Abstract:
Recent landmark advances in public health that have benefitted consumers in larger urban municipalities have not been realized in many small rural water systems. Even for small municipalities (serving < 500 people) that are regulated by the U.S. Environmental Protection Agency (USEPA), approximately 25% violate a Safe Drinking Water Act (SDWA) health-based standard, which hints at the magnitude of problems likely experienced by the 47 million residents reliant on unregulated private water systems (e.g., household wells, springs). With system maintenance and water quality monitoring solely the responsibility of the homeowner, it is not surprising state surveys report that 23-58% of systems exceed at least one SDWA health-based standard. Despite the limited research conducted, lead in water due to corrosion of plumbing components in private systems is of growing concern. This presentation will focus on sampling efforts in Virginia where 19% of private systems sampled exceeded the SDWA lead action level of 15 µg/L with concentrations as high as 24,740 µg/L. Our research suggests that three patterns of waterborne lead exposure are occurring in private systems: no elevated lead or lead elevated in the first draw of water only (Type 1), spikes of particulate lead mobilized from plumbing during periods of water use (Type 2), and sustained detectable lead concentrations (≥1 µg/L) even with extensive flushing (Type 3). In order to protect rural public health, it is imperative that private system surveys investigate the type of waterborne lead exposure as the effectiveness of remediation strategies will depend on sources and location of lead release.