

St. Tammany Parish Adopt a Pond Program

BOYET JR HIGH

TENET POND



Section 1: The Program

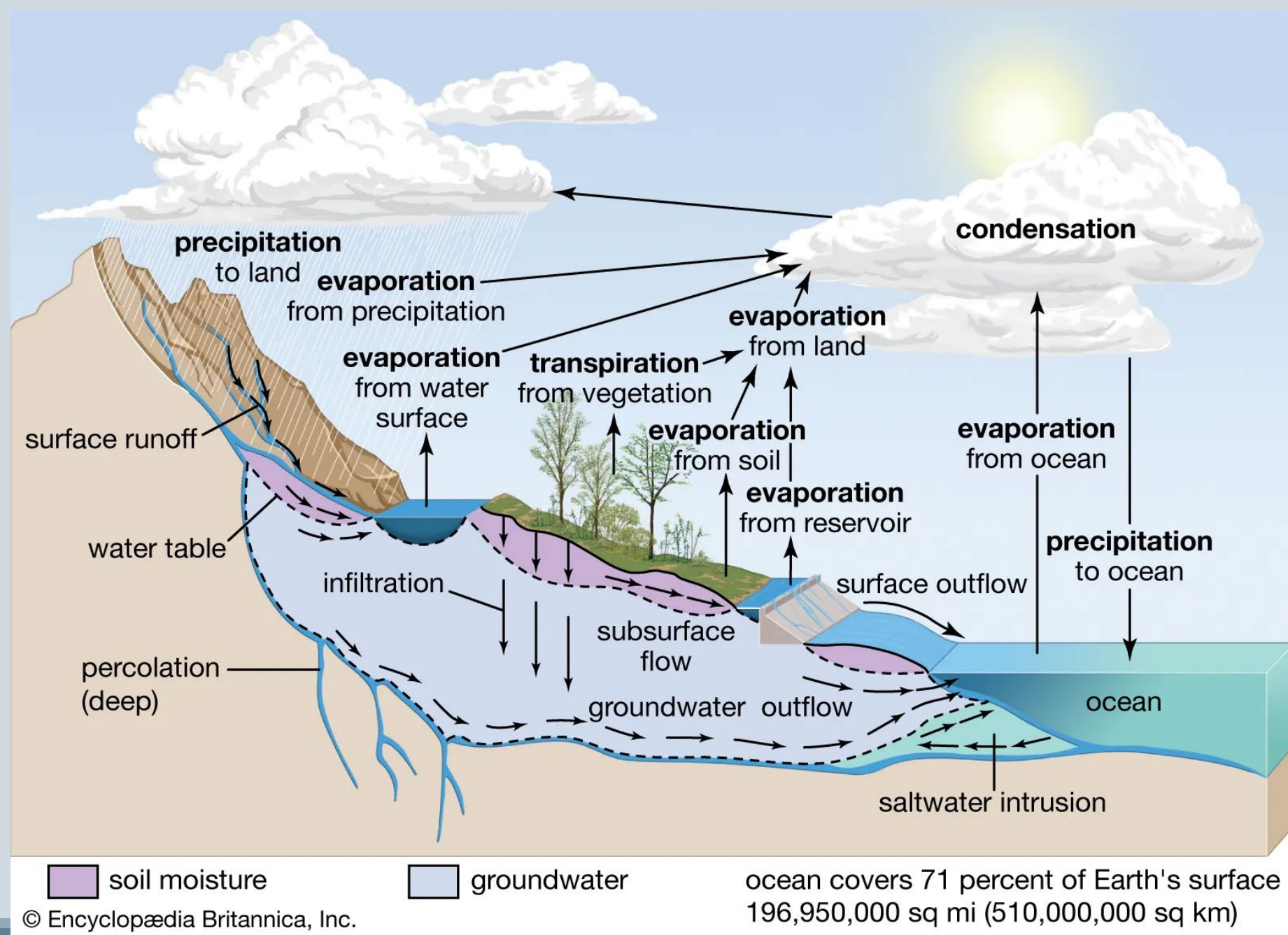
Students will gain knowledge about:

1. Wetland Environments
2. Watersheds
3. Stormwater Flooding
4. Water Pollution and Clean Water Act
5. Water Related Human Health Issues
6. Planting Trees
7. Water Quality Testing
8. Wetland Animals
9. Potential Careers
10. Community Stewardship



The Water Cycle

The Hydrologic Cycle

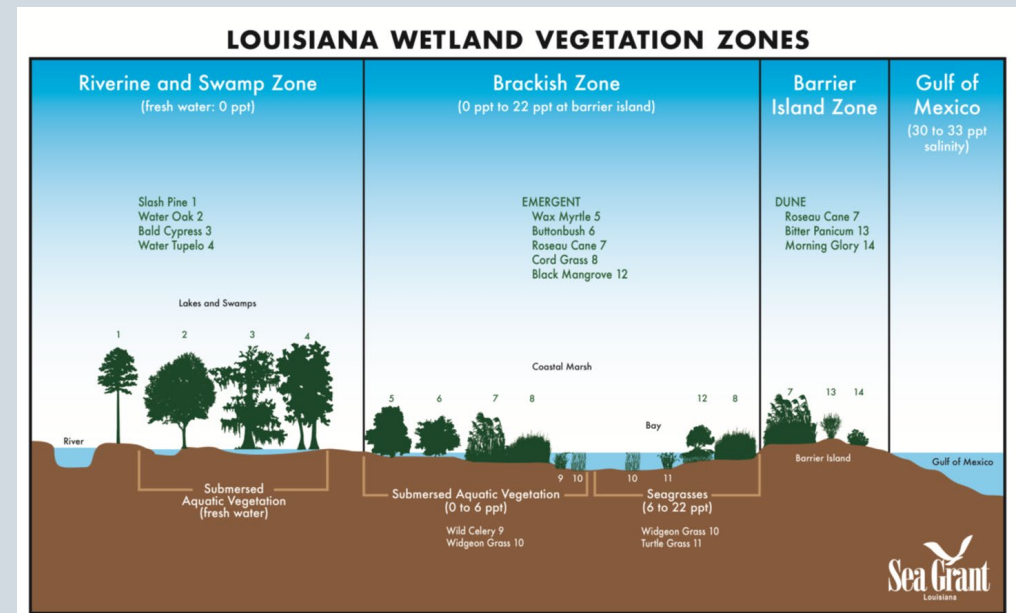


Watersheds and Wetlands

A **Watershed** is a land area that **channels rainfall and snowmelt** to creeks, streams, and rivers, and eventually to **outflow points** such as lakes, reservoirs, bays, and the ocean.



Wetlands are areas where **water covers the soil**, or where water is **present either at or near the surface of the soil** all year or for varying periods of time during the year.





