



Groundwater susceptibility

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What is a groundwater susceptibility map?

A groundwater contamination susceptibility map shows the likelihood that pollution originating at or near the land surface could reach groundwater. Contamination can come from waste disposal sites (such as landfills), chemical spills, septage or manure spreading, septic systems, leaking tanks, application of fertilizer or pesticides, and other sources. A susceptibility map shows the relative risk of groundwater contamination; it does not show where contamination has occurred or that it will occur.

The map shows the susceptibility of groundwater to contamination using a three-color system. Areas shaded yellow have moderate susceptibility, light orange areas have high susceptibility, and dark orange indicates areas with highest susceptibility to contamination.

Why is groundwater susceptibility important?

It is important to understand why and where groundwater is susceptible to pollution because once contaminated, groundwater is extremely difficult and expensive to clean up. Maintaining good groundwater quality is particularly important in Columbia County because almost all of the water used there, including drinking water, is groundwater. Unfortunately, tests from over 3,000 drinking water wells in the county show that 20 percent of them are already contaminated with unsafe levels of nitrate.

Making the map

This susceptibility map was made by combining information about four features of the landscape that affect the movement of contaminants from the land to groundwater. Each has been mapped separately.

- ◆ **Type of material over bedrock**—Sand and gravel allow water and pollutants to move quickly through the ground; clay, silt, and peat slow their infiltration.
- ◆ **Depth to bedrock**—Thick soil and sediment overlying bedrock slow the downward movement of contaminants. Areas where bedrock is near the land surface are more susceptible to groundwater contamination than areas where the bedrock is deep.

- ◆ **Depth to the water table**—The water table is the top of the saturated zone, below which all cracks and pores in sediment and rock are water-filled. The depth of the water table varies from about 20 to over 80 feet below the ground surface. The deeper the water table, the greater the opportunity for chemical and biological reactions to break down and lessen the contamination before it reaches groundwater.

- ◆ **Groundwater recharge**—Groundwater recharge is rain and snowmelt that percolate downward through sediment or rock and reach the water table. The amount of recharge varies from year to year and place to place. It is controlled by the weather, soil type, plant type, and land use. Areas with more recharge are typically more susceptible to contamination than areas where less recharge occurs because pollutants can be carried along with recharge to the water table.

What the map shows

The map illustrates that almost all of the groundwater in Columbia County is at high risk of contamination. This is due to widespread sandy deposits and shallow depths to the water table. Areas with moderate susceptibility to contamination generally contain some peat or clay and receive less groundwater recharge than other areas.

Using the map

Given the vulnerability of Columbia County's water supply to pollution, this map can be used to inform certain land-use decisions. For example, in areas with high groundwater contamination susceptibility, activities that can affect groundwater quality may warrant an increased level of planning, safeguards, and monitoring. This map can also guide discussions about the potential impact of land-use on groundwater quality.

More information about the groundwater resources of Columbia County, including a large-scale version of the susceptibility map, is available from the Wisconsin Geological and Natural History Survey.

Groundwater susceptibility in Columbia County, Wisconsin

