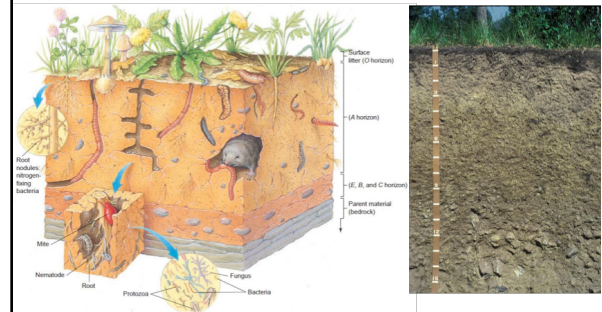


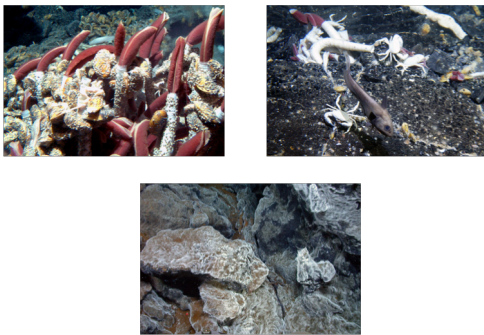
## Lecture 2: Soil Water and Physical Properties

HSSP : Soil Ecosystems

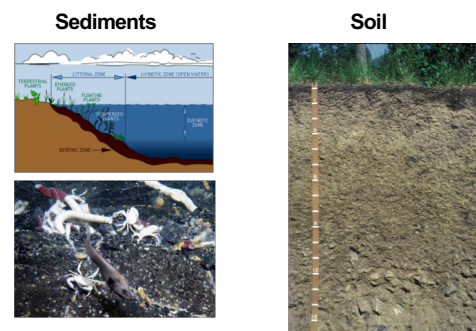
## Soil Ecosystem



## Is the ocean floor a soil?



## Sediment vs Soil

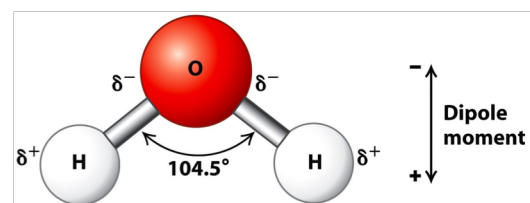


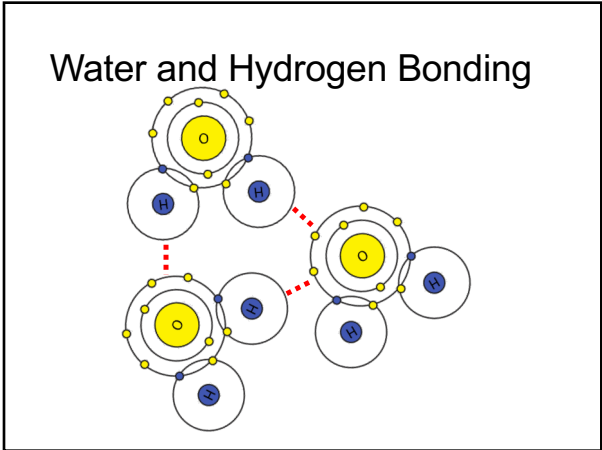
## Learning Objectives

1. Define water balance in a soil
2. Define soil particle size fractions
3. Explain how soils interact with the water cycle
4. Understand how particle sizes influences interactions between water and soil

**Activity:** Soil Texturing

## Structure of Water





### Properties of Water

Santa Barbara 73°  
 Los Angeles (Airport) 75°  
 San Diego 72°  
 Burbank 90°  
 Santa Ana 84°  
 San Bernardino 100°  
 Riverside 96°  
 Palm Springs 106°

