

# How groundwater moves in southeast Minnesota: Karst landscape



## 4 Groundwater or surface water?

The distinction between groundwater and surface water is not always clear. Groundwater may emerge as a spring, flow a short distance in a stream, and then disappear. This same water could then re-emerge within hours or days farther downstream again as surface water.

## 5 Shale barrier

Layers of shale are less permeable than limestone and hinder the downward movement of water. Instead, water travels sideways, following the easiest path across the shale.

## 6 Groundwater mixing

In areas of the landscape where the shale has been removed by streams or erosion, younger, local groundwater from above the shale mixes with older and deeper regionally sourced groundwater.

## 7 What decade are you drinking?

Younger water is often from aquifers located above shale layers and can be just days to decades old. Older water is typically from aquifers below protective shale layers and can be decades to centuries old. In many cases, drinking water is a mixture of both younger and older water.

## 1 Eroded rock

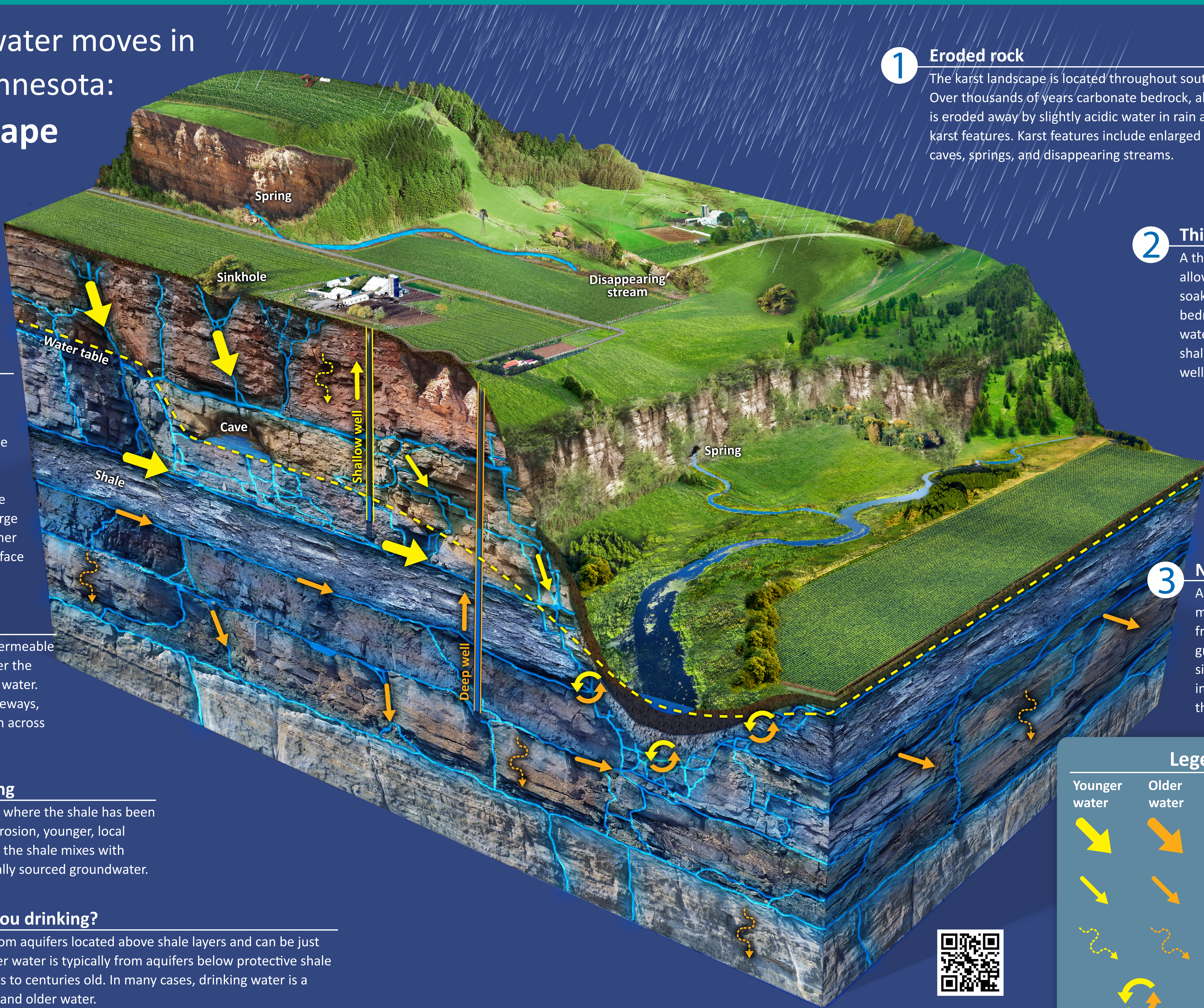
The karst landscape is located throughout southeast Minnesota. Over thousands of years carbonate bedrock, also called limestone, is eroded away by slightly acidic water in rain and soil, creating karst features. Karst features include enlarged fractures, sinkholes, caves, springs, and disappearing streams.

