Reviewer 3:

I agree with the two previous reviewers that this manuscript is more about runoff products validation. Because for interannual variability of mixed layer salinity in such a big region, the datasets (observations & model) cited in this manuscript are good enough. There's no need for such complex high-resolution sets of simulations. Therefore, the title, introduction, objectives, methodology needs to be reviewed substantially.

Following reviewer 1 comment, we have modified the title of our study, which better reflects the aim of the present work. The introduction was also modified to clarify the purpose of the study (lines 69 - 74). However, the methodology was not modified, as we believe that our approach using a high-resolution model and a mixed layer salinity budget is sound. The high resolution of the model allows to represent the river inputs more precisely than a low-resolution model. It is possible that we would have obtained similar results using a model configuration at 0.25° like the one used by Camara et al. (2015). However, we have used a modelling tool recently developed by Ndoye et al. (2018) that is used in many studies by our group.

The study region needs better reasoning. Currently the dashed black box in Figure 1 does not include the impacts of the whole merged catchment.

The dashed box indicates the region of study for the ocean. Indeed, it does not include the rivers south of the box, but the low salinity waters produced by these runoffs are transported into the box by advection. Furthermore, we analyze the impact of the lumped river discharge south of the box in Figure 7 (see lines 494, 515).

The datasets description lacks important specifications such as data period, temporal and spatial resolution.
We have added information on the availability period of each dataset, as well as their resolution, where it was missing:

"TSG data are available from 1993 to present, between 5 to 15 m depth, and we use the hourly product." (lines 125 – 126).

"ERA5 hourly fields are available over the period 1950-2023 at a horizontal resolution of 31 km" (lines 173 - 174)

"IMERG data are available from 2000 to present, at a resolution of 0.1° every half-hour." (lines 185 - 186)

The GloFAS hydrological model simulations are available from 1979 to present at a daily and 0.1° resolution." (line 197 - 198)

"ISBA-CTRIP data is available daily from 1979 to June 19, 2019, at a 0.5° resolution." (line 209 - 210)

The figures in the appendix should be included in a separated supplement document with increasing numbering order.

Appendices are now moved to a supplementary material file, where figures are numerated from S1 to S10, as suggested.