

Supplementary Material

Dominant Contribution of South Asia Monsoon to External Moisture for Extreme Precipitation Events in Northern Tibetan Plateau

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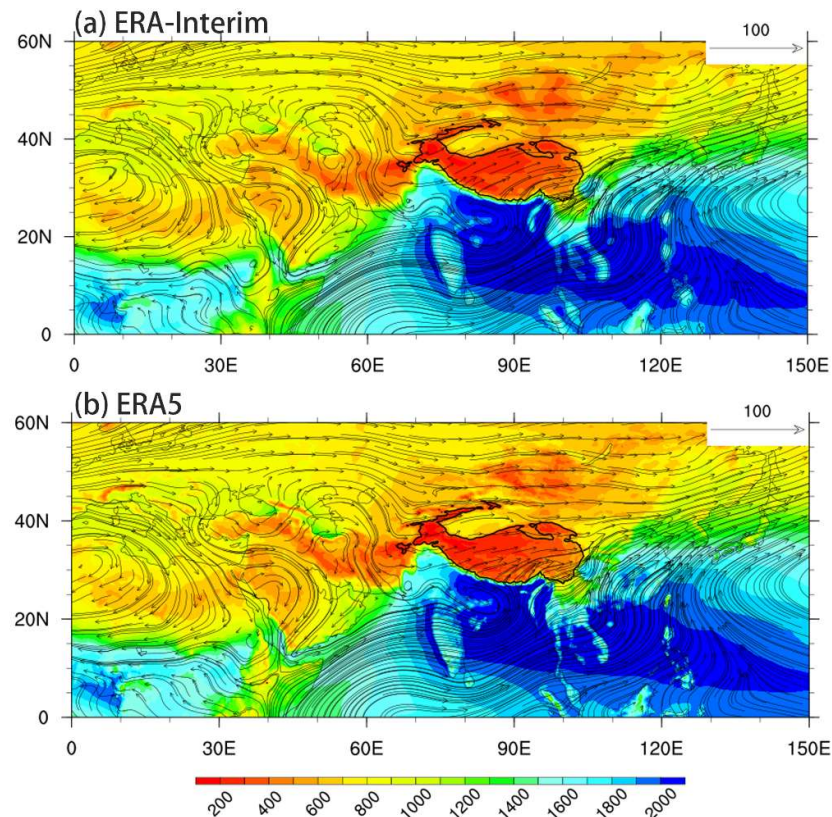


Figure S1. The spatial pattern of total column water vapor (shade, unit: kg m⁻²) and vertical integral of water vapor flux (arrow, unit: kg m⁻¹ s⁻¹) from the ERA-Interim (a) and ERA5 (b), averaged over JJAS (monsoon season: June-July-August-September) from 2010 to 2018.