Stormwater Flooding

Heavy rain-storms can cause flooding in both rural and urban areas

Causes of Flooding:

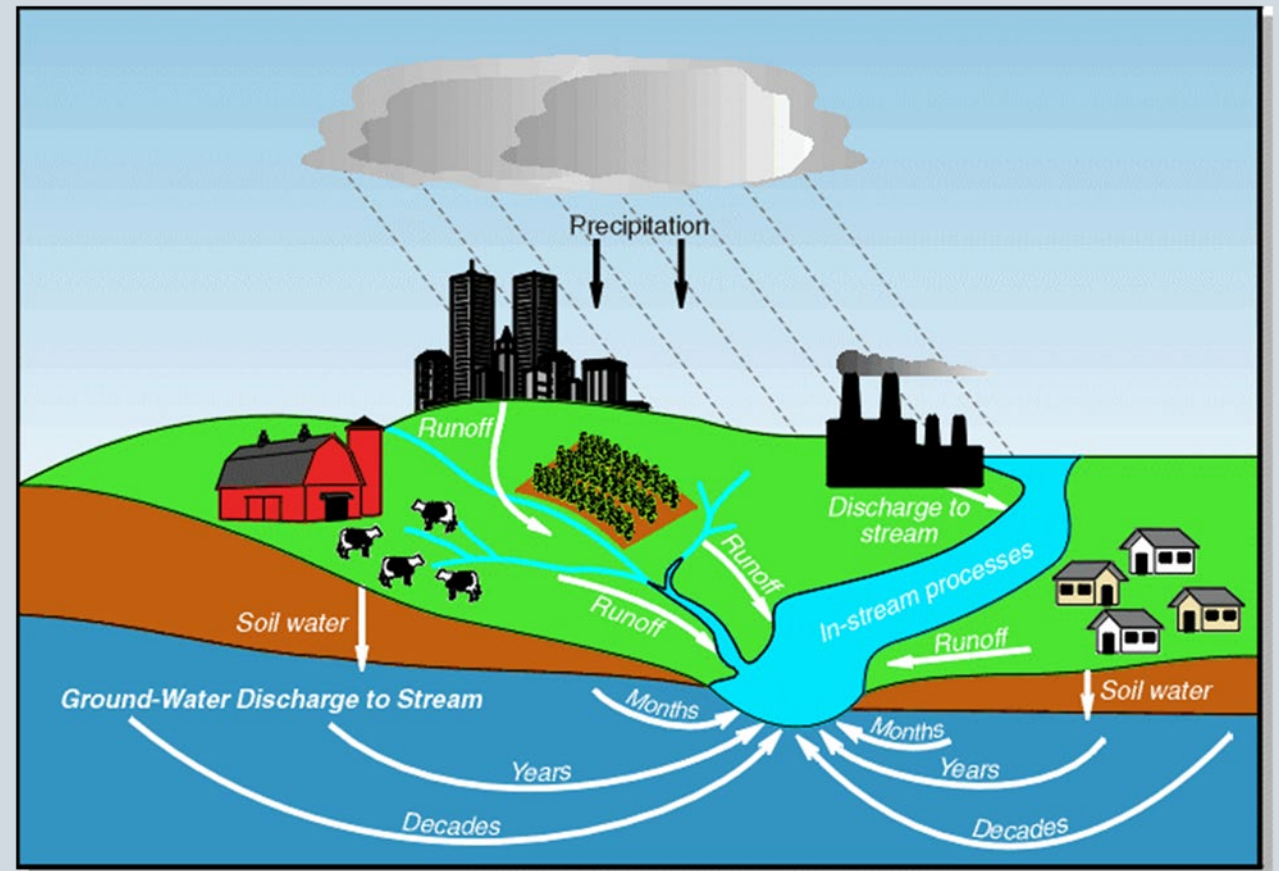
- Paved roadways - concrete/asphalt
- Overwhelmed drainage systems
- Reduced Green Spaces - reduced absorption ability of rainwater into groundwater storage



Rainfall Runoff – stormwater pollution

Pollutants are picked up and deposited into local waterbodies. **Land use practices** that contribute to point and nonpoint source pollution:

- Agriculture and Forestry - fertilizer, pesticides, herbicides, animal waste, soil and sediment erosion
- Urban runoff - pet waste, oil, grease, antifreeze, spilled fuel, fertilizer, pesticides, herbicides
- Home sewage systems – human waste
- Sand and gravel mining - soil
- Construction – soil and sediment erosion



Courtesy: <http://md.water.usgs.gov>

Improving Parish Waterbodies

Many waterbodies in the Parish are impaired. Water quality standards are set by the federal government (US EPA) by order of the Clean Water Act and enforced through LA Department of Environmental Quality.



States must maintain good water standards, reduce pollution entering waterbodies and remove pollutants in water or face fines.

The **Adopt a Pond Program** monitors the efforts by the Parish to reduce pollutants in stormwater drainage flowing through constructed ponds.

Measuring stormwater inflow and outflow allows the parish to show pollutant removal ability of the stormwater ponds.

Why do we care about healthy waterbodies?

Use for Recreation

- Swimming
- Boating
- Fishing
- Birding

Value to the Ecosystem

- Fisheries – commercial and sport
- Wildlife habitat
- Storm water management
- Filtration to ground water

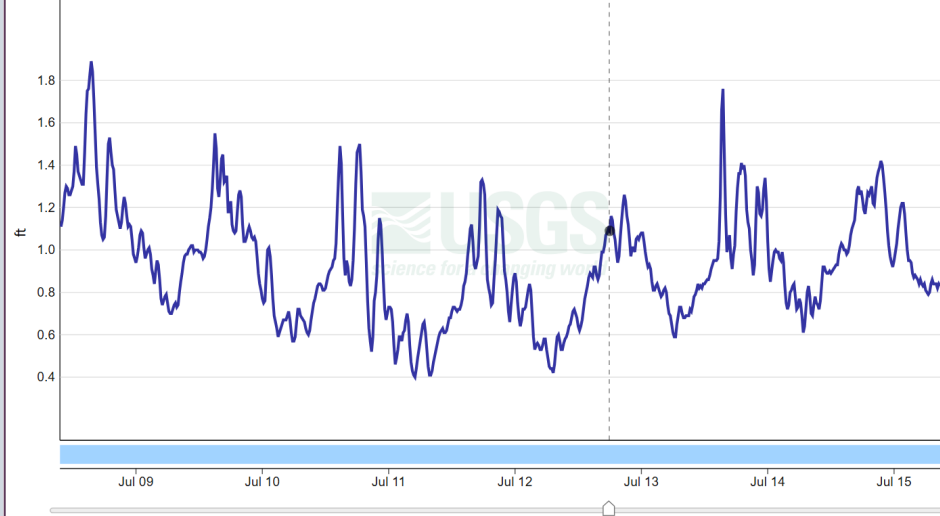


Bayou Liberty near Slidell, LA - 07374581

[Subscribe to WaterAlert](#)

