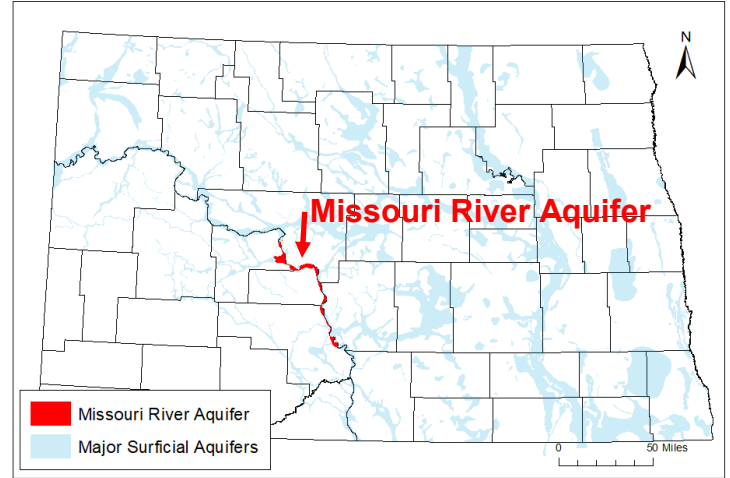


Missouri River Aquifer

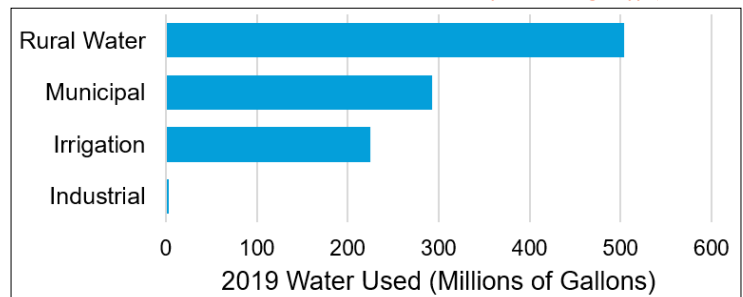
Mercer, Morton, and Oliver Counties

Aquifer At-a-Glance	
Area	96.5 square miles
Aquifer Type	Unconfined Surficial
Major Land Uses over Aquifer (percentage of aquifer area covered in 2017) ¹	Open Water/Wetlands (51%) Crops (26%)
Depth to Water* ²	5-50 feet
Total Unique Wells Sampled	17
Wells Sampled in 2020	8
Samples Collected in 2020	9
Years Sampled	1995, 2000, 2005, 2010, 2015, 2020

*Depths to water may vary seasonally, year to year, and across the aquifer



2019 Missouri River aquifer permitted water use (from North Dakota State Water Commission (swc.nd.gov)) ↓



- Aquifer materials consist of sands and gravels deposited by streams moving meltwater away from glaciers during the last ice age and more recent sands and gravels deposited by the Missouri River.²
- The aquifer is up to 200 feet thick.²
- Domestic wells are common in the aquifer. Irrigation and stock wells are also installed in the aquifer.
- The city of Bismarck and the South Central Regional Water District rural water system draw water from the aquifer.
- In North Dakota, permits are required to withdraw large quantities of groundwater. In 2019, 1.02 billion gallons of permitted water were drawn from the aquifer; rural water use consumed the largest quantity of water. For more information on water use and permits, contact the North Dakota State Water Commission (swc.nd.gov).

About the Agricultural Groundwater Monitoring Program

- The North Dakota Department of Environmental Quality monitors a network of wells in approximately 50 surficial aquifers that are at elevated risk of agricultural contamination.
- Aquifers are sampled on a 5-year rotation.
- Monitoring began in 1992.
- The vast majority of these aquifers are located in central and eastern North Dakota.
- Water is tested for 21 general chemistry parameters, eight trace metals, and 64 pesticides.

References

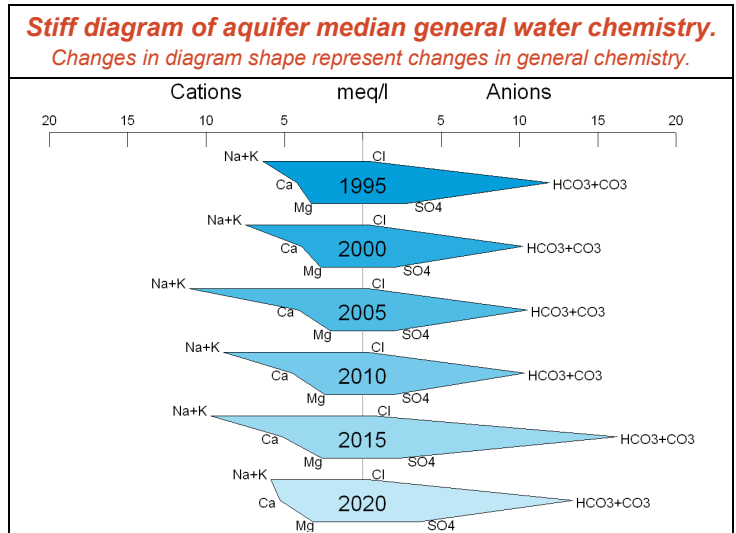
- (1) US Department of Agriculture, 2017, National Agricultural Statistics Service Cropland Data Layer.
- (2) Croft, M.G., 1973, Ground-Water Resources of Mercer and Oliver Counties, North Dakota, North Dakota State Water Commission County Ground-Water Studies 15-Part 3, North Dakota Geological Survey Bulletin 56.

