

## **Trophic condition of the volcanic Lake Nemi (Central Italy): environmental factors and planktonic communities in a changing environment**

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### **ABSTRACT**

*Lake Nemi is an interesting case of anthropogenic overexploitation which has caused its progressive environmental deterioration in the past decades. On this lake historical data about the trophic situation are available from 1975 to 1984. The research performed in 2002-03, about ten years after the diversion of urban waste waters, concerned a biological investigation on the phyto- and zooplanktonic communities, integrated with a physico-chemical analysis. The aims of our study are to evaluate the current water quality of the lake and compare it with the water quality observed in 1982-1983, when all biotic and abiotic components indicated a heavily compromised hypereutrophic condition. The water quality data and the comparison with a previous study point out that the biological aspects have partially changed (increased number of Cyanobacteria and phytoplanktonic taxa, particularly Chlorophyta and Dinophyta; zooplankton composition changed at a species level, with the appearance of taxa associated to light trophic conditions), and the physico-chemical conditions significantly improved. The mean transparency, dissolved oxygen, nutrients and chlorophyll-a concentrations have all improved. Mean annual temperature at different depths increased, probably due to differences in climatic period and the lowering of the lake surface level (from 32.5 to 27.5 m in 1982 and 2002, respectively). Our results indicate a general improving trend in water quality is taking place since the diversion of waste water discharges. The present abiotic characteristics of the lake allow the phytoplankton to distribute itself in the whole epilimnion, and the zooplankton in the whole water column. A possible further improvement is hypothesized, and the constraints represented by excessive water level lowering and water temperature increasing are also discussed.*

*Key words: eutrophication, lake recovery, planktonic monitors*

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