



Linking the composition of dissolved organic matter and nutrient cycling in streams of temperate forested catchments

Dissolved organic matter (DOM) is an important component of the carbon and nutrient cycle in terrestrial and aquatic systems, and plays a prominent role in many biogeochemical processes and ecosystem functioning. Changing environmental conditions, such as decreasing acidic and nitrogen deposition and changing water regimes with more frequent and intense storm and drought events, strongly influence the dynamics of DOM with unknown effects on important ecological functions of DOM as its role in C and nutrient cycling. Soils are the major source of organic matter to streams, and depending on hydrological conditions, either surface organic horizons or subsoil mineral horizons will control the amount and composition of stream DOM. However, changes in DOM composition because of changes on its source have not been linked to the role of DOM for nutrient cycling. This will be the main topic of this MSc thesis research. Our overarching hypothesis is that the composition of DOM determines its contribution to nutrient cycling in forested streams, i.e. serving as a C or N source for microorganisms depending on the soil horizons that mostly contribute to stream discharge. Nutrient addition experiments will be carried out in small streams in the German Ore mountains (catchment of the Sosa drinking water reservoir) and in Slavkov Forest Critical Zone Observatory in the Czech Republic, about 2.5 h from Dresden. In the laboratory, the student project would examine the composition of stream DOM using mainly fluorescence spectroscopy (excitation-emission matrices). The MSc-thesis research will be carried out in close collaboration with the Czech Geological Survey in Prague (Prof. Jakub Hruska; jakub.hruska@geology.cz).

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