No	Metadata element name	Your input	Help reference no.
1	**Submission Date**	12/12/2017	1
2	**Accession no. of related data sets**	0127524, 0162290	2
3	**Investigator-1 name**	Rik Wanninkhof	3.1
4	**Investigator-1 institution**	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	3.2
5	**Investigator-1 address**	4301 Rickenbacker Causeway, Miami, FL 33149, USA	3.3
6	**Investigator-1 phone**	(305) 361-4379	3.4
7	**Investigator-1 email**	Rik.Wanninkhof@noaa.gov	3.5
8	**Investigator-1 researcher ID**		3.6
9	**Investigator-1 ID type (ORCID, Researcher ID, etc.)**		3.7
10	**Investigator-2 name**	Leticia Barbero	3.1
11	**Investigator-2 institution**	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	3.2
12	**Investigator-2 address**	4301 Rickenbacker Causeway, Miami, FL 33149, USA	3.3
13	**Investigator-2 phone**	(305) 361-4453	3.4
14	**Investigator-2 email**	Leticia.Barbero@noaa.gov	3.5
15	**Investigator-2 researcher ID**		3.6
16	**Investigator-2 ID type (ORCID, Researcher ID, etc.)**		3.7
17	**Investigator-3 name**	Jonathan A. Hare	3.1
18	**Investigator-3 institution**	NOAA Northeast Fisheries Science Center	3.2
19	**Investigator-3 address**	28 Tarzwell Drive, Narragansett, RI 02882	3.3
20	**Investigator-3 phone**	401-782-3295	3.4
21	**Investigator-3 email**	Jon.Hare@NOAA.gov	3.5
22	**Investigator-3 researcher ID**		3.6
23	**Investigator-3 ID type (ORCID, Researcher ID, etc.)**		3.7
441	**Investigator-4 name**	Donald Christopher Melrose	3.1
442	**Investigator-4 institution**	NOAA Northeast Fisheries Science Center	3.2
443	**Investigator-4 address**	28 Tarzwell Drive, Narragansett, RI 02882	3.3
444	**Investigator-4 phone**	401-782-3350	3.4
445	**Investigator-4 email**	Chris.Melrose@NOAA.gov	3.5
446	**Investigator-4 researcher ID**		3.6
447	**Investigator-4 ID type (ORCID, Researcher ID, etc.)**		3.7
448	**Investigator-5 name**	Denis Pierrot	3.1
449	**Investigator-5 institution**	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	3.2
450	**Investigator-5 address**	4301 Rickenbacker Causeway, Miami, FL 33149, USA	3.3
451	**Investigator-5 phone**	(305) 361-4443	3.4
452	**Investigator-5 email**	Denis.Pierrot@noaa.gov	3.5
453	**Investigator-5 researcher ID**		3.6
454	**Investigator-5 ID type (ORCID, Researcher ID, etc.)**		3.7
455	**Investigator-6 name**	Nathan D.Rebuck	3.1
456	**Investigator-6 institution**	NOAA Northeast Fisheries Science Center	3.2
457	**Investigator-6 address**	28 Tarzwell Drive, Narragansett, RI 02882	3.3
458	**Investigator-6 phone**	401-782-3240	3.4
459	**Investigator-6 email**	Nathan.Rebuck@NOAA.gov	3.5
460	**Investigator-6 researcher ID**		3.6
461	**Investigator-6 ID type (ORCID, Researcher ID, etc.)**		3.7
462	**Investigator-7 name**	Christopher Taylor	3.1
463	**Investigator-7 institution**	NOAA Northeast Fisheries Science Center	3.2
464	**Investigator-7 address**	28 Tarzwell Drive, Narragansett, RI 02882	3.3
465	**Investigator-7 phone**		3.4
466	**Investigator-7 email**	Chris.1.Taylor@NOAA.gov	3.5
467	**Investigator-7 researcher ID**		3.6
468	**Investigator-7 ID type (ORCID, Researcher ID, etc.)**		3.7
469	**Investigator-8 name**	David W. Townsend	3.1

470	Investigator-8 institution	University of Maine	3.2
471	Investigator-8 address	341 Aubert Hall, Orono, ME 04469-5707	3.3
472	Investigator-8 phone	207-581-4367	3.4
473	Investigator-8 email	davidt@umaine.edu	3.5
474	Investigator-8 researcher ID		3.6
475	Investigator-8 ID type (ORCID, Researcher ID, etc.)		3.7
476	Investigator-9 name	Maura Thomas	3.1
477	Investigator-9 institution	University of Maine	3.2
478	Investigator-9 address	454 Aubert Hall, Orono, ME 04469-5707	3.3
479	Investigator-9 phone	207-581-4314	3.4
480	Investigator-9 email	mthomas@umaine.edu	3.5
481	Investigator-9 researcher ID		3.6
482	Investigator-8 ID type (ORCID, Researcher ID, etc.)		3.7
24	Data submitter name	Leticia Barbero	4.1
25	Data submitter institution	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	4.2
26	Data submitter address	4301 Rickenbacker Causeway, Miami, FL 33149, USA	4.3
27	Data submitter phone	(305) 361-4453	4.4
28	Data submitter email	Leticia.Barbero@noaa.gov	4.5
29	Data submitter researcher ID		4.6
30	Data submitter ID type (ORCID, Researcher ID, etc.)		4.7
31	Title	Monitoring of Water Column DIC, TAlk, and pH on the Northeast U.S. Shelf and the Development of Ocean Acidification Indicators to Inform Marine Resource Management	5
