

"Identifying Controls on Patterns of Intermittent Streamflow in Three Streams of the American Southwest: A Geospatial Approach"

by

Dr. Katie Costigan
University of Louisiana at Lafayette

Abstract

Despite a rising interest in intermittent river systems, landscape influences on long-term wetting and drying patterns of streamflow are not well understood. There has been a significant increase in the presence of intermittent rivers worldwide due to climate change and subsequent increases in groundwater abstraction, and these effects are intensified in already arid regions such as the American Southwest. Consequently, the spatial extent of wet and dry reaches of Arizona's Agua Fria River, Cienega Creek, and San Pedro River has been documented by citizen scientists for several years. Citizen science involves the use of trained members of the public for data collection, and the analysis of datasets produced from citizen science projects have become a huge asset to the scientific community. Here, we synthesize the most current data (1999-2016) to determine what stream and valley characteristics act as drivers for patterns of surface water flow. We found that land cover (i.e., agricultural, urban, and wetland) may be the most significant control on patterns of intermittent streamflow within our areas of study. Agricultural land cover contributed to increases in perennial flow, while urban and wetland land cover contributed to increases in intermittent flow. Physical watershed characteristics (i.e., drainage area, elevation, and slope) and physical channel characteristics (i.e., channel width, slope, and urban land cover) each had some influence on surface water flow patterns. This study highlights the value of citizen science programs and begins to understand what landscape characteristics control the intermittency patterns of desert streams.

Biography

Katie Costigan has been an Assistant Professor in the School of Geosciences at UL Lafayette since 2015. She completed her undergraduate at the University of Connecticut, master's at the University of Nevada, Reno, and PhD at Kansas State University. She then did post doctoral research at Kansas State University and the Ohio State University before going to UL Lafayette. She research focuses on rivers that run dry and is interested in the interactions between hydrology and ecology.