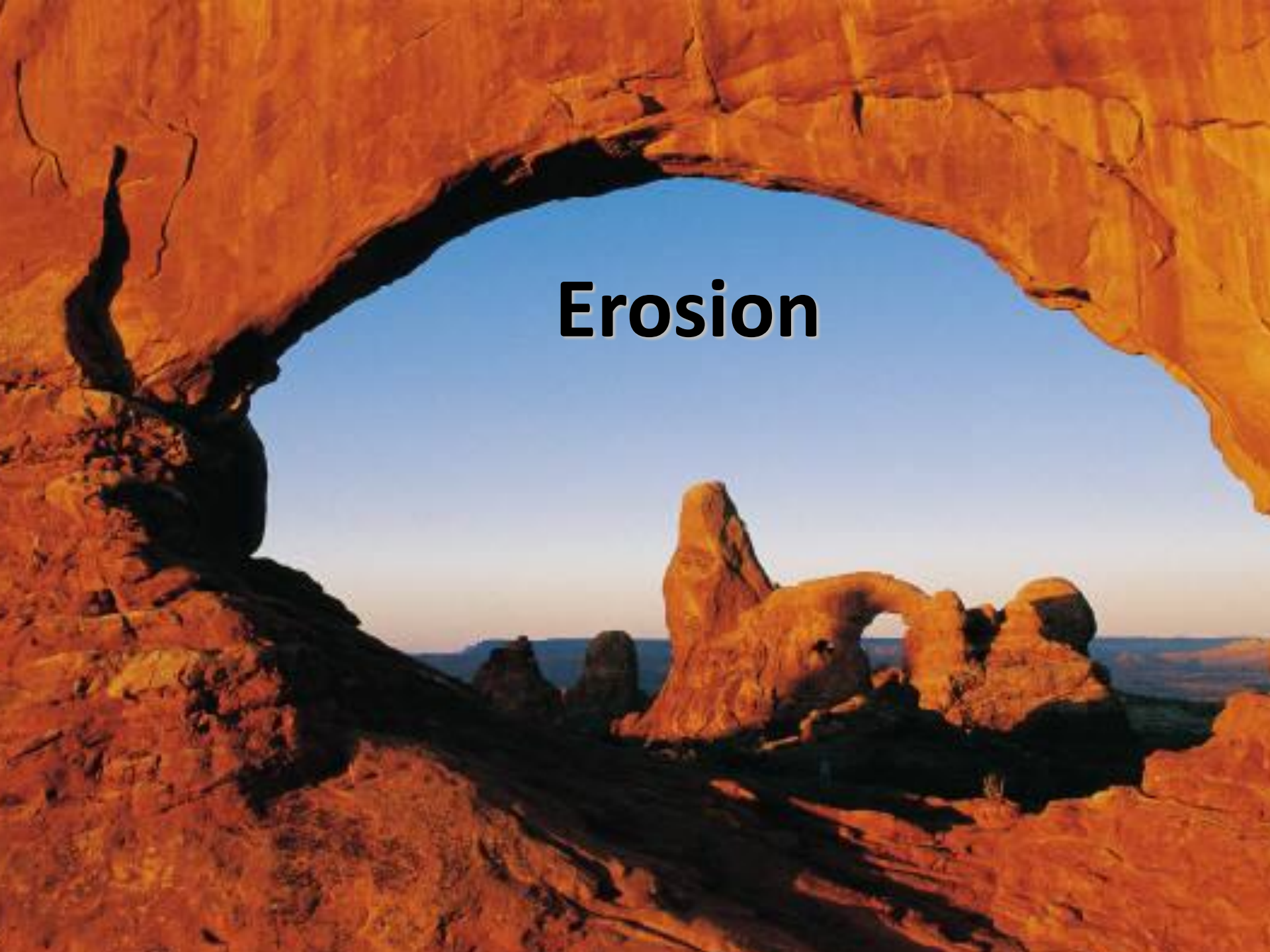
Erosion and Deposition

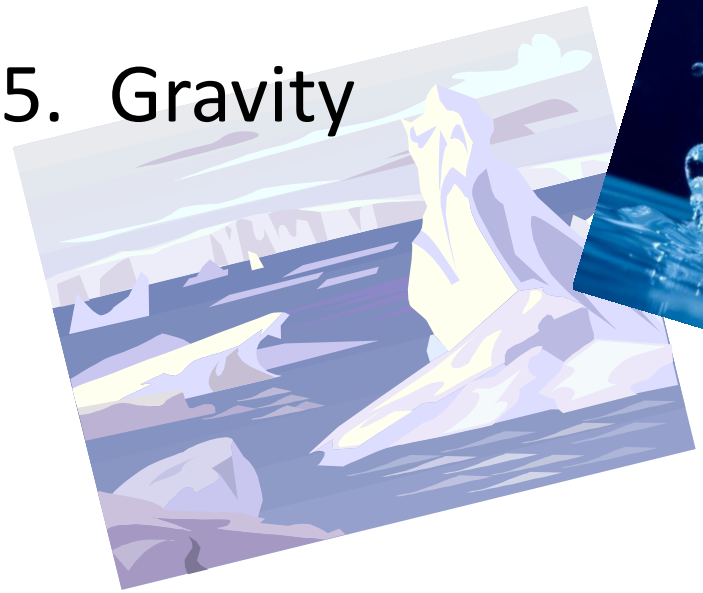

Erosion

Erosion-

- the process by which wind, water, ice, or gravity transports soil and sediment from one location to another

The 5 Agents of Erosion and Deposition

1. Surface/running water
2. Ocean waves
3. Wind
4. Ice
5. Gravity



1. **Surface/Running Water**

- We'll actually come back to this topic in the next unit.
- For now, this is what I want you to know:

1. **Surface/Running Water**

- It's the major cause of erosion (think of rivers and streams).
- When water moves, it carries particles called the **load**.

2. **Ocean Waves**

- **<u>Waves</u>**: caused by <u>wind</u>
  - Can <u>break</u> solid rock and <u>throw</u> broken pieces against shore

2. **Ocean Waves**

- Rushing water enters cracks, breaks off large boulders, and washes away sand.
- Sand particles polish other rocks.
- Rocks continually break down until they become sand particles.

2. **Ocean Waves**
Features From Erosion:

- **Sea stacks**: once connected to the mainland, which eroded and left an isolated column of rock

- **Sea caves**: waves cut large holes in weak rock, common in the cliffs of limestone rock

- **Sea arches**: when a cave erodes all the way through

2. **Ocean Waves**
Features From Erosion:

