Comparison of Two Mercury Contaminated Surface Water Bodies

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Due to the methyl mercury (MeHg) burden in fish tissues, the Virginia Department of Health and the Tennessee Department of Environment and Conservation have posted fish advisories for the South River, VA and the East Fork Poplar Creek, TN (EFPC), respectively. This presentation will compare and contrast the hydrogeochemical characteristics of these two industrially contaminated water bodies. Both streams share broad similarities in terms of their general chemistry and underlying geology. Nevertheless, patterns of waterborne mercury (Hg) and, importantly, MeHg concentration are different. For example, in the South River both Hg and MeHg concentrations increase with increasing distance downstream from the industrial site of mercury origin whereas in EFPC Hg decreases while MeHg increases with increasing distance downstream. Although both sites are the focus of concerted research efforts to identify effective remediation, the underlying mechanisms that drive the patterns within each system and therefore account for the differences between them are poorly understood. We intend for this presentation to provide a context within which attendees can frame their discussion of the challenges inherent to studying the biogeochemical cycling of Hg in general and at contaminated sites in particular where effective remedies can be elusive.