

## **NUMERIC SIMULATION OF WATER FLOW AND DEVELOPMENT OF CHANNEL PATTERNS**

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A variety of channel patterns and relocation mechanisms are observed in natural rivers. The shape and slope of the valley, lithology of the substrate along with the rainfall pattern are the principal parameters that govern the discharge capacity and sediment load of the alluvial system and hence the fluvial style. The effects of slope, shape and roughness of the alluvial tract and of the rainfall pattern, on the drainage network are investigated in a numeric simulation. A set of "cells" of different heights represents the river-valley. Transfer of water-parcels between neighboring cells, a function of (1) the relative elevations of the cells, (2) relative heights of water columns in them, (3) the directional inertia, mimics the flow. The modification of the topographic surface related to the erosion or deposition is not considered. Preliminary results show that water added in the upper reach of the valley flows downward along quasilinear paths similar to natural channels. A multi-channel pattern develops when water input is highly periodic and both cross-valley and down-valley slopes are low. It is observed, however, that the multi-channel pattern is only developed where the topographic surface is sufficiently rough. A single channel pattern is favored by low periodicity of the water-input and high cross-valley and/or down valley slopes. At constant but high water-input and where cross-valley and down-valley slopes are not too high, the flow is essentially non-localized and sheet-like regardless of the degree of topographic irregularity.