How does vegetation influence the interaction between climate change, insect disturbance, and wildfire?

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Forests are essential for ecosystem biodiversity and provide numerous ecological services to humans. In recent decades, Bark beetle outbreaks and wildfire have consumed millions of hectares of forest. Climate change is projected to increase the severity and frequency of these two disturbances. Recent studies have focused on understanding the interactions between climate and forests in the field where controlled experiments are not always feasible. Furthermore, natural wildfires occur over complex terrain and rarely provide the set of conditions needed to understand and predict how wildfires interact to climate and insect outbreaks over space and time or how they influence ecosystem and watershed processes. Complementing field studies, which have the advantage of being realistic, with physically-based models (e.g., Regional Hydro-ecologic Simulation System) will enable researchers to manipulate and isolate the effects of multiple drivers over a range of possible future scenarios.

Dr. Ren completed his PhD in Civil and Environmental Engineering from WSU. His research focuses on interactions between climate change, beetle outbreaks, and wildfire at basin scales. He is also uses remote sensing data to study how climate and land use change influence water management at regional and global scales.