

Decadal variability of the Benguela Niño/Niña

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The Benguela Niño/Niña is a dominant mode of sea surface temperature (SST) variability along the southwest African coast, with large amplitudes in austral fall. While interannual characteristics and mechanisms of this event have been extensively investigated by previous studies, its decadal fluctuation remains unclear. By synthesizing historical climate observations, we show that decadal SST variability in the Angola-Benguela area (ABA) is affected not only by local air-sea feedback but also by remote forcing from the North Atlantic and Pacific. On decadal time scales, the Benguela Niños (Niñas) tend to co-occur with negative (positive) SST anomalies in the tropical North Atlantic. This SST pattern is not confined in the tropical Atlantic but characterized by SST tripole in the whole North Atlantic, with a negative (positive) North Atlantic Oscillation-like SLP anomaly pattern. The strengthening (weakening) of the Azores high cools (warms) the tropical North Atlantic and weakens (strengthens) cross-equatorial trade winds, making favorable conditions for development of the Benguela Niño (Niña). The Pacific Decadal Oscillation also contributes to decadal SST anomalies in the tropical North Atlantic through atmospheric teleconnection. We will discuss how these remote forcings affect the decadal fluctuation of the Benguela Niño/Niña events.

Keywords: Benguela Nino/Nina, Decadal variability, Ocean-atmosphere interaction