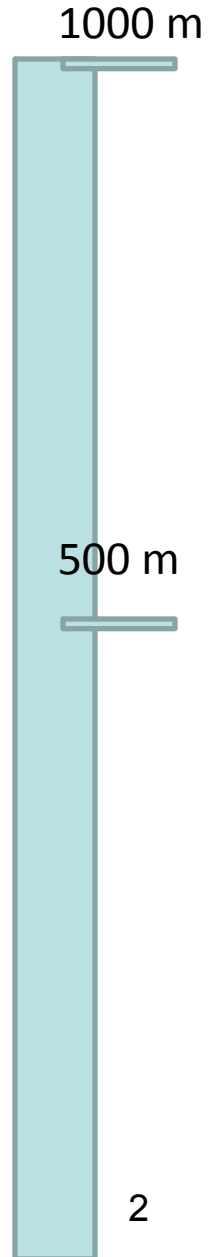


# Glaciation of Canada

Mr. Wittmann  
CGC1D1

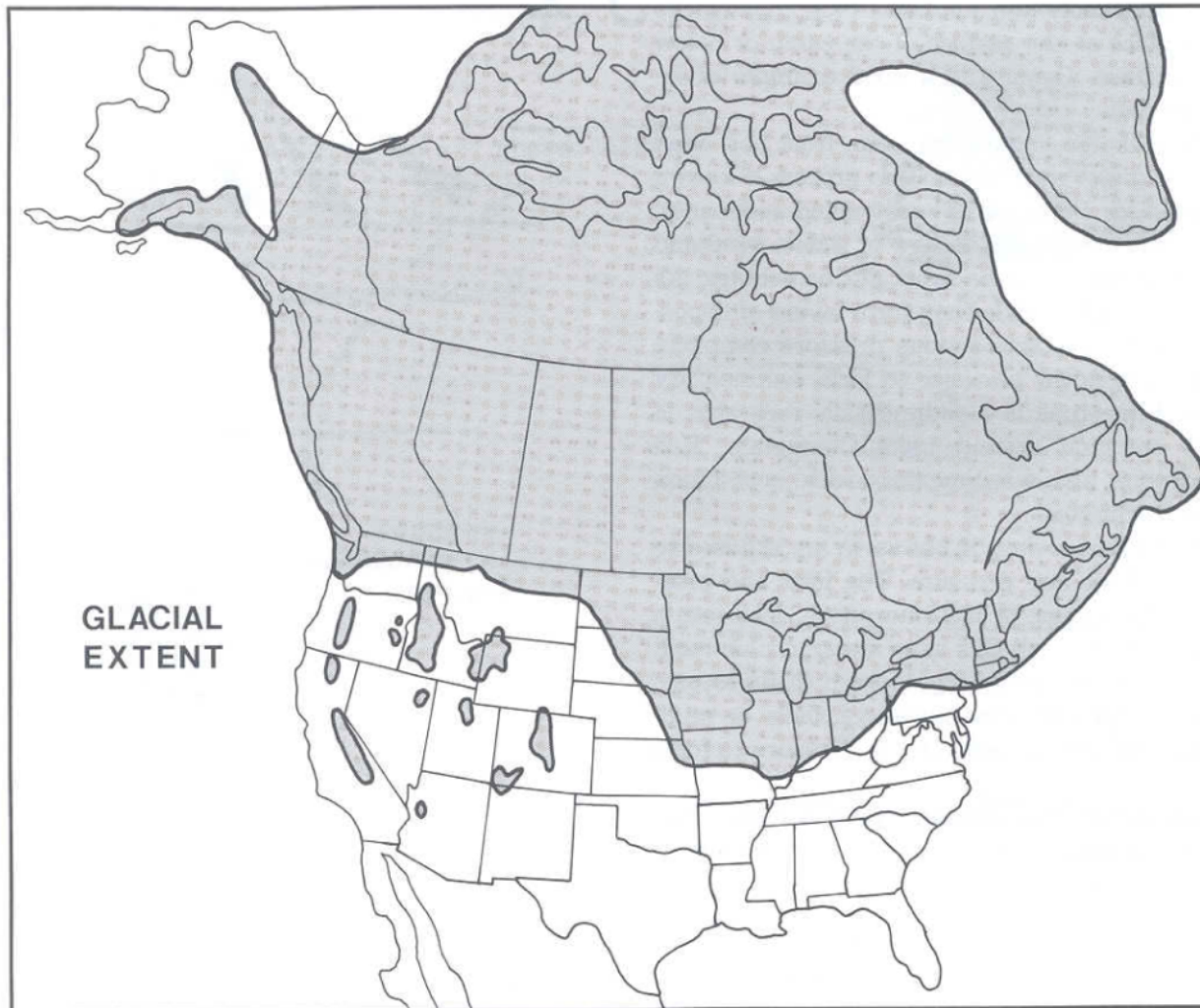
# Glaciation Happened Fast...

