

## Suspended Sediment Transport in Flash Floods: Turbulence and Boundary Shear Stress

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Sediment transport in flash flood dominated channels has received relatively little study compared to perennial streams, despite arid and semi-arid landscapes covering one-third of the earth's surface. Precipitation events in arid regions can result in high surface runoff into ephemeral channels, resulting in flash floods that can be highly erosive and destructive. A flash flood hydrograph is composed of three major parts. First is a flash flood bore or "wall of water," a front of water typically characterized by increased turbulence, followed by a rising limb with increasing discharge, and lastly a decreasing falling limb. Field observations show that sediment transport rates are elevated in the flood bore and decrease in the rising limb even though discharge is increasing. Two experimental facilities are used to test the hypothesis that elevated turbulence in the bore results in higher sediment transport rates; the first is a large channel-like flash flood flume and the second is a rotating drum flume. Data from these experiments show that flash flood bores have higher suspended sediment transport rates, turbulent kinetic energy, and boundary shear stress than steady flow.

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