

Using National Models to Evaluate Water Availability for Arid Agricultural Areas Impacted by Climate Change: The Case of FEWtures in the Central Arkansas River basin (CARB)

Professor Mary Hill

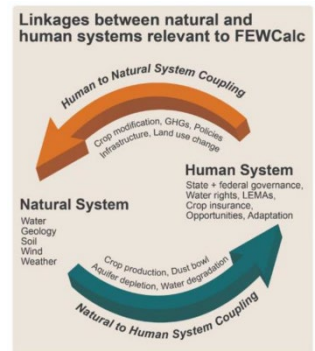
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Abstract:

The NSF FEWtures project seeks to evaluate potential ways to lower carbon production and enhance local economies and communities in arid agricultural regions using local renewable energy supplies. To serve this purpose, the study focuses on the Central Arkansas River basin (CARB) in the central USA. The economics and stakeholder adoption potential of two local renewable energy powered enterprises are explored: (a) locally produced green ammonia for use as fertilizer and energy storage, and (b) treatment of water that has been historically unusable due to salinity or other water quality issues. A critical issue is that the system depends on water resources that have been dramatically depleted by irrigation, a characteristic it unfortunately shares with many other systems worldwide. This talk presents a strategy to quantify water availability under climate change developed by the FEWtures Water Supply and Treatment Teams, composed of Patience Bosompemaa, Sam Zipper, Andrea Brookfield, and Edward Peltier. Deep groundwater resources that are not highly interactive with surface water are evaluated using a water-balance method based on historical annual precipitation and head changes. Surface water resources and closely connected groundwater are evaluated using national models. Two national models are available: the USGS National Hydrologic Model (NHM) and the National Water Model (NWM). Adding to water supplies through treatment of saline groundwater stores, saline groundwater produced with oil and gas extraction, and water from feedlots is also considered. The strategy and approaches for addressing difficulties are discussed.



Speaker Bio: **Mary C. Hill** is a professor of Geology at the University of Kansas, Fellow of the American Geophysical Union, and member of the National Academy of Engineering. Dr. Hill received her PHD in Civil Engineering from Princeton University in 1987. She also holds AB degrees in from Hope College in Holland Michigan in Business Administration and Geology. She was a Hydrologist with the USGS from 1981 – 2014. Since 2014 at KU, Prof. Hill has focused on the food, energy, water (FEW) nexus - integration of science and policy, with an emphasis on creating an environmentally and economically sustainable future for people on earth.