

## **Are the main drivers for phytoplankton configuration related to climate change and nutrient loading? A study on seven deep peri-Alpine lakes**

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A lot of questions arise assessing human related impacts on the biological compartment in lake ecosystems. In this study, our main purpose is to investigate the phytoplankton community, with a special focus on cyanobacteria proliferating in the deep lakes at the northern and southern border of the Alps. Besides the impact due to eutrophication, many recent studies carried out in single lakes showed an increasing importance of the effects mediated by climate change on the phytoplankton structure and development. Nevertheless, a better understanding of the differential impact of nutrient availability and climate on the phytoplankton communities in a large number of lakes is required to reach a better level of integration and generalization of the available information. In this study we analysed data belonging to seven different lakes representing nine different datasets. The deep lakes considered in this study were chosen to represent the whole trophic gradient. We identified the significant drivers in the annual and seasonal phytoplankton groups by using multivariate ordination methods and vector fitting. The results of these synoptic analyses allowed us to obtain a better understanding of the configuration of phytoplankton in deep peri-Alpine lakes. At the same time, the results will improve the capacity to forecast the distribution and development of phytoplankton groups, which is an essential element in the formulation of water quality management plans.