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Flow pathway separation from stream flow using various water quality parameters in an agricultural catchment in Austria

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The objective of our research is to determine the individual flow pathways of various nutrients and substances within a typical Austrian agricultural catchment. The Hydrologic Open Air Laboratory (HOAL) catchment is located in Lower Austria approximately 100 km west of Vienna. The HOAL catchment was established in 2009 through funding by the Austrian Science Foundation to be used for multidisciplinary hydrologic research for understanding water flow and transport processes in catchments. The catchment land cover is characterized as 90% agriculture, 5% impermeable surface, and 3% forest. The predominant soil type is a clayey silt loam and a section of the catchment contains a subsurface tile drainage network that extends approximately 5.5 km. Our catchment has several different types of point discharges along the main stream. These include the subsurface drainages described earlier, surface tributaries, and springs. A representative selection of these discharges are monitored for discharge and several water quality parameters to capture the various types of flow pathways of the water and substances.

Quantitative methods have been developed to differentiate at the catchment scale the hydrograph components from several water quality parameters. Current work will be to further develop this differentiation within the individual components at increasingly finer scales. This will allow us to better understand the sources and residence times of nutrients pollutants entering the stream from the agricultural lands.