The Atlantic SST influences on the Pacific subdecadal variability

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By performing two sets of partial data assimilation experiments using global climate model, we have demonstrated that sea surface temperature (SST) anomalies in the tropical and subtropical Atlantic Ocean contribute to forming high ocean temperature anomalies of the tropical Pacific in the early-2000s. Low SST over the tropical 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. While the subtropical north Atlantic SST may help the subdecadal SST rising in the equatorial Pacific, the resultant SST anomalies show 1-year delay in phase transition and are hardly accompanied by the ocean thermocline deepening.