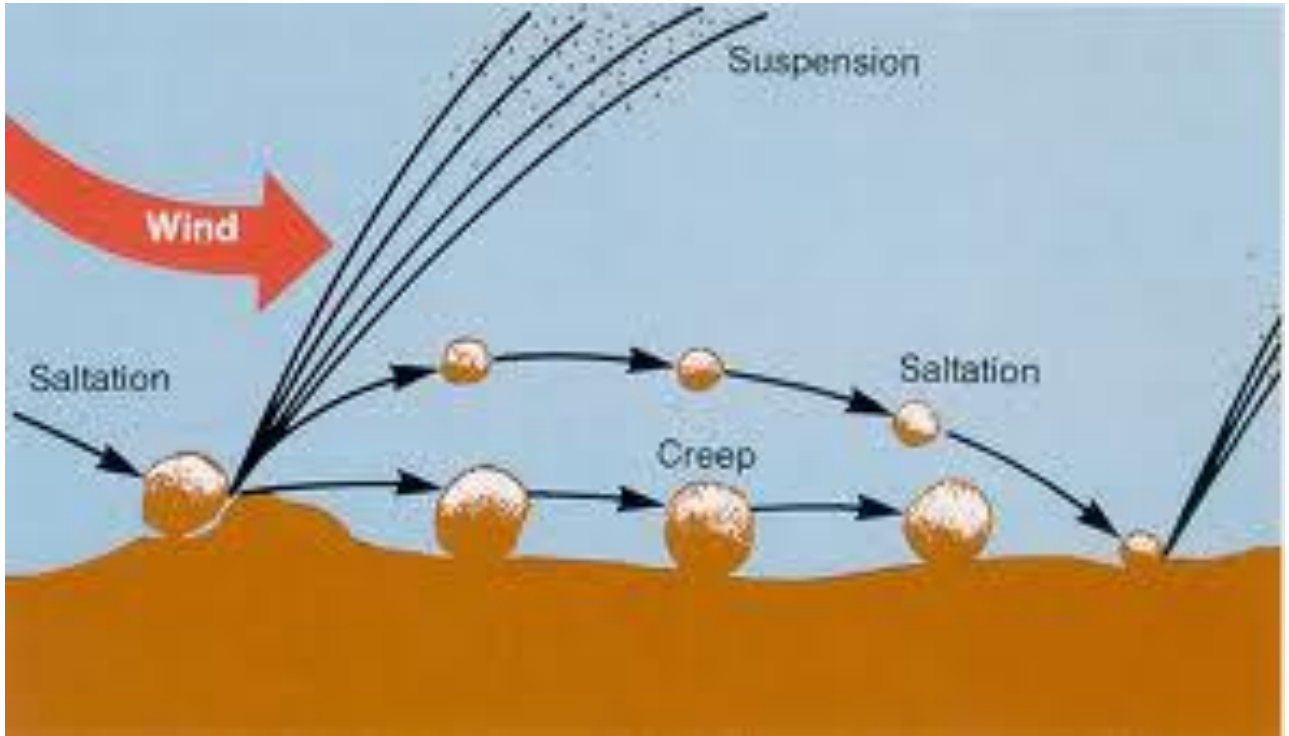
- **Headlands**: finger-shaped projections that erode slower than the surrounding rock
- **Wave-cut terraces-** when a sea cliff is worn back and makes nearly level platform beneath the water

3. Wind
Things to Know:

- Wind is caused by uneven heating of the Earth's surface by the sun.
- Some places are more vulnerable to wind erosion.
  - Ex: Places without a lot of plants

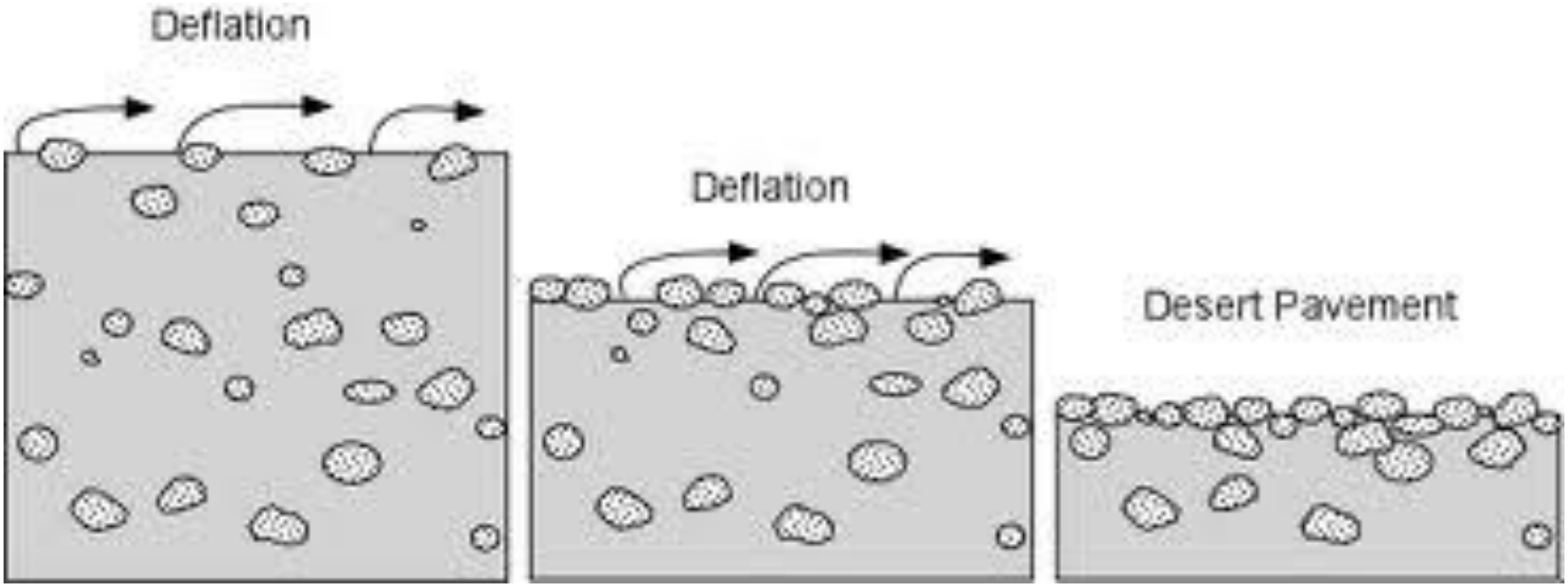
3. Wind
Processes of Wind Erosion:

