**Earth System
Science Data
Discussions**

Interactive comment on "The Irminger Sea and the Iceland Sea time series measurements of sea water carbon and nutrient chemistry 1983–2006" *by* J. Olafsson et al.

Anonymous Referee #1

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Overall the paper seems to be an adequate description of the QC methods used for the IRM and IS time-series data sets. The overall approach to QC seems reasonable and consistent with most other CO2 system data sets. The TCO2 QC section is a bit unclear and will require more explanation. I also have a few minor comments/questions (see below). Though the paper is written clearly there are a number of grammar issues - the authors should reread the text carefully to catch these.

Major Issue: The TCO2 QC section is unclear: 1) What is a DRM? The acronym is not explained. 2) The paper says "no analyses were conducted in 1999 and 2000". Do you mean no CRMs were analyzed, or no samples were analyzed? There are 1999

and 2000 data in the database - did these samples sit for 2 years prior to analysis? 3) Was the 1.0029 loop correction factor applied to the 1991-1998 data from both IRM and IS? Because the deepwater data from IRM exhibit what could be a step function increase around the end of this period. 4) Were any corrections applied to any of the the 1999-2000 data? 5) There again appears to be a step function increase in the deep IRM data beginning in 2001. Are you sure the same corrections were applied to both the IS and IRM data sets? 6) The paper does not say whether any correction was applied to any of the 2001-2008 data to account for the 5.3 umol/kg offset - was there a correction applied? 7) How exactly did you estimate precision and accuracy? The 1-2 umol/kg figures seem generous given the range of errors shown in Fig. 4. 8) A gas loop volume error would create a concentration-proportional bias, not a fixed bias. I expect you used several different reference materials with different concentrations over this long time period, so it is a bit misleading to refer to fixed biases of -4.7 and 5.3 umol/kg. Similarly, Fig. 4 should show relative deviation, not absolute deviation, unless you used the exact same reference material concentration throughout the study.

Minor issues/questions: 1) p.481 line 7: Define "nearby". 1km? 10km? 1000 km? 2) p.482 lines 12-14: Why use a polynomial rather than a linear fit? What is the source of the nonlinearity? 3) p. 483 lines 2-4: Please give the concentrations of the nutrient reference materials - otherwise these % errors don't tell us a whole lot. 4) p. 485 lines 5-7: Define "appeared reasonable". Also, have you considered estimating alkalinity from salinity and using this to check internal consistency between TCO2-pCO2-Alk? This might help in identifying pCO2 or TCO2 outliers.

Interactive comment on Earth Syst. Sci. Data Discuss., 2, 477, 2009.