Driving Water Savings Through Advanced Data Collections and Modeling in the Twin Platte NRD

WSF #5242

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This project was significant for the Twin Platte Natural Resources District (TPNRD) and the Nebraska Department of Natural Resources (NDNR), to jointly adopt 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 the approach of this project provides a superior avenue to complete the next Robust Review currently scheduled for 2023. The mechanics behind the Robust Review were significantly upgraded over the course of 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 TPRND to have a tool for its growers to track, and know how much ground water irrigation was 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 being installed to give growers the time their wells operated. Once all the pieces were connected, the software calculates how much water is pumped per well and 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, such as crops, tillage, and 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.

Funding this grant made possible significant improvements in water management in the TPNRD. The Water Data Program is a one-of-a-kind program, that gives growers real-time information so they can make educated management decisions based on their actual irrigation practices.