

# Mass Movement

## Definition

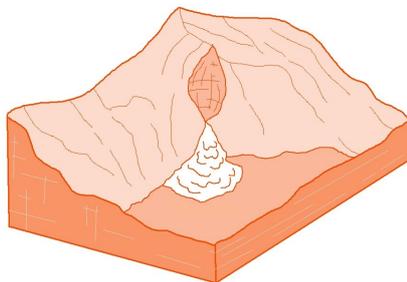
The movement of rocks, earth and surface material downhill as a result of gravitational forces acting on the slope.

## Types of mass movement

Mass movement is broadly classified into four types of movement.

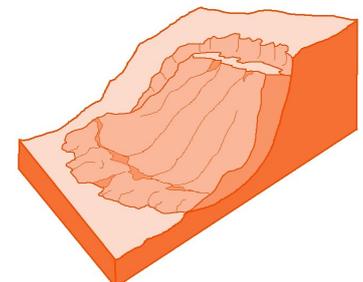
**Falls** Falls are movements of dry material that occur very quickly. They can create cones of material at the base of slopes known as talus cones. The space that has been vacated is known as a scar.

Examples include rock falls, land falls (right) and cliff toppling.



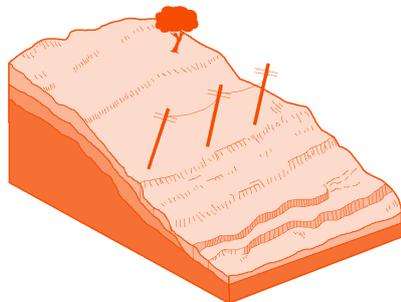
**Slides** Slides are movements of wet material, which tend to happen relatively quickly. Water in the earth or rock tends to create a slip-plane on which the material slides.

Examples include rotational slumps which tend to happen on curved slopes (right) and translational slides which happen on flat slopes.



**Creeps** Creeps are very slow movements of relatively moist earth and soil, that can continue for hundreds of years. Terracettes (earth wrinkles) can form on slope surfaces and features such as fences and trees can start to lean and move down slopes too.

Examples include soil creep (right) and earth spreads.



**Flows** Flows are very quick movements of loose material, usually mixed with water. They are most often seen during flood events and are very dangerous due to their speed.

Examples include mud flow (right), and debris flow.



## Factors that affect mass movement

**Plate Tectonics:** Vibrations and shifts in the Earth's crust can dislodge material and create scenarios where mass movement is more likely. Equally, the tectonic folding of rock layers on the crust surface can expose different rock types and if a weaker rock is exposed to meteorological elements, mass movement may be more likely. Volcanic eruptions of ash near water commonly produce mud flows or 'lahars'.

**Geology:** Some rocks have a geological structure that means that mass movement may be more likely. For example layers and fissures that run through sedimentary rocks may allow them to more easily slide over each other in wet weather conditions.

**Gradient:** The steeper the slope the more likely it is that mass movements will happen frequently due to the force acting on a greater gradient.

**Water:** Water has a number of different effects on a slope. It can create slip planes on which already loose material can slide. It also adds to weight to soil, making it more likely to move on a gradient. Water can also get between particles of soil and rock and push them apart, making the debris more likely to move.

**Vegetation and Buildings:** Plant life can stabilise some slopes as root systems can hold soil in place. However on a rocky slope, these roots may also force strata apart and increase the chance of mass movement too. Buildings built on slopes can also add weight and make the force of gravity on a slope much greater.