NOTES- GLACIER MOVEMENT, TYPES, + GLACIATIONS

Glacier- large mass of recrystallized snow that is on land and is moving

a. Snow compacts into firn (granular ice) then firn compacts into glacial ice
b. **Accumulation** the amount of snow added annually
c. **Ablation** – the amount of ice lost annually

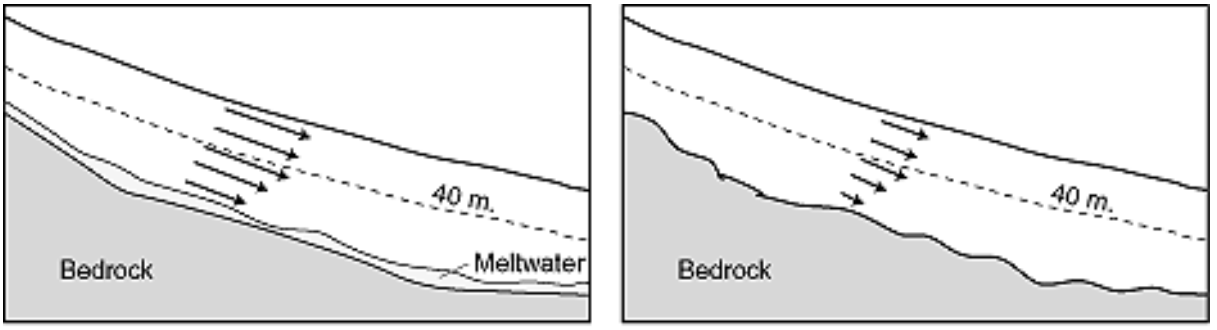
4 mechanisms responsible for ablation

a. Melting
b. **iceberg calving**- pieces of ice break off and form icebergs when a glacier reaches a shoreline
c. **sublimation**- ice turns directly into gas
d. **wind erosion**- strong winds can cause melting and sublimation

II. GLACIER MOVEMENT—ultimately, movement occurs due to gravity

1. **internal plastic deformation**, (or **internal flow** or **ductile flow**)
   a. the glacier's weight becomes too much to support itself
   b. ice layers slip within the glacier
   c. glacier moves downhill like a deck of cards being spread
   d. top layers move more quickly than the bottom layers due to friction at base

2. **basal sliding**
   a. Pressure at the base of the glacier causes a thin layer of ice to melt.
   b. This reduces friction,
   c. the entire glacier moves as a single unit like it's on a water slide



Wet glacier Dry glacier

- **Dry glaciers**: In colder climates, basal melting is minimal or absent, and flow is entirely through internal plastic deformation.
- **Wet glaciers**: In warmer climates, basal slip can predominate.

3. Glaciers always move forward, never backward
   a. **Stationary** --If it moves forward at the same rate as the front of the glacier melts
   b. **Advancing** – when a glacier moves forward faster than it melts
   c. **Retreating**—when a glacier melts faster than it moves forward

4. Move 300ft (100 m) per year**,** and mostly in summer

III. TYPES OF GLACIERS

1. **Continental** glaciers / **Ice Sheets** -large mass of ice that covers almost all surface features (must cover at least 30,600 square miles (50,000 km)
   a. Examples: Antarctica, Greenland
   b. 2-3 miles thick!

2. **Alpine**/ **valley**/ **mountain** glacier - between 2 mountains
   a. Examples: Andes, Rockies, Himalayas, Alps, Mt Kilamenjaro, Mt Kenya

3. **Piedmont** glacier - a valley glacier that enters a lowland plain and spreads out like a fan
   a. Example: Malaspina glacier in Alaska

4. **<u>Cirque</u>** glacier- glacier fills "bowl" on mountainside then eventually feeds valley glaciers
    a. Example: Switzerland

IV. 4 glaciations of the last ice age (2,000,000 ya to 10,000 ya)

1. **<u>Glaciation</u>** - the temporary enlargement of a glacier during an ice age
2. Named by the state that the ice reached
    a. Nebraskan = 2,000,000 ya
    b. Kansan = 1,250,000 ya
    c. Illinoisan = 500,000 ya
    d. Wisconsin = 40,000 ya