32	Abstract	Increasing amounts of atmospheric carbon dioxide from human industrial activities are causing changes in global ocean carbon chemistry resulting in a reduction in pH, a process termed ocean acidification. Studies have demonstrated adverse effects on calcifying organisms, particularly some invertebrates, corals, sea urchins, pteropods, and coccolithophores. This effort is in support of the coastal monitoring and research objectives of the NOAA Ocean Acidification Program (OAP).	6
33	Purpose	To measure key carbon, physical and biogeochemical parameters in coastal waters of the US in relation to Ocean Acidification and monitor changes over time.	7
34	Start date	2/10/2017	8.1
35	End date	2/22/2017	8.2
36	Westbd longitude		9.1
37	Eastbd longitude		9.2
38	Northbd latitude		9.3
39	Southbd latitude		9.4
40	Spatial reference system	WGS 84	10
41	Geographic names	Gulf of Maine, Georges Bank, Mid-Atlantic Bight	11
42	Location of organism collection		12
43	Funding agency name	NOAA's Ocean Acidification Program	13.1
44	Funding project title	East and Gulf Coast Ocean Acidificati0on Observing Support. Monitoring of Water Column DIC, TAlk, and pH on the Northeast U.S. Shelf and the Development of Ocean Acidification Indicators to Inform Marine Resource Management	13.2
45	Funding project ID (Grant no.)		13.3
46	Research projects	none	14
47	Platform-1 name	Henry B. Bigelow	15.1
48	Platform-1 ID	33HH	15.2
49	Platform-1 type	Research Vessel	15.3
50	Platform-1 owner	NOAA, U.S. Government	15.4
51	Platform-1 country	United States	15.5
52	EXPOCODE	33HH20170210	16
53	Cruise ID	HB1701	17
54	Section	none	18
55	Author list for citation	Barbero, Leticia, Wanninkhof, Rik, Pierrot, Denis; Melrose, Donald Christopher; Hare, Jonathan; Rebuck, Nathan D., Townsend, D.W., Thomas, M.; Taylor, C.	19
56	References		20
57	Supplemental information	Please consult Readme file for additional information on analysis of carbon parameters. The most up to date version of this dataset is available at http://www.aoml.noaa.gov/ocd/gcc/shortcruises.htm	21

58	DIC: Variable abbreviation in data files	DIC	22.1
59	DIC: Observation type	Profile/underway (flow through)	22.2
60	DIC: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	22.3
61	DIC: Manipulation method (SPECIAL USE ONLY) (SPECIAL USE ONLY)		22.4
62	DIC: Variable unit	micro-mol/kg	22.5
63	DIC: Measured or calculated	Measured	22.6
64	DIC: Calculation method and parameters		22.7
65	DIC: Sampling instrument	Niskin bottle / flow through system	22.8
66	DIC: Analyzing instrument	Two systems consisting of a coulometer (UIC Inc.) coupled with a Dissolved Inorganic Carbon Extractor (DICE) inlet system. DICE was developed by Esa Peltola and Denis Pierrot of NOAA/AOML and Dana Greeley of NOAA/PMEL to modernize a carbon extractor called SOMMA (Johnson et al. 1985, 1987, 1993, and 1999; Johnson 1992)	22.9
67	DIC: Detailed sampling and analyzing information	Samples for total dissolved inorganic carbon (DIC) measurements were drawn according to procedures outlined in the Guide to best practices for ocean CO2 measurements (Dickson et al., 2007) from Niskin bottles into cleaned 294-ml glass bottles. Bottles were rinsed and filled from the bottom, leaving 6 ml of headspace; care was taken not to entrain any bubbles. After 0.2 ml of saturated HgCl2 solution was added as a preservative, the sample bottles were sealed with glass stoppers lightly covered with Apiezon-L grease and were stored at room temperature to be sent back to the lab for analysis after the cruise. The analysis was done by coulometry with two analytical systems (AOML3 and AOML4) used simultaneously. In the coulometric analysis of DIC, all carbonate species are converted to CO2 (gas) by addition of excess hydrogen ion (acid) to the seawater sample, and the evolved CO2 gas is swept into the titration cell of the coulometer with pure air or compressed nitrogen, where it reacts quantitatively with a proprietary reagent based on ethanolamine to generate hydrogen ions. In this process, the solution changes from blue to colorless, triggering a 102 samples each 500-ml, 10 sets of duplicate samples.	22.10
68	DIC: Field replicate information		22.11
69	DIC: Standardization technique description	The coulometers were calibrated by injecting aliquots of pure CO2 (99.99%) by means of an 8-port valve outfitted with two sample loops with known gas volumes bracketing the amount of CO2 extracted from the water samples for the two AOML systems.	22.12.1
