

Role of mixed layer depth in surface frontogenesis of the Kuroshio Extension region: Interannual variability

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Using the JRA-55 reanalysis data and Argo observation dataset from 2004 to 2015, we examine how meridional variations in the mixed layer depth across the sea surface temperature (SST) front in the Kuroshio Extension region affects the surface frontogenesis. A mixed layer heat budget analysis shows that the surface heat flux term generally strengthens the SST front despite the stronger net surface heat loss on the equatorward side, because the surface mixed layer is much deeper on the equatorward side, and the SST is less sensitive to the surface heat flux.

Keywords: Kuroshio Extension, sea surface temperature front, mixed layer depth, surface heat flux