July 8, 2025 - July 15, 2025
Gage height, feet

1.09 ft - Jul 12, 2025 06:00:00 PM CDT



**St. Tammany Parish
receives 62 inches of rain,
on average, per year.**

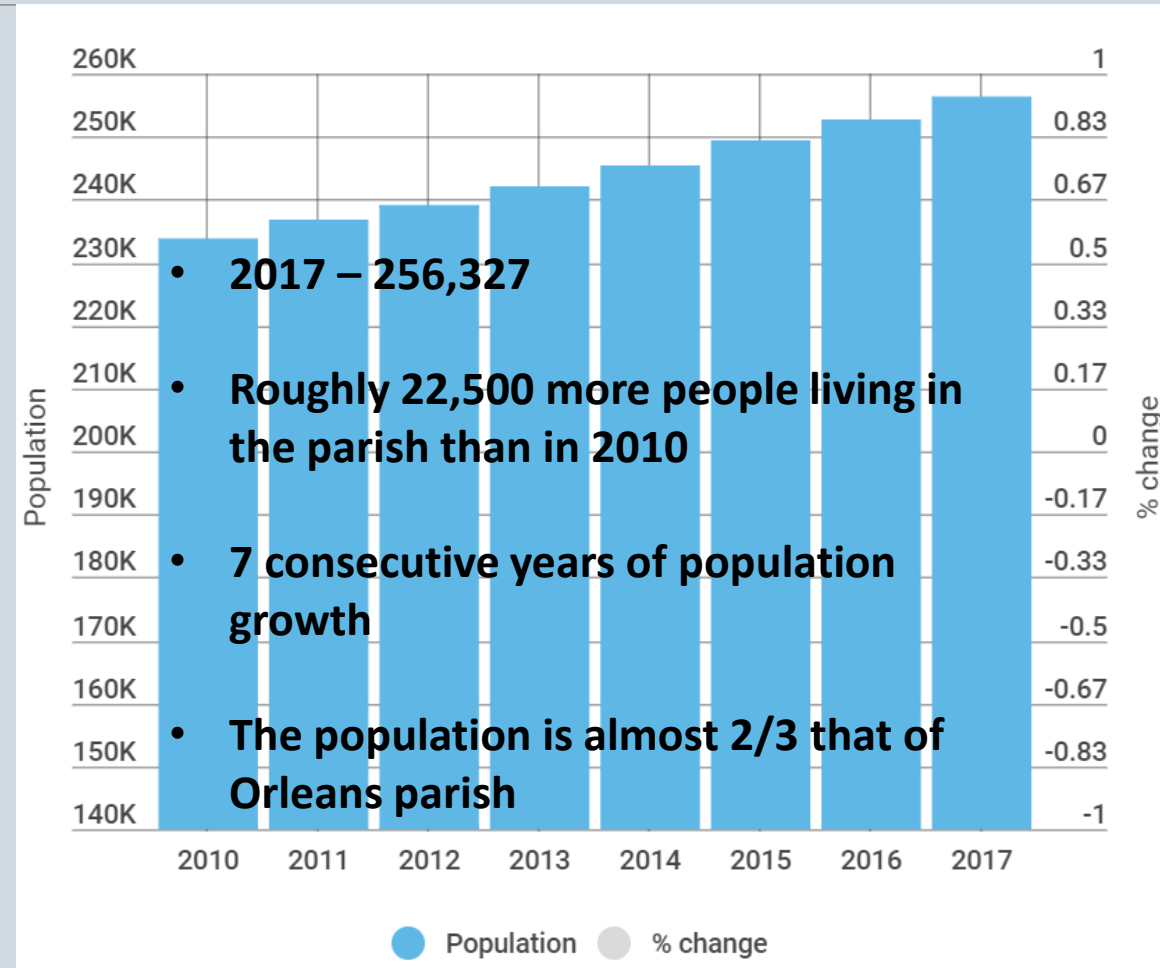
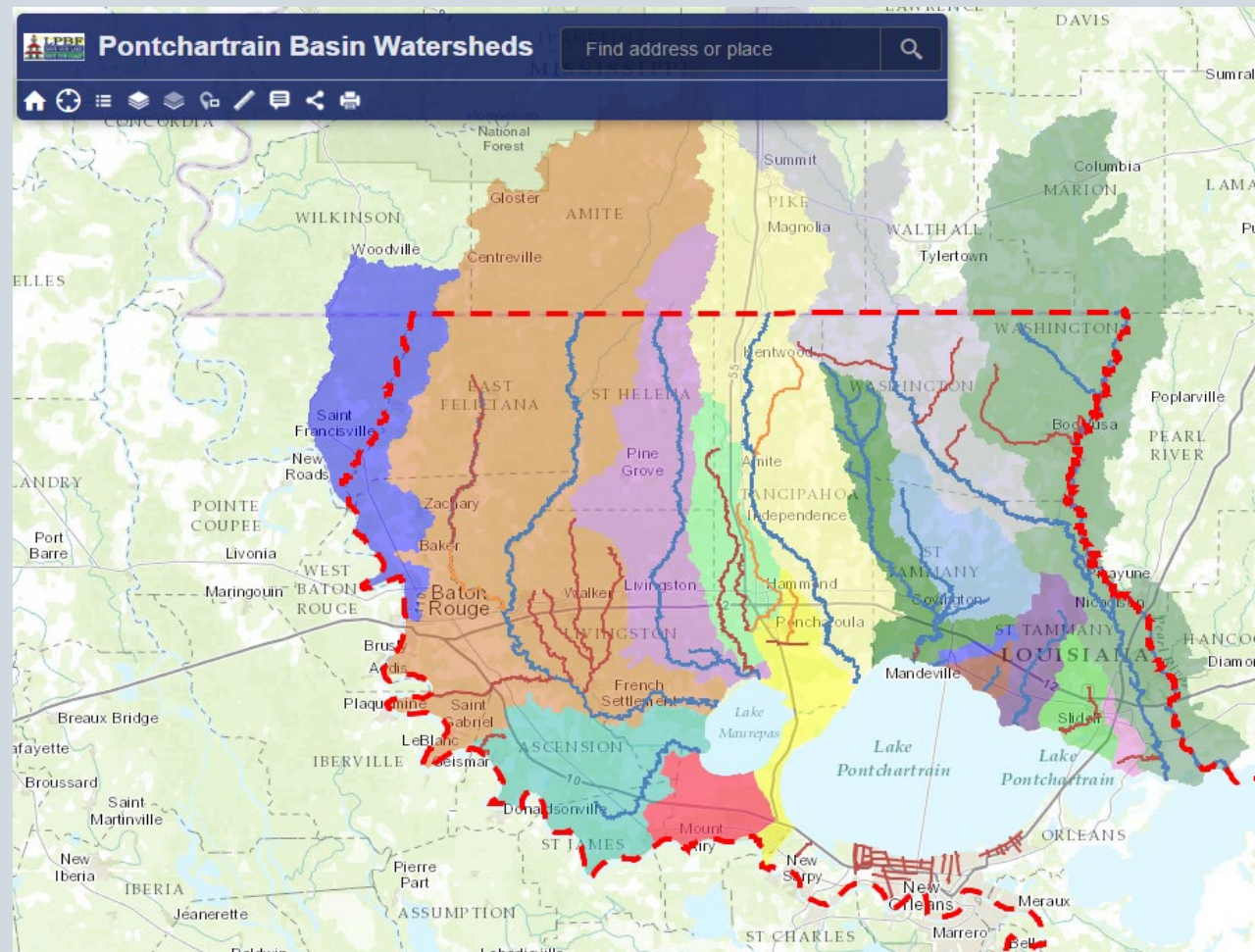
**US average is 38 inches
per year.**



Map prepared using data from the Hydrological Derivatives
for Modeling and Analysis Database for North America

Riverine

Your Watershed – St. Tammany Parish

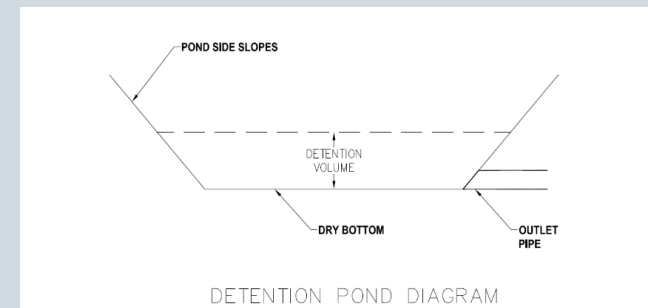
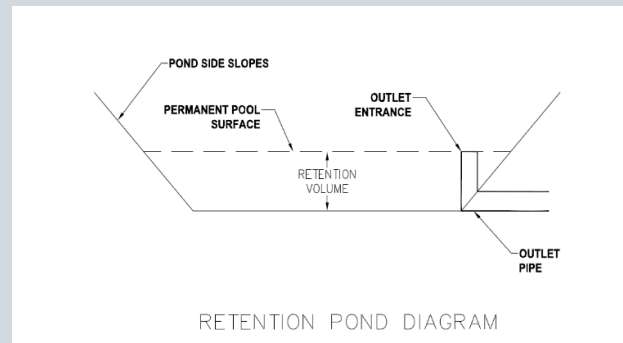


Constructed Stormwater Ponds

Used for flood control and storm water runoff treatment

Retention Pond “wet ponds”

- Permanent pond
- Shaped to accommodate additional rainfall
- Holds stormwater indefinitely
- Provides aesthetic value



Detention Pond “dry pond”

- Holds water temporarily
- Slows water flow to mitigate flooding
- Provides aesthetic value



What is the Adopt a Pond Program?

Goal 1.

Decrease stormwater flooding in St. Tammany Parish.

Goal 2.

Increases tree canopy lost during hurricanes and development and allow, native wetland plants to colonize stormwater ponds.

