Soil Water Movement and Retention

Functions of Soil
- Medium for plant growth
- Regulator of water supplies
- Recycler of raw materials
- Habitat for soil organisms
- Engineering medium

Functions of Soil
- Medium for plant growth
- Physical Support
- Gas exchange
- Water
- Temperature
- Nutrient source
Functions of Soil

- Regulator of water supplies
- Infiltration
- Run-off
- Storage/Movement
- Distribution
- Purification

Integral to hydrologic cycle

Total Earth Water

<table>
<thead>
<tr>
<th>Water Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceans</td>
<td>97%</td>
</tr>
<tr>
<td>Ice and Glaciers</td>
<td>2.0%</td>
</tr>
<tr>
<td>Aquifer/Groundwater</td>
<td>0.6%</td>
</tr>
<tr>
<td>Atmosphere</td>
<td>0.2%</td>
</tr>
<tr>
<td>Lakes</td>
<td>0.012%</td>
</tr>
<tr>
<td>Soil</td>
<td>0.001%</td>
</tr>
<tr>
<td>Rivers</td>
<td>0.0002%</td>
</tr>
</tbody>
</table>

Water Movement
Two Forces Responsible for Water Movement in Soils

Gravity

Capillarity

Gravity
Capillarity

Spontaneous movement of water into and through pore spaces in soil without the aid of gravity.

Adhesion and Cohesion

Cohesion
Adhesion and Cohesion

- Adhesion
- Cohesion

Strong adhesion
Weak adhesion
Weak Adhesion

Adhesion to Soil Particles

Soil Pores

Adhesion and Cohesion
- Adhesion to the tube or pore wall
- Cohesion between water molecules
Soil Pores and Pore Size Distribution

Texture
Density
Structure

Define.

Particle Size: Large/coarse, Medium, Fine/Small
Texture: Sandy, Loamy Sand, Sandy Loam, Silt
Pore Size: Large/Macro, Meso/Medium, Micro/Small
Capillarity: Weak, Moderate, Strong

Soil Pores: Sandy, Silty, Clayey
Aggregates

Same Texture and Density

Relevance

transpiration