

The reversal of the multi-decadal trends of the tropical Pacific trade winds, and the Indonesian Throughflow and Leeuwin Current transports

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Multi-decadal weakening trend of the Pacific trade winds during 1960-1993 has reversed since 1993. The multi-decadal trend reversal has induced cooling (shallow thermocline) trend in the equatorial western Pacific before 1993, followed by a warming (deepening thermocline) trend from 1993 to the present. All atmospheric reanalysis products corroborate the trend reversal of the trade winds during the two multi-decadal periods. The magnitudes of the trade wind reversals along the equatorial Pacific, however, differ among the reanalysis products, with the NCEP-1 reanalysis overestimating (underestimating) the weakening (strengthening) trend of trade winds during the period before (after) 1993. The trend reversals of regional ocean circulations are assessed using linear regressions derived from an eddy-permitting numerical model, which suggests a reversal of the Indonesian Throughflow and the Leeuwin Current transport anomalies during the two multi-decadal periods.