Biogeosciences Discuss., 6, C155–C156, 2009
www.biogeosciences-discuss.net/6/C155/2009/

Biogeosciences Discussions

Interactive comment on "Stoichiometries of remineralisation and denitrification in global biogeochemical ocean models" *by* A. Paulmier et al.

Anonymous Referee #3

Received and published: 22 April 2009

Paulmier et al. present an interesting study with the aim of highlighting the inconsistencies among ocean biogeochemistry models (OBMs) in the implicit assumptions made on the hydrogen content of organic matter. These differences lead to variations in remineralization and denitrification stoichiometries among the models, with implications for simulated tracer distributions. The study derives algebraic relationships linking the stoichiometric ratios for different biogeochemical processes in varying marine environments. The authors use these relationships to examine the parameterization of stoichiometries in four different OBMs.

The paper has a useful message, and the algebraic analysis of stoichiometries pro-

vides interesting insights. However, for some cases, while the algebraic formulations are presented in detail, the ensuing analysis and discussion (particularly in the latter half of the paper) would benefit from clarification and expansion. Examples are given in the 'Specific Comments' section below. I recommend publication of the paper following revisions to expand the interpretive discussion, particularly in sections 3.2 and 3.3.

SPECIFIC COMMENTS and TEXT CORRECTIONS

Section 1, pg. 2541, Line 1. Add 'the' before 'chemical'.

Section 2, pg 2545, Line 6, Correct spelling to 'implicitly' .

Section 1, pg 2543, Lines 4-6, If dissolved organic matter is not considered in this analysis, additional discussion in this section (or in section 4) would be useful to discuss the implications of this. Many OBMs do include varying contributions to the organic matter cycle from DOM.

Section 3.1.3, pg. 2548,: Lines 14-19 appear to compare Equation 11 and Equation 12, before Equation 12 has been defined. This section should be reorganized.

Section 3, pg 2551, Line 23, Correct spelling to'oxic'.

Section 3.3.1 : pg 2552, Lines 8-25. This discussion on nitrate vs. oxygen demand is not clear.

Section 3.3.2. pg. 2553. The authors use the ratio of fixed N to organic N denitrified to identify this. However the accompanying discussion does not sufficiently discuss the rationale for their analysis. Further clarification is needed.

Pg. 2556, Line 5, Correct spelling to 'implicitly'

Pg. 2557, Line 7, Correct spelling to 'implicitly'

Interactive comment on Biogeosciences Discuss., 6, 2539, 2009.