70	DIC: Frequency of standardization	The stability of each coulometer cell solution was confirmed three different ways: two sets of gas loops were measured at the beginning; also the Certified Reference Material (CRM), supplied by Dr. A. Dickson of UCSD, were measured at the beginning; and the duplicate samples at the beginning, middle, and end of each cell solution. The coulometer cell solution was replaced after 25 mg of carbon was titrated, typically after 9 to 12 hours of continuous use.	22.12.2
71	DIC: CRM manufacturer	Dr. A. Dickson of UCSD	22.12.3.1
72	DIC: Batch number	Batch 129	22.12.3.2
73	DIC: Poison used to kill the sample	saturated HgCl2	22.13.1
74	DIC: Poison volume	0.2 ml	22.13.2
75	DIC Poisoning correction description	The DIC values were corrected for dilution by 0.2 ml of saturated HgCl2 used for sample preservation. The total water volume of the sample bottles was 288 ml (calibrated by Esa Peltola, AOML). The correction factor used for dilution was 1.00037.	22.13.3
76	DIC: Uncertainty		22.14
77	DIC: Data quality flag description	WOCE quality control flags are used: 2 = good value, 3 = questionable value, 4 = bad value, 5 = value not reported, 6 = mean of replicate measurements, 9 = sample not drawn.	22.15
78	DIC: Method reference (citation)	Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp.	22.16
79	DIC: Researcher Name	Johnson, K.M., Kortzinger, A.; Mintrop, L.; Duinker, J.C.; and Wallace, D.W.R. (1999). Coulometric total carbon dioxide analysis for Rik Wanninkhof	22.17.1
80	DIC: Researcher Institution	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	22.17.2
81	TA: Variable abbreviation in data files	TAlk	23.1
82	TA: Observation type	Profile/underway (flow through)	23.2
83	TA: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	23.3
84	TA: Manipulation method (SPECIAL USE ONLY)		23.4
85	TA: Variable unit	micro-mol/kg	23.5
86	TA: Measured or calculated	Measured	23.6
87	TA: Calculation method and parameters		23.7
88	TA: Sampling instrument	Niskin bottle / flow through system	23.8

89	TA: Analyzing instrument	Semi-automatic titration systems, System 1 consists of a Metrohm 765 Dosimat titrator, a pH meter (Orion 720A, ThermoScientific), a ROSS half cell pH glass electrode (Orion 9101BN, ThermoScientific) and a reference electrode (Orion 900200, ThermoScientific)	23.9
90	TA: Type of titration	Full Titration	23.10
91	TA: Cell type (open or closed)	Open	23.11
92	TA: Curve fitting method	Least-Square Analysis	23.12
93	TA: Detailed sampling and analyzing information	All of the samples were run using leftover water from the same sample bottles used for DIC and pH. Please refer to DIC for detailed information on sampling and conservation of samples. For each measurement, approximately 200 ml of water sample were titrated with an HCl solution provided by Dr. Andrew Dickson of UCSD (0.25175 moles per kilogram-solution). Please consult the accompanying Readme file for additional details.	23.13
94	TA: Field replicate information	102 samples each 500-ml, 9 sets of duplicate samples.	23.14
95	TA: Standardization technique description	2 CRM samples were run daily on each cell, before and after the seawater samples. The Total Alkalinity for the water samples was corrected using the daily averaged ratios between the certified and measured values of the 2 CRMs run on each cell. This TA titration system has a precision of 0.1 %. All the TA values were directly measured with reference to Certified Reference Material. The accuracy after correction is 0.1%. Please check attached pdf for more details.	23.15.1
96	TA: Frequency of standardization	All values were directly measured with reference to Certified Reference Material (Dickson, UCSD). 2 CRM samples were run daily on each cell.	23.15.2
97	TA: CRM manufacturer	Dr. A. Dickson of UCSD	23.15.3.1
98	TA: Batch Number	CRM batch: 129 and 144	23.15.3.2
99	TA: Poison used to kill the sample	saturated HgCl2	23.16.1
100	TA: Poison volume	0.2 ml	23.16.2
101	TA: Poisoning correction description		23.16.3
102	TA: Magnitude of blank correction		23.17
103	TA: Uncertainty	The precision of this method is better than 0.1% and accuracy is 0.1%.	23.18
104	TA: Data quality flag description	WOCE quality control flags are used: 2 = good value, 3 = questionable value, 4 = bad value, 5 = value not reported, 6 = mean of replicate measurements, 9 = sample not drawn.	23.19
105	TA: Method reference (citation)	Millero, F. J., Zhang, J. Z., Lee, K., & Campbell, D. M. (1993). Titration alkalinity of seawater. *Marine Chemistry* , *44* (2), 153-165.	23.20
