

No	Metadata element name		Help reference no.
1	Submission Date	2016-12-08	1
2	Accession no. of related data sets		2
3	Investigator-1 name	Uwe Send	3.1
4	Investigator-1 institution	Scripps Institution of Oceanography	3.2
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8	Investigator-1 researcher ID		3.6
9	Investigator-1 ID type (ORCID, Researcher ID, etc.)		3.7
10	Investigator-2 name	Mark Ohman	3.1
11	Investigator-2 institution	Scripps Institution of Oceanography	3.2
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14	Investigator-2 email	mohman@ucsd.edu	3.5
15	Investigator-2 researcher ID		3.6
16	Investigator-2 ID type (ORCID, Researcher ID, etc.)		3.7
17	Investigator-3 name	Matthias Lankhorst	3.1
18	Investigator-3 institution	Scripps Institution of Oceanography	3.2
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23	Investigator-3 ID type (ORCID, Researcher ID, etc.)		3.7
24	Investigator-4 name	Hey-Jin Kim	
25	Investigator-4 institution	Scripps Institution of Oceanography	
26	Investigator-4 address	9500 Gilman dr., #0230, La Jolla, CA 92093-0230	
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29	Investigator-4 researcher ID		

30	Investigator-4 ID type (ORCID, Researcher ID, etc.)		
17	Data submitter name	Hey-Jin Kim	4.1
18	Data submitter institution	Scripps Institution of Oceanography	4.2
19	Data submitter address	9500 Gilman dr., #0230, La Jolla, CA 92093-0230	4.3
20	Data submitter phone	858-534-4986	4.4
21	Data submitter email	hjkim@ucsd.edu	4.5
22	Data submitter researcher ID		4.6
23	Data submitter ID type (ORCID, Researcher ID, etc.)		4.7
24	Title	Dissolved inorganic carbon (DIC), total alkalinity (TA), temperature, salinity, nutrients, dissolved oxygen, CHL-a and phaeo pigment measured by discrete water samples and CTD for calibration and validation of California Current Ecosystem (CCE) mooring timeseries California Current Ecosystem moorings (CCE1 and CCE2) are surface buoys equipped with interdisciplinary scientific sensors including NOAA PMEL pCO2 system, meteorological sensors (wind, air temperature, air humidity, and air pressure), CTDs (temperature and conductivity), Acoustic Doppler Current Profiler (ADCP, ocean current), oxygen sensor, pH sensor, SUNA (nitrate+nitrite), and FLNTUS (fluorescence). CCE1 is located offshore in the core of the California Current (CalCOFI station 80.80), and CCE2 is closer to shore on the shelf break that is influenced by strong coastal upwelling process (CalCOFI station 80.55). CCE moorings measure physical, biological, and chemical variables with temporal resolutions high enough to resolve event-scale phenomena and transmit real-time data to shore. These data are viewed on the website, http://mooring.ucsd.edu/cce and updated every 6 hours. Typically annual cruises are conducted to recover and redeploy CCE moorings. During the cruises, CTD-Rosette casts are performed with collecting water samples of salinity, oxygen, DIC, total alkalinity, nutrients (NO2, NO3, Silicate, PO4, and NH4), chlorophyll-a, and phaeo pigment. This data file includes these discrete water sample results and CTD temperature and salinity values where the bottles are taken.	5
25	Abstract		6
26	Purpose	To calibrate and validate CCE mooring timeseries.	7
27	Start date	2009-12-15	8.1
28	End date	2015-04-29	8.2
29	Westbd longitude	-124.5737	9.1
30	Eastbd longitude	-117.6783	9.2
31	Northbd latitude	34.3295	9.3
32	Southbd latitude	31.2	9.4
33	Spatial reference system	WGS 84	10
34	Geographic names	California Current	11
35	Location of organism collection		12
36	Funding agency name	NOAA's Ocean Acidification Program	13.1
37	Funding project title	Moored Carbon, Biogeochemical, and Ecosystem Observations in the Southern California Current (CCE)	13.2

