

## 1806SR CTD Processing Summary

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Category: CalCOFI 1806SR (/cruises/2018-cruises/calcofi-1806sr.html)

C Last Updated: 26 June 2019

## CTD Processing Summary CalCOFI 1806SR CTD Final Data

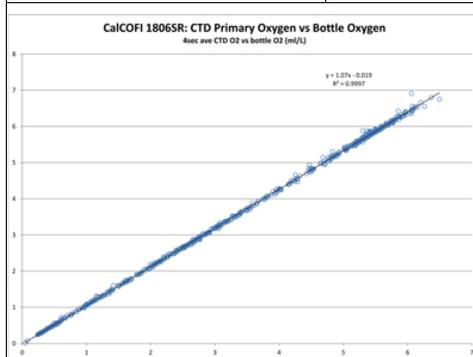
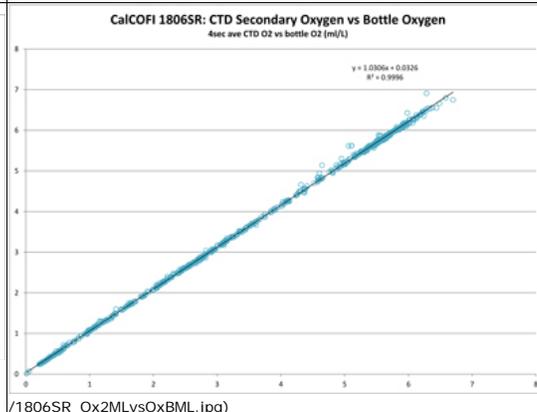
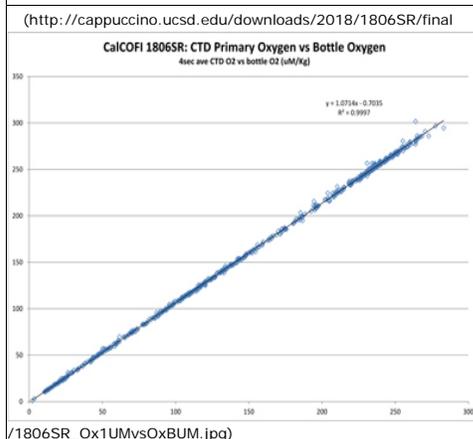
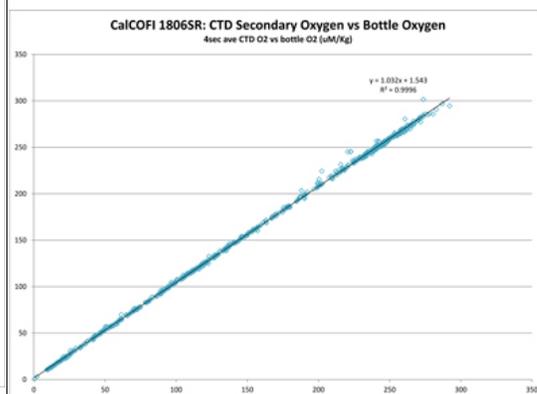
Download 1806SR CTD raw cast files zipped

[http://cappuccino.ucsd.edu/downloads/2018/20-1806SR\\_CTDcast.zip](http://cappuccino.ucsd.edu/downloads/2018/20-1806SR_CTDcast.zip)Download 1806SR FinalQC CTD + bottle data ([http://cappuccino.ucsd.edu/downloads/2018/20-1806SR\\_CTDFinalQC.zip](http://cappuccino.ucsd.edu/downloads/2018/20-1806SR_CTDFinalQC.zip))**General CTD Notes** - data acquisition notes, logistics, processing - see below.

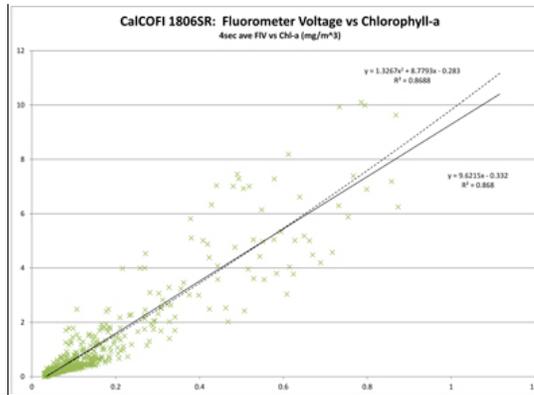
**Please note that these regressions are generated from FINAL CTD vs bottle data** and have been reprocessed. CTD temperatures and salinities do not usually change compared to preliminary data but oxygen, estimated chlorophyll-a, estimated nitrate may change significantly after point-checking. Questionable or mistrip bottle data are removed from these comparisons but may be visible on the CTD.csv plots. 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. These plots are under the "csv-plots\Primary" & "csv-plots\Secondary" subdirectories.

