



# STORMY DAY REVIEW

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Southern Boone Middle School Summer Science Class

Southern Boone FFA, 4H Club, and middle school summer science classes have been spray painting with a purpose. Students in Ashland have been painting storm drains to educate the community about stormwater. Until this year, most storm drains in Ashland were blank or said "storm sewer" in small print.

Storm drains directly affect our waterways, making it crucial that people understand how the storm drainage system functions and that only rain goes down the storm drain. To help educate the public about these systems, Boone County Stormwater Management has been helping the students paint, "**DUMP NO WASTE DRAINS TO STREAM**" on storm drains. The message is intended to inform the public where the water goes and hopefully make people think about oil, trash, leaves, fertilizers, and other pollutants that might be carried to the local streams.

Ashland is rapidly growing and creating massive amounts of impervious surfaces. When it rains water runs off buildings and parking lots before running onto roads, causing them to be covered in water and making it potentially hazardous for drivers.



Storm drains are crucial to road traction and safety during significant rain events. Storm drains that are properly placed, and sized allow water to quickly remove from the roads, which reduces flooding and increases traction and safety for drivers. With the ever-increasing number of roads and other hard surfaces, sending water onto roadways, storm drains are becoming more utilized than ever. Therefore, preventing stormwater from becoming polluted is extremely important.

### **Where does the water and the pollutants go after it enters the storm drains?**

If you ask people in the community, there are a few common responses. Many people think stormwater is piped to the local wastewater treatment facility, cleaned, and then released into a stream. While this is incorrect, it is an understandable response because often storm drains have “storm sewers” written on them which leads to confusion. However, “sewer” does not always mean waste. In Boone County there are separate systems for sanitary sewers and storm sewers. Another common response is that people do not know where the water goes once it enters the storm drain. The correct answers, the marking is trying to help people understand is stormwater goes directly to our local waterways completely untreated.

Runoff entering the storm drain system does not only contain water, it carries pollutants and debris it picks up along its way, it is then piped directly into water bodies.

One method to reduce the amount of pollution entering our waterways is to minimize hard surfaces and allow water to seep into the ground by slowing the water down, spreading it out, and soaking it in. There are many ways for this to be accomplished. Some practices used to reduce hard surfaces include using permeable pavers, green roofs, rain gardens, and deep-rooted plants. By using these methods there is less stormwater runoff. Therefore, less water is piped through the storm drains, improving safety and water quality.



Southern Boone High School FFA

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## ***Stormwater Fact***

Road salt (sodium chloride) is a chemical most commonly used to remove ice from roads, parking lots, and sidewalks. **Just one teaspoon can permanently pollute five gallons of water.** As snow and ice melt, the resulting water along with rain wash the salt from the road, flushing the salt into the storm drains, and contaminating surface water bodies. The salt can even make its way down into the groundwater.

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## THE WATER BENEATH US

Streams and lakes are visible stormwater features. After a rainfall you can see changes in the amount and color of the water. However, there is much more going on than what is seen on the surface. A vast amount of water is within the earth's crust and is known as groundwater. This water is used for many things including drinking water, agricultural irrigation, and energy production. Stormwater runoff can have a major impact on groundwater in any environment.

Stormwater becomes groundwater in most environments by slowly moving down through soil and rock. This can take days or millennia for the water to make its way through different levels to reach an aquifer or where the water meets up in zones of saturations, as seen in Figure 1.

During this process, soil acts as a filter removing many of the contaminants from the water before it reaches the aquifer but, soil can only do so much. If people on the surface introduce oil, fertilizer, or other pollutions to the water, surface water contaminations can make its way down into the groundwater.

Caves, sinkholes, and losing streams are openings in the earth and provide a way for the water to interact with the groundwater directly. Areas with these landforms are known as karst topography. When stormwater enters these openings, water can bypass the soil filtration process before reaching groundwater, allowing for the introduction of many contaminants into aquifers. Because these regions are known to offer a direct connection between groundwater and surface water, these areas are known as environmentally sensitive and should be handled carefully.

