

Chemistry Departmental Colloquium

Thursday, December 14, 2023

4:30 p.m. ~ WTHR 104

"What's in the Water? Analytical and Environmental Chemistry of Emerging Contaminants"

Abstract:



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Clean water is essential for maintaining human and ecosystem health, but how do we know when it is contaminated with potentially harmful levels of chemicals of concern? The answer to this question resides in analytical chemistry, but meaningful water resource management information requires a holistic approach to understand the dynamic interactions between geology, hydrology, chemistry, and biology. A unique aspect of the Anthropocene is the introduction of synthetic chemicals created by humans, many of which are designed for specific biological activity. With increasing demands on water supplies from population growth and climate change, there is an increasing reliance on wastewater reuse to sustain municipal, agricultural, and industrial needs. This talk will focus on the occurrences, sources, fates, and effects of a range of organic and inorganic emerging contaminants including solvents, surfactants, pesticides, pharmaceuticals, per- and polyfluoroalkyl substances, and rare earth elements. These chemicals occur as complex mixtures in surface waters and groundwaters, reflecting diverse uses and loading sources. Relatively constant inputs and environmental persistency of emerging contaminants result in widespread exposure and potential risk to aquatic organisms and humans.

Biography:

Dr. Barber is a research geochemist with the U.S. Geological Survey and has been exploring the world of emerging contaminants in water for over 40 years. He has a B.Sc. in geology/geochemistry from the University of Arkansas, and M.Sc. and Ph.D. degrees in geology/geochemistry from the University of Colorado.