CTD sensor corrections derived by comparing CTD sensor data, 4sec averages prior-to-bottle closure, to bottle samples

| Dual T, S, & O2   | Primary Sensor                           | Secondary Sensor                                    |
|---|--|---|
| Salinity offset (bottle - CTD salinity; > 350m only; Seabird SBE4)      | -0.0045                                  | -0.0071   |
| Oxygen ml/L (dual Seabird SBE43)  | $y = 1.07x - 0.019$<br>$R^2 = 0.9997$    | $y = 1.0306x + 0.0326$<br>$R^2 = 0.9996$            |
| Oxygen umol/Kg (dual Seabird SBE43)                                     | $y = 1.0714x - 0.7035$<br>$R^2 = 0.9997$ | $y = 1.032x + 1.543$<br>$R^2 = 0.9996$              |
| Single sensors  | Linear                                   | Polynomial  |
| Nitrate - ISUS 4sec ave voltage vs Bottle NO3 (Satlantic ISUS v3 SN111) | $y = 27.652x - 10.323$<br>$R^2 = 0.9958$ |   |
| Fluorometer - linear & polynomial regressions                           | $y = 9.6215x - 0.332$<br>$R^2 = 0.868$   | $y = 1.3267x^2 + 8.7793x - 0.283$<br>$R^2 = 0.8688$ |

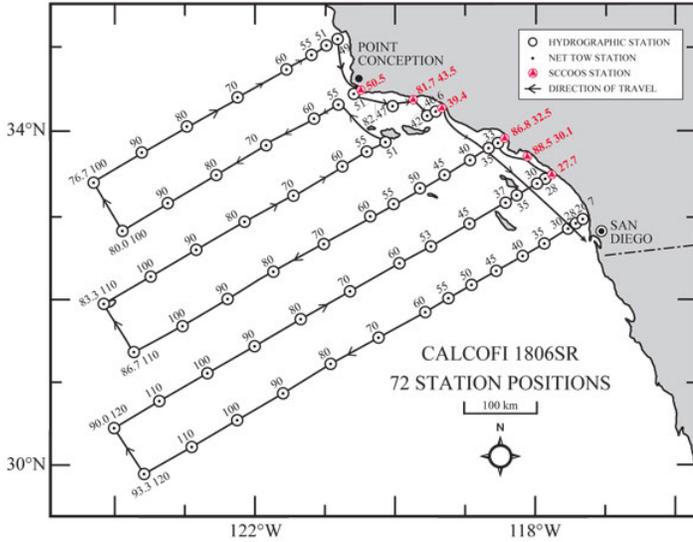
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([http://cappuccino.ucsd.edu/downloads/2018/1806SR/final/1806SR\\_ISUSVsNO3.jpg](http://cappuccino.ucsd.edu/downloads/2018/1806SR/final/1806SR_ISUSVsNO3.jpg))



([http://cappuccino.ucsd.edu/downloads/2018/1806SR/final/1806SR\\_FIVvsChla.jpg](http://cappuccino.ucsd.edu/downloads/2018/1806SR/final/1806SR_FIVvsChla.jpg))

**General notes: These are cast & preliminary CTD Processing Notes from 1806SR cruise**



(<http://cappuccino.ucsd.edu/downloads/2018/1802SH/1802ActualCruiseTrack.jpg>)

## CalCOFI 1806SR General Cruise &amp; Cast Notes:

CalCOFI Summer Cruise 1806SR was scheduled to occupy 73 stations from San Diego to Pt Conception. All stations were occupied except one - sta 85.4 35.8 Pt Dume SCCOOS - which was dropped due to time lost to bad weather. This was an unusually early summer cruise and late Spring winds and rough seas were prevalent.

