

Water

- Hydrologic Cycle
 - Ocean -> Atmosphere -> Land -> Ocean
 - Hydrosphere -> where hydrologic cycle takes place
 - Only 3% earth's water is drinkable
- Water phase changes
 - Melting, evaporating, condensing, freezing
- Sun evaporates a trillion tons of water daily
- Condensation
 - Condensation nuclei
 - Solids in water that allow water to grow
 - Dust, ash, airborne sea salt
- One million water droplets make one raindrop
- Runoff – Water that runs from land into lakes and streams
- If precipitation falls on saturated soils, flooding occurs
- Floodplain – Area outside channel
- Groundwater – 30x more plentiful than rivers and lakes
 - Aquifers hold water (absorbent rocks)
 - Water table, top layer of aquifer
- Water freezes from top down
 - Allows insulated shield that protects water animals

1. Water as a resource

- a. % on earth
 - i. 70% earth is water
 - ii. 97% of water is salt
 - iii. 3% of water is fresh
 1. 76% FW is in ice caps
 2. 24% Is liquid
 3. Most FW is in the ground
- b. Less than 1% of lakes, rivers and streams
- c. A lot of water above ground is unusable because of pollution
- d. Other ways to augment Fresh water
 - i. Desalinization
 1. Turning salt water into fresh water
 2. Expensive
 3. Reverse osmosis
 - a. Semi permeable membrane, force sea water through
 - b. Membranes break is a problem

2. 3 ways to look at water
 - a. How we use it
 - b. How we store it
 - c. How we can conserve it
3. How do we store water?
 - a. Reservoirs
4. How do we use water?
 - a. Agriculture
 - b. Industry
 - c. Residential
5. How would we get farmers to use less?
 - a. Water at night

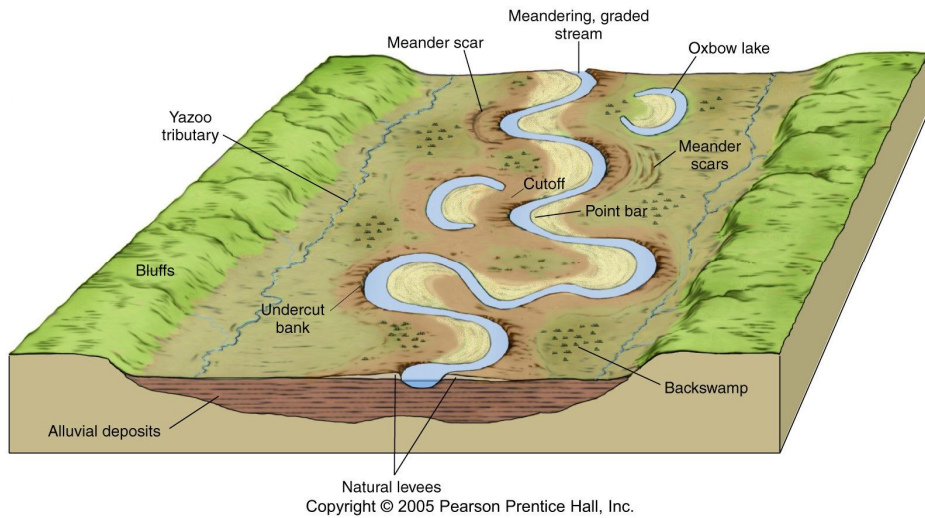
Pittsburgh Three Rivers

- Allegheny River makes a U turn
- Navigable = Depth of at least 9 feet in channel
- Flanking -> Bringing in gently
- Difference between lock and a dam
 - Lock -> a boat can go through
 - A dam does not open
- Pool is the water up river from a dam

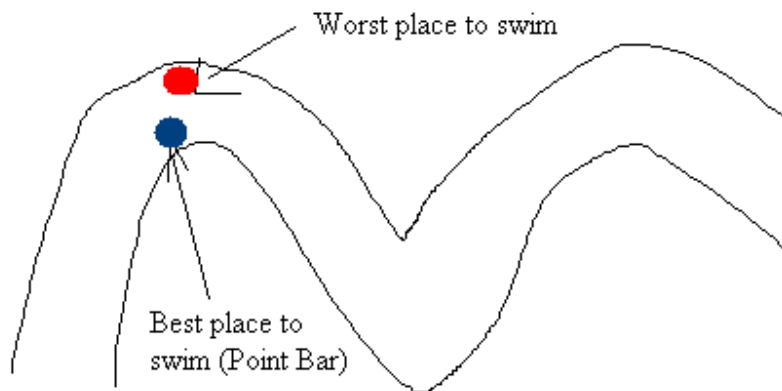
Water budget

- Precipitation = Incoming
- Evaporation = Outgoing
- Precipitation minus evaporation equals "deficit" or "surplus" of water
 - Precipitation > evaporation = Surplus
 - Precipitation < evaporation = Deficit
- Pittsburgh surplus is November to May
- Pittsburgh deficit is June to October
- 40 inches of yearly precipitation
 - On average 1 inch of rain = 10 inches of snow on average
 - 4 out of 40 inches is in snow

Building on a floodplain is dangerous



Meander



Water Notes

- What is Groundwater?
 - Underground water found in the spaces of rocks and sediments
 - Less contaminated than surface water
 - Most important source of water for rural domestic use
 - Provides drinking water for half of the population of the U.S.
 - Shallow groundwater may be held in pore spaces for thousands or millions of years
 - Rate of movement of groundwater is controlled by the permeability of the rock sediment
 - Porosity – Open spaces or voids in rocks

- Water table – level that water seeks when in the earth's surface – Normally follows topography
- Permeability – Ability of rock to allow liquids to pass through
- Artesian well – Low area where water table is above opening and water comes out
- Aquifer – porous layer that water travels in
- Spring – Place where groundwater naturally comes out at surface