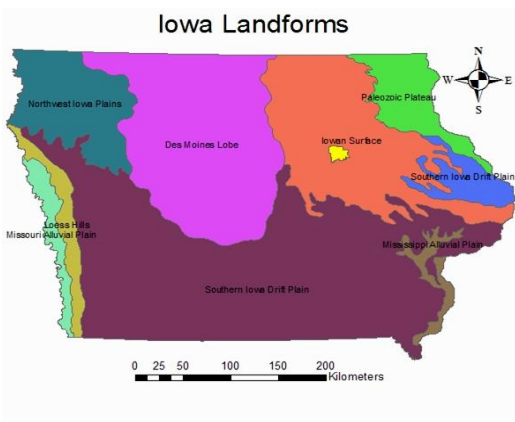


Glaciers

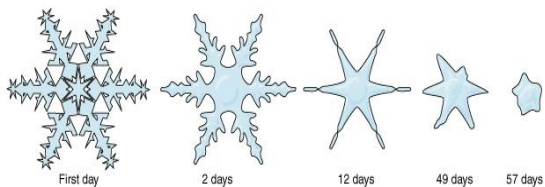


Why study glaciers?

- Glaciers and climate change
- Iowa's surficial geology



Snow to ice



Glaciers

- A body of ice, firn, and snow that is,
 - On land and
 - On the move!

Glacial Regimes (zones)

- Terms
 - Accumulation
 - Equilibrium line
 - Ablation

Zone of accumulation

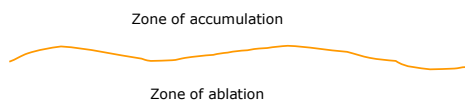
- Area of positive gain
- Highlands

Zone of Ablation

- Area of loss
- The 'distal' glacier area, ice is lost!
 - Melting
 - Sublimation
 - Erosion
 - Caving into water.

Equilibrium line

- A irregular line separating the two primary glacial zones



Glacial movement

- Accumulation > Abalation
- Accumulation < Abalation
- Accumulation = Abalation

Glaciers are dynamic

- Fact: Glacial movement and gravity
- Concept: Glacial margins and retreat
- Abalation > Accumulation.
 - Glaciers always flow **forward** or down gradient!

Basic types of Glaciers

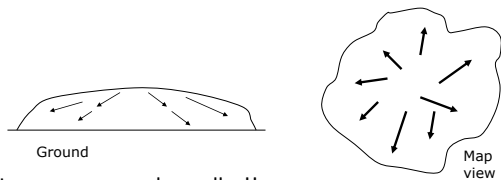
- Continental
- Alpine
- Piedmont

Ice sheets and caps

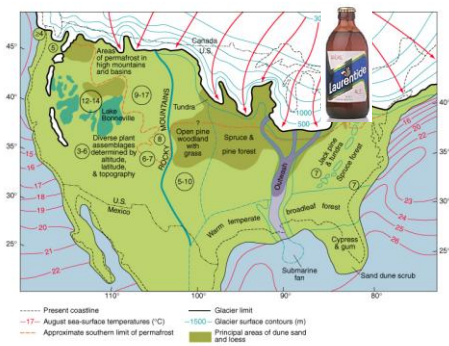
- Massive, unconfined, bodies of snow, firn, and ice
 - Ice sheets are larger than ice caps
- Extremely sensitive to climatic change

Morphologic classification of glaciers

1. Continuous sheets; Ice sheets (i.e. continental glaciers)



Ice caps are much smaller!!

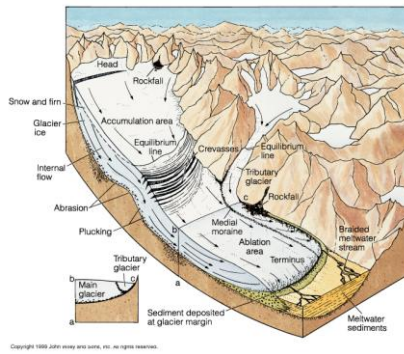


Laurentide Ice Sheet

Alpine glaciers

Confined by topographic features such as mountains or valleys.