### Properties of Water

**Cohesion**  
I LOVE YOU.

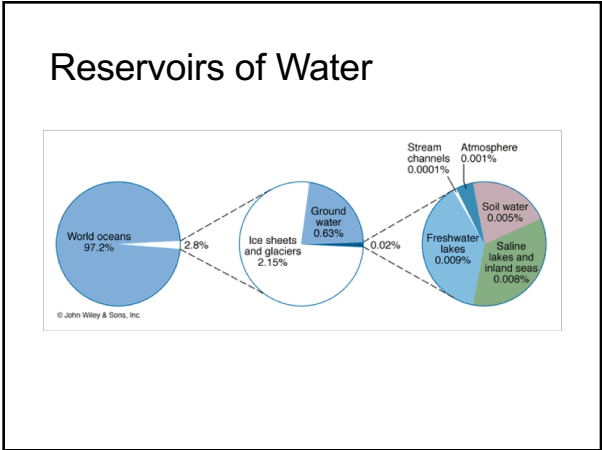
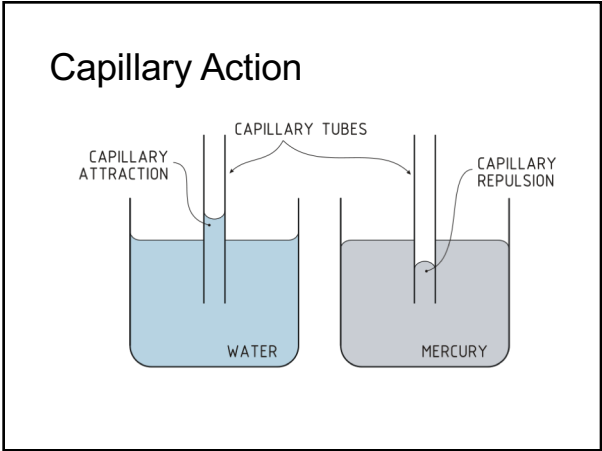
**Adhesion**  
I LOVE YOU TOO!  
OTHER STUFF

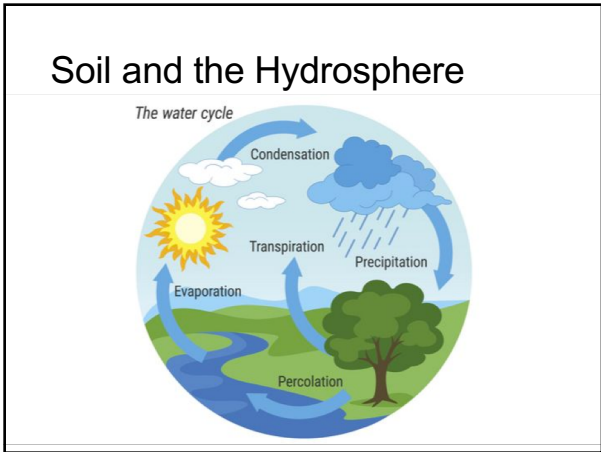
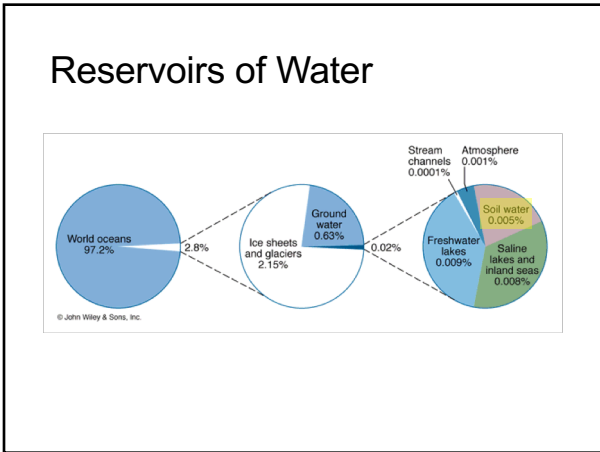
**Surface Tension**  
WE CAN HOLD UP BUGS!

