Seasonal prediction of agroclimatic indices in Serbia and Austria

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Extreme weather events, like drought and heat waves, their duration and intensity are difficult to predict since they usually depend on large spectre of environmental factors. Seasonal weather forecast (SWF) is therefore a powerful tool in assessing timing and effect of adverse weather conditions for crops. SWF used in this study is one of the newly available data products developed by European Centre for Medium-Range Forecasts (ECMWF). SWF is composed of ensembles of individual forecasts coupled to an ocean model and post-processed products of average conditions with the associated uncertainty. SWF products are available up to 7 months ahead with the resolution of $0.5° \times 0.5°$. To describe appearance and intensity of adverse weather conditions we used full set of meteorological data (temperature, precipitation, radiation, humidity and wind speed). The observed and forecasted meteorological data were in the form of daily averaged values.

Values for the specific location were obtained from SWF meteorological fields from the four nearest points. We analysed ensemble SWF for two locations, one in Serbia (Rimski Sančevi, 45°20'N, 19°50'E, 84 m a.s.l.), and one in Austria (Groß-Enzersdorf, 48°12'N, 16°33'E, 148 m a.s.l.) for the time period of 2006-2014, using AGRICLIM model. To characterise extreme weather events appearance and intensity we used agroclimatic indices like (i) precipitation, (ii) temperature sums (iii) number of days with intensive water deficit, (iv) number of days with maximal temperature above 28°C and (v) number of days with mean temperature continuously above 15°C. The efficiency of the SWF in adverse weather conditions prediction is expressed by comparing the indices calculated with observations and ensembles of SWF for both locations.