

**Driving Water Savings Through Advanced Data Collections
and
Modeling in the Twin Platte NRD – Phase 2**

WSF #5319

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This project was significant for the Twin Platte Natural Resources District (TPNRD) and the Nebraska Department of Natural Resources (NDNR), who jointly adopted the Integrated Management Plan (IMP) in 2009 which provided for an initial 10-year increment of joint planning activities. During this 10-year increment two over-arching activities were carried out. The TPNRD implemented various projects to provide offset water to the Platte River in amounts specified in the original IMP, and the TPNRD and the NDNR completed a Robust Review as outlined in the IMP in order to reassess the amount of offset water the TPNRD should be required to provide in order to achieve the Goals and Objectives of the IMP.

A key shortcoming of the previous management strategy was actual water use was not being directly measured. The TPNRD and the NDNR agreed for the second 10-year IMP increment the TPNRD needed to implement the Water Data Program to measure water use. The approach of this project provides a superior avenue to complete the next Robust Review. The data for the 2023 Robust Review was significantly upgraded with this project. All data collection, processing, and execution of model simulations required for future Robust Reviews are now fully automated for the TPNRD and the NDNR, providing annual daily scale feedback to water managers and irrigators. This project now allows irrigators and managers in the TPNRD to make proactive water management decisions by understanding how an action can affect the aquifer and stream before they use the water.

This project involved the development and delivery of a software solution that allows the TPNRD to track agricultural ground water use in the NRD. It allows the TPNRD to have a tool for its growers to track and know how much ground water irrigation is occurring daily.

The first couple years most of the work went on behind the scenes developing the interface that the grower would be using, and developing the pieces that would then be connected. While that was occurring, flow tests were being performed in the summer months on all irrigation wells in the district. Work was also going on with the electrical providers making connections, so their pumping times were being imported into a dashboard for each grower's fields. For the non-electric wells, wireless continuity devices were installed to give growers the time their wells were being operated. Once all the pieces were connected, the software calculates how much water is

pumped per well for the field. The software was created to update nightly to the grower's dashboard which each grower has access to through their smart phone, tablet, or computer. Not only did this give accurate measurements of water use to the grower, but it also gave the TPNRD accurate data for the models used for the Robust Review.

Data is now entered in the dashboard directly from growers for crops and tillage in addition to the water pumped, which is all stored digitally, and can be directly inputted into the model. The most recent Robust Review model runs, and future runs, will have accurate data inputs.

Phase 2 included work that is vital to completing the 2023 Robust Review, which is now underway. This allows the TPNRD to observe the status of water use across the district at a glance thru the field-by-field data in the Groundwater Manager Platform. Providing statistical summaries and visualizations at a glance has been a game changer. Also included in Phase 2 are improvements to the sensor network page to view device diagnostics, such as signal strength and battery life. New ET data available from Open ET will provide consumptive use during the 2011-2023 period, for which no actual water use data is available. Modeling beyond 2020 runs, Open ET data will be accessed through an application programming interface (API), which will allow automated data retrieval for ALL irrigated acres in the TPNRD.

Phase 2 will provide benefits to the overall project objective of measuring water use across the TPNRD. Both the TPNRD and the grower will be working together to strike the appropriate balance between maximum beneficial consumptive use and limiting adverse impacts to the aquifer and streamflow. This will provide a true paradigm shift to irrigators and managers in the TPNRD, empowering them to make proactive water management decisions by understanding how an action can affect the aquifer and stream before they take the water.