106	TA: Researcher Name	Rik Wanninkhof	23.21.1
107	TA: Researcher Institution	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	23.21.2
108	pH: Variable abbreviation in data files	pH	24.1
109	pH: Observation type	Profile/underway (flow through)	24.2
110	pH: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	24.3
111	pH: Manipulation method (SPECIAL USE ONLY)		24.4
112	pH: Measured or calculated	Measured	24.5
113	pH: Calculation method and parameters		24.6
114	pH: Sampling instrument	Niskin bottle / flow through system	24.7
115	pH: Analyzing instrument	Agilent 8453 spectrometer setup with a custom-made temperature-controlled cell holder	24.8
116	pH: pH scale	Total	24.9
117	pH: Temperature of measurement	20 (+/- 0.05) degrees Celsius	24.10
118	pH: Detailed sampling and analyzing information	The same sample bottle was used for pH, DIC and Talk analyses, with pH being analyzed first. The samples were fixed with HgCl2 (refer to DIC for more information on sampling and storage). Samples were thermostated at 20 (+/- 0.05) degrees Celsius in a water bath. Approximately 80 ml of sample were extracted from each DIC sample bottle by syringe before DIC analysis to determine the pH. Temperature for each sample was measured before analysis using a Hart Scientific Fluke 1523 reference thermometer. Absorbance blanks were taken for each sample and 10 micro liter of purified m-cresol purple (10 mmol kg-1) were added for the analysis. The equations of Liu et al, 2011 formulated using the purified m-cresol purple indicator were used to determine pH of the samples. pH samples were analyzed at 20C. Please check accompanying readme file for additional details.	24.11
119	pH: Field replicate information	102 samples each 500-ml, 10 sets of duplicate samples.	24.12
120	pH: Standardization technique description	The pH is calibration-free.	24.13.1
121	pH: Frequency of standardization		24.13.2
122	pH: pH values of the standards		24.13.3
123	pH: Temperature of standardization		24.13.4
124	pH: Temperature correction method		24.14

125	pH: at what temperature was pH reported	20 degrees Celsius	24.15
126	pH: Uncertainty	Please check attached pdf for more details	24.16
127	pH: Data quality flag description	WOCE quality control flags are used: 2 = good value, 3 = questionable value, 4 = bad value, 5 = value not reported, 6 = mean of replicate measurements, 9 = sample not drawn.	24.17
128	pH: Method reference (citation)	Liu, X.; Patsavas, M.C.; and Byrne, R. H. (2011). Purification and characterization of meta-cresol purple for spectrophotometric seawater pH measurements. Environmental Science and Technology, 45(11), 4862-4868. doi: 10.1021/es200665d	24.18
129	pH: Researcher Name	Rik Wanninkhof	24.19.1
130	pH: Researcher Institution	Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)	24.19.2
131	pCO2A: Variable abbreviation in data files		25.1
132	pCO2A: Observation type		25.2
133	pCO2A: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		25.3
134	pCO2A: Manipulation method (SPECIAL USE ONLY)		25.4
135	pCO2A: Variable unit		25.5
136	pCO2A: Measured or calculated		25.6
137	pCO2A: Calculation method and parameters		25.7
138	pCO2A: Sampling instrument		25.8
139	pCO2A: Location of seawater intake		25.9
140	pCO2A: Depth of seawater intake		25.10
141	pCO2A: Analyzing instrument		25.11
142	pCO2A: Detailed sampling and analyzing information		25.12
143	pCO2A: Equilbrator type		25.13.1
144	pCO2A: Equilibrator volume (L)		25.13.2
145	pCO2A: Vented or not		25.13.3
146	pCO2A: Water flow rate (L/min)		25.13.4
147	pCO2A: Headspace gas flow rate (L/min)		25.13.5
148	pCO2A: How was temperature inside the equilibrator measured .		25.13.6
149	pCO2A: How was pressure inside the equilibrator measured.		25.13.7
150	pCO2A: Drying method for CO2 gas		25.14
151	pCO2A: Manufacturer of the gas detector		25.15.1
152	pCO2A: Model of the gas detector		25.15.2
153	pCO2A: Resolution of the gas detector		25.15.3
154	pCO2A: Uncertainty of the gas detector		25.15.4
155	pCO2A: Standardization technique description		25.16.1
156	pCO2A: Frequency of standardization		25.16.2
157	pCO2A: Manufacturer of standard gas		25.16.3.1
158	pCO2A: Concentrations of standard gas		25.16.3.2
159	pCO2A: Uncertainties of standard gas		25.16.3.3
160	pCO2A: Water vapor correction method		25.17
161	pCO2A: Temperature correction method		25.18
162	pCO2A: at what temperature was pCO2 reported		25.19
163	pCO2A: Uncertainty		25.20
164	pCO2A: Data quality flag description		25.21
