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Trends in Environmental Tracer Applications

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Considering the enormous challenges we are facing in terms of water resources, environmental tracer applications are more important than ever. The development of new technologies including Atom Trap Trace Analysis, Dynamic Isotope Ratio Mass Spectrometry, Cavity Ring-Down Spectroscopy, and novel exchange membranes allow us to study processes on an extended range of timescales at a significantly lower cost. Some tracers have run their course, established ones are used in different ways, and new ones appear on the landscape. Applications of these techniques have spread all over the world and make it now possible to look at processes on the microscopic, local, regional, and global scale, often using multiple tracers in combination with classic hydrologic methods and integrated numerical models. As a result of the increasing human footprint, more and more tracer applications are shifting from natural to disturbed aqueous systems and the active management of water resources.

This presentation will review the current trends in environmental tracer applications and illustrate them with case studies.