Water Chemistry

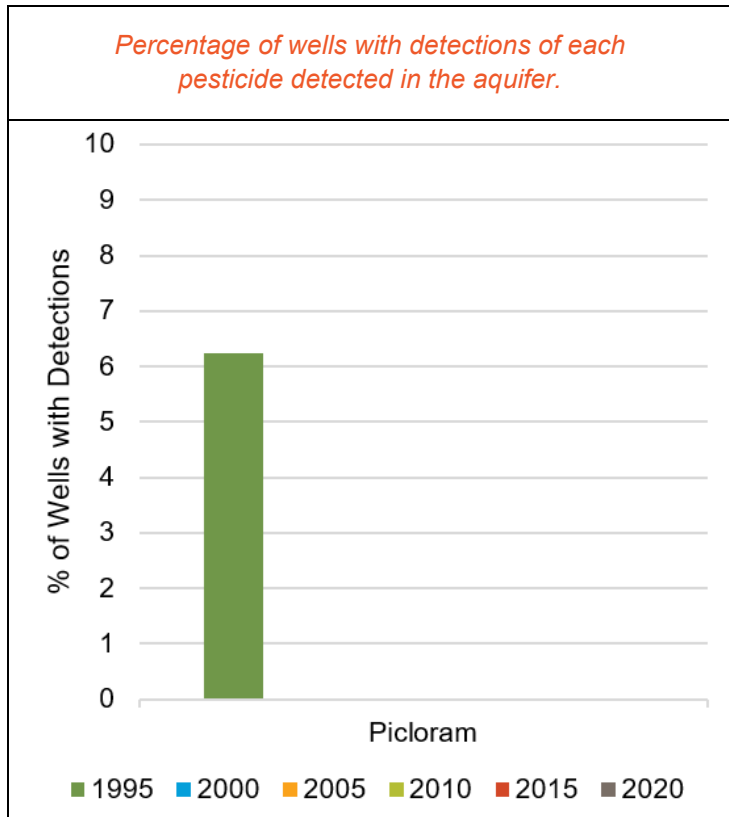
Is Aquifer Water High in...?	Analyte	Result	2020 Median Concentration	Potential Effects
	Arsenic	Locally	0.007 mg/L	Skin or circulatory system damage, increased cancer risk
	Iron	YES	0.77 mg/L	Metallic taste/odor, discoloration of surfaces
	Manganese	YES	0.14 mg/L	
	Sodium	YES	131 mg/L	Taste, people with certain health conditions may need to limit intake
	Sulfate	NO	171 mg/L	Taste/odor, laxative effect for people not used to the water
For more information about Maximum Contaminant Levels (MCLs), health effects, and treatment options for these contaminants and more, see the NDDEQ's fact sheets (deq.nd.gov/wq/1_Groundwater) or visit the US EPA website (epa.gov/ground-water-and-drinking-water).				

Dominant Water Type	Water Hardness
Sodium-Bicarbonate	Very Hard

Nitrate
<i>Percentage of Wells Exceeding the Nitrate Maximum Contaminant Level (MCL)* (10 mg/L as N).</i>
No Nitrate MCL Exceedances



Pesticides



State Pesticide Management Plan	
Agricultural Groundwater Monitoring Program aquifers are monitored as a part of the State Pesticide Management Plan. A Prevention Action Level (PAL) threshold of 25% of the pesticide's Maximum Contaminant Level (MCL)* or Health Advisory Level (HAL) is used to identify whether action is needed to prevent further contamination.	
Prevention Action Level Exceedances	None
MCL or HAL Exceedances	None

Number of Unique Wells with Pesticide Detections since 1995	1 of 17 Total Wells
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2020 Pesticide Detections
No Pesticide Detections

*Note that MCLs are for public drinking water systems; private wells are not regulated in North Dakota. MCLs still provide guidelines for drinking groundwater.

Feel free to use this information, but please credit the North Dakota Department of Environmental Quality.