38	Funding project ID (Grant no.)	NOAA - NA10OAR4320156, NOAA - NA15OAR4320071	13.3
39	Research projects	Long Term Ecological Research (LTER) California Current Ecosystem	14
40	Platform-1 name	R/V New Horizon	15.1
41	Platform-1 ID	32NM	15.2
42	Platform-1 type	Research vessle	15.3
43	Platform-1 owner	UCSD	15.4
44	Platform-1 country	USA	15.5
45	Platform-2 name	R/V Robert Gordon Sproul	15.1
46	Platform-2 ID	32QU	15.2
47	Platform-2 type	Research vessle	15.3
48	Platform-2 owner	UCSD	15.4
49	Platform-2 country	USA	15.5
50	EXPOCODE	32NM20150426	16
51	Cruise ID	NH1505	17
52	Section	none	18
53	Author list for citation	Send, Uwe; Ohman, Mark;Lankhorst, Matthias;Kim, Hey-Jin	19
54	References		20
55	Supplemental information	none	21
56	DIC: Variable abbreviation in data files	DIC	22.1
57	DIC: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	22.2
58	DIC: In-situ observation / manipulation condition / response variable	In-situ observation	22.3
59	DIC: Manipulation method		22.4
60	DIC: Variable unit	umol/kg	22.5
61	DIC: Measured or calculated	Measured	22.6
62	DIC: Calculation method and parameters	none	22.7
63	DIC: Sampling instrument	Rosette bottle	22.8
64	DIC: Analyzing instrument		22.9
65	DIC: Detailed sampling and analyzing information	DIC was determined by acidifying the sample, and using a gas extraction/coulometric titration technique as described in Dickson et al. (2007).	22.10
66	DIC: Field replicate information		22.11
67	DIC: Standardization technique description		22.12.1

68	DIC: Frequency of standardization		22.12.2
69	DIC: CRM manufacturer		22.12.3.1
70	DIC: Batch number		22.12.3.2
71	DIC: Poison used to kill the sample	mercury(II) chloride	22.13.1
72	DIC: Poison volume		22.13.2
73	DIC Poisoning correction description		22.13.3
74	DIC: Uncertainty		22.14
75	DIC: Data quality flag description	WOCE quality flags	22.15
76	DIC: Method reference (citation)	Dickson, Andrew Gilmore, Christopher L. Sabine, and James Robert Christian. "Guide to Best Practices for Ocean CO2 Measurements." (2007).	22.16
77	DIC: Researcher Name	Andrew Dickson	22.17.1
78	DIC: Researcher Institution	Scripps Institution of Oceanography	22.17.2
79	TA: Variable abbreviation in data files	TA	23.1
80	TA: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	23.2
81	TA: In-situ observation / manipulation condition / response variable	In-situ observation	23.3
82	TA: Manipulation method		23.4
83	TA: Variable unit	umol/kg	23.5
84	TA: Measured or calculated	Measured	23.6
85	TA: Calculation method and parameters		23.7
86	TA: Sampling instrument	Rosette bottle	23.8
87	TA: Analyzing instrument	Alkalinity titrator	23.9
88	TA: Type of titration		23.10
89	TA: Cell type (open or closed)	Open	23.11
90	TA: Curve fitting method		23.12
91	TA: Detailed sampling and analyzing information	Amber 250 ml polypropylene bottles are filled with water from Niskin bottles. TA was determined using a two-stage open-cell-titration technique as described in Dickson et al. (2003).	23.13
92	TA: Field replicate information		23.14
93	TA: Standardization technique description		23.15.1
94	TA: Frequency of standardization		23.15.2

