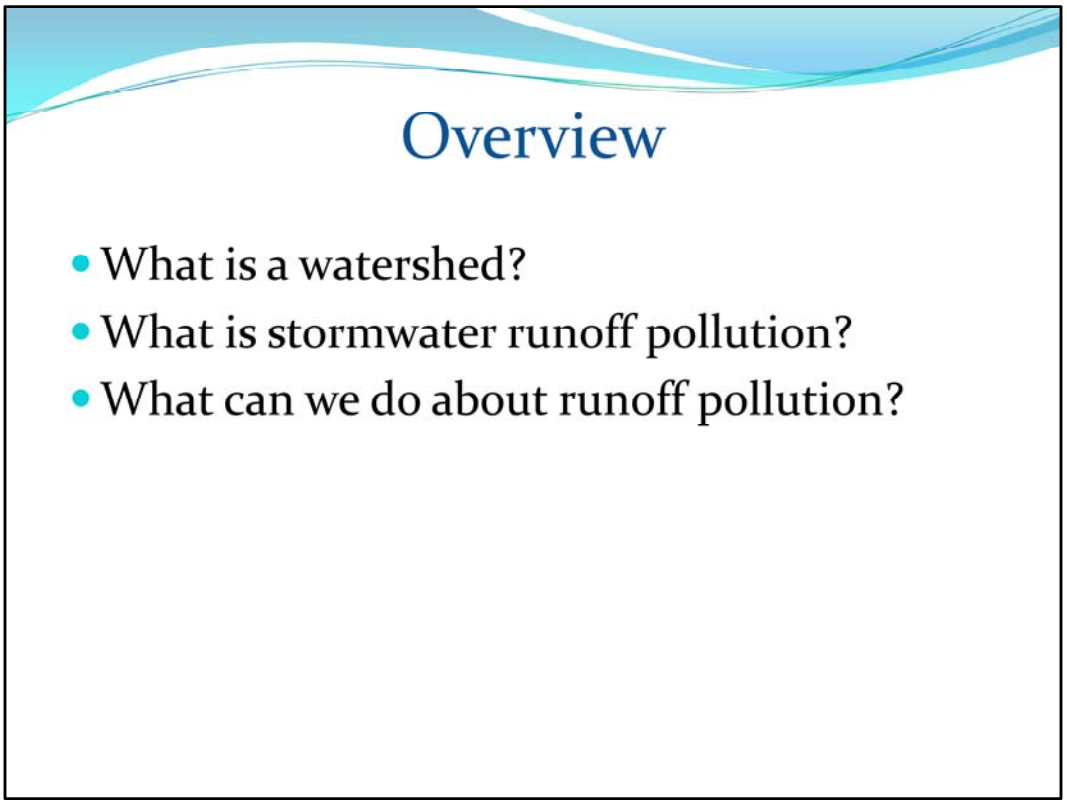
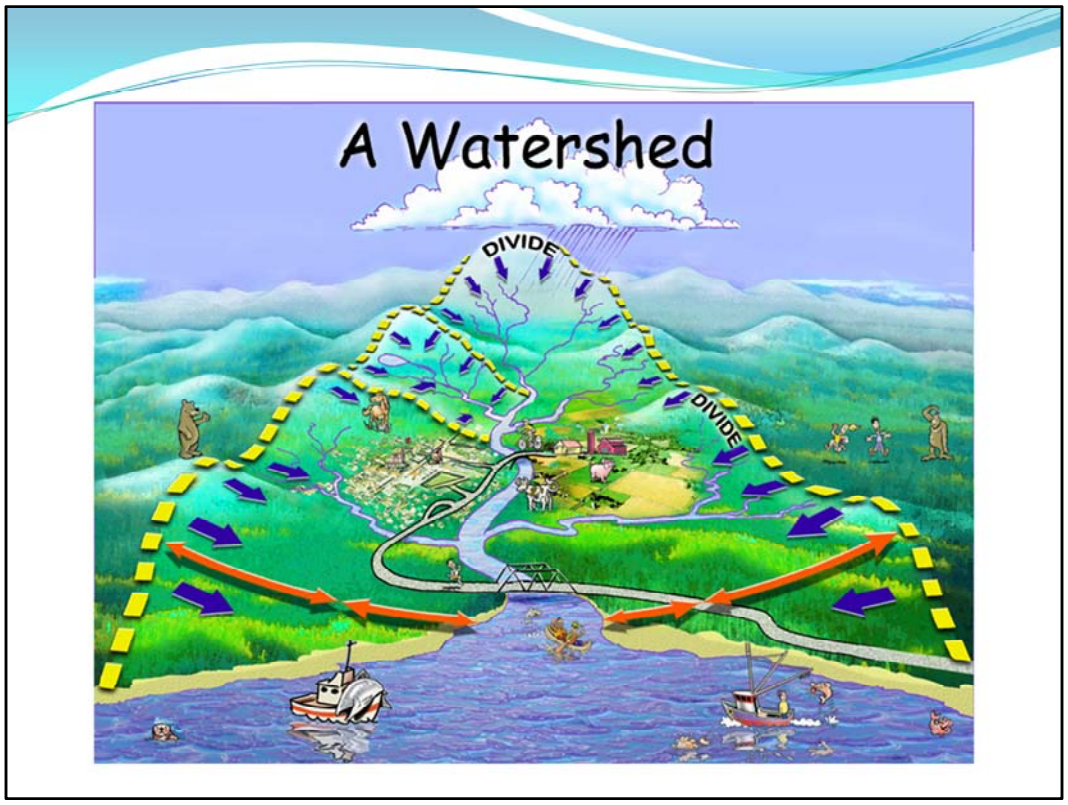

