DETERMINATION ON INTERVAL BED LOAD TRANSPORT RATE IN STREAMS OF NE GREECE WITHIN THE SENSE OF FUZZY REGRESSION

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ABSTRACT

Fluvial process in river engineering contains a lot of uncertainties. In this work, the bed load transport rate in two streams, in northeastern Greece, was computed by means of Meyer-Peter and Müller formula, by using interval number considering the total roughness coefficient. The spatial variability of the stream bed roughness is expressed, in the present study, by characteristic grain diameters of the bed material. In a next step, a cost function was defined in order to calibrate the Meyer-Peter and Müller formula using the interval output. Based on the concept of fuzzy regression analysis, the produced interval outputs must include all the data. Thus, an optimization model results, which is solved by means of heuristic optimization. 27 measurements of stream discharge and bed load transport rate were carried out in Kosynthos River and 37 measurements in Kimmeria Torrent (northeastern Greece) and they were used for the presented application.

Key-words: bed load transport rate, Meyer-Peter and Müller, fuzzy regression, heuristic optimization