



An Interdecadal Change in the Intensity of Interannual Variability in Summer Rainfall over Southern China around Early 1990s

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The intensity of interannual variability (IIV) in southern China (SC) summer rainfall experienced a remarkable increase in early 1990s, concurrent with the interdecadal increase in SC summer rainfall. Two factors are proposed for this interdecadal change. One is the interdecadal increase of IIV in tropical eastern Indian Ocean (TEIO) sea surface temperature (SST) after early 1990s. Anomalous warmer (cooler) TEIO SST triggers anomalous ascending (descending) motion and lower-level cyclonic (anticyclone) circulation in situ, which in turn induces anomalous descent (ascent) over SC through an anomalous meridional vertical circulation. This contributes to interannual summer rainfall variability over SC. The increase in the amplitude of TEIO SST anomalies in early 1990s led to an intensified interannual variability of summer rainfall over SC. The other is the strengthened influence of a coupled mode of the North Atlantic Oscillation (NAO) and North Atlantic triple SST anomaly on interannual variability in summer rainfall over SC after early 1990s. The leading EOF mode of the North Atlantic SST is characterized by a stripe pattern during 1979-1992, while during 1993-2008 the dominant mode of the North Atlantic SST is a triple pattern. The triple pattern of North Atlantic SST may exert positive effect on the NAO after early 1990s. Compared to the period 1979-1992, the relationship between the NAO and interannual summer rainfall over SC is enhanced during 1993-2008. The NAO coupled with North Atlantic SST triple exerts an important impact on SC summer rainfall variability through Eurasian wave-like train (EUW).