CTD.csv: Bottle-corrected CTD+Bottle Index with QC

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CalCOFI collects seawater samples using 24-10L bottles mounted on a CTD-Rosette. The seawater samples are analyzed at-sea then undergo a series of additional data-processing, calibration, & data-quality steps on shore. Once final, good bottle data are merged with 1m-binaveraged CTD sensor data from the same cast, same depths. The bottle salinities from >350m are used to correct CTD salinities (from all depths) by applying (separate) offsets to both primary and secondary CTD salinities. The oxygen bottle samples are regressed against the corresponding CTD primary and secondary oxygen sensor data. Four cruise-average correction regression plots, using all the bottle samples, are plotted and coefficients applied, resulting in Ox1_CruiseCorr ml/L and umol/Kg and Ox2_CruiseCorr ml/L and umol/Kg.

Both station and cruise-average correction regression plots, using all the chlorophyll bottle samples, are plotted versus the CTD fluorometer voltage. The coefficients are applied to the 1m binavg fluorometer voltages from 0-200 meters - EstChl_StaCorr & EstChl_CruiseCorr. Lastly, two regression plots, station & cruise-average correction, using all the nitrate bottle samples, are plotted versus the CTD ISUS sensor voltages. Coefficients are applied to the 1m binavg ISUS voltage to calculate two estimated nitrate profiles - cruise-corrected using coefficients from all the bottle data & sta-corrected using coefficients from the cast's ~20 bottle samples.

CTD + Bottle CSV Column Format (color key & data code index at bottom)

Count	Field	Description	Format
1	Project	Cruise; usually CalCOFI	Text, variable
2	Study	YYMMSS (year month ship) Cruise designation	Text, 6 char
3	Ord_Occ	Order Occupied	Integer
4	Event_Num	CTD-at-Depth event number	Integer
5	Cast_ID	Study+Order Occupied+up or downcast	Text, 9 char
6	Date_Time_UTC	Date Time UTC; downcast = start time; upcast=time @ 1st bottle tripped	DD-MMM-YYYY HH:M:SS
7	Date_Time_PST	Date Time PST: downcast = start time; upcast=time @ 1st bottle tripped	DD-MMM-YYYY HH:MM:SS

8	Lat_Dec	GPS Decimal Latitude: downcast = start lat; upcast=lat @ 1st bottle tripped	R7.5; ##.#####
9	Lon_Dec	GPS Decimal Longitude: downcast = start lon; upcast=lon @ 1st bottle tripped	R8.5; -###.#####
10	Sta_ID	CalCOFI Line and Station	Text; LLL.L SSS.S
11	Line	CalCOFI Line	R4.1; LLL.L
12	Sta	CalCOFI Station	R4.1; SSS.S
13	Depth	1 Meter Binavg Depth (meters)	R7.3; D.DDD
14	Pressure	1 Meter Binavg Pressure (db)	R7.3; P.PPP
15	PrQ	Pressure Sensor Data Quality	I1
16	Temp1	1° Temperature (deg C)	R6.4; ##.####
17	T1Q	1° Temperature Data Quality Code	I1; see key below
18	Temp2	2° Temperature (deg C)	R6.4; ##.####
19	T2Q	2° Temperature Data Quality Code	I1
20	TempAve	Average Temperature, deg C; (1°+2°)/2	R6.4;# #.####
21	Salt1	1° Salinity (PSU)	R6.4; ##.####
22	S1Q	1° Salinity Data Quality Code	I1
23	Salt1_Corr	1° Salinity, Bottle-corrected (PSU)	R6.4
24	Salt2	2° Salinity (PSU)	R6.4
25	S2Q	2° Salinity Data Quality Code	I1
26	Salt2_Corr	2° Salinity, Bottle-corrected (PSU)	R6.4
27	SaltAve_Corr	Average Corrected Salinity; (1°+2°)/2	R6.4
28	Ox1	1° Oxygen; ml/L	R6.5
29	Ox1Q	1° Oxygen Data Quality Code	I1