Goal 3.

Monitor the quality of water entering and leaving the natural sinks and constructed stormwater ponds to document pollution removal to receiving waters.

Goal 4. Increase awareness of potential human health risks like West Nile mosquito vector exposure.

Goal 5.

Engage area school students through partnerships by utilizing STEM enhanced, hands on learning activities to develop community stewards, showcase career opportunities.

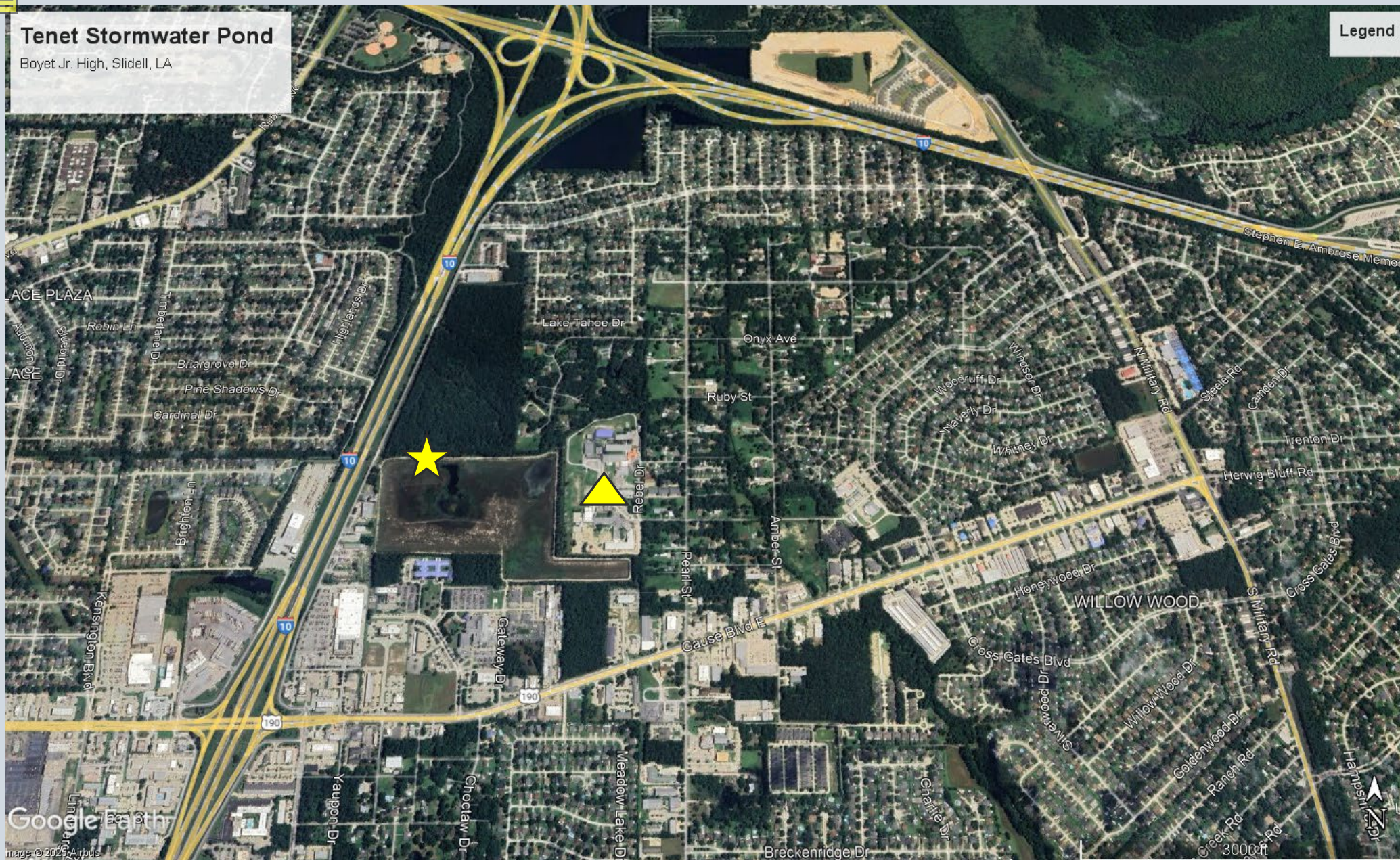
Tenet Stormwater Pond

Boyet Jr. High, Slidell, LA

Legend

★ Stormwater Pond

▲ Boyet Jr. Little Oak School Complex





What to expect:





What to wear...or not...

Do wear:

- Long pants/sleeves
- Belt loops are helpful
- Shoes appropriate for getting wet and muddy
- A change of socks
- Sweatshirt/jacket for cold or rain
- A change of clothes
- Tie hair back
- Garden gloves



Don't wear:

- Sandals
- Crocs
- Slip on shoes
- Rings
- Bracelets
- Nice clothes
- Cellphone or wallet
- Shorts



Section 2: Student Field Activities

Tree Planting and Water Quality Testing

In this section students will gain knowledge about:

1. Why trees are planted at the constructed stormwater ponds.
2. Why wetland plants are allowed to colonize the stormwater ponds.
3. Why water quality testing indicates pollution from the inflow and removal of pollution from the outflow.
4. What water quality tests indicate about pollution levels in waters.
5. Other ways to determine potential impairments in waterways, like insect collection.



How do vegetative plantings help?

Slows water flow – mitigates flooding

Reduce sediment erosion and nutrient loading

Plants absorb pollutants into their tissues

- Excess nutrients

Roots

- Provide substrate for the growth of bacteria and algae
– nutrient cycling
- Increase soil strength and stability to prevent erosion

Provide habitat for animals

- Reptiles, amphibians, birds, insects, fish, mammals

Plants return water to the atmosphere through evapotranspiration

- Drawn through the roots and transpires through the leaves

Add aesthetic value!

