

Manuscript « Regional sea level budget over 2004-2022 »

Responses to C. Ludwigsen Comment (*in italics*)

30 March 2025

Comment posted by Carsten Ludwigsen

This paper addresses a critical aspect of the regional sea level budget. Beyond the reviewers' comments, **I believe it's essential to discuss how reanalysis models assimilate Argo data and how potential issues in the Argo dataset might propagate into the reanalysis outputs.** Given this, I find the suggestion that GRACE may not accurately observe manometric sea level is currently insufficiently supported. The authors should provide a more detailed elaboration on these points to strengthen their analysis.

Response

This is indeed a key issue. We added the following text:

“One may wonder whether the salinity drift observed in some Argo floats as of 2015 is impacting the CIGAR reanalysis since, unlike altimetry data, T/S data are assimilated during the reanalysis integration, thus non-linearly interacting with dynamical processes. The treatment of the salinity drift simply consisted in rejecting data that Argo had flagged for rejection in the delayed mode. But this may not fully guarantee that all bad salinity data have been discarded. However, to compute the reanalysis-based manometric component, the local steric contribution is removed. Thus any effect of the Argo salinity drift should be minimized.”