- Peaked 20,000 years ago
- Glaciers took thousands of years to form
- Glaciers advance (get larger) and retreat (get smaller)
- Glacier ice is thousands of metres thick
- Glaciers can move and change the landscape

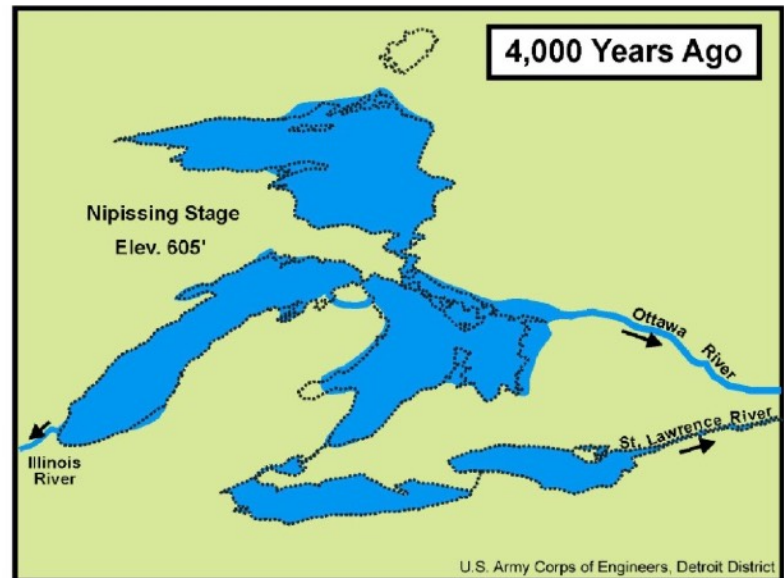
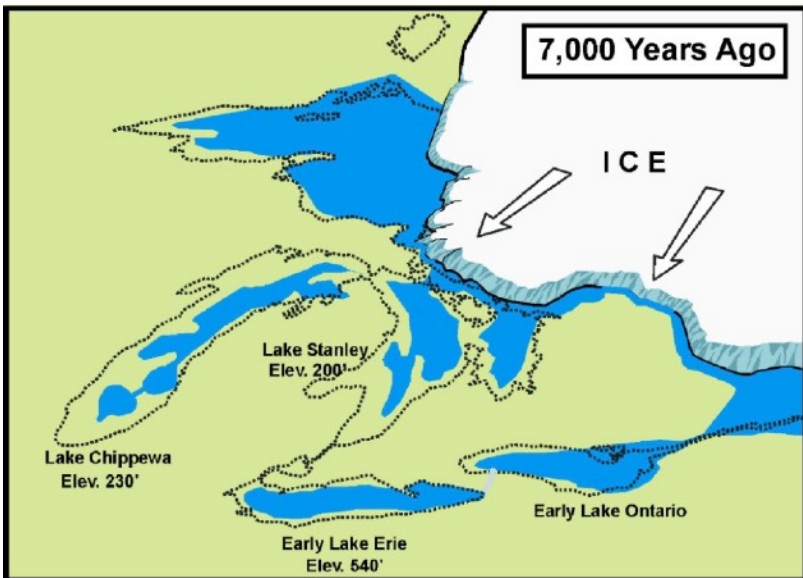
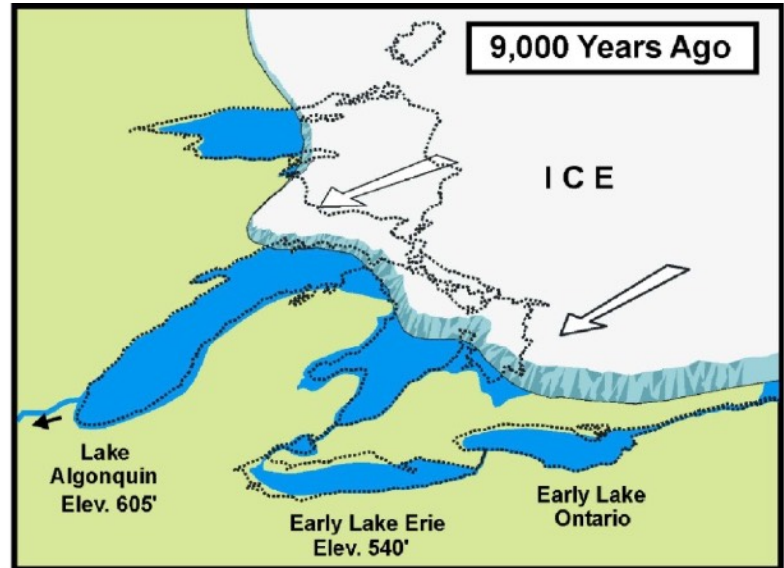
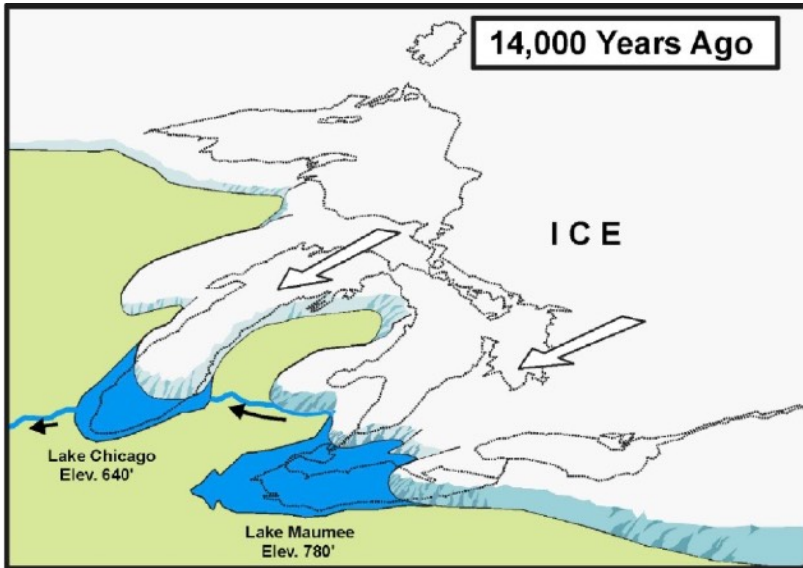


# Glaciers and the Great Lakes

COVERING ALL OF CANADA! (Except highest peaks)



After Johnson 1980.

