

## **Predicting Hydrologic Extremes for Biological Assessment at Ungauged Basins in the Western United States**

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**Abstract.** The goal of this work is to develop statistical models for the prediction of a broader class of flow regime variables chosen for their relevance in biological assessment. Stream ecosystems respond to extremes as well as central tendency variables. We selected ten flow variables that, in our judgment, are sufficient to characterize the hydrologic regime of a stream relevant to biota. These variables include the following that quantify the hydrologic extremes. 1) base flow index (BFI) 2) daily coefficient of variation (DAYCV) 3) average daily flow (QMEAN), 4) Number of zero flow days (ZERODAY) 5) bank full flow (Q1.67) 6) Colwell's index 7) seven day minimum (7Qmin) 8) seven day maximum (7Qmax) 9) number of flow reversals (NOR) and 10) flood frequency. The first step in this effort is to create a database of flow regime variables and watershed attributes at gauged locations to use in model development. We are quantifying the above mentioned variables from stream flow data obtained from USGS Hydro-Climatic Data Network (HCDN) stream gauges in the Western United States. Digital watershed boundaries and other topographic variables for the watersheds of these gauges are being developed from digital elevation models. Climatic, soils and geologic data attributes are being derived for these watersheds from nationally available geospatial information. In this paper we examine the relationship between the watershed attributes and the flow regime variables that quantify the hydrologic extremes.

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