- **Saltation**: skipping and bouncing of sand-sized particles
  - Bump into each other and the ground



3. Wind
Processes of Wind Erosion:

- **<u>Deflation</u>**: removal of the sediments by wind
  - Leaves <u>heavy</u> pieces behind



3. Wind
Processes of Wind Erosion:

- **<u>Abrasion</u>**: grinding and wearing of rock surface by other particles.

4. Ice
Things to Know:

- **Glacier**: an enormous mass of moving ice
  - Form in places where snow stays on the ground year-round

4. Ice

Things to Know:

- **<u>Alpine</u> glacier**: in mountains/valleys.
  - As it flows down, it broadens valleys into <u>U-shapes</u>.

4. Ice

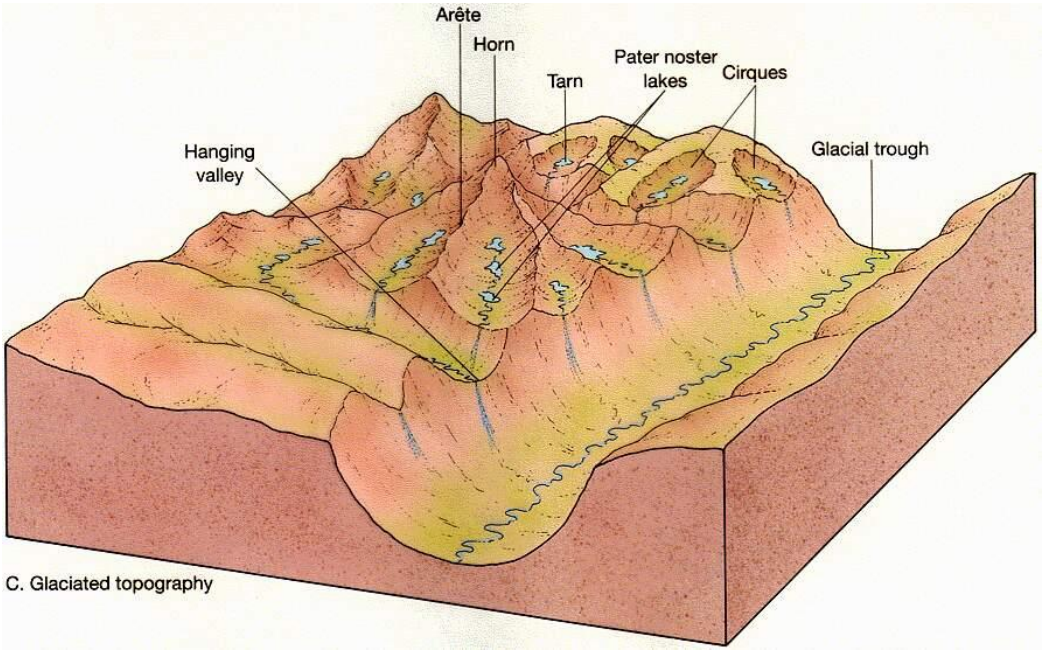
Things to Know:

