sciforum-174275: Addressing the Cyanobacterial Bloom Challenge: A Spatio-Temporal Sediment Analysis of Reservoirs and Artificial Lakes Across the SUDOE Region within the Framework of the Cyan'EAU Project

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The occurrence of phytoplankton blooms dominated by potentially toxic cyanobacteria has been widely observed across aquatic ecosystems of Europe, especially in the SUDOE regions, leading to contamination events and restrictions on water use for human purposes. These occurrences represent a growing threat to water quality, public health and local ecosystems. Their multifactorial origin requires close cooperation between the scientific community and public entities. Within the framework of the Interreg Sudoe Cyan'EAU project, we aim to develop realistic and actionable tools and solutions for water resource managers to support the prevention, early detection, and remediation of cyanobacterial blooms. A crucial step toward this objective is the identification and understanding of the trigger factors of cyanobacterial bloom development. For this purpose, we carried out a multidisciplinary study focused on spatio-temporal sediment analysis of reservoirs and artificial lakes across the SUDOE region. Sediment cores were collected at five aquatic ecosystems across Portugal, Spain, and France. Each core was sectioned into distinct layers, which were analyzed for various parameters, including dating, cyanotoxins, cyanobacterial community composition, and physicochemical characteristics (*e.g.* nutrients, pH). The analyses combined radiometric, chromatographic, molecular biology, and physicochemical techniques. This approach would allow us to reconstruct the historical dynamics of cyanobacterial proliferation preserved in the sediment layers and to identify key drivers of bloom development. These insights will guide the development of future strategies aimed at bloom prevention and the sustainable management of water resources.

Acknowledgements

This work was financially supported in the framework of the European project Cyan'EAU, Interreg SUDOE S1/2.5/P0158 (Innovative control systems for cyanobacteria proliferation in Sudoe water bodies).