

University of Anbar

College of Science – Applied Geology Department

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4th Stage

Quaternary

Lecture 4: Glacial Systems – part 2

2 - Continental Glaciers

Large-scale Ice Sheets

Ice sheets

- Continent-sized ice masses
- Ice sheets include 95% of all glacier ice
- Glacial ice accounts for 2.14% of all water on Earth



Glaciers produce unique geomorphic features

- **Arete** - A sharp crested ridge bounded by 2 cirques

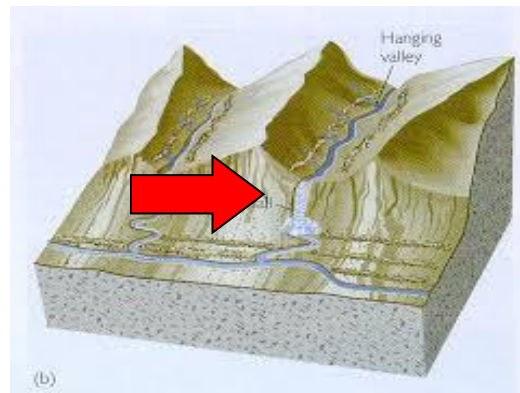


– **Horn** - A sharp peak bounded by 3 or more cirques



Hanging valleys - characteristic U shape valley of a smaller glacier .

Formed when two valleys meet to gather but different by their size and depths .



- **Till** - debris that accumulates beneath and at glacier margins



Moraines

Most important glacial deposits mixtures of poorly sorted sediment deposited directly by glacial ice

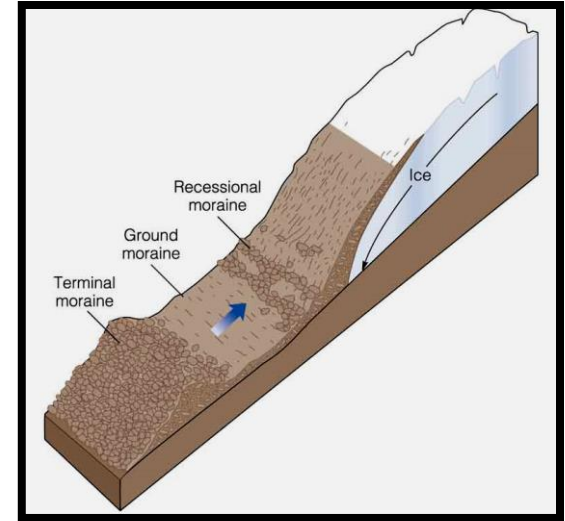
There are some types of moraine different by their location and process of forming

- **End moraine** is deposited when a glacier's body remains stationary for some time that will leave the deposits in the end margin
- **Ground moraine** is deposited beneath ice



- **Recessional Moraine**

If the glacier's terminus should recede and then stabilize once again another end moraine forms