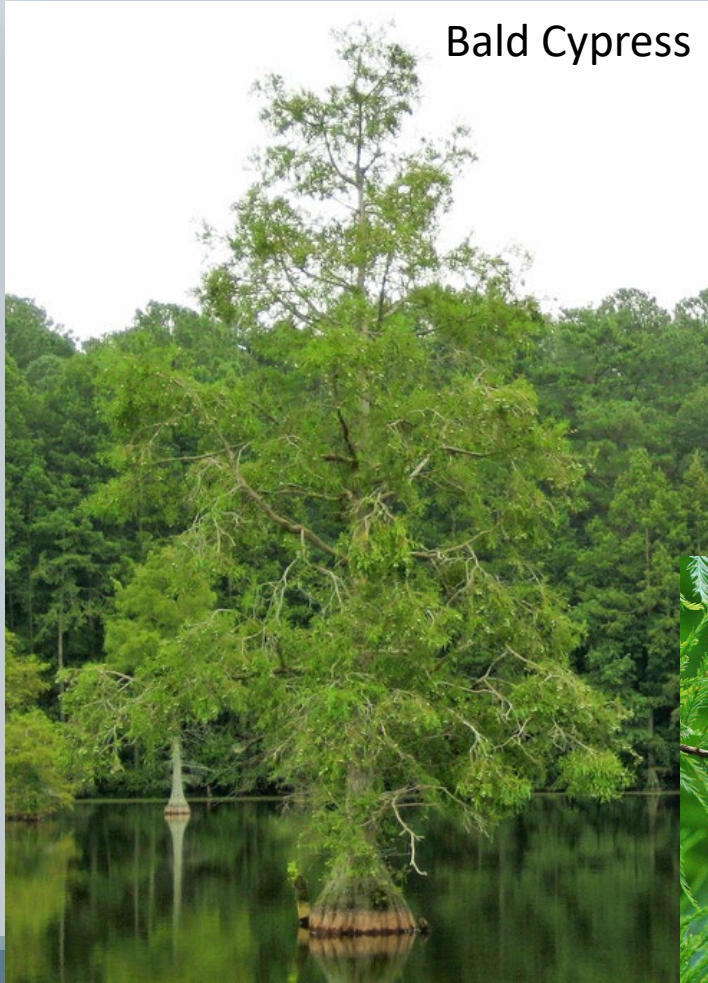




Tree Planting

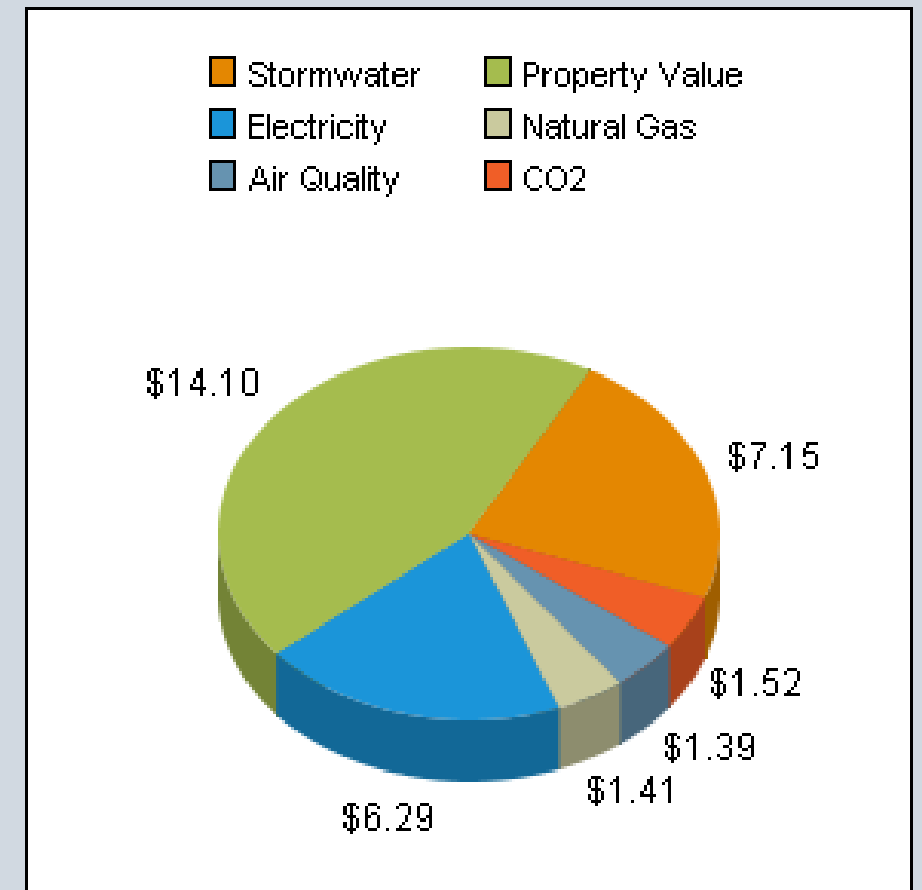
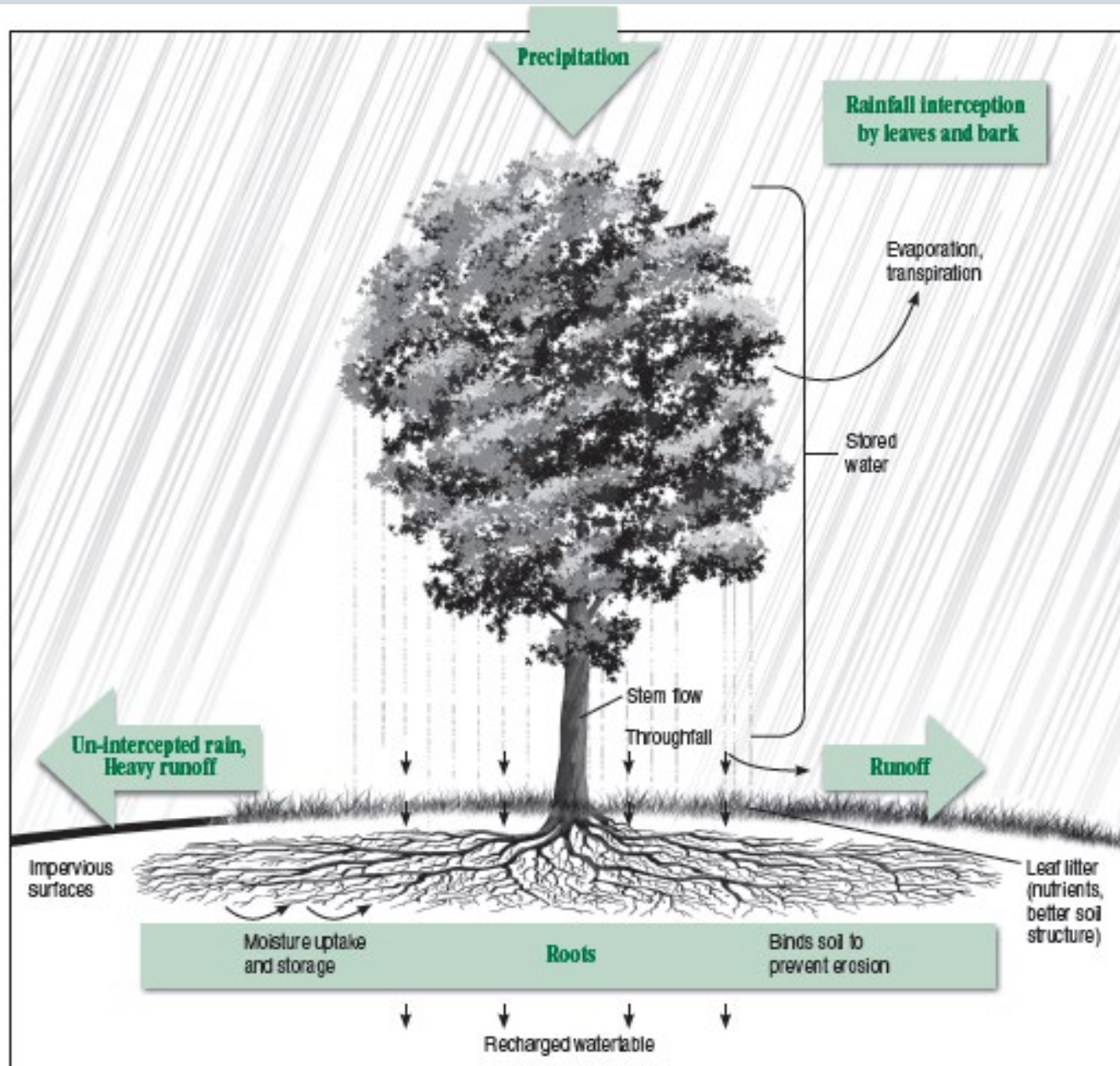
Can tolerate continuous wet trunk.

Bald Cypress



Tupelo Gum





A 10 –inch Bald cypress will intercept 1,182 gallons of stormwater runoff in a year.



Tree Planting - Perimeter



Cow Oak
Swamp Chestnut Oak



©2009 Will Cook

Prefer temporary trunk submersion.

