



Variability of the Heat and Salt Budget in the Subtropical South-Eastern Pacific Mixed Layer between 2004 and 2010: Spice Injection Mechanism

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The mixed layer heat and salt budget in the southeastern subtropical Pacific is estimated using 7 years (2004-2010) of Argo profiling float data, surface fluxes, precipitation, surface velocity data and wind stress observations and reanalysis. In this region the mixed layer heat budget is characterized by a strong annual cycle mainly modulated by the shortwave radiation annual cycle. During the austral fall and winter the shortwave radiation input minimum is overwhelmed by the heat loss mainly due to the latent heat flux. The mixed layer salt budget presents also a strong annual cycle with a minimum of salt content during the late austral winter. In contrast with the heat budget, the salt budget is mainly driven by the unresolved terms computed as the residual of the budget. Among these missing terms, the most likely candidate is the vertical eddy mixing due to convection caused by the heat surface buoyancy loss and the destabilizing vertical gradient of salinity at the base of the mixed layer. This downward flux of salt at the base of the mixed layer could explain the annual spiciness injection and interannual spiciness variability in the permanent thermocline in the southeastern Pacific.