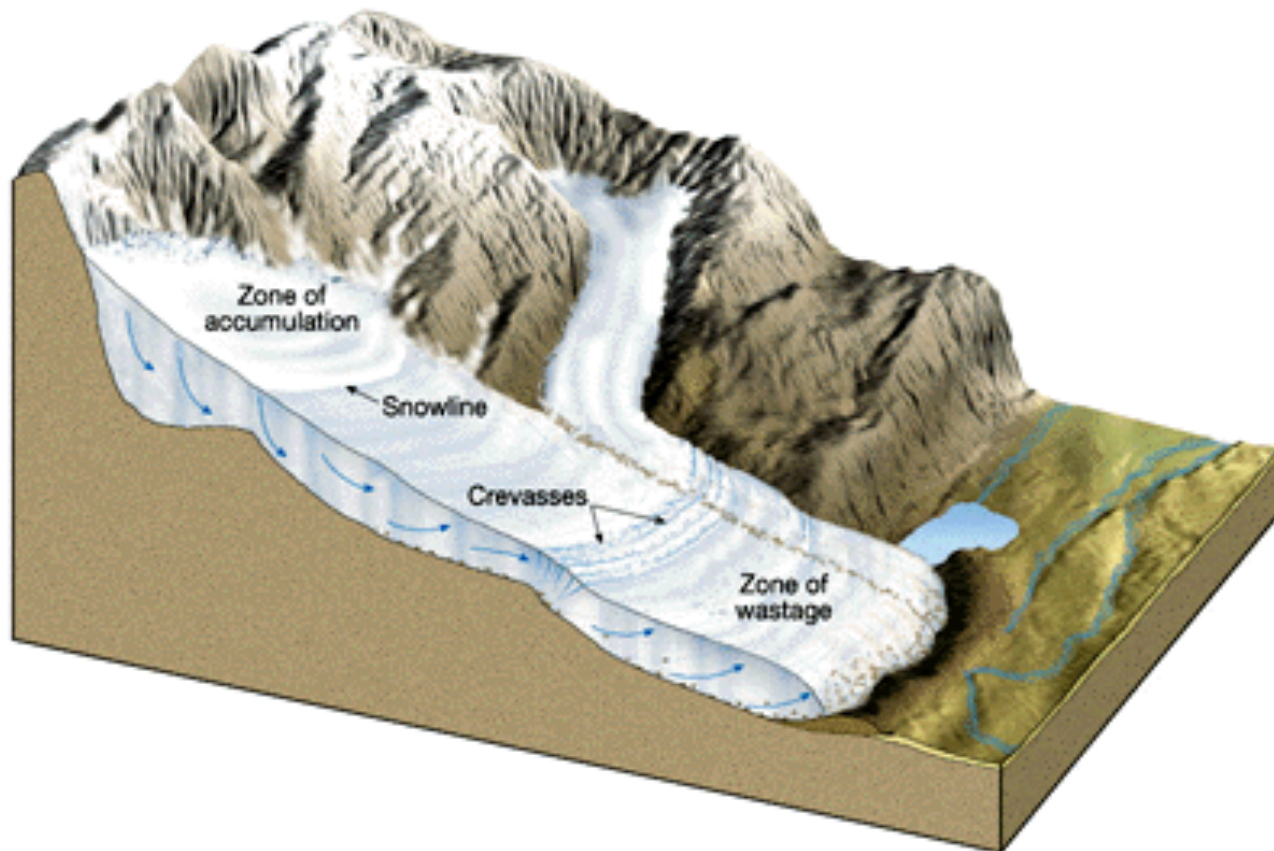


U.S. Army Corps of Engineers, Detroit District

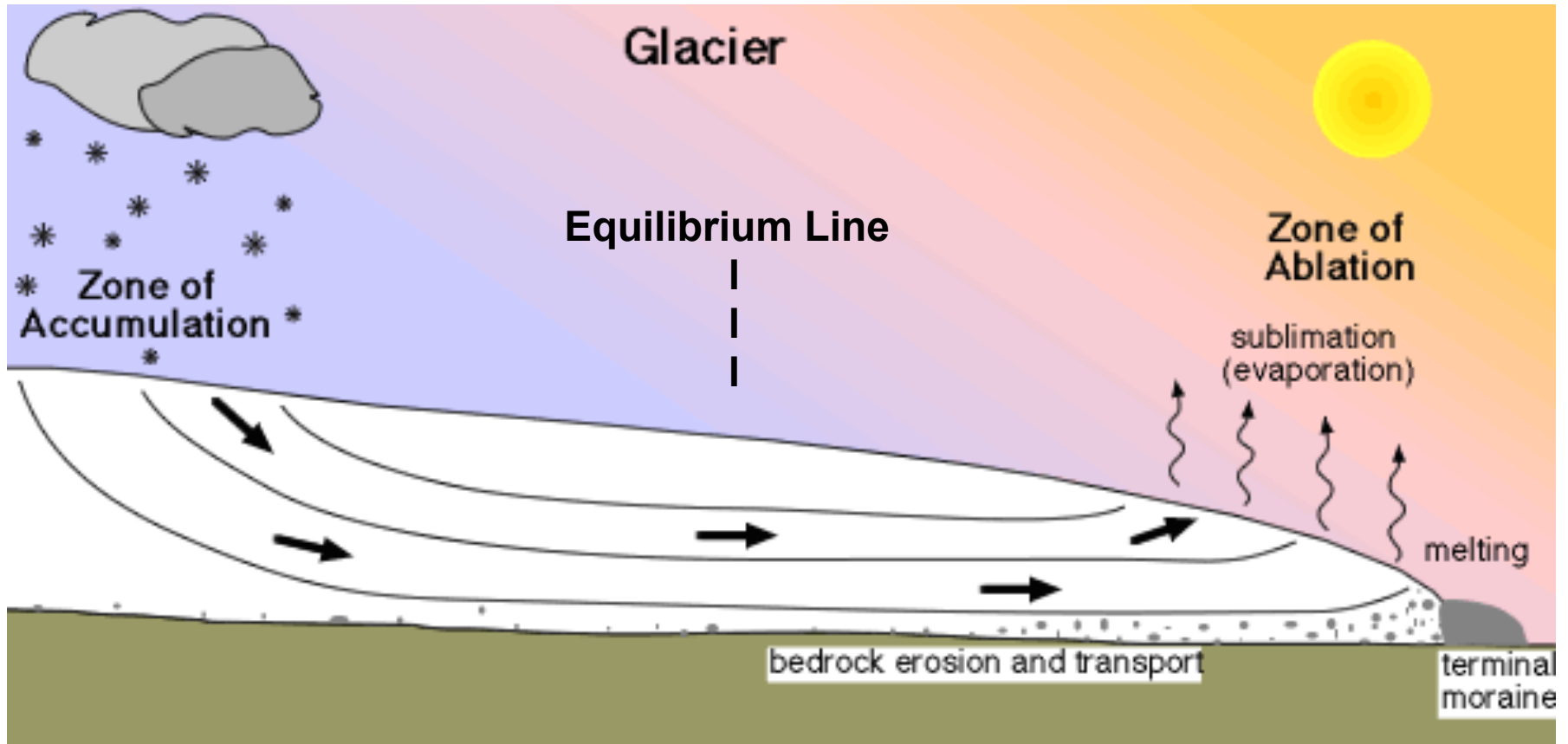


