

## **Assessing the Impacts of Drought and Wildfire on the Colorado Front Range**

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### Abstract

The effects of drought and wildfire disturbances on the quality and availability of water are far-reaching and often difficult to predict, this providing a challenge to simulate. Hydrologic models have been applied to quantify the impacts of drought and wildfire on human and environmental systems in the western U.S., yet quantifying the impacts on these systems remains a greater challenge. In this study, we explore modifications to a meso-scale hydrologic model to portray the effects of drought and wildfire disturbance to improve predictions of future water supply and suspended sediment loading in disturbed watersheds on the Colorado Front Range. Stochastic weather sequences trained on historical dry-periods are used to create a range of synthetic drought conditions. Connections between historical dry conditions and wildfires are then incorporated to identify potential fire scenarios. Finally, wildfire disturbance is simulated through modification of soil and vegetation characteristics based on historical in-situ and remotely sensed observations. The results from this study have implications for future water management in the West.

### Biography

Aaron received his B.S. in Environmental Engineering from the Colorado School of Mines in 2014 and is currently pursuing a Ph.D. at the University of Colorado - Boulder. During his undergraduate career, he was a member of the McBride Honors Program, studied abroad in Newcastle, Australia, and received an Honors Enrichment Scholarship to intern at TechIDEAS, a software development company in Barcelona, during the summer of 2014. Additionally, he participated in research investigating the effects of tailored, reclaimed water on the irrigation of turfgrass as an undergraduate research assistant. After graduation, Aaron spent a year in Akita, Japan as an English teacher, while volunteering at Save the Water, Inc., a nonprofit dedicated to water contamination research. His current research involves assessing and predicting wildfire impact on water resources in the western United States. Aaron is originally from Grand Junction, CO, and enjoys travel, exercise, painting, and hiking in the great outdoors.