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Constructing a pan-European database of past meteorological drought events

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Drought is a complex climate-related phenomenon that may cause relevant economic, social, and environmental impacts. We distinguish between meteorological, agricultural, hydrological, groundwater, and socio-economic drought. Here we focus on the first category and discuss the construction of a database of past events regarding the period 1950-2012 in Europe. To define a drought event, we computed the Standardized Precipitation Index (SPI), the Standardized Precipitation Evapotranspiration Index (SPEI), and the Reconnaissance Drought Index (RDI). Subsequently, we merged them into a combined indicator for two accumulation periods (3 and 12 months: X-3 and X-12). The indicators are based on precipitation and temperature data from the E-OBS (v10, spatial resolution: 0.5˚x0.5˚) dataset of the European Climate Assessment and Dataset (ECA&D) of the Royal Netherlands Meteorological Institute (KNMI). and we subdivided Europe into thirteen regions according to climatic and political reasons. For each region we compiled a list of drought events and we assigned a set of parameters to each event (start and end month, peak month, severity score, duration, average area involved, and area involved in the peak month). Moreover, we found 20 multi-region events according to X-3 and 15 multi-region events according to X-12. Northern Europe and Russia show a higher drought frequency, duration, and severity in the 1950s and 1960s; Central Europe and the British Islands in the 1970s; the Mediterranean area and the Baltic Republics in the last decades.