



Applying the Palmer Drought Severity Index to regional climate models

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Drought is one of the climate states that are most difficult to analyse scientifically. Amongst other things it depends on (lack of) precipitation, evapotranspiration, and water holding capacity of the soil at a given place, and how the two first parameters vary with time. One of the most used parameters to evaluate the occurrence and severity of drought is the Palmer Drought Severity Index. We have calculated the Self-Calibrated Palmer Drought Severity Index (SC-PDSI) of the output of some of the regional climate models included in the Ensembles data base covering the area of Europe, in the case where the climate models are forced by the real weather in the period 1960 to 2000. The climate models provide precipitation data as well as the data needed to calculate the potential evapotranspiration in an unbroken time series on a regular grid in the area covered by the regional climate model. To calculate the evapotranspiration we use the Penman-Monteith equation following the guidelines of FAO of the United Nations. The regularity of the output of the climate models makes the output ideal for determining the time-varying SC-PDSI over the entire model area and the entire period. We have compared the simulations of the occurrence of meteorological drought made by the SC-PDSI with independent data of hydrological drought, which has become available with the drought analyses, that has been made as part of the WATCH project. This allows us to evaluate if the predictions of the SC-PDSI are coherent with some of the direct observations of drought, and thus if the SC-PDSI calculated from climate model data gives a good representation of the real occurrence of droughts.