

Lecture 2

# Soil Genesis

Tutor: Hawar Razvanchy

# What environmental factors influence soil formation?

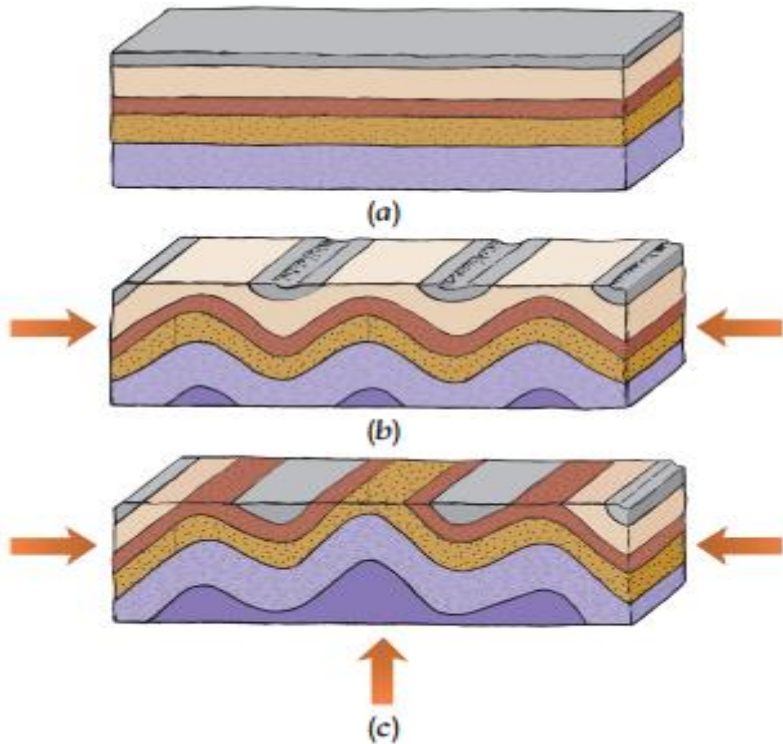
- **Hans Jenny** equation: **Soil =factor (cl,o,r,p,t)**
- **cl**: climate (primarily **precipitation** and **temperature**)
- **o**: organisms (**biota**, especially native vegetation, microbes, soil animals, and increasingly, human beings)
- **r**: relief or topography(slope, aspect, and landscape position)
- **p**: parent materials
- **t**: time(the period of time since the parent materials began to undergo soil formation)

# Soils

- Soils are often defined in terms of these factors as **dynamic natural bodies** having properties derived from the combined effects of **climate** and **biotic activities**, as modified by **topography**, acting on **parent materials** over periods of **time**.

# Parent Materials

- The **parent materials** have been formed through the **geological processes** on the **earth's surface**.



(d)

Activate Window

# Parent Materials

- The nature of the parent material profoundly **influences soil characteristics**. For example, a soil might **inherit a sandy texture** from a **coarse-grained, quartz-rich** parent material such as **granite** or **sandstone**.
- **Soil texture**, in turn, helps control the **percolation of water** through the **soil profile**, thereby affecting the **translocation** of fine soil particles and plant nutrients.

# Parent Materials

- The **chemical** and **mineralogical** composition of parent material also influences both **chemical weathering** and the **natural vegetation**.
- For example, the **presence of limestone** in parent material will **slow** the development of **acidity** that typically occurs in **humid climates**.

# Classification of Parent Materials

- **Residual Parent Material**

- Residual parent material develops **in place** from weathering of the underlying rock.

- **Transported Parent Material**

- Parent materials will **transported** to a different places and the process of soil forming will begin.

