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The Impact of Climate Change on Water Resources availability

B. Bracic Zeleznik (1), B. Cencur Curk (2), T. Zajc Benda (2), and P. Souvent (3)

(1) Public Water Supply Company JP Vodovod-Kanalizacija d.o.o. Ljubljana, Research Department, Ljubljana, Slovenia (bzeleznik@vo-ka.si), (2) University of Ljubljana, Faculty of Natural Sciences and Engineering, Department of Geology, Ljubljana, Slocvenia, (3) Ministry of the Environment and Spatial Planning, Slovenian Environmental Agency, Ljubljana, Slovenia

Extreme weather events, such as longer dry periods or strong rainfall, have impact on water resources. When the impact is reflected as a deteoration of groundwater quality or decrease of available groundwater quantity, it can be a critical issue for society and economy. The extent of climate change and its impact on water resources was studied on two test sites, Ljubljana field's and Mura valley's aquifers. These two aquifers differentiate by geometry, yield, land use and response to climate change. The first one lies beneath urbanised and agricultural areas and on the second one the agricultural land use prevails.
To estimate the future water resource availability in the first step the temperature and precipitation daily data sets were modelled with three RCM models, based on EOBS data base for two periods: 2021-250 and 2071-2100. In the next step the future discharges of rivers Sava, Mura and Ledava were calculated. The water resources availability was calculated by GROWA-SI model which takes into account climate, soil type, land use, surface inclination and hydrogeological attributes of aquifers. The results were surface runoff, groundwater flow and real evapotranspiration for periods 1971-2000, 2021-2050 and 2071-2100.
Water balance and groundwater modelling of worst case scenarios (maximum values for T, P and minimum values for river discharge) have shown decrease in future groundwater recharge in Mura valley, as well as in Ljubljana field. In the period 2021-2050 the groundwater recharge will decrease up to 10% and in the period 2071-2100 up to 15%.
Projections of climate change and water resource availability for the future are significant for managing drinking water resources. Current water management practices are likely to be inadequate to reduce impacts of climate change on water supply reliability. There is a need for water supply management adaptation measures, which will be able to manage the risks associated with future climate change impacts.