

# 2022 Anjan Bose Lecture

## Incorporating Natural Resource Management into Complex Integrated Modeling Frameworks to Inform Adaptation to Global Change

### Jennifer Adam

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2021 Anjan Bose Outstanding Researcher Recipient

**Monday, April 11**

**3:30 p.m. – Lecture ETRL 101**

**4:40 p.m. – Reception ETRL 119**

*Light Refreshments Provided*

#### BIOGRAPHY

Dr. Jennifer Adam is the Berry Distinguished Professor in the Department of Civil and Environmental Engineering at Washington State University. She received her graduate degree 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.



#### ABSTRACT

Global change (such as population growth, shifts in land use, and changing weather patterns) are putting heightened pressure on our natural resource systems that provide food, energy, and water for human needs. Because unprecedented levels of scarcity and conflict are expected to occur in the future, computational process-based models are needed to characterize how natural systems respond to perturbations such as heat waves, droughts, and climate change. Humans play a critical role in determining how these impacts play out over space and time. For example, the question of “who gets the water during a drought?” is a water management decision that is determined by human institutions. Whether the water is left in the stream or is withdrawn for out-of-stream purposes is determined by water law and has important implications for both humans (e.g., downstream water users) and the natural system (e.g., atmospheric feedbacks, aquatic habitat, etc.). Nevertheless, there has been relatively less effort dedicated to incorporating human activities into models used for characterizing global change impacts. In addition, there has been less attention paid to utilizing these modeling frameworks for developing strategies to adapt to global change (rather than just characterizing impacts). Over the last decade, federal agencies (such as the NSF, USDA, and the DOE) have established funding for projects that address these shortcomings. In this lecture, I will describe examples from projects that I have led or been involved in related to incorporating natural resource management decisions into integrated modeling platforms to 1) characterize the role of humans in driving changes in our natural resources, and 2) explore global change adaptation strategies. I will describe examples related to management of water resources, food production, and wildfire, using locations within the Pacific Northwest as case studies.



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