

HYDROLOGICAL AND SEASONAL CONTROLS OF NITRATE MOBILIZATION FROM A FORESTED CATCHMENT

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Understanding of interactions between hydrological and biogeochemical responses of catchments on rainfall events which is usually unclear from periodic measurements and requires tracing of the temporal dynamics of the processes. Smaller streams reflect strong connections between hydrological processes of the rainfall runoff formation and biogeochemical processes in the catchment, consequently, the responsiveness of the streamwater chemistry to changed hydrological states is very high. In accordance with the analysis of hydrological factors it is therefore possible to obtain an insight into the changeable biogeochemical conditions which are reflected on the changed flux of nutrients with rainfall runoff from the catchment.

In the contribution, we present results of the measurements which have been carried out in year 2006 in the scope of the project "Arrangement of the water supply for the Slovenian coastal region" on a forested watershed of the Padež stream in hilly area of Brkini. From the hydrogeological point of view, the Padež watershed has a uniform structure characterized by low permeability of erodible flysch layers and a consequent well developed, dense and highly incised stream channel network. In the climatic sense, the Brkini hilly area is a transitional area between the mediterranean and continental climate. Detailed hydrological monitoring which included measurements of rainfall, meteorological conditions (air temperature, solar radiation) and discharges in the Padež stream and its tributary, the Suhorka stream, has been supplemented by periodical continuous measurements of streamwater chemistry (water temperature, pH, conductivity, dissolved oxygen concentration, ORP, nitrate concentration) in different seasons.

Acquired cognition about the responsiveness of the streamwater nitrate concentration to changed hydrological conditions recognized through streamwater electrical conductivity measurements are important from the viewpoint of understanding the seasonal mobility of nutrients and mobility of nutrients imposed by given rainfall event. Determination of the quantity of the nutrient flux shall answer the question what is the role of natural background of the nutrient fluxes from the forested catchments in the sense of broader ecological impacts.

