Dataset Description

This New Production During Winter Convective Mixing Events (New Production) Project biogeochemistry dataset includes the following data: nutrients, dissolved oxygen, organic matter and alkalinity**.** Detailed methods for all data collected as part of this study can be found in one of four publications arising from this study (references given below). The references include information on analytical machines and certified standards where applicable.

ACQUISITION: Sample QA/QC procedures followed those of the Bermuda Atlantic Time-series Study (BATS). At the point of collection, any leaking Niskin bottles were noted on the master cast sheets and samples were taken from a different Niskin fired at the same depth as the leaking bottle. No data are reported for leaking Niskin bottles. During sample analysis standard curves and/or certified standards were carefully examined to ensure that they were consistent with expectations and accurate. Next, data were plotted as depth profiles and compared to a quality control window for the February/March period at BATS. The QC window consisted of the upper and lower 95% confidence limits based upon all data collected at BATS during February/March from 1989-2005. If our data fell well within these bounds it was considered 'acceptable'. For those data that fell near or outside the QC window, we went back to the original data run to ensure there was no miscalculation or other error. If nothing was found, then we examined other data from that Niskin to see if other samples are in question. If no obvious error or problem was found, the data were considered OK and in the range of extremes that this study hoped to observe.

Sample accuracy and precision. Sample accuracy was assessed by using certified standards, for those measurements where standards are available (dissolved oxygen, nutrients, salinity, dissolved inorganic and organic carbon). Certified standards were run with each analytical run and compared to long term control charts for respective analyses. Samples were not run until certified standards were shown to be accurate for that analytical run. Sample precision was determined by analyzing replicate samples (not replicate analyses on the same sample) and therefore is higher than analytical precision due to the inclusion of sampling error. At the concentrations observed during this study, sample precision was <5% for stock measurements and <10-15% for rate measurements. Some analyses, namely dissolved oxygen and salinity, were much better and often had a sample precisions <1%. These precision estimates are consistent with the long term QA/QC seen with the BATS program.

The provided data files are complete matrices and therefore not every sample (columns) will be taken from every Niskin fired (rows). Data that were either not collected, or were associated with leaking Niskins, or were found to be in error for other reasons are denoted by "-nd" in the spreadsheets.

References:

Detailed information on phytoplankton analysis.
Lomas, M.W., Roberts, N., Lipschultz, F., Krause, J.W., Nelson, D.M., and Bates, N.R. 2009. Biogeochemical responses to late-winter storms in the Sargasso Sea. IV. Rapid

succession of major phytoplankton groups. Deep Sea Research I, 56: 892-909. doi:10.1016/j.dsr.2009.03.004

Detailed information on all silica cycle measurements.
Krause, J.W., Nelson, D.M., and Lomas, M.W. 2009. Biogeochemical responses to late-winter storms in the Sargasso Sea. 2009. II. Increased rates of biogenic silica production and export. Deep Sea Research I, 56: 861-875. doi:10.1016/j.dsr.2009.01.002

Maiti, K., Benitez-Nelson, C.R., Lomas, M.W., and Krause, J. W. 2009. Biogeochemical responses to late-winter storms in the Sargasso Sea. IV. Comparison of Export Production by 234Th and Sediment Traps. Deep Sea Research I, 56: 875-892. doi:10.1016/j.dsr.2009.01.008

Detailed information on general biogeochemical measurements.
Lomas, M.W., Lipschultz, F., Nelson, D.M., and Bates, N.R. 2009. Biogeochemical responses to late-winter storms in the Sargasso Sea. I. Pulses of new and primary production. Deep Sea Research I, 56: 843-861. doi:10.1016/j.dsr.2008.09.002

PROCESSING: Most of the data given in this dataset are not derived variables and are calculated using reasonably standard equations as given in the appropriate reference above. The one exception is CTD data. Raw CTD data were processed using SBE-Data Processing software using configuration and calibration files provided by the Shipboard Science technician. Sensors were calibrated shortly before each cruise, however, most sensor data were 'calibrated' using data collected in this project. Manual determinations of dissolved oxygen, salinity and HPLC Chlorophyll a, once passing the above QA/QC steps, were taken as correct. CTD sensor data was regressed against the appropriate manual variable. In all cases save 1, regression statistics were very strong and linear, and represent an offset (y-intercept) and drop in sensitivity (slope of the regression). CTD data were corrected to manual measurements using the regression data and it is this corrected data that is given in the associated data files. OC399-3 had a problem with the dissolved oxygen sensor that could not be resolved so only manual oxygen data are reported for that cruise.

Only nutrient analyses were close to analytical method detection limits (MDL). MDLs were estimated as 3x the standard deviation of the lowest standard used for the analysis and are 1.5nM for nitrate and nitrite using a standard autoanalyzer with a 1m fiber optic flow cell, ~20nM for phosphate on a standard autoanalyzer, and <100nM for Si(OH)4 by manual analysis and a 10cm cuvette. Samples below the MDL are reported as calculated for the reason that they somewhere between the MDL and a true zero; we consider listing them as either to be incorrect. Carbon productivity rate measurements, particularly at the base of the euphotic or below, on occasion are negative due to subtraction of the dark incubated sample from the light incubated sample. This was not considered below the MDL because there is a reasonable explanation for negative values. These measurements were ~14h deployments and it is possible that at very low light there can be less 14C in the light bottles due to grazing, than in the dark bottles that are subtracted from the light

bottles. Moreover, light and dark respiration rates are not the same and therefore this correction is not a perfect correction for inherent respiration by the autotrophs.