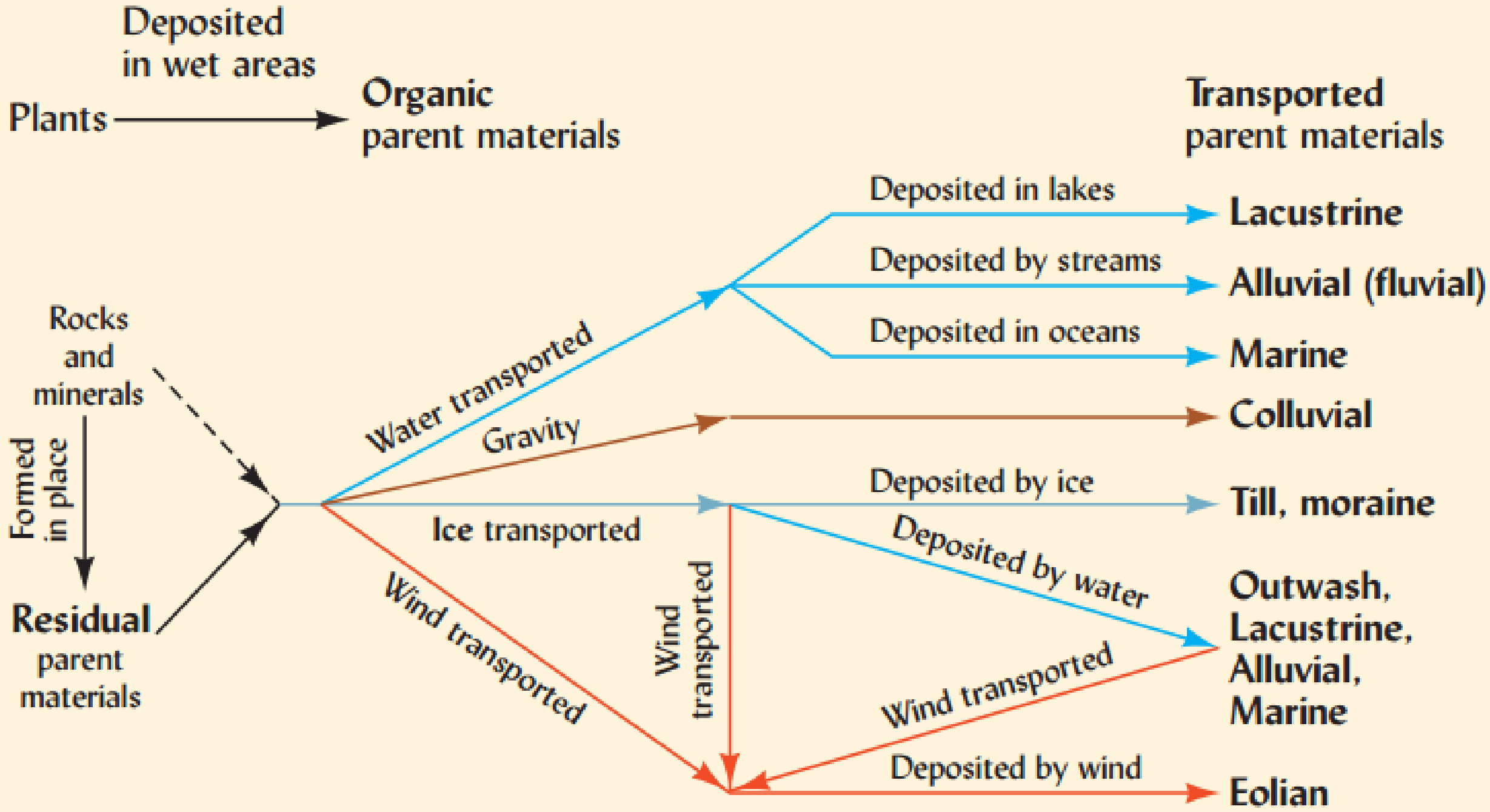
# Classification of Parent Materials

- In **stable landscapes** it may be faced a long and possibly **intense weathering**. Where the climate is **warm and very humid**, residual parent materials are typically **leached** and **oxidized**, and they show the **red** and **yellow** colors of various **oxidized iron** compounds.
- In **cooler** and especially **drier** climates, the **color** and **chemical composition** of residual parent material tends to resemble more closely the rock from which it formed













***Lacustrine***



***Alluvial***



***Marine***



***Colluvial/ Colluvium***

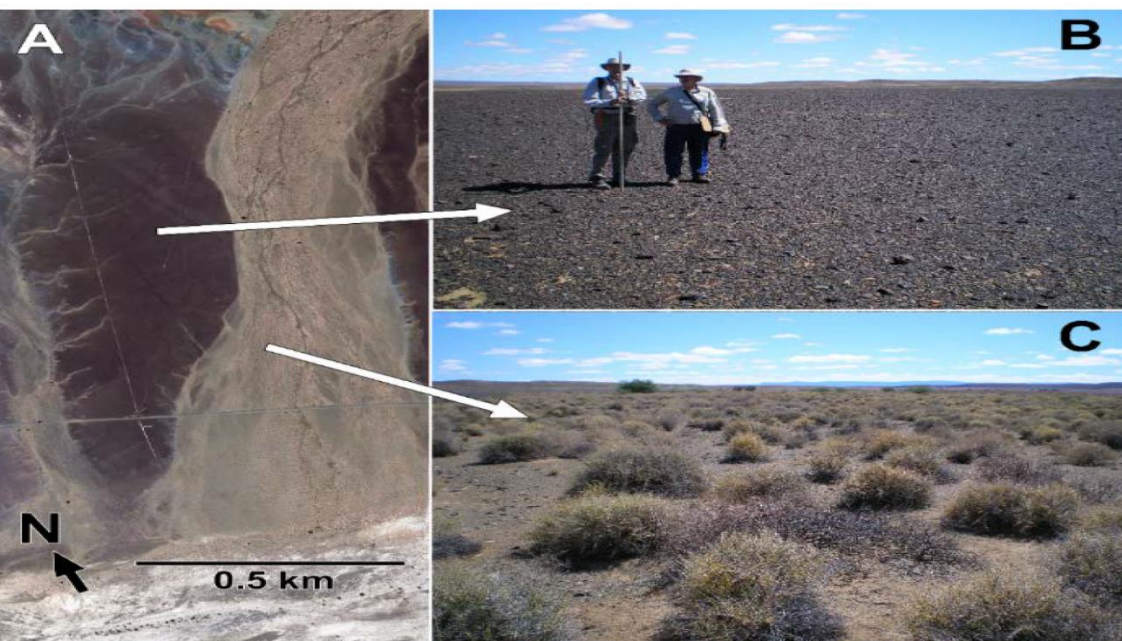




*Till*



*Outwash*



*Eolian/ Aeolian*



*Eolian/ Aeolian*



Questions?