



## Groundwater Quality in Mura Valley (Slovenia)

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Groundwater quality is one of the most important parameters in drinking water supply management. For safe drinking water supply, the quality of groundwater in the water wells on the recharge area has to be controlled. Groundwater quality data will be presented for one test area in the SEE project CC-WaterS (Climate Change and Impacts on Water Supply) Mura valley, which lies in the northeastern part of Slovenia. The Mura valley is a part of the Pannonian basin tectonic unit, which is filled with Tertiary and Quaternary gravel and sand sediments. The porous aquifer is 17 m thick in average and recharges from precipitation (70 %) and from surface waters (30 %). The aquifer is the main source of drinking water in the area for almost 53.000 inhabitants. Most of the aquifer lies beneath the agricultural area what represents the risk of groundwater quality.

The major groundwater pollutants in the Mura valley are nitrates, atrazine, desethyl-atrazine, trichloroethane and tetrachloroethene. National groundwater quality monitoring is carried out twice a year, so some polluting events could be missed. The nitrate concentrations in the past were up to 140 mg/l. Concentration trends are decreasing and are now below 60 mg/l. Concentrations of atrazine and desethyl-atrazine, are decreasing as well and are below 0,1  $\mu\text{g/l}$ . Trichloroethene and tetrachloroethene were detected downstream of main city in Mura valley, in the maximum concentrations of 280  $\mu\text{g/l}$  in June 2005 (trichloroethene) and 880  $\mu\text{g/l}$  in October 1997 (tetrachloroethene). So, it can be summarized that the trends for most pollutants in the Mura valley are decreasing, what is a good prediction for the future.

Input estimation of the total nitrogen (N) (mineral and organic fertilizers) in the Mura valley shows, that the risk of leaching is enlarged in the areas, where the N input is larger than 250 kg/ha, this is at 6,3 % of all agricultural areas. Prediction for the period 2021-2050 indicates that the leaching of N could increase, but no more that 5 %. The high risk of leaching of pesticides can be expected at 60 % of the Mura valley area. According to expert judgment, the climate conditions during 2021-2050 (increase of mean annual T for more than 0,5 °C and increase of precipitation) will lead to a faster degradation of pesticides and therefore smaller chance for pesticide residuum to reach the groundwater.

It can be concluded that the climate change will slightly reduce the danger of leaching into the groundwater but the extent of it will nevertheless stay comparable to the present condition.