



An assessment of the mixed-layer salinity budget in the tropical Pacific ocean, 1989-2009

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Sea surface Salinity (SSS) variability is being considered as one of the best indicators of the changing marine water cycle. In the tropical Pacific, previous studies have shown that seasonal to interannual (ENSO) variability in SSS mainly result from changes in horizontal salt advections and fresh water fluxes (E-P). Those studies, however, were based on rather sparse in situ observations, meaning that all processes governing the mixed-layer salinity budget cannot be precisely quantified. The use of Ocean General Circulation Model (OGCM) outputs is an alternative approach to quantify all contributors to these SSS changes.

In this presentation, we will first evaluate the skill score of up-to-date DRAKKAR simulations to correctly reproduce changes in SSS over the 1989-2009 period, using a newly-derived observed SSS gridded field (and SMOS-derived observations if considered reliable at the meeting date). We will then discuss possible failures in the model outputs and analyse their possible causes. Where the model outputs can be trusted, we will finally diagnose the relative contributions of horizontal and vertical advections, freshwater input, diffusivity and mixing to the SSS changes, with an emphasis on the seasonal and ENSO time scales, both in E- and P-dominated regions of the tropical Pacific. This presentation will so enables us to partly assess where and at what time scale changes in SSS could actually account for changes in the marine water cycle.