

Introduction to Soils: Foundations of Ecosystems

What is soil?

Role of soil in ecosystems

1. Medium for plant growth
2. Control fate of water
3. Recycling system
4. Habitat for soil organisms

Soil formation is controlled by

1. Parent material
2. Climate
 - a. Physical weathering
 - b. Chemical weathering
 - i. Cation Exchange Capacity (CEC)
3. Biota
 - a. Types of Soil Organic Matter (SOM)
4. Topography
5. Time

Physical composition of soil

Texture triangle (p 62)

Percent sand, silt, & clay

Soil Profiles

Layers development over time (p 58)

Horizontal and vertical movement within soil profile

How ecosystems influence soils

Variety of scales Macro to micro

Capture of solar energy and carbon fixation

Deposition of organic material (OM)

Decomposition

 Functions

 Soil microorganisms

Influence of plants

 Rhizosphere

Soils are open systems

Workshop: Soils in Forests—Temperate vs. Tropical (20 minutes)

Form groups of three. Appoint one person to take notes during your discussion. At the end of the discussion, make sure that each person has time to copy down the list of answers you agree upon. Carefully consider each of the following attributes/ factors that influence soils and how they differ between temperate and tropical forests. Briefly outline the differences and the resulting influence you would expect to see in the soils of forests in these areas. Discuss and list the reasons for your answers.

1. Climate
2. Plant Biomass
3. Decomposition rate
4. SOM accumulation
5. Degree of weathering
6. Relative fertility of soil
7. Ability to hold cations & anions
8. Major pool (storage) of nutrients
9. Soil Depth