**High Specific Heat**

**Solvent**

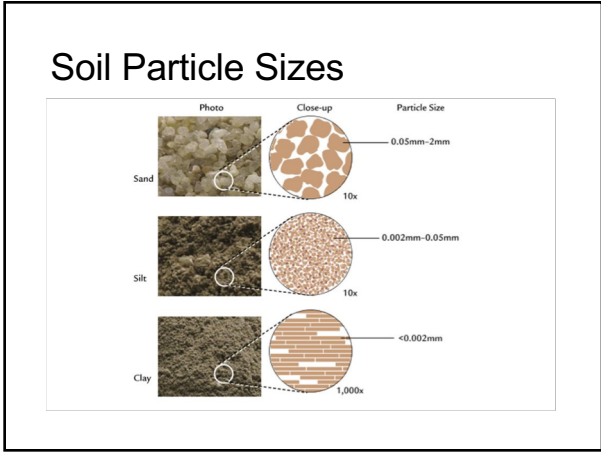
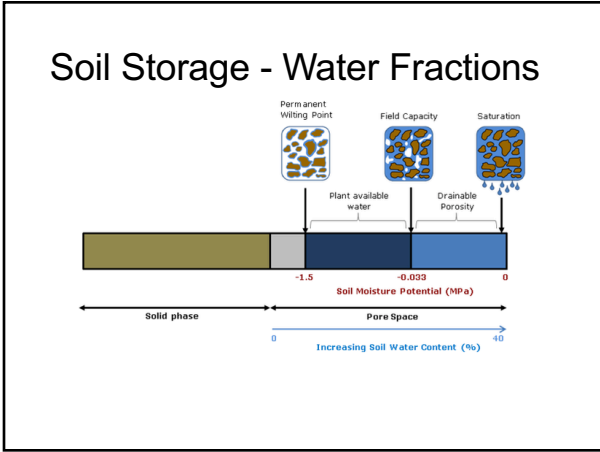
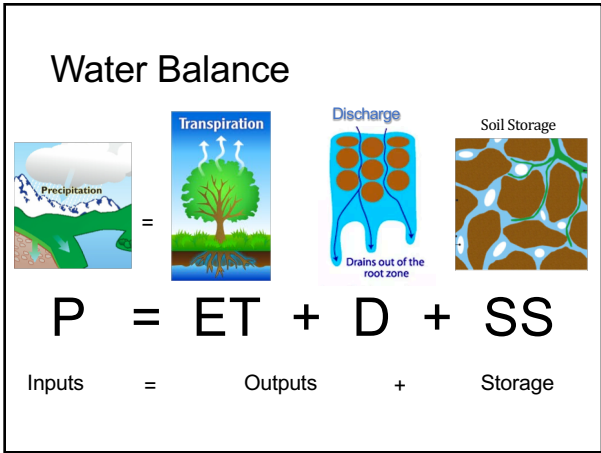
Santa Barbara 73°  
 Los Angeles (Airport) 75°  
 San Diego 72°  
 Burbank 90°  
 Santa Ana 84°  
 San Bernardino 100°  
 Riverside 96°  
 Palm Springs 106°