30	Ox1_CruiseCorr	1° Oxygen, cruise-corrected; ml/L	R6.5; see key
31	Ox1_StaCorr	1° Oxygen, sta-corrected; ml/L	R6.5; see key
32	Ox2	2° Oxygen; ml/L	R6.5
33	Ox2Q	2° Oxygen Data Quality Code	I1
34	Ox2_CruiseCorr	2° Oxygen, cruise-corrected; ml/L	R6.5
35	Ox2_StaCorr	2° Oxygen, sta-corrected; ml/L	R6.5
36	OxAve_StaCorr	Average Oxygen (ml/L); (1° +2°)/2	R6.5
37	Ox1uM	1° Oxygen; uM/Kg	
38	Ox1uM_CruiseCorr	1° Oxygen;cruise-corrected;uM/Kg	
39	Ox1uM_StaCorr	1° Oxygen;sta-corrected; uM/Kg	
40	Ox2uM	2° Oxygen; uM/Kg	
41	Ox2uM_CruiseCorr	2° Oxygen;cruise-corrected;uM/Kg	
42	Ox2uM_StaCorr	2° Oxygen;sta-corrected; uM/Kg	
43	OxAveuM_StaCorr	Average Oxygen (ml/L); (1° +2°)/2	
44	FluorV	Fluorometer Voltage (V)	R5.4
45	FlQ	Fluorometer Data Quality Code	I1
46	EstChl_CruiseCorr	Estimated Chlorophyll, cruise-corrected	R6.4
47	EstChl_StaCorr	Estimated Chlorophyll, sta-corrected	R6.4
48	ISUSV	ISUS Voltage	R5.4
49	IsQ	ISUS Data Quality Code	I1

50	EstNO3_CruiseCorr	Estimated Nitrate, cruise-corrected	R5.4
51	EstNO3_StaCorr	Estimated Nitrate, sta-corrected	R5.4
52	SigThetaTS1	Sigma-theta T1S1	R6.4
53	SigTheta1Q	Sigma-theta T1S1 Quality Code	I1
54	SigThetaTS2	Sigma-theta T2S2	R6.4
55	SigTheta2Q	Sigma-theta T2S2 Quality Code	I1
56	BAT	Beam Attenuation Coefficient	R5.4
57	XMiss	% Light Transmission	R6.4
58	TransQ	Transmissometer Quality Code	I1
59	pH	pH Sensor	R6.4
60	pHQ	pH Sensor Quality Code	I1
61	SPAR	Surface PAR	#.##E+##
62	SPARQ	Surface PAR Quality Code	I1
63	PAR	Remote PAR	#.##E+##
64	PARQ	Remote PAR Quality Code	I1
65	PoT1	Potential Temperature	R6.4
66	PoT2	Potential Temperature	R6.4
67	DynHt	Dynamic Height	R5.4
68	SVA	Specific Volume Anomaly	R6.3
69	OxSat1	Oxygen Saturation	R5.4
70	OxSat2	Oxygen Saturation	R5.4
71	BTL_Depth	Bottle Depth (meters)	I4
72	BTL_Temp	Bottle Temperature (deg C); usually 1°T	R5.3
73	SaltB	Bottle Salinity (PSU)	R6.4
74	OxB	Bottle Oxygen (ml/L)	R4.3
75	Chl-a	Bottle Chlorophyll	R4.3
76	Phaeo	Bottle Phaeopigments	R4.3
77	NO3	Bottle Nitrate	R3.1

78	NO2	Bottle Nitrite	R3.2
79	NH4	Bottle Ammonium	R3.2
80	PO4	Bottle Phosphate	R4.2
81	SIL	Bottle Silicate	R5.2
82	Comment	Data-related comment(s)	Text

Color Codes for this table		
Color	Data Type	Source
White	CTD Cast Information	CTD "At Depth" Metadata
Green	CTD Data	1m binavg CTD Data, Seasave processed
Yellow	Bottle-corrected CTD Data	1m CTD Data, Seasave processed, bottle corrected
Blue	Bottle Data	Final, processed bottle data
Purple	Data Quality	Data Quality Codes and Comments:
		• 0 or blank = Good Data • 1 = use Primary sensor data (dual sensors) • 2 = use Secondary sensor data (dual sensors) • 8 = data questionable • 9 = bad or missing data