Chapter 6: Weathering and Erosion

Lecture Summary

- Major Factors Controlling Rates of Weathering
- Chemical Weathering and the Products
- Physical Weathering and the Products

**Weathering** – the set of processes by which rocks are broken down at the Earth’s surface.

**Erosion** – the set of processes that loosen and move soils and rock downhill or downwind.

**Major Factors Controlling Rates of Weathering**

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<th>Weathering Rate</th>
<th>Slow</th>
<th>Fast</th>
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Properties of parent rocks

Climate

Presence or Absence of Soil and Vegetation

Length of Exposure

**Chemical Weathering** – the process by which the minerals in rocks are chemically altered or dissolved.

Chemical Weathering of Silicate Minerals:
Chemical Weathering of Carbonate Minerals:

**Mechanical (Physical Weathering)**

*Unloading* — removal of overlying rock (overburden) resulting in a decrease in pressure.

*Thermal Expansion (Frost Wedging)* — differential expansion of minerals due to temperature changes creates stress in rocks — water expands by 9% when it freezes

*Organic activity* — fragmentation of rocks by organisms such as tree roots.

*Mechanical abrasion* — scouring and plucking of rock due to movement of water, glaciers, or other rocks over them.