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The climatic differences of extreme high temperature in China

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Heat wave (HW) is commonly regarded as a prolonged period of hot weather. The extreme high temperature events are different among the areas in China. High frequency areas of wet HW events occurred mostly in East China, including the lower reaches of the Yellow River, the mid-lower reaches of the Yangtze River and South China, while there were few events in the non-monsoon regions in the northwest part of China. Wet HW events occurred when the western North Pacific Subtropical High or the continental high circulation controlled eastern China during summer. Stations with dry HW frequencies over 0.1 times per year were located in the northwestern part of China and North China. Intense solar radiation and dry desert environment are favorable for high temperature events in Northwest China. A high frequency of dry HW events mainly occurred from May to August, with one peak in June, while wet HW events occurred from April to September and mostly in July and August. The high frequency of duration and extent of wet and dry HW events were from June to August, while low values of intensity were in the three months. The temperature climatology was high from June to August, and it was more difficult to get higher temperature anomaly in these months. Strong wet HW events occurred mainly in June, July and August, with the highest frequency in July. Moderate and weak wet HW events were mostly in July and August. The peak comprehensive index (Ci) values appeared in July and secondly in June, which indicated that the events in these two months were strong. Strong dry events occurred mostly in July. The highest frequency of moderate and weak dry HW events was observed in June. The Ci values were relatively high in May and July, while low in June and August. The majority of wet and dry HW events were observed from June to August. The duration of wet HW events varied from 3 to 40 days, with a peak number of 51 events lasting 3 days. For the dry HW events, the duration ranged from 3 to 12 days, with a peak number of 24 events lasting 3 days. The increase in the frequency and severity of the dry HWs and the wet HWs in China might be easily attributed to the global warming, but the phenomenon seems to be more complex than that.