

Eawag Seminar Invitation

Trace Organics in Water Supplies: a Continuing Challenge for Environmental Scientists, Engineers and Regulators

Speaker **Prof. Emer. Martin Reinhard**
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When **April 20, 11.00 – 12.00 a.m.**

Where **Forum Chriesbach, room C20, Eawag Dübendorf**

Abstract Contamination of water supplies with trace organic contaminants (often referred to as emerging contaminants (ECs)) by discharges of wastewater effluent, combined sewer overflows, and storm-water is a growing issue, especially in mega cities such as Singapore. Most ECs are structurally complex relative to the hydrophobic legacy chemicals and generalizing broadly about their behavior in the aquatic environment is difficult. Therefore, studying their environmental fate is by necessity limited to narrowly defined compound classes. Furthermore, the limited availability of resources requires focusing on compounds of high priority. My presentation summarizes studies on the occurrence, fate, and transport of selected ECs in Singapore's highly managed and protected surface waters. Even though there are no obvious wastewater discharges, the presence of wastewater indicator compounds revealed the impacts of storm-water and leaky sewers. The most abundant wastewater indicators were caffeine, salicylic acid, acetaminophen, bisphenol A (BPA) and the insect repellent N,N-Diethyl-meta-toluamide (DEET). A series of field and laboratory studies focused on the occurrence, behavior, sources, and sinks of perfluoroalkyl and polyfluoroalkyl substances (PFASs), including carboxylates (PFCAs), sulfonates, and perfluorooctane sulfonamide compounds. Most PFASs originate from non-point sources whereas perfluoroundecanoic acid and the pesticide sulfluramid (N-ethyl perfluorooctane sulfonamide) appeared to originate from point sources. Modeling EC behavior in surface water bodies and, therefore, managing their impacts are complicated by our limited understanding of the EC-particulate matter interactions and the transport and geochemistry of the suspended solids. To shed light on the sorption mechanism of PFASs by sediments, the sorption/desorption behavior of selected PFAs was tested over multiple cycles. Conclusions and limitations of these investigations will be discussed.