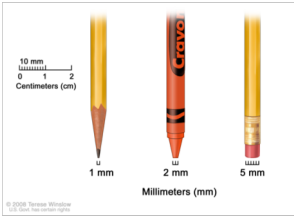
### Water Balance

Inputs = Outputs + Storage



### Soil Particle Sizes


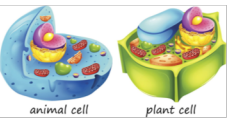
**Sand**  
• 0.05 mm to 2 mm

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### Soil Particle Sizes


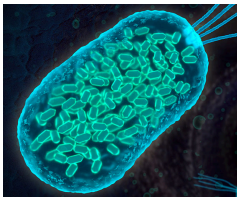
**Silt**  
• 0.002 mm to 0.05 mm

animal cell      plant cell  
Cells are ~0.01 mm

### Soil Particle Sizes

**Clay**  
• < 0.002 mm

Bacteria ~ 0.0015 mm

### Soil Particle Sizes

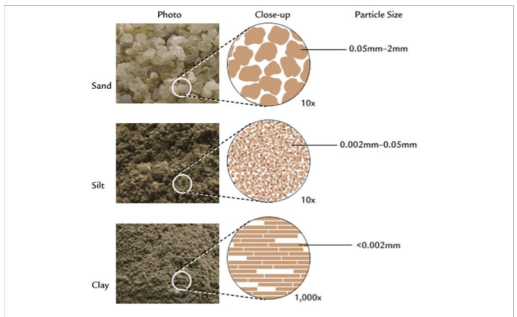
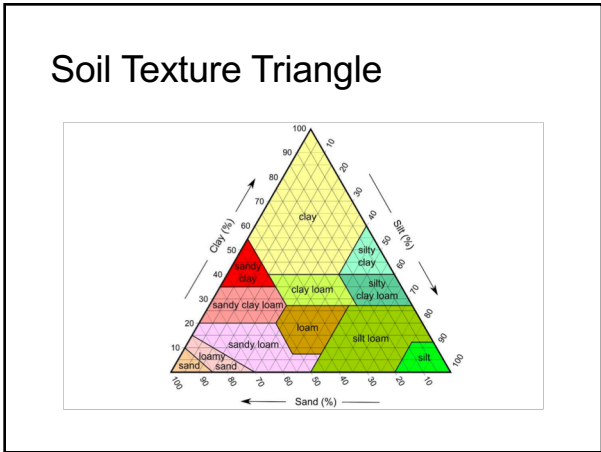
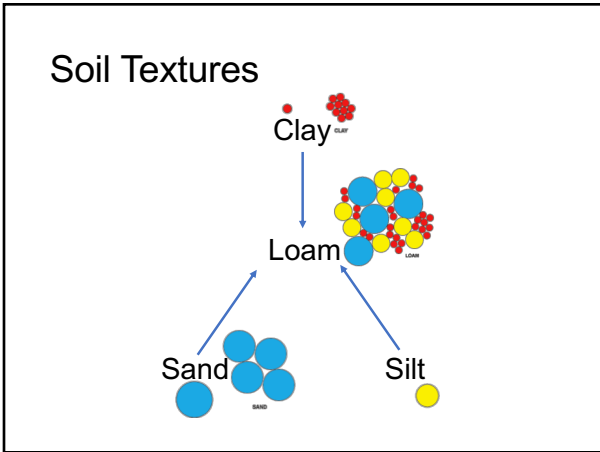


