

Quantifying the respective contribution of steric sea level for different oceanic layers at global and regional scales from the last decades to the recent yearsWilliam Llovel[†];[†] JPL/NASA, USALeading author: william.llovel@jpl.nasa.gov

For the last two decades, steric sea level CHANGE HAS BEEN IDENTIFIED AS one of the major contributors to the observed sea level rise (Bindoff et al, 2007). This contribution is not steady and varies with time both globally and regionally. Different estimates, based on different analyses and computing strategies of in situ hydrographic data, have found a substantial global ocean warming signal located principally in the upper 500m to 700m depth of the ocean (Lyman et al., 2010). Although a deeper ocean signal may also be non-negligible (Purkey and Johnson, 2010). In this study, we analyze the contribution of different oceanic layers to steric sea level changes over the recent years using existing temperature and salinity databases (in particular from Argo since ~2003). We study the depth-time dependence of the thermosteric/halosteric/steric component, at global and ocean basin scales. Inference on the depth and time evolution of thermal expansion and its contribution to sea level is explored. Differences between the different databases and outputs of Ocean General Circulation Models are also investigated and discussed.