EGUsphere, referee comment RC2
https://doi.org/10.5194/egusphere-2022-41-RC2, 2022

Comment on egusphere-2022-41

Anonymous Referee #2

Referee comment on "Moana Ocean Hindcast – a > 25-year simulation for New Zealand waters using the Regional Ocean Modeling System (ROMS) v3.9 model" by Joao Marcos Azevedo Correia de Souza et al., EGUsphere,
https://doi.org/10.5194/egusphere-2022-41-RC2, 2022

General comment

Overall this is a good and detailed paper on a hindcast dataset while providing background information and validation of the dataset. The methods undertaken are robust and I commend the authors for their interesting study. As is mentioned in the manuscript, the work builds on earlier work and extensively compares model results with other data sources (like GLORYS). The work presented in novel and provides a major step in the direction of predictive models and I think it is worthy of publishing in NHESS. However, I have listed a couple of modest comments and technical correction I would like to see addressed.

Modest comments

- In the introduction the authors mention that global reanalysis with DA, because of horizontal resolution have little capacity for complexities like riverine influences and mesoscale variability. While the authors mention mesoscale variability in the manuscript, I was left wondering if the MOANA hindcast is able to capture riverine influences in ocean dynamics and if authors have tried to analyze this.
- I think in general the methodology section can benefit from a summarizing table or flowchart containing the many datasets (including for the model evaluation datasets) the research is using.
- Line 214-215: Add a sentence or two why and when it is to be expected that higher resolution leads to larger variances (seasonal, peaks, gradient is large).
- Line 240-241: It is stated that patterns of RSME are similar to patterns observed in

variance of SST of Fig 3. Whereas there are some similar patterns, notably the highest RMSE (43S-174E and 48S-166E) fall in relatively low variance areas which contradicts the statement. Please elaborate on this.

- Line 259-261: Elaborate how the surface forcing and boundary conditions from GLORYS could trickle down to observed difference in salinity.

Technical correction:

- Line 68 and 70 uses the abbreviation DA, but it is not written in full. Do the authors mean Data Assimilation?
- Line 6 and 7: "sea surface temperature (SST), sea surface height (SSH)" should be with capitals.
- Line 37: add "Due 'to' the large".
- Line 144: the link is not working for me, maybe better to just provide the link to the product store (https://resources.marine.copernicus.eu/products) and give the dataset name along with it instead of this large link.
- Line 177: SST is already in use in the introduction.
- For example, in Figs 2-3-4, what is meant with Moana 'Backbone', please provide context.
- Please provide contour boundaries in the caption of Fig 3.
- Line 239: Further explored in which section?
- Line 259-261: Sentence doesn't flow well.
- Line 285 and 336: Question mark.
- Line 318: sections 1 without the 's'. Also line 354
- Figure 10a: section 8 is missing
- Table 4: Denote separations with A-D in the Table

Please also note the supplement to this comment:
https://egusphere.copernicus.org/preprints/2022/egusphere-2022-41/egusphere-2022-41-RC2-supplement.pdf