# How Glaciers Move

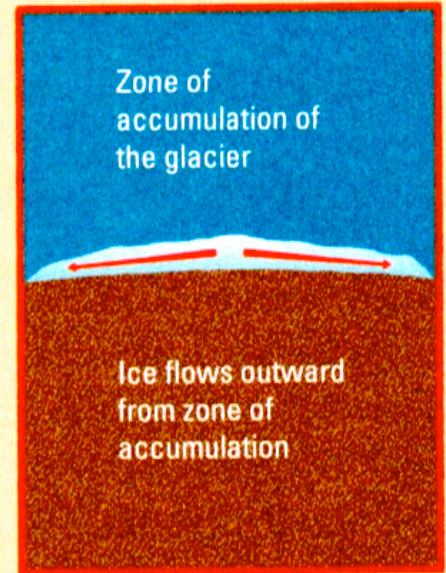
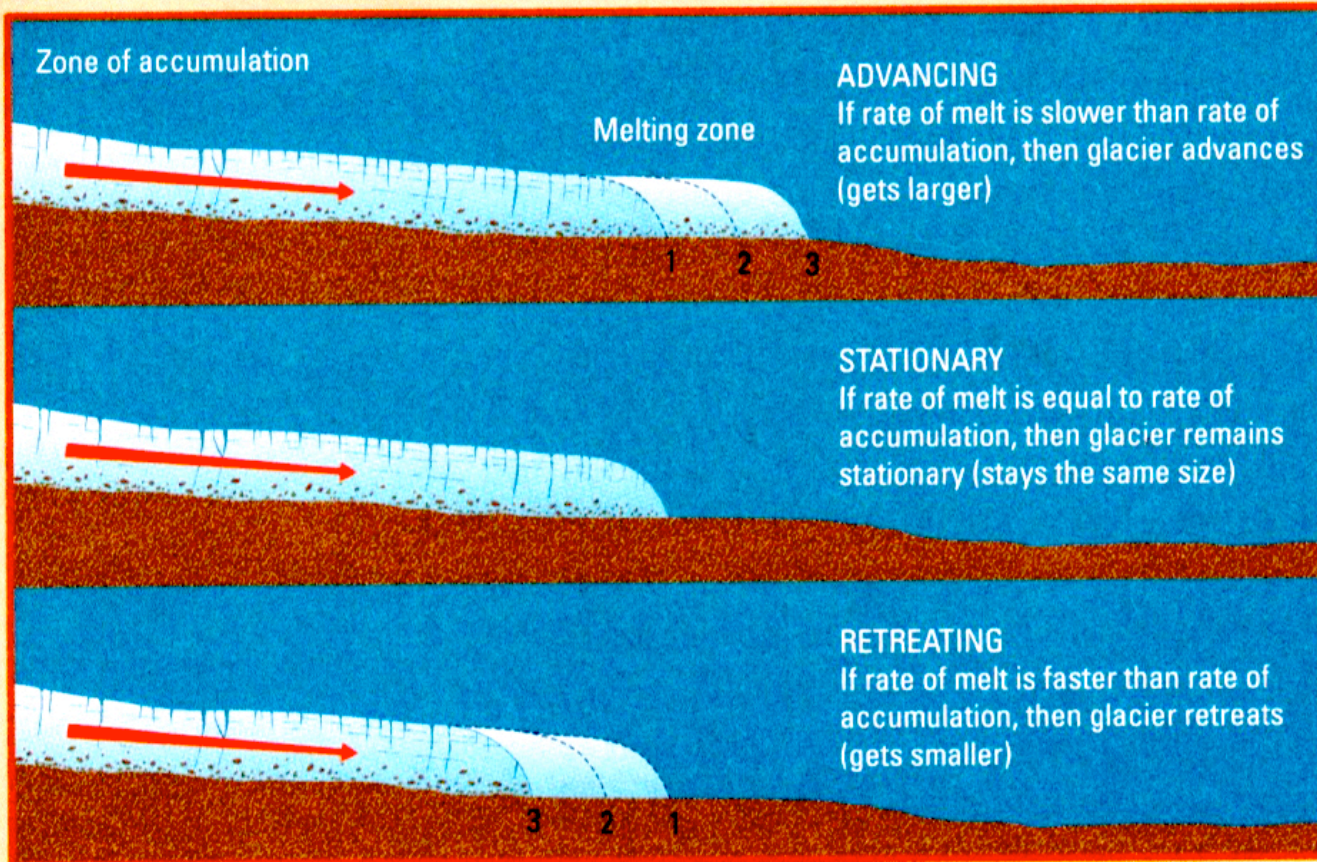
- Pressure from glacier's weight + gravity = moving glacier



