

## ***Interactive comment on “Winter measurements of biogeochemical parameters in the Rockall Trough (2009–2012)” by T. McGrath et al.***

### **Anonymous Referee #2**

Received and published: 19 August 2013

#### General comments

It is of great value for anyone who wants to use data stored on CDIAC or other data centers to have clear information on the procedures, methods and quality control used when the data was created. This paper should fulfill that purpose and it therefore merits publication after some improvements. The data set is on winter measurements from a region in the North Atlantic Ocean. In winter the expected concentration ranges for the biogeochemical parameters would be relatively small. High precision and good accuracy is therefore needed if the data is to be used for assessing water mass differences and temporal changes. The data set is not large but may have significant future value for assessing ocean climate changes. The manuscript is clearly written but it is somewhat lacking in detail and presentation.

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## Specific comments

The sections on analysis, 3.2.2, 3.3.2, 3.4.2 and 3.5.2 should provide sufficient information on instruments, selected methods and references to papers and handbooks so that the reader can get an impression on limits of detection, precision, accuracy etc. The sections do that except for 3.3.2 which stands out as being far too general. It indicates that the nutrient analysis is based on well known methods. The well known methods are, however, applied in different modifications by different laboratories using different equipment. There are no references to methods or handbooks here and this section has to be improved.

The sections on quality control, 3.2.3, 3.3.3, 3.4.3 and 3.5.3 illustrate that good attention has been given to the subject and certified reference materials used where available. It is very positive to see that a sample storage experiment for DIC and TA was conducted and is described in detail. The figures illustrating the QC results provoke some suggestions for improvement. The results for DIC in Fig. 2 indicate that the CRM correction has consistently been  $>1$ . The results in Fig. 2 for TA show a non-consistent pattern. There the correction factor has been  $<1$  but Batch# 102 stands out with much larger correction than the others. This reviewer suggests that the mean TIC and TA correction factors be tabulated by CRM batch. The TA results for Batch #102 call for an explanation or at least a comment.

The expression of QUASIMEME results as z scores has its merits, particularly for assessing the individual laboratory performance in relation to other laboratories. The QUASIMEME test materials for nutrients and salinity have generally larger ranges of concentrations (assigned values) than are observed in this dataset. Secondly, the assigned QUASIMEME values come into the calculations of the z scores. It is not possible to relate the z scores to the nutrient concentrations observed and filed. It seems therefore more appropriate and illustrative to present the QUASIMEME results in Figs. 4 and 5 as concentration differences (laboratory result – assigned value) and even use only results for those test materials that had concentrations at levels similar to the ocean

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data reported.

Regarding the data already on CDIAC, the CTD oxygen sensor data are uncalibrated. In the opinion of this reviewer, it is bad practice to store uncalibrated data on CDIAC. What is uncalibrated data good/bad for? The data originators should calibrate the oxygen sensor data using the results from Winkler titrations of discrete samples. If that is not possible then the uncalibrated data on this parameter should be removed.

#### Specific comments

Title: The title should reflect that this is ocean data.

#### Page Line

392 1 -3 Was the CTD salinity calibration carried out with samples collected once per year or more frequently? Was there no oxygen sensor calibration by comparison with discrete samples?

392 15 The sample is diluted with the mercuric chloride solution. How is that dealt with?

399 3 Are the oxygen bottles individually volume calibrated?

399 11 Is the titration carried out in the sample bottle or is an aliquot taken for titration?

#### Technical comments

#### Page Line

409 Fig. Legend. Replace nutrients with salinity

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Interactive comment on Earth Syst. Sci. Data Discuss., 6, 389, 2013.

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