

# Springs

## Early Warning Systems for our Groundwater



Watershed  
Committee  
of the Ozarks

**S**prings—natural wonders; mysterious, even mystical. How often people have paused to refresh; and wonder—where does all this water come from? How did it get here? But while our forefathers had an imperfect knowledge of karst hydrology, they did not question the absolute purity of spring water. How could a substance offered up in such bounty by Mother Earth be otherwise?

Today, we understand a lot more about springs—their origins; how they work; and we know that springs are, in fact, easily polluted—that the crystal clear, cold water may harbor unseen pollutants—bacteria and chemicals that could make us sick.

*Spring are important natural resources.*

This fact sheet is not intended to diminish our sense of wonder about springs. Instead, it is meant to increase our appreciation of them—to illustrate their values and explain why we need to protect them. Springs can tell us a lot about the health of our environment. They serve as sensitive barometers—telling us when our activities on the land surface are polluting groundwater. Springs replenish and sustain Ozarks streams and lakes during times that, without springs, such water bodies would be bone-dry. And springs are ultimately connected to the deeper groundwater system—the one that thousands of Ozark residents depend on for their drinking water supplies.



*Steury Spring and Natural Arch, Greene County*  
Photograph courtesy The History Museum for Springfield-Greene County



*Bluff Spring, Ozark, Christian County*  
Photograph courtesy Christian County Historical Society



*McKerrell Spring, Greene County ca. 1892*  
Photograph courtesy Springfield-Greene County Public Libraries

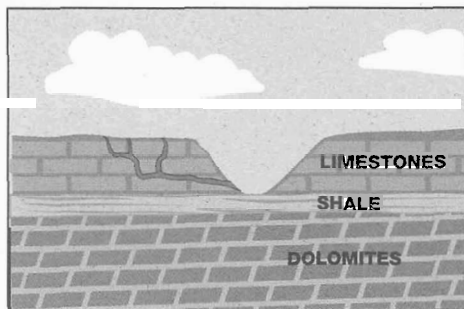


Springs served as settlement sites for many Ozark communities—such as Springfield and Ozark. Underscoring their importance to settlement is the fact that over 65 towns in the state have the word “spring” in their names.

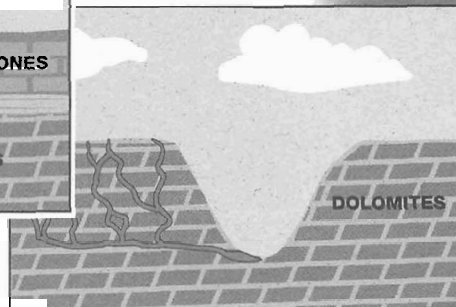
# ANATOMY C

## Spring Flow

The flow of springs is directly tied to precipitation in the recharge area. The amount of flow can even be used to estimate the size of the recharge area. Big springs have big recharge areas. Springs draining the Springfield Plateau are typically smaller than those in the Salem Plateau of the Central Ozarks with its thicker layers of porous bedrock.