165	pCO2A: Method reference (citation)		25.22
166	pCO2A: Researcher Name		25.23.1
167	pCO2A: Researcher Institution		25.23.2
168	pCO2D: Variable abbreviation in data files		26.1
169	pCO2D: Observation type		26.2
170	pCO2D: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		26.3

171	pCO2D: Manipulation method (SPECIAL USE ONLY)		26.4
172	pCO2D: Variable unit		26.5
173	pCO2D: Measured or calculated		26.6
174	pCO2D: Calculation method and parameters		26.7
175	pCO2D: Sampling instrument		26.8
176	pCO2D: Analyzing instrument		26.9
177	pCO2D: Storage method		26.10
178	pCO2D: Seawater volume (mL)		26.11
179	pCO2D: Headspace volume (mL)		26.12
180	pCO2D: Temperature of measurement		26.13
181	pCO2D: Detailed sampling and analyzing information		26.14
182	pCO2D: Field replicate information		26.15
183	pCO2D: Manufacturer of the gas detector		26.16.1
184	pCO2D: Model of the gas detector		26.16.2
185	pCO2D: Resolution of the gas detector		26.16.3
186	pCO2D: Uncertainty of the gas detector		26.16.4
187	pCO2D: Standardization technique description		26.17.1
188	pCO2D: Frequency of standardization		26.17.2
189	pCO2D: Temperature of standardization		26.17.3
190	pCO2D: Manufacturer of standard gas		26.17.4.1
191	pCO2D: Concentrations of standard gas		26.17.4.2
192	pCO2D: Uncertainties of standard gas		26.17.4.3
193	pCO2D: Water vapor correction method		26.18
194	pCO2D: Temperature correction method		26.19
195	pCO2D: at what temperature was pCO2 reported		26.20
196	pCO2D: Uncertainty		26.21
197	pCO2D: Data quality flag description		26.22
198	pCO2D: Method reference (citation)		26.23
199	pCO2D: Researcher Name		26.24.1
200	pCO2D: Researcher Institution		26.24.2
201	Var1: Variable abbreviation in data files	Depth_station	27.1
202	Var1: Full variable name	Depth of water at station	27.2
203	Var1: Observation type	Profile	27.4
204	Var1: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Surface underway and profile	27.5
205	Var1: Variable unit	meters	27.7
206	Var1: Measured or calculated	Measured or calculated	27.8
207	Var1: Calculation method and parameters	Calculated from ETOPO1 global relief (http://www.ngdc.noaa.gov/mgg/global/global.html) when sounder or altimeter data not available	27.9
208	Var1: Sampling instrument	Sounder or altimeter, models vary	27.10
209	Var1: Analyzing instrument		27.11
210	Var1: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
211	Var1: Detailed sampling and analyzing information	Ship based sounder used when available. Depth from an altimeter on the CTD may also be used. Where neither of theses sources were available (typically due to water depth exceeding sounder's detection limit), depth may be estimated using the ETOPO1 bathymetry.	27.13
212	Var1: Field replicate information		27.14
213	Var1: Uncertainty	Uncertainty varies with source	27.15
214	Var1: Data quality flag description	-999 indicates bad or missing data	27.16
215	Var1: Method reference (citation)		27.17
216	Var1: Biological subject (SPECIAL USE ONLY)		27.18
217	Var1: Species Identification code (SPECIAL USE ONLY)		27.19

218	Var1: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
219	Var1: Researcher Name	D. Christopher Melrose	27.21.1
220	Var1: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
221	Var2: Variable abbreviation in data files	Depth_sampling	27.1
222	Var2: Full variable name	Depth of water at sample collection	27.2
223	Var2: Observation type	Profile	27.4
224	Var2: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
225	Var2: Variable unit	meters	27.7
226	Var2: Measured or calculated	Measured	27.8
227	Var2: Calculation method and parameters		27.9
228	Var2: Sampling instrument	SBE 911plus CTD	27.10
229	Var2: Analyzing instrument		27.11
230	Var2: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
231	Var2: Detailed sampling and analyzing information		27.13
232	Var2: Field replicate information		27.14
233	Var2: Uncertainty	plus or minus 1 meter (data has also been vertically binaveraged to 1 decibar bins)	27.15
234	Var2: Data quality flag description	-999 indicates bad or missing data	27.16
235	Var2: Method reference (citation)		27.17
236	Var2: Biological subject (SPECIAL USE ONLY)		27.18
237	Var2: Species Identification code (SPECIAL USE ONLY)		27.19
238	Var2: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
239	Var2: Researcher Name	D. Christopher Melrose	27.21.1
240	Var2: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
241	Var3: Variable abbreviation in data files	CTDPRS	27.1
