**WATERSHED**

* Common point where all water drains. AKA Basin or Catchment.
* Large or small / sub-watersheds
* Key aspects of hydrology: precipitation, evaporation, transpiration, soil water, groundwater, and streamflow.
* Changes in land use (pervious vs impervious surfaces).
* 10% to 15% impervious area and you see increases in pollution, flooding, and streambank erosion.
* We all live in watershed and have an impact. Drive a car, flush a toilet, consume products…

**TREES**

* 40% of Maryland is covered with forests. When Europeans arrived the **Bay watershed** was 95% forested (now 58%).
* 160 species of native & naturalized trees in Maryland.
* **Where did they go?** Expansion of agriculture & cities / industry / construction / fuel / other products.
* 6,000 trees to make a ‘ship of the line’ in the 1600s (30-50 ac).
* **What do trees do?** In one day, one large tree can lift up to 100 gallons of water out of the ground and discharge it into the air.
* A tree can absorb as much as 48 pounds of carbon dioxide per year, and can sequester one ton of carbon dioxide by the time it reaches 40 years old.
* Provides for a microclimate…up to 30 degrees cooler in some cases.
* One large tree can provide a day’s supply of oxygen for up to four people.
* Trees lower surface and air temperatures by providing shade. Shaded surfaces may be 20–45°F cooler than the peak temperatures of unshaded materials.
* More than 20% of the world’s oxygen is produced in the Amazon Rainforest.
* Over 5,000 products are made from trees.
* Up to 40% of precipitation may not reach the ground due to canopy interception.
* Vermont was estimated 90% covered, went to <30%, and now is 78%.

**WATER**

* Supports and sustains life (plants and animals).
* Universal solvent (dissolves many other compounds).
* For both **good and bad** it moves / transports sediment, nutrients, and pollutants.
* **Destroys**: storms/floods and erosion (evulsion).
* **Creates**: erodes rocks that form soil. Accretion of land.
* Powered industry / Transportation / Power.
* Recreation / food (fish, shellfish…)

**SOIL**

* 3 components: sand, silt, and clay.
* Formerly rocks that have eroded or been broken down (weather, lichen, glaciers, atmospheric changes…acid rain).
* Used to be treated as an **abiotic** factor but now considered living (**biotic**) by many scientists. Plays host to bacteria, algae, fungi, protozoa, nematodes, micro-arthropods, earthworms, insects, small vertebrates, and plants.
* “There are more soil microorganisms in a teaspoon of healthy soil than there are people on the earth!”
* It takes at least 100 years to create 1 inch of topsoil.
* **What soil does**:
* ***Regulates water movement*** via runoff, infiltration, and storage.
* Sustains plant and animal life
* ***Filters & buffers pollutants*** via the minerals and microbes in soil which filter, buffer, degrade, immobilize, and detoxify organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits.
* ***Cycle nutrients*** including Carbon, nitrogen, phosphorus, which are stored, transformed, and cycled in the soil.
* ***Provides physical stability and support*** as a medium for plant roots, support for human structures, even protection for archeological treasures.

**TRASH**

**Transport** – water, wind, and people.

**Why?** Economic / don’t know / don’t care / inadequate facilities.

**Impacts** – visual / health (rats, stray animals) / injures or kills animals / contamination from breakdown / cost to clean up / clogging or fouling of pipes, intakes, and inlets /