



Preparation of high resolution climate scenarios for agricultural impact analysis in Hungary

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Climate change may significantly alter agricultural productivity which could directly affect food security in several parts of the world during the 21st century. In order to mitigate the robust effects of climate change, agriculture related impact studies are needed. Reliable regional climate model (RCM) based scenarios are essential to realistic estimations of the potential effects of the changing climate conditions. Every climate model suffers from systematic errors (e.g. under- or overestimation the amount and frequency of precipitation), which may prevent direct application of the RCM results for agricultural purposes. There are several bias correction strategies to correct those errors in the RCM datasets. Our main aim is to correct the available, state-of-the-art RCM results to prepare complex impact studies for the Carpathian Basin. The overarching aim is to estimate the expected changes of agricultural productivity in Hungary.

In this study eight RCM experiments are used that were created and disseminated within the framework of the ENSEMBLES FP6 project. After statistical bias correction the daily data is used to drive the 4Mx crop simulation mode which is a daily-step, deterministic model that simulates the water and nutrient balance of the soil, the soil-plant interactions as well as the plant development and growth. 4Mx was developed in the Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences. In the present study the effect of bias correction on the climate scenarios as well as on selected crop simulation results is demonstrated.