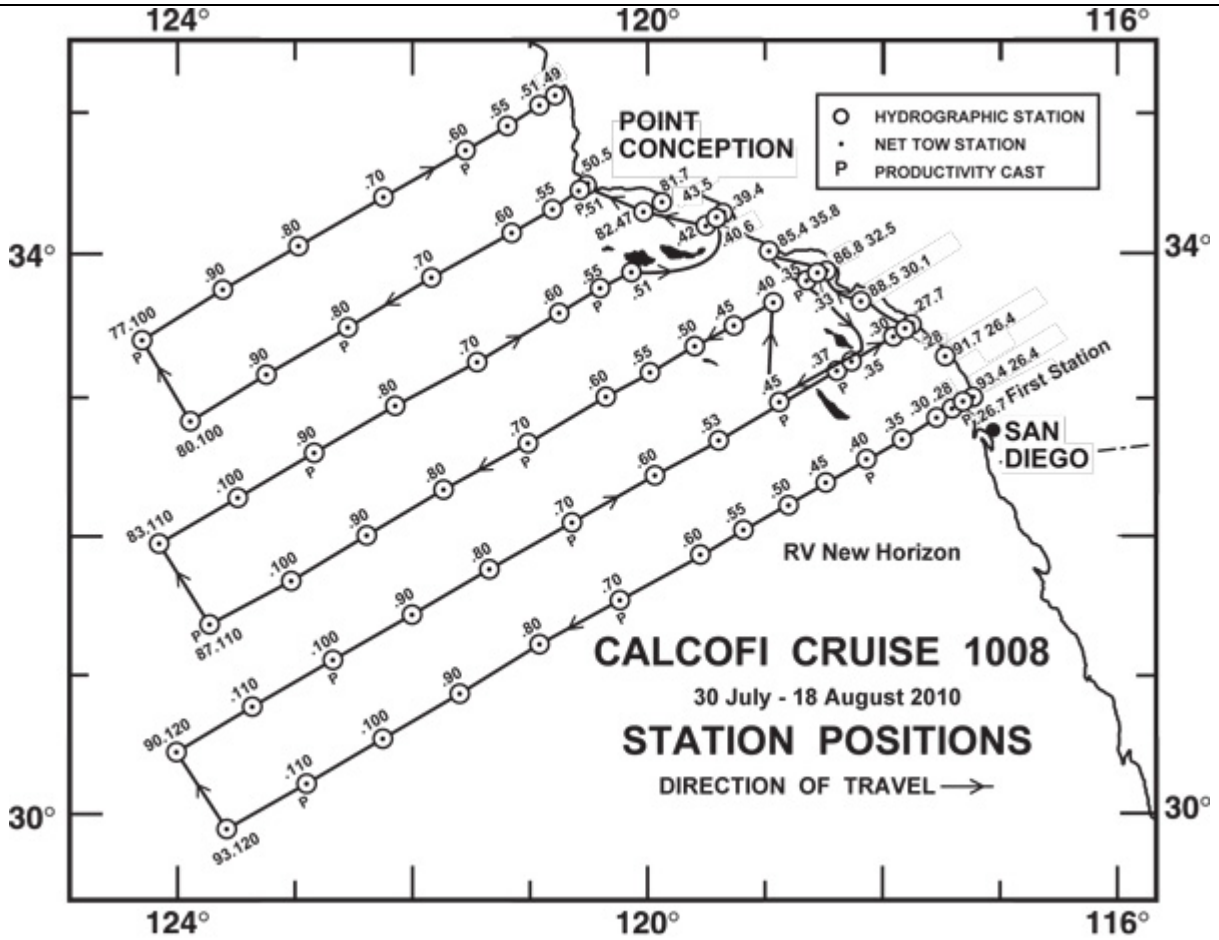

(http://cappuccino.ucsd.edu/downloads/underway/2010/1008NH/1008NH_CruiseTrack.png)

General notes:

CalCOFI 1008NH: 30 Jul - 17 Aug 2010 on SIO RV New Horizon. **CalCOFI 1008NH: 30 Jul - 17 Aug 2010; SIO R/V New Horizon** departed San Diego 30 Jul at 0800 PST from MarFac and after successfully occupying 75 station returned to San Diego at 0600 17 Aug. Upon arrival to MarFac on 17 Aug and disembarking most of the scientific party, New Horizon sailed into San Diego Bay for several hours of post-cruise acoustics calibration. Please refer to the CalCOFI 1008NH Cruise webpages (http://calcofi.org/cruises/older-cruises/2010-cruises/calcofi-1008nh.html) or the CalCOFi 1008NH Cruise Data Report PDF (http://calcofi.org/data/data_reports/2010/1008final.pdf) for more cruise info.

