Earth Syst. Sci. Data Discuss., author comment AC4
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Reply on RC4

Jiye Zeng et al.

Author comment on "A new estimate of oceanic CO_2 fluxes by machine learning reveals the impact of CO_2 trends in different methods" by Jiye Zeng et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-71-AC4, 2022

The reviewer has given valuable opinions, including changing the title to focus on the dataset. Yes, our intention is to improve our previous method for ocean CO2 reconstruction, not the focus on scientific discovery. We are considering to change the title to "A surface oceanic CO2 product reconstructed by using machine learning to extract CO2 trends at decadal scale". The following are point-to-point to the reviewer's comments.

- We are adding more details in the method section to address the issues of air-sea flux calculation, rate extraction, and etc.
- Instead of using flux values in comparison products, we used their pCO2 to recalculate fluxes by a common method. Discussions on the comparison have been revised substantially.
- Our method did set aside part of SOCAT fCO2 for validation. We called it "leave-one-year-out" validation method. For each of the three machine learning methods, 41 validations were done by set aside data in 1980 to 2020 year by year for validation and use the rest for training.