Variability of drought characteristics in Europe over the last 250 years

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The mesoscale hydrological model (mHM) with spatial resolution 0.5deg is applied to simulate water balance across large part of continental Europe (excluding Scandinavia and Russia) for the period 1766-2015. The model is driven by available European gridded monthly temperature and precipitation reconstructions (Casty et al, 2007), which are disaggregated into daily time step using k-nearest neighbour resampling (Lall and Sharma, 1996). To quantify the uncertainty due to temporal disaggregation, several replicates of precipitation and temperature fields for the whole period are considered. In parallel, model parameter uncertainty is addressed by an ensemble of parameter realizations provided by Rakovec et al (2016). Deficit periods with respect to total runoff and soil moisture are identified at each grid cell using the variable threshold method. We assess the severity and intensity of drought, spatial extent of area under drought as well as the length of deficit periods. In addition, we also determine the occurrence of multi-year droughts during the period and evaluate the extremity of recent droughts in Europe (i.e. 2003, 2015) in the context of the whole multi-decadal record.

References:

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