

A VALIDATION STUDY OF A RAPID FIELD-BASED RATING SYSTEM FOR DISCRIMINATING AMONG FLOW PERMANENCE CLASSES OF HEADWATER STREAMS IN SOUTH CAROLINA

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Classifying streams according to permanence is important in determining regulatory jurisdiction and in implementing pollution control programs. Administrators of these programs need rapid methods for making timely and defensible decisions. A rapid, field-based stream classification method developed in North Carolina compares the overall sum of ordinal scores based on observation of 26 geomorphology, hydrology, and biology attributes to numeric thresholds in order to preliminarily classify a stream reach as ephemeral, intermittent or perennial. Our study was among the first to evaluate the method and directly compare classifications based on scores to continuous hydrologic data from electrical resistance sensors and from direct observations of instream conditions during discrete wet and dry season visits. Ephemeral reaches scored lower than intermittent and perennial, but scores were not significantly different between intermittent and perennial reaches. Scores were seasonally stable and related to measures of duration, but not frequency. Geomorphology attributes were not important in a random forest model. Scores of the presence of baseflow in the dry season were more important than those from the wet season. Other important attributes and parameters were macrobenthos, rooted upland plants, bankfull width, drainage area, and ecoregion. Continuous hydrologic data and statistical analysis can be used to calibrate and fine-tune similar tools in other regions.

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