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# Continuous phosphorus measurements reveal catchment-scale transport processes.

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A small fraction of the nutrients used for agriculture is transported by rivers and artificial drainage networks to downstream waters. In lakes and coastal seas such as the Baltic Sea and the Gulf of Mexico these nutrients cause large-scale algal blooms and hypoxia and thus are a major environmental hazard. In this presentation we focus on the transport of phosphorus from agricultural fields. An improved understanding of the flow routes and stores of phosphorus within a catchment and of the chemical properties of these phosphorus stores and fluxes are crucial for developing effective remediation and mitigation strategies.
In the Hupsel brook agricultural catchment in the Netherlands (6.5 km2), we measured dissolved and total phosphorus every 15 minutes for a 1 year period. Many studies have found that phosphorus is mainly transported adsorbed to sediments and other oxide surfaces. We, however, show for the Hupsel brook catchment that the affinity for phosphorus to bind with particles has a strong seasonality. During the winter season the ratio dissolved versus bound phosphorus is approximately 3:2 (i.e. more dissolved than adsorbed), while during the summer this ratio reduces to 1:5 (i.e. more adsorbed than dissolved), with variations during discharge events. In our presentation we will use the weekly sampling of other ions at several locations within the catchment, chemical analyses of transported sediments and continuous water temperature and discharge records to shed some light on the biological, chemical and physical processes that drive catchment-scale transport of phosphorus for this agricultural stream.