Sixty-four standard hydrographic stations plus 2-3500m deep stations (90.90, 80.90); 9-SCCOOS 20m coastal stations; 'High Density Acoustics Survey' between sta 83.3 40.6 & 90.60; and 13-500m & 3-1500m (16 total) Oozeki trawls were performed.

A Sea-Bird Electronics, Inc., Conductivity-Temperature-Depth (CTD) instrument (Seabird 911, Serial number 1049) with a 24-10L bottle rosette was deployed at each station. Dual temperature (2-SBE 3+), conductivity (2-SBE 4), and oxygen (2-SBE 43) sensors were deployed; each set of three sensors (T, C, O2) plumbed in series to a Seabird pump (2-SBE 5t). Additional sensors include: Seapoint fluorometer (10x), Seatech 25cm transmissometer (660nm), Biospherical remote PAR (QSP-2300), QSR-240 surface PAR (RV New Horizon's), SBE 18 pH sensor, ISUS v2 nitrate sensor, and altimeter. Each CTD/rosette cast sampled ~20 depths to a maximum sampling depth of ~515 meters, bottom depth permitting. The bottle spacing is designed to sample depth intervals as close as 10 meters around the sharp upper thermocline features such as the chlorophyll, oxygen, nitrite maxima and the shallow salinity minimum. Salinity, oxygen and nutrients were determined at-sea for all depths sampled. Chlorophyll-a and phaeopigments were determined at-sea on samples from the top 200 meters, bottom depth permitting.

[1] Primary CTD O2 Sensor (SBE43 SN1590) worked fine on all casts but secondary CTD O2 Sensor (SBE43 SN1075) shifted for unknown reasons between cast 017 & 019. Separate bottle-correction regressions were derived (plotted) and applied to secondary CTD O2 sensor data - both ml/L and uM/Kg - refer to plots above. Coefficients from 001-017 were applied to cast 018 although the sensor data seems split between both when plotted.

Cast specific Notes from Console Ops (MGS was primary CTD tech):
It should be noted at the ISUS and pH sensors on V7 & V6 respectively, were intially configured reversed on the .con files for cast 001-006. This error has been corrected and the .con files for these casts updated in the archive.
Cast 001 sta 93.3 26.7: prodo cast restarted, trouble with pressure sensor - fixed and restarted; 60m cast (although drifted into 240m)
Cast 002 sta 93.4 26.4 SCCOOS: 20m bottom, 4-bottle 15m cast
Cast 003 sta 91.7 26.4 SCCOOS: 21m bottom, 5-bottle cast (dup at 10m)
Cast 004 sta 93.3 28.0: 515m 20-bottle type I cast, chl max at 15m; Pr offset of -0.300 was added to zero the deck pressure pre-cast; no mixed layer, steep shallow gradient starting at surface
Cast 005 sta 93.3 30.0: 515m 20-bottle type I cast, chl max at 15m; winch slowed to ~27m/min ~200m downcast because of currents. CTD profiles shows feature at that depth. Bottle #20 (surface) did not close until bottle #21 was tripped as well. Bottle valve on bottle #9 dripping a lot.
Cast 006 sta 93.3 35.0: 515m 20-bottle type I cast, chl max at 25m
Cast 007 sta 93.3 40.0: ~28m chl max, type I 22-bottle prodo sta; ISUS battery cleaned and regreased pre-cast
Cast 008 sta 93.3 45.0: 28m chl max, type I; bottle #17 may have tripped late - salt off by ~0.05
Cast 009 sta 93.3 50.0: 25m chl max, type I; closed bottle #21 since #20 was questionable but turned out fine
Cast 010 sta 93.3 55.0: 29m chl max, type I; 21-bottle 515m cast, extra LTER 10m bottle
Cast 011 sta 93.3 60.0: 40m chl max, type I
Cast 012 sta 93.3 70.0: very tiny chl max ~70m, type II prodo sta, 22 bottles; ISUS not plugged in - no data, battery replaced post-cast; forgot to turn off deck unit
Cast 013 sta 93.3 80.0: 56m chl max type II; ISUS working
Cast 014 sta 93.3 90.0: double chl-max ~64 mini-max & 83m max, type II/III; unusual salinity & O2 profiles noted; bottle #17 mistripped - no seawater samples
Cast 015 sta 93.3 100.0: chl max 42m, type I; bottle #17 didn't trip again - no samples; console ops labeled sta 93.3 90.0 instead of 93.3 100.0 but all files look fine - corrected
Cast 016 sta 93.3 110.0: chl max 63m, type II/III, 23 bottle prodo sta; #17 hung open so CTD was sent back to 54m and bottle #23 closed
Cast 017 sta 93.3 120.0: 84m chl max type II/III; bottle #17 lanyard shortened & strung on the left side of the bottle, carousel #17 trigger cleaned pre-cast; on upcast, winch went to 80m then back down to 87m
Cast 018 sta 90.0 120.0: 81m chl max type II/III; 20 bottle cast to 515m, bottle #17 closed fine this cast
Cast 019 sta 90.0 110.0: 68m chl max type II/III 21 bottles; fired bottle #20, no action so fired again; CTD PC blue-screened before the cast, rebooted and used it anyways. MGS cast but DMW finished sampling/filtering. "Overheated" noted.
Cast 020 sta 90.0 100.0: 58m chl max type II/III; 21 bottle prodo sta
Cast 021 sta 90.0 90.0: 70m chl max type II/III 24-bottle 3500m/12 DIC station; PAR, pH, ISUS+battery removed pre-cast;
Cast 022 sta 90.0 80.0: 45m chl max type I; lots of features in the profiles, lots of ship roll during the

