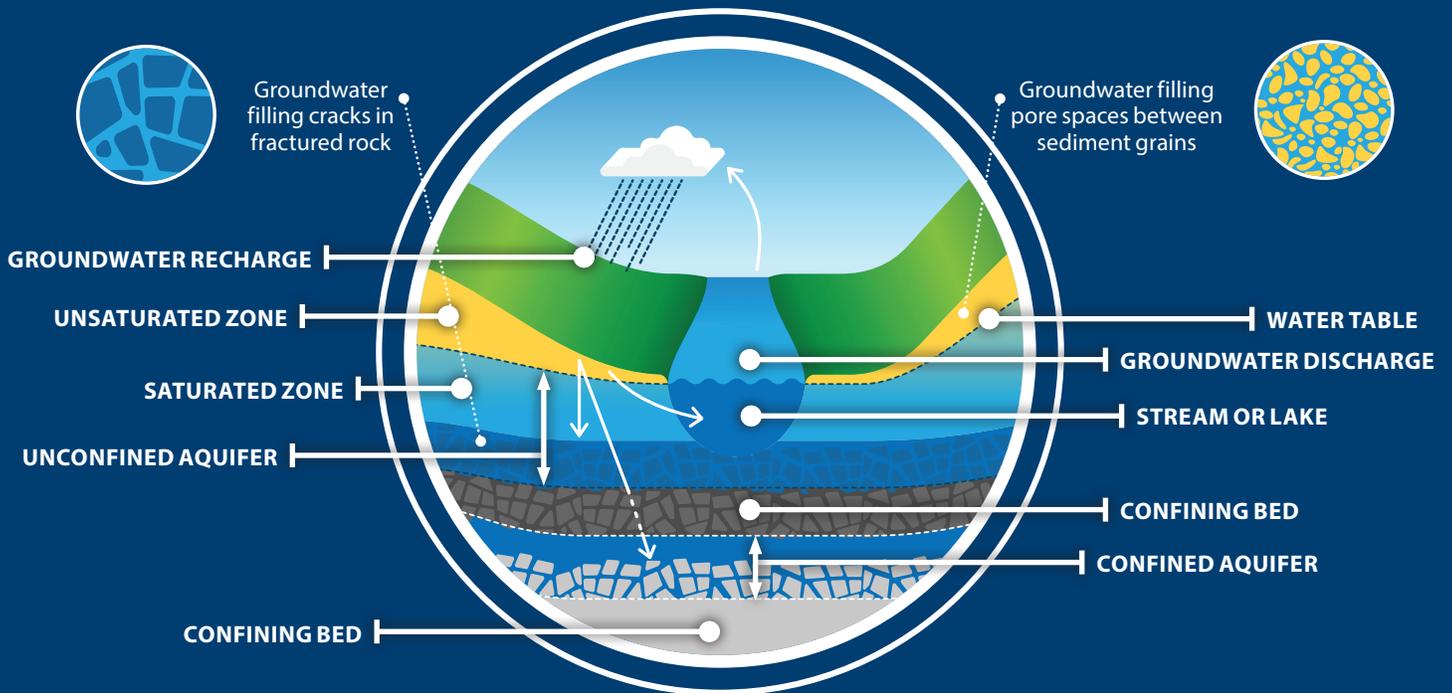


# AQUIFERS



## WHAT IS AN AQUIFER?

Water that drains below the ground's surface eventually reaches a point where all spaces between the rocks or sediments are filled with water. This is called the saturated zone, and the water itself is called groundwater. In the saturated zone, geological deposits of sediments (such as sands and gravels), sandstones, and fractured rocks that transmit, store, and release usable amounts of water are called aquifers.



An estimated 60 million acre-feet of water may be stored in glacial drift aquifers in North Dakota.

60M

During the last decade, permitted groundwater use from North Dakota's aquifers averaged 56 billion gallons, or 174,000 acre-feet, per year.

56B

67% of North Dakota's permitted groundwater use is for irrigation - the largest groundwater user.

67%

### WHAT ARE THE TWO MAIN TYPES OF AQUIFERS?

The two primary types of aquifers are unconfined and confined. Unconfined aquifers are generally near the surface, recharge quickly, and feed shallower wells. Confined aquifers are deeper and are protected by impermeable layers, making them more difficult to access. Many of North Dakota's unconfined and confined aquifers include materials deposited by glaciers, called glacial drift aquifers. In areas of the state with no glacial drift aquifers, wells may be drilled to access the water in underlying bedrock layers.

