INSPIRATION

Innovative Training Network

Individual information

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Transfer of GHGs in the soil - vadose zone - groundwater - river - atmosphere system

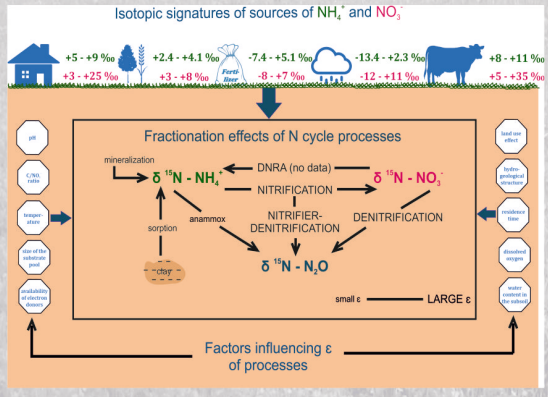
I am a PhD student at the University of Liege (Belgium). In the Marie Curie ITN project my research is focused on the study of the groundwater contribution to GHGs emissions from inland waters, with the particular attention to groundwater systems located in agricultural areas that are often considered as a "hotspots" of GHGs evasion.

I hold two master degrees: one in Ecology, awarded by the Geological Department of the of the Ivan Franko Lviv National University (Ukraine, 2009), and another in Ecohydrology, awarded by the Department of Hydrology and Water Resources Research of the University of Kiel (Germany, in 2015).

After completing my first master degree I worked as a lecture at the Natural Sciences College of the Ivan Franko Lviv National University. In 2016 I started to work in the geological group at the LLC "Institute "HIRHIMPROM". In my master research theses, I was focused on the analysis of the processes of transfer and transformation of nutrients in surface water and groundwater and applied numerical modelling for their quantification.

Research strategy

In this project I attempt to: 1) enhance the understanding of the processes of N_2O production, consumption and transport in the subsurface (Fig. 4), and 2) improve the quantification of N_2O fluxes between different compartments (groundwater, surface water, sediments, soils etc.) of the basin on the catchment scale.



Source: Nikolenko et al., 2017

Fig. 3. N sources and transformation processes that affect N species in the subsurface

In this study stable isotope analyses, push-pull method and passive sampling of sediment pore water are planned to be applied in order to identify the origin of N_2O, to understand the N_2O dynamics and to estimate N_2O fluxes between the different compartments of the Geer hydrological basin.

Site description

The chosen area for the study of N_2O dynamics is the Geer river basin (Belgium) (Fig. 3):

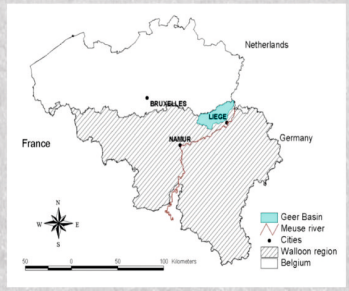


Fig. 4. Location of the studied area

- area: 480 km^2;
- 65% of the basin area is used for agricultural activities;
- high fracturing of chalk aquifer;
- eolian loess soil layer;
- aquifer is unconfined in the south (extended to the area about 350 km^2), semi-confined near the Geer river and confined in the north-west of the basin.

Acknowledgements

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