

Interactive comment on “Using biogeochemical data assimilation to assess the relative skill of multiple ecosystem models: effects of increasing the complexity of the planktonic food web” by Y. Xiao and M. A. M. Friedrichs

Anonymous Referee #2

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In this paper the authors assess the ability of five ecosystem model variants to predict surface chlorophyll and particulate organic carbon. The five variants differ in their degree of complexity ranging from a simple 1P1Z food web to more complex 3P2Z food web. Satellite-derived chlorophyll and particulate organic carbon are assimilated at four different sites on the continental shelf of the Mid-Atlantic Bight. A cross validation is then performed at five independent sites. An additional experiment is performed where 20% random noise is added to the satellite data prior to the assimilation. The authors found that the moderately complex model (2P2Z) was associated with the highest

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model skills. The resulting optimal parameters after noise was added to the satellite-derived chlorophyll data were nearly identical for all variants except for the most complex one (3P2Z). The paper is well presented and written, the scientific approach and methods valid and described sufficiently for traceability. The authors give proper credit to related work and indicate the novelty of their study.

Major comments: The biggest problem of this paper is the fact that a lot of the background on the method used is in a paper that has not gone through a peer review process yet. The paper by Xiao and Friedrichs (2014) is not yet published yet referenced several times in the paper. It may be best to wait until that paper has been accepted before publishing this one.

The title should include the term Mid-Atlantic Bight or something similar since the results are not cross-validated outside this area. This leads me to my next comment: why did the authors focus on this area only? Why not try to cross-validate in other regions?

Minor comments: P487,L15: define MAB P491, L7: fall bloom not Fall bloom Figure 1: why did you choose these sites? Why are all the DA sites in coastal waters? Why not several CV sites in the open ocean? Figure 2: the text on these figures is hard to read

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