

Atlantic impacts on the tropical Pacific climate in the 2000s

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A subdecadal (i.e., 3-year-running means) variation over the tropical Pacific is very distinctively observed in the 2000s. Here, we have demonstrated that sea surface temperature (SST) anomalies in the tropical Atlantic contribute to forming high ocean temperature anomalies of the tropical Pacific in the early-2000s, by performing partial data assimilation of global climate model. Low SST over the equatorial Atlantic changes the Walker circulation and the associated weakening of the Pacific trade wind raises the equatorial SST on the subdecadal timescales. At the same time, high SST anomaly is generated also in the off-equatorial North Pacific through deepening of the upper ocean thermocline due to an accompanying anti-cyclonic surface wind anomaly aloft. In addition, the north tropical Atlantic SST may help the subdecadal warming in the equatorial Pacific, similar to the common changes working as a seasonal trigger of the so-called central Pacific El Nino Southern Oscillation event.

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