



DETAILED STUDIES OF NORTH DAKOTA AQUIFERS UNDERWAY

North Dakota's water resources play a crucial role in supporting agriculture, industry, and communities across the state. Beneath the rolling plains lies an intricate network of underground aquifers, which are essential for ensuring reliable water supplies. However, these vital resources face challenges, including drought-stress, and increased demand. To continue addressing these issues, the North Dakota Department of Water Resources (DWR) is taking a proactive approach by studying three key aquifers.

WHY AQUIFERS MATTER

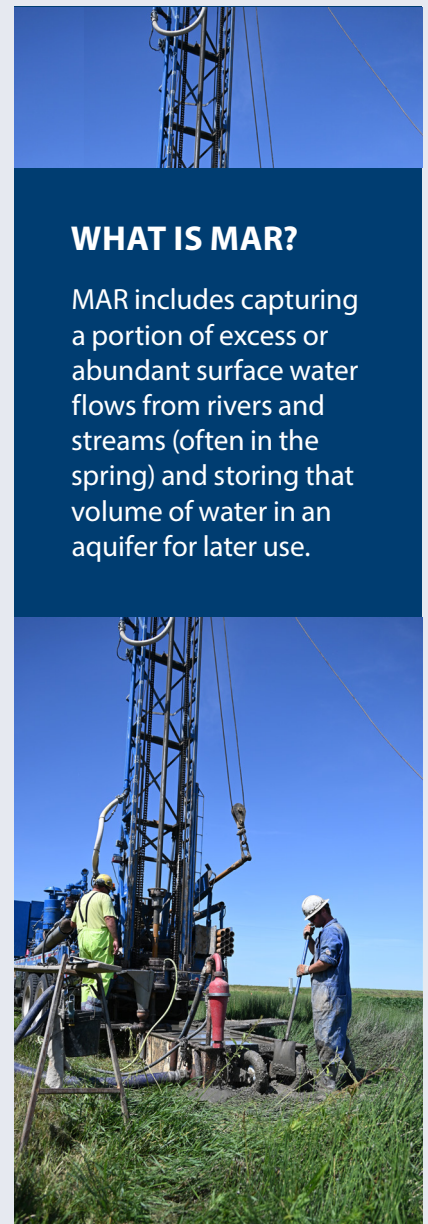
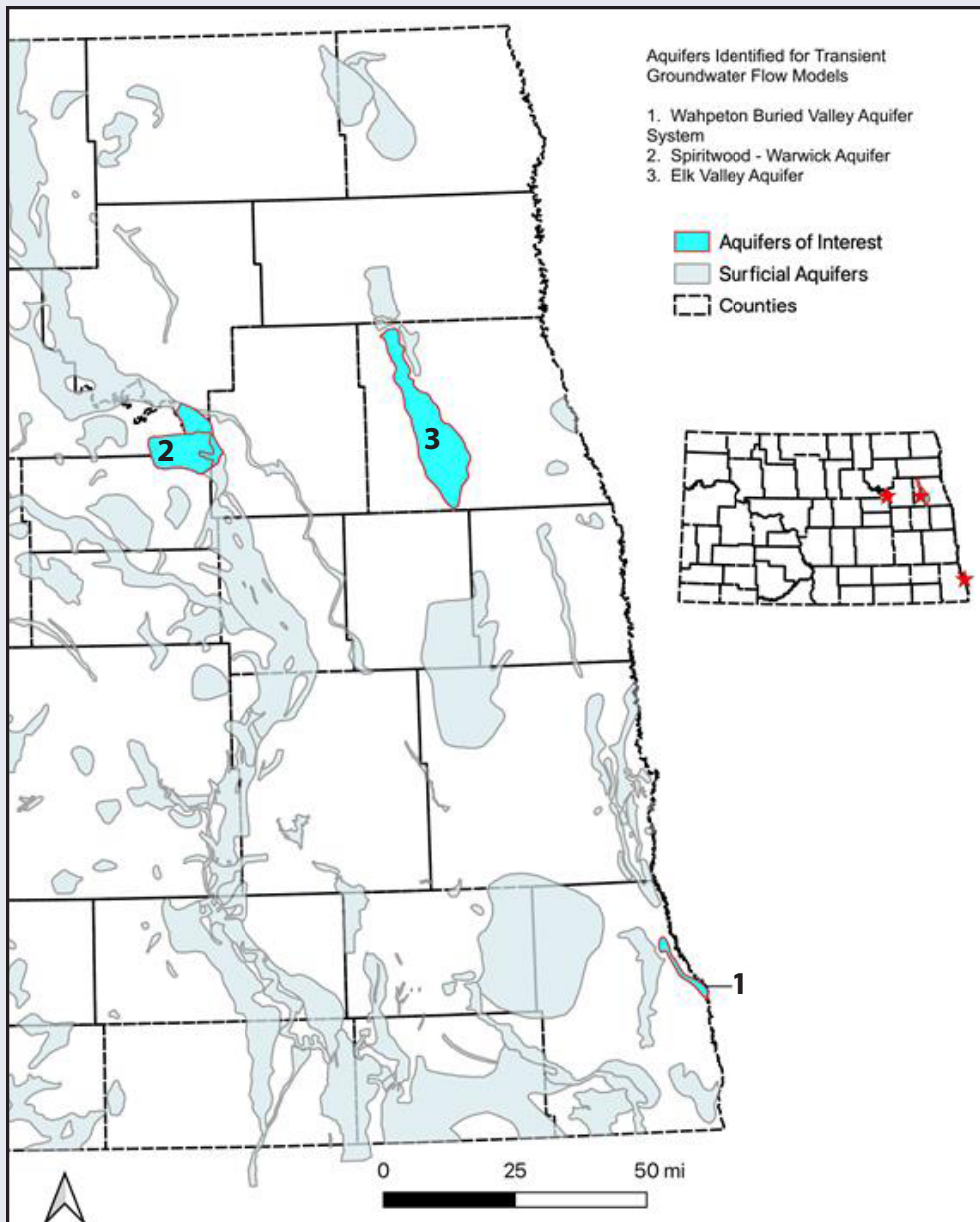
Aquifers are underground layers of water-bearing rock or sand that store and transmit water. They act as natural reservoirs, supplying water for drinking, irrigation, and industrial use. In North Dakota, aquifers like Elk Valley, Spiritwood-Warwick, and Wahpeton Buried Valley are critical to sustaining agriculture and communities. However, increasing demands and changing climate patterns have raised concerns about their long-term viability, especially during extended droughts.



