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Reemergence of wintertime sea surface temperature anomalies in the extratropical South Pacific

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In this study, the impact of the seasonal cycle of the depth of the mixed layer on the persistence of SSTs in the extratropical South Pacific Ocean is examined. As the mixed layer shoals in the spring, surface temperature anomalies induced during the previous winter are sequestered beneath the mixed layer throughout the summer. During the fall and winter, the mixed layer deepens, re-entraining the sequestered temperature anomalies. This mechanism, commonly referred to as reemergence, is examined using lagged correlation/regression analysis of surface and subsurface ocean temperature anomalies. The results indicate that temperature anomalies beneath the summer mixed layer are highly correlated to temperature anomalies in the mixed layer in the previous and following winters but are weakly correlated to temperature anomalies in the mixed layer in the summer, suggesting that wintertime SST anomalies tend to persist beneath the summer mixed layer and are re-entrained in the following winter. The winter-to-winter recurrence of surface temperature anomalies is also confirmed using an independent sea surface temperature (SST) dataset.