

The Water-Energy-Land Nexus and Biofuels

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ABSTRACT

Biofuels are part of the President's "all of the above" energy strategy and the Department of Energy has major fundamental and applied programs to support the development of biofuels. The development of crops for biofuels and technologies to convert biomass into fuel has been a major focus of these programs. Apart from efforts to overcome technological challenges, it is important to evaluate how a significant biofuel industry would impact the allocation of water and land. One of the key challenges is to develop a biofuel strategy that does not impact food production, which translates into finding ways to grow crops on marginal lands without diverting significant amounts of water. A group of scientists drawn from across the Department of Energy has recently evaluated some of these tradeoffs and researchers at BNL are actively working to develop plant-microbe systems amenable to grow on marginal lands. In this talk, a broad overview of these efforts will be presented.

BIOGRAPHY

Martin Schoonen oversees the staff of the Biological, Environmental and Climate Sciences Department, Nonproliferation and National Security Department, and the Nuclear Sciences and Technology Department. The directorate is structured with our vision for Brookhaven as a world-class Laboratory ready to take on the scientific challenges of the future fully utilizing our core competencies, leverages our primary user facilities, and will grow our programs through more effective integration. The EBNN Directorate brings together several strong, mission-aligned departments that we believe can leverage each other and the rest of the Laboratory to grow.

Martin has held a joint appointment with Stony Brook University (SBU) since 2013 as a SBU geochemistry professor. He is an interdisciplinary scientist who has previously served in several administrative positions at SBU, including Associate Vice President for Research, developing large-scale, multidisciplinary proposals and leading multidisciplinary research programs. He played a key role in the development of the proposal leading to the establishment of the Center for Environmental Molecular Science at SBU and Brookhaven Lab. Martin earned a Ph.D. in geochemistry and mineralogy from Pennsylvania State University in 1989.

Schoonen's research areas include environmental molecular chemistry, geocatalysis, medical geology, and astrobiology. An expert in synthesis, surface chemistry, and geochemistry of metal sulfides, in particular iron sulfides, his applied research efforts have included geologic sequestration of hydrogen sulfide and carbon dioxide (CO₂),

development of mineral-based photocatalysts, and development of acid mine drainage abatement technology. His current research projects focus on the role of iron minerals in subsurface CO₂ sequestration, the use of metal sulfides as catalysts to degrade organic pollutants, and the role of mineral dust in the onset of lung ailments in US servicemen and women stationed in Iraq and Afghanistan.

Schoonen earned a Ph.D. in geochemistry and mineralogy from Pennsylvania State University in 1989, a Doctoral (equivalent to M.S.) from the University of Utrecht, The Netherlands, in 1984 with a double major in geochemistry as well as physical and colloid chemistry, and Kandidaats (equivalent to B.S.) in Geochemistry, University of Utrecht, The Netherlands, January 1981. He is a member of the American Chemical Society, the American Geological Society, and the International Medical Geology Association.