SPRINGFIELD PLATEAU



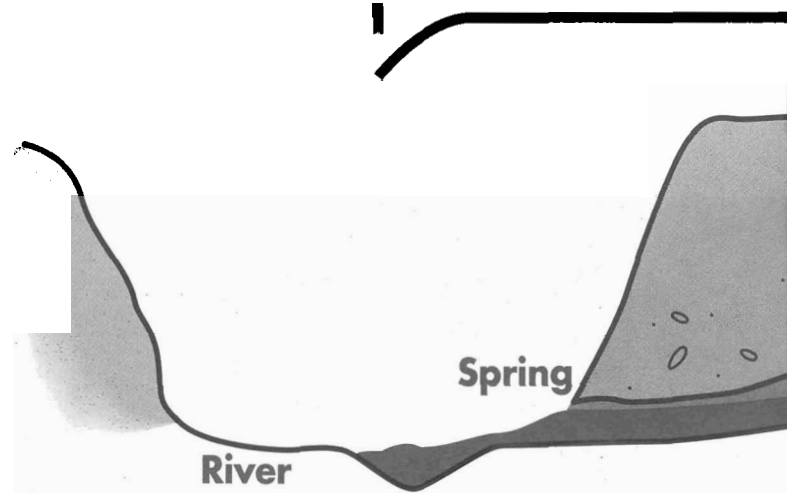
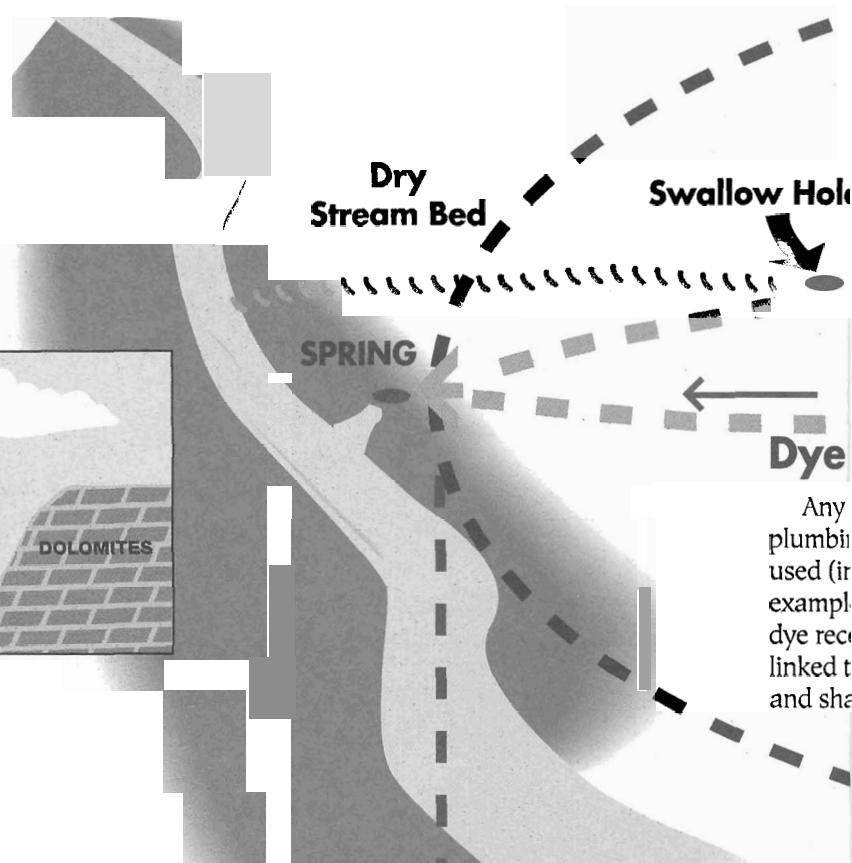
SALEM PLATEAU

## Diffuse versus Discrete Flow

Diffuse flow is water moving slowly through small cracks and holes in bedrock. Diffuse flow springs respond slowly to rainfall and may not get cloudy after heavy rains. Discrete flow is more massive, moving through large cracks and surface features such as sinkholes and losing streams. Springs dominated by discrete flow are flashier, rising rapidly in response to rainstorms, and often getting "muddy". Most springs have both kinds of flow in their recharge areas, but many springs are dominated by one or the other type of flow.

## Springs As Barometers

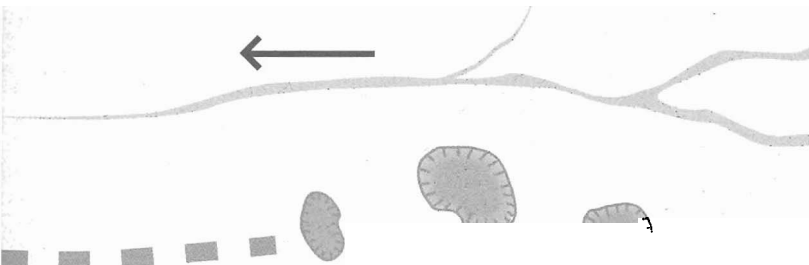
Springs gather flow from relatively large land areas, concentrating at a single point the effects of pollution and human activity. Therefore, springs are sensitive indicators and efficient, inexpensive (compared to monitoring wells) sites for monitoring the health of the shallow groundwater. It is very important that we know what is happening to this shallow groundwater—because eventually it will affect the deeper groundwater that most rural wells tap for their drinking water supplies.