242	Var3: Full variable name	Water pressure	27.2
243	Var3: Observation type	Profile	27.4
244	Var3: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
245	Var3: Variable unit	decibars	27.7
246	Var3: Measured or calculated	Measured	27.8
247	Var3: Calculation method and parameters		27.9
248	Var3: Sampling instrument	SBE 911plus CTD	27.10
249	Var3: Analyzing instrument		27.11
250	Var3: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
251	Var3: Detailed sampling and analyzing information		27.13
252	Var3: Field replicate information		27.14
253	Var3: Uncertainty	plus or minus decibar (data has also been vertically binaveraged to 1 decibar bins)	27.15
254	Var3: Data quality flag description	-999 indicates bad or missing data	27.16
255	Var3: Method reference (citation)		27.17
256	Var3: Biological subject (SPECIAL USE ONLY)		27.18
257	Var3: Species Identification code (SPECIAL USE ONLY)		27.19
258	Var3: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
259	Var3: Researcher Name	D. Christopher Melrose	27.21.1
260	Var3: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
261	Var4: Variable abbreviation in data files	CTDTMP	27.1
262	Var4: Full variable name	Water temperature	27.2
263	Var4: Observation type	Profile	27.4

264	Var4: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
265	Var4: Variable unit	degrees celsius (ITS-90)	27.7
266	Var4: Measured or calculated	Measured	27.8
267	Var4: Calculation method and parameters		27.9
268	Var4: Sampling instrument	SBE 911plus CTD	27.10
269	Var4: Analyzing instrument		27.11
270	Var4: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
271	Var4: Detailed sampling and analyzing information		27.13
272	Var4: Field replicate information		27.14
273	Var4: Uncertainty	plus or minus 0.001 degrees celsius	27.15
274	Var4: Data quality flag description	-999 indicates bad or missing data	27.16
275	Var4: Method reference (citation)		27.17
276	Var4: Biological subject (SPECIAL USE ONLY)		27.18
277	Var4: Species Identification code (SPECIAL USE ONLY)		27.19
278	Var4: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
279	Var4: Researcher Name	D. Christopher Melrose	27.21.1
280	Var4: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
281	Var5: Variable abbreviation in data files	CTDSAL	27.1
282	Var5: Full variable name	Salinity	27.2
283	Var5: Observation type	Profile	27.4
284	Var5: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
285	Var5: Variable unit	practical salinity scale of 1978	27.7
286	Var5: Measured or calculated	Seasave 7, calculated from temperature and conductivity	27.8
287	Var5: Calculation method and parameters		27.9
288	Var5: Sampling instrument	SBE 911plus CTD	27.10
289	Var5: Analyzing instrument		27.11
290	Var5: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
291	Var5: Detailed sampling and analyzing information	CTD Salinity values were validated using water samples collected during profiles. Corrections were applied when needed.	27.13
292	Var5: Field replicate information		27.14
293	Var5: Uncertainty	plus or minus 0.01 PSS-78	27.15
294	Var5: Data quality flag description	-999 indicates bad or missing data	27.16
295	Var5: Method reference (citation)		27.17
296	Var5: Biological subject (SPECIAL USE ONLY)		27.18
297	Var5: Species Identification code (SPECIAL USE ONLY)		27.19
298	Var5: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
299	Var5: Researcher Name	D. Christopher Melrose	27.21.1
300	Var5: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
301	Var6: Variable abbreviation in data files	Sigma-Theta	27.1
302	Var6: Full variable name	Potential density at surface pressure	27.2
303	Var6: Observation type	Profile	27.4
304	Var6: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
305	Var6: Variable unit	kilograms per cubic meter minus 1000	27.7
306	Var6: Measured or calculated	Calculated	27.8
307	Var6: Calculation method and parameters	SeaBird Seasave 7 from measured temperature, conductivity and pressure	27.9
308	Var6: Sampling instrument	SBE 911plus CTD	27.10
309	Var6: Analyzing instrument		27.11

310	Var6: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
311	Var6: Detailed sampling and analyzing information		27.13
312	Var6: Field replicate information		27.14
313	Var6: Uncertainty	plus or minus 0.01 kilograms per cubic meter	27.15
314	Var6: Data quality flag description	-999 indicates bad or missing data	27.16
315	Var6: Method reference (citation)		27.17
316	Var6: Biological subject (SPECIAL USE ONLY)		27.18
