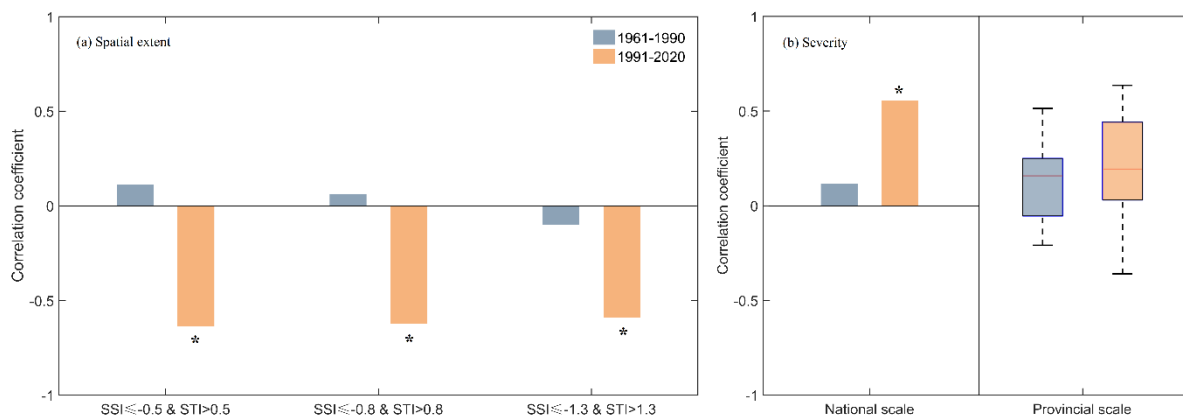
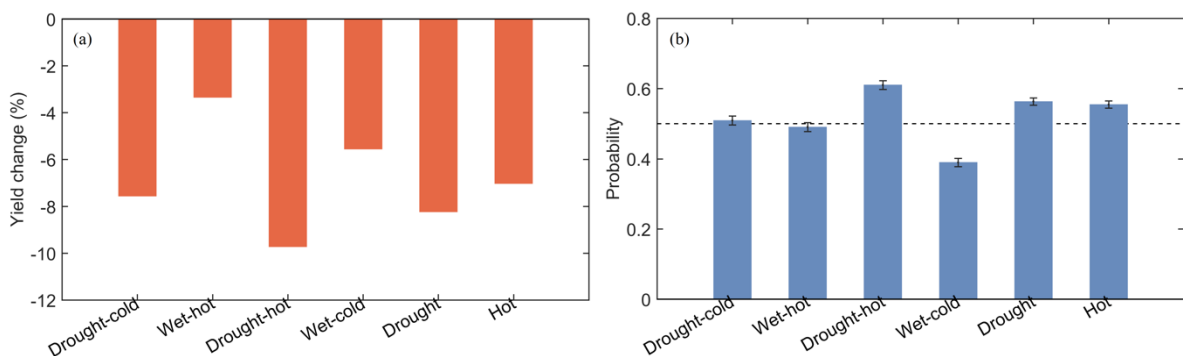


## Supplementary Material



**Fig. S1.** Changes in the correlation coefficients between (a) spatial extent or (b) severity of the CADHEs based on the SCEI and the maize yield during the main growing season in maize harvested area over China in 1991–2020 relative to 1961–1990. The star \* indicates significant correlation at the 0.05 significance level. The national and provincial scales in (b) mean that they are calculated based on national and provincial yield data, respectively. CADHEs: compound agricultural drought and hot events, SCEI: Standardized Compound Event Indicator.



**Fig. S2.** Same as Fig. 3 (in the main article), but for another threshold of climate events, i.e.  $SSI_0 = -0.5$  and  $STI_0 = 0.5$ . SSI: Standardized Soil Moisture Index, STI: Standardized Temperature Index. The dashed line at 0.5 indicates the probability of yield reduction associated with climate events

