



Mean-state dependence of multi-decadal changes in equatorial Atlantic interannual variability.

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A prominent multi-decadal shift in equatorial Atlantic variability, occurring around the year 2000, is investigated by means of observations and reanalysis products. Compared to the time period 1960-1999, the interannual sea surface temperature (SST) variability in the eastern equatorial Atlantic during 2000-2017 has reduced by 30%. In addition to the well-known maximum in boreal summer, the SST variability depicts a more pronounced secondary peak in boreal winter during the latter period. Changes in the mean-state of the tropical Atlantic are proposed to play an important role in this shift. The mean-state induced change is enhanced by coupled air-sea feedbacks, namely the Bjerknes feedback, which is an important driver of interannual equatorial Atlantic SST variability. In the period 2000-2017 the whole tropical Atlantic basin has warmed up by 1K relative to the period 1960-1999, and the thermocline tilt became steeper consistent with stronger trade winds. Moreover, a stronger and more westward position of the upward branch of the Walker circulation is noted, resulting in a decrease in precipitation over Brazil. The inter-basin teleconnection between the tropical Pacific and tropical Atlantic is suggested as another potential factor for multi-decadal changes in interannual equatorial Atlantic variability. In fact, reduced interannual SST variability over the tropical Pacific Ocean is observed since 2000.