

Groundwater

If you dig a hole and water begins to seep in, you have hit groundwater. It is simply the area beneath the land's surface where all the spaces between soil particles, or in rocks, are filled with water.

Deep soils help filter out sediment and pollutants as water from rain and melting snow percolates downward. Shallow soils are not as effective and, in karst areas, surface water may flow into the groundwater with little or no soil filtration.

In karst areas, groundwater can move 100 feet or more per day (in other areas, groundwater typically moves less than 1 foot per day). The water flows through cracks in the limestone, moving deep and spreading out under the ground.

Eventually groundwater returns to the surface at a spring, river, lake or well. However, it can also remain deep underground for thousands of years, only reaching the surface again when pumped from very deep wells.

What can be done?

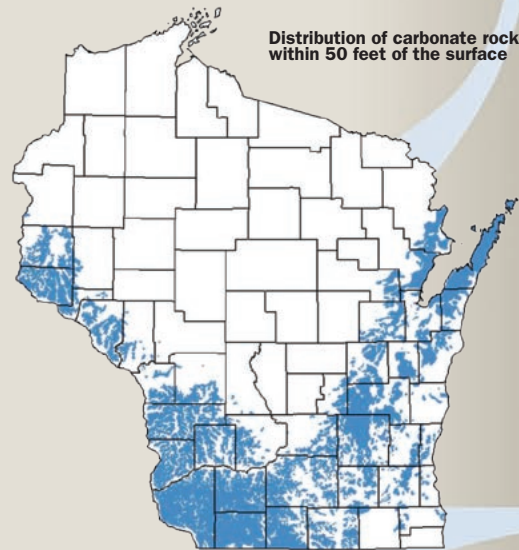
Once contaminants enter the groundwater, little can be done to remove them. The best, easiest and cheapest thing to do is to prevent contamination in the first place.



Karst: Why be concerned?

Where soils are shallow, karst conditions make it easier for groundwater to become contaminated with bacteria, nitrate, salt, and pesticides.

Even wells that are hundreds of feet deep can become contaminated.



Help is available

For more information about bedrock concerns, drinking water or cost-share programs, contact:

County Land and Water Conservation Departments
Public Health Departments
University of Wisconsin – Extension
USDA Natural Resources Conservation Service
Wis. Dept. of Natural Resources Service Centers
Wis. Geological and Natural History Survey
Wis. Dept. of Agriculture, Trade and Consumer Protection
University of Wisconsin – Water Resources Institute
UW-Madison Water Resources Library

Or web sites:

basineducation.uwex.edu/rockriver
www.uwex.edu/wgnhs/karst.htm

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Karst

Avoid that



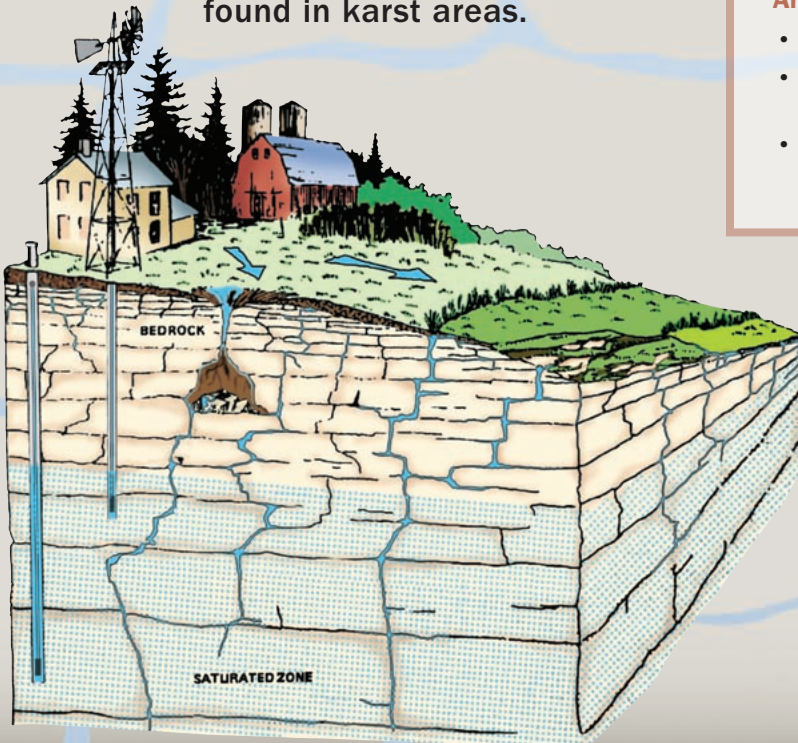
Sinking Feeling

Sinkholes, Limestone
and Groundwater
Contamination

Karst

What is it?

Karst refers to an area where bedrock such as limestone has been dissolved by water. Karst regions are generally characterized by connected cracks and layers between rocks that easily transport water and pollutants through the groundwater. Sinkholes, shallow soils, sinking streams and springs are found in karst areas.



In karst areas, groundwater is threatened by:

Contaminated water from

- ✓ Barnyards and other areas where manure accumulates.
- ✓ Cropland where chemicals and manure are applied.
- ✓ Septic systems and household waste disposal.
- ✓ Roads and other paved areas.

Properly sealing an unused well.



Take action to prevent groundwater contamination in karst areas

In the community

- Use care when planning and constructing roads and ditches to avoid runoff draining into cracks in the bedrock.
- Provide “clean sweep” programs to properly dispose of unwanted home and farm chemicals and medicines.
- Consider geology and groundwater in land use planning.

Around the home

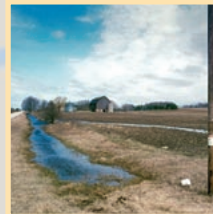
- Properly fill and seal unused wells.
- Test wells annually for nitrate and bacteria.
- Pump your septic system at least every three years.

On the farm

- Grow a grass buffer 10-200 feet wide, depending on site conditions, around sinkholes and crevices.
- Do not apply manure, fertilizers, pesticides, industrial sludge or other agricultural chemicals near sinkholes.
- Any manure applied near sinkholes should be incorporated into the soil as soon as possible.
See your NRCS or LCD office for site-specific guidelines.
- Divert water away from sinkholes and crevices.
- Do not dispose of chemical containers, dead animals or anything else in sinkholes.

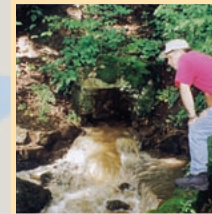


A sinkhole without a protective berm before and during flooding. A berm would have prevented runoff containing fertilizers and pesticides from draining into the sinkhole.



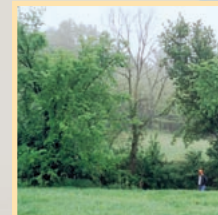
The water along this ditch disappears into a sinkhole, carrying with it oils, lead, salt and other chemicals from road and field.

Caves, which are rare in Wisconsin, represent important homes for bats and hibernating animals. During heavy rains, polluted water entering caves can adversely impact these fragile habitats as well as contaminate groundwater and wells.



This is a typical karst spring, but not all springs bubble out of karst areas. Many springs in Wisconsin flow out of gravel and sand deposited by the glaciers.

Sinkholes like this one are often used to dispose of unwanted junk. Sometimes this junk can contaminate a well miles away.



The fractures in the bedrock under shallow soil can be seen during a drought. The alfalfa was able to send deep roots down into the moist soil that had accumulated through the cracks.