317	Var6: Species Identification code (SPECIAL USE ONLY)		27.19
318	Var6: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
319	Var6: Researcher Name	D. Christopher Melrose	27.21.1
320	Var6: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
321	Var7: Variable abbreviation in data files	CTDOXYmg	27.1
322	Var7: Full variable name	Dissolved Oxygen	27.2
323	Var7: Observation type	Profile	27.4
324	Var7: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		27.5
325	Var7: Variable unit	milligrams per liter	27.7
326	Var7: Measured or calculated	Measured	27.8
327	Var7: Calculation method and parameters		27.9
328	Var7: Sampling instrument	SBE-43 dissolved oxygen sensor	27.10
329	Var7: Analyzing instrument		27.11
330	Var7: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
331	Var7: Detailed sampling and analyzing information		27.13
332	Var7: Field replicate information		27.14
333	Var7: Uncertainty	plus or minus 2 percent of saturation	27.15
334	Var7: Data quality flag description	-999 indicates bad or missing data	27.16
335	Var7: Method reference (citation)		27.17
336	Var7: Biological subject (SPECIAL USE ONLY)		27.18
337	Var7: Species Identification code (SPECIAL USE ONLY)		27.19
338	Var7: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
339	Var7: Researcher Name	D. Christopher Melrose	27.21.1
340	Var7: Researcher Institution	NOAA Northeast Fisheries Science Center	27.21.2
341	Var8: Variable abbreviation in data files	CTDOXY	27.1
342	Var8: Full variable name	Dissolved Oxygen	27.2
343	Var8: Observation type	Profile	27.4
344	Var8: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		27.5
345	Var8: Variable unit	micromoles per kilogram	27.7
346	Var8: Measured or calculated	Measured	27.8
347	Var8: Calculation method and parameters		27.9
348	Var8: Sampling instrument	SBE-43 dissolved oxygen sensor	27.10
349	Var8: Analyzing instrument		27.11
350	Var8: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
351	Var8: Detailed sampling and analyzing information		27.13
352	Var8: Field replicate information		27.14
353	Var8: Uncertainty	plus or minus 2 percent of saturation	27.15
354	Var8: Data quality flag description	-999 indicates bad or missing data	27.16
355	Var8: Method reference (citation)		27.17

356	**Var8: Biological subject (SPECIAL USE ONLY)**		27.18
357	**Var8: Species Identification code (SPECIAL USE ONLY)**		27.19
358	**Var8: Life stage of the Biological subject (SPECIAL USE ONLY)**		27.20
359	**Var8: Researcher Name**	D. Christopher Melrose	27.21.1
360	**Var8: Researcher Institution**	NOAA Northeast Fisheries Science Center	27.21.2
361	**Var9: Variable abbreviation in data files**	SILCAT	27.1
362	**Var9: Full variable name**	Silicic acid concentration	27.2
363	**Var9: Observation type**	Profile	27.4
364	**Var9: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)**	In-situ observation	27.5
365	**Var9: Variable unit**	micromoles per kilogram	27.7
366	**Var9: Measured or calculated**		27.8
367	**Var9: Calculation method and parameters**		27.9
368	**Var9: Sampling instrument**	SeaBird 32 Carousel Water Sampler	27.10
369	**Var9: Analyzing instrument**	The samples are analyzed using a Bran-Luebbe Autoanalyzer 3	27.11
370	**Var9: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)**		27.12
371	**Var9: Detailed sampling and analyzing information**	Water samples collected during vertical CTD profiles, analysis of Samples performed by Maura Thomas, University of Maine	27.13
372	**Var9: Field replicate information**		27.14
373	**Var9: Uncertainty**	0.22 micromolar detection limit	27.15
374	**Var9: Data quality flag description**	-999 indicates bad or missing data	27.16
375	**Var9: Method reference (citation)**	Whitledge, T.E., D.M. Veidt, S.C. Mallow, C.J. Patton, C.D. Wirick. 1986. Automated nutrient analyses in seawater. Brookhaven National Laboratory, Publication BNL 38990, 177 p.	27.17
376	**Var9: Biological subject (SPECIAL USE ONLY)**		27.18
377	**Var9: Species Identification code (SPECIAL USE ONLY)**		27.19
378	**Var9: Life stage of the Biological subject (SPECIAL USE ONLY)**		27.20
379	**Var9: Researcher Name**	David Townsend and Maura Thomas	27.21.1
380	**Var9: Researcher Institution**	University of Maine	27.21.2
381	**Var10: Variable abbreviation in data files**	NITRIT+NITRAT	27.1
382	**Var10: Full variable name**	Nitrate and Nitrite total concentration	27.2
383	**Var10: Observation type**	Profile	27.4
384	**Var10: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)**	In-situ observation	27.5
