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Biogeosciences
Discussions

Interactive comment on "Assessing the value of BGC Argo profiles versus ocean colour observations for biogeochemical model optimization in the Gulf of Mexico" *by* Bin Wang et al.

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This is a very useful contribution that explains the benefit that models can derive from the incorporation of satellite and BGC-Argo observations. The paper is timely and clearly written. I recommend publication after minor revisions.

Specific comments: The introduction is comprehensive. It could be shortened a bit (the 3rd and 5th paragraphs could mostly be removed) but this is not essential.

Methods switch between present and past tense. Also not a big deal, just disconcerting

for the reader.

P6 L48: Here and in subsequent equations/text I'm a bit confused. The float and satellite measure bbp700 and bbp670 respectively. So why are we now talking about bbp470? And what is meant by 'validated bbp470'?

P6 Eq 2 and 3: What are the units of the terms on the LHS? Please be more specific about what 'Phytoplankton' is. I think it's phytoplankton N.

P11 L69: Here and in section 3.1, the temporal resolution of the satellite data is not specified. I also think a bit more information here would be useful. How are monthly climatologies of the float profiles created? What distance from the 1D site is considered? Maybe this is described elsewhere and I missed it, but I see the other reviewer asked something similar.

P14-15: In the sub-section headings, it wouldn't hurt to remind us what experiments A, B and C are. That is 'satellite only' etc.

Figures 3 and 8: Why not just put the parameter labels on the y axes?

For the 3D case, I think it's correct to say that Figure 8 is an average of all model grid cells where the water depth is >1000m. That's a pretty big area. Yes, it's reasonably uniformly low chlorophyll, so one could make the case that this encompasses a contiguous bio-region. But why not choose a smaller box in the middle of the deep part of the basin, and perhaps one from the shelf, to illustrate the model performance? I suspect the latter will not perform as well, but that would still be interesting to know.

The results proceed in a logical fashion through the different experiments, 1D and 3D. The presentation of the results is clear and concise.

In a paper like this, readers will likely be looking for a clear recommendation: Which of the three options should they choose? I think the conclusions do a good job of summarising the recommendations and the figures represent what's lost if it's not possible to implement the best case scenario.

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