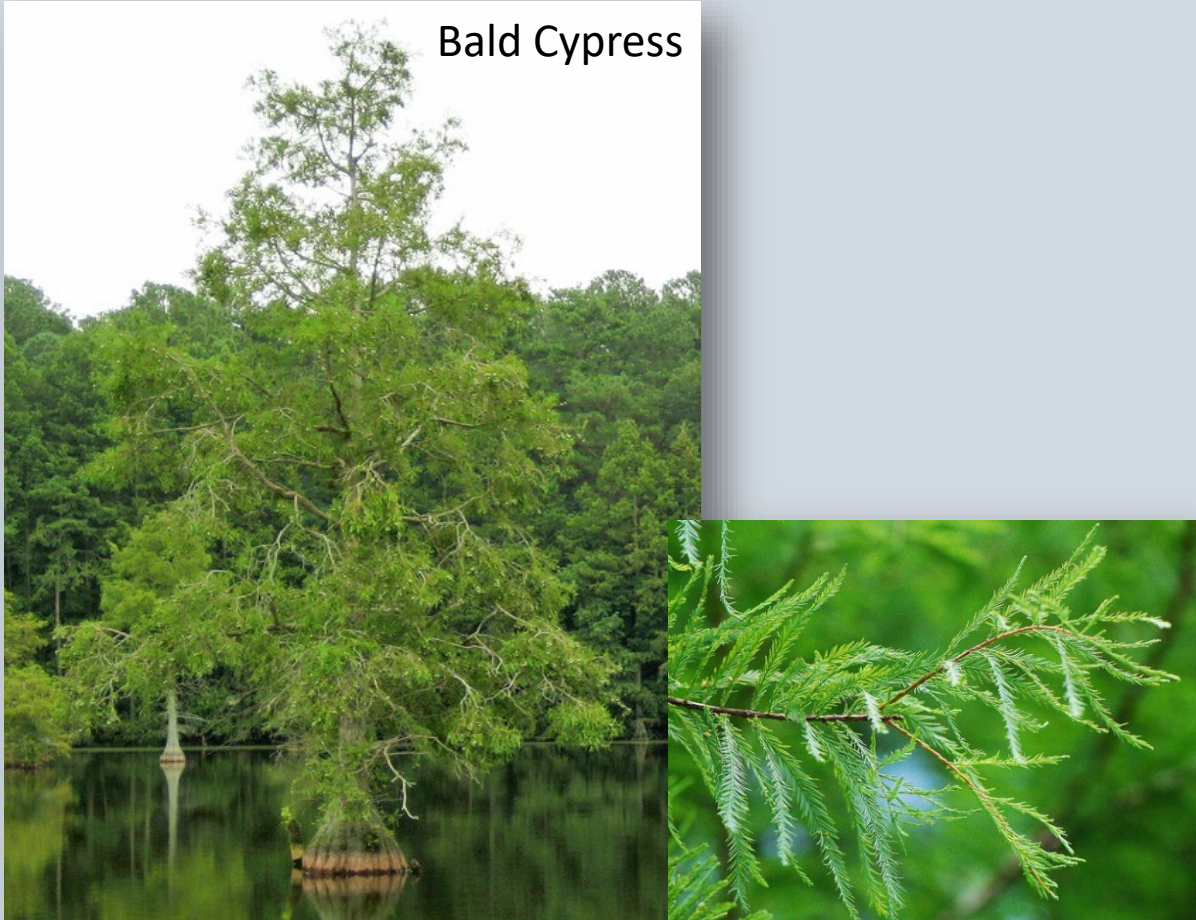


Live Oak



Tree Planting - Perimeter

Bald Cypress



Willow
Oak





Your role - water quality monitoring

Participating school students will monitor water quality by testing indicator characteristics listed:

- Water Clarity
- Dissolved Oxygen
- Temperature
- Nitrates
- Phosphates
- pH
- Salinity



Water Clarity

Aquatic plants die without sufficient light

- Less food and refuge for many animals
- Lower oxygen production

Cloudy water = turbid water

- Sediment
- Algae

Gilled creatures can suffocate

Secchi disc – depth of light penetration

- The deeper the disc, the clearer/less turbid the water

Secchi disc



Water Clarity Tube



Dissolved Oxygen

Aquatic animals also need oxygen

Low oxygen = stressed habitat

Oxygen can be mixed into water:

