Geophysical Research Abstracts
Vol. 20, EGU2018-2136, 2018
EGU General Assembly 2018

Spatiotemporal trend and variability of precipitation extremes in the source region of the Yellow River and links to global teleconnection patterns

Feifei Yuan, Zhenchun Hao, and Qing Cao
State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering; Hohai University, China

Precipitation extremes and their underlying causes are important processes to understand to plan appropriate adaptation measures. This paper presents an analysis of the spatiotemporal trend and variability of precipitation extremes in the important source region of the Yellow River and explores the connection to global teleconnection patterns and the 850-mb vector wind. Six indices for precipitation extremes were computed and analysed for assessment of a changing regional climate. Results showed that these indices have a strong gradient from the northwest to the southeast part for the period 1961-2015 due to the great influence from the south-easterly summer monsoon flow. However, no statistically significant changes were found for the indices at the majority of stations and their spatial patterns are characterized by irregular positive and negative changes except for the maximum number of consecutive wet days (CWD). Singular value decomposition analysis revealed that the precipitation extreme indices including annual total precipitation when daily precipitation > 95th percentile (R95p), annual count of days with daily precipitation >10 mm (R10mm), annual maximum consecutive 5-day precipitation (R5d), total precipitation divided by the number of wet days (SDII), and CWD are negatively related to the El Nino-Southern Oscillation (NINO 3.4) in the first mode, and the maximum number of consecutive dry days (CDD) is positively related to Scandinavia Pattern in the second mode at 0.05 significance level. The 850-mb vector wind analysis showed that the southwestern monsoon from the Indian Ocean brings abundant water vapour to the region. Besides, the anti-cyclone in the western part of North Pacific plays a significant role in the transport of moisture to the source region of the Yellow River. The links between extreme precipitation indices and teleconnection patterns found in this work could pave the way for better prediction and preparedness of climatic extremes.