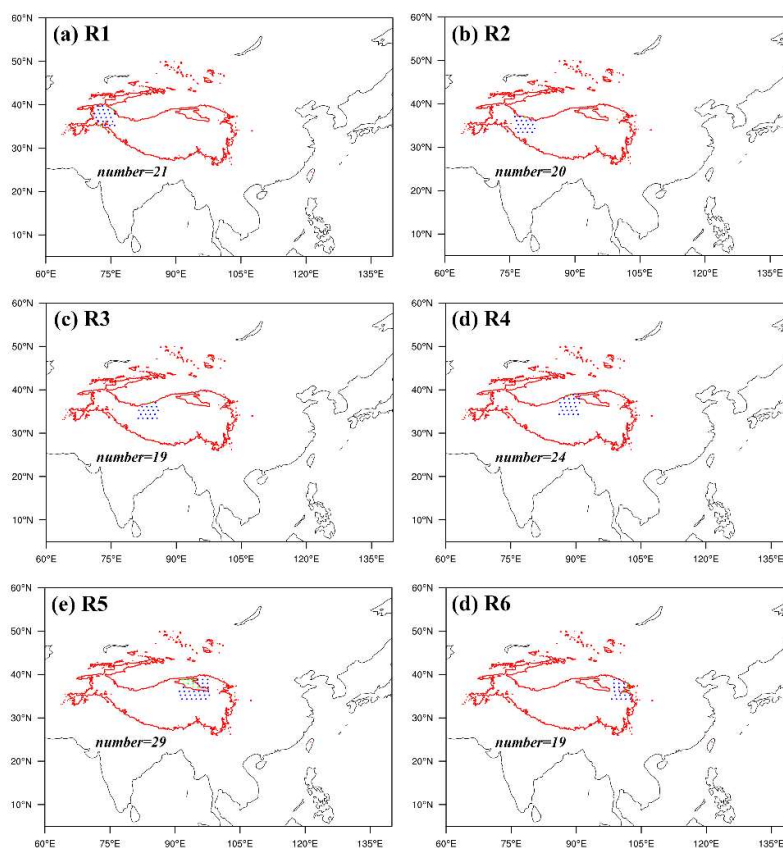


Figure S2. Spatial distribution of trajectory starting positions (blue dots), which are above 2500 m a.s.l., over each target sub-region in the Northern Tibetan Plateau (NTP). The number of starting points is presented in every sub-graph.

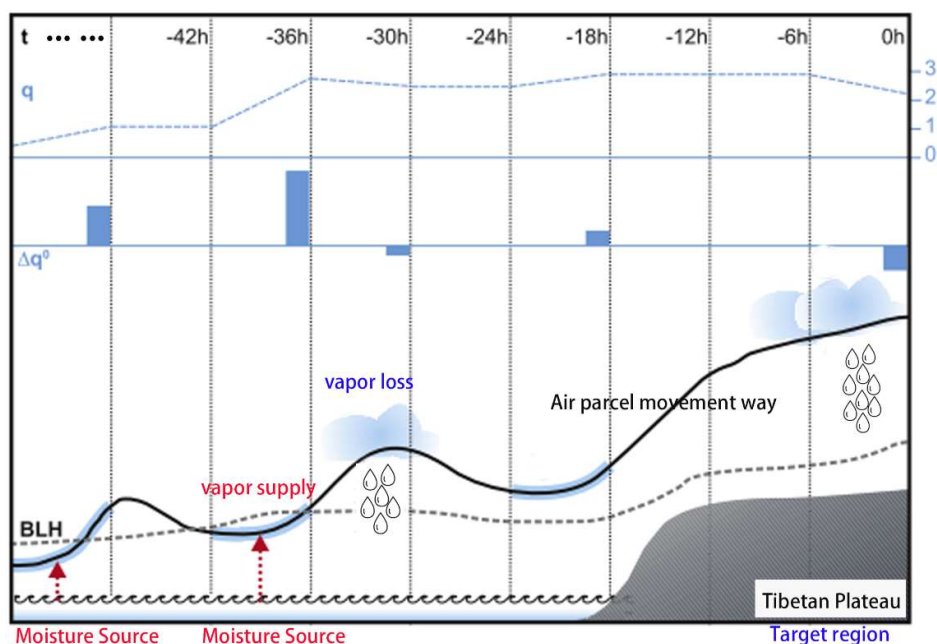


Figure S3. Sketch of the method for identifying uptakes along a backward trajectory of an air parcel on the way from external source to the target regions (revised on fig.1 in Sodemann et al. 2008).

Time before arrival is given at the top. q (dashed line), specific humidity in the air parcel (g kg^{-1}); Δq^0 , changes in specific humidity of an air parcel between two time intervals; BLH , boundary layer height. Thick blue sections along the trajectory denote sections of moisture increase, and red arrows are identified evaporation locations.

