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Scientists find soil density affects speed and impact of landslides

Even small variations in the porosity of soil can affect a landslide's speed, scientists with the U.S. Geological Survey say. Rapid slides can cause fatalities while slower slides only tend to damage property.

Richard M. Iverson, a hydrologist with the Cascades Volcano Observatory in Vancouver, Wash., and his colleagues use a 310-foot-long, sensor-equipped concrete flume in the H.J. Andrews Experimental Forest near Eugene to study landslides.

They mimicked a mountain slope to track how soils behaved when water was added. In high porosity, or loosely packed soil, the addition of water sets off a chain of events that reduces the frictional strength between soil grains. This effect liquefied the slope into a high speed flow. Slightly denser soils — only one-tenth less porous — increased frictional strength, resulting in slower landslides.

The researchers reported their findings in the current issue of Science.

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