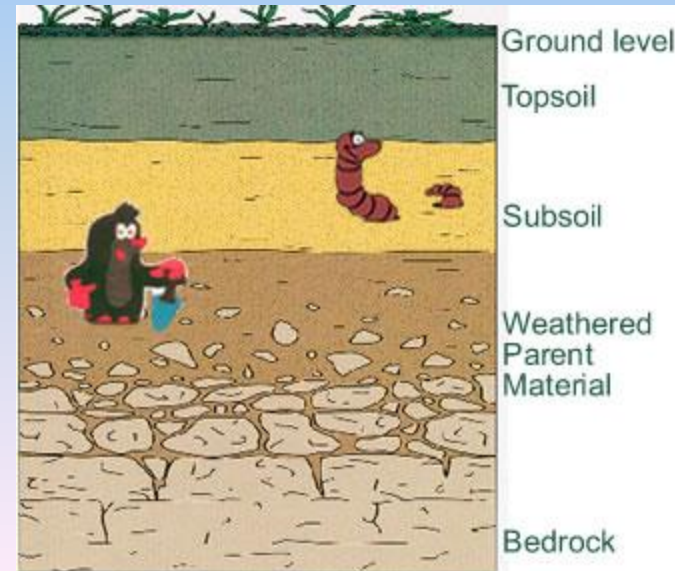


# Chapter Soil

## 5.2B

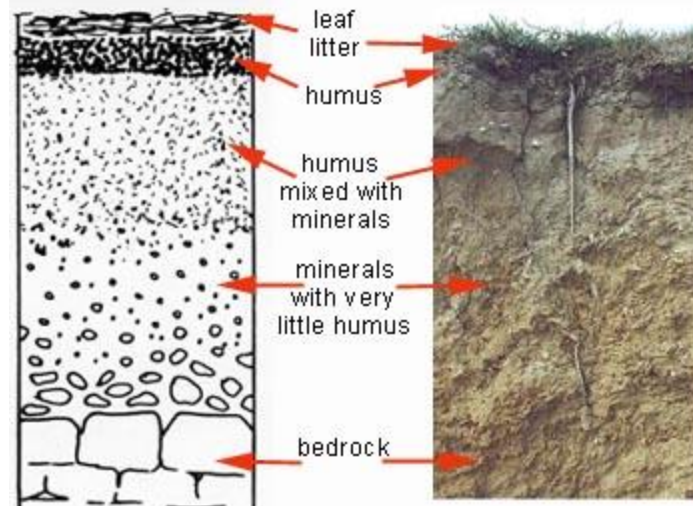
You will be able to...

- *Identify the three soil horizons*
- *Explain how human activities affect the rate of soil erosion.*

