

**Some influences of channel characteristics on sediment surface roughness in a cellular automata model.**

Nancy E. Brown

Department of Geosciences, Colorado State University, Fort Collins

Jorge A. Ramirez

Water Resources, Hydrologic and Environmental Sciences Division, Civil Engineering Department, Colorado State University, Fort Collins

**Abstract.** A cellular automata model of interactions between particles in a stream channel was used to simulate the effect of varying stream channel characteristics, including sediment particle size distribution, bed width or slope. Series of runs were generated, with each run having a different initial value of one of the channel variables. Each run was continued until the modeled channel surface roughness stabilized. Preliminary model results indicate that, with some exceptions, an increase in the initial particle size distribution width, bed width or slope results in increasing geometric roughness of the channel boundary after the system has evolved to a stable state. In contrast, a small but distinct reduction in bed slope was correlated with increasing width of the particle size distribution, in the runs with varying particle size distributions.