



Variability of the Tropical Atlantic and Pacific SSS Minimum Zones and Their Relations to the ITCZ and SPCZ (1979-2013)

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This study focuses on the time-space variability of the low Sea Surface Salinity (SSS) waters located from the West to the East within about 2°N-12°N in the Atlantic and Pacific oceans and within about 6°S-16°S in the western Pacific. The analysis is based on a combination of in situ SSS observations collected in the last 3.5 decades from voluntary observing ships, TAO/TRITON and PIRATA moorings, Argo floats and (few) CTD profiles. We show that the mean positions of the Atlantic and Pacific low SSS waters are tightly related to the local minimum in Evaporation minus Precipitation (E-P) budget linked to the Inter Tropical Convergence Zones (ITCZ) and South Pacific Convergence Zone (SPCZ). We also show that the meridional position of the SSS minima varies both at seasonal time scale, with an overall poleward displacement in summer (or winter in the western Pacific ITCZ), and at interannual time scale in relation with ENSO and the Atlantic meridional mode, with however subtle differences in timing between the western, central and eastern basins. The role of the ITCZ- and SPCZ-related E-P budget in these seasonal and interannual changes is examined. We further document long-term meridional migrations of these low SSS waters in the last 3.5 decades and discuss whether or not they are consistent with documented decadal variability and/or expected global change effects.