

SOILS

WEATHERING

** The processes by which rocks are **chemically altered or physically broken** into fragments as a result of exposure to atmospheric agents and the pressures & temperatures *at or near the Earth's surface*, **with little or no transportation of the loosened or altered materials.**

* 2 Principle Types of Weathering:

* **Mechanical or Physical**

* **Chemical**

** **Mechanical or Physical Weathering**

** the breakdown or disintegration of rocks into smaller fragments by physical processes. **With no chemical alteration.**

* **By-products of weathering:**

* *regolith*: the partially weathered rock below the surface which overlays the bedrock

* may in time become parent material, soil, or exposed at the surface

* *parent material*: unconsolidated material, from organic & mineral sources, that is the basis of soil development/formation

SOIL

** the fine material covering the Earth's surface composed of both mineral & organic material; dirt

** *weathering* provides the raw materials (*parent material*) for soil formation & development

* **Soil Characteristics:**

* **soil profile:** The array of soil layer; their sequence from top(surface) to bottom(bedrock)

* **soil horizon:** A distinct layer of soil within the soil profile

* **Soil Properties:**

* **color** * **texture** (clay, sand, silt)

* **structure** * **consistence** (cohesion)

* **porosity** * **moisture**

SOIL FORMATION

* an on-going process of a renewable resource, but not an inexhaustible resource

** **Components of Soil:**

Minerals: Elements or compounds with a crystalline structure; the building blocks of rocks; found in all soils

Organic matter: That part originally from living matter; decaying matter of plants, animals & their waste products

Water: Fills space in the soil or forms a thin film around particles

Air: Also fills pour spaces

** **Factors Involved in Formation:**

Parent Material: The type of rock & minerals the soil was formed from

** **residual soil:** made from the underlying rock

** **transported soil:** made from material not found in underlying rock

Climate: If temperature & precipitation (moisture) differ, will yield different soils, even from same parent material

Biological Agents: Decomposers, microorganisms, bacteria, fungi, type of **humus** or organic matter

Topography: flat vs steep slopes; windward vs leeward slopes; sun exposure

Time: for a given place, more time means more complete development & increased thickness of soil

Development Processes of Soil Horizons:

** Soils develop layers or **horizons**, often quite distinct, by **4 processes**

Addition: grains of soil made by adding material to the soil already in place; adding organic matter

Transformation: weathering of rock, minerals, & soil particles already present; physically or chemically changing them

Depletion: Particles are carried out of an area & downward through soil by percolation water, to an area below

Translocation: Deposition of particles in a lower area from an area above

** SO, Soils develop **Soil Profiles** or a particular sequence of soil layers or **horizons**

* Main horizons: **(Know sequence/order of horizons)**

'O' horizon: organic horizon, consisting entirely of organic material **(by addition)**

'A' horizon: upper most layer developed from parent material **(by transformation)**

'E' horizon: lighter colored layer just below the 'A' horizon **(by depletion)**