cast

Cast 023 sta 90.0 70.0: 40m chl max type I prodo cast 22-bottles; greasing winch on startup - slight delay 515-44-m

Cast 024 sta 90.0 60.0: 35-55m chl max type I; ISUS voltage went to zero @~200-265m during downcast

Cast 025 sta 90.0 53.0: 0-24m chl max type I; .nav file created a little late (440m)

Cast 026 sta 90.0 45.0: 20m chl max type I; 23 bottle 515m cast, one insurance @30m (for bottle #17); bottle #11 didn't close so CTD was sent back down to 100m, #23 = 100m

Cast 027 sta 90.0 37.0: 25m chl max type I; 23 bottle prodo sta

Cast 028 sta 90.0 30.0: 22m chl max, 21 bottle 515m cast; unusual (bad?) ISUS profile on downcast 0-115m; winch failure (blackout) on start of upcast - one bottle tripped. Restarted the upcast after the power returned, labeled downcast 1008028b, upcast labeled 1008028. CTD sent back to 515m to restart upcast, one "ghost" bottle tripped then tripped another #1 and marked. Edited the mrk file, erasing the 1st 515m bottle trip; merged 1008028b+1008028.ascs for bottle-calibration

Cast 029 sta 90.0 27.7 SCCOOS: 27m bottom, 5-bottles 20-0m;

Cast 030 sta 90.0 28.0: 66m shallow 8 bottle cast; restarted since ISUS battery was not connected - brought back onboard, connected, redeployed - worked fine.

Cast 031 sta 88.5 30.1 SCCOOS: 20m bottom, 4-bottle cast, 9m chl max; hit a buoy port side, cannot manuver, CTD recovered and redeployed (data collection not started 1st deployment)

Cast 032 sta 86.8 32.5 SCCOOS: 27m bottom, 5-bottle cast

Cast 033 sta 86.7 33.0: shallow 64m bottom, 9-bottle cast; station labeled 87 instead of 86.7 in .hdr, fixed and rebacked-up for sample log & prn file.

Cast 034 sta 85.4 35.8 SCCOOS: 24m bottom, slightly off station; 4-bottle cast

Cast 035 sta 86.7 35.0: 15m chl type I 24 bottle prodo cast

Cast 036 sta 90.0 35.0: out-of-usual sequence; bottom getting deeper during cast 368 > 382, 20-bottle cast to 370m

Cast 037 sta 86.7 40.0 Santa Monica Basin: 22m chl max type I, 24-bottle basin station cast; bottom reads 760m (LoFreq HiFreq Knudsen) but altimeter reads 10m from bottom at 730m, possible benthic boundary layer?

Cast 638 sta 90.0 45.0: 8-bottle prodo cast done separately at 10:45 to start incubations before Oozeki trawl started, delaying full CTD cast

Cast 038 sta 90.0 45.0: 22-bottle 515m cast (15:15), post-Oozeki trawl.

Cast 039 sta 86.7 50.0: 14m chl max type I; San Nic Is station, 81m bottom; 10-bottle cast

Cast 040 sta 86.7 55.0: 20m chl max type I; 22-bottle cast

Cast 041 sta 86.7 60.0: 20m chl max type I; ship rolling pretty good +-2m

Cast 042 sta 86.7 70.0: 32m chl max, 22-bottle prodo cast

Cast 043 sta 86.7 80.0: 25m chl max type I; deep Oozeki trawl done prior to CTD & nets; 150m O2 feature noted; bottle #17 mistrip suspected

Cast 044 sta 86.7 90.0: 50m chl max type I; ISUS not functioning properly; bottle #20 open, sent back to 10m, bottle #22 closed

Cast 045 sta 86.7 100.0: 100m chl max type II/III; 24-bottle prodo cast; ISUS still not working properly

Cast 046 sta 86.7 110.0: 65m chl max type II/III; fired an extra bottle @ #3 - went from 3 to 5, skipping #4 (onscreen). ISUS working fine this cast - battery not charging perhaps. Carousel "crown" rebuilt & cleaned prior to cast so problem mostly likely is software/pc-related. Rebooting CTD PC post-cast

Cast 047 sta 83.3 110.0: 100m chl max type II/III; no unusual tripping problems, all 21 bottles closed at surface inspection; O2 sample draw temperatures look good especially on bottle #17; ISUS worked fine

Cast 048 sta 83.3 100.0: 110m chl max type II/III; nav file created at 440m upcast; SBE 11 (deck unit) beeping every 5-10 seconds, no light corresponding @ 25-0m upcast.

