

Reliable Method for Estimating Rating Curves in the Natural Rivers

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Abstract : Stage-discharge curve is one of the conventional methods for continuous river flow measurement. In this paper, an innovative approach is proposed for predicting the stage-discharge relationship using the application of isovel contours. Using the proposed method, it is possible to estimate the stage-discharge curve in the whole section with only using discharge information from just one arbitrary water level. For this purpose, multivariate relationships are used to determine the mean velocity in a cross-section. The unknown exponents of the proposed relationship have been obtained by using the second version of the Strength Pareto Evolutionary Algorithm (SPEA2), and the appropriate equation was selected by applying the TOPSIS (Technique for Order Preferences by Similarity to an Ideal Solution) approach. Results showed a close agreement between the estimated and observed data in the different cross-sections.

Keywords : rating curves, SPEA2, natural rivers, bed roughness distribution

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