95	TA: CRM manufacturer		23.15.3.1
96	TA: Batch Number		23.15.3.2
97	TA: Poison used to kill the sample		23.16.1
98	TA: Poison volume		23.16.2
99	TA: Poisoning correction description		23.16.3
100	TA: Magnitude of blank correction		23.17
101	TA: Uncertainty		23.18
102	TA: Data quality flag description	WOCE quality flags	23.19
103	TA: Method reference (citation)	Dickson, AG, Afghan JD, Anderson GC. "Reference materials for oceanic CO2 analysis: a method for the certification of total alkalinity". Marine Chemistry. 80:185-197. 10.1016/s0304-4203(02)00133-0 (2003)	23.20
104	TA: Researcher Name	Andrew Dickson	23.21.1
105	TA: Researcher Institution	Scripps Institution of Oceanography	23.21.2
106	pH: Variable abbreviation in data files		24.1
107	pH: Observation type		24.2
108	pH: In-situ observation / manipulation condition / response variable		24.3
109	pH: Manipulation method		24.4
110	pH: Measured or calculated		24.5
111	pH: Calculation method and parameters		24.6
112	pH: Sampling instrument		24.7
113	pH: Analyzing instrument		24.8
114	pH: pH scale		24.9
115	pH: Temperature of measurement		24.10
116	pH: Detailed sampling and analyzing information		24.11
117	pH: Field replicate information		24.12
118	pH: Standardization technique description		24.13.1
119	pH: Frequency of standardization		24.13.2
120	pH: pH values of the standards		24.13.3

121	pH: Temperature of standardization	24.13.4
122	pH: Temperature correction method	24.14
123	pH: at what temperature was pH reported	24.15
124	pH: Uncertainty	24.16
125	pH: Data quality flag description	24.17
126	pH: Method reference (citation)	24.18
127	pH: Researcher Name	24.19.1
128	pH: Researcher Institution	24.19.2
129	pCO2A: Variable abbreviation in data files	25.1
130	pCO2A: Observation type	25.2
131	pCO2A: In-situ observation / manipulation condition / response variable	25.3
132	pCO2A: Manipulation method	25.4
133	pCO2A: Variable unit	25.5
134	pCO2A: Measured or calculated	25.6
135	pCO2A: Calculation method and parameters	25.7
136	pCO2A: Sampling instrument	25.8
137	pCO2A: Location of seawater intake	25.9
138	pCO2A: Depth of seawater intake	25.10
139	pCO2A: Analyzing instrument	25.11
140	pCO2A: Detailed sampling and analyzing information	25.12
141	pCO2A: Equilibrator type	25.13.1
142	pCO2A: Equilibrator volume (L)	25.13.2
143	pCO2A: Vented or not	25.13.3
144	pCO2A: Water flow rate (L/min)	25.13.4
145	pCO2A: Headspace gas flow rate (L/min)	25.13.5
146	pCO2A: How was temperature inside the equilibrator measured .	25.13.6

147	pCO2A: How was pressure inside the equilibrator measured.	25.13.7
148	pCO2A: Drying method for CO2 gas	25.14
149	pCO2A: Manufacturer of the gas detector	25.15.1
150	pCO2A: Model of the gas detector	25.15.2
151	pCO2A: Resolution of the gas detector	25.15.3
152	pCO2A: Uncertainty of the gas detector	25.15.4
153	pCO2A: Standardization technique description	25.16.1
154	pCO2A: Frequency of standardization	25.16.2
155	pCO2A: Manufacturer of standard gas	25.16.3.1
156	pCO2A: Concentrations of standard gas	25.16.3.2
157	pCO2A: Uncertainties of standard gas	25.16.3.3
158	pCO2A: Water vapor correction method	25.17
159	pCO2A: Temperature correction method	25.18
160	pCO2A: at what temperature was pCO2 reported	25.19
161	pCO2A: Uncertainty	25.20
162	pCO2A: Data quality flag description	25.21
163	pCO2A: Method reference (citation)	25.22
164	pCO2A: Researcher Name	25.23.1
165	pCO2A: Researcher Institution	25.23.2
166	pCO2D: Variable abbreviation in data files	26.1
167	pCO2D: Observation type	26.2

