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Future weakening of southeastern Tropical Atlantic Ocean interannual SST variability in a nested coupled model

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Tropical Atlantic interannual sea surface temperature (SST) variability has significantly weakened since 2000. Here, we use a coupled ocean-atmosphere model with an embedded high-resolution nest in the tropical Atlantic Ocean to investigate future changes in the southeastern tropical Atlantic SST variability in response to anthropogenic global warming. In the model, the Angola-Benguela Area (ABA) is among the regions in the tropical Atlantic that exhibit the largest surface warming. Relative to 1970-1999, the SST variability in the ABA during the peak season, May-June-July (MJJ), decreases by about 24% during 2070-2099 under the worst-case scenario of the Shared Socioeconomic Pathway 5-8.5 (SSP5-8.5). The MJJ interannual temperature variability weakens along the Angolan and Namibian coasts in the top 40 m of the ocean. This reduction appears to be due to a smaller temperature response to thermocline-depth variations, i.e. a weaker thermocline feedback. The weaker thermocline feedback is found where the thermocline deepens the most. Our model results suggest that the trend towards a weakening of the interannual SST variability in the ABA observed during the recent decades could persist in the future under a worst-case global warming scenario.