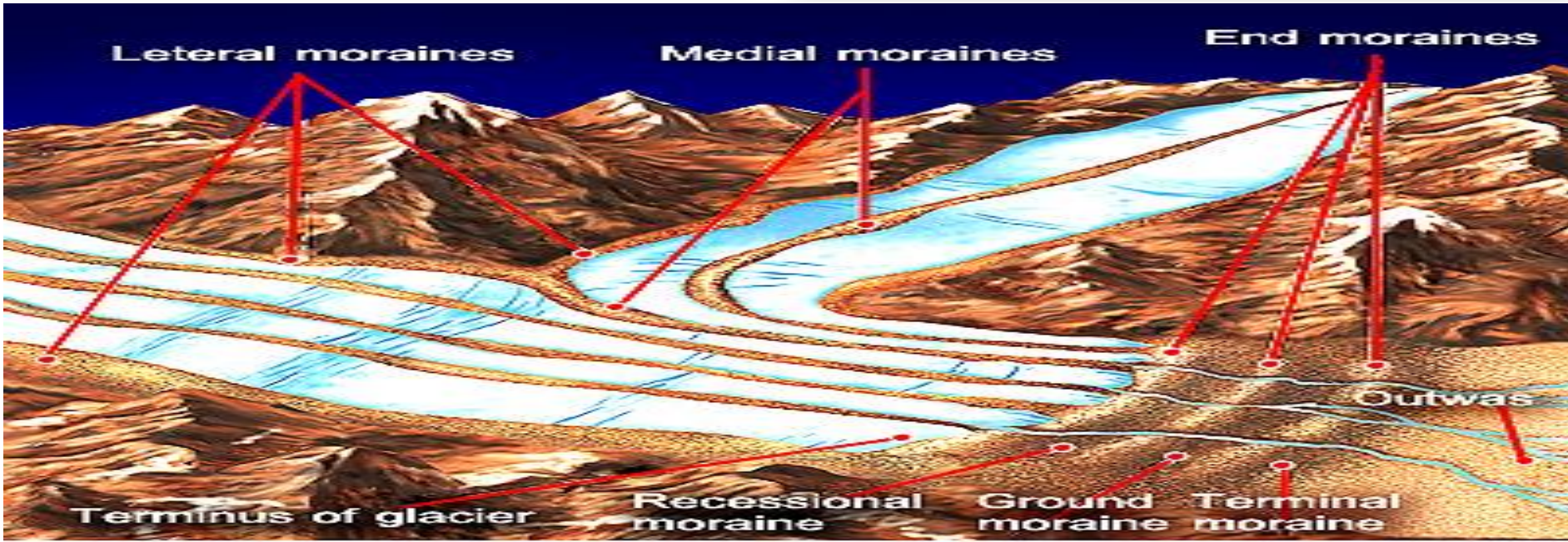
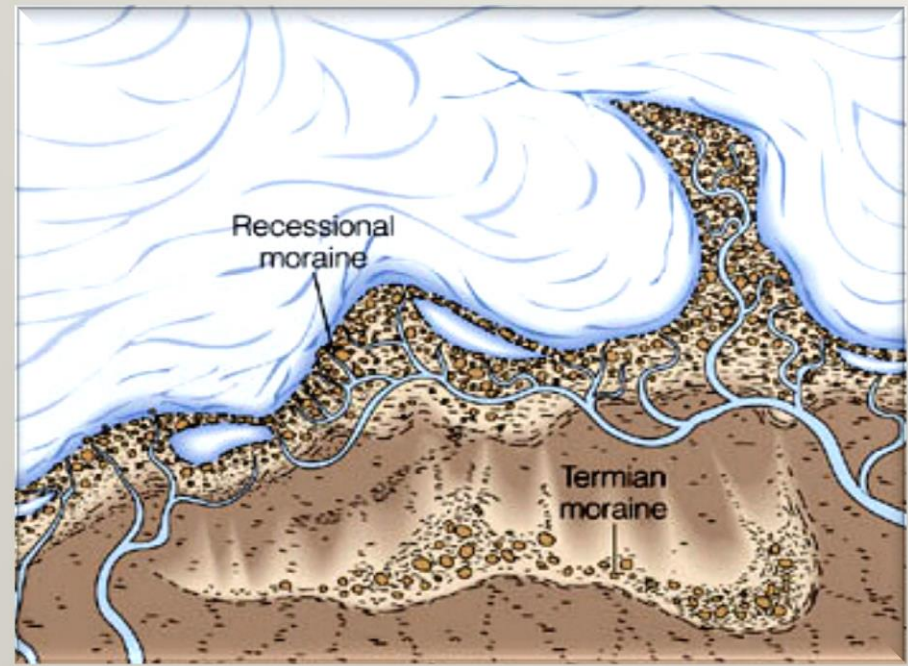
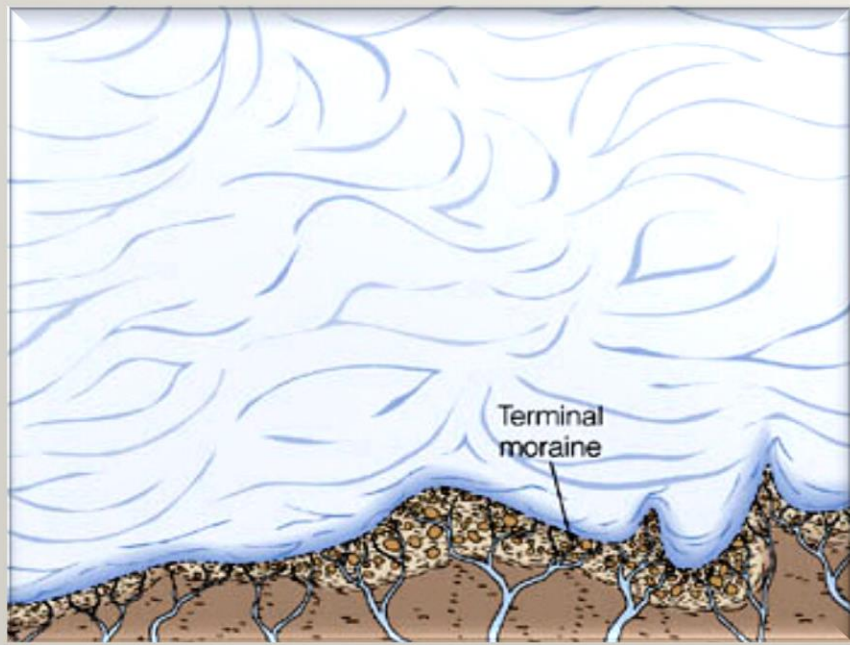