168	pCO2D: In-situ observation / manipulation condition / response variable	26.3
169	pCO2D: Manipulation method	26.4
170	pCO2D: Variable unit	26.5
171	pCO2D: Measured or calculated	26.6
172	pCO2D: Calculation method and parameters	26.7
173	pCO2D: Sampling instrument	26.8
174	pCO2D: Analyzing instrument	26.9
175	pCO2D: Storage method	26.10
176	pCO2D: Seawater volume (mL)	26.11
177	pCO2D: Headspace volume (mL)	26.12
178	pCO2D: Temperature of measurement	26.13
179	pCO2D: Detailed sampling and analyzing information	26.14
180	pCO2D: Field replicate information	26.15
181	pCO2D: Manufacturer of the gas detector	26.16.1
182	pCO2D: Model of the gas detector	26.16.2
183	pCO2D: Resolution of the gas detector	26.16.3
184	pCO2D: Uncertainty of the gas detector	26.16.4
185	pCO2D: Standardization technique description	26.17.1
186	pCO2D: Frequency of standardization	26.17.2
187	pCO2D: Temperature of standardization	26.17.3
188	pCO2D: Manufacturer of standard gas	26.17.4.1
189	pCO2D: Concentrations of standard gas	26.17.4.2
190	pCO2D: Uncertainties of standard gas	26.17.4.3

191	pCO2D: Water vapor correction method	26.18
192	pCO2D: Temperature correction method	26.19
193	pCO2D: at what temperature was pCO2 reported	26.20
194	pCO2D: Uncertainty	26.21
195	pCO2D: Data quality flag description	26.22
196	pCO2D: Method reference (citation)	26.23
197	pCO2D: Researcher Name	26.24.1
198	pCO2D: Researcher Institution	26.24.2
199	Var1: Variable abbreviation in data files	27.1
200	Var1: Full variable name	27.2
201	Var1: Observation type	27.4
202	Var1: In-situ observation / manipulation condition / response variable	27.5
203	Var1: Variable unit	27.7
204	Var1: Measured or calculated	27.8
205	Var1: Calculation method and parameters	27.9
206	Var1: Sampling instrument	27.10
207	Var1: Analyzing instrument	27.11
208	Var1: Duration (for settlement/colonization methods)	27.12
209	Var1: Detailed sampling and analyzing information	27.13
210	Var1: Field replicate information	27.14
211	Var1: Uncertainty	27.15
212	Var1: Data quality flag description	27.16
213	Var1: Method reference (citation)	27.17
214	Var1: Biological subject	27.18

215	Var1: Species Identification code		27.19
216	Var1: Life stage of the biological subject		27.20
217	Var1: Researcher Name	Matthias Lankhorst	27.21.1
218	Var1: Researcher Institution	Scripps Institution of Oceanography	27.21.2
219	Var2: Variable abbreviation in data files	CTD Temperature	27.1
220	Var2: Full variable name	Sea water temperature	27.2
221	Var2: Observation type	profile	27.4
222	Var2: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
223	Var2: Variable unit	ITS-90 scale degC	27.7
224	Var2: Measured or calculated	Measured	27.8
225	Var2: Calculation method and parameters		27.9
226	Var2: Sampling instrument	SBE 3plus	27.10
227	Var2: Analyzing instrument		27.11
228	Var2: Duration (for settlement/colonization methods)		27.12
229	Var2: Detailed sampling and analyzing information	SBE 3plus dual temperature sensor connected to the CTD-Rosette measures temperature profiles. During upcasts, Rosette bottles are closed at target depths to trap seawater. CTD temperature values are averaged over 1.5 seconds from bottle closure to obtain discrete temperature values. Typically SBE 3plus calibration is done every 4 months by the Oceanographic Data Facility at Scripps Institution of Oceanography.	27.13
230	Var2: Field replicate information		27.14
231	Var2: Uncertainty	plus minus 0.001 degC	27.15
232	Var2: Data quality flag description	WOCE quality flags	27.16
233	Var2: Method reference (citation)		27.17
234	Var2: Biological subject		27.18
235	Var2: Species Identification code		27.19
236	Var2: Life stage of the biological subject		27.20
237	Var2: Researcher Name	Matthias Lankhorst	27.21.1
238	Var2: Researcher Institution	Scripps Institution of Oceanography	27.21.2
239	Var3: Variable abbreviation in data files	CTD Salinity	27.1

