Geophysical Research Abstracts
Vol. 16, EGU2014-15385, 2014
EGU General Assembly 2014

Investigating DOC export dynamics using high-frequency instream concentration measurements

Marieke Oosterwoud (1), Toralf Keller (1), Andreas Musolff (1), Sven Frei (2), Ji-Hyung Park (3), and Jan H. Fleckenstein (1)

(1) Helmholtz Center for Environmental Research, UFZ, Department of Hydrogeology, Leipzig, Germany (jan.fleckenstein@ufz.de, +49-341-2351837), (2) University of Bayreuth, Department of Hydrology, Bayreuth, Germany, (3) Ewha Womans University, Department of Environmental Science & Engineering, Seoul, Republic of Korea

Being able to monitor DOC concentrations using in-situ high frequency measurements makes it possible to better understand concentration-discharge behavior under different hydrological conditions. We developed a UV-Vis probe setup for modified/adapted use under field conditions. The quasi mobile probe setup allows a more flexible probe deployment. New or existing monitoring sites can easily be equipped for quasi-continuous monitoring or measurements can be performed at changing locations, without the need for additional infrastructure. We were able to gather high frequency data on DOC dynamics for one year in two streams in the Harz mountains in Germany. It proved that obtaining accurate DOC concentrations from the UV-Vis probes required frequent maintenance and probe calibration. The advantage of the setup over standard monitoring protocols becomes evident when comparing net exports over a year. In addition to mass improved balance calculations the high-frequency measurements can reveal intricate hysteretic relationships between discharge and concentrations that can provide valuable insights into the hydrologic dynamics and mechanisms that govern the delivery of DOC to the receiving waters. Measurements with similar probes from two additional catchments in Southern Germany and South Korea will be used to illustrate different discharge-concentration relationships and what can be learned from them about the hydrologic mechanisms that control the dynamics of DOC export.