Getting to Know: Erosion by Gravity

Have you ever seen a sign that reads “Falling Rocks?” Warning signs are necessary in areas where erosion by gravity causes dangerous conditions. Gravity is constantly pulling on objects that are on Earth’s surface. That is why loose rocks fall down mountainsides. Erosion by gravity causes rapid movements of material such as landslides, but it also causes material to shift so gradually that the movement is difficult to detect.

What is erosion by gravity?

Gravity is a force of attraction between two masses. Erosion is the removal of weathered rocks or soil from their original location. That means erosion by gravity occurs when rocks are pulled down an incline by the force of gravity.

Sometimes a few pebbles will roll down a hill while at other times, an entire wall of rock and soil can move down a slope. This is called a mass movement.

What are examples of mass movement?

Mass movement may occur suddenly over a large area. For example, rocks along a steep cliff can suddenly fall to the bottom in a landslide. Sometimes, weather can influence the mass movement of rock material. Persistent rains can soak the ground causing sudden mass movements called mudslides. During a mudslide, the force of gravity pulls soil, rocks, and vegetation rapidly downhill. The sudden movement of material can endanger lives and destroy property and habitat.

Ground creep is another example of mass movement over time. During creep, the soil slowly shifts downward. The movement may go unnoticed until things on the surface such as fence posts and trees are moved from their original location.

Misconception 1: Aren’t erosion and weathering the same?

Weathering and erosion often work together, but they are different processes. Weathering breaks down rocks, whereas erosion carries the broken material away.
**Does erosion by gravity always cause large masses of rock to move?**

Erosion by gravity can also affect very small pieces of rock. Gravity can pull small pieces of rock to the bottom of a slope. One boulder or one pebble can fall down a slope, landing at the bottom. The rocks gather at the bottom forming a *talus slope*.

**What are some other types of erosion by gravity?**

*Abrasion* occurs when rocks bump and tumble into each other causing them to break. Abrasion on a slope is an example of both mechanical weathering and erosion by gravity. Loose rocks rolling down a mountain will bump into other rocks causing them to break. Then the rocks continue to move down the hill, away from their original locations.

**Can erosion by gravity be prevented?**

Many people look for ways to control erosion by gravity. For example, to control soil erosion, farmers will plant crops so that they align with the contours of a hill. This limits the amount of soil that washes down the hill. The plants hold the soil more securely, preventing soil erosion.

In some regions, trees act as barriers to erosion by gravity. Fences are also commonly used. Construction crews may also build tall walls along highways to prevent sediment from falling onto the roads.

**Misconception 2: Do we need to stop all erosion?**

Erosion is not always harmful to ecosystems. New soil is formed by a combination of weathering and erosion. In fact, a special name is given to soils that form from rock material that is not original to a region. These soils are called *transported soils* because the rock material that makes them up was transported by erosion.