Rain, wind, waves, and currents

Produced through Process of Photosynthesis

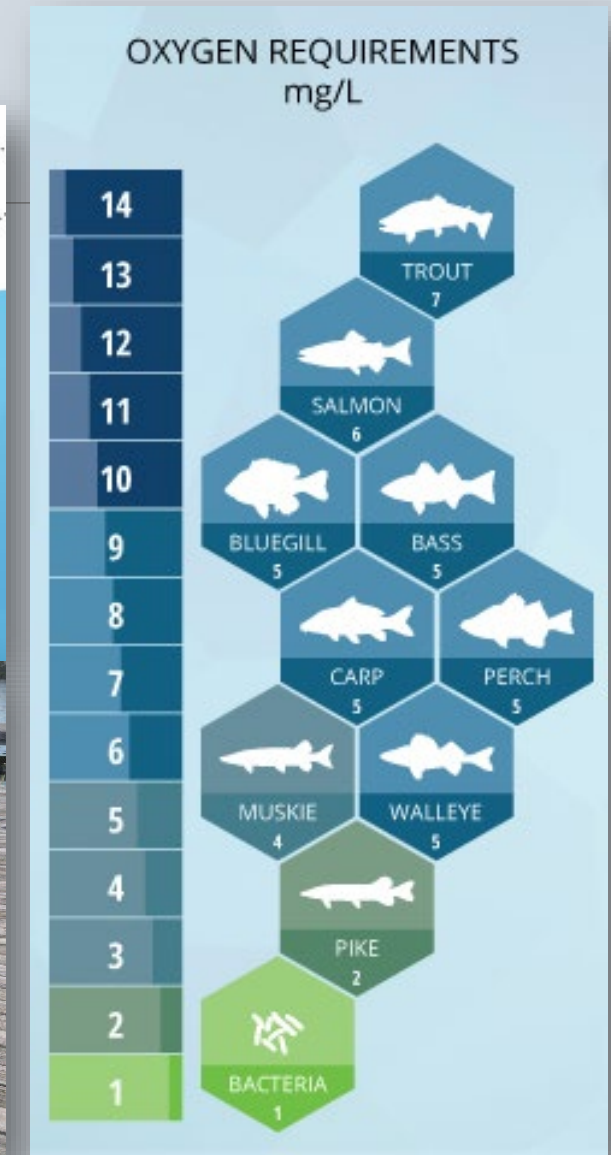
Aquatic plants and algae

5 mg/L = is the standard set by EPA

Less than 2 mg/L = hypoxic

0 mg/L = anoxic

Coldwater holds oxygen better than warm



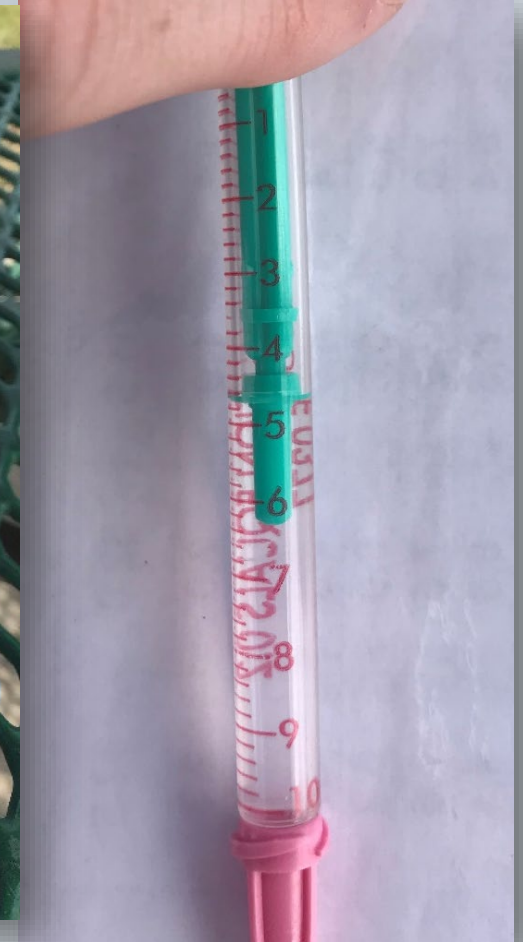
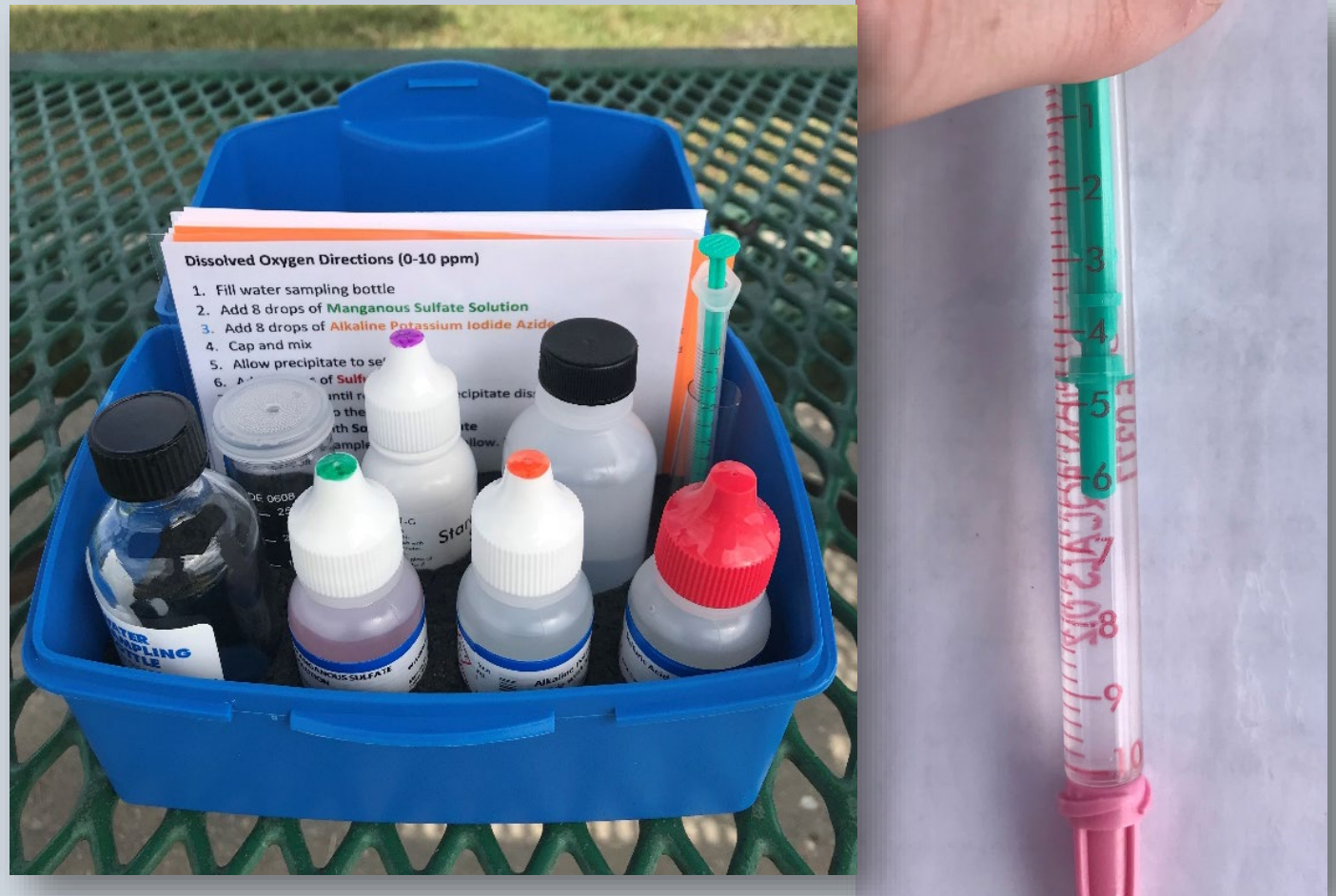
Dissolved Oxygen Kit

Titration Method

Two Critical Steps in the Method

Add chemicals to:

1. Fix the sample to ensure the oxygen stays the same
2. Isolate oxygen content



Temperature

- Aquatic creatures – cold-blooded
Body temp, metabolism, growth rates controlled by water temp
Most can tolerate only a certain range of temperatures
- Cold water holds more DO than warm water
- Summer high temperatures may cause lowered DO
- Looking for a change from natural conditions (seasonal and diurnal anomalies) Not checking for a specific value
- Thermal pollution can occur from heated water discharge
Waterways around power plants or sewage facilities

Example of impact to aquatic life:

Manatees will remain in an area during winter months due to warm water discharges – food can become scarce as surrounding temps drop



Power plant, FL



West Indian Manatee

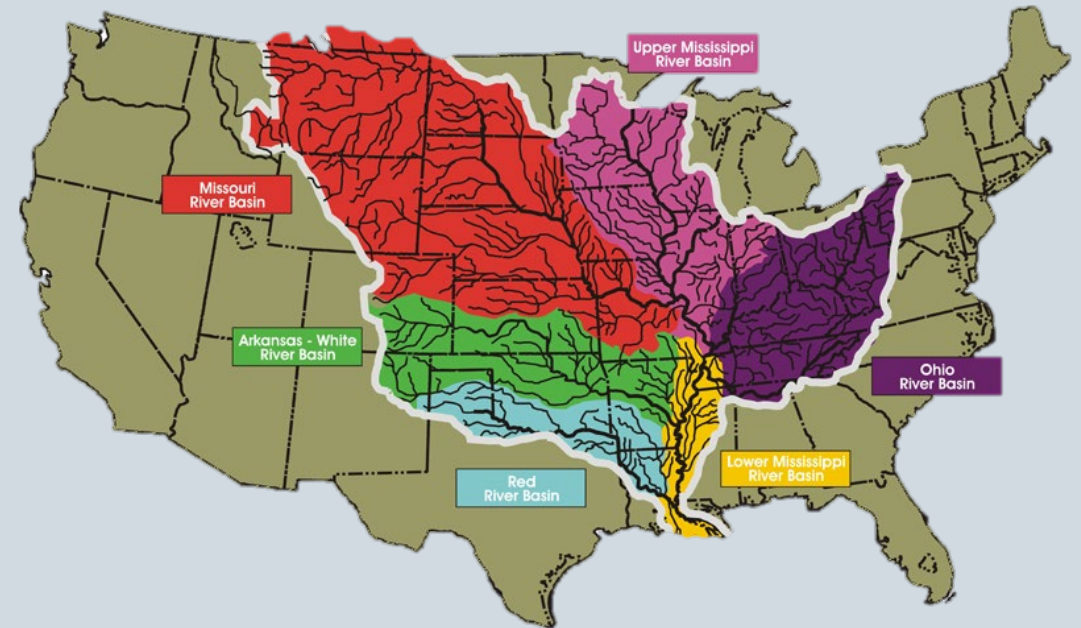
Nutrients

Nitrate-Nitrogen

Excess nutrients in water

- Algal bloom – initial increase in DO
- Algae dies – bacterial decomposition
- Uses up most or all of the available DO
- Hypoxic environments
- Dead Zones

The concentration of inorganic nitrogen in relatively unpolluted streams in Louisiana ranges from 0.03 to 0.18 parts per million (ppm), polluted streams can be as high as 0.50 ppm.



The Mississippi River drains 41% of the continental U.S.

Nutrients

Phosphorus

< 0.01 mg Total Phosphorous per liter- Oligotrophic (low growth potential)
0.01 mg to 0.03 mg Total Phosphorus per liter – Mesotrophic (intermediate)
> 0.03 mg Total Phosphorous per liter - Eutrophic (significant algal growth)

Phosphorus is an essential nutrient for plant growth (fertilizers, plant, human and animal waste).

