

Jeffery Watson

Hydrologic Investigation of Lower Colorado River Catchment Between Austin and Bastrop, Texas.

My master's thesis research topic focuses on quantifying hyporheic flux along the Lower Colorado River between Austin and Bastrop. Dam releases from Longhorn Dam in East Austin cause localized surface water flux into adjacent river banks downstream of the dam, which would be expected to greatly impact the temperature, chemistry, and biological regimes within the river bank. While my research thus far focuses on specific field sites along Colorado stream reach I currently lack a larger picture hydrologic understanding of the Colorado system. In order to remedy this lack of understanding I propose a project investigating hydrology within the Lower Colorado catchment along the reach of my study area. I will create maps delineating tributary catchments, calculating basin area, and estimating tributary flow in order to better understand how tributaries may be affecting flood pulses from upstream dam releases. I also plan to plot rainfall data from the May 2015 flooding event and somehow integrate it with in-stream flow, conductivity, and temperature data that our research group collected during that same time period along the study reach. This will help us to better understand how the flood pulse changed downstream as inputs from tributaries were added to it. In order to better understand the groundwater endmember that surface waters interact with during flood pulses I also propose to do a spatial analysis of groundwater quality data from the TWDB WIID database. Of particular interest are high levels of nitrate that we observed in wells during May 2015 water sampling. A spatial analysis of groundwater nitrate concentrations could provide insight into the extent of and source of nitrate contaminants.