### DO AQUIFERS AFFECT YOU DIRECTLY?

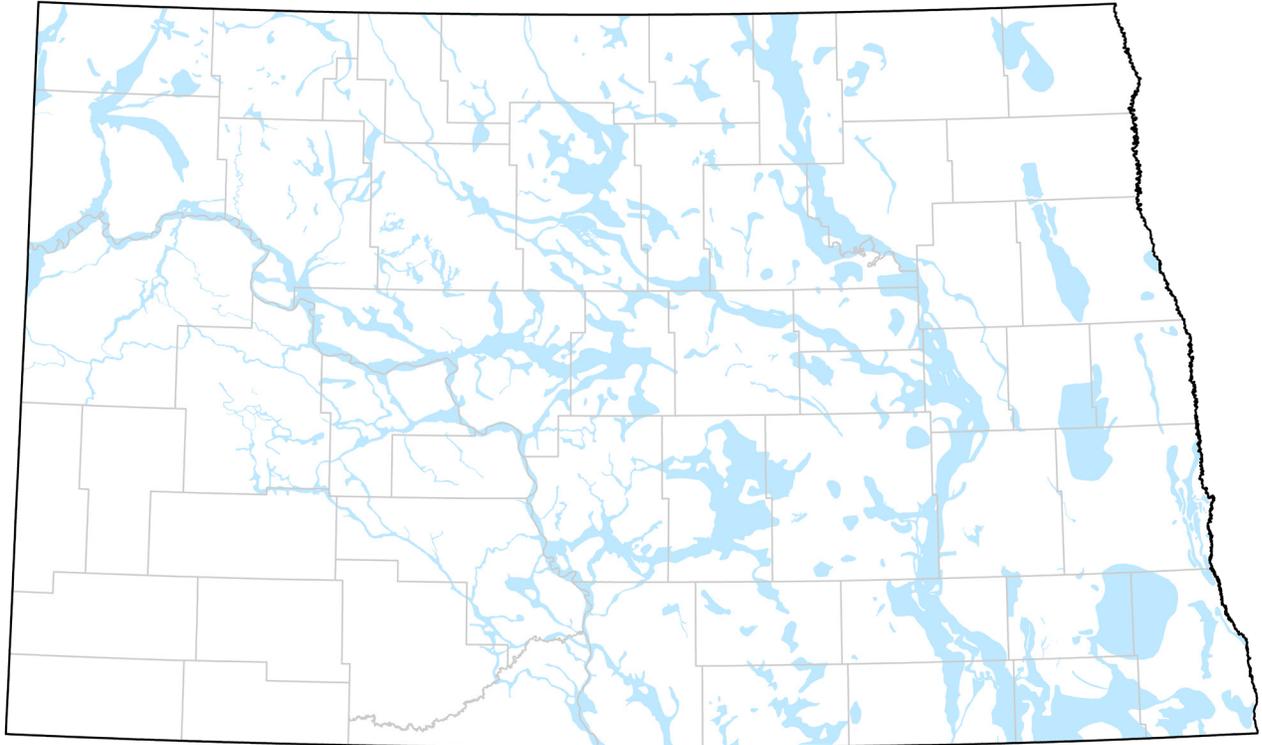
Chances are, the answer is yes! Almost half of North Dakota's population uses groundwater from aquifers for their drinking water source, including 98 community water systems. Of the 29 regional/rural water systems currently operating in the state, 28 use groundwater at least partially. Only the Southwest Pipeline Project is completely reliant on surface water.

Aquifers are critical resources beneath the Earth's surface, serving as vital reservoirs of water. These underground formations play a critical role for North Dakota, providing water for people, agriculture, and industrial processes.

# AQUIFERS IN NORTH DAKOTA

## NORTH DAKOTA'S SHALLOW GLACIAL DRIFT AQUIFERS

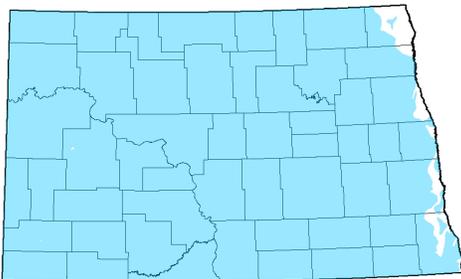
North Dakota's glacial drift aquifers are located throughout much of the state and include groundwater within subsurface materials deposited where glaciers were once present.



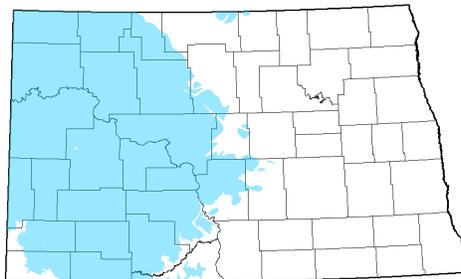
## NORTH DAKOTA'S BEDROCK AQUIFERS

North Dakota is underlain by a series of rock layers that can be thousands of feet thick. The bedrock aquifers shown below are found among these layers. These aquifers are more continuous, but the water can be too salty to drink. The deepest, the Dakota Aquifer, is over a mile below the surface in western North Dakota.

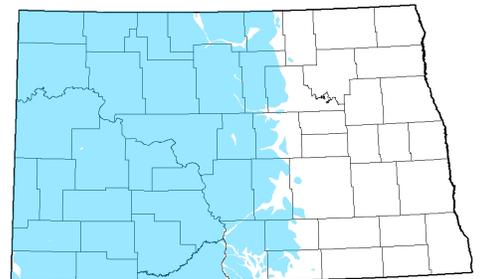
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