We All Live In A Watershed
59
290
96
10
610
45
Galveston Island
TCEQ
Dickinson Bayou
WATERSHED PARTNERSHIP
AgriLIFE EXTENSION
Texas A&M System
Sea Grant
Texas
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



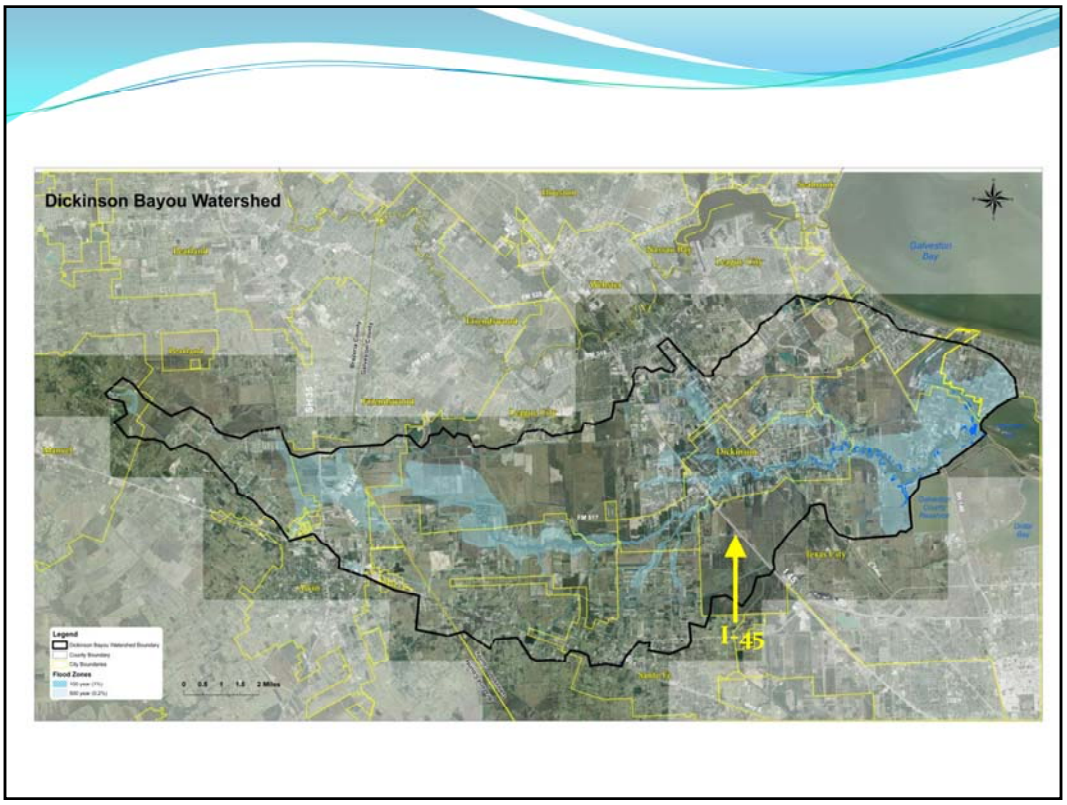
Today we will talk about three main topics. We will define a watershed, stormwater runoff and pollution, finally, we'll discuss ways we all can help stop stormwater runoff pollution.

What is a Watershed?

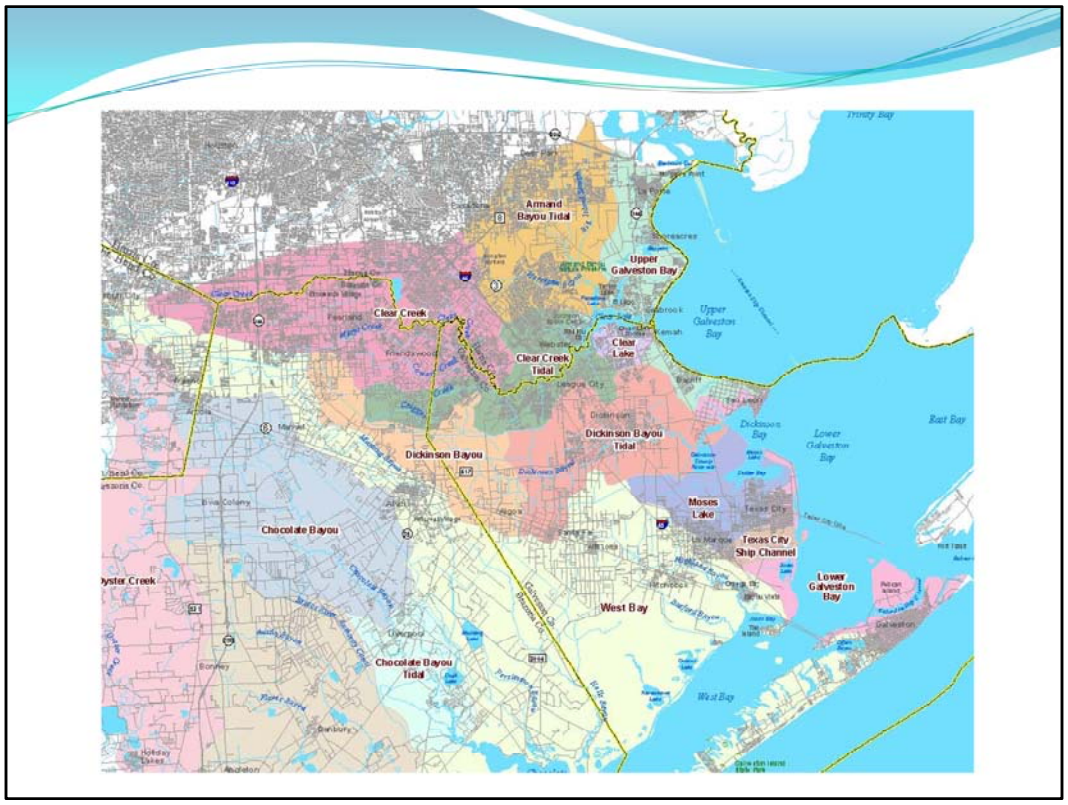
- An area of land where all of the precipitation that falls drains into a given body of water



