

Ocean Sci. Discuss., referee comment RC4 https://doi.org/10.5194/os-2021-35-RC4, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

Comment on os-2021-35

Anonymous Referee #4

Referee comment on "Can assimilation of satellite observations improve subsurface biological properties in a numerical model? A case study for the Gulf of Mexico" by Bin Wang et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2021-35-RC4, 2021

The study is investigated the ability of available satellite information on ocean surface physical and biological properties to constrain and improve simulated subsurface biogeochemistry in the Gulf of Mexico. The study also shows an example of using complementary Argo data. In this respect the paper nicely suits the frame of the journal. Generally, the manuscript is well structured and clearly written. The figures are of a good quality. I have got just minor comments (please see below) the authors might still want to consider before publishing the manuscript.

Title: an edit is required "...assimilation of satellite physical and biological observations ...".

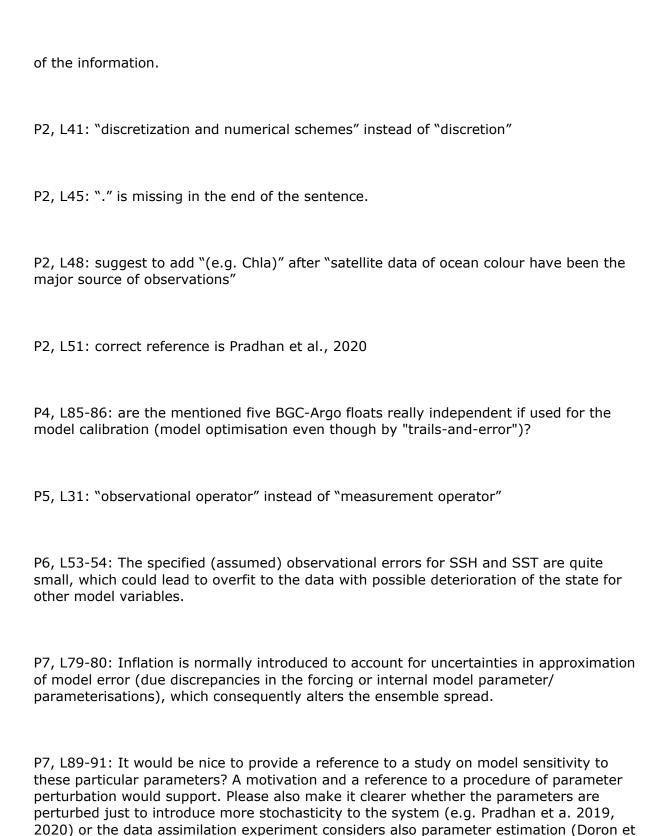
It is a bit confusing: the title emphasizing the use/role of satellite information in improving subsurface biogeochemistry, however Argo data are also assimilated. Could the title reflect the use of Argo data?

Specific comments:

Line 15:16. reads as BGC-Argo data are also assimilated complementary to the satellite data. Reads a bit contradictory to the title or vice versa the title reads contradictory to the statement.

P1, L18: "... into a three-dimensional biogeochemical model ..."

P2, L30-31: How was the tuning done? To a certain extent it is still a kind of assimilation



P8, L1-3: Please consider rephrasing this sentence. The length of the state vector should not affect crucially the computational cast. Normally the time required for the analysis (independent on the length of the state vector) takes much less than the computational expenses required for running the ensemble itself. It is worth providing another argument for justification of the choice of model variables included to the state vector.

al., 2011, Simon et al. 2015).