## CTD General Notes and Problems:

CalCOFI used their 24-10L CTD-rosette on RV Sally Ride's infrastructure - two-pin termination, cable grip, & shackle; deck unit, monitor, trackball, & network. SIO-CalCOFI's Seabird 911+, 24-bottle epoxy-coated LARS rosette was deployed by the forward LARS winch arm on 72 stations.

Standard sensor configuration: dual T, C, & O<sub>2</sub> on separately plumbed & pumped horizontal arrays; Wetlabs ECO-FI fluorometer; C-Star transmissometer; Biospherical PAR & Surface PAR (mounted on the LTER GP van); MBARI-ISUS v3 w/ battery; SBE18 pH; altimeter. Refer to .hdr files for serial & model numbers or the table below. Primary & secondary T, C, & O<sub>2</sub> sensors were not changed from the last cruise, 1804SH, since their calibration & agreement were still on target. ISUS was DI lab calibrated prior to the cruise. Both sensor sets worked fine throughout the cruise and no changes were necessary.

|  |  |
|--|--|
| Setup: Using SIO-CalCOFI's 24-10L bottle CTD-rosette epoxy-coated LARS frame.  |  |
| CTD - SBE 9+ (SN#3161-0936) Sensor Configuration   |  |
| 1° Sensors:  | 2° Sensors:  |
| SBE 3plus temperature sensor (SN#5102);<br>Conductivity SBE 4 Sensor (SN#3569)<br>Oxygen SBE 43 Sensor (SN#1590)<br>Pump         | SBE 3plus temperature sensor (SN#5109);<br>Conductivity SBE 4 Sensor (SN#2206)<br>Oxygen SBE 43 Sensor (SN#1075)<br>Pump |
| Other sensors (unpumped)   |  |
| Wetlabs ECO/FL Fluorometer SN#3122<br>Wetlabs C-Star Transmissometer<br>SN#CST-811DR<br>pH SBE 18 SN#0709<br>Remote PAR SN#70209 | CCE-LTER MBARI-ISUS v3 SN#111<br>Altimeter SN#46604<br>Carousel SBE 32 3217964-0225<br>Reference PAR SN#20514            |

## Logistics &amp; General System/Sampling Notes:

Cast Notes (transcribed from console ops, clipboard notes, & data processing):

## CalCOFI 1806SR CTD Setup &amp; Cast Notes:

## CalCOFI 1806SR CTD &amp; Sample Notes

## CalCOFI 1806SR CTD &amp; Sample Notes

Cast 001 93.3 26.7: prodo station; tripped all 24 to test carousel, all closed except #23 top hung up on stanchion; bottles #11-17 closed at 21m, #18-24 closed at 12m

Cast 002 93.3 28.0: 0 & 30m DIC/pH

Cast 003 93.3 30.0: DIC sta

Cast 004 93.3 35.0: extra marker #17 @38m

Cast 005 93.3 40.0: high chl max @30m; pH sensor misbehaving, odd dips @230, 240, 295, 320m downcast; slightly moderate seas

Cast 006 93.3 45.0: moderate seas already, underway seawater off; winch operator 20min delay

Cast 007 93.3 50.0: prodo station; uway pH from underway seawater #15265; nutrients samples: #1 & #9 look questionable, #5 not drawn

Cast 008 93.3 55.0: nothing noted

Cast 009 93.3 60.0: mistrip bottle #9 - skip

Cast 010 93.3 70.0: moderate-rough seas; pH sensor still funky 100-200m downcast, serviced the cable post-cast

Cast 011 93.3 80.0: moderate seas, CTD at surface in air (popped out), pumps off, lowered 2m deeper, waited ~90secs before sending down to 515m

Cast 012 93.3 90.0: prodo station; Uway pH #15266

Cast 013 93.3 100.0: event log offline on bridge, DMW unable to help them get re-started

Cast 014 93.3 110.0: moderate seas but calming; deep chl max ~120m; salinity inversion 70-140m; pH bad 90-280m on downcast; Slight salinity spikes on upcast at stops 175m, 160m, 150m, 140m, 130m, 120m - biofouling?