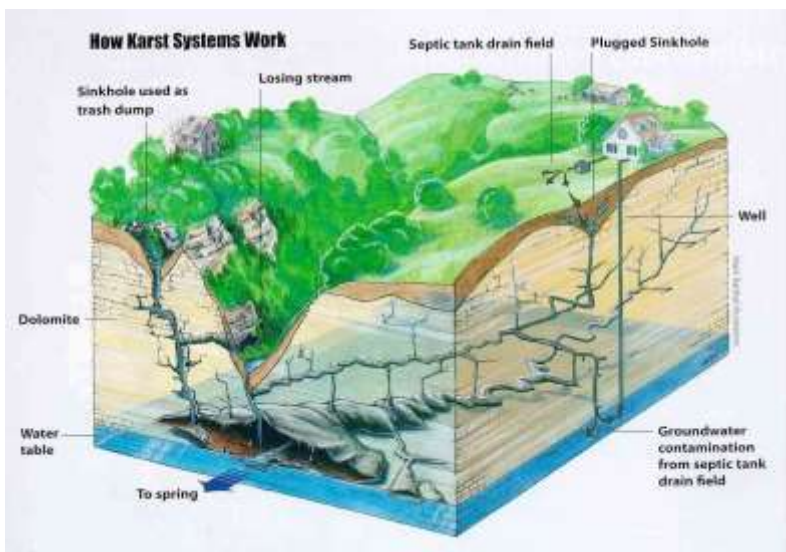


Figure 2, How Karst Systems Work (4)

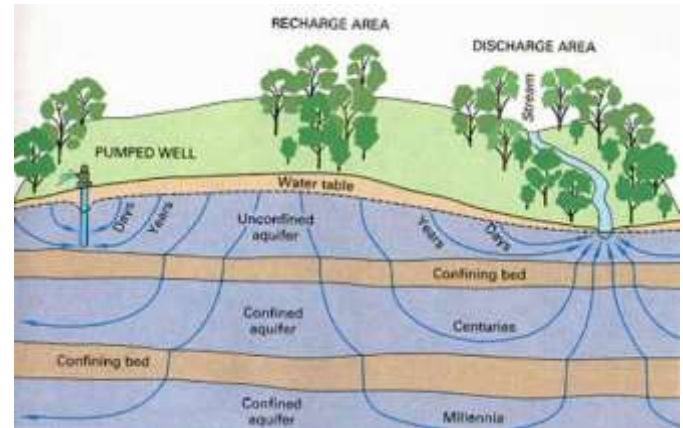


Figure 1, Groundwater Recharge (3)

Groundwater is the primary source of water for Boone County residents. There are special ordinances or rules in the county for building development and wastewater systems to help protect these environmentally sensitive areas and the groundwater.

These ordinances are designed to help people avoid and/or minimize the impacts to the soil and hydrology within these areas, which could potentially result in groundwater alterations and contaminations. To learn more about Boone County's ordinances for development including how a sinkhole is classified and how close you can build around them, please visit

<https://www.showmeboone.com/stormwater/ordinance.asp>



## Calendar of events

**January 1<sup>st</sup> 12:30PM-3:30PM  
First Day Hike**

Deer Run Trail at Rock Bridge  
Memorial State Park

**February 8<sup>th</sup> 12:30PM-4:30PM  
Columbia Young Scientists  
Expo**

Memorial Union, the University  
of Missouri Campus

**February 15<sup>th</sup> time TBA  
Worm Show**

Rock Bridge High School  
Planetarium

**February 29<sup>th</sup> 10:00AM-  
5:00PM**

**Sustainable Living Fair**  
the Columbia City Hall

**March 7<sup>th</sup> time TBA  
Bonne Femme Land  
Management Workshop**  
Missouri Department of  
Conservation

**March 25<sup>th</sup> 10:00AM-  
12:00PM  
Missouri River Education**  
Daniel Boone Reginal Library

**May 9<sup>th</sup> 8:30AM-12:30PM  
Spring Monitoring Blitz**

Rock Bridge Memorial State  
Park

**June 22<sup>nd</sup>-26<sup>th</sup>  
STEMetts Summer  
Program**

University of Missouri

**July 18<sup>th</sup> 8:30AM-  
12:00PM  
Water Festival**  
Rock Bridge Memorial State  
Park

For more information about these events email [stormwater@boonecountymo.org](mailto:stormwater@boonecountymo.org) or call (573) 886-4330

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## Quick Quiz

Enter to win a prize by taking this quick quiz or send in a historic photo of a Boone County stream. Send these to Michele Woolbright in Resource Management or email them to [stormwater@boonecountymo.org](mailto:stormwater@boonecountymo.org) by January 9th. Participants are entered to win a mug and a gift certificate to [Starbucks!](#)

- 1) What event is happening February 29th? \_\_\_\_\_
- 2) What message is being painted on the storm drains?  
\_\_\_\_\_
- 3) How many gallons of water can one tablespoon of salt pollute? \_\_\_\_\_
- 4) Name a landform that could be found in karst topography? \_\_\_\_\_