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The influence of climate changes on the quality of water and sediments in the Sulina branch of the Danube River

Abstract: The researchers of the REXDAN Research Infrastructure have carried out a series of studies on the state of the aquatic ecosystems in the area of the Sulina branch of the Danube river. In the last 2 years, several sampling campaigns were carried out from the critical points of the study area located on one of the most navigable channels of the Danube. The following physico-chemical parameters were determined for the water samples: pH, temperature, oxygen regime (DO, BOD₅ and COD), nutrient regime (N-NH₄⁺, N-NO₃⁻, N-NO₂⁻, N-total, P-total), salinity (SO₄²⁻, Cl⁻) and heavy metals (Fe-total, Zn²⁺, Cr-total; Cd²⁺, Ni²⁺). Sediment samples were analysed to assess the concentration of heavy metals, such as Fe-total, Zn²⁺, Cr-total; Cd²⁺, Ni²⁺. Spectrophotometric method, ion exchange chromatography, electrochemical method and inductively coupled plasma mass spectrometry were used to determine the value of water and sediment parameters. (WFD). With these results, as well as historical data, a number of machine learning prediction algorithms were trained and validated. In this way, an analytical framework based on virtual sensors was developed, the purpose of obtaining them is to increase the sustainability of monitoring activities. In this way, an effective monitoring of the quality of aquatic ecosystems can be carried out, any changes that occur as a result of climate change (especially during periods of extreme drought or flooding) can be noticed and alarm signals can be given to the authorities that manage water resources.

Biography: Catalina Iticescu received BSc. in Chemistry in 1995 from the University “Al. I. Cuza” of Iasi (Romania), the PhD in 2004 and the habilitation in 2018 from the “Dunarea de Jos” University of Galati (Romania). She is presently full professor at the “Dunarea de Jos” University of Galati (Romania). Her current field of research interests is related to the development in the field of chemistry, environment science and engineering, quality of environmental factors, water (WQI), sewage sludge. She is co-author of over 150 papers in peer-reviewed journals (94 in WoS), 4 monographs and 2 laboratory guidelines, 4 patents.