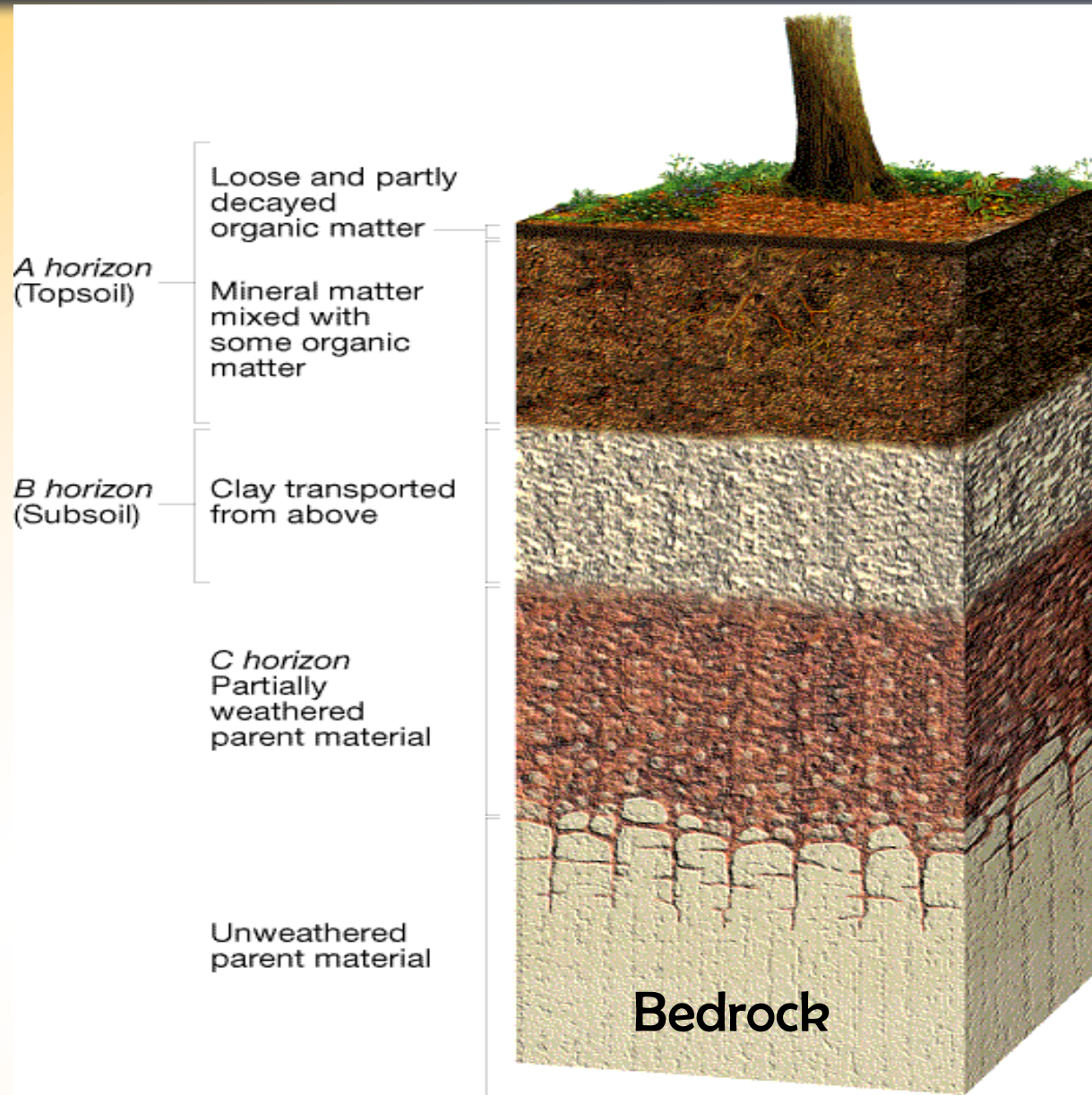


# 5.2 Soil Profile

- ◆ Soil varies in composition, texture, structure, and color at different depths.
- ◆ **Soil horizons** are zones or layers of soil.
- ◆ A **soil profile** is a vertical section through all the soil horizons.