- **Continental glacier**: spans entire continents

- http://www.youtube.com/watch?v=lOjEBp8sR1c

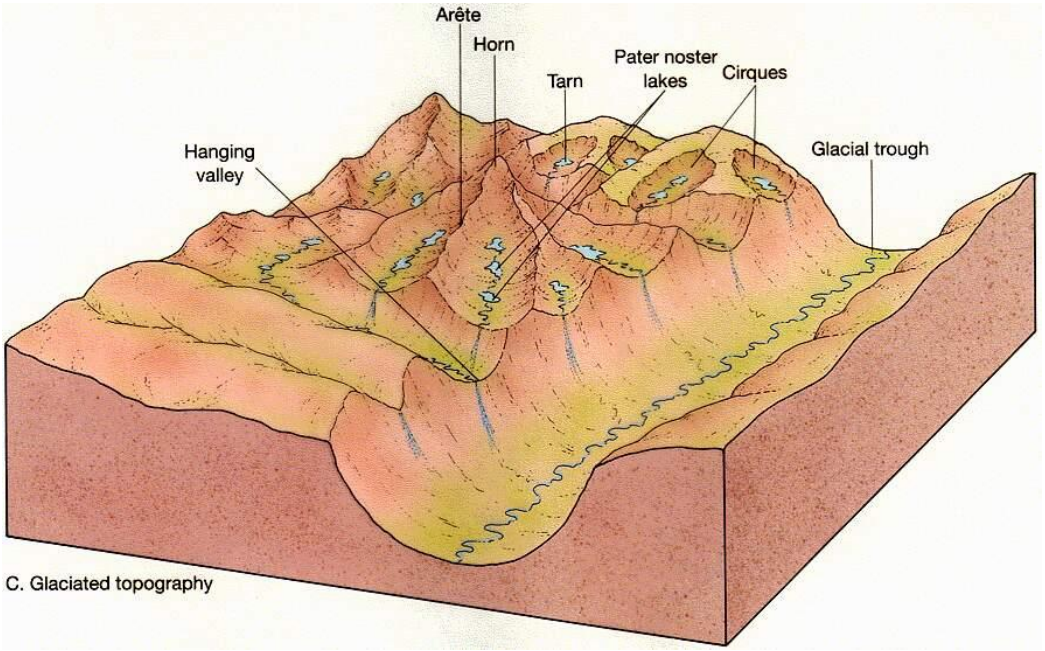
4. Ice
Features Caused by Ice Erosion:

- Horns: sharp, pyramid-shaped peaks
- Cirques: bowl- shaped depressions
- Arêtes: jagged ridges that form between two or more cirques in the same valley



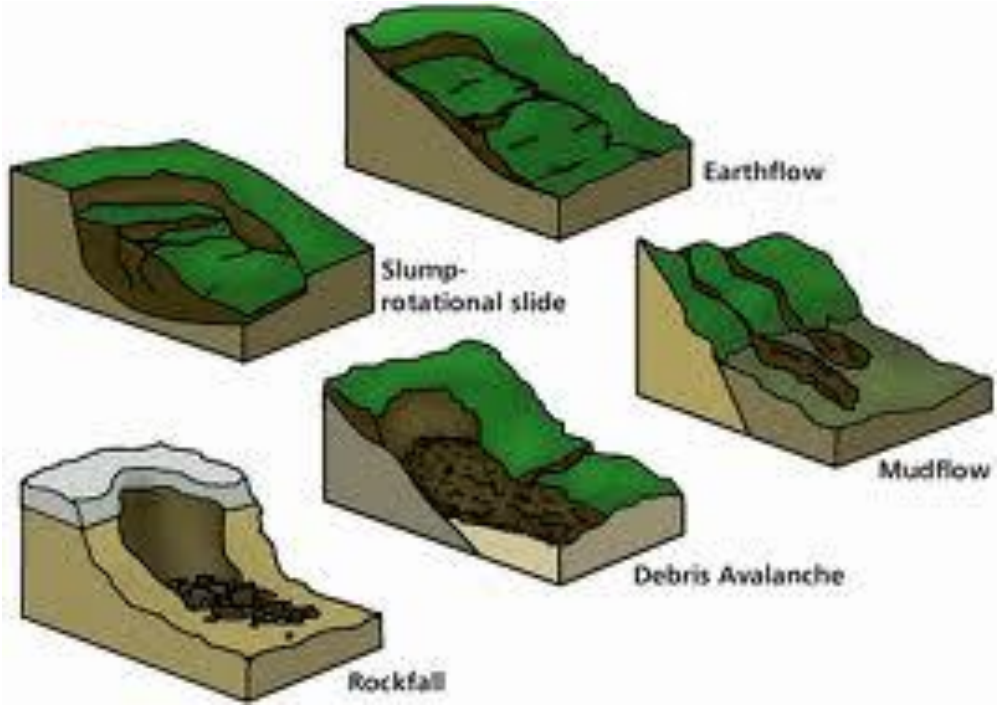
4. Ice
Features Caused by Ice Erosion:

