

| No  | Metadata element name                               | Your input   | Help<br>reference no. |
|-----|---|--|-----------------------|
| 1   | Submission Date                                     | 11/26/2018   | 1                     |
| 2   | Accession no. of related data sets                  |  | 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                                | <a href="mailto:Rik.Wanninkhof@noaa.gov">Rik.Wanninkhof@noaa.gov</a>   | 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                                | <a href="mailto:Leticia.Barbero@noaa.gov">Leticia.Barbero@noaa.gov</a>                                       | 3.5                   |
| 15  | Investigator-2 researcher ID                        |  | 3.6                   |
| 16  | Investigator-2 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 17  | Investigator-3 name                                 | Donald Christopher Melrose   | 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                                | 401-782-3350   | 3.4                   |
| 21  | Investigator-3 email                                | <a href="mailto:Chris.Melrose@NOAA.gov">Chris.Melrose@NOAA.gov</a>   | 3.5                   |
| 22  | Investigator-3 researcher ID                        |  | 3.6                   |
| 23  | Investigator-3 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 461 | Investigator-4 name                                 | Denis Pierrot  | 3.1                   |
| 462 | Investigator-4 institution                          | Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA) | 3.2                   |
| 463 | Investigator-4 address                              | 4301 Rickenbacker Causeway, Miami, FL 33149, USA   | 3.3                   |
| 464 | Investigator-4 phone                                | (305) 361-4443   | 3.4                   |
| 465 | Investigator-4 email                                | <a href="mailto:Denis.Pierrot@noaa.gov">Denis.Pierrot@noaa.gov</a>   | 3.5                   |
| 466 | Investigator-4 researcher ID                        |  | 3.6                   |
| 467 | Investigator-4 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 468 | Investigator-5 name                                 | Christopher Taylor   | 3.1                   |
| 469 | Investigator-5 institution                          | NOAA Northeast Fisheries Science Center  | 3.2                   |
| 470 | Investigator-5 address                              | 28 Tarzwell Drive, Narragansett, RI 02882  | 3.3                   |
| 471 | Investigator-5 phone                                |  | 3.4                   |
| 472 | Investigator-5 email                                | <a href="mailto:Chris.1.Taylor@NOAA.gov">Chris.1.Taylor@NOAA.gov</a>   | 3.5                   |
| 473 | Investigator-5 researcher ID                        |  | 3.6                   |
| 474 | Investigator-5 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 475 | Investigator-6 name                                 | Paula Fratantoni   | 3.1                   |
| 476 | Investigator-6 institution                          | NOAA Northeast Fisheries Science Center  | 3.2                   |
| 477 | Investigator-6 address                              | 28 Tarzwell Drive, Narragansett, RI 02882  | 3.3                   |
| 478 | Investigator-6 phone                                |  | 3.4                   |
| 479 | Investigator-6 email                                |  | 3.5                   |
| 480 | Investigator-6 researcher ID                        |  | 3.6                   |
| 481 | Investigator-6 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 482 | Investigator-7 name                                 | Harvey Walsh   | 3.1                   |
| 483 | Investigator-7 institution                          | NOAA Northeast Fisheries Science Center  | 3.2                   |
| 484 | Investigator-7 address                              | 28 Tarzwell Drive, Narragansett, RI 02882  | 3.3                   |
| 485 | Investigator-7 phone                                |  | 3.4                   |
| 486 | Investigator-7 email                                |  | 3.5                   |
| 487 | Investigator-7 researcher ID                        |  | 3.6                   |
| 488 | Investigator-7 ID type (ORCID, Researcher ID, etc.) |  | 3.7                   |
| 489 | Investigator-8 name                                 | David W. Townsend  | 3.1                   |

|     |   |   |      |
|-----|---|---|------|
| 490 | Investigator-8 institution                          | University of Maine   | 3.2  |
| 491 | Investigator-8 address                              | 341 Aubert Hall, Orono, ME 04469-5707   | 3.3  |
| 492 | Investigator-8 phone                                | 207-581-4367  | 3.4  |
| 493 | Investigator-8 email                                | <a href="mailto:davidt@umaine.edu">davidt@umaine.edu</a>  | 3.5  |
| 494 | Investigator-8 researcher ID                        |   | 3.6  |
