

Human impacts on the hydrologic cycle across the US

Abstract:

Humans are altering hydrologic processes in myriad ways, both directly – through infrastructure and extractions – and indirectly through anthropogenic climate change. However, quantification of the water cycle at continental scales often neglects the direct impact of humans, instead focusing on climate variability and change. This study seeks to fill that gap, including both direct and indirect human-induced hydrologic alteration, over the United States. To do this, a number of datasets characterizing infrastructure, land cover, and river channel alterations are used in conjunction with a calibrated VIC model run to quantify the relative direct and indirect impacts of humans on the water cycle components, identifying hot spots of human alteration. A framework is developed for assessing how alteration through the river network as a prototype for thinking about how anthropogenic impacts propagate through the earth system. Studies such as this are critical for better characterization of the water cycle but also for identifying the drivers of hydrologic alteration and how they vary spatially.

Bio:

Dr. Tara Troy is an Assistant Professor in the Department of Civil Engineering at the University of Victoria in British Columbia, Canada. Her research group focuses on how the built environment impacts a variety of terrestrial hydrologic processes and how to incorporate these impacts into hydrologic models. Prior to joining the faculty at UVic, she was a P.C. Rossin Assistant Professor at Lehigh University, an Associate Research Scientist at the Columbia University Water Center, and did her Ph.D. in Civil and Environmental Engineering at Princeton University.