



Early signs of extremely sunny and dry summers in Central Europe

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With the progress of global warming extreme summers in terms of heat and drought are expected to appear more frequently in Europe. Such events are a serious threat to human health and have large negative impacts on agriculture and infrastructure (e.g. shortages in energy supply). An efficient management of such events, like the installation of precautionary measures to prevent and mitigate the worst impacts, would benefit from an early warning prior to the event. In this presentation results of an investigation of possible signs of extremely hot and dry summers in the prior late winter / early spring months are discussed.

The summer month June, July, August of the time period 1958 – 2011 are analysed regarding positive anomalies in global irradiation and negative anomalies in both, soil moisture content and precipitation in Germany and adjacent areas. For the years in which extreme summers are identified the previous late winter / early spring conditions of global irradiation, soil moisture and precipitation in the study area are analysed as well as the large scale atmospheric circulation over the north Atlantic.

Global irradiation data derived from geostationary satellite observations, provided by CM SAF, were supplemented with data from the European Centre of Medium Range Weather Forecasting re-analysis (ERA). Also data on soil moisture and the geopotential were taken from the ERA dataset. The precipitation data were taken from the Global Precipitation Climatology Centre (GPCC).

It has been found that during late winter / early spring prior to most of the extremely sunny and dry summers in central Europe, there was not only a clear anomaly in global irradiation, soil moisture, and precipitation, but also interesting patterns in the atmospheric circulation over the north Atlantic have been identified. The findings may serve as the basis for an early warning of extremely hot and dry summers in the study area.