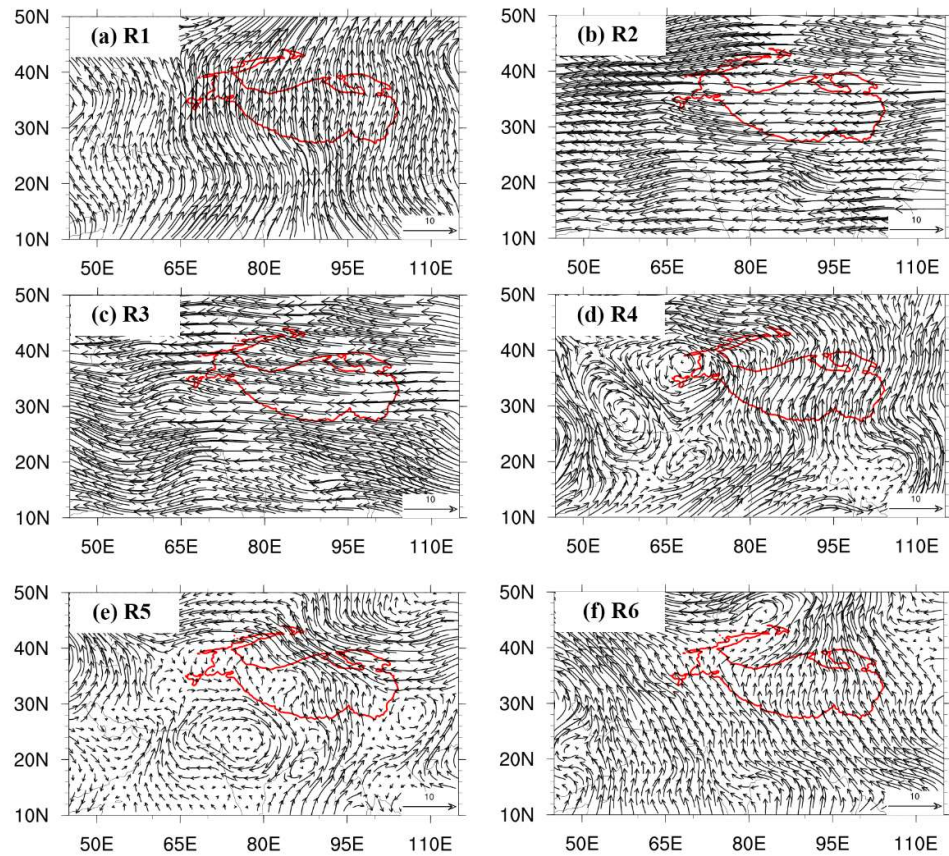


Figure S4. The differences of spatial distributions of ERA5 wind at 500 hPa two days prior to the extreme precipitation events, which are controlled by the Asia Monsoon, against the climatology. The climatology state is averaged during the JJAS from 2010 to 2018.

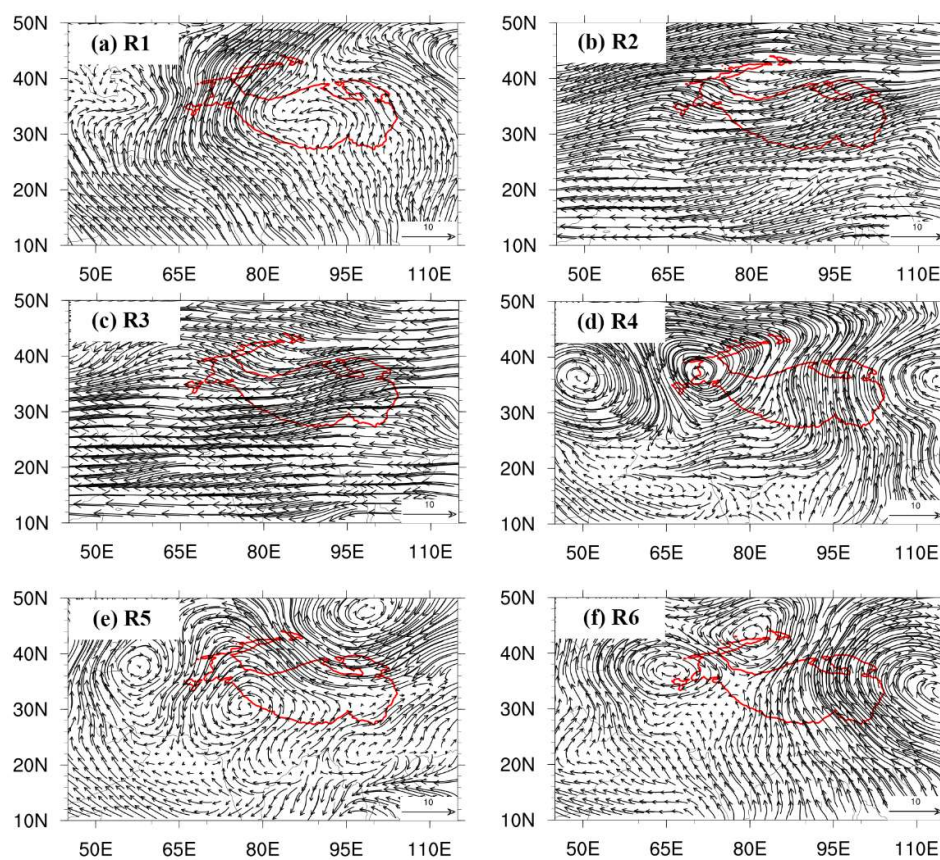


Figure S5. Similar as Figure S4, but at 200 hPa.