

Editor comment on decision (accepted subject to minor revisions):

Regional biogeochemical modelling is still a challenge due to the complexity of the respective systems and the complexity of the underlying model systems. As many other papers, this paper cannot solve all problems, but it makes a contribution to the scientific discussion about the importance of DOC in the carbon cycle. Even though the model skill assessment is not perfect likewise, at least the authors make a comprehensive attempt to assess the performance of their model, which is not always the case. All the reviewer comments have been highly welcome and I thank all of them for their work, their reasoning, and their patience with this manuscript. Also the patience and willingness of the authors to improve the manuscript is highly appreciated. I disagree somewhat on the request by reviewer #3 about the lacking complexity of the particle flux model (no different size classes, no aggregation model). Kriest et al. (2010) [I. Kriest, S. Khatiwala, A. Oschlies, Towards an assessment of simple global marine biogeochemical models of different complexity, *Progress in Oceanography* 86 (2010) 337–360] have shown, that increased model complexity is not always the remedy against mismatch between simulation and reality. Taken all aspects into account I would like to accept the paper subject to minor revisions. These revisions need to address comments of the reviewers of the already revised paper (referees#3, 4, and 5). In particular, I would like to ask the authors for the following:

1. Please, convert the appendix into “supplementary information”, to be placed separately on the web upon publication. This should address the length problem as raised by referees #3 and #4.
2. Add a few sentences of critical appraisal concerning the observational data base (BOUM cruise) and why it may be non-ideal (referees #3 and #5).
3. Cite the work by Kriest et al. (2010) and/or respective other material to comment on the issue of complexity versus simplicity in ocean biogeochemical models.

Thank you for submitting your work the open access journals such as Biogeosciences!