

Name: Raina Maier

Presentation title: Phytoremediation of Mine Tailings in Arid and Semi-Arid Environments

Abstract: In arid and semi-arid parts of the world, including parts of the western United States, mine tailings and their associated contaminants are prone to wind and water erosion. These problems are extensive and can persist for decades because these sites lack normal soil stabilization processes including the establishment of a plant cover and the associated development of soil structure. These sites can have profound health and environmental consequences especially for children in nearby communities or for sensitive riparian or wildlife refuge areas. Phytostabilization - the establishment of a vegetation cover using native plants – is a remediation approach that can minimize erosion processes. This seminar will provide a discussion of strategies to achieve successful establishment of native plants in mine tailings. This includes consideration of the tailings type (pH, metal content), plant type, the minimum organic amendments required for plant germination and growth, the potential for accumulation of metals into above-ground tissues, and the supporting rhizosphere microbial community. The discussion will also include approaches to evaluate the success of phytostabilization and indicators that can be used to evaluate success.

Short Bio: Raina M. Maier is a Professor of Environmental Microbiology in the Department of Soil, Water and Environmental Science at the University of Arizona and currently serves as the Associate Director of the University of Arizona NIEHS Superfund Basic Research Program (SBRP). Dr. Maier received her undergraduate degree in Biology/Chemistry from the University of Minnesota, her Ph.D. in Microbiology from Rutgers University, and was a post-doctoral research associate in Biochemistry at Iowa State University.

Dr. Maier's research is interdisciplinary and is focused on developing a fundamental understanding of the biological factors and processes that influence the transport and fate of both microorganisms and chemical contaminants in the environment. The information gained from this research is used in the development of innovative remediation approaches which can be tested at a range of scales, from the pore-scale to the field-scale. Recent research has focused on the ability of bacteria to survive and metabolize in extremely oligotrophic environments. Dr. Maier is seeking patterns in the diversity and community structure of bacteria in a variety of oligotrophic environments including subsurface soils, Sonoran and Atacama Desert soils, cave environments, and desert mine tailings sites. Dr. Maier has over 90 scientific publications representing this body of work. She is also the lead author on the widely-used textbook "Environmental Microbiology".
