Comment on gmd-2022-159

Anonymous Referee #1

Referee comment on "Monthly-scale extended predictions using the atmospheric model coupled with a slab ocean" by Zhenming Wang et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-159-RC1, 2022

Review For GMD "Monthly-Scale Extended Predictions Using the Atmospheric Model Coupled with a Slab-Ocean" By Wang et al.

This study compares the month-scale predication with WRF coupling with two different modes: Slab-ocean model (SOM) or ROMS. It shows that the SOM performs better than the ROMS by avoiding the SST bias in ROMS. The result are interesting and the topic fits GMD well. The experiments are well designed and manuscript is well written. I suggest major revision for with my comments listed below:

1 Your model domain covers north Pacific high latitude. Some of the area should be covered by sea ice, especially in winter. How do you deal with the sea ice in your SOM? The sea-ice region overlap with the region with large cold SST error in (Figure 3). What is the forecast sea ice error in ROMS?

2 Section 2.3 Can you provide some details about your WCDA in terms of DA method and assimilated observations? The details of generating initial conditions of SOM are missing, for example, how do you derive the mixed layer depth.

3 It will be good to show the prediction improvement over different season.

Ln 148 "for each example" to "for each experiment"