# How Glaciers Move



# How Glaciers Move



△ **Fig. 11-19** *Glaciers move like a very thick liquid.*

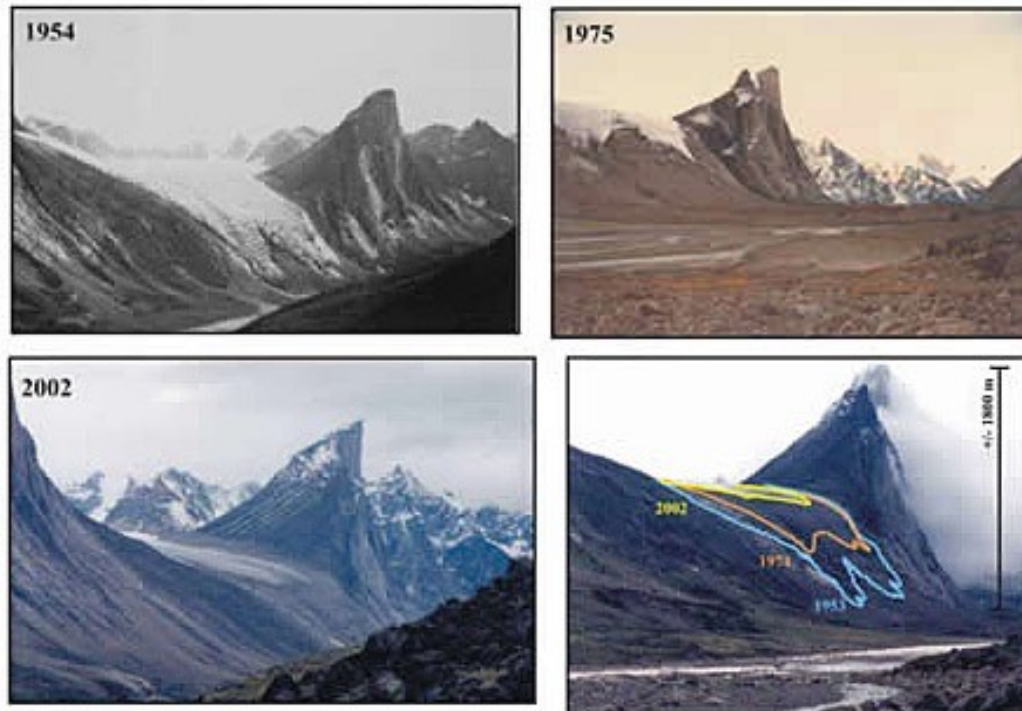
◁ **Fig. 11-20** *The advance or retreat of a glacier is determined by the balance between the ice build-up and the ice melt. In all cases the ice continues to move outward from the zone of accumulation.*



# How Glaciers Move

As long as more snow is added, the ice moves outward.

If melting happens faster than accumulation, the glacier appears to retreat.