## 2 Thin soils

A thin layer of top soil allows water to easily soak into the underlying bedrock. Once in bedrock, water moves quickly to shallow drinking water wells, springs, and streams.

## 3 Not just sinkholes

Although some rain and melting snow moves from the surface to groundwater through sinkholes, most soaks into the ground across the entire land surface.

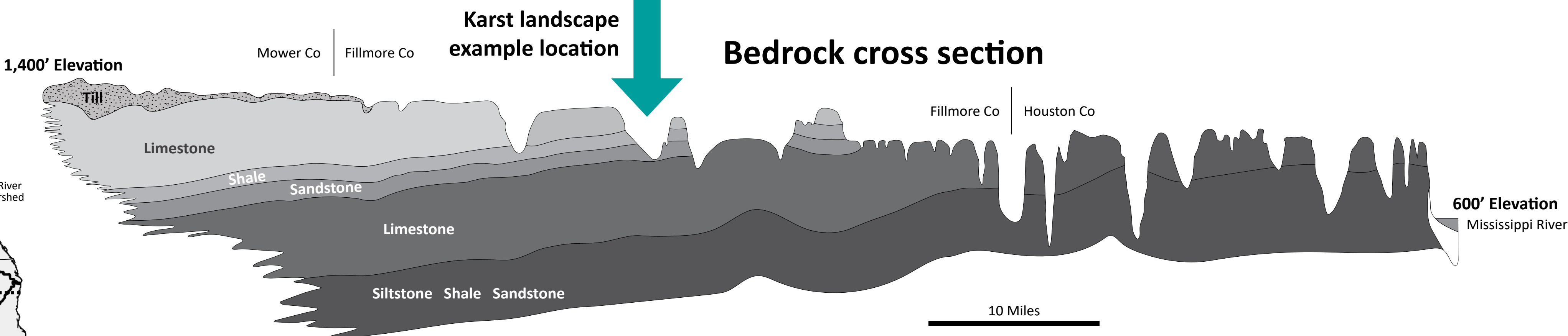
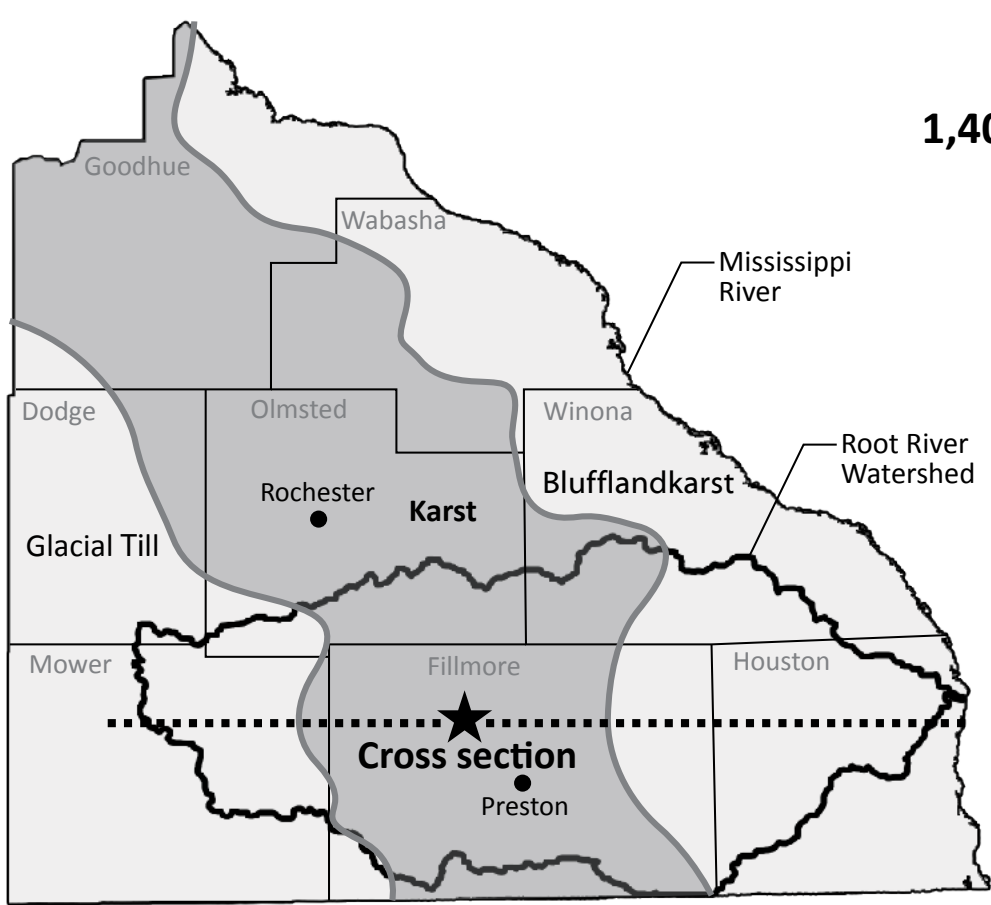


Legend

Younger water	Older water	Fast movement of water
		Moderate movement of water
		Slow movement of water
		Mixing of younger and older water



Watch the Video!



## Root River Field to Stream Partnership