240	Var3: Full variable name	Sea water salinity	27.2
241	Var3: Observation type	profile	27.4
242	Var3: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
243	Var3: Variable unit	psu	27.7
244	Var3: Measured or calculated	calculated from measured conductivity	27.8
245	Var3: Calculation method and parameters		27.9
246	Var3: Sampling instrument	SBE 4C	27.10
247	Var3: Analyzing instrument		27.11
248	Var3: Duration (for settlement/colonization methods)		27.12
249	Var3: Detailed sampling and analyzing information	SBE 4C dual conductivity sensor connected to the CTD-Rosette measures conductivity profiles. During upcasts, Rosette bottles are closed at target depths to trap seawater. CTD salinity values calculated from CTD conductivity are averaged over 1.5 seconds from bottle closure to obtain discrete salinity values. Typically SBE 4C calibration is done every 4 months by SBE. No other data processing has been applied.	27.13
250	Var3: Field replicate information		27.14
251	Var3: Uncertainty	plus minus 0.005 psu	27.15
252	Var3: Data quality flag description	WOCE quality flags. 2=good data, 3=questionable data, 4=bad data, 5= data not reported, 6=mean of replicate measurements, 9=sample not drawn	27.16
253	Var3: Method reference (citation)		27.17
254	Var3: Biological subject		27.18
255	Var3: Species Identification code		27.19
256	Var3: Life stage of the biological subject		27.20
257	Var3: Researcher Name	Matthias Lankhorst	27.21.1
258	Var3: Researcher Institution	Scripps Institution of Oceanography	27.21.2
259	Var4: Variable abbreviation in data files	Bottle salinity	27.1
260	Var4: Full variable name	Sea water practical salinity	27.2
261	Var4: Observation type	Discrete measurements from Rosette bottle water samples collected on CTD casts	27.4
262	Var4: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
263	Var4: Variable unit	psu	27.7
264	Var4: Measured or calculated	Measured	27.8

265	Var4: Calculation method and parameters		27.9
266	Var4: Sampling instrument	Rosette bottle	27.10
267	Var4: Analyzing instrument	Salinometer	27.11
268	Var4: Duration (for settlement/colonization methods)		27.12
269	Var4: Detailed sampling and analyzing information	Rosette bottle water samples were taken to the shore and salinity measurements were made using salinometer.	27.13
270	Var4: Field replicate information		27.14
271	Var4: Uncertainty		27.15
272	Var4: Data quality flag description	WOCE quality flags. 2=good data, 3=questionable data, 4=bad data, 5= data not reported, 6=mean of replicate measurements, 9=sample not drawn	27.16
273	Var4: Method reference (citation)		27.17
274	Var4: Biological subject		27.18
275	Var4: Species Identification code		27.19
276	Var4: Life stage of the biological subject		27.20
277	Var4: Researcher Name	Matthias Lankhorst	27.21.1
278	Var4: Researcher Institution	Scripps Institution of Oceanography	27.21.2
279	Var5: Variable abbreviation in data files	Bottle dissolved oxygen	27.1
280	Var5: Full variable name	Dissolved oxygen concentration in sea water	27.2
281	Var5: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
282	Var5: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
283	Var5: Variable unit	ml/L	27.7
284	Var5: Measured or calculated	Measured	27.8
285	Var5: Calculation method and parameters		27.9
286	Var5: Sampling instrument	Rosette bottle	27.10
287	Var5: Analyzing instrument	Oxygen titrator	27.11
288	Var5: Duration (for settlement/colonization methods)		27.12
289	Var5: Detailed sampling and analyzing information	Bottle samples are analyzed by an SIO oxygen titrator (an iodine titrator). The function of the SIO oxygen titrator is little different in principle from the basic Winkler titration as modified by Carpenter (1965). As an end-point indicator, the very strong ultra-violet light absorption is used instead of the visible color of the iodine-starch complex.	27.13
290	Var5: Field replicate information		27.14