385	**Var10: Variable unit**	micromoles per kilogram	27.7
386	**Var10: Measured or calculated**	Measured	27.8
387	**Var10: Calculation method and parameters**		27.9
388	**Var10: Sampling instrument**	SeaBird 32 Carousel Water Sampler	27.10
389	**Var10: Analyzing instrument**	The samples are analyzed using a Bran-Luebbe Autoanalyzer 3	27.11
390	**Var10: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)**		27.12
391	**Var10: Detailed sampling and analyzing information**	Water samples collected during vertical CTD profiles, analysis of Samples performed by Maura Thomas, University of Maine	27.13
392	**Var10: Field replicate information**		27.14
393	**Var10: Uncertainty**	0.12 micromolar detection limit	27.15
394	**Var10: Data quality flag description**	-999 indicates bad or missing data	27.16
395	**Var10: Method reference (citation)**	Whitledge, T.E., D.M. Veidt, S.C. Mallow, C.J. Patton, C.D. Wirick. 1986. Automated nutrient analyses in seawater. Brookhaven National Laboratory, Publication BNL 38990, 177 p.	27.17
396	**Var10: Biological subject (SPECIAL USE ONLY)**		27.18
397	**Var10: Species Identification code (SPECIAL USE ONLY)**		27.19
398	**Var10: Life stage of the Biological subject (SPECIAL USE ONLY)**		27.20

399	Var10: Researcher Name	David Townsend and Maura Thomas	27.21.1
400	Var10: Researcher Institution	University of Maine	27.21.2
401	**Var11: Variable abbreviation in data files**	AMMONIA	28.1
402	**Var11: Full variable name**	Ammonia concentration	28.2
403	Var11: Observation type	Profile	27.4
404	Var11: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	In-situ observation	27.5
405	**Var11: Variable unit**	micromoles per kilogram	27.7
406	Var11: Measured or calculated	Measured	27.8
407	Var11: Calculation method and parameters		27.9
408	Var11: Sampling instrument	SeaBird 32 Carousel Water Sampler	27.10
409	Var11: Analyzing instrument	The samples are analyzed using a Bran-Luebbe Autoanalyzer 3	27.11
410	Var11: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
411	Var11: Detailed sampling and analyzing information	Water samples collected during vertical CTD profiles, analysis of Samples performed by Maura Thomas, University of Maine	27.13
412	Var11: Field replicate information		27.14
413	**Var11: Uncertainty**	0.14 micromolar detection limit	27.15
414	Var11: Data quality flag description	-999 indicates bad or missing data	27.16
415	Var11: Method reference (citation)	Whitledge, T.E., D.M. Veidt, S.C. Mallow, C.J. Patton, C.D. Wirick. 1986. Automated nutrient analyses in seawater. Brookhaven National Laboratory, Publication BNL 38990, 177 p.	27.17
416	Var11: Biological subject (SPECIAL USE ONLY)		27.18
417	Var11: Species Identification code (SPECIAL USE ONLY)		27.19
418	Var11: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
419	Var11: Researcher Name	David Townsend and Maura Thomas	27.21.1
420	Var11: Researcher Institution	University of Maine	27.21.2
421	**Var12: Variable abbreviation in data files**	PHSPHT	28.1
422	**Var12: Full variable name**	Profile	27.4
423	Var12: Observation type	In-situ observation	27.5
424	Var12: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	micromolar	27.7
425	**Var12: Variable unit**	Measured	27.8
426	Var12: Measured or calculated		27.9
427	Var12: Calculation method and parameters	SeaBird 32 Carousel Water Sampler	27.10
428	Var12: Sampling instrument	The samples are analyzed using a Bran-Luebbe Autoanalyzer 3	27.11
429	Var12: Analyzing instrument		27.12
430	Var12: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)	Water samples collected during vertical CTD profiles, analysis of Samples performed by Maura Thomas, University of Maine	27.13
431	Var12: Detailed sampling and analyzing information		27.14
432	Var12: Field replicate information	0.17 micromolar detection limit	27.15
433	**Var12: Uncertainty**	-999 indicates bad or missing data	27.16
434	Var12: Data quality flag description	Whitledge, T.E., D.M. Veidt, S.C. Mallow, C.J. Patton, C.D. Wirick. 1986. Automated nutrient analyses in seawater. Brookhaven National Laboratory, Publication BNL 38990, 177 p.	27.17
435	Var12: Method reference (citation)		27.18
436	Var12: Biological subject (SPECIAL USE ONLY)		27.19
437	Var12: Species Identification code (SPECIAL USE ONLY)		
438	Var12: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
439	Var12: Researcher Name	David Townsend and Maura Thomas	27.21.1
440	Var12: Researcher Institution	University of Maine	27.21.2