Lake Garda: diatom-based reconstruction of past lake ecological evolution.

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Within the Central European EuLakes project (European Lakes Under Environmental Stressors, Supporting lake governance to mitigate the impact of climate change, Nr. 2CE243P3) lake's sediments from Lake Garda have been investigated in order to reconstruct lake evolution at secular scale and to determine the lake reference conditions before stronger human impact. In fact the deepest basin (350 m) of the lake is less impacted by human activities and is suitable for reconstruction of long term environmental variability, including climate change and its effects on lake ecology. On the other side, the shallowest basin (81 m) is strongly affected by tourism and intensive agriculture, and thus is more suitable for studies on lake eutrophication.
The main aim of this contribution is to evaluate the vulnerability of Lake Garda, the largest Italian lake, respect to specific human stressors (e.g. nutrients, hydroelectrical exploitation) in a climate change scenario and through a palaeolimnological approach. It focusses on changes in sub-fossil diatom assemblages in two short sediment cores collected from the deepest point of the two basins and on diatom-based reconstruction of lake trophic status. The core collected at 350 m presents two discontinuities. The deepest one dates in the mid 1940s and shows a decrease in benthic taxa, which might be related with the intensive hydroelectrical exploitation of the catchment area. The second discontinuity is in early 1960s and coincids with an increase in Fragilariaceae respect to centric taxa, the result of nutrient enrichment and climate change. The core from the shallower basin does not show discontinuities, though the diatom assemblages show a decrease in both mesotrophic Fragilariaceae and *Cyclotella* spp. since the middle 1960s. A preliminary diatom based reconstruction of lake TP concentration over the last 200 years confirm trends in limnological data collected during the last few decades.