Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2022-228

Anonymous Referee #2

Referee comment on "Multidecadal and climatological surface current simulations for the southwestern Indian Ocean at 1/50° resolution" by Noam S. Vogt-Vincent and Helen L. Johnson, Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-228-RC2, 2023

Multidecadal and climatological surface current simulations for the southwestern Indian Ocean at 1/50 degree resolution

The study evaluates the ability of high resolution CROCO (Coastal and Regional Ocean Community Model) to reproduce the surface characteristics of the southwestern Indian Ocean, which eventually could be used for marine dispersal studies in the area. The work is simple and straightforward, scientifically sound and could be very useful for different applications. I, however, have a couple of comments

- The title says multi-decadal and climatological simulations, however the evaluation is only done at a climatological scale. Is there a way to evaluate any multidecadal variability of the surface characteristics being analyzed here?
- The choice of the southern boundary of the domain seems to be quite random. If the main focus, as mentioned in the introduction, is not only the Seychelles but also the southwestern Indian Ocean as whole, then the southern boundary is placed further north. On the other hand, if the focus is only on the Seychelles, then the choice of such a large domain is a bit wasteful.If focusing on the southwestern Indian Ocean, there are few things to be considered. Just to name a few there is the Southeast Madagascar current along with southeast Madagascar bloom (e.g. Dilmahamod et al., 2020), which are important features in the area. Similarly, the Sofala bank over the Mozambique Channel where four rivers along the eastern African coast drain into the bank, plays important roles on the dynamics of marine organisms in the area (e.g. Malauene et al., 2018). These features are important in the area but being cut by the southern boundary.
- The evaluation/ comparison with observational/reanalysis data is clear, however it would be helpful also if the authors could refer to how WINDS perform compared to other models (ROMS – ex CROCO for instance) in the area. There are modeling studies, especially on the eddies over the Mozambique Channel, that have been conducted in the area before (e.g. Halo 2012 on the Mozambique Channel eddies). This could be an opportunity to showcase the importance of having high res model in the area?