



World drought projections based on CORDEX data

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We present a world meteorological drought climatology for the period 1981-2100 under two different climate scenarios (RCP4.5 and RCP8.5). As input data, we selected monthly precipitation and minimum-maximum temperature from 1981 to 2100 from more than a hundred simulations – representing the combinations between more than 15 GCMs and 15 RCMs – from the CORDEX (COordinated Downscaling Regional Experiment) project outputs. The spatial resolution is 0.44° . As drought indicators, we selected the Standardized Precipitation Index (SPI) and the Standardized Precipitation-Evapotranspiration Index (SPEI), computed at 12-month time scale. We separately analyzed the two indicators to distinguish between droughts induced by lack of precipitation and by the combined effect of precipitation shortage and high evapotranspiration. For each of fourteen regions, we analyzed the decrease or increase in drought frequency, duration, severity, and intensity of drought events as the 21st century progresses. All the results are provided with the related uncertainties due to the ensemble of simulations. For the past, a validation with independent datasets based on observed temperature and precipitation is shown. The regional results have been merged into World maps, which show the areas projected to experience the largest increase in drought quantities: the Amazon forest, Southern Europe, Africa, China, and Southern Australia. Oppositely, a moderate decrease in drought quantities is projected for sparse areas in Northern America and Central Asia.