Abstract

River channel pattern is controlled primarily by sediment transport rate and mean power, which are influenced by a channel discharge (Q) and slope (S). Discriminators of the form \( aQ^mS^n \) have been shown to quantitatively discriminate the transitions between meandering and braided rivers. We used a commercially available physical model, the Emriver River Process Simulator (hereafter, to investigate whether the relationship developed in the model could be applied to natural systems.

\[ aQ^mS^n = 1 \]

\[ 1 < m < 2 \]

\[ 0 < n < 1 \]

The experiments, the resultant “reasonable effectiveness” of stratigraphic and geomorphic experiments: Earth

Results

Data were plotted on a log graph of dimensionless slope versus discharge. The data form two clearly defined fields of meandering and braided channels. The line determined by the equation

\[ Q = \frac{1}{2} \times 10^{-0.44} \]

Discriminating Meandering and Braided Channel Patterns on the Basis of Discharge and Slope using a Physical Laboratory Model: the Emriver River Process Simulator

Experimental Setup & Procedure:

The physical model is the commercially available Emriver River Process Simulator (Emriver, Inc., 1994). The model includes two main reservoirs: inflow reservoir & outflow reservoir & stream table. The Emriver model sediment is composed of sand, gravel, and pebbles.

The sand used in the model is well sorted, ground mirror plastic. Two grain size analyses were conducted by using the same planning procedure. The sand has a mean grain size of 1.15 mm. A manual probe measure was taken at the sand level of the sand plane, and the mean grain size of the sand plane was monitored at the sand level. The sand plane was monitored with a head gauge (mm).

The water elevation within the reservoir that was the commercially available model and the commercially available physical model. The Emriver River Process Simulator (hereafter, to investigate whether the relationship developed in the model could be applied to natural systems.

Discriminators of channel pattern based on discharge, slope, and sediment transport density.

\[ \frac{Q}{a} = \frac{S}{b} \]

\[ \frac{S}{d} = \frac{a}{c} \]

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Regression analysis

Observations

References Cited