Jennifer Adam

Increasing Resilience across the Food, Energy, and Water Sectors in the Columbia River Basin

Abstract: Together, rapid population growth, economic development, and associated climate change have placed increased stresses on water, energy and agricultural resources. Concerns over food, energy and water security and the need to be able to withstand future disturbances at multiple scales (such as climate change, drought, and heat waves) require careful management of these resources. Understanding relationships between food, energy, and water is critical to developing strategies that will promote sustainability and resilience of the entire system. In this seminar, I will provide a brief overview of a project that is jointly funded by the National Science Foundation and the United States Department of Agriculture, and is a collaboration between Washington State University and the University of Idaho. We hypothesized that improved management of water storage systems can increase system resilience because it increases effective storage of the overall system and enhances its buffering capacity to disturbances. Coordinated management also can be augmented with innovations in technology (e.g., more efficient irrigation systems and new crop varieties) to further increase system-wide resilience. Our testbed is the Columbia River Basin (CRB), an ideal location to explore food-energy-water interactions due to its management complexity and that it is becoming increasingly "storage limited" due to its loss of snowpack. I will provide an overview of the goals of the project along with two case studies. The first examines the role of new crop varieties (as a technological innovation) in affecting crop yield volatility in a changing climate (Malek et al. 2020). The second explores the use of managed aquifer recharge as a water storage management strategy to adapt to droughts (Zhao et al. 2021).

Bio: *Dr. Jennifer Adam* is Berry Distinguished Professor in the Department of Civil and Environmental Engineering at Washington State University (WSU). She received her graduate degrees from the University of Washington and her undergraduate degree from the University of Colorado. Her group works to enable humans and the environment to adapt to global change. To do this, they use computational models to study the connections between climate, hydrology, land use, and ecological (natural and agricultural) processes. Dr. Adam has experience leading multiple large multi-disciplinary research programs, including an INFEWS/T1 award entitled, *"Increasing regional to global-scale resilience in Food-Energy-Water systems through coordinated management, technology and institutions".*