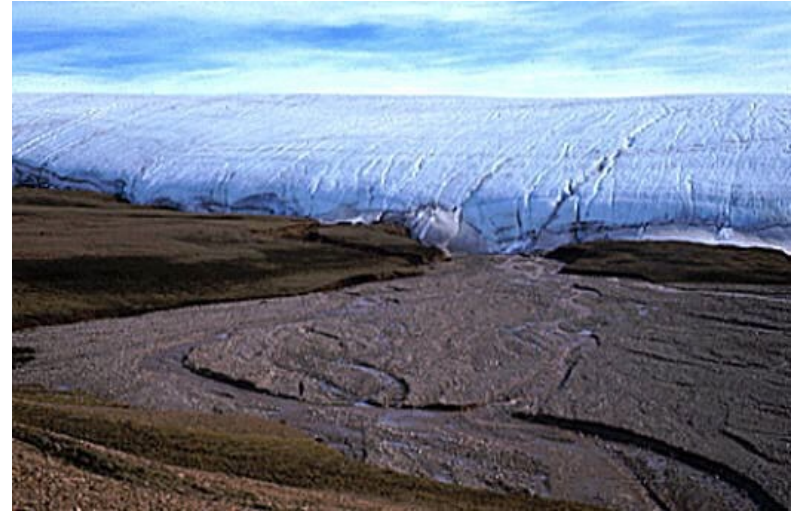
# There are two types of Glaciers

## ALPINE



Their movement is mainly due to gravity

## CONTINENTAL

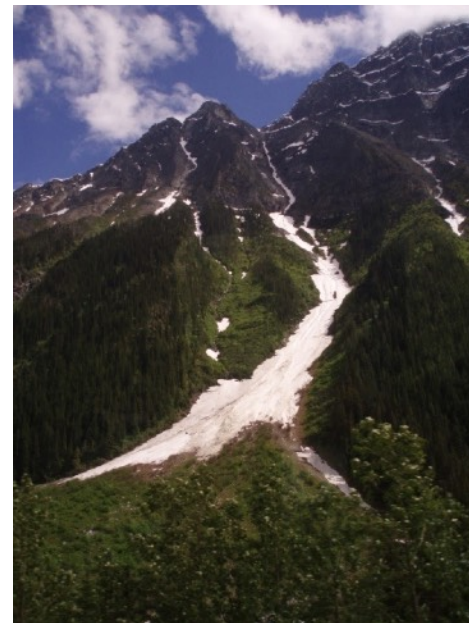


They move due to their own weight

# Two Types of Glaciers

## Alpine

- Rocky Mountains
- Himalayas

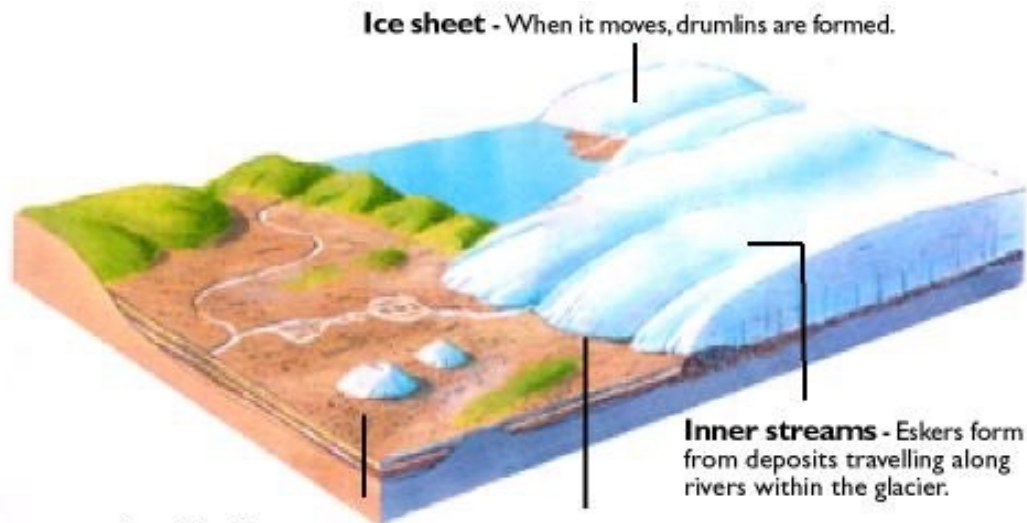


## Continental

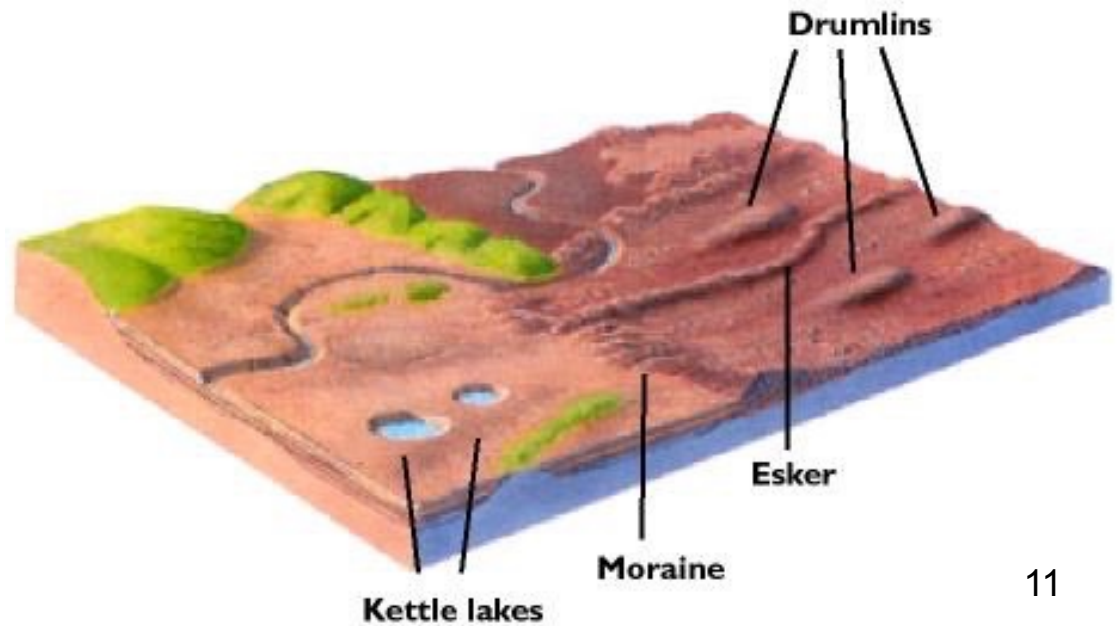
- Greenland
- Antarctica



# Glacial Features



**Ice block** - When it melts, it becomes a kettle lake.





# U-Shaped Valley

Glaciers pass through jagged mountain valleys making them smooth and u-shaped after the ice retreats. The ice (and rocks embedded in it) scrape the valley floor and sides.



# Striations

Rocks are carried in the bottom of a glacier act like cutting tools.

They carve long grooves in the bedrock as they move.

The direction of these grooves shows which way the glacier traveled.





