

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2021-2

Anonymous Referee #1

Referee comment on "S2P3-R v2.0: computationally efficient modelling of shelf seas on regional to global scales" by Paul R. Halloran et al., Geosci. Model Dev. Discuss.,
<https://doi.org/10.5194/gmd-2021-2-RC1>, 2021

General comments

The overall quality of the preprint is good, and the described developments of the S2P3-R model are suitable for publication in this journal. The manuscript describes novel model updates and evaluations of the model both globally and regionally. The information and data provided will allow others to assess if the model may be appropriate for their use.

Specific comments

No comparison is made of regional biogeochemical performance compared to a long reanalysis such as the Copernicus Marine Service NORTHWESTSHELF_REANALYSIS_BIO_004_011 product. This seems like a missed opportunity given the spatial coverage compared to satellite data.

Suggested minor revisions

Comparisons to satellite data state data was limited to "case 2 water, i.e. water $\geq 70\text{m}$ water depth (Jackson et al., 2019)". Whether this is meant to be "case 1 water" or " $\leq 70\text{m}$ " isn't clear as the reference "Jackson et al 2019" does not seem to be available. I would suggest a clarification of satellite data selection criteria.

The data variability in Figure 9A and 9B (and to a lesser extent Figure 18) is difficult to distinguish with a grey background. I would suggest the use of a white background for plots with viridis colourmap, such as in Figure 7. These global plots would also benefit

from being larger, single viridis and blue-white-red colour bars could be positioned either side.

Figure 13 would benefit from enlargement and using a log scale may be more appropriate.

Technical corrections

Page 12 Line 21: suggest replacing "other" with "apart from"

Page 29 line 41: This reference doesn't appear to be available from the url provided.