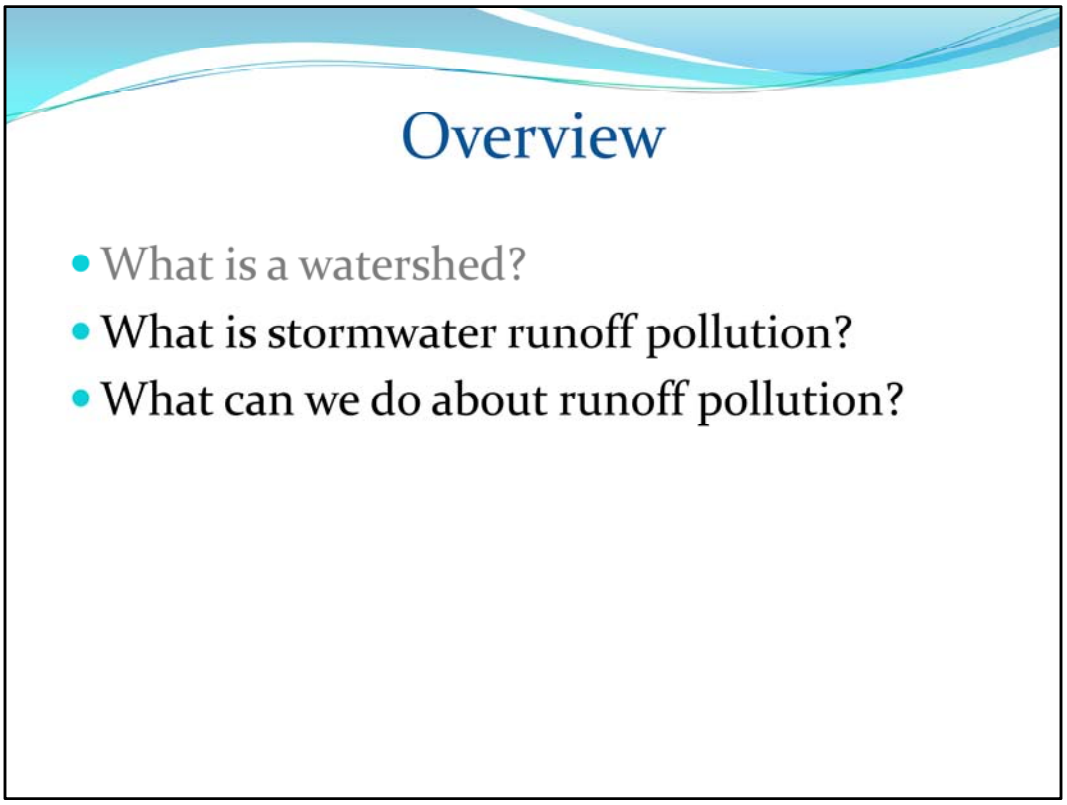
Here is a diagram of what a watershed can look like. Notice that a watershed incorporates both the natural and human-made world. Also, the dividing lines are not so easy to spot on the flat Texas gulf coast.



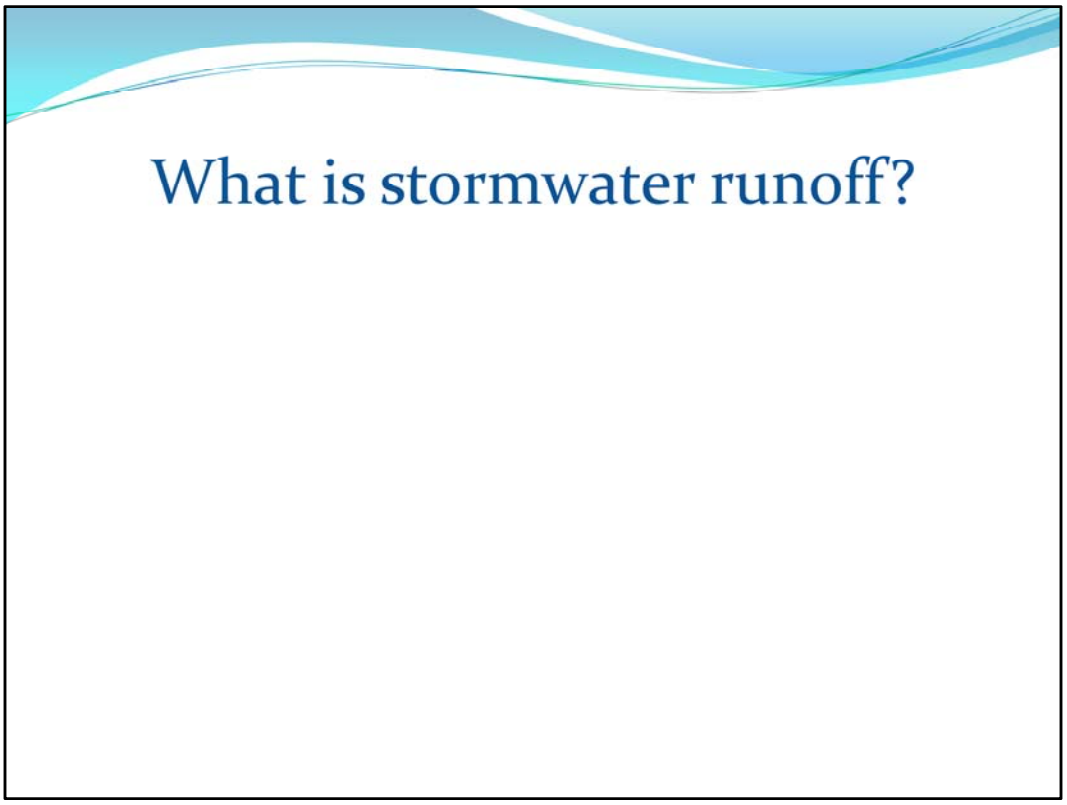
The black outline is the Dickinson Bayou watershed. Note the blue meandering line, this is Dickinson Bayou. I-45 is marked as a reference. Can you find where you live on this map?



