

Landslides: On the Road of Destruction

By Joyce Furstenau

Landslides happen often and can be one of the most destructive forces on earth. In Washington state, the Nile Valley landslide occurred on October 11, 2009. Later that month, a landslide occurred in North Carolina on October 25. Two more occurred in Tennessee on November 10, 2009. All of these landslides caused road closures and severe road damage. The worst landslide in history occurred in China on December 10, 1920. Over 180,000 lives were lost in this landslide.

A landslide is a natural disaster. Most landslides take place when part of a mountain breaks away and slides down its slope. Landslides usually happen as a result of gravity. Landslides occur when something changes the stability of the slope.

A landslide can cause serious damage to the area around it. It can cause rivers to change course and cause flooding. A landslide can cover sections of roadway cutting off access. Roads buckle under the stress of the ground deformation.

What causes these changes? An increase in underground water can put pressure on a slope from deep beneath the soil. The pressure causes the slope to become unstable. Simple erosion can also cause a slope to become unstable. Erosion happens more often where there are no plants to keep the soil in place. Other times, heavy rains, snow, or snowmelts can cause the soil to loosen. In the winter of 1996-97, severe storms brought heavy rain and snow to Seattle, Washington. The soils became saturated and over one hundred landslides were reported in the area. Many people lost their homes in these slides.

Serious events such as earthquakes and the eruption of volcanoes can also cause landslides. Earthquakes can destroy entire cities and are not easily predicted. Human activities can also create unstable conditions on a slope. Vibrations from machinery, blasting, construction, and de-forestation activities can also cause landslides.

Landslides are divided into five basic categories. A *debris flow* is usually a quick, mass movement in which a combination of loose soil, rock, organic matter, air, and water flow down slope. A *debris avalanche* is the same as a debris flow, only faster. An *earthflow* is when the material at the top of a slope either becomes so fine or so saturated with water that it moves downhill. This leaves an empty "bowl" at the top of the flow, creating an hourglass shape to the flow. A *mudflow* is created when the dirt on a slope gets so saturated that it slips away. They are often called mudslides.

Finally, a *creep* is a slow, steady, downward movement of the soil or rock that forms the slope. This generally happens over a period of time and often, measures can be taken to protect these areas from further erosion.

Landslides are dangerous natural disasters. It is important for geologists to understand the causes of a landslide so they can try to prevent them from occurring wherever they can.



Name _____



Date _____

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Questions

1. What is a landslide?

_____ 2. What landslide occurred in Washington state in 2009?

- A. the Toutle River landslide
- B. the Interstate landslide
- C. the Nile Valley landslide
- D. the Pacific slope landslide

_____ 3. Which of these things can be an underlying cause of a landslide?

- A. too much rain
- B. an increase in underground water
- C. an earthquake
- D. all of the above

_____ 4. Over one hundred landslides were reported in the area of what city in the winter of 1996-97?

- A. Portland
- B. Boise
- C. Seattle
- D. Fresno

5. Which kind of landslide leaves an hourglass shape?

_____ 6. Which kind of landslides happens over a long period of time?

- A. an earthflow
- B. a mudslide
- C. an avalanche
- D. a creep