Cast 015 93.3 120.0: prodo station; pH sensor cable changed, pH sensor signal looks good; wave buoy drifter deployed #621

Cast 016 90.0 120.0: 0&30m DIC/pH+NCOG; Uway pH #15267

Cast 017 90.0 110.0: depth sounder unable to find bottom, stuck at 3129m - should be ~4000m

Cast 018 90.0 100.0: moderate seas but improving; chl max @ 97m; pH sensor working well finally; depth sounder settings needed new ranges

Cast 019 90.0 90.0: prodo station; DIC+NCOG

Cast 020 90.0 80.0: 55m chl max; UWay pH #15271

Cast 021 90.0 70.0: 50m chl max; NCOG station

Cast 022 90.0 60.0: couple of chl spikes on downcast - "bugs on the windshield?"; shallow depth sounder working after restech tweaking; DIC station (only 3)

Cast 023 90.0 53.0: prodo station with DIC+NCOG; extra bottle tripped @50m bottle #16 - ignore, not needed; nutrient #24 missed, not drawn

Cast 024 90.0 45.0: 0&30m DIC/pH; extra bottle tripped at surface, "just in case"

Cast 025 90.0 37.0: 0&30m DIC/pH+NCOG

Cast 026 90.0 35.0: lots of kelp fragments floating by on launch; calm warm night off Catalina Is. - shallow bottom depth ~320m, 18 bottle cast; chl max ~46m, 8m mixed layer

Cast 027 90.0 30.0: getting light out, land visible; DIC station

Cast 028 90.0 27.7: SCCOOS station, 18m bottom, 3 bottles tripped

Cast 029 90.0 28.0: prodo station; 0&30m DIC/pH, Uway pH #15284; 105m bottom so 14 bottle cast to 90m

Cast 030 88.5 30.1: 18m bottom, 6-bottle 15m SCCOOS station

Cast 031 86.8 32.5: 24m bottom, 5-bottle 20m SCCOOS station

Cast 032 86.7 33.0: 0&30m DIC/pH; 54m bottom, 7-bottle 50m cast

Cast 033 86.7 35.0: DIC station

Cast 034 86.7 40.0: Santa Monica Basin station, CTD profile to 730m, 1st bottle closed at 515m; red tuna crabs in net tows (PRPOOS 3 pints; 4 individuals in Bongo) but not visible at surface, one came up caught between bottle 16 & 17

Cast 035 86.7 45.0: Calm night, 21 bottle cast to 515m

Cast 036 86.7 50.0: San Nicolas Island 10-bottle 70m station, 75m bottom; shallow chl max ~4-10m; cast number mislabeled 037 in hdr - fixed

Cast 037 86.7 55.0: 24-bottle prodo cast to 515m;

Cast 038 86.7 60.0: 21-bottle cast to 515m; bottles #15 & #16 tripped in reverse, CTD yo-yo'd

Cast 039 86.7 70.0: 21-bottle cast to 515m; "Weird surface Sal & O<sub>2</sub> on downcast" noted - looks like the CTD came out of the water upon returning to surface & the pumps turned off. This was not noticed before the CTD started down. Pumps came back on at ~13m so T, S, O<sub>2</sub> data from surface to 13m on downcast are bad, use upcast data; Uway pH #15290; downcast O<sub>2</sub> data looks questionable from 0-11m, coded "8"

Cast 040 86.7 80.0: 21-bottle cast to 515m; 94m chl max, 69m mixed layer

Cast 041 86.7 90.0: 24-bottle prodo cast to 515m; 80m chl max; uway pH #15291

Cast 042 86.7 100.0: 21-bottle cast to 515m, 82m chl max

Cast 043 86.7 110.0: 21-bottle cast to 515m; winch reading 5m offset this cast, not sure why (not zeroed at surface?); Sabrina on the con from bottles 6-21; wave buoy drifter #622 deployed

Cast 044 83.3 110.0: 21-bottle cast to 515m; strange fluctuations around 60-90m on downcast noted; Hannah training this cast by JRW - took longer than usual; surface bottle #21 tripped but didn't close - lanyard on right, needs to be on left; second surface bottle not closed so surface samples from underway seawater effluent