291	Var5: Uncertainty		27.15
292	Var5: Data quality flag description	WOCE quality flags	27.16
293	Var5: Method reference (citation)	Carpenter, J. H., "The Chesapeake Bay Institute technique for the Winkler dissolved oxygen method," <i>Limnology and Oceanography</i> , 10, pp. 141-143 (1965).	27.17
294	Var5: Biological subject		27.18
295	Var5: Species Identification code		27.19
296	Var5: Life stage of the biological subject		27.20
297	Var5: Researcher Name	Matthias Lankhorst	27.21.1
298	Var5: Researcher Institution	Scripps Institution of Oceanography	27.21.2
299	Var6: Variable abbreviation in data files	NO3	27.1
300	Var6: Full variable name	Nitrate concentration in sea water	27.2
301	Var6: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
302	Var6: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
303	Var6: Variable unit	umol/L	27.7
304	Var6: Measured or calculated	Measured	27.8
305	Var6: Calculation method and parameters		27.9
306	Var6: Sampling instrument	Rosette bottle	27.10
307	Var6: Analyzing instrument	Seal Analytical continuous-flow AutoAnalyzer 3 (AA3)	27.11
308	Var6: Duration (for settlement/colonization methods)		27.12
309	Var6: Detailed sampling and analyzing information	Water samples are analyzed by a Seal Analytical continuous-flow AutoAnalyzer 3 (AA3). A modification of the Armstrong et al. (1967) procedure is used for the analysis of nitrate and nitrite.	27.13
310	Var6: Field replicate information		27.14
311	Var6: Uncertainty		27.15
312	Var6: Data quality flag description	WOCE quality flags	27.16
313	Var6: Method reference (citation)	Armstrong, F.A.J., Stearns, C.A., and Strickland, J.D.H., "The measurement of upwelling and subsequent biological processes by means of the Technicon Autoanalyzer and associated equipment," <i>Deep-Sea Research</i> , 14, pp.381-389 (1967).	27.17
314	Var6: Biological subject		27.18
315	Var6: Species Identification code		27.19

316	Var6: Life stage of the biological subject		27.20
317	Var6: Researcher Name	Mark Ohman	27.21.1
318	Var6: Researcher Institution	Scripps Institution of Oceanography	27.21.2
319	Var7: Variable abbreviation in data files	NO2	27.1
320	Var7: Full variable name	Nitrite concentration in sea water	27.2
321	Var7: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
322	Var7: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
323	Var7: Variable unit	umol/L	27.7
324	Var7: Measured or calculated	Measured	27.8
325	Var7: Calculation method and parameters		27.9
326	Var7: Sampling instrument	Rosette bottle	27.10
327	Var7: Analyzing instrument	Seal Analytical continuous-flow AutoAnalyzer 3 (AA3)	27.11
328	Var7: Duration (for settlement/colonization methods)		27.12
329	Var7: Detailed sampling and analyzing information	Water samples are analyzed by a Seal Analytical continuous-flow AutoAnalyzer 3 (AA3). A modification of the Armstrong et al. (1967) procedure is used for the analysis of nitrate and nitrite.	27.13
330	Var7: Field replicate information		27.14
331	Var7: Uncertainty		27.15
332	Var7: Data quality flag description	WOCE quality flags	27.16
333	Var7: Method reference (citation)	Armstrong, F.A.J., Stearns, C.A., and Strickland, J.D.H., "The measurement of upwelling and subsequent biological processes by means of the Technicon Autoanalyzer and associated equipment," Deep-Sea Research, 14, pp.381-389 (1967).	27.17
334	Var7: Biological subject		27.18
335	Var7: Species Identification code		27.19
336	Var7: Life stage of the biological subject		27.20
337	Var7: Researcher Name	Mark Ohman	27.21.1
338	Var7: Researcher Institution	Scripps Institution of Oceanography	27.21.2
339	Var8: Variable abbreviation in data files	NH4	27.1
340	Var8: Full variable name	Ammonium concentration in sea water	27.2
341	Var8: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4