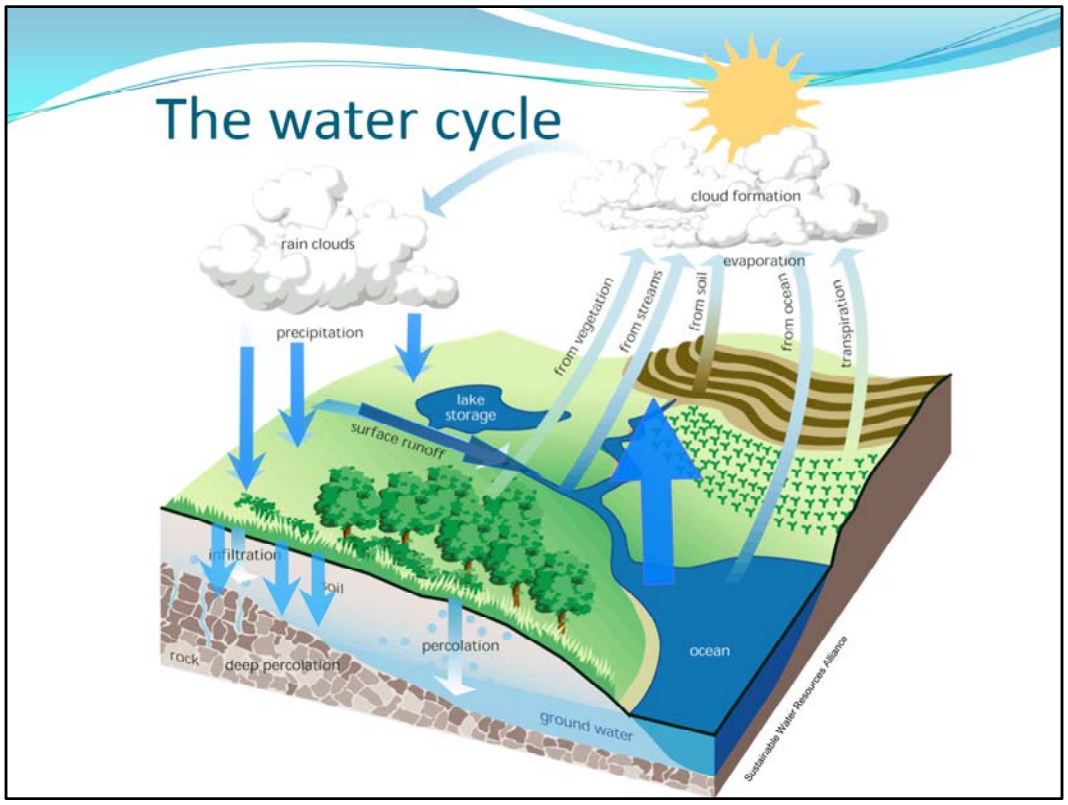
Dickinson bayou watershed and those in the surrounding area. Did you know there were so many watersheds close to where you live?



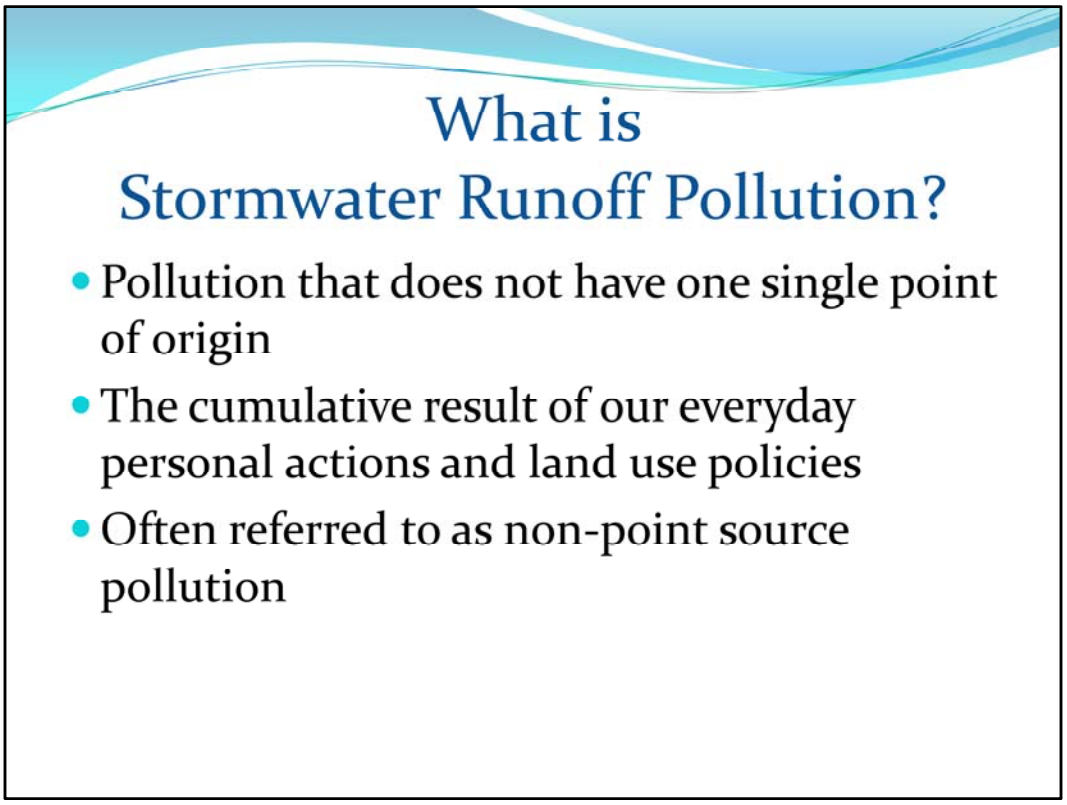
Now that we know what a watershed is let's talk about stormwater runoff pollution.



