Dependence on Initial Conditions in a Numerical Model of River Network Formation GEOFFREY POORE, Department of Physics, University of Illinois at Urbana-Champaign, SUSAN KIEFFER, Department of Geology, University of Illinois at Urbana-Champaign — We investigated the effect of initial conditions on river network formation, using a simple model of erosional dynamics. Previous research suggests that river network scaling and geomorphic properties may be sensitive to initial conditions, but this has not been systematically studied. We used simulations of a stream power law, with initial conditions consisting of a flat or sloping surface combined with random fluctuations in elevation, and considered dependence of steady-state solutions on initial slope and randomness. The sinuosity exponent and the sinuosity are sensitive to these initial conditions, while the Hack exponent and hypsometry show little or no sensitivity. The results suggest that initial conditions deserve greater consideration in attempts to understand the emergence of scaling in river networks.

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