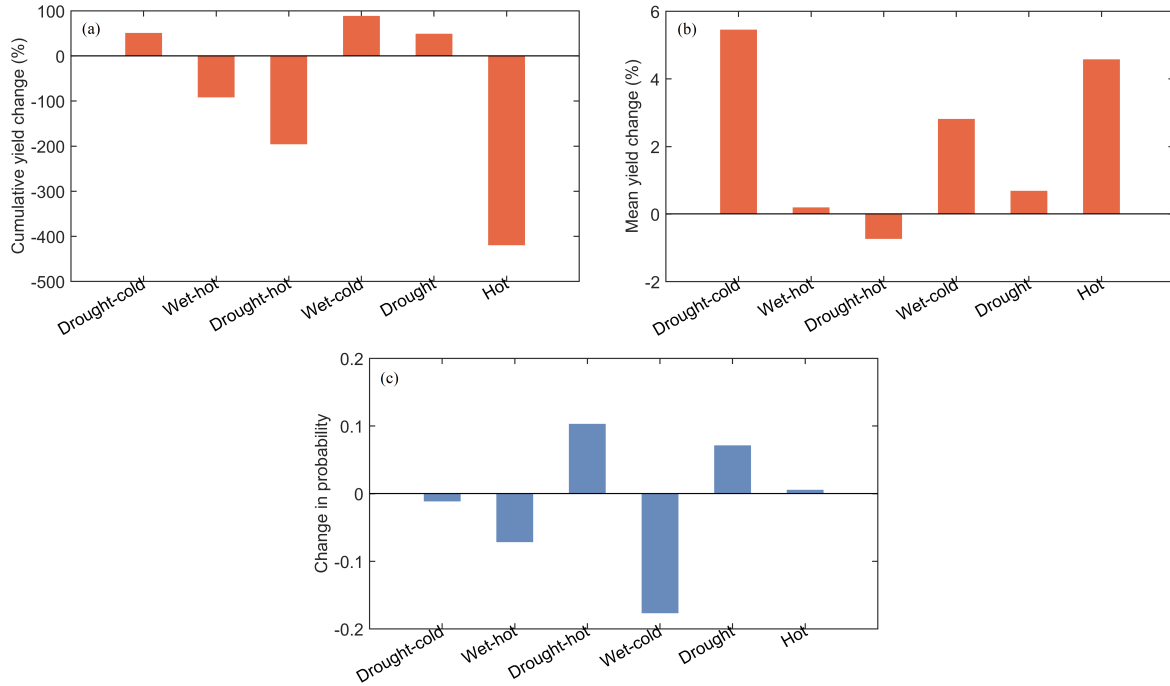


Fig. S3. Changes in (a) cumulative and (b) mean negative maize yield anomalies attributed to different climate events during the main growing season in 1991–2020 relative to 1961–1990 over China. (c) Changes in the conditional probability of yield reduction under the six modes of events.

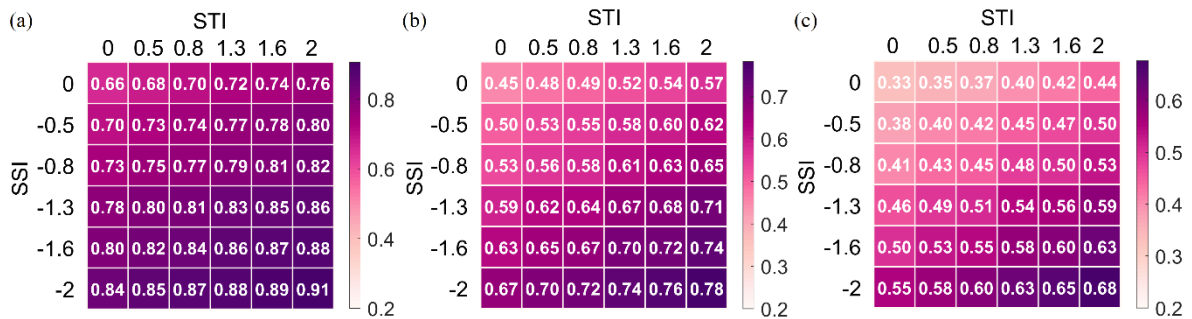
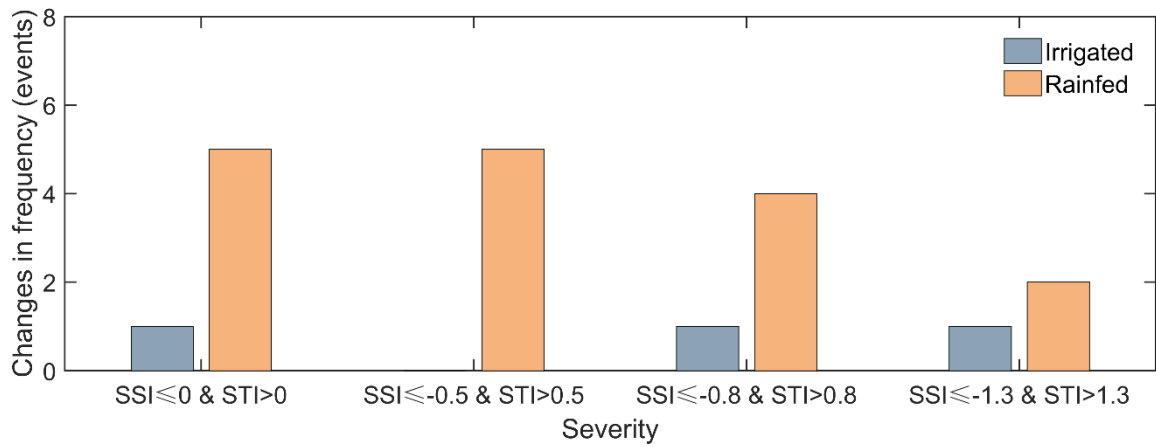


Fig. S4. The conditional probability of different national yield reduction levels (i.e.,  $Y_d \leq 0$ ,  $-0.5$ ,  $-0.8$ ) given different configurations of droughts (i.e.,  $SSI \leq 0$ ,  $-0.5$ ,  $-0.8$ ,  $-1.3$ ,  $-1.6$ ,  $-2$ ) and hot conditions (i.e.,  $STI > 0$ ,  $0.5$ ,  $0.8$ ,  $1.3$ ,  $1.6$ ,  $2$ ). (a)  $Y_d \leq 0$ , (b)  $Y_d \leq -0.5$ , (c)  $Y_d \leq -0.8$ . SSI: Standardized Soil Moisture Index, STI: Standardized Temperature Index,  $Y_d$ : the standard normal form of maize yield.



**Fig. S5.** Changes in the frequency of CADHEs with different severity levels (i.e.,  $SSI \leq 0$  &  $STI > 0$ ,  $SSI \leq -0.5$  &  $STI > 0.5$ ,  $SSI \leq -0.8$  &  $STI > 0.8$ , and  $SSI \leq -1.3$  &  $STI > 1.3$ ) in 1991–2020 relative to 1961–1990 in rainfed and irrigated cropland areas over China. SSI: Standardized Soil Moisture Index, STI: Standardized Temperature Index.