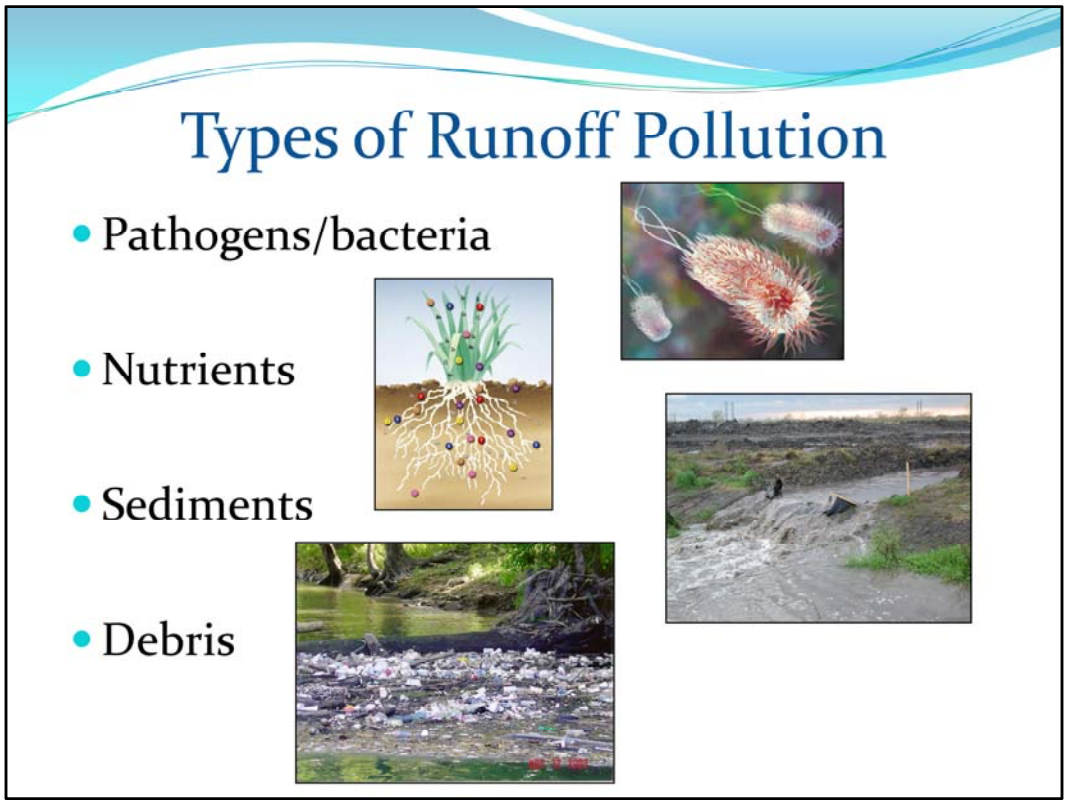
BUT, before we define *polluted* stormwater runoff we first need to define stormwater runoff. To do this we need to look at the water cycle.



To define runoff we need to review the water cycle. When it rains (snows, hails, etc) the water comes down and either infiltrates into the soil or runs across the surface of the land. The water flowing across the land is *runoff*. It travels into creeks, streams, pond and lakes then it evaporates, forms clouds and the cycle continues.



Water that flows across the land picks up whatever is on the land, lose soil, chemicals, motor oil, trash, debris, etc. Runoff that contains these things, especially harmful things, is called polluted.



