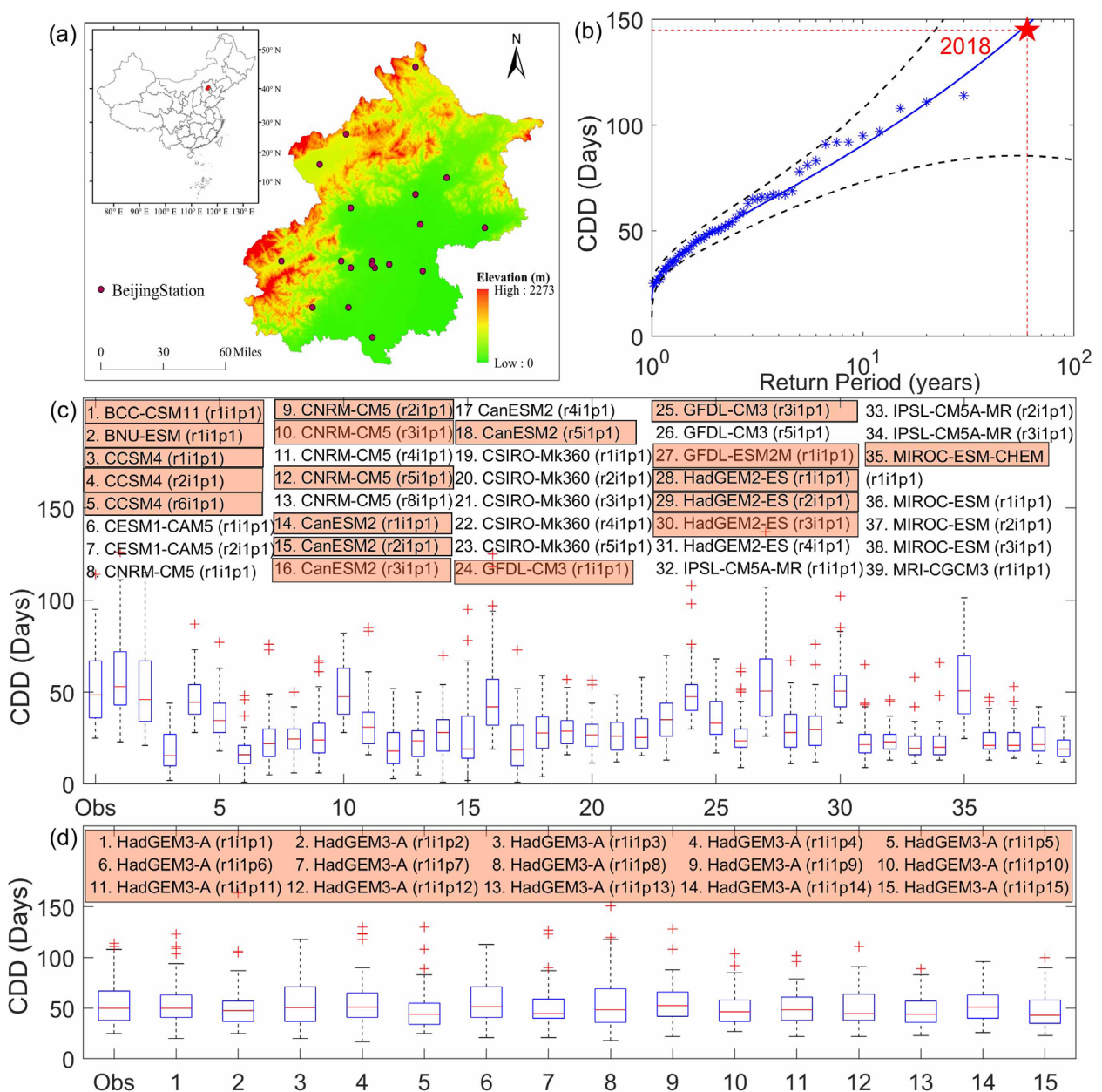


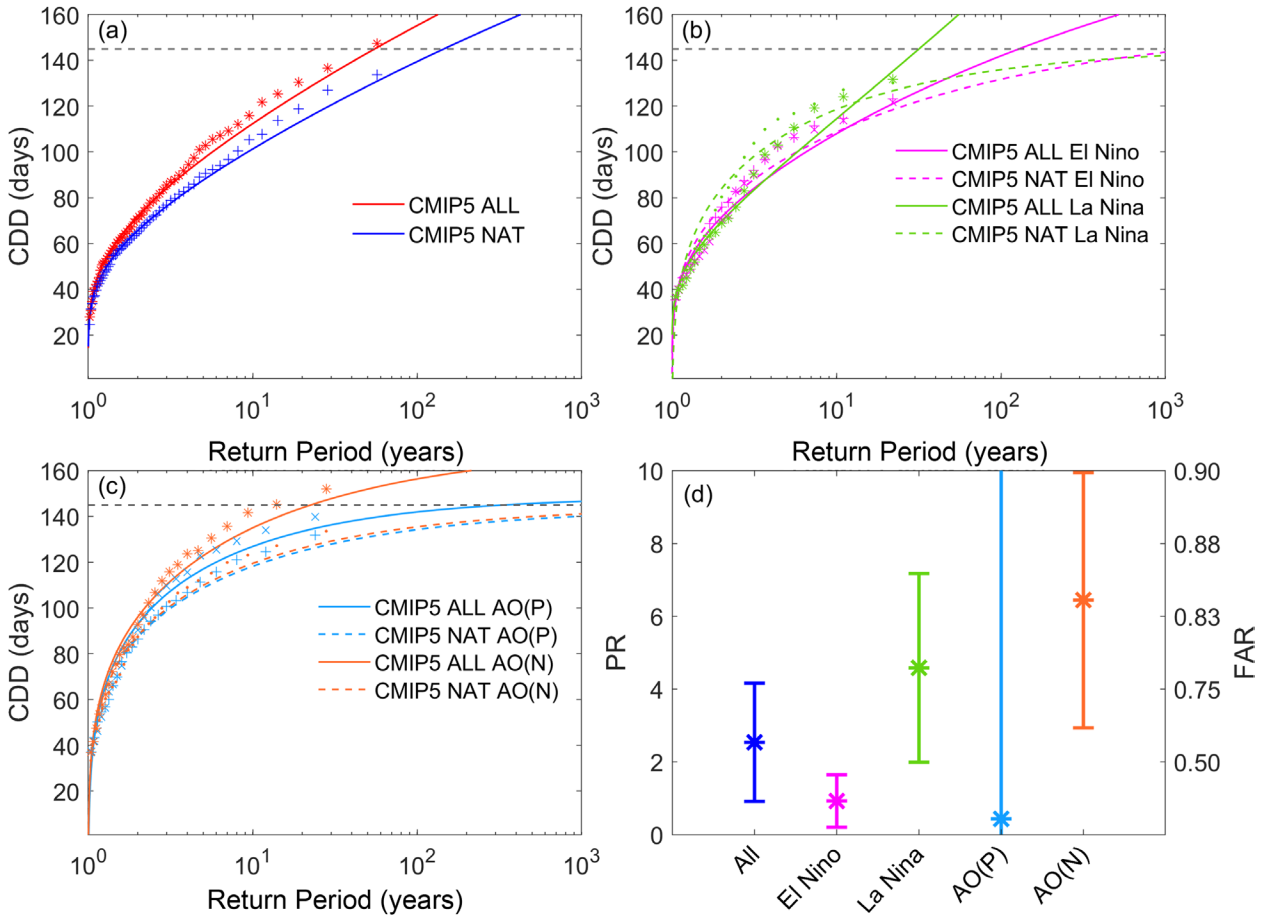
## ATTRIBUTION OF THE RECORD-BREAKING CONSECUTIVE DRY DAYS IN WINTER 2017/18 IN BEIJING

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**FIG. ES1.** (a) Location and topography of Beijing and the spatial pattern stations selected for research. (b) Return period (years) and 95% confidence level for the CDD anomaly, and the red five-pointed star represents 2018. (c) Box plot comparing the observed CDD distribution (Obs) to 39 ensembles from 12 models. Each box indicates the median and first and third quartiles, while the whiskers extend to the last values that are 1.5 times the interquartile range above or below the quartiles. (d) Same as (c), but for 15 ensembles from the HadGEM3-A System. Note that the estimations of probability ratios were estimated using a bootstrapping procedure (resampling the distributions 1000 times with replacement); the bars show the interquartile range (5th–95th percentiles); the dots and triangles show the median values and best estimates, respectively.



**FIG. ES2.** (a) Return periods for the annual longest CDD during 1950–2005 from CMIP5 simulations under ALL and NAT forcings, and the black dash line denotes the observed CDD in 2017/18. (b) As in (a), but during El Nino or La Nina years (see text for definitions). (c) As in (b), but during the AO positive phase (P) or negative phase (N). (d) The fraction of attributable risk (FAR) and corresponding probability ratios (PR) calculated using different scenario combinations for  $P_0$  and  $P_1$  as shown in Eq (2). The estimation of probability ratios was calculated using a bootstrapping approach (resampling the distributions 1000 times with replacement); the bars show the interquartile range (5th–95th percentiles); the asterisks indicate the best estimates for the fraction of attribution risk.