Photo      Close-up      Particle Size

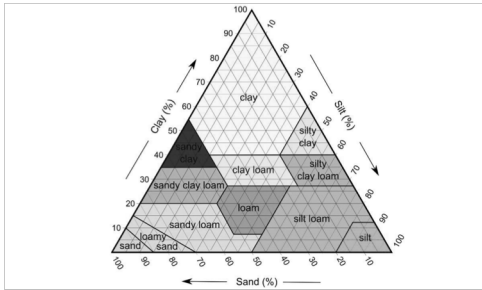
Sand      0.05mm-2mm

Silt      0.002mm-0.05mm

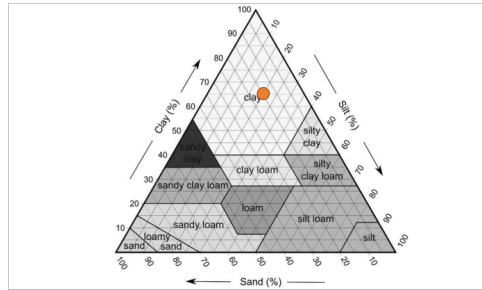
Clay      <0.002mm



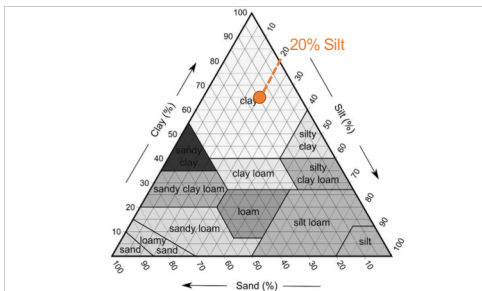
### Soil Texture Triangle



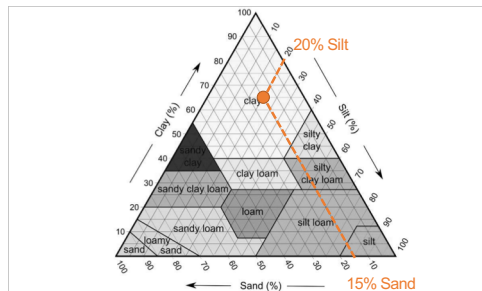
### Soil Texture Triangle



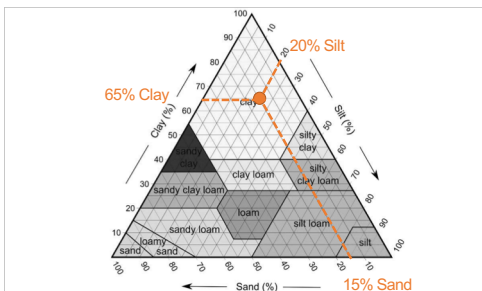
### Soil Texture Triangle



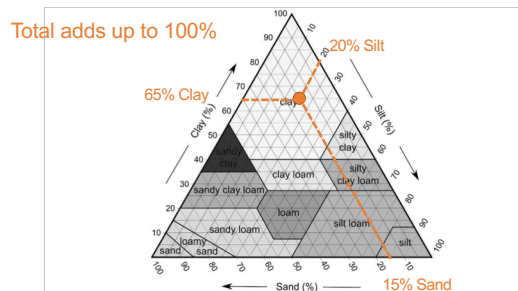