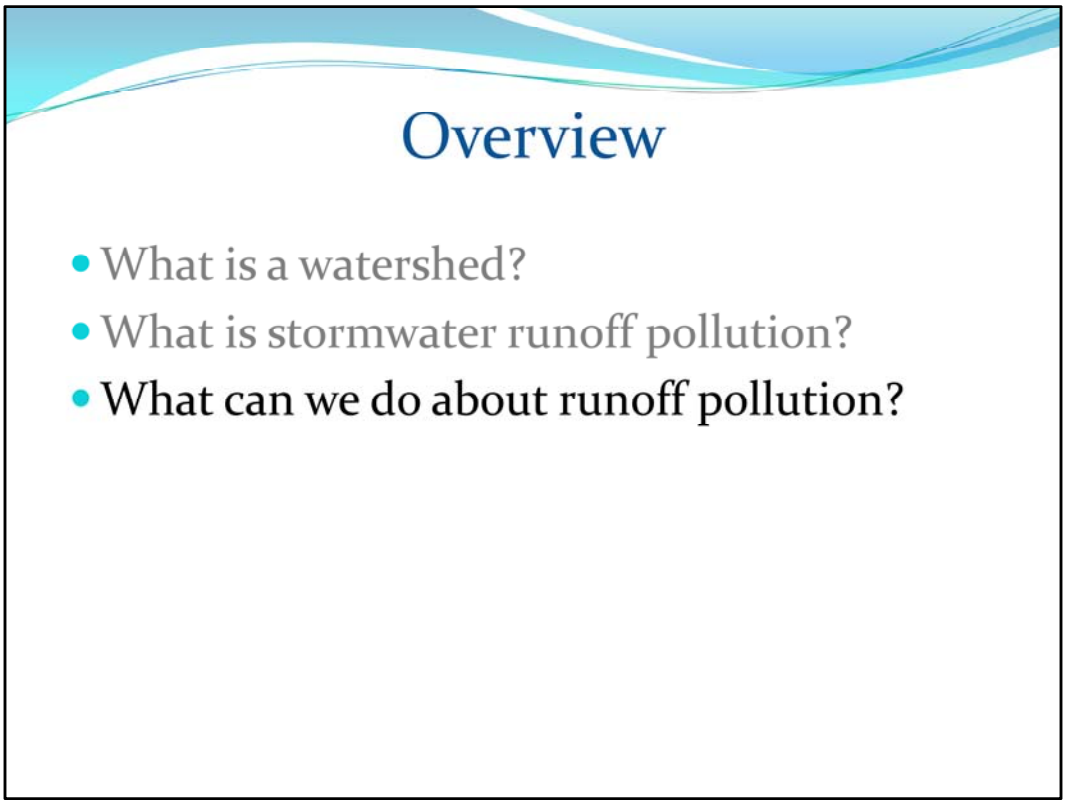
The most common types of pollution are bacteria, excess nutrients, sediment and debris. All of these things occur naturally in small amounts in our bayous and creeks. However, in excess amounts they can all be problematic. Where does this pollution come from?

Polluting is something we all do, but not on purpose! It's little things that we don't usually think about that can cause big problems. Over fertilizing your yard (always apply according to package directions! Or choose organic) allows excess nitrogen and phosphorus to runoff. Pick up after you pets as their poo is a source of bacteria. Wash you car on the grass or at a commercial car wash to keep heavy metals from your brakes, oil, and other things from going down the stormdrain. Report problems with silt fences, these should actually hold back sediment. Finally, don't litter. Pick up trash when you see it and set an example for those around you.

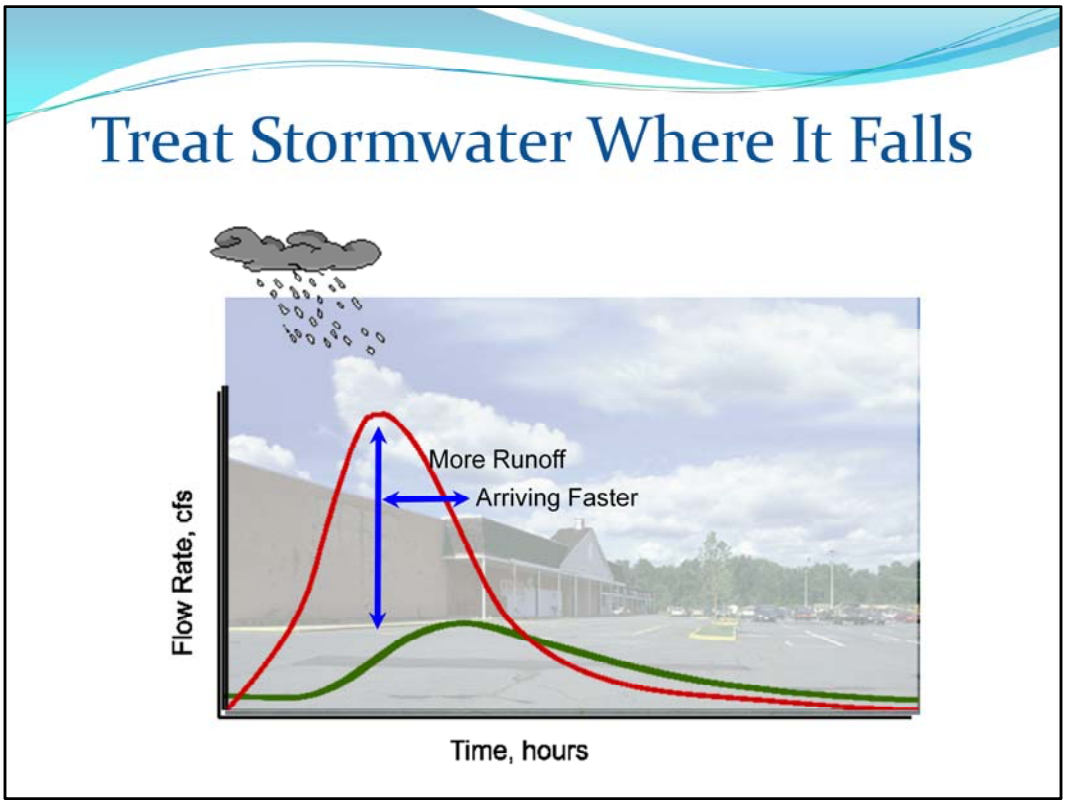
This is a storm drain. When it rains and water washes over the land and streets, it runs into these. Then moves though a system of pipes and ditches and into Dickinson Bayou. This water does NOT go to the waste water treatment plant!

An example of polluted runoff. This is sediment (soil), probably form a construction site, washing down a road. Most pollution is not this obvious. You can not see nutrients and bacteria washing into the bayou, but they are there.

