

## **Lakes as organic matter upgraders – seasonal variation in biochemical compositions of in- and outflowing particles in pre-alpine Lake Lunz, Austria**

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Lakes are typically recharged by inflowing stream water and discharge into outflowing streams. In this multiannual field study on pre-alpine, oligotrophic Lake Lunz, Lower Austria, we hypothesized that, irrespective of seasons, stream water recharging the lake contains predominantly recalcitrant particular organic matter (POM; >1.2  $\mu\text{m}$  particle size), whereas outflowing lake water is mostly composed of more labile, algae-derived POM. We collected POM for 3 years (2013-2015) at a monthly basis from the inflowing and outflowing streams of Lake Lunz, analyzed POM content, its carbon and nitrogen, their stable isotopes, and fatty acids as biochemical indicators of POM sources. Preliminary results show that, independent of seasons, inflowing POM is rich in terrestrial markers, as evidenced by long-chain saturated fatty acids (>C22:0), with little contribution of autochthonous stream POM, such as algae-derived long-chain polyunsaturated fatty acids (LC-PUFA). However, POM in outflowing water contained considerably less terrestrial markers, but clearly higher contents of highly nutritious, algae-derived LC-PUFA. These results suggest that oligotrophic Lake Lunz acts as a biochemical upgrader within the fluvial network of this drainage basin and supplies highly nutritional POM to consumers further downstream. Ongoing research is aimed at identifying how much of the terrestrial and autochthonous POM is retained and processed in the lake (biota, sediments, or respired).