- **Medial Moraine**

When 2 glacial meet together the middle edges of moraines will form a small ridge of sediment in middle of a new glacial

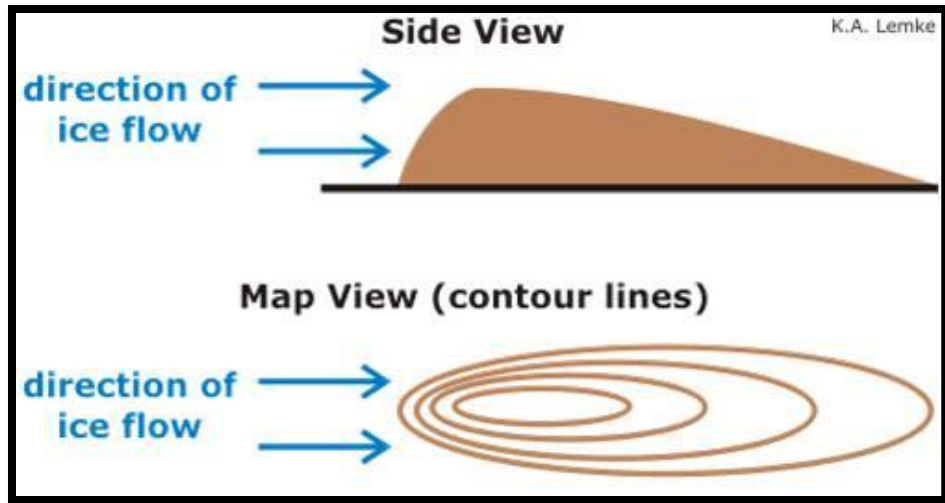
- **Lateral Moraine**

its moraine formed on main edges of the main glacial that come from merge of many smaller glacial .



Types of Moraines

Drumlins - streamlined hills , its type of sediments formed after the melting at wide open areas . Like overturned spoon . Indicate the direction of ice movement



