

## [RC2]

Review of Gap-filling processes on GOCI-derived daily sea surface salinity product for Changjiang diluted water front in the East China Sea by Jisun Shin, Dae-Won Kim, So-Hyun Kim, Gi Seop Lee, Boo-Keun Kim, Young-Heon Jo.

The paper presents a method to generate daily gap-filled sea surface salinity fields using as input lower resolution passive microwave data taking into account the correlation between ocean color and salinity fields and exploiting machine learning. The study focuses on the short term evolution of the Changjiang diluted water (CDW) front. It is essentially ok for publication after the recommendation below are followed.

My first recommendation is to modify the title that in its current form suggests that there are gap-filling processes at work in the East China Sea while I believe the authors should use instead of “Gap-filling processes on GOCI-derived...” the following: “Gap-filling techniques applied to GOCI-derived...” It would be important if the difference in methodology between *Kim, D. W., Kim, S. H., and Jo, Y. H.: Machine Learning to Identify Three Types of Oceanic Fronts Associated with the Changjiang Diluted Water in the East China Sea between 1997 and 2021, Remote Sens., 14(15), 3574, doi:10.3390/rs14153574, 2022b* and the current paper were clearly explained to show the reader the novelty of the current approach.

- Thank you for the comment. We agree that it is important to show the novelty of our study. According to the comment, we revised the title.
- “Gap-filling techniques applied to GOCI-derived daily sea surface salinity product for Changjiang diluted water front in the East China Sea”

After the first definition of GOCI (Line 15) do not spell it out in the text and figure legends.

- We confirmed and revised this part.
- [Line 165, Table 1 caption]: “Table 1. Summary of inputs and output used for training and testing of the machine learning model. The output data was used for daily SSS map derived from Geostationary Ocean Color Imager (GOCI) by Kim et al. (2021). In situ SSS data for the model testing were provided by the NIFS and I-ORS.”

The following figures need to be regenerated with increased resolution: 2, 3, 4, 5, 7 and 8

- We increased the resolution of the figures and re-inserted it into the word file. The resolution of the original figures inserted in the word file is high, but it seems that the resolution decreased during the preprint process.

Detailed suggested changes to improve readability and correct apparent mistakes:

Line 13 Replace “high” with “higher”

- According to the comment, we revised the word in the manuscript [line 14].

Line 16 Replace “season from with “seasons of”

- We revised this part as follows: [line 17-18] “during the summer seasons from 2015 to 2019”.

Line 17 Replace “Copernicus Marine Environment Monitoring Service” with “Copernicus Marine Service”

- We referred to these full names in the following sites.
- <https://insitu.copernicus.eu/FactSheets/CMEMS/>

Line 30 Replace “horizontal” with “zonal”

→ According to the comment, we revised the word in the manuscript [line 31].

Line 37 remove “—the salinity of the ocean at its surface—”

→ According to the comment, we removed the part in the manuscript [line 38].

Line 38 replace “dataset” with “products”

→ According to the comment, we revised the word in the manuscript [line 39].

Line 69 Replace “Copernicus Marine Environment Monitoring Service” with “Copernicus Marine Service”

→ We referred to these full names in the following sites.

→ “<https://insitu.copernicus.eu/FactSheets/CMEMS/>”

Line 130 replace and track with “along track”

→ According to the comment, we revised the word in the manuscript [line 128].

Line 130-131 replace “using a reduced-order Kalman filter, and track altimeter data, satellite SST and in situ TS profiles were jointly assimilated” with “using a reduced-order Kalman filter, along track altimeter data, satellite SST, and in situ TS profiles.”

→ According to the comment, we revised the word in the manuscript [line 128-129].

Line 184 Replace “horizontal” with “zonal”

→ According to the comment, we revised the word in the manuscript [line 182].

Line 431 Replace “patter” with “patterns”

→ According to the comment, we revised the word in the manuscript [line 414].

Line 518 & 519 It seems from the manuscript that “>31 psu” (at line 518) should be swapped with “<31 psu” (at line 519)

→ “>31 psu” means 31 psu or more, so this sentence is correct.

Line 519 What is meant by “most oceanic environment”? “Typical” perhaps?

→ To avoid confusion, we revised as follows: [line 505] “the <31 psu range in the ECS during summer.”

In Table 4: Model 1 (SMAP) with bagged trees reports the best RMSE 1.17 psu with 1.36 MSE however, we have either 1.36 MSE with 1.17 RMSE or 1.35 MSE with 1.16 RMSE. So a rounding off error was made. Since this model was selected as the best, from validation results, it is a relevant issue.

→ To avoid rounding errors, we expressed the values of RMSE, MSE, MAE in Table 4 up to three decimal places.