# Soil Profile

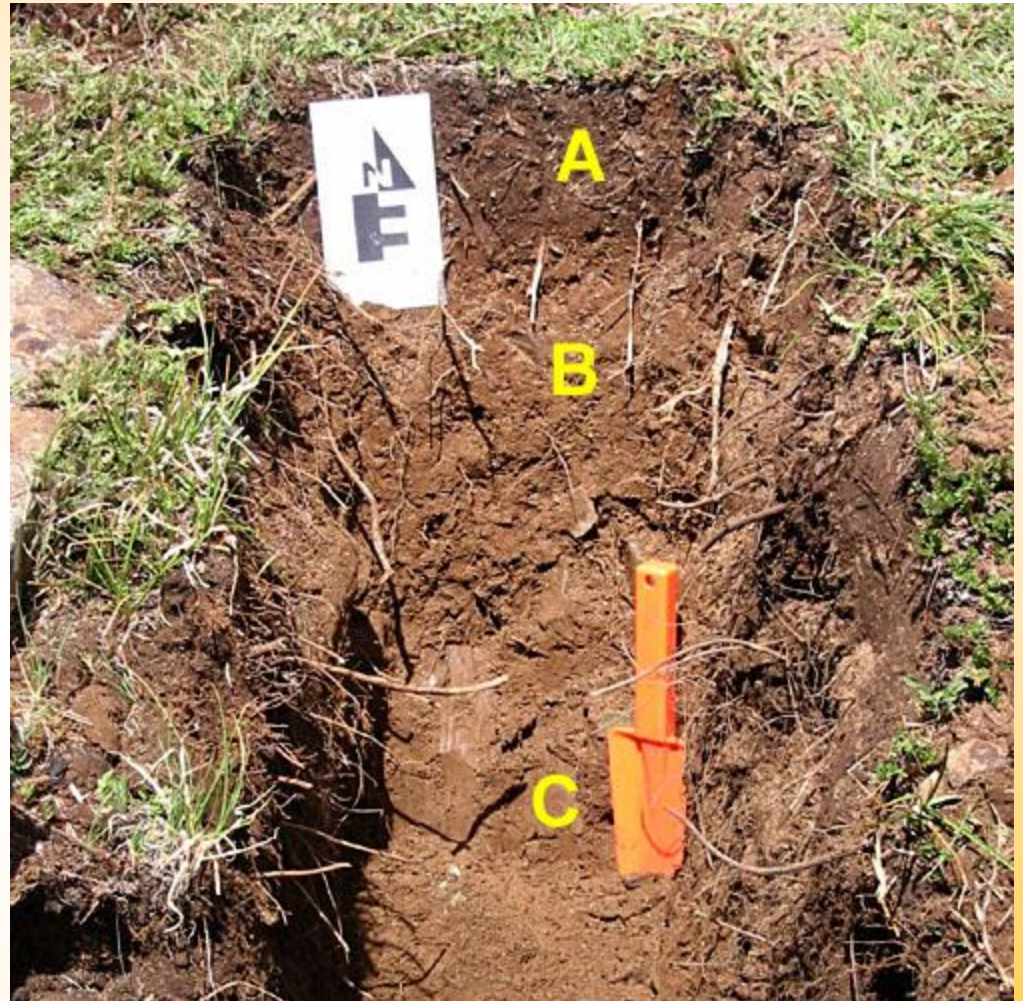


# A Soil Profile Showing Different Horizons

*Can you identify  
the three soil  
Horizons?*



# Soil Profile



# 5.2 Soil Erosion

- ◆ Water erodes soil.



**Figure 18 Gullies** The unprotected soil in this field in southern Colombia is deeply eroded.



**Figure 17 Soil Erosion by Raindrops** A raindrop can splash soil particles more than a meter away from where it strikes the soil.

# 5.2 Soil Erosion

## ◆ Rates of Erosion

- Human activities that remove natural vegetation, such as farming, logging, and construction, *have greatly accelerated erosion.*



**Figure 16 Clearing a Tropical Rain Forest in Borneo** The laterite soil cannot support agriculture for more than a few years.

# 5.2 Controlling Erosion

- Planting rows of trees called windbreaks
- Terracing hillsides
- Plowing along the contours of hills
- Rotating crops



Chapter

# Mass Movements

## 5.3

**You will be able to...**

- *Define mass movement*
- *Identify what triggers mass movements*
- *Classify mass movements*

# 5.3 Triggers of Mass Movements

- ◆ The transfer of rock and soil downslope due to gravity is called **mass movement**.



# 5.3 Triggers of Mass Movements

- ◆ Among the factors that commonly trigger mass movements are:
  - saturation of surface materials with water
  - oversteepening of slopes
  - removal of vegetation
  - earthquakes

**Figure 19 Landslide** This home in Pacific Palisades, California, was destroyed by a landslide triggered by the January 1994 Northridge earthquake.



## 5.3 Types of Mass Movements

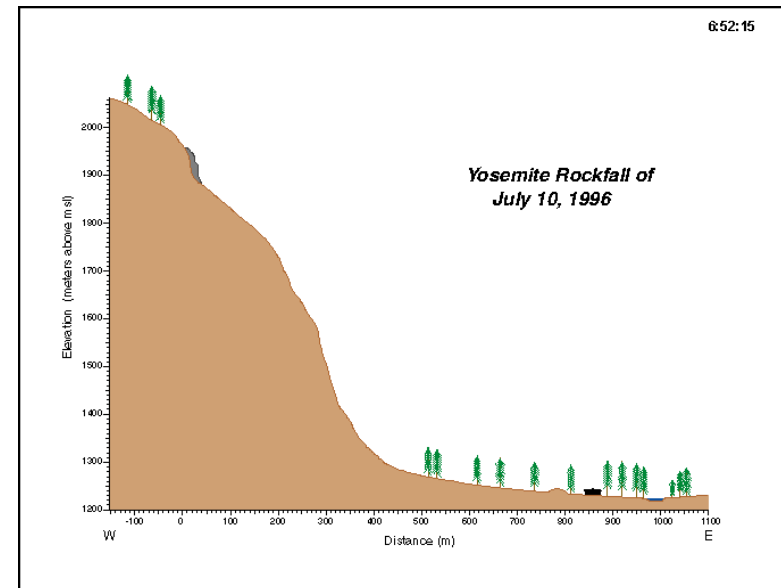
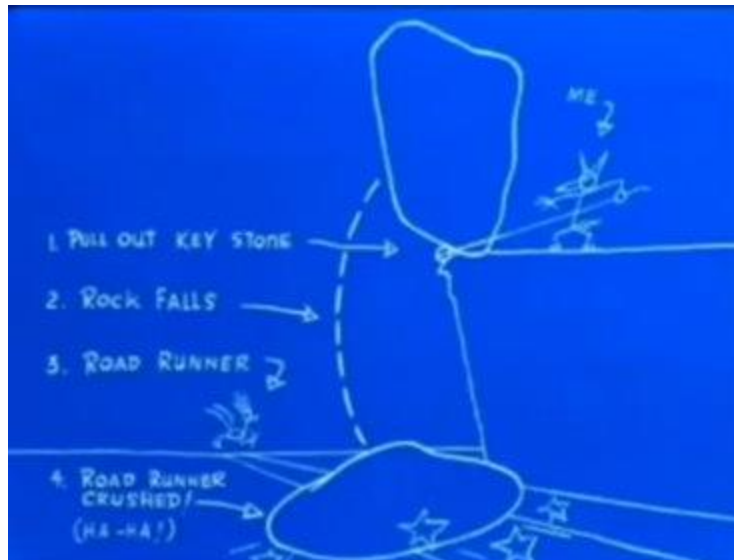
- ◆ Geologists classify mass movements based on:
  - the kind of material that moves
  - how it moves
  - the speed of movement.

