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Adaptive Policy Design in Water Resources Systems Under Uncertain Climate and Human Stressors

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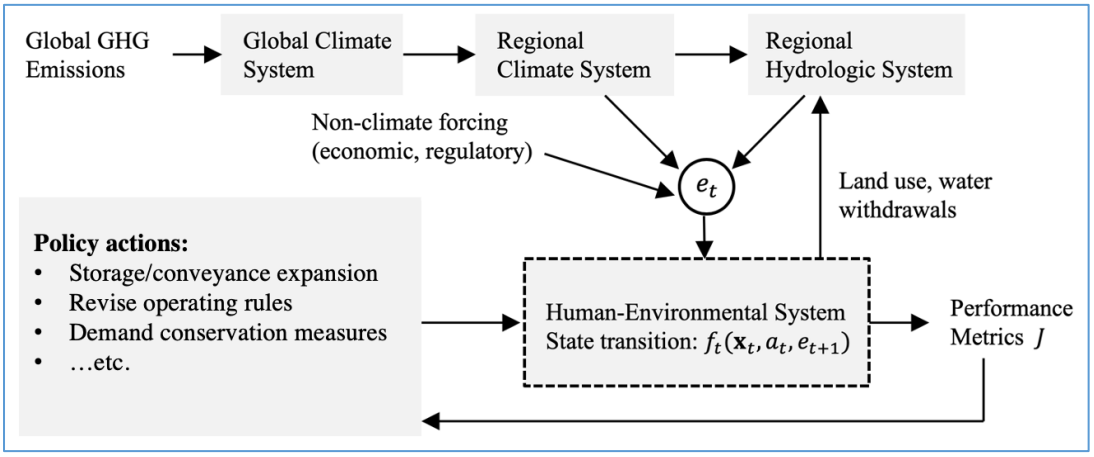
November 4, 2020 – 10:30 AM Mountain Time

By Zoom:
https://usu-edu.zoom.us/j/84342900372?pwd=SW5CNU5rdWVWK3Z1YW9iWlo2Wm0zQT09



Abstract: Long-term planning of water resources systems must contend with severe uncertainty in future projections of hydroclimatic variability across multiple scales, as well as uncertainty in human behavior, such as land use and reservoir operation. This talk will review recent developments in adaptive policy design to meet this challenge, centered around the key question: how should we learn from, and react to, dynamic observations of hydroclimatic, human, and ecological variables to ensure long-term sustainability? Specific contributions will cover three areas: (1) adaptation of short-term control rules, enabling existing infrastructure to manage multiple objectives across a range of possible futures; (2) exploration of endogenous system dynamics and feedbacks governing agricultural water demand, an additional source of structural uncertainty in the planning problem; and (3) dynamic adaptation of infrastructure and operations by designing policies conditioned on projected future observations of climate and hydrologic variables. Collectively, these advances provide a foundation to directly map observations and projections of system states and fluxes to adaptive actions for both short-term management and long-term planning. While the studies presented here will focus on the California water resources system, the methods are broadly applicable across agriculture and energy systems facing uncertain climate risks. The talk will conclude with a discussion of future directions and open research questions in the area of adaptive planning.

Bio: Jon Herman is an assistant professor in the Department of Civil and Environmental Engineering at UC Davis. His research group focuses on water resources systems analysis, specifically the development of computational methods to support planning and management under uncertainty. Recent work includes forecast-based reservoir control, dynamic adaptation to climate change, and sensitivity analysis of simulation models for human-environmental systems. Jon is an associate editor for the ASCE Journal of Water Resources Planning and Management and a regular contributor to open source software libraries for scientific computing.

Series Schedule

Date / Time (Mountain)	Person	Title
Oct. 28, 10:30 AM	Dr. Jian Wang (USU)	Strategies for Managing the Colorado River in an Uncertain Future
Nov. 4, 10:30 AM	Dr. Jon Herman – University of California, Davis	Adaptive policy design in water resources systems under uncertain climate and human stressors
Nov. 9, 10:30 AM	Dr. Sarah Fletcher – Stanford University	Water Supply Infrastructure Planning: Decision-Making Framework to Classify Multiple Uncertainties and Evaluate Flexible Design
Nov. 11, 1:00 PM	Dr. Marjolijn Haasnoot – Deltares, Netherlands	Dynamic Adaptive Policy Pathways
Nov. 13, 10:30 AM	Dr. Patrick Ray – University of Cincinnati	TBD

All presentations and discussions via Zoom. Will be recorded.
https://usu-edu.zoom.us/j/84342900372?pwd=SW5CNU5rdWVWK3Z1YW9iWlo2Wm0zQT09
Co-convened with CEE 5410/6410 Systems Analysis in the Age of Uncertainty