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Hörsaal Fahrenbergplatz, Friedrichstr. 39

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Water quality and groundwater droughts: insights from large-sample hydrology

Understanding the state and variability of water quality and quantity is central to water management and security, in particular under global change. In many rivers, including in Germany, water quality remains impaired by high nutrient inputs from agriculture and wastewater. The recent multi-year drought affected both water quality and water quantity, in part, with strongly delayed effects, e.g. groundwater head declines.

Large-sample hydrology offers an opportunity to investigate spatial and temporal variability across diverse hydro-climatic and land-use settings and thus to identify general patterns, controls and underlying processes. Both the process understanding and the data can further inform modelling and future scenario analyses.

This talk presents results from two thematic areas applying large-sample principles. The first focuses on nutrient export from catchments, drawing on a water quality data set of 1386 German catchments. Aspects include spatial patterns, long-term trajectories, and nutrient ratios. The second focuses on how groundwater heads respond to droughts highlighting similarities and differences of >6000 monitoring wells in Germany. Together, these examples illustrate how large-sample hydrology supports a broader understanding of water quality dynamics at the catchment scale and groundwater head variability.