# OF A SPRING

## Losing Streams

Surface streams that leak all or part of their flow directly into groundwater are said to be "losing." As with sinkholes, any surface pollution entering a losing stream has rapid access to groundwater.



## Tracing

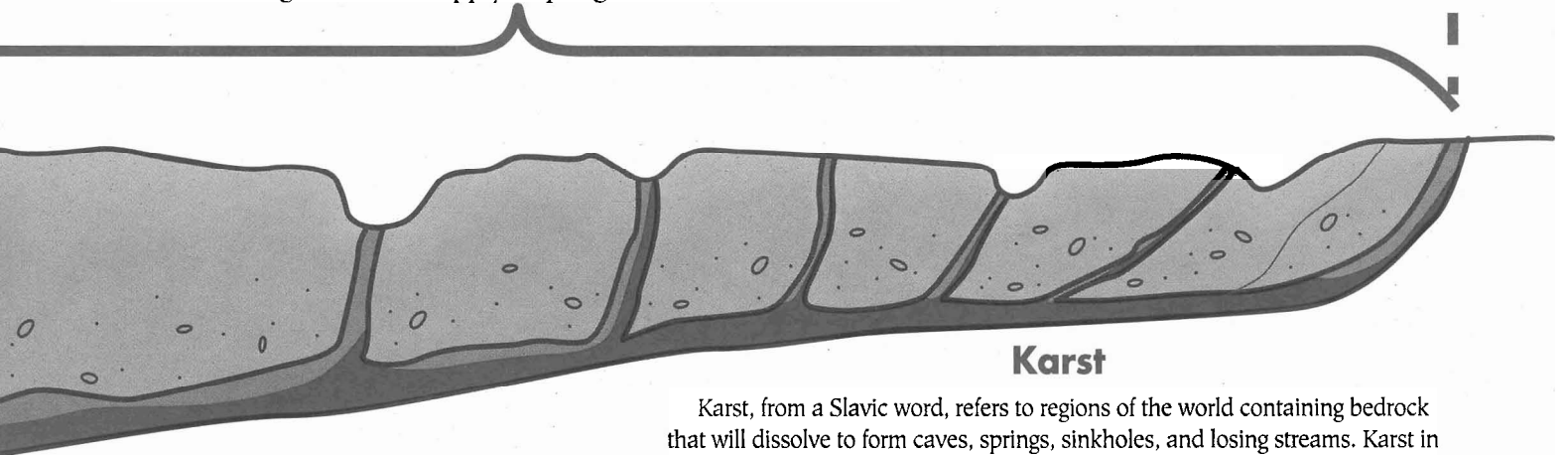
Material small enough to pass through a spring's internal drainage system could be used as a tracer. Normally, dyes are used in small concentrations to link injection points (for example, a sinkhole) where the dye is introduced, to the point of emergence, often a spring. When several injection points are used, we begin to get a picture of the size and shape of the spring's recharge area.

## Sinkholes

Sinkholes are natural inlets for the underground drainage system (see Watershed Committee "sinkhole" fact sheet.) Vegetated "buffer" areas around sinkholes can help slow and filter runoff before it enters groundwater. Trash and other wastes should never be dumped into sinkholes.

## Recharge Area

The area of land that contributes flow to a spring or spring system is called the recharge area. This groundwater flow area does not necessarily correspond to surface watersheds, and water often flows under a surface drainage divide to supply a spring in a different watershed.



## Karst

Karst, from a Slavic word, refers to regions of the world containing bedrock that will dissolve to form caves, springs, sinkholes, and losing streams. Karst in the Ozarks forms in landscapes composed of limestone and dolomite bedrock.

# Spring Pollution

Because of the "open" nature of spring recharge areas, it is easy for surface pollution to find its way into springs. Any pollution that is dumped or drains into a sinkhole, for example, can directly impact water quality at springs.