- U-shaped valleys: when a glacier erodes a river valley from its original V-shape to a U-shape
- Hanging valleys: smaller glacial valleys that join the deeper main valley
  - Usually forms a waterfall when the ice goes away



5. Gravity
Things to Know:

- **<u>Mass movement-</u>**
  a movement of a section of land <u>down a slope</u>
  - Can have rapid mass movement or slow mass movement

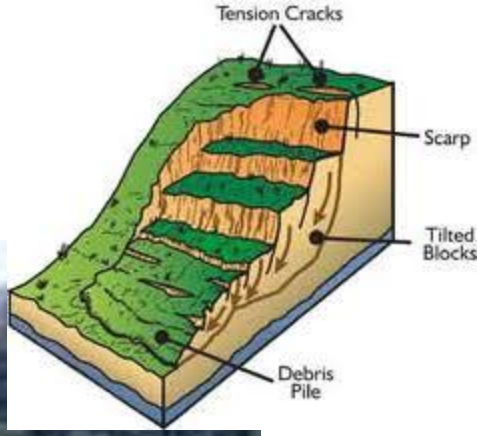


5. Gravity
Rapid Mass Movement

- **Rock fall**: loose rocks fall down a steep slope
- **Landslides**: sudden movement of rock/soil down a slope
- **Mudflow**: mud/rock and soil mixed with a large amount of water
  - Lahar is a special kind with volcanic ash

Rock Fall

Landslides

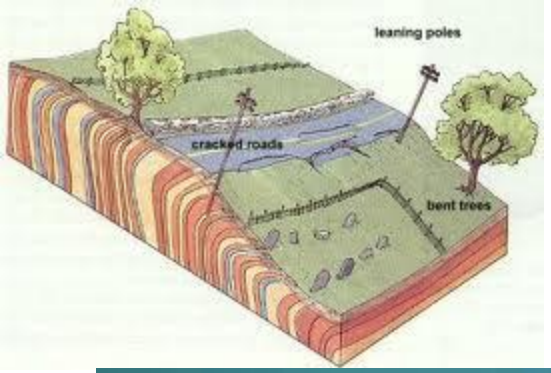



Mudslides

5. Gravity
Slow Mass Movement

- More frequent, less noticeable
- More material is moved over time
- **Creep-** extremely slow movement of material down a slope
  - Caused by water loosening soil, burrowing animals, etc.

Creep



Deposition

Deposition:

- The process in which material is laid down

1. Surface/running water

- Water carries the particles, or **load**.
  - The particles can then be deposited elsewhere.

2. Ocean Waves
Features From Deposition:

- **Shoreline deposition**: deposition along the shore when waves lay down various materials (sand, rock fragments, dead coral, and shells)
  - Makes a **beach**
    - Different types of beaches