# 5.3 Types of Mass Movements



## ◆ 1) Rockfalls

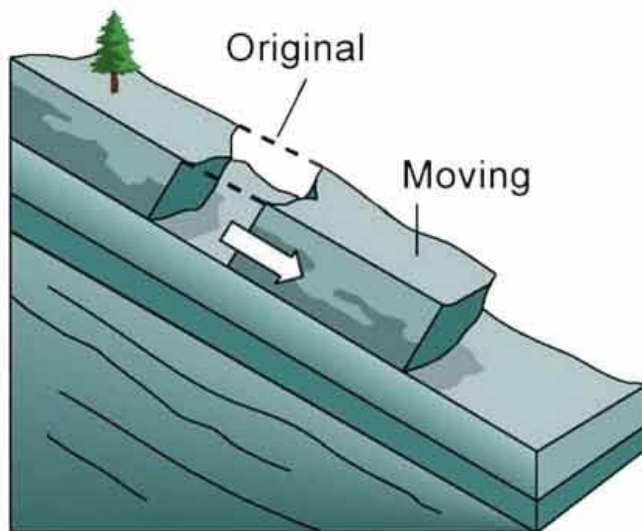
- A **rockfall** occurs when rocks or rocks fragments fall freely through the air.



# 5.3 Types of Mass Movements

## ◆ 2) Slides

- In a slide, a block of material moves suddenly along a flat, inclined surface.
- Slides that include segments of bedrock are called **rockslides**.



# 5.3 Types of Mass Movements

## ◆ 3) Slumps

- A **slump** is the downward movement of a block of material along a curved surface.
- Leave a crescent-shaped cliff just above the slump.

**Figure 22 Slump** Heavy rains triggered this slump in Santa Barbara, California. Notice the crescent-shaped cliff just above the slump.



# 5.3 Types of Mass Movements

## ◆ 4) Flows

- Flows are mass movements of material containing a large amount of water.
- **Mudflows** move quickly and carry a mixture of soil, rock, and water that has a consistency of wet concrete.
- **Earthflows** move slowly. Tongue-shaped mass



**Figure 23 Earthflow** This small, tongue-shaped mass movement occurred on a newly formed slope along a recently built highway.

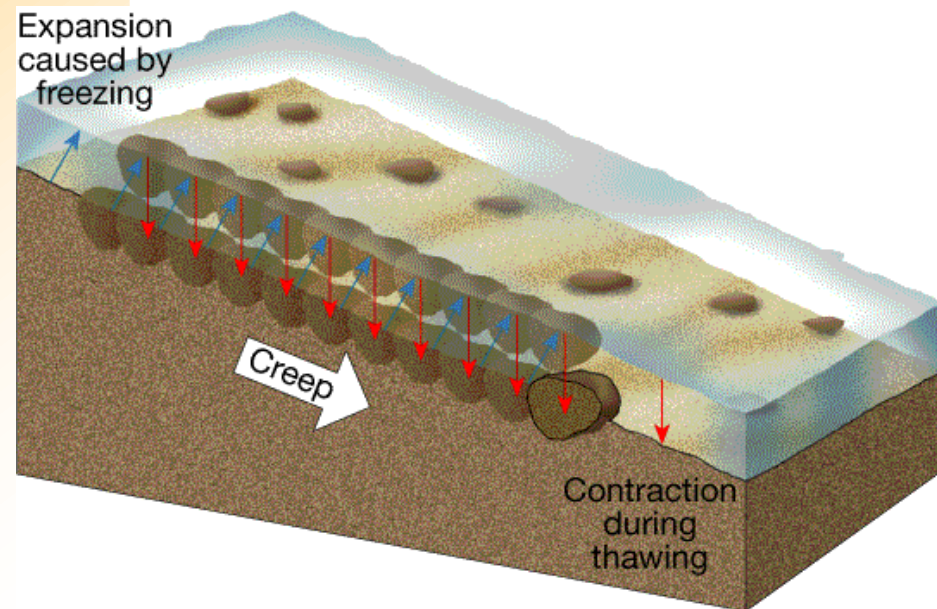
**Comparing and Contrasting**

*Which other type of mass movement looks most similar to an earthflow?*

# 5.3 Types of Mass Movements

## ◆ 5) Creep

- **Creep** is the slow, downhill movement of soil and regolith.



**Figure 24 Creep** **A** Repeated expansion and contraction of the soil on a slope results in a gradual downhill movement of the soil. **B** Years of creep have caused these gravestones to tilt. **Inferring** In which direction is creep occurring in this photograph?