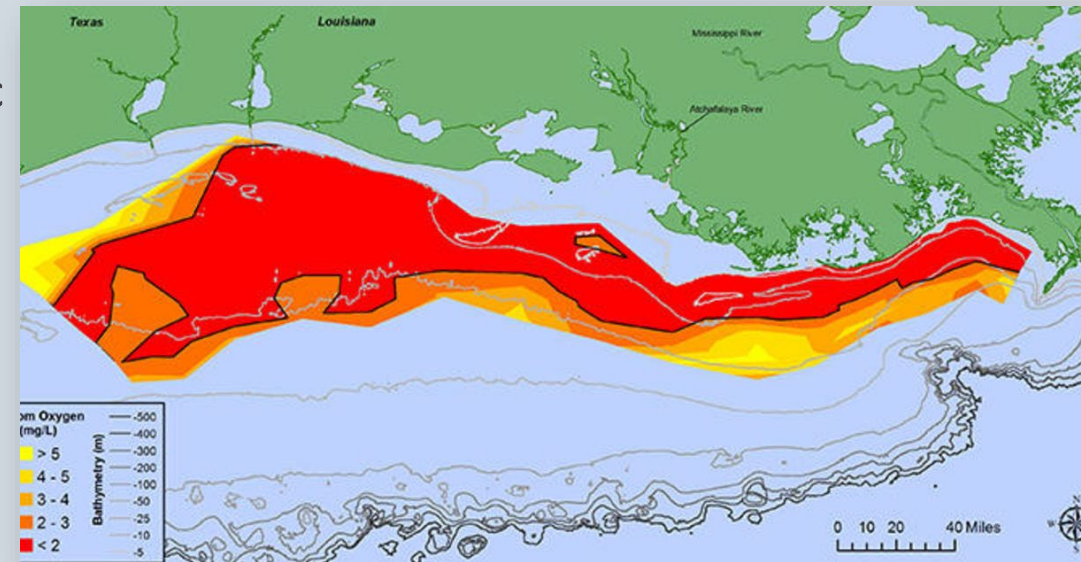
The concentration of PO_4 in unpolluted Louisiana streams ranges from 0.05 to 0.10 ppm, polluted streams can be as high as 1.0 ppm.

Phosphorus is usually held on soil particles, bound into organic material, or part of mineral compounds. Released by agitation.

Relationship of phosphorus and pH.

The transfer of PO_4 into the water column may increase algae growth, which removes CO_2 and drives pH to higher values, facilitating additional PO_4 release and exacerbating the potential for harmful algal blooms.

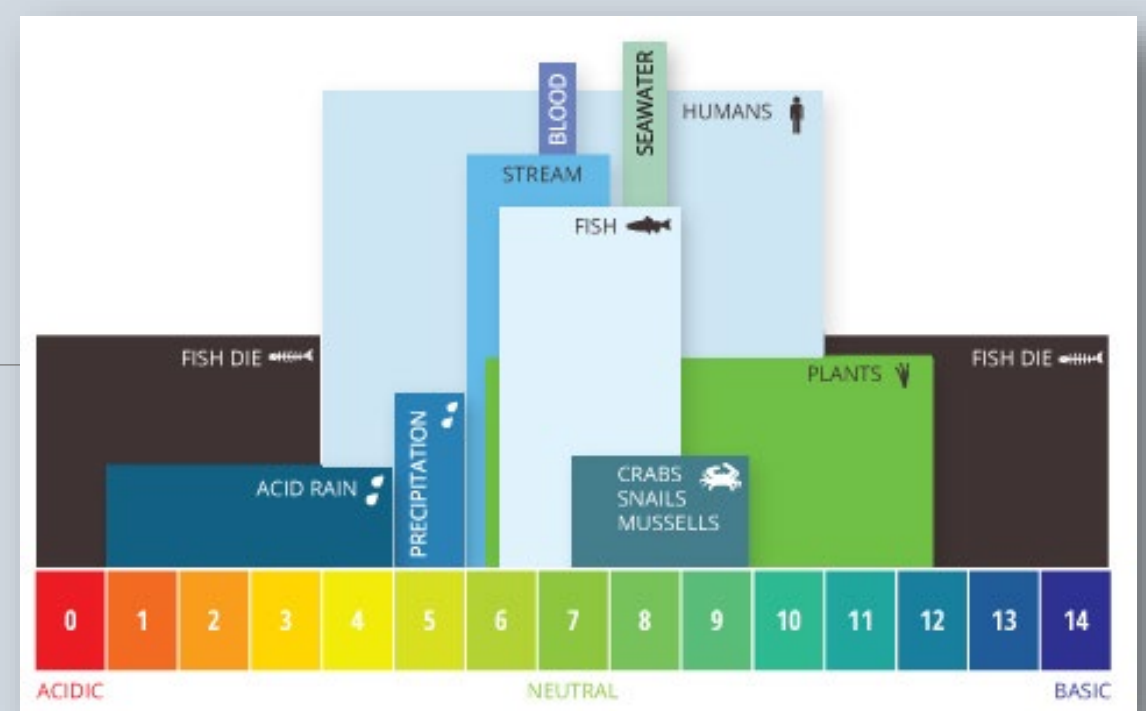
Gulf of America “Dead Zone”
caused by high nutrient load of Mississippi River



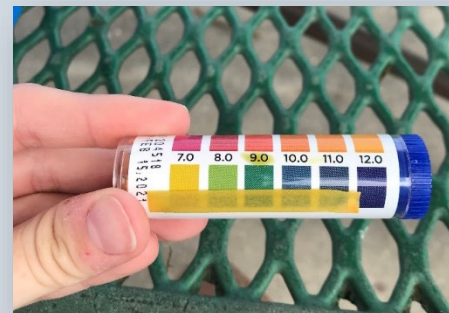
pH Kit

Measure of hydrogen ions (H⁺)

- More hydrogen ions = more acidic
- Neutral range 6.0-8.0, most animals tolerate
- Sudden, dramatic changes in pH can endanger aquatic life
- Causes include automobiles, coal-burning, factories, contributions to acid rain
- Pollutants transported in runoff
- pH test strips are a quick way to sample



pH test strips



Salinity

A measure of concentration of dissolved salts in the water

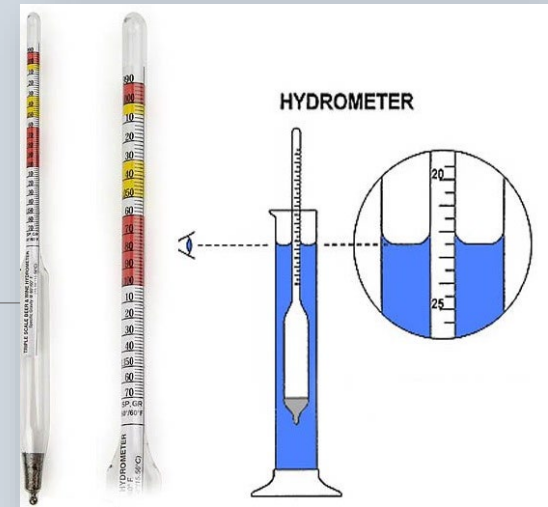
Plants and animals adapted to living in certain salinity ranges

Measured as a ratio of salts to water, reported as parts per thousand (ppt)

Water at high salinities hold less DO

Freshwater	0-2 ppt
Intermediate	3-10 ppt
Brackish	11-20 ppt
Saltwater	21-above ppt

Based on plant community assertions



Macro-Invertebrate Sampling

Aquatic Insects



Another way to determine whether a waterbody is impaired is to sample the aquatic insect community (Macro-Invertebrates) from the water or water bottoms (top 6 cm). An abundance of pollution tolerant invertebrates indicates further investigation is needed to determine the source of the pollution.

As an Example: An abundance of *Culex quinquefasciatus* (southern house mosquitoes) indicates sewage influenced water. Testing for *E.coli* further indicates sewage pollution presence.

Human health maybe at risk for West Nile Virus or other, similarly harmful viruses.

Other aquatic invertebrates or the lack of certain species might indicate low dissolved oxygen.