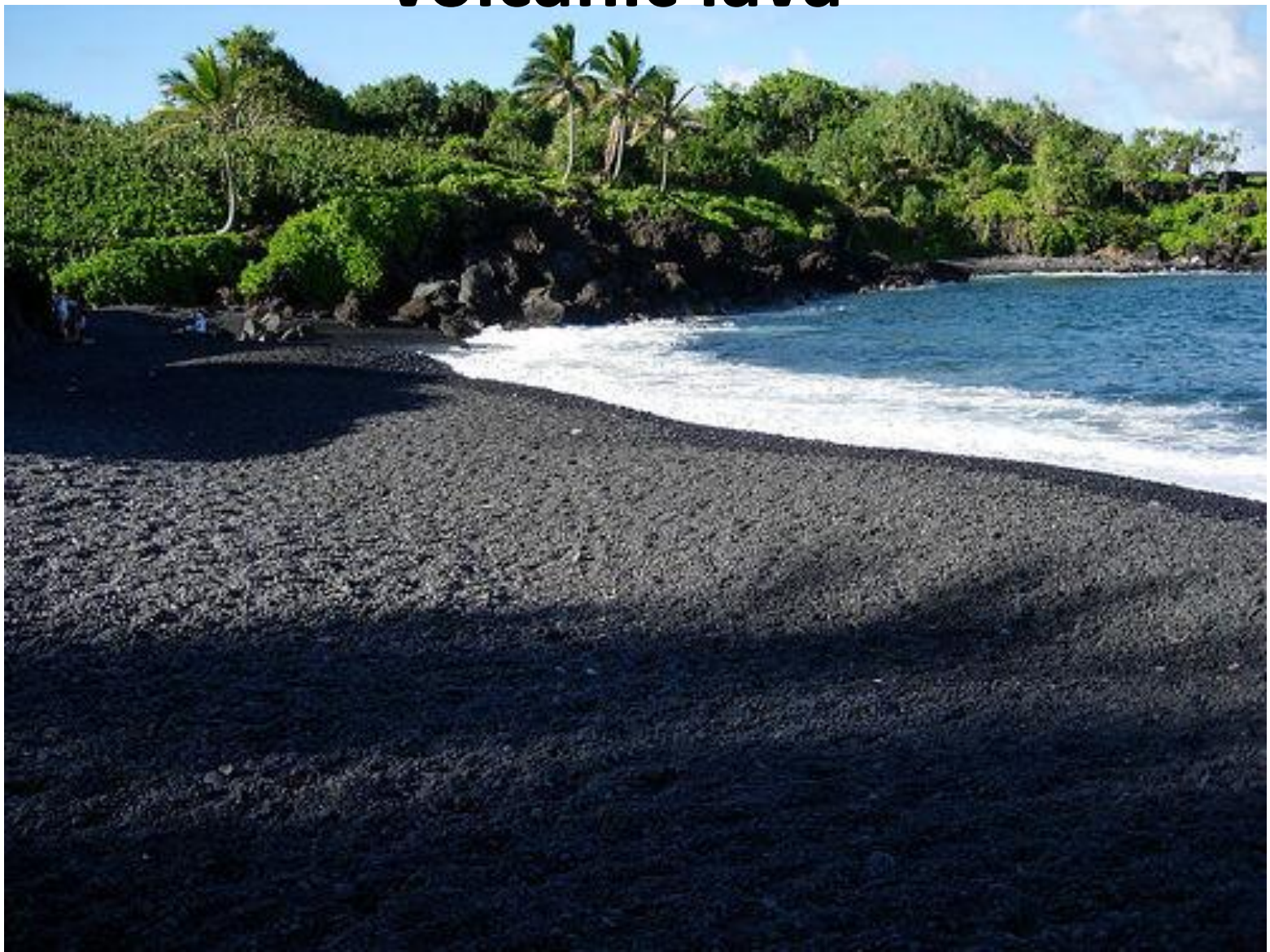
The Typical Beach- Made from broken-down quartz

Glass beach in CA


Virgin Islands- fine white coral

Florida- small seashells

Hawaii- black sand from eroded volcanic lava



2. Ocean Shoreline/Waves Features from Deposition:

- Offshore deposits: **sandbars** are underwater or exposed ridges of sand, gravel, or shell matter
- When they are connected to a shoreline, it's called a **barrier spit**.
  - Ex: Cape Cod

Sandbar

Barrier Spit
Cape Cod, Massachusetts

3. Wind

Wind Deposited Materials:

- Loess: fine-grained sediments
- Dunes: mounds of wind-deposited sand

Sand dunes

4. Ice
Types of Ice Deposits:

- **Glacial drift-** all material carried and deposited by glaciers
- 2 Types
  1. **Till**: unsorted rock material deposited by glaciers (unsorted= a mix of rock particles of different sizes)

4. Ice
Types of Ice Deposits:

2. **Stratified drift**: deposits that have been sorted by the action of streams or meltwater