

Chapter 4: Weathering, Erosion, Deposition, and Landscapes

Weathering

- **Physical Weathering**

Kinetic Energy

Frost Action

Wind Action

Wave Action

Land Slide

Motion

- **Chemical Weathering**

Molecules of minerals chemically breakdown.

The best environment for chemical weathering is a “hot” and “wet” climate.

Soils

- All soil forms from weathered bedrock
- A good soil has three horizons, “A, B, C”
 - “A” Horizon:** Organic material and leached zone
 - “B” Horizon:** Mineral enriched zone
 - “C” Horizon:** Broken bedrock

Erosion

- **Erosion by Water**

- Stream Velocity

Water velocity controls the size of particles carried by the moving water in the stream.

When streams curve, the faster moving water carries away sediments “Erosion”, and the slower moving water “Deposition” deposits sediments.

Note: Use ESRT page 6

- **Erosion by Wind**

Sand dunes are moved by one grain of sand at a time.

Snow drifts also move in the same way

Sand blasting of rocks is a physical form of weathering.

Erosion by Ice: “Glaciers”

Note: Sediments deposited by glaciers are always unsorted.

Alpine Glacier:

Small sized glacier found in mountain areas. After melting away, the landscape valleys are always U-shaped.

Continental Glacier:

Very large sized glacier that covers the majority of a continent. After melting, landscape region will have:

Drumlins, Eskers, Kettle Lakes, Till, Erratics, Striations, Moraines, and Kames.

Deposition

- Particle Size
- Particle Shape
- Particle Density
- Settling Rate
- Settling Time
- Vertical Sorting
- Horizontal Sorting
- Deposition in Streams
- Deposition by Wind
- Deposition by Gravity
- Deposition by Glaciers

Ocean and Coastal Processes

- Oceans cover 71% of our planet's surface.
- Ocean waves constantly cause weathering “breakdown” of sediments where the water meets the land.
- Quartz is one of the harder minerals, subsequently we find it on beaches because minerals softer than quartz are readily broken down.
- Continental Shelf
- Surf Zone
- **Long Shore Drift:** Wind creates waves on the oceans. Depending on the angle that the waves strike the beach, the wave energy is moved in a direction parallel to the shoreline. Note: Did you ever notice while swimming in the ocean, that when you looked at the shoreline that you were no longer near the lifeguards green flags? The long shore drift was carrying you away...
- In the open ocean waves carry objects in circular motions.

Ocean and Coastal Processes

- Jetties
- Beach
- Barrier Island
- Spit
- Wave-cut platform
- Jetty
- Wave-cut cliff
- Baymouth Bar

Landscapes

- Mountain Landscape: High Relief
- Plateau Landscape: Moderate Relief
- Plain Landscape: Very little Relief

Landscapes Affects Drainage Patterns

- Streams are greatly influenced by the bedrock as shown in the following four types of stream patterns:

Dendritic Pattern

Radial

Rectangular

Annular

Climates

- **Humid Climate**

- Rounded Hills
- Rich in plants
- Little Erosion
- Precipitation > Evaporation

- **Arid Climate**

- Angular Hills
- Few plants
- Lots of Erosion
- Evaporation > Precipitation

New York Landscapes

- NYS Landscape Regions are located on page 2 of your ESRT. Most times you will need to use page 3 of your ESRT to locate a city in NYS then use page 2 to determine the cities landscape region.