



## **Effects of land use and flow paths on the quality of dissolved organic matter (DOM) in streams and its use and degradation by benthic microorganisms**

Gabriele Weigelhofer (1,2), Lena Campostrini (1), Damir Masic (1), Alexandra Tiefenbacher (3), Alexander Eder (3), and Peter Strauss (3)

(1) University of Natural Resources and Life Sciences Vienna, Institute of Hydrobiology and Aquatic Ecosystem Management, Water, Atmosphere and Environment, Austria (gabriele.weigelhofer@wcl.ac.at), (2) WasserCluster Lunz - Biological Station GmbH, Austria, (3) Bundesamt für Wasserwirtschaft, Petzenkirchen, Austria

Agriculture delivers significant amounts of dissolved organic matter (DOM) to streams, thereby changing basic biogeochemical processes at the water-sediment interface. The project ORCA (2017-2019) aims to investigate the influence of agriculture on the quantity and quality of DOM inputs to streams and to clarify the effects of different DOM sources on the in-stream carbon cycling.

We analyzed streams along a land use gradient as to DOC quantity and DOM quality (absorbance and excitation-emission fluorescence indices) and performed laboratory flume experiments with leachates from different soils to study the effects of DOM quality on microbial abundances, benthic respiration, DOC degradation, and enzymatic activities. In addition, we conducted percolation experiments with agricultural soils to determine the effects of fertilization on the DOM composition of soil pore water. Results showed increasing freshness and fluorescence indices from forest to cropland streams, indicating an increased influence of microbially derived DOM. Leachates of untreated forest and grassland soils were better degraded than those of cropland or fertilized grassland soils, despite lower initial nutrient concentrations. Percolation experiments showed increased freshness and fluorescence indices in the pore water of fertilized soils during the first 3-4 weeks, corresponding to increased nitrogen concentrations.