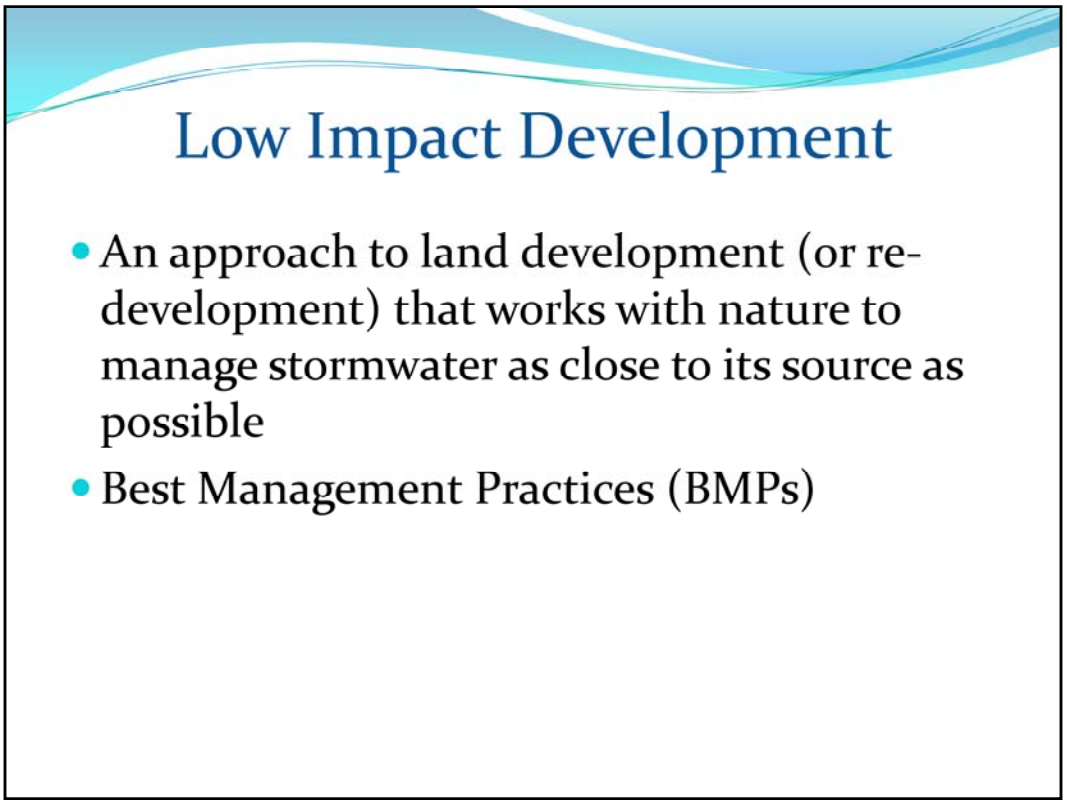
Other examples of pollution you can see. The left photo is trash and the right is motor oil, antifreeze or other chemicals floating on top of the water.



We've talked about runoff pollution and what causes it, so now let's talk about what we can do about it.



There are two ways to think about treating runoff. One is managing the amount of runoff and the second is managing the quality of the runoff. Land in it's natural state soaks up and filters most pollutants from runoff. But as areas are paved over, less water soaks into the ground, and it moves across the land faster picking up pollutants as it travels.



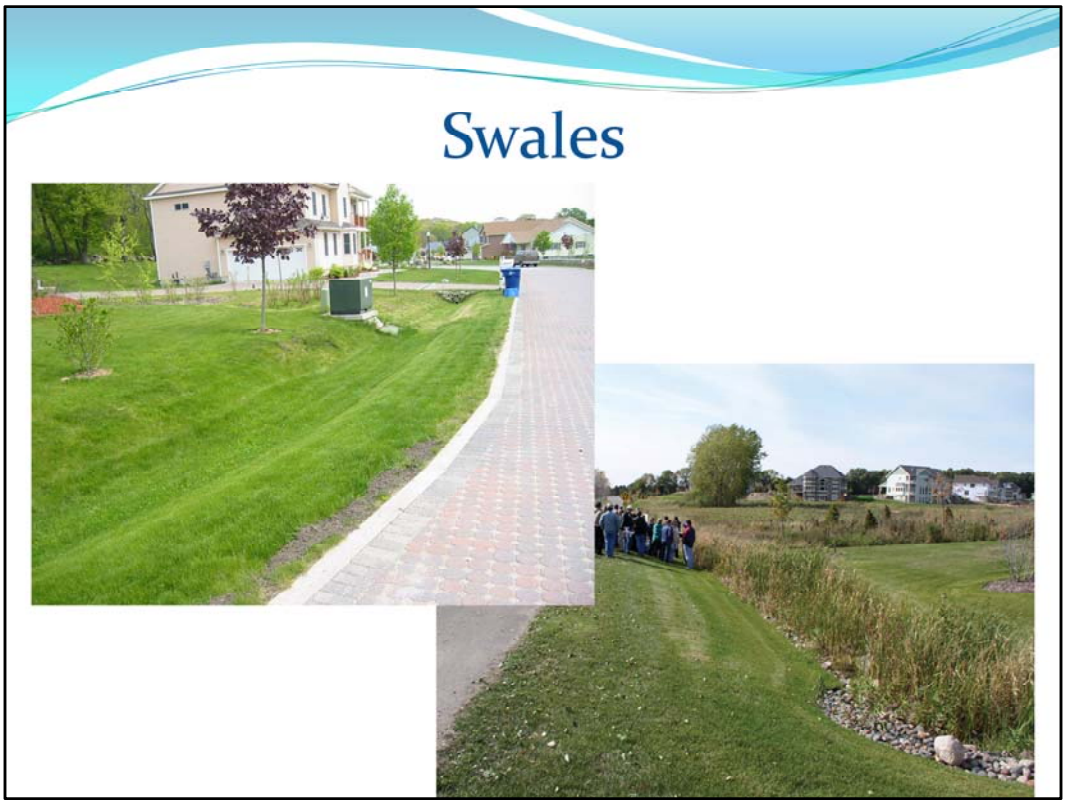
One of the best ways to treat runoff and increase infiltration is though Low Impact Development. What is LID? Low Impact Development is defined in different ways by different people. It can be… Individual stromwater treatment systems are referred to as best management practices or BMPs

Here are some examples of BMPs. We'll spend the rest of our time looking at each one a little closer.