342	Var8: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
343	Var8: Variable unit	umol/L	27.7
344	Var8: Measured or calculated	Measured	27.8
345	Var8: Calculation method and parameters		27.9
346	Var8: Sampling instrument	Rosette bottle	27.10
347	Var8: Analyzing instrument		27.11
348	Var8: Duration (for settlement/colonization methods)		27.12
349	Var8: Detailed sampling and analyzing information	The basic method of Kerouel and Aminot (Kero97) is used.	27.13
350	Var8: Field replicate information		27.14
351	Var8: Uncertainty		27.15
352	Var8: Data quality flag description	WOCE quality flags	27.16
353	Var8: Method reference (citation)	Kerouel, R., Aminot, A., "Fluorometric determination of ammonia in sea and estuarine waters by direct segmented flow analysis." Marine Chemistry, vol 57, no. 3-4, pp. 265-275, July 1997	27.17
354	Var8: Biological subject		27.18
355	Var8: Species Identification code		27.19
356	Var8: Life stage of the biological subject		27.20
357	Var8: Researcher Name	Mark Ohman	27.21.1
358	Var8: Researcher Institution	Scripps Institution of Oceanography	27.21.2
359	Var9: Variable abbreviation in data files	PO4	27.1
360	Var9: Full variable name	Phosphate concentration in sea water	27.2
361	Var9: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
362	Var9: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
363	Var9: Variable unit	umol/L	27.7
364	Var9: Measured or calculated	Measured	27.8
365	Var9: Calculation method and parameters		27.9
366	Var9: Sampling instrument	Rosette bottle	27.10
367	Var9: Analyzing instrument		27.11

368	Var9: Duration (for settlement/colonization methods)		27.12
369	Var9: Detailed sampling and analyzing information	A modification of the Bernhardt and Wilhelms (1967) method was used.	27.13
370	Var9: Field replicate information		27.14
371	Var9: Uncertainty		27.15
372	Var9: Data quality flag description	WOCE quality flags	27.16
373	Var9: Method reference (citation)	Bernhardt, H., and Wilhelms, A., "The continuous determination of low level iron, soluble phosphate and total phosphate with the AutoAnalyzer," Technicon Symposia, I,pp.385-389 (1967).	27.17
374	Var9: Biological subject		27.18
375	Var9: Species Identification code		27.19
376	Var9: Life stage of the biological subject		27.20
377	Var9: Researcher Name	Mark Ohman	27.21.1
378	Var9: Researcher Institution	Scripps Institution of Oceanography	27.21.2
379	Var10: Variable abbreviation in data files	SIL	27.1
380	Var10: Full variable name	Silicate concentration in sea water	27.2
381	Var10: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
382	Var10: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
383	Var10: Variable unit	umol/L	27.7
384	Var10: Measured or calculated	Measured	27.8
385	Var10: Calculation method and parameters		27.9
386	Var10: Sampling instrument	Rosette bottle	27.10
387	Var10: Analyzing instrument		27.11
388	Var10: Duration (for settlement/colonization methods)		27.12
389	Var10: Detailed sampling and analyzing information	The basic Armstrong et al. (1967) method was used.	27.13
390	Var10: Field replicate information		27.14
391	Var10: Uncertainty		27.15
392	Var10: Data quality flag description	WOCE quality flags	27.16

