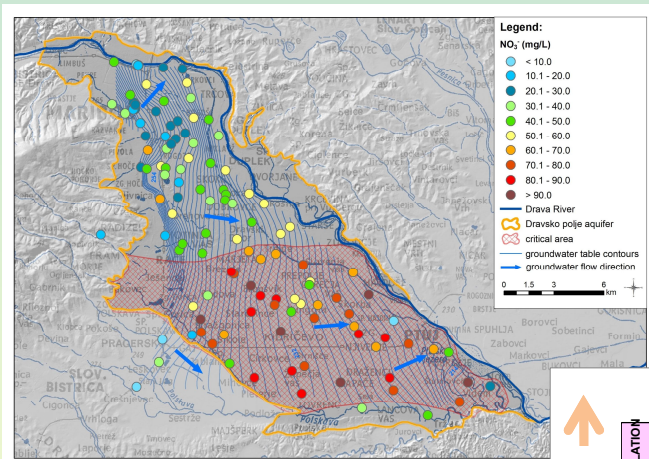


INTRODUCTION

The European Water Framework Directive 2000/60/EC (WFD) demands that EU member states establish a good chemical status of all ground- and surface water bodies by 2015. A serious problem related to the possibility of reducing chemical pollution arises in aquifers which are highly vulnerable to pollution due to their specific hydrogeological and climatic properties. In such aquifers, already a considerably small input of pollutants causes a bad chemical status of ground- and surface water bodies. Put into practice, this means that in order to attain a good chemical status of water bodies, agricultural production would have to be practically disabled, since it in most cases puts the most significant pollution load on groundwater.

STUDY AREA

Dravsko polje aquifer is situated between cities Maribor (NW part) and Ptuj (SE part). Aquifer represents a highly permeable ($k=10^{-3}$ m/s) Quaternary aquifer with intergranular porosity. Main recharge sources are precipitation (300 – 400 mm/year) and seepage from creeks from Pohorje in the western part of the area. General direction of groundwater flow is W – E, while locally deviations do occur. The aquifer is shallow and unconfined and as that, it is exposed to direct pollution from the surface.



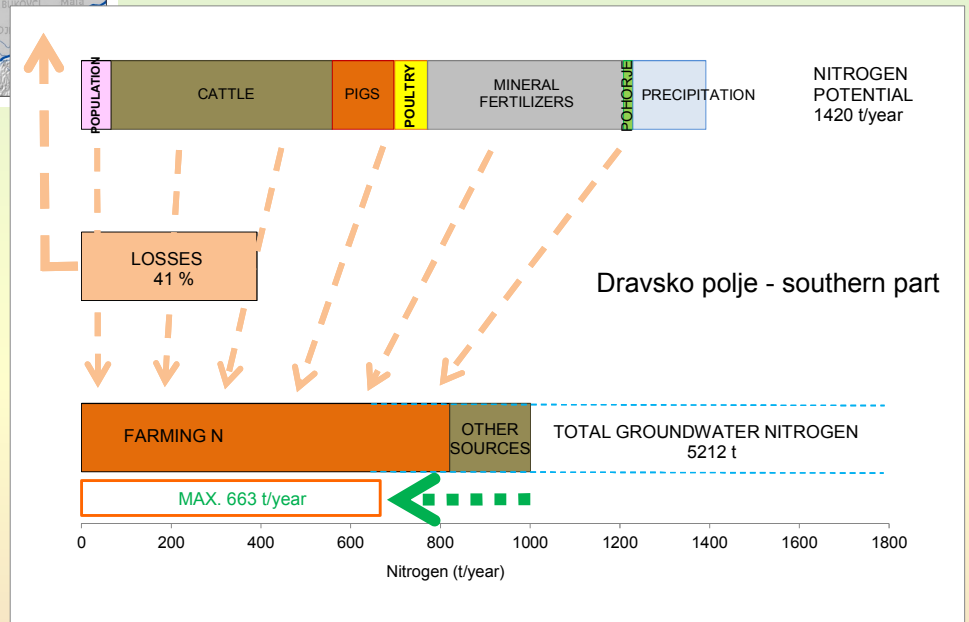
Mean concentration of nitrate in the groundwater of Dravsko polje aquifer



Illegal livestock mud deposition

DESCRIPTION OF WORK

Our measurements showed that especially the southern part of the Dravsko polje groundwater body is overloaded with nitrate. The large quantities of nitrogen which are produced here cannot be absorbed by the aquifer system without harm. The research shows that the biggest nitrogen pollution potential in the area is due to cattle and the application of mineral fertilizers. Pig farms are a lesser source; even less nitrogen is produced by poultry, while the share of sheep and goats is practically negligible. The potential of lowering nitrogen emissions from mineral fertilizers is expected to be significantly smaller.



RESULTS AND DISCUSSION

Hydrochemical balance shows that nitrogen input should be lowered approximately by 1/3 in order to establish a good chemical status of groundwater body. This is a very high degree of reduction, meaning that radical changes in the way of farming in this area would be necessary. Therefore we see a great need for the introduction of animal manure processing technologies in this area, which would enable the reduction of nitrogen leaching into groundwater and into drinking water resources.

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