Title: Mechanistic understanding of the summer precipitation and recent wetting trend over Northwest China and Mongolia

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Supplementary Information:
This file contains Supplementary Figures S1–S3
Links for precipitation datasets used in Figure S1 are provided below: The CPC Global Unified Gauge-Based Analysis of Daily Precipitation dataset can be found at https://psl.noaa.gov/data/gridded/data.cpc.globalprecip.html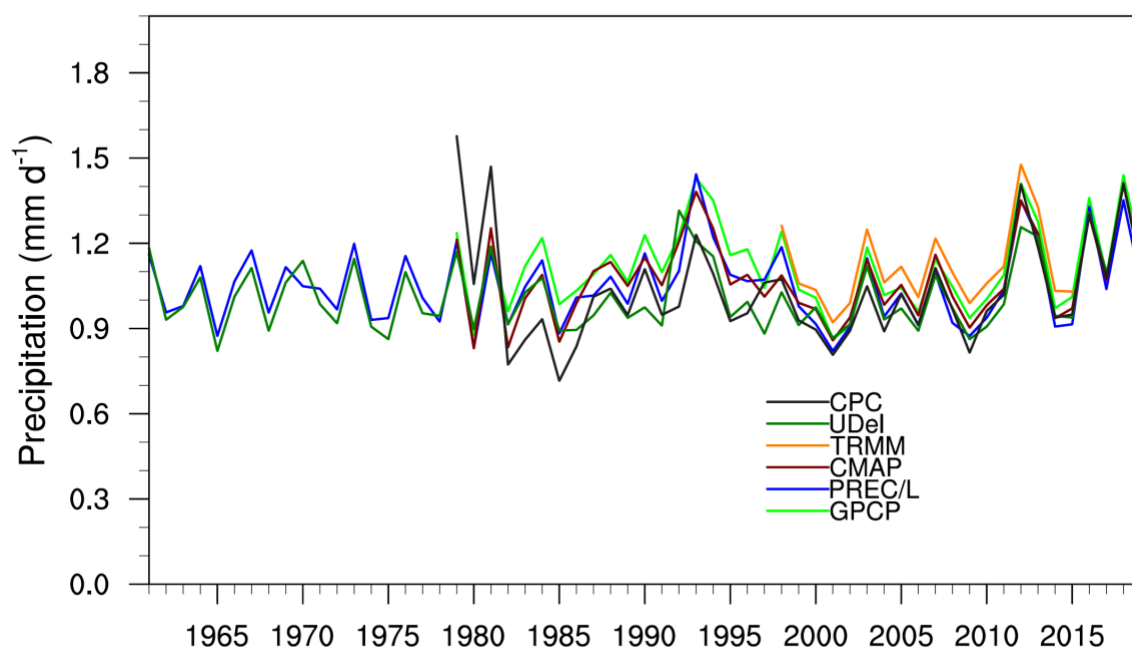, The monthly Tropical Rainfall Measuring Mission (TRMM) precipitation data is accessible at https://disc.gsfc.nasa.gov/datasets/TRMM_3B43_7/summary. The monthly GPCP precipitation dataset can be found at https://psl.noaa.gov/data/gridded/data.gpcp.html, the monthly UDel precipitation dataset can be found at https://psl.noaa.gov/data/gridded/data.UDel_AirT_Precip.html, and the monthly CPC Merged Analysis of Precipitation (CMAP) precipitation dataset can be found at https://psl.noaa.gov/data/gridded/data.cmap.html. The NOAA's Precipitation Reconstruction over Land (PREC/L) dataset can be found at https://psl.noaa.gov/data/gridded/data.precl.html.

