

## **Deciphering recent climatic and environmental changes from a short-term sediment record**

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**KEYWORDS:** lake, land-use, recent changes, Carpathians, multi-proxy

The unprecedented environmental changes which characterise the recent period of the Carpathian region highlight the need of integrative approach for tracing the landscape dynamics, identify drivers of changes and thus, providing critical information for improving the management and conservation strategies.

Here, we present the multi-proxy results of a short-core from Ighiel, a mid-altitude lacustrine record in the Carpathian Mountains with the aim to identify the main drivers of change (natural vs anthropogenic) and evaluate their impacts on the catchment and lake ecosystem over the past century. To answer this aim, a multi-proxy approach was developed including high-resolution sedimentological, geochemical, environmental magnetic, diatom analysis and cartographic evidence. In the interval spanning between 1920 and 1960, the correspondence between sediment signatures and climate variables like temperature, NAO shows that sedimentation regime during this interval is mainly controlled by hydroclimate variability. Starting with 1960 the depositional regime underwent a marked change expressed as a shift from laminated to homogenous sediments accompanied by increase in erosion and a shift in lake ecosystem (diatom community). These changes denote a strong response of the lacustrine system to human activities mainly forestry and fishery which increased during this period. Over the last three decades, forest loss continued, and grazing intensified, significantly imprinting an abrupt, sharp and unprecedented changes in diatom assemblages and sedimentation which suggest a highly human-impacted landscape driving ecological changes.

This study shows the complex link between drivers of catchment-scale impacts and lake proxy responses and highlights the vulnerability of mid-altitude environments, particularly in central-eastern Europe, to recent anthropogenic pressure and climate change and the importance of applying integrated historical-paleolimnological approaches for evaluating the environmental response.

**Acknowledgement**

This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P4-ID-PCE-2020-0914, within PNCDI III.