Applying ANFIS to Estimate Stream-Way Erosion

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Abstract

Due to Taiwan’s special geological conditions and the onset of global climate change, increased precipitation intensity has enhanced the development of turbulence inside river channels. Consequently, ongoing erosion takes place in riverbeds and frequency in movement of sediment is increasing. In this study, adaptive-network-based fuzzy inference system was used to analyze and predict river channel erosion, and the results were compared with those obtained through traditional linear regression method. The study used the Houfeng Bridge section of the Ta-Chia River in Taiwan as a case study, and factors such as flow rate, gradient change, amount of sediment, number of typhoons and floods, and geological conditions were included as major factors affecting erosion. Results indicated that under strong turbulence, strong erosion potential exists in flow areas of both Houfeung Bridge and the Chenglung Revetment. Our results were consistent with the actual situation.

Keyword：Erosion, Adaptive-Network-Based Fuzzy Inference System (ANFIS).