



Assessment of the dissolved methane concentrations in lakes of the Alpine area

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An increasing number of studies show that inland waters may negate a substantial fraction of the carbon sink through methane (CH₄) emissions and thus should be viewed as 'reactors' which process a large fraction of the terrigenous carbon. To date, most of our knowledge on freshwater CH₄ concentrations derives from studies in tropical and boreal regions, while temperate freshwater ecosystems are understudied.

Atmospheric temperature of the Alpine area is increasing twice as large as the north hemisphere. This study aimed to assess the content of dissolved methane from lakes situated in the Alpine area in order to understand whether they could be potential CH₄ emitters towards a global change. We also would like to relate concentrations to lake characteristics and potential biotic and abiotic driving forces.

A set of 9 lakes situated in Italy (Trentino and South Tirol) and Austria (North Tirol), distributed in a gradient of elevation from 200 to 1900 m a.s.l., were visited during summer and fall 2018. Complementary to dissolved CH₄ surface water samples, in-situ parameters were measured.

The first results show that all the sampled lakes were super-saturated in dissolved methane concentrations, and lago di Caldaro is distinguishable from the other by its high CH₄ dissolved concentration. As expected, surface water temperature and dissolved CH₄ were correlated. A preliminary clustering analysis highlighted that surface area and depth would be the main driver for CH₄ dissolved concentration.