| 495 | Investigator-8 ID type (ORCID, Researcher ID, etc.) |   | 3.7  |
| 496 | Investigator-9 name                                 | Maura Thomas  | 3.1  |
| 497 | Investigator-9 institution                          | University of Maine   | 3.2  |
| 498 | Investigator-9 address                              | 454 Aubert Hall, Orono, ME 04469-5707   | 3.3  |
| 499 | Investigator-9 phone                                | 207-581-4314  | 3.4  |
| 500 | Investigator-9 email                                | <a href="mailto:mthomas@umaine.edu">mthomas@umaine.edu</a>  | 3.5  |
| 501 | Investigator-9 researcher ID                        |   | 3.6  |
| 502 | Investigator-9 ID type (ORCID, Researcher ID, etc.) |   | 3.7  |
| 24  | Data submitter name                                 | Charles Featherstone  | 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                                | <a href="mailto:Charles.Featherstone@noaa.gov">Charles.Featherstone@noaa.gov</a>  | 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  | 10/31/2017  | 8.1  |
| 35  | End date  | 11/9/2017   | 8.2  |
| 36  | Westbd longitude                                    | -73.98  | 9.1  |
| 37  | Eastbd longitude                                    | -67.6883  | 9.2  |
| 38  | Northbd latitude                                    | 42.4967   | 9.3  |
| 39  | Southbd latitude                                    | 39.36   | 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<br>East and Gulf Coast Ocean AcidificatiOon Observing Support.   | 13.1 |
| 44  | Funding project 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   | 13.2 |
| 45  | Funding project ID (Grant no.)                      |   | 13.3 |
| 46  | Research projects                                   | none  | 14   |
| 47  | Platform-1 name                                     | Gordon Gunter   | 15.1 |
| 48  | Platform-1 ID                                       | 33GG  | 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  | EXPCODE   | 33GG20171031  | 16   |
| 53  | Cruise ID   | GU1706  | 17   |
| 54  | Section   | none  | 18   |

|    |   |  |           |
|----|---|--|-----------|
| 55 | <b>Author list for citation</b>   | Barbero, Leticia, Wanninkhof, Rik, Pierrot, Denis; Melrose, Donald Christopher; Fratantoni, P.; Walsh, H.; Townsend, D.W., Thomas, M.; Taylor, C.  | 19        |
| 56 | <b>References</b>   |  | 20        |
| 57 | <b>Supplemental information</b>   | Please consult Readme file for additional information on analysis of carbon parameters. The most up to date version of this dataset is available at <a href="http://www.aoml.noaa.gov/ocd/gcc/shortcruises.htm">http://www.aoml.noaa.gov/ocd/gcc/shortcruises.htm</a>  | 21        |
| 58 | <b>DIC: Variable abbreviation in data files</b>   | DIC  | 22.1      |
| 59 | <b>DIC: Observation type</b>  | Profile  | 22.2      |
| 60 | <b>DIC: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)</b> | In-situ observation  | 22.3      |
| 61 | <b>DIC: Manipulation method (SPECIAL USE ONLY) (SPECIAL USE ONLY)</b>                           |  | 22.4      |
| 62 | <b>DIC: Variable unit</b>   | micro-mol/kg   | 22.5      |
| 63 | <b>DIC: Measured or calculated</b>  | Measured   | 22.6      |
| 64 | <b>DIC: Calculation method and parameters</b>   |  | 22.7      |
| 65 | <b>DIC: Sampling instrument</b>   | Niskin bottle  | 22.8      |
| 66 | <b>DIC: Analyzing instrument</b>  | 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 | <b>DIC: Detailed sampling and analyzing information</b>   | 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 45 samples each 500-ml, 6 sets of duplicate samples. | 22.10     |
| 68 | <b>DIC: Field replicate information</b>   |  | 22.11     |
| 69 | <b>DIC: Standardization technique description</b>   | 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 | <b>DIC: Frequency of standardization</b>  | 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 | <b>DIC: CRM manufacturer</b>  | Dr. A. Dickson of UCSD   | 22.12.3.1 |
| 72 | <b>DIC: Batch number</b>  | Batch 153  | 22.12.3.2 |
| 73 | <b>DIC: Poison used to kill the sample</b>  | saturated HgCl2  | 22.13.1   |
| 74 | <b>DIC: Poison volume</b>   | 0.2 ml   | 22.13.2   |
| 75 | <b>DIC Poisoning correction description</b>   | 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 | <b>DIC: Uncertainty</b>   |  | 22.14     |
| 77 | <b>DIC: Data quality flag description</b>   | 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 | <b>DIC: Method reference (citation)</b>   | 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 | <b>DIC: Researcher Name</b>   | Johnson, K.M., Kortzinger, A., Maitov, L., Quicker, J.C., and Wallace, D.W.B. (1999). Coulometric total carbon dioxide analysis for Rik Wanninkhof   | 22.17.1   |
| 80 | <b>DIC: Researcher Institution</b>  | Atlantic Oceanographic and Meteorological Laboratory, National Oceanic and Atmospheric Administration (NOAA)   | 22.17.2   |
| 81 | <b>TA: Variable abbreviation in data files</b>  | TAlk   | 23.1      |
| 82 | <b>TA: Observation type</b>   | Profile  | 23.2      |
