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Increasing Influence of Central Pacific El Niño on the Interdecadal Variation of Spring Rainfall in Northern Taiwan and Southern China Since 1980

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Decadal variation of spring (February–April) rainfall in Northern Taiwan and Southern China was significantly related to the Pacific Decadal Oscillation (PDO) during the twentieth century. However, this interdecadal relationship subsequently weakened, and the sea surface temperature (SST) associated with the central Pacific El Niño (CPEN) has determined the interdecadal variation of spring rainfall in Northern Taiwan and Southern China since the 1980s. In this study, the effect of CPEN–SST on the interdecadal variation of spring rainfall in Northern Taiwan and Southern China was investigated. We found that a CPEN-associated positive SST anomaly in the eastern North Pacific forced an east–west overturning circulation anomaly in the subtropical North Pacific, the descending motion of which may have generated an anticyclonic circulation anomaly in the Philippine Sea. Simultaneously, the anticyclone associated southerly winds anomaly may enhance the southwesterly in northwest of the anticyclone, which in turn enhance the trough extending from Japan to Northern Taiwan. The anticyclone and trough associated with the respective southwesterly and northeasterly anomalies created a convergence environment in Northern Taiwan. In turn, this convergence environment contributed substantially to an interdecadal rainfall enhancement in Northern Taiwan and Southern China. Our results suggest that the effect of CPEN–SST on the interdecadal variation of spring rainfall in Northern Taiwan and Southern China has increased since 1980, especially during the transition period from the termination of a warm PDO phase to a cold phase in the late 1990s