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Impact of eutrophication and climate change on the development of cyanobacteria in a deep southern subalpine lake (Lake Garda)

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This contribution will consider the research carried out in the LTER (Long-Term Ecological Research) station of Lake Garda, in the framework of the project EULAKES. Major focus in interpreting phytoplankton changes in this specific typology of waterbodies is directed towards nutrients and climatic dynamics. During the last 35 years, Lake Garda underwent a significant increase of phosphorus in the water column, from ca. $10 \mu\text{g P l}^{-1}$ to $18\text{-}22 \mu\text{g P l}^{-1}$. At the multi-decadal scale, the increase of the trophic status had a positive impact on the growth of Cyanobacteria. At the seasonal and annual scale, the development of this algal group was strongly controlled by specific modes of atmospheric circulation, which controlled the extent of spring vertical water mixing and surface nutrient fertilization. At the seasonal scale, and comparing the results obtained also in the other deep sub-alpine lakes, the results indicated a positive relationship between the development of the more abundant and eutrophic-sensitive algal groups and the interaction between trophic status and water temperature. Finally, this contribution will discuss the implications due to the development of toxic cyanobacteria in water management and risk assessment.