



## **Flow path and travel time dynamics in a lowland catchment.**

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The distribution of time it takes water from the moment of precipitation to reach the catchment outlet is widely used as a characteristic for catchment flow path contributions, catchment vulnerability to pollution spreading and pollutant loads from catchments to downstream waters. However, this distribution tends to vary in time driven by variability in precipitation and evapotranspiration. Catchment scale mixing of water controls how dynamics in rainfall and evapotranspiration are translated into dynamics of travel time distributions. In this presentation we use the concept of StorAge selection (SAS) functions, that quantify catchment scale mixing of water, to describe chloride and nitrate flow. We will show how SAS functions relate to the topography and subsurface and how they are effective in describing nitrate and chloride transport. The presented analyses will combine unique datasets of high-frequency discharge and water quality concentrations with conceptual models of water flow and solute transport. Remarkable findings are the large contrasts in travel times between lowland and sloping catchments and the strong relationship between evapotranspiration and stream water nutrient concentration dynamics.