

# **An Analogy to the Natural Flow Regime: Quantification of River Drying with Satellite Imagery**

***Eliza I. Gilber***

Department of Biology, University of New Mexico, Albuquerque, NM USA

Most rivers around the world are regulated making downstream ecosystems reliant on human management and the natural flow regime paradigm was developed to support regulated river management for ecosystem function. The paradigm suggests hydrograph components (e.g., magnitude, duration, frequency, etc.) drive fish-flow relationships. However, our ability to mimic the natural flow regime is diminishing as human demands and climate driven aridification causes perennial river drying and increased intermittency in naturally intermittent rivers. Here we use a rare dataset from the Rio Grande to assess fish-drying relationships with the idea that drying components, analogous to hydrograph components, can be used to understand how resilient different fish species are to drying. We then assess the feasibility of using satellite imagery of two southwestern rivers to develop a similar river drying dataset. Our results suggest drying components predict the decline or persistence of Rio Grande fishes. Use of satellite imagery to detect and quantify river drying is feasible but some aspects of southwestern rivers such as narrow their widths, riparian species composition, and sediment laden monsoonal water can confuse common algorithms used to remotely detect water.

Contact Information: Eliza I. Gilbert, Department of Biology, 1 University of New Mexico, Albuquerque, NM 87131, Phone: 505-761-4746, Email: [egilbe01@unm.edu](mailto:egilbe01@unm.edu)