# Topic: Weathering, Erosion, and Deposition

**Aim:** What are the different agents of erosion?

**Erosion -** the movement of weathered material

**1. Erosion by Gravity –** a.k.a. mass movement

Gravity is the driving force behind all erosion

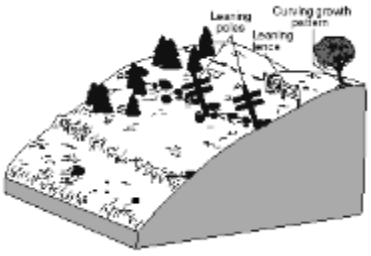
**Evidence of Gravity Erosion -** unsorted (mixed) sediments found at the bottom of a steep slope

Examples:

a. landslides

b. mudslides

c. avalanches



**2. Erosion by Wind –**

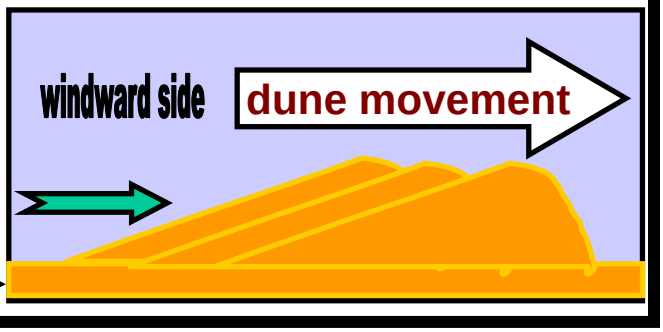
- dominant force of erosion in deserts

- contributes to beach erosion

**Evidence of Wind Erosion –**

a. mushroom rocks

b. dune formation and migration



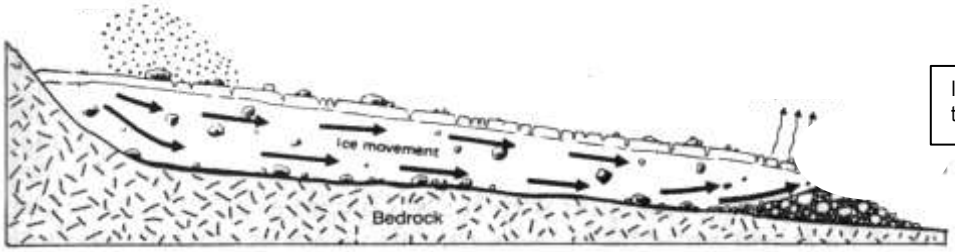
## 3. Erosion by Glaciers - large masses of moving ice

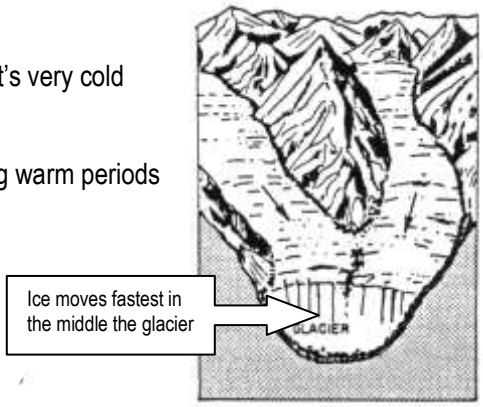
**Today, glaciers are found on Earth:** high latitudes (near the poles) and high elevations

### Glacial Movement

**Glacial ADVANCE -** snow accumulation > ice melting … glacier grows when it's very cold

**Glacial RETREAT -** ice melting > snow accumulation … glacier shrinks during warm periods




### Evidence of Glacier Erosion –

a. U-shaped valleys

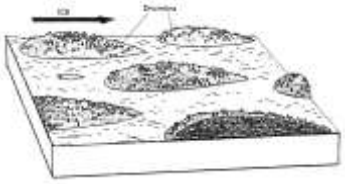
b. polished bedrock with parallel grooves (scratches or striations)

c. hills of unsorted sediments

d. erratics – random boulders dropped off by glaciers

e. **moraines -** elongated hills of glacial till (unsorted deposits) dropped off directly by glacier when it melts (hills on Long Island's north shore)

f. **drumlins -** unsorted teardrop-shaped hills that point in direction of glacier movement



g. **outwash plain –** sorted rock material deposited by glacial meltwater (Long Island's flat south shore)

h. **kettle lakes -** steep lake left when glacier carves out a hole and then ice from glacier melts to fill it (N.Y.'s Finger Lakes)

## 4. Erosion by Running Water (streams, rivers, runoff from precipitation, etc..) -

water is the dominant agent of erosion on Earth today

## Evidence of Water Erosion –

a. rounded, smooth sediments

b. sorted and layered sediments

c. V-shaped stream valleys (canyons)

d. delta formation – triangular landform at the end of a stream where eroded sediments are dropped off

**Stream Velocity (speed of water)** determines the amount of erosion – **faster = more erosion**

Factors that affect stream velocity:

| a. Gradient (slope of the land) | b. Stream Discharge (volume of water in the stream) | c. Channel Shape |
|---|---|---|
| steeper = faster velocity | more discharge = faster velocity<br>- greatest in the spring when snowcaps on mountains melt and because of excess rainfall<br>- increases when smaller rivers flow into a bigger one | strighter = faster velocity |

## Stream Velocity affects Carrying Power

Faster streams can carry more particles, and larger particles.

What is the biggest particle size that can be carried by water moving at…

a. 0.1 cm/sec? **.002 cm (silt)**

b. 1.0 cm/sec? **.02 cm (sand)**

c. 20 cm/sec? **.3 (small pebbles)**

Streams carry sediments in 3 different ways:

**rolling on the bottom** – larger (coarser), denser particles

**suspension** – smaller (finer) particles are carried in the water

**solution** – some minerals dissolve in the water (salt)