Cast 045 83.3 100.0: 24-bottle prodo cast to 515m;  
Cast 046 83.3 90.0: 21-bottle cast to 515m; uway pH #152292  
Cast 047 83.3 80.0: 21-bottle cast to 515m;  
Cast 048 83.3 70.0: 21-bottle cast to 515m; -0.5pr offset applied to CTD pressure in cfg; Hannah running CTD, much quicker this time (47mins)  
Cast 049 83.3 60.0: 24-bottle prodo cast to 515m;  
Cast 050 83.3 55.0: 22-bottle cast to 515m;  
Cast 051 83.3 51.0: 11-bottle cast to 90m, 97m bottom; heading north to line 80 after this station  
Cast 052 80.0 55.0: 23-bottle cast to 515m -DIC+NCOG at 10m plus 40m bottle; a couple anchovies washed up on deck, seas confused, 21kt winds; shallow gradient, green @ surface-20m; major wire jerk on landing (4000lb spike)  
Cast 053 80.0 60.0: 21-bottle cast to 515m; chl 0-35m with no distinct peak; winds dropped from 25 to 20kts; sunrise but heavy overcast, no sun; DIC+uway pH #15299  
Cast 054 80.0 70.0: 24-bottle prodo cast to 515m; DIC+NCOG; CTD salt & O2 data looks questionable from 0-5m on downcast, coded "8"  
Cast 055 80.0 80.0: 22-bottle cast to 515m; DIC+NCOG; bottle #13 85m not tripped = missed; #18 25m & #19 40m tripped out of order - CTD yo-yo'd again; nutrient #2 not drawn  
Cast 056 80.0 90.0: 20-bottle cast to 515m; DIC+uway pH #15309; chl max @75m, mixed layer 32, jogs slightly, then steady to 70m; moderate-rough seas; chl spike @352m downcast; nice landing this time, no jerk of wire  
Cast 057 80.0 100.0: 22-bottle cast to 515m; chl max 85m, 41m mixed layer; DIC+NCOG; wave buoy drifter #636 deployed; winch operator late - launch delayed, problematic launch - autodeploy not working, CTD freefell ~3m when jibbed out, not boomed out, tension spiked to 6500lbs; auto-recovery not working either, recovered by switching to manual/auto/manual  
CalCOFI Line.Sta in .hdr incorrect - listed as 80.0 1000.0, corrected to 80.0 100.0  
Cast 058 76.7 100.0: 24-bottle prodo cast to 515m; wave buoy drifter #637 deployed; uway pH #15314; on Line 76.7; CTD O2 data looks questionable from 0-5m on downcast, coded "8"  
Cast 059 76.7 90.0: 21-bottle cast to 515m;  
Cast 060 76.7 80.0: 20-bottle cast to 515m; rough seas but ship riding okay; some wire angle at 515m; interesting O2 inversion noticed at 150-300m downcast; lots of biomass in Bongo (krill, copepods, myctophiids)  
Cast 061 76.7 70.0: 24-bottle prodo cast; uway pH #15315; Seasave locked up in some weird mode - unable to trip bottles or create markers, bottles #23 & #24 closed manually using the deck unit.  
Note: Seasave was still acquiring data (background data acquisition scan count was updating) but program was frozen <Ctrl><Alt><Del> required. Data files seem okay; PC was rebooted, plots regenerated  
Cast 062 76.7 60.0: 21-bottle cast to 515m; no software problems  
Cast 063 76.7 55.0: 21-bottle cast to 515m; nutrient #12 (85m) looks bad, possible mistrip  
Cast 064 76.7 51.0: 17-bottle cast to 230m, 236m bottom; #12 mistripped again, no water  
Cast 065 76.7 49.0: 9-bottle cast to 60m, 66m bottom; bottles #10, #11, #12 test fired - all closed; uway pH #15316; shallow station, moon clearly visible for the 1st time this cruise; pretty calm finally, high surface chl visible  
Cast 066 80.0 51.0: 10-bottle cast to 68m, 74m bottom; DIC+uway pH #15317; calm overcast/foggy sunrise station; surface T noticeably warmer since last sta, Line 77  
Cast 067 80.0 50.5: 5-bottle cast to 15m, 20m SCCOOS station  
Cast 068 81.8 46.9: 24-bottle Santa Barbara Basin prodo station w/ DIC+NCOG, CTD to 565m, 575m bottom.  
Cast 069 81.7 43.5: 5-bottle cast to 19m, 23m SCCOOS station  
Cast 070 83.3 42.0: 13-bottle cast to 125m, 135m bottom; 0&30m DIC/pH; #12 mistripped at surface so #13 was tripped  
Cast 071 83.3 40.6: 6-bottle cast to 30m, 32m bottom (4.7m noted on altimeter); 0&30m DIC/pH+uway pH #15329  
Cast 072 83.3 39.4: 5-bottle cast to 16m, 19m SCCOOS station - last station

JRW 26 Jun 2019