

## **Soil Formation**

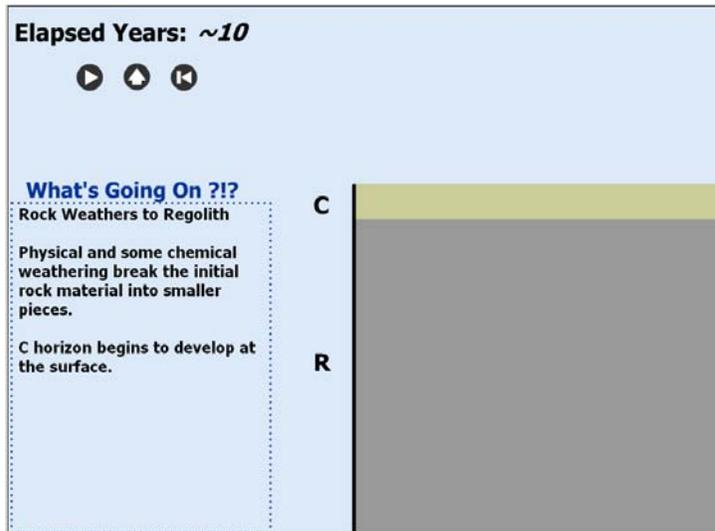
**Soil** == sediment mixed with organic matter that can support vegetation  
(There's no such thing as "dirt")

### Composition

1. Mineral material (sediment)
2. Organic material (humus = decayed organic material)
3. Void space filled with:
  - a. Water – w/ dissolved ions
  - b. Gasses – air ( $O_2$ ,  $N_2$ ),  $CO_2$
  - c. Plants – roots
  - d. Animals – worms, nematodes (tiny worms), insects  
(2 acre-foot can contain 3 tons of organic matter)

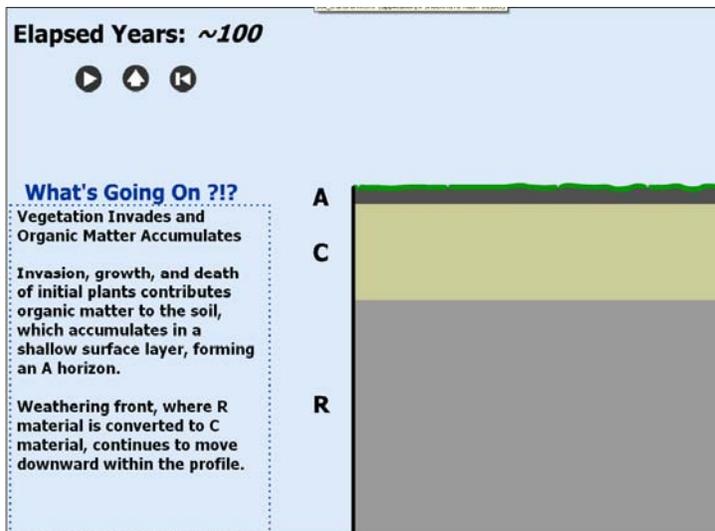
## Formation of the Soil Profile

- Formed over long time (~10,000yrs)
- Grow deeper with time (as underlying bedrock “decays”)



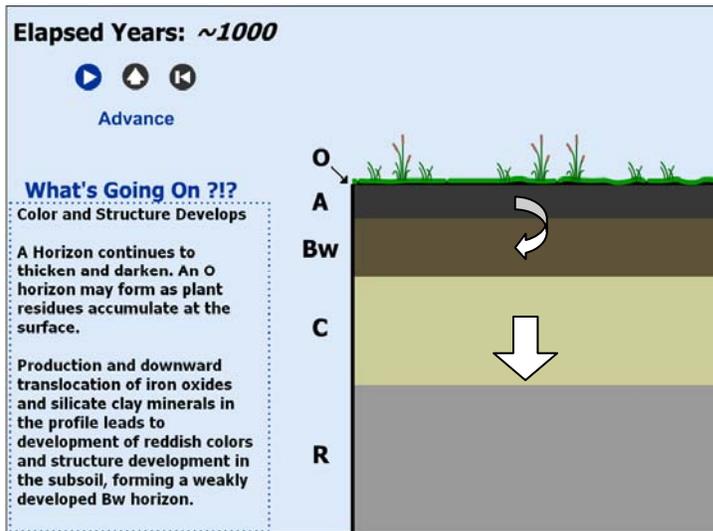
**C horizon** – rotten rock (wx)

**R horizon** – parent rock source rock



**Vegetation**

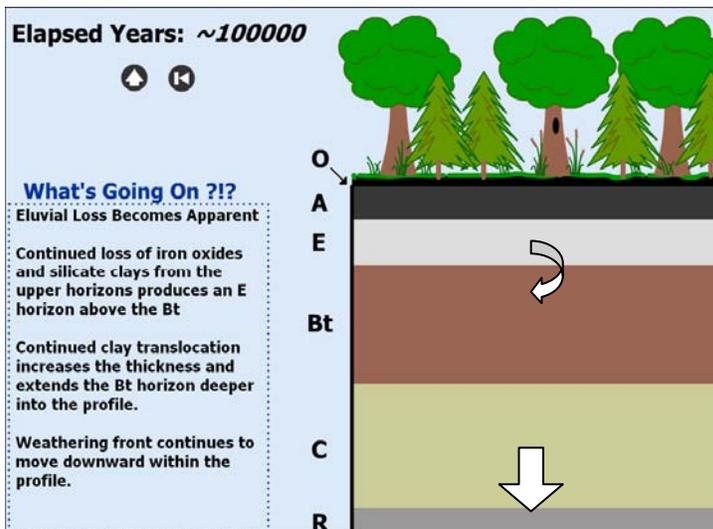
**A horizon** – soil, organic matter



**O horizon** – organic, leaf litter

**A horizon** – thickens, leaching  
*eluviation*

**B horizon** – enriched w/ ions  
*illuviation*  
subsoil, hardpan



**E horizon** - *eluviation*

**B horizon** – enriched w/ ions  
*Illuviation*  
(iron, clay)

[http://courses.soil.ncsu.edu/resources/soil\\_classification\\_genesis/soil\\_formation/soil\\_transform.swf](http://courses.soil.ncsu.edu/resources/soil_classification_genesis/soil_formation/soil_transform.swf)

- 1) Laterite soil is an extreme case
  - a. wet tropics, rain forests
  - b. intense leaching (even  $\text{SiO}_2$ )
  - c. leaves Fe, Al, oxides (bauxite)
  - d. brick red
  - e. lousy farmland, nutrient poor