SPOTLIGHT ON THREE AQUIFERS

The DWR has identified the Elk Valley, Spiritwood-Warwick, and Wahpeton Buried Valley aquifers as priorities for study. These aquifers were chosen based on their importance to local water needs and potential for enhancement through techniques like managed aquifer recharge, or MAR.

- **ELK VALLEY AQUIFER:** Spanning 200 square miles, this largely unconfined aquifer supports irrigation and municipal and rural water supplies. Yet, its resilience during droughts is a concern. With nearly 50 pending water permit applications, understanding the aquifer's sustainability is crucial. DWR aims to assess its ability to withstand prolonged dry periods and explore recharge methods to enhance its sustainability.
- **SPIRITWOOD-WARWICK AQUIFER:** Part of a larger system stretching from Canada to South Dakota, this aquifer is experiencing declining water levels due to increased use. The DWR is studying how much more water can be safely withdrawn without impacting existing users and whether recharge methods can stabilize its levels for future demands.
- **WAHPETON BURIED VALLEY AQUIFER SYSTEM:** With nearly 50 years of ongoing use and over 40 feet of developmental decline, this aquifer faces unique challenges. Major users, including the City of Wahpeton and industrial facilities like Cargill, depend on this resource. Projections indicate significant stress during drought conditions, particularly if industrial water usage spikes. The study seeks to determine how this aquifer can be managed and potentially enhanced to meet growing demands.



WHAT IS MAR?

MAR includes capturing a portion of excess or abundant surface water flows from rivers and streams (often in the spring) and storing that volume of water in an aquifer for later use.

TOOLS FOR UNDERSTANDING AND PLANNING

To ensure these aquifers remain viable, the DWR is developing detailed groundwater models. These models will simulate various scenarios, such as drought conditions or increased water withdrawals, to predict their effects on water levels and availability. They also explore the feasibility using MAR.

BALANCING NEEDS AND SUSTAINABILITY

The studies aim to strike a balance between current water usage and the long-term sustainability of these aquifers. For example, deferred water permit applications may be revisited to determine which ones can proceed without compromising existing users. Additionally, these models help identify when and how MAR can be implemented to support agriculture, municipalities, and industries.

LOOKING AHEAD

North Dakota's proactive efforts highlight the importance of understanding and managing water resources in a changing environment. By focusing on these three aquifers, the DWR is paving the way for sustainable water use that benefits everyone—from farmers irrigating crops to families relying on clean drinking water.

Groundwater may be hidden from sight, but it is critical to the state's prosperity. Through careful study and innovative solutions, North Dakota is ensuring that this resource remains a reliable foundation for the future.