Kettle : Pits full with water happened after ice melting in wash plain



Outwash plain : the melting water come from ice sheet to a wide plain



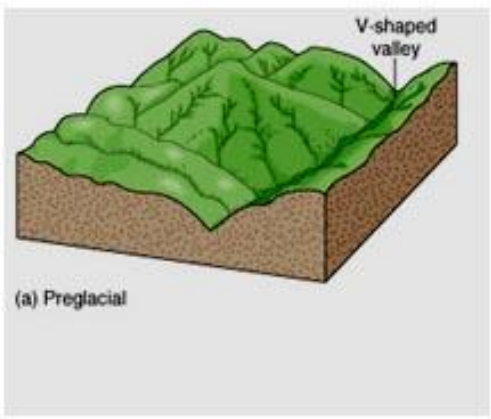
Eskers : melt water stream deposits



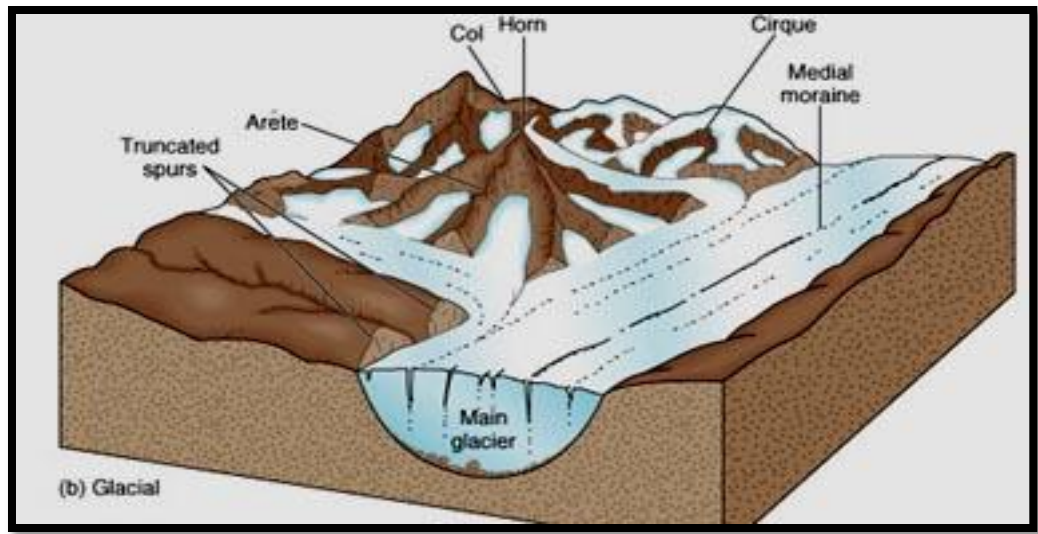
Erratic : a big rock or boulder that differs from the surrounding rock and its have been brought from a distance by glacial action. Most time found in very flat areas



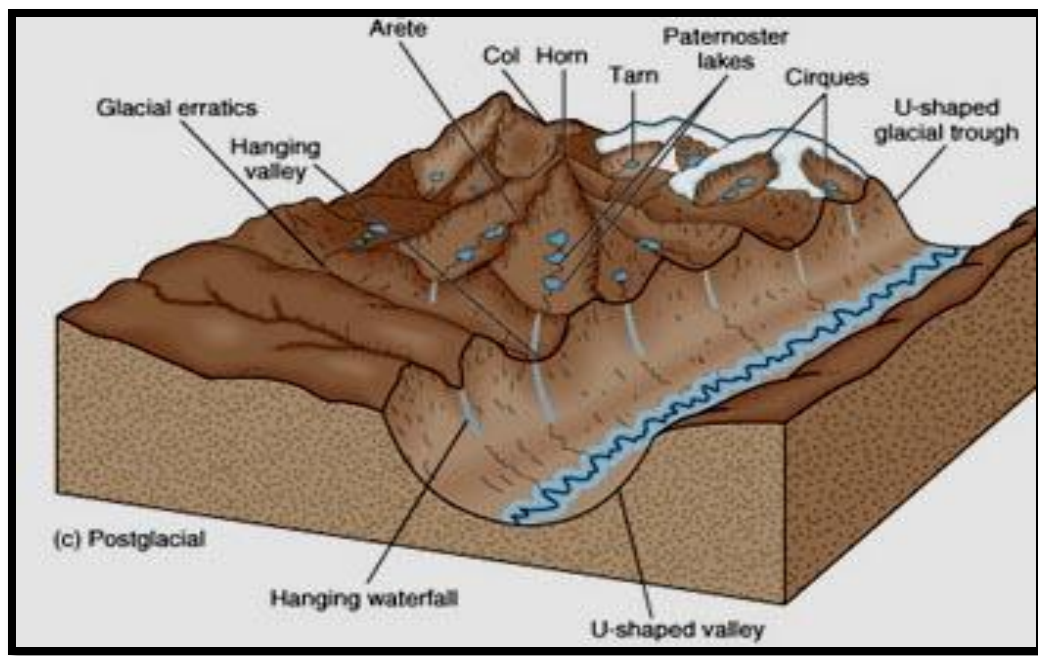
Glacial effects on Earth surface



Before Quaternary Glacial



In Quaternary Period



After Quaternary with all Changes happened

References

Glacial and Quaternary Geology

http://www.colby.edu/geology/GE354/Index_GE354.html

Internet Remote Sensing Lectures sites