



## **Greenhouse gas emissions of various lakes in the alpine region**

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Recent research indicates that inland waters play a crucial role in the global carbon cycle. However, direct measurements of lake-atmosphere greenhouse gas (GHG) exchange are still sparse and mainly concentrated to boreal or tropical regions. Our study aims at increasing data availability and quality of GHG fluxes of lakes in the alpine region and to relate them to abiotic and biotic controls. To that end, a mobile eddy covariance (EC) station was designed to measure CO<sub>2</sub>, CH<sub>4</sub>, and energy fluxes at various lakes in the (pre)alpine region of Austria and Italy along a latitudinal and elevational transect. We expect that temperature is one of the major drivers of GHG emissions and hypothesize therefore that generally lakes at lower elevation or lower latitude will have higher GHG emissions. So far, measurements were conducted at 9 lakes at different elevations ranging from 200 to 1900 m.a.s.l. during summer and fall 2018. In addition to EC measurements, water samples were taken and analyzed for dissolved gases and nutrients and various abiotic and biotic factors were recorded.

There was a wide range in the physico-chemical and biological parameters of the analyzed lakes. As expected, the surface water temperature was generally higher in lakes at lower elevation. Preliminary results showed that one lake in particular, Lago di Caldaro in South Tyrol, had rather high concentrations of dissolved CO<sub>2</sub> and CH<sub>4</sub>, coinciding with high concentrations of dissolved organic carbon and nitrogen.