



A New Online Water Quality Monitoring System within the TERENO Hydrological Observatory “Bode”, Germany

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Climate change and land use changes are the most important factors of global environmental change which have to be managed by the society in the next years. Therefore, long-term operated „Global Change Observatories“ for monitoring, analyzing and predicting changing state variables and fluxes within different environmental compartments are of special importance. The infrastructure activity of the TERENO Hydrological Observatory “Bode”, a research initiative of the Helmholtz Environmental Research Centre UFZ, aims to establish an observation platform linking terrestrial and aquatic monitoring in a sensitive and representative region.

High spatial and temporal resolution monitoring systems are needed to improve our knowledge on flow and matter transport pathways and substance transformation. The presentation will introduce a new online water quality monitoring system as part of the Bode Observatory using a nested catchment approach. Additionally it will be shown how this new information can improve load calculations and water quality modelling.

The online monitoring system currently comprises eight water quality stations where eight water quality variables (O_2 , temperature, SAC, nitrate, turbidity, Chl a, electric conductivity, pH- value) are measured continuously at a 10 minute time step using conventional sensors (YSI) and new optical UV sensors. Additionally automatic samplers are used to measure supplementary water quality constituents (e.g. SRP, $\delta^{15}N$ of nitrate) at low and/or high flow stages. Implementing online monitoring stations at long river reaches without major tributaries allow relating changes of river loads to in-stream transformation processes. First results show a clear seasonal pattern in nutrient in-stream transformation and retention for nitrate during low flow conditions. The use such additional new water quality measurement information for model identification of hydrological and water quality models will be discussed.