



Palaeolimnological evidence of vulnerability of Lake Neusiedl (Austria) toward climate related changes since the last “vanished-lake” stage.

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The palaeolimnological reconstruction of secular evolution of European Lakes with key socio-economical relevance respect to large (climate change) and local scale (land use, tourism) environmental changes, represents one of the objectives of the project EuLakes (European Lakes Under Environmental Stressors, Supporting lake governance to mitigate the impact of climate change, Reg. N. 2CE243P3), launched in 2010 within the Central European Initiative.

The project consortium comprises lakes of different morphology and prevalent human uses, including the meso-eutrophic Lake Neusiedl, the largest Austrian lake (total area 315 km²), and the westernmost shallow (mean depth 1.2 m) steppe lake of the Euro-Asiatic continent. The volume of Lake Neusiedl can potentially change over the years, in relation with changing balance between atmospheric precipitation and lake water evapotranspiration. Changing water budget, together with high lake salinity and turbidity, have important implications over the lake ecosystem. This contribution illustrates results of the multi-proxi palaeolimnological reconstruction of ecological changes occurred in Lake Neusiedl during the last ca. 140 years, i.e. since the end of the last “vanished-lake” stage (1865-1871). Geochemical and biological proxies anticipate the increase in lake productivity of ca. 10 years (1950s) respect to what reported in the literature. Diatom species composition indicate a biological lake recovery in the late 1980s, and suggest a second increment in lake productivity since the late 1990s, possibly in relation with the progressive increase in the nitrogen input from agriculture. Abundance of diatoms typical of brackish waters indicated no significant long-term change in lake salinity, while variations in species tolerating desiccation confirm the vulnerability of Lake Neusiedl toward climate-driven changes in the lake water balance. This fragility is aggravated by the semi-arid climate conditions of the catchment area. Biodiversity changes, pollution, agricultural and touristic over-exploitation represent further risk factors.