

Modeling Dry Ravel in 3D

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Abstract. Dry ravel describes the down slope movement of soil and rock particles due to gravity. The process occurs most commonly in semi-arid locations where slopes are greater than the ravel particle's angle of repose. In these environments, vegetation can trap particles behind their stems and hold material on slopes with root systems. After a fire, the removal of vegetation frees the particles to roll, bounce, and/or slide down slope. Land managers are interested in predicting dry ravel movements as these materials can load channels and gullies with sediment that can later be transported on to streams and reservoirs. Researchers at Washington State University developed a spatial mass flux dry ravel model to help fill this need. This model is being further developed using dry ravel field measurements from four small watersheds in the San Dimas Experimental Forest. Different model configurations related to ravel movement, velocity limitation, and pre-fire ravel storage behind vegetations stems are being tested against the field data in order to optimize model performance.