- a. Cirque glaciers
- b. Valley glaciers



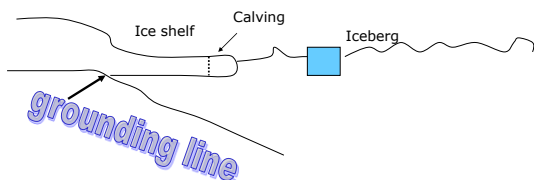
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C.E. Heinzel

Glacial calving

Calving is when glacial ice from an ice shelf breaks off into the water forming an iceberg.



Glacial products

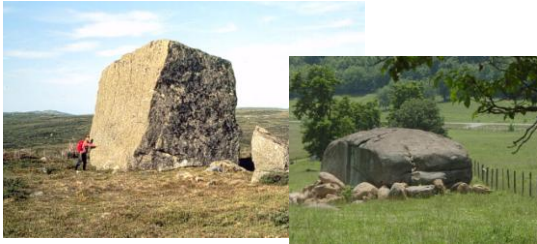
- Deposition
- Erosion



Concept

- Glacial are conveyor belts that transport mass amounts of sediment.

Glacial Erratics



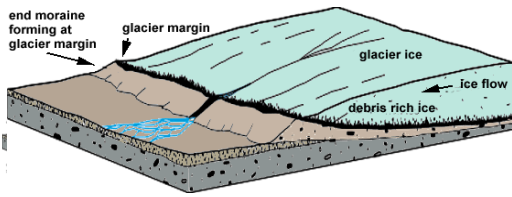
Till



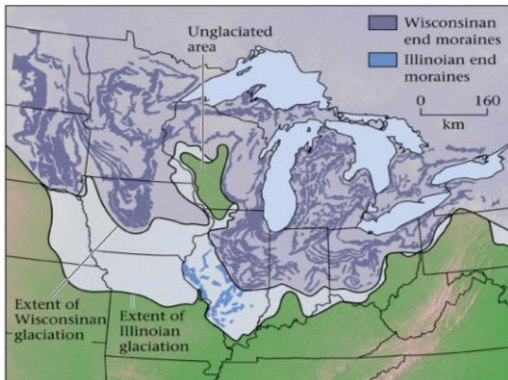
Depositional Landforms

- Moraines
- Eskers
- Drumlins (Depositional/Erosional)

Moraines



End moraines



Eskers



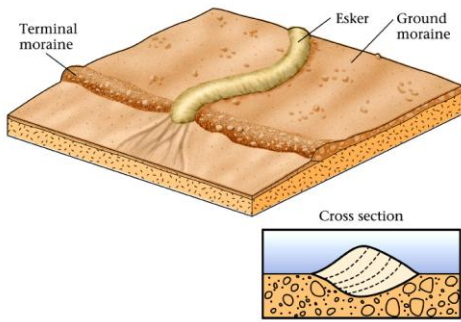


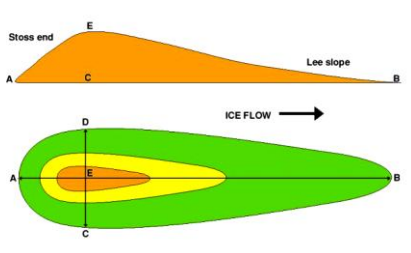
FIGURE 22.31

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Drumlins



Drumlin shape



Erosion Processes

- Abrasion
 - Concept

- Plucking
 - Concept

Coarse-grained Abrasion

- Striations

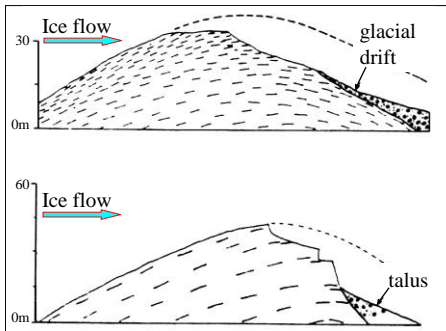


Fine-grained abrasion

- Glacial Polish



Plucking



Roches Moutonnees