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Coordination of built and natural infrastructure to enhance human-natural water system resilience

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DR. JOHN SABO

Director, Future H2O, Arizona State University

Natural infrastructure offers a promising, soft-path solution to water security challenges, but the scientific framework for siting and measuring the efficacy of such restoration projects is nascent. In this study, we addressed this research gap in the Brazos River basin, the largest river basin in Texas, USA, and a basin undergoing intensifying extremes (drought and flood). Our analysis is motivated by the tension between changing extremes and the resilience of coastal manufacturing in the region, but with an eye for guiding corporate water stewardship "beyond the four walls" of manufacturing facilities and towards a broader basin-scale view of water stewardship. To this end, we developed a scientific framework and financial toolkit for quantifying the potential impact of constructed wetlands on streamflow (water outcomes) and cash flow (investment outcomes) compared to a purely built, or hard path, infrastructure project heightening an existing dam.

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Guest Speaker

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John Sabo is a Professor of River Ecology and Water Resources in the School of Life Sciences and Founding Director of Future H2O in the Office of Knowledge Enterprise Development at Arizona State University. Future H2O was committed by ASU to the 2016 White House Water summit. He is also a Senior Sustainability Scientist in the Julie Ann Wrigley Global Institute of Sustainability, a Fellow in the Institute for the Future of Innovation in Society, an Honors Faculty in the Barrett Honors College, and serves on the Graduate Faculty in the Hydrosystems Engineering Graduate Program.

By training, Sabo is a river food web ecologist and has designed and implemented large scale field experiments to understand the role of aquatic-terrestrial energy flow on terrestrial food web dynamics as well as the dynamic effects of ground water on surface water food webs. This research has been published in top journals including, Ecology, Ecological Monographs, Ecology Letters, Global Change Biology, Frontiers in Ecology and the Environment, PNAS, and Science. This work has been supported by over 14 M in research grants from the US National Science Foundation, US Department of Defense, US Geological Survey, MacArthur Foundation, The Cynthia and George Mitchell Family Foundation and private sector companies like Intel Corporation and Levi Strauss & Co.

With degrees in Fisheries (University of Washington), and Ecology (UC Berkeley) Sabo has developed quantitative, data-driven methods to connect hydrology to freshwater fisheries and aspects of riverine biodiversity. His work in this realm is driven by a desire to understand how to better manage basin scale flows in rivers ranging from the Colorado in Arizona's Grand Canyon, the Mekong River in SE Asia and the Amazon River in South America. In all of this work Sabo leverages relationships with transboundary agencies and multilaterals to co-develop action-oriented science and tools.