



Ranking the most severe meteorological drought events in 1951-2018

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The European Commission's Global Drought Observatory includes the recently published Global Database of Meteorological Events from 1951 to 2016. With the publication of the new ERA5 dataset, such database could be extended to 2018 and its spatial resolution improved from 0.5° to 0.25° at global scale. From the ERA5 data, we use monthly minimum and maximum temperature to compute potential evapo-transpiration (PET) with the Hargreaves-Samani approach; subsequently, we used PET and monthly precipitation to compute the Standardized Precipitation-Evapotranspiration Indicator (SPEI) at multiple accumulation scales (from 3-month to 72-month) for each grid point (0.25°), country, and macro-region over the emerged lands, excluding the Sahara Desert, the Antarctica, and the northernmost Siberia. We therefore applied a special classification scheme, based on duration, severity, intensity, peak value, and area involved, to rank the largest meteorological drought events from 1951 to 2018 for each country and then the 100 most severe events at global scale. From such list, we furtherly subset a selected list of mega-droughts, including for example the Australian Millennium Drought in the 2000s, the Central Europe summer drought in 2003, and the extreme drought that hit South Africa in 2017. Taking a deeper look at the most severe droughts in the last 68 years, a tendency towards an increased rate of mega-droughts and very severe droughts can be found - in particular from the second half of the 1990s - over Southern Europe, southern Africa, Western United States, Eastern Asia, and Australia. The complete list will be included in the GDO, together with dedicated maps, references, and possibly a collection of impacts for the most severe events.