Rain gardens are shallow depressions (less than 12 inches deep) that collect and hold stormwater for less than 24 hours, allowing it to soak into the ground. These are planted with native plants that can handle being inundated for short periods of time. These gardens have the same basic requirements as any other flower bed, needing mulch, weeding and supplemental water during establishment and drought.

Before and after of a rain garden at a Harris County Courthouse Annex near Bay Area Blvd.

The typical homeowner applies 8-10 times as much pesticides and fertilizers as does the average farmer on a per acre basis. These extra chemicals do not make better yards as they can not be used by plants, instead they runoff into our bayous and streams. One way to reduce the need for fertilizers and pesticides is to use less grass in your yard. Opt for other ground covers or larger beds planted with native trees and shrubs. You can also use compost on your yard, as this helps build healthy soil and healthy soils holds more water and helps grow healthier plants.



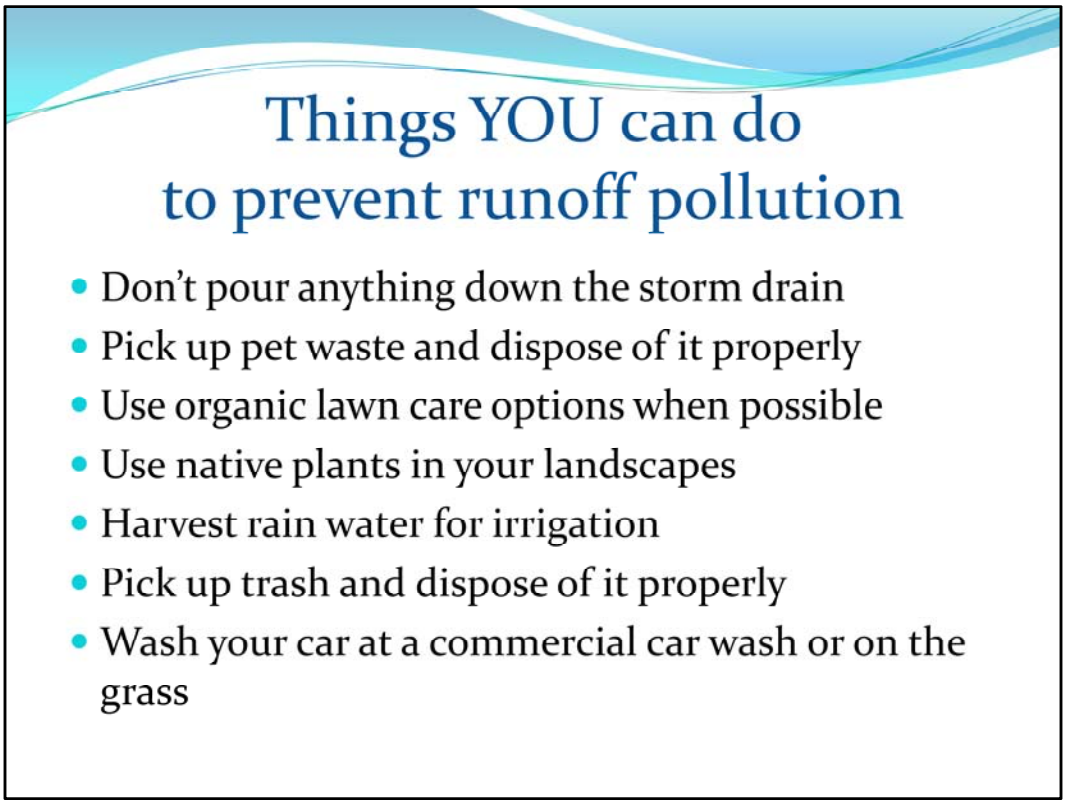
These are basically open ditches, with a special design. They have sloping sides and a flat bottom to allow water to be absorbed as it moves though the channel. They are also vegetated, slowing water just enough to allow sediment to drop out of the water.

Rainwater harvesting is collecting rain water from impervious surfaces (typically roofs) and using the water instead of allowing it to run off an into the storm drain. Thsese systems can be very small scale like this rain barrel which can collect enough water to irrigate a small garden. Especially paired with a low flow irrigation system, this is a reasonable option for most homes. Note the down spout, this water is coming off of a roof. Of course you are not treating a lot of stormwater this way. For a real treatment effect you either need a lot of these, or something larger.

Here, rainwater is collected in a cistern. Typically, the roof of a building is used to collect the rain water, that is diverted into gutters then to the cistern. Most cisterns (especially ones of this size) need a small pump to get the water out. There is a filter within the system to keep debris and mosquitoes out of the tank! There are many different options when it comes to cisterns. Some are prettier than others. But most can be dressed up. These collect enough water to wash cars or flush toilets.

Stormwater wetlands are manmade and designed to function much like natural wetlands. They are planted with native species and filter pollutants out of the water through a series of biological and chemical processes. These wetlands can vary in size, shape and

Turn them into a green roof. Can anyone guess where this roof is? It's in Webster on Medical Center Blvd. A LEED Certified green building. But, you must make sure the engineering is right for the building to withstand the added weight of the plants, substrate and water. Remember our second definition for BMP? Better And More Planning!



Here are some things that we can do, or that we can encourage or family, friends and neighbors to do that will help improve the water quality in our bayours.