# Till

This is the material picked up and carried by the glacier. It is made up of everything from very fine particles of sand, to huge boulders.





# Till Plain

When the ice melts and leaves a layer of till behind, it is called a till plain. It is flat or gently rolling. They are very useful as farmland, due to the rich deep soil left behind.



# Spillways

When glaciers melt, huge amounts of water must flow away.

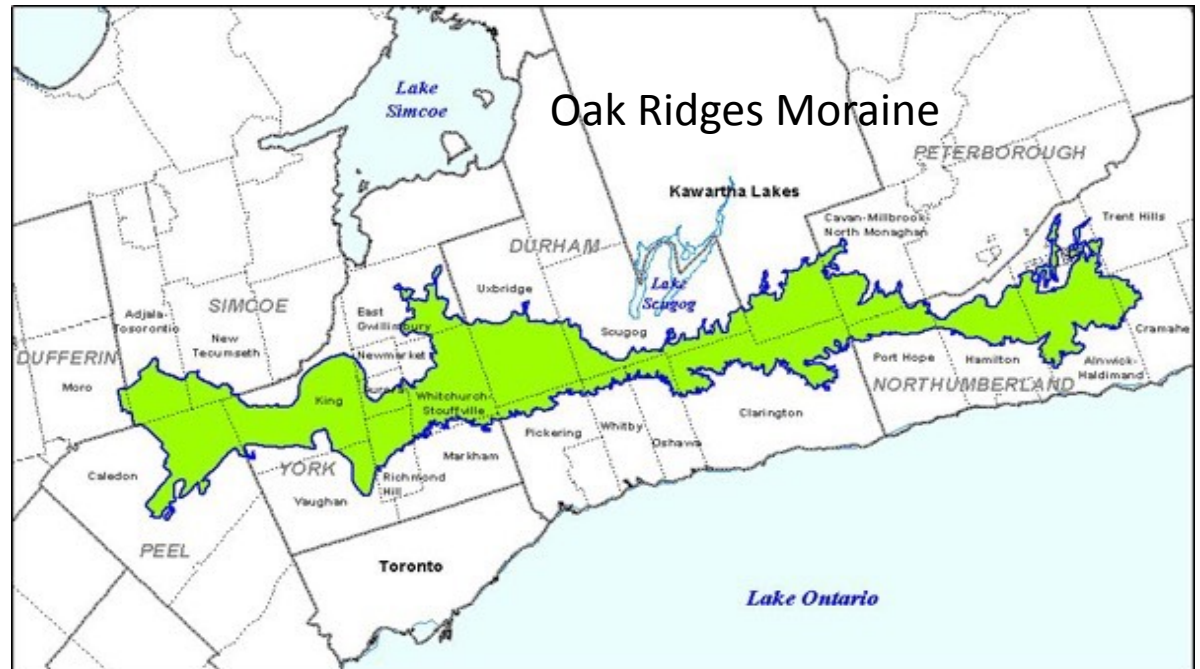
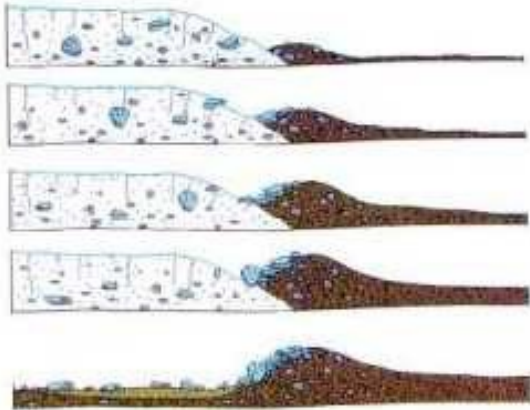
These large volumes of water carve out wide deep valleys.

When all of the ice is melted, the valley is left behind, often with a very tiny stream, called a “misfit” stream.



# Moraines

These are ridges of till left either at the front or sides of a glacier as it retreats. Terminal moraines occur at the front end of the glacier and show how far it advanced.





# Drumlin

These are egg shaped hills that usually occur in clusters. They are used for farming due to the soil deposits, and are also mined for gravel.



