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**Serie storiche e indagini attuali per costruire
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PROGRAMMA
Program

Sediment records of Perialpine lakes anticipate the timing of lake responses to human impact and climate warming in the 20th century

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The majority of Perialpine lakes suffered on nutrient enrichment since the early 1960s, as a consequence of the economic boom that followed World War II. However, limnological surveys have been sparse and irregular for both large and small perialpine lakes during the early stage of nutrient enrichment, and regular monitoring programs started mainly during the most acute eutrophication or in concomitance with the launching of lake restoration measures. As a result, reconstruction of the early stage responses of Perialpine lakes to major human-related perturbations occurred during the Anthropocene can only be reconstructed based on information preserved in deep lake sediment records. The available paleolimnological surveys showed that lake biological responses to changes in lake nutrient availability was particularly rapid, especially for the phytoplanktonic compartments, and rather coherent for lakes belonging to homogeneous lake types north and south of the Alps. However, such studies suggest that first lake changes already occurred during the first half of the 20th century. Here we present results from sediment studies, which were conducted during the last ca. 10 years on six Perialpine and alpine lakes north and south of the Alps. Although the lakes differ in location, morphology (e.g. altitude, size, depth), and exposition to direct and indirect human impacts, the phytoplanktonic proxies of each sediment record indicate first relevant changes between the 1930s and 1940, i.e. well before the beginning of post war nutrient enrichment. These changes could be interpreted as lake responses to the first documented climate warming after the Little Ice Age, sometimes in combination with superimposed perturbations that ranged from early eutrophication to hydroelectric exploitation. These results underscore the importance of sediment studies for complementing and expanding decadal limnological surveys in predicting future lake ecological trends based on the understanding of past lake responses.