Septic tanks in poor, rocky, Ozark soils can leak untreated sewage into the shallow groundwater leading to springs. Spills of gasoline or other chemicals can flow into surface streams, sink into groundwater in losing sections of the stream to reappear at a spring. Even urban runoff flowing into sinkholes can negatively impact shallow groundwater quality.

## Springs as Drinking Water Supplies

Because springs are so vulnerable to pollution, Health Departments recommend against their use as drinking water sources without treatment. It is especially important that treatment methods kill bacteria and human pathogens.

## How Many Springs Are There?

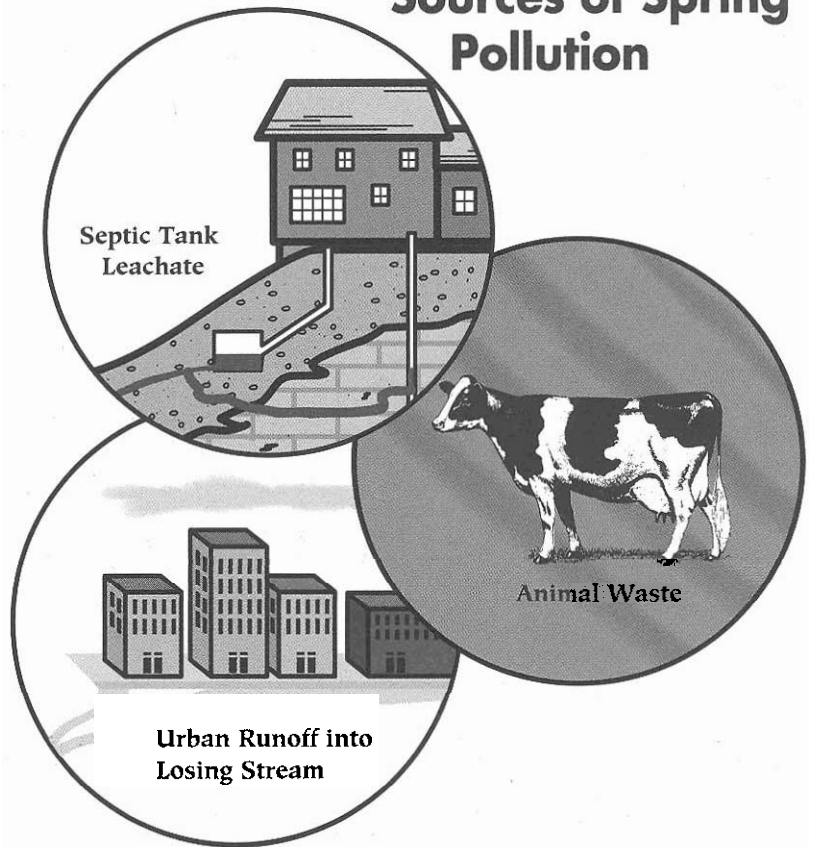
There are thousands of springs in the Ozarks. The actual number is hard to define because some "springs" might more appropriately be called "seeps"—they flow only during wet weather, and may be very small. There are hundreds of named springs in Greene County, but thousands that flow during wet periods.



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## Sources of Spring Pollution



## Spring Houses

Before refrigerators, or ice-boxes, springs served as natural refrigeration. Because springs remain near the average annual temperature of an area (about 59° F in the Ozarks), they will keep perishables cool. This cooling effect is enhanced by building an enclosing structure (the spring house.) The spring house often reflects the distinctive architecture of a homestead.



*The Watershed Committee of the Ozarks is a not-for-profit citizens advisory group dedicated to the protection of drinking water sources in the Springfield area.*

*Other publications available from the Watershed Committee:*

**Watershed News**—Quarterly newsletter (free)

**Maintaining Your Septic System**—Proper maintenance protects your family's health, saves you money, and guards area water quality (free)

**Sinkholes-Inlets to the Groundwater System**—How to recognize sinkholes, how they function, and how they affect groundwater (free)

**Quality Development and Stormwater Runoff**—What you can do to reduce flooding, erosion and pollution (free)

**How To Protect Your Well**—Your family's health depends on a safe, reliable source of drinking water...(free)