Geophysical Research Abstracts
Vol. 15, EGU2013-4144, 2013
EGU General Assembly 2013

Assessment of the potential impact of climatic change and variability on the flow of Somes river basin, Romania

Rodica Paula Mic and Ciprian Corbus
National Institute of Hydrology and Water Management, Bucharest, Romania

The paper presents the results that have been obtained until present within ECLISE FP7 Project („Enabling Climate Information Services for Europe"), in which it is studied, among others, the potential impact of the climatic change and variability on the mean monthly flow of Somes river basin.
Somes river basin is situated in the North – West part of Romania. Somes River springs from the Eastern Carpathians (Rodnei Mountains), the length of its riverbed on the Romanian territory is of 15740 km2 and represents 6.6% from the country's surface.
For the flow simulation it was used the hydrological model WatBal, using as entrance data the monthly temperatures and precipitation.
The WatBal is a water balance model with a small number of parameters and with simple approaches using physically based hypothesis which are adequate for the assessment of the climatic impact on the flow of certain river basin. There are two main modelling components within WatBal model. The first is the water balance component which uses continuous functions in order to describe the water movement in a conceptualized river basin. The second component is the calculation of the monthly potential evapotranspiration using the Priestly-Taylor radiative approach.
In a first stage, the parameters of the WatBal model were calibrated through the simulation of the monthly average discharges from the reference period 1971-2000 in the 33 considered gauging stations on Somes River and its tributaries. The series of monthly precipitation and monthly average temperatures, for each sub – basin, were obtained by processing the observation time series from 14 meteorological stations within the analyzed river basin.
Furthermore, there were applied two climatic scenarios which consisted in the simulation with WatBal model (having calibrated parameters) of the monthly average flow from the periods 1971 – 2000 and 2021-2050, considering the meteorological entrances simulated with the help of four climatic models (CNRM_RM5.1_ARPEGE, HC_HadRM3Q0_HadCM3Q0, SMHI_RCA3_BCM and SMHI_RCA3_ECHAM5).
The meteorological entrances for WatBal model, in grid format with 25 km spatial resolution, were provided by the Swedish Institute of Meteorology and Hydrology (SMHI), one of the partners within ECLISE Project.
After the simulations, the results consisted in 4 series of monthly average discharges, calculated for the periods 1971-200 and 2021-2050, in the sections of the 33 considered gauging stations. The analysis of these results emphasizes the impact of the climatic changes on the mean monthly flow of Somes river basin in the period 2021-2050.