| 83 | <b>TA: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)</b>  | In-situ observation  | 23.3      |
| 84 | <b>TA: Manipulation method (SPECIAL USE ONLY)</b>   |  | 23.4      |
| 85 | <b>TA: Variable unit</b>  | 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  | 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   | 45 samples each 500-ml, 6 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: 153   | 23.15.3.2 |
| 99  | TA: Poison used to kill the sample  | saturated HgCl <sub>2</sub>  | 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. <i>Marine Chemistry</i> , 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  | 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  | 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 HgCl <sub>2</sub> (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 <sup>-1</sup> ) 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   | 45 samples each 500-ml, 6 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  | 24.15     |
| 126 | pH: Uncertainty  | 24.16     |
| 127 | pH: Data quality flag description  | 24.17     |
| 128 | pH: Method reference (citation)  | 24.18     |
| 129 | pH: Researcher Name  | 24.19.1   |
| 130 | pH: Researcher Institution   | 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: Equilibrator 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 | <b>pCO2D: Variable abbreviation in data files</b>  |   | 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 | <b>pCO2D: Variable unit</b>  |   | 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 | <b>pCO2D: Uncertainty</b>  |   | 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 | <b>Var1: Variable abbreviation in data files</b>   | Depth_station   | 27.1      |
| 202 | <b>Var1: Full variable name</b>  | Depth of water at station   | 27.2      |
| 203 | <b>Var1: Observation type</b>  | Profile   | 27.4      |
| 204 | <b>Var1: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)</b> | Surface underway and profile  | 27.5      |
| 205 | <b>Var1: Variable unit</b>   | meters  | 27.7      |
| 206 | <b>Var1: Measured or calculated</b>  | Measured or calculated  | 27.8      |
| 207 | <b>Var1: Calculation method and parameters</b>   | Calculated from ETOPO1 global relief ( <a href="http://www.ngdc.noaa.gov/mgg/global/global.html">http://www.ngdc.noaa.gov/mgg/global/global.html</a> ) when sounder or altimeter data not available   | 27.9      |
| 208 | <b>Var1: Sampling instrument</b>   | Sounder or altimeter, models vary   | 27.10     |
| 209 | <b>Var1: Analyzing instrument</b>  |   | 27.11     |
| 210 | <b>Var1: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)</b>                   |   | 27.12     |
| 211 | <b>Var1: Detailed sampling and analyzing information</b>   | 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 | <b>Var1: Field replicate information</b>   |   | 27.14     |
| 213 | <b>Var1: Uncertainty</b>   | Uncertainty varies with source  | 27.15     |
| 214 | <b>Var1: Data quality flag description</b>   | -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   | Measured   | 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  | Phosphate concentration  | 27.4    |
| 423 | Var12: Observation type  | Profile  | 27.5    |
| 424 | Var12: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY) | In-situ observation  | 27.7    |
| 425 | Var12: Variable unit   | micromoles per kilogram  | 27.8    |
| 426 | Var12: Measured or calculated  | Measured   | 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 |
| 441 | Var13: Variable abbreviation in data files   | Niskin_nuts   | 28.1    |
| 442 | Var13: Full variable name  | Profile   | 27.4    |
| 443 | Var13: Observation type  | In-situ observation   | 27.5    |
| 444 | Var13: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY) |   | 27.7    |
| 445 | Var13: Variable unit   |   | 27.8    |
| 446 | Var13: Measured or calculated  |   | 27.9    |
| 447 | Var13: Calculation method and parameters   | SeaBird 32 Carousel Water Sampler   | 27.10   |
| 448 | Var13: Sampling instrument   | The samples are analyzed using a Bran-Luebbe Autoanalyzer 3   | 27.11   |
| 449 | Var13: Analyzing instrument  |   | 27.12   |
| 450 | Var13: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)                   | Niskin bottle from where nutrients were sampled, often different from Niskin used for CO2 parameteres, but tripped at the same depth. | 27.13   |
| 451 | Var13: Detailed sampling and analyzing information   |   | 27.14   |
| 452 | Var13: Field replicate information   |   | 27.15   |
| 453 | Var13: Uncertainty   |   | 27.16   |
| 454 | Var13: Data quality flag description   |   | 27.17   |
| 455 | Var13: Method reference (citation)   |   | 27.18   |
| 456 | Var13: Biological subject (SPECIAL USE ONLY)   |   |         |
| 457 | Var13: Species Identification code (SPECIAL USE ONLY)                                      |   | 27.19   |
| 458 | Var13: Life stage of the Biological subject (SPECIAL USE ONLY)                             |   | 27.20   |
| 459 | Var13: Researcher Name   |   | 27.21.1 |
| 460 | Var13: Researcher Institution  |   | 27.21.2 |