

Extreme drought event of 2009/2010 over southwestern China

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The extreme drought of 2009/2010 over southwestern China is the driest event with the lowest percentage rainfall anomaly and the longest non-rain days in the past 50 years, and also the severest with the lowest percentage rainfall anomaly since 1880. The strongest negative-phase Arctic Oscillation is the most important contributor to this drought through triggering favorable circulations, including the weakened Southern Branch Trough (SBT), the Arabian Sea cyclonic anomaly and the Lake Baikal cyclonic anomaly. The weakened SBT reduces the moisture transport toward the southwestern China; The Arabian Sea cyclonic anomaly induces the positive rainfall anomaly over Indian Peninsular which attracts western Pacific Subtropical High (WPSH) to shift westward so that intensifies the weakening of SBT; the Lake Baikal cyclonic anomaly deepens the East Asian major trough and leads more dry cold air toward southwestern China; both the weakened SBT and the Lake Baikal cyclonic anomaly favors the formation of the local anticyclonic anomaly over southwestern China and exacerbates the local drought. In addition, the developing El Niño phase favors the westward extension of WPSH that further weakens the SBT and intensifies the drought.