

Selected Hydrological Tools for Instream Flow Analysis

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Abstract: The selection of an instream need for a river requires analysis of the riverine hydrology. Selected tools useful in such an analysis are presented in this paper. Experience in the determination of an instream flow water right and in the determination of a regulation establishing an instream flow requirement has shown that riverine hydrological analysis must be tailored to the specific river, the riverine ecosystem, and competing water use needs. The riverine hydrological analysis of a specific river most often will include five regimes. These are 1) annual flow regime, 2) high flow regime, 3) low Flow regime, 4) streamflow variation regime, and 5) sediment transport capacity regime. The annual flow regime includes annual runoff and annual maximum discharges. High flows regime includes the time streamflows exceed a selected lower limit on high flows and the selection of the streamflow that is the minimum for high flow needs in a river. The low flow regime includes the frequency of low flows and the number of zero flow days. Streamflow variation regime considers the variation of streamflows including rapid changes in streamflow. The sediment transport capacity regime considers both the transport of sediment and the maintenance of a channel in a state suitable for a desired ecosystem. The selection of an analysis year is also considered. In the United States this is October – September (a water year) but other starting and ending months may be more appropriated for a specific river.

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