



Multidecadal oscillations in rainfall and hydrological extremes

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Many studies have anticipated a worldwide increase in the frequency and intensity of precipitation extremes and floods since the last decade(s). Natural variability by climate oscillations partly determines the observed evolution of precipitation extremes. Based on a technique for the identification and analysis of changes in extreme quantiles, it is shown that hydrological extremes have oscillatory behaviour at multidecadal time scales. Results are based on nearly independent extremes extracted from long-term historical time series of precipitation intensities and river flows. Study regions include Belgium – The Netherlands (Meuse basin), Ethiopia (Blue Nile basin) and Ecuador (Paute basin).

For Belgium – The Netherlands, the past 100 years showed larger and more hydrological extremes around the 1910s, 1950-1960s, and more recently during the 1990-2000s. Interestingly, the oscillations for southwestern Europe are anti-correlated with these of northwestern Europe, thus with oscillation highs in the 1930-1940s and 1970s. The precipitation oscillation peaks are explained by persistence in atmospheric circulation patterns over the North Atlantic during periods of 10 to 15 years.

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