



Analyzing uncertainties of climate impacts on the water deficit in agriculture soil over Europe

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In this abstract we present changes in soil water balance by combining ensemble of RCMs from ENSEMBLES project (van der Linden and Mitchell, 2009) and soil water balance (SWB) model. With this we have objectively estimated climate impacts on soil water deficit (duration and magnitude) and hence climate impacts on droughts over the Europe. We have used outputs from multi-model ensemble with 8 RCMs, 1 static soil map, and 3 land cover scenarios. Thus 24 soil water balance developments in each grid cell over Europe have been calculated. Duration of the SWD has been expressed as the number of days with dry soil (DDS) and magnitude was expressed as cumulative soil water deficit (SWD) in calendar year.

Preliminary results show that number of DDS will increase in the southern Europe in average by up to 6 (-3 to 17 in 10th to 90th percentile range) days in the period 2021-2040, by up to 12 (-3 to 24) days in period 2041-2060 and by up to 17 (1 to 34) days in period 2061-2080. In the northern Europe model shows decrease in DDS in all analysed future periods. Projections of the SWD in southern Europe show increase by average 110 mm/year in 2021-2040, and by 360 and 400 mm/day in periods 2041-2060 and 2061- 2080, respectively. Over the northern Europe SWB model shows significant decrease in SWD.

There is space to improve SWB model with improving the parameterization of the snow and with adding more RCMs and additional crop coefficient development scenarios. After this upgrade comprehensive picture of the climate impact on water deficit will be drawn and higher degree of freedom will be obtained for addressing uncertainties.