Cast 049 sta 83.3 90.0: 83m chl max type II/III 24-bottle prodo cast; no deck unit issues noted; transmissometer noisy - scale expanded? - prior and post profiles look good; ISUS good

Cast 050 sta 83.3 80.0: 33m chl max, 21-bottle 515m cast, extra at 10m; chl spikey, transmissometer too - will service the cables post-cast

Cast 051 sta 83.3 70.0: 28m chl max type I; serviced fluorometer, transmissomter, & altimeter connectors prior to cast, tightened all others that were loose; signals look less noisy

Cast 052 sta 83.3 60.0: 15m chl max

Cast 053 sta 83.3 55.0: 20m chl max, 23-bottle prodo cast

Cast 054 sta 83.3 51.0: 30m chl max, 95m cast, 103m bottom

Cast 055 sta 83.3 42.0: 132m bottom, chl max 21m; 12-bottle 125m cast

Cast 056 sta 83.3 40.6: 12m chl max type I; 6-bottle 30m cast in 36m of water

Cast 057 sta 83.3 39.4 SCCOOS: 22m bottom, 5-bottle cast to 20m(!)

Cast 058 sta 81.7 43.5 SCCOOS: 19m bottom; 4-bottle 15m cast

Cast 059 sta 81.8 46.9 Santa Barbara Basin: 12m chl max; 24-bottle cast to 567m (8.5m off bottom according to altimeter); Knudsen reads 685m

Cast 060 sta 80.0 51.0: 9m chl max type, 11-bottle prodo cast; 70m cast (~5m off 77m bottom)

Cast 061 sta 80.0 50.5 SCCOOS: 20m 6-bottle cast, 24m bottom

Cast 062 sta 80.0 55.0: near CCE-LTER mooring; 17m chl max, 22-bottle 515m cast

Cast 063 sta 80.0 60.0: 20m chl max type I; odd chl "feature" @150m on downcast, looks real - "bug-on-the-windshield"?, not seen on upcast

Cast 064 sta 80.0 70.0: 10m chl max type I

Cast 065 sta 80.0 80.0: 25m chl max type I 22 bottle prodo; bottle #18 mistripped, sent back down to 31m - CTD landed on deck then was redeployed to trip bottle. Upcast should only include 1st trip up, not redeployment. Trigger #18 replaced post-cast

Cast 066 sta 80.0 90.0: 53m chl max type I 3500m deep cast; PAR, ISUS, pH removed; trigger #18 cleaned and #17 replaced with new trigger; 200m O2 feature on downcast. All sensors reinstalled post-cast while on station

Cast 067 sta 80.0 100.0: 95m chl max type II/III; primary T/C/O2 biofouled(?) upon deployment, brought back on deck, back-flushed, redeployed but still looks noisy - pump proble/fouling or could be ship roll and slow descent speed - boat is rolling +-2m

Cast 068 sta 76.7 100.0: 48m chl max, 22 bottle prodo cast, #15 & #16 are 52m prodo bottle dups, insurance since #15 did not close last cast (not noted on 067 console ops)

Cast 069 sta 76.7 90.0: 32m chl max type I; transmissometer voltage still noisy but responding

normally

Cast 070 sta 76.7 80.0: 29m chl max type I; 12degC water noted at 30m

Cast 071 sta 76.7 70.0: 35m chl max type I, bottles #4 & #15 mistripped, #4 triggered but didn't close, bottle #15 closed but bottom lid was ajar

Cast 072 sta 76.7 60.0: 25m chl max type I 22 bottle prodo station; no mistrips noted

Cast 073 sta 76.7 55.0: 15m chl max type I; LTER size fractionation 10m bottle dup

Cast 074 sta 76.7 51.0: 0-10m chl max type I; shallow 240m bottom, 16-bottle cast

Cast 075 sta 76.7 49.0: 3-15m chl max type I, shallow 70m bottom, 9-bottles closed 0-60m

Note: although these data were originally processed in 2010, the transcription of console and sample log notes was not started till later. These notes were added in 2018 from the original console operation forms.

JRW 01/16/2018