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Towards drought risk mapping on a pan-European scale

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Drought is a very complex and multifarious natural hazard, which causes a variety of direct and indirect environmental and socio-economic impacts. For the last 30 years, droughts in Europe caused over 100 billion Euros of losses from impacts in various sectors e.g. agriculture, water quality or energy production. Despite the apparent importance of this hazard observed pan-European drought impacts have not yet been quantitatively related to the most important climatological drivers. Fundamentally, a common approach to describe drought risk on a pan–European scale is still missing. This contribution presents an approach for linking climatological drought indices with observed drought impacts at the European scale. Standardized precipitation index (SPI) and standardized precipitation and evapotranspiration index (SPEI) for different time scales were calculated based on E-OBS data and are used to describe the drought hazard. Data from the European Drought Impact Inventory (EDII) compiled by the EU FP7 Drought R&SPI (Fostering European Drought Research and Science-Policy Interfacing) project are used as a proxy for multi-sectorial (impact categories) vulnerability following the assumption that a reported impact reflects a region's vulnerability to the hazard. Drought risk is then modelled statistically by applying logistic regression to estimate the probability of impact report occurrence as a function of SPI and SPEI. This approach finally allows to map the probability of drought impact occurrence on a year by year basis. The emerging patterns compare well to many known European drought events. Such maps may become an essential component of Drought Risk Management to foster resilience for this hazard at the large scale.