Abstract View

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Atmosphere-Ocean Mechanisms of Climate Anomalies in the Angola-Tropical Atlantic Sector

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ABSTRACT

Interannual variations in the large-scale atmospheric and oceanic fields over the tropical Atlantic are studied in relation to rainfall anomalies on the Angola coast. Departure patterns are constructed by stratification with respect to extremely dry and wet years and by correlation with rainfall in Angola, which is concentrated in March–April.

The analysis suggests a causality chain of atmospheric-oceanic anomalies. Variations of westward wind stress on the western equatorial Atlantic constitute an early link in this chain. The annual cycle is characterized by a relaxation of the wind stress from September–November to February–March. Anomalous seasonal relaxation of easterly wind stress over the western equatorial Atlantic remotely forces the sea surface temperature (SST) departures in the eastern South Atlantic, a large relaxation being followed by positive SST departures. Sea surface temperature modulates the rainfall over downstream Angola by controlling the atmospheric moisture and stability. Within each link of this causality chain, a substantial portion of the variance stems from processes other than the direct line wind stress → SST → rainfall.