

Climate or land use change – identification of future main factor influencing water management. Narew River Basin case study.

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Keywords: climate change, hydrological mode, land use change, Narew River Basin, SWAT

Abstract

In this paper authors present the results of the water scenario development process linked with hydrological modelling carried out in the Narew River Basin (NRB) within the SCENES Project – Water Scenarios for Europe and Neighbouring States. In the NRB, which was one of the Pilot Areas in the SCENES project, three scenario development workshops with active stakeholder participation were organized to establish long-term future water visions using methods proposed within the Project. Two alternative visions of the future of the NRB were elaborated: Sustainability First and Markets First. A method based on the Story-And-Simulation (SAS) approach (Alcamo, 2008) was used to translate qualitative storylines into quantified model drivers. The main driver that could be quantified for modelling purposes was future land use change.

A physically-based semi-distributed catchment model SWAT (Soil & Water Assessment Tool) was used for quantitative assessment of the impact of climate and land use change on selected hydrological indicators. SWAT was first validated using the observed daily discharges from 23 gauges within the basin, with satisfactory values of the goodness-of-fit measures. Climate change impact was estimated using the input for two climate models coupled with the A2 emission scenario. Preliminary results indicate that the climate change would be a more influencing factor than the land use change, however, the uncertainty related to climate modelling is very large.