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# Anthropogenic contaminants vs. geochemical tracers: heavy metals and radiogenic isotopes in environmental matrices

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In the last two decades trace elements geochemistry in river waters has been receiving increasing attention due the key role they play in potable water supply and their sensitivity to climate change. Advanced analytical techniques such as Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Thermal Ionization Mass Spectrometry (TIMS) allow to increase the knowledge on how dissolved trace elements, which can be either toxic or essential for life, distribute in the geological matrices of riverine environments (water, sediment and suspended solid). Thus, understanding their behavior is critical for identifying their source(s) and undertake appropriate actions when the anthropogenic pressure is affecting the water quality and the ecosystems. The Padule di Fucecchio (Tuscany, Central Italy) is a protected swampy area located in the lower reaches of the Nievole River Valley (or Valdinievole sub-basin). The Nievole River Valley, which is practically supplying the whole water budget to the Padule di Fucecchio, has four main courses, i.e. Nievole, Pescia di Collodi and Pescia di Pescia rivers. Moreover, many other creeks and artificial channels crosscut the western part of the basin and drain the highly anthropized northern sector of the basin. The Padule di Fucecchio waters are controlled by the Usciana River, which in turn flows into the Arno River. The Valdinievole sub-basin includes several potential pollution sources such as anthropic activities (residential areas, paper mills, intensive agriculture practices) and thermal spring discharges. Downstream the Padule di Fucecchio, the most important Italian tanning district, established in the second half of the XIX century, and forming the so-called "Comprensorio del Cuoio", stands along the Usciana River. In the framework of this project, one of the main targets is to characterize the natural and anthropogenic sources that contribute the presence of heavy metals in the river system of the Valdinievole sub-basin. A combined approach of geochemical tracers (trace elements Sr-Pb isotopic ratios) was applied to the Valdinievole sub-basin waters, suspended solid loads.



## The Speaker

Chiara Maccelli is currently PhD student at the University of Pisa and lab manager of the Geochemistry of Radiogenic Isotopes at the Department of Earth Sciences of University of Florence. Her scientific background is as environmental geochemist and mostly focused on the presence of pollutants in surface waters. Her research is indeed dedicated to investigate the riverine environmental matrices (waters, suspended solids, and stream sediments) by a geochemical and isotopic point of view and aimed at evaluating the geogenic and anthropogenic inputs.

