Comment on os-2021-70

Anonymous Referee #1

Referee comment on "A framework to evaluate and elucidate the driving mechanisms of coastal sea surface $p\mathrm{CO}_2$ seasonality using an ocean general circulation model (MOM6-COBALT)" by Alizée Roobaert et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2021-70-RC1, 2021

This paper thoroughly evaluated the model performance in the coastal region. Then, it examined the drivers of pCO2 seasonal variations in several coastal regions using the decomposition method recently proposed.

Recent studies have shown that the CO2 uptake in the coastal ocean cannot be ignored in the global CO2 budget. The detailed analysis the variability of the coastal CO2 flux has been needed.

The manuscript is well organized and easy to follow.

My concern is just that the decomposition results are shown in the only three coastal regions.

As the authors mentioned, uncertainty of the reconstructed pCO2 dataset is not small especially in the data limited region. Therefore the model performance is not necessarily doubtful even if the model output is not consistent with the observation-based estimates.

As long as the discrepancy is clearly stated, the decomposition result in other regions and the detailed discussion of the geographical distribution of the driving force is useful for our understanding.

Other minor comments are follows;

Line 139 and many others, "Socatv6": "SOCATv6"would be better.

Figure 1a: Dots and dashes in the inserted table are not similar with those in the main body of Figure 1a.