393	Var10: Method reference (citation)	Armstrong, F.A.J., Stearns, C.A., and Strickland, J.D.H., "The measurement of upwelling and subsequent biological processes by means of the Technicon Autoanalyzer and associated equipment," Deep-Sea Research, 14, pp.381-389 (1967).	27.17
394	Var10: Biological subject		27.18
395	Var10: Species Identification code		27.19
396	Var10: Life stage of the biological subject		27.20
397	Var10: Researcher Name	Mark Ohman	27.21.1
398	Var10: Researcher Institution	Scripps Institution of Oceanography	27.21.2
399	Var11: Variable abbreviation in data files	CHL-a	27.1
400	Var11: Full variable name	Mass concentration of cholophyll-a in sea water	27.2
401	Var11: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
402	Var11: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
403	Var11: Variable unit	ug/L	27.7
404	Var11: Measured or calculated	Measured	27.8
405	Var11: Calculation method and parameters		27.9
406	Var11: Sampling instrument	Rosette bottle	27.10
407	Var11: Analyzing instrument	Fluorometer	27.11
408	Var11: Duration (for settlement/colonization methods)		27.12
409	Var11: Detailed sampling and analyzing information	Water samples are filtered onto GF/F filters, then chlorophyll-a is extracted in an acetone solution. Fluorometer is used to read fluorecence before and after acidification to calculate chlorophyll-a and phaeopigment.	27.13
410	Var11: Field replicate information		27.14
411	Var11: Uncertainty		27.15
412	Var11: Data quality flag description	WOCE quality flags	27.16
413	Var11: Method reference (citation)	Yentsch, C.S., Menzel, D.W., "A method for the determination of phytoplankton chlorophyll and phaeophytin by fluorescence", Deep-Sea Res. 10: 221-231 (1963). Holm_Hansen, O., Lorenzen, C.J., Holms, R.W., Strickland, J.D.H., "Fluorometric Determination of Chlorophyll", J. Cons.perm.int Explor. Mer. 30: 3-15 (1965). Lorenzen, C. J., "Determination of chlorophylls and phaeopigments: spectrophotometric equations", Limnol. Oceanogr. 12: 343–346 (1967).	27.17
414	Var11: Biological subject		27.18

415	Var11: Species Identification code		27.19
416	Var11: Life stage of the biological subject		27.20
417	Var11: Researcher Name	Mark Ohman	27.21.1
418	Var11: Researcher Institution	Scripps Institution of Oceanography	27.21.2
419	Var12: Variable abbreviation in data files	Phaeo pigment	27.1
420	Var12: Full variable name	Mass concentration of phaeo pigment in sea water	27.2
421	Var12: Observation type	Deiscrete measurements from Rosette bottle water samples collected on CTD casts	27.4
422	Var12: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
423	Var12: Variable unit	ug/L	27.7
424	Var12: Measured or calculated	Measured	27.8
425	Var12: Calculation method and parameters		27.9
426	Var12: Sampling instrument	Rosette bottle	27.10
427	Var12: Analyzing instrument	Fluorometer	27.11
428	Var12: Duration (for settlement/colonization methods)		27.12
429	Var12: Detailed sampling and analyzing information	Water samples are filtered onto GF/F filters, then chlorophyll-a is extracted in an acetone solution. Fluorometer is used to read fluorescence before and after acidification to calculate chlorophyll-a and phaeopigment.	27.13
430	Var12: Field replicate information		27.14
431	Var12: Uncertainty		27.15
432	Var12: Data quality flag description	WOCE quality flags	27.16
433	Var12: Method reference (citation)	Yentsch, C.S., Menzel, D.W., "A method for the determination of phytoplankton chlorophyll and phaeophytin by fluorescence", Deep-Sea Res. 10: 221-231 (1963). Holm_Hansen, O., Lorenzen, C.J., Holms, R.W., Strickland, J.D.H., "Fluorometric Determination of Chlorophyll", J. Cons.perm.int Explor. Mer. 30: 3-15 (1965). Lorenzen, C. J., "Determination of chlorophylls and phaeopigments: spectrophotometric equations", Limnol. Oceanogr. 12: 343–346 (1967).	27.17
434	Var12: Biological subject		27.18
435	Var12: Species Identification code		27.19
436	Var12: Life stage of the biological subject		27.20

437	Var12: Researcher Name	Mark Ohman	27.21.1	
438	Var12: Researcher Institution	Scripps Institution of Oceanography	27.21.2	