### Soil Texture Triangle

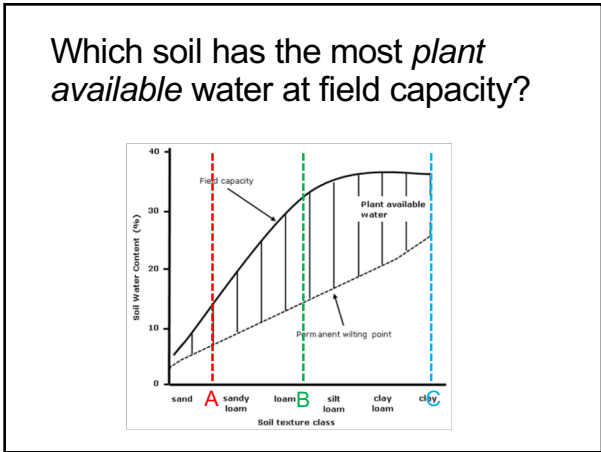
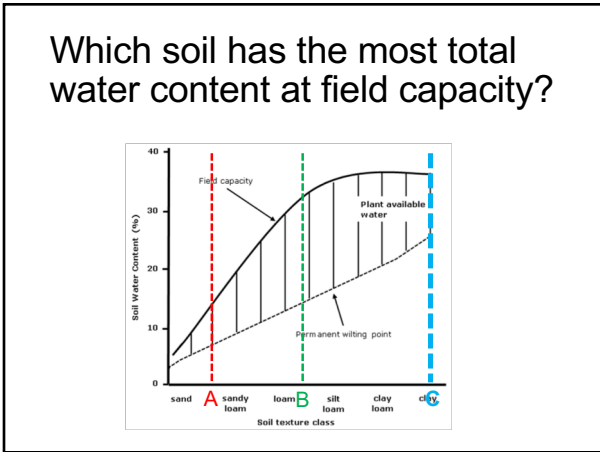
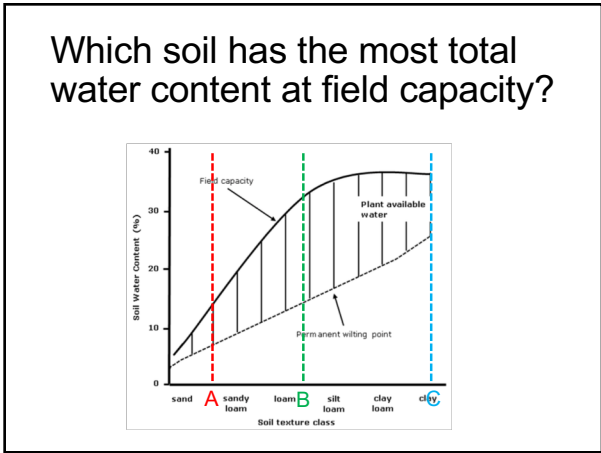
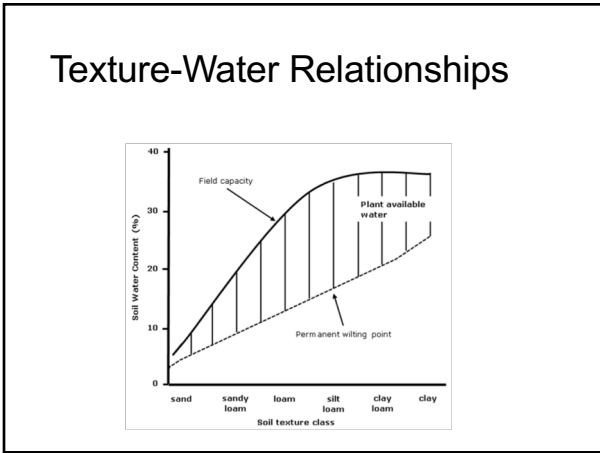
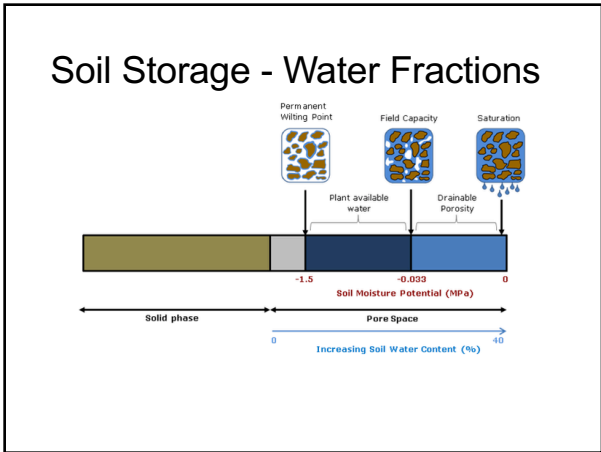
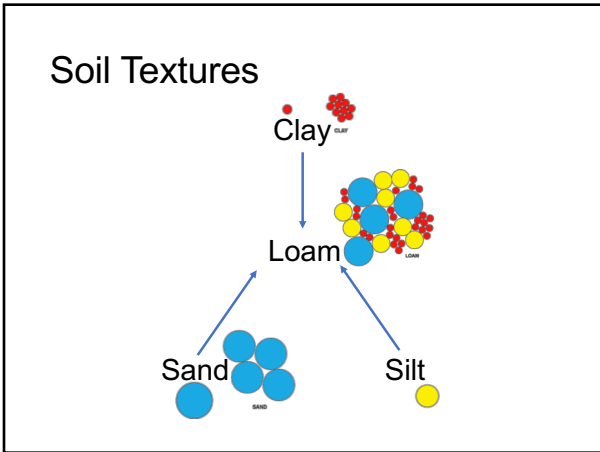


### Soil Texture Triangle

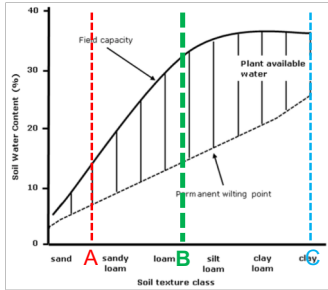


### Soil Texture Triangle





Which soil has the most *plant available* water at field capacity?



### Soil Texturing Video

