

Potential future changes through climate indices related to the vegetation period

A. Krzic (1,2), I. Tosic (3), V. Djurdjevic (2,3), K. Veljovic (3), B. Rajkovic (2,3)

(1) Institute of Physics, Belgrade, Serbia (alexandra.k255@gmail.com), (2) Republic Hydrometeorological Service of Serbia, SEEVCCC, Belgrade, Serbia, (3) University of Belgrade, Faculty of Physics, Dept. of Meteorology, Belgrade, Serbia

In this study we analyzed three climatic indices: growing season length (GSL), frost days (Fd) and simply daily intensity index (SDII). Indices Fd and SDII are calculated only for spring and autumn season because of their big influence on plant growth.

Potential changes of these three indices in Serbia are estimated for the reference period 1961-1990 and for the future period 2071-2100 (A1B and A2 scenario), as derived from the results of the coupled regional climate model EBU-POM. In order to verify the appropriateness of the EBU-POM to simulate the regional climate in future, changes in the indices are studied on the basis of the model data and daily series of temperature and precipitation observations from 17 meteorological stations in Serbia for the reference period.

As for climate indices for the reference period we found that the model underestimates the number of frost days, with positive trend during autumn and negative one in spring. The south of Serbia is colder than the north (more frost days) which is consistent with observed data. Simulated SDII shows less rain on wet days than observations and negative trend. The largest difference in SDII between model and observations is during the autumn in south Serbia. The growing season length is very well simulated. Better agreement is achieved for the south of Serbia than for the north. A comparison of trends over Serbia between observations and the model shows that the model is capable of simulating the seasonal pattern of indices.

In the future, concerning the number of frost days we predict its decrease and a small increase of SDII. Decrease of Fd in the north is smaller than the one in the south. It is expectable longer duration of vegetation period. For all considered indices, the changes are smaller for the A1B than for the A2 scenario. They indicate that future climate will have serious implication on vegetable and fruit growing, dominant crops in Serbian agriculture.