# Erratic

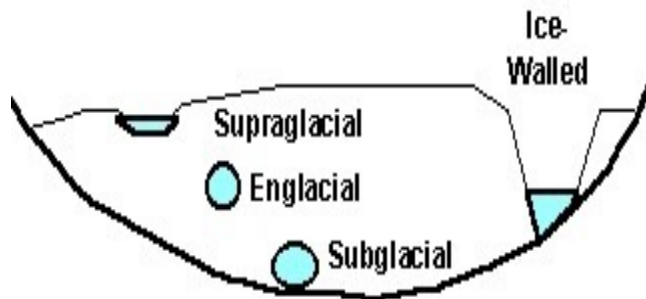
An erratic is a large boulder that is carried by the ice to a spot where it is dropped. They are easily spotted, since they are usually unlike the rock around them.



# Esker

A long sinuous ridge of sand and gravel deposited by water flowing under a glacier or ice sheet.

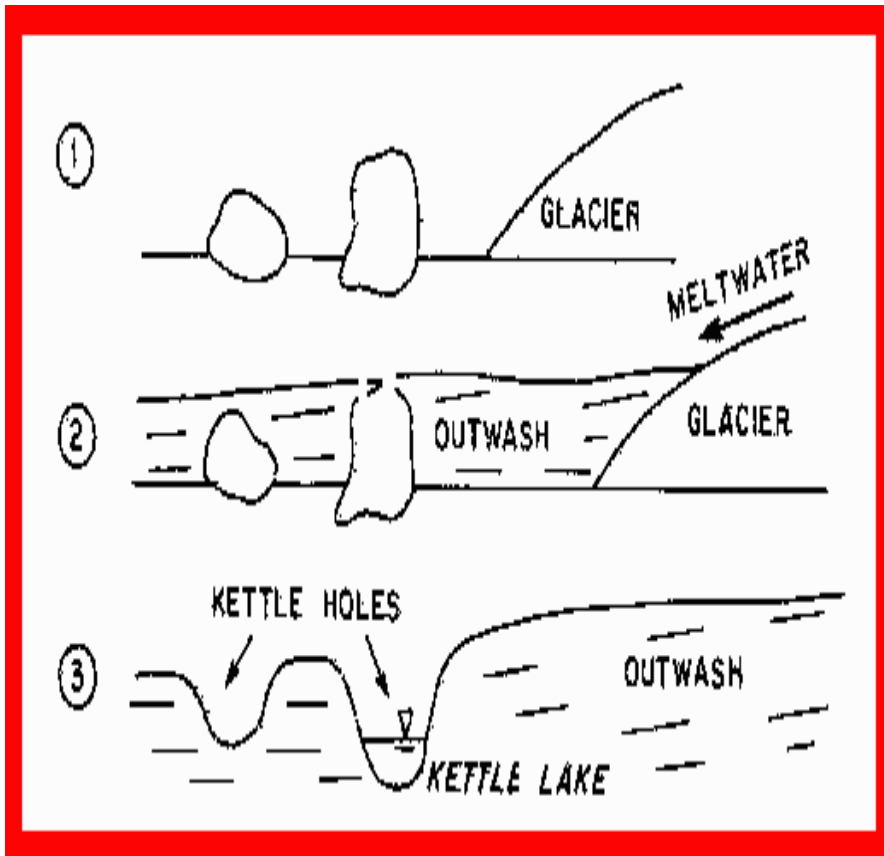
Possible Esker Positions



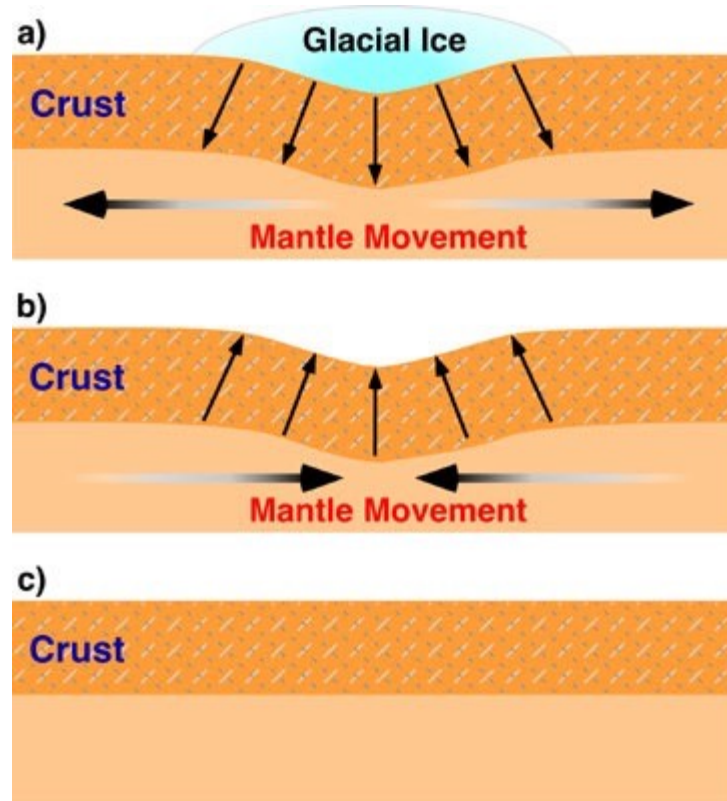


# Kettle Lakes

Blocks of ice get separated They are buried by outwash. They melt and form lakes called kettle lakes.



# Isostatic rebound...



The Earth's crust is depressed as a result of the weight of the ice. When the ice melts the surface slowly bounces back. It is still going on!

**THE END**