



UFZ-Seminar „Wasser and Environment“



1st December 2014, 2pm

Saal, Brückstr. 3a, Magdeburg

Klaus Kaiser

Soil Sciences, Martin Luther University Halle-Wittenberg, Halle

gives a talk on:

Dissolved organic matter in soils and beyond

Much of the organic material produced within terrestrial ecosystems becomes respired within a short period of time, and only a small portion is stored in soils or exported to aquatic ecosystems. One major link between soils and aquatic systems is dissolved organic matter. Dissolved organic matter inputs to aquatic ecosystems have been increasing during the last two decades. Especially the increase in so-called coloured dissolved organic matter (phenolic compounds) raises concerns about possible consequences for treatment of drinking water.

The major source of organic compounds in soils and aquatic systems is plant biomass. Biological degradation breaks down polymeric structures and results in partially oxidized organic compounds, either directly originating from plant biomass or released by degraders. These compounds are water-soluble, and once dissolved in water, they can be transported within soil or exported to aquatic systems. However, most soils have a large capacity to retain dissolved organic matter via sorption to reactive mineral phases; and so, concentrations of dissolved organic matter typically decrease strongly with soil depth. The retention is strong, and only reversible upon drastic changes in chemical conditions. Thus, most input from soils to aquatic ecosystems occurs in situations where retention is little. Rain storms can cause rapid water flow through macropores or induce interflow through organic layers. Shallow and water-logged soils may have limited retention capacity; the former because of little soil at all, the latter due to reductive conditions.

Despite detailed knowledge on dissolved organic matter transport within, through and from soil, possible causes of the observed increase in dissolved organic matter in surface water are still under lively debate. Proposed drivers of the increase include changes in rainfall and temperature regimes, increasing nitrogen input to terrestrial ecosystems, and decreasing inputs of sulphate and acids. The presentation aims at discussing the validity of the proposed effectors on dissolved organic matter release from soil in the light of knowledge on soil processes.

If you are interested to join via Video-Conference to UFZ Halle or UFZ Leipzig, please send a note to nina.baumbach@ufz.de by Friday, 28.11.14., 12am.