

Interactive comment on “Towards an improved organic carbon budget for the Barents Sea shelf, marginal Arctic Ocean” by I. Pathirana et al.

Anonymous Referee #2

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This is a detail-rich and timely manuscript. It attempts to create an improved organic carbon budget from the Barents Sea shelf region. It does not address the marginal Arctic Ocean, which starts north of the Barents Sea shelf. The approach is interesting, but the referee knows too little about the sedimentological specifics of it. A proper quantitative understanding of the modern carbon storage capacity and future changes under variable physical conditions is essentially important, write the first author. Indeed! But can the results be trusted? By no means and here is the severe criticism that I have. It may be that my judgement feels harsh.

Today's primary production is described and discussed, but never critically compared with the results of the investigation. Fig. 8 indicates primary production as it is today and this figure is in utmost contrast to any primary production model so far published.

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Primary production is high in the south (150 g C m⁻² y⁻¹), intermediate in the seasonal ice zone (100 g C?) and low in the north (50 gC?). If the model cannot provide us with figures that are approximately similar to this, what should we then think about the remaining results of the model? Let's forget about primary production and look at Fig. 7. "Well captured" is not a term I would use when so many data are seemingly in contrast with the model. It may be that the standards are different in various fields. In my the results are not well captured.

If the present is the key to the past and investigations of the recent past cannot nearly reproduce the present I wonder how much confidence I have in this model. A primary production model as executed by Slagstad, Ellingsen, Arrigo, Wassmann and others are suggestions that are based upon many algorithms. There is naturally doubt about these and the results. But compared to the present model they rest upon firm(er) ground. The present model seems not even to be in the vicinity of the above mentioned model. If this would have resulted in a conclusion that the model may not be good enough I would have accepted. But this seems not the case.

I suggest that the manuscript is reevaluated and scrutinized for what it may be good for and where it fails. The approach is clearly important and valuable!!! The results and their interpretation are not accompanied with sufficient care and critical attitude.

Interactive comment on Clim. Past Discuss., 9, 4939, 2013.

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