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Supporting Information

Figure S1. Time series of the NCM-average summer precipitation based on the widely used
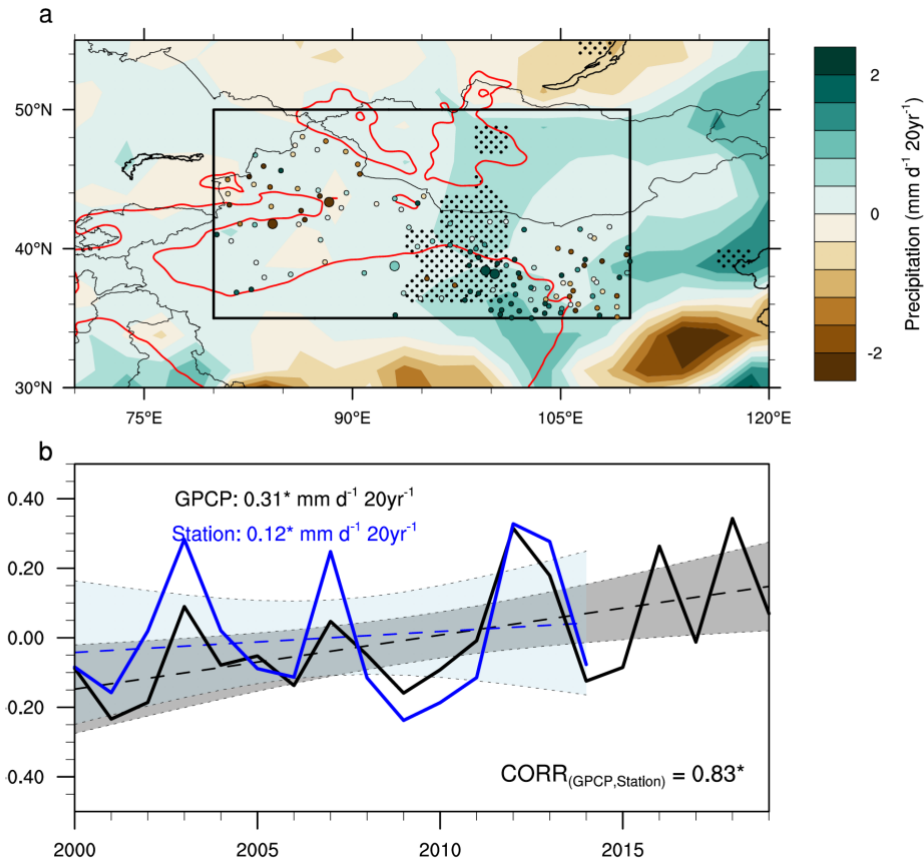
global precipitation datasets.

Figure S2. (a) Spatial distribution of the linear trend of the summer precipitation (2000-2019) based on GPCP dataset (shading) and station records (circles). Stippling (larger circles) denotes statistical significance at the 95% confidence level. (b) Time series of the NCM-average summer precipitation based on GPCP dataset (black) and station records (blue). The geographic locations of the station are shown in (a). The best linear fit and prediction errors are represented by the dashed line and shading, respectively. The linear trend is given, with an asterisk denoting statistical significance at the 95% confidence level.
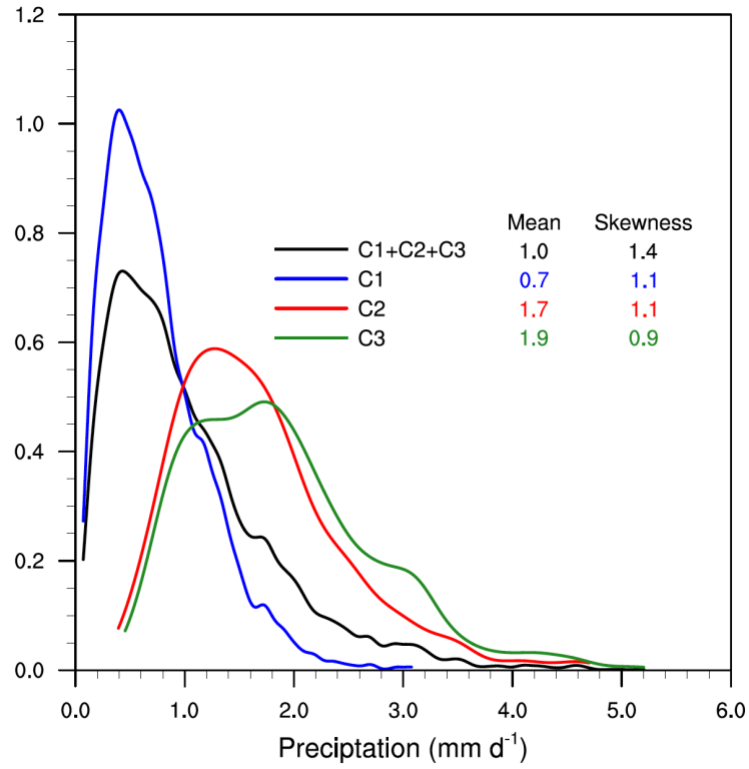
Figure S3. Probability density distribution of the intensity of precipitation events for the three clusters and their combination. The mean value and skewness are given for the three clusters and their combination.