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Quantifying Reference Hydrologic Conditions for California Streams

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Abstract

Defining environmental flow targets for California rivers is complicated by extreme hydrologic variability and an intensive water and land management legacy. Improved understanding of the diversity of natural streamflow patterns and their spatial arrangement across the state is needed to support the future development of effective environmental flow targets at appropriate scales for management applications with minimal resource and data requirements. This talk outlines the development of a spatially explicit reach-scale stream classification for the State of California culminating from two distinct classification studies based on unimpaired streamflow time-series and geospatial information related to climate, topography, geology, and soils. The resulting classification system identifies nine natural flow classes representing distinct flow sources, hydrologic characteristics, and catchment controls over rainfall-runoff response in California. Dimensionless reference hydrographs were generated to characterize the distinct seasonal patterns and daily within-class variability of each natural flow class. This final integrated stream classification and associated dimensionless hydrographs provide a broad-scale hydrologic framework upon which flow-ecology relationships can be established for the State.