Aquifer Monitoring Around the Northern Texas Panhandle

Challenge

To make wise decisions concerning the district's water resources and identify future groundwater concerns where 95% of the water from the Ogallala aquifer is used for crop irrigation.

Solution

37 monitoring wells were equipped with OTT ecoLog 500's for groundwater measurement. Wellcaps and OTT PLS pressure sensors allow 11 remote stations to send daily data through Iridium satellite.

Benefits

The easy and efficient telemetry set-up that allows data from each station to travel to the local servers resulted in an online interactive map with near real-time groundwater data to share with the district.

"It's great how readily accessible this data is. Someone can come in and see their own area, and how it compares to other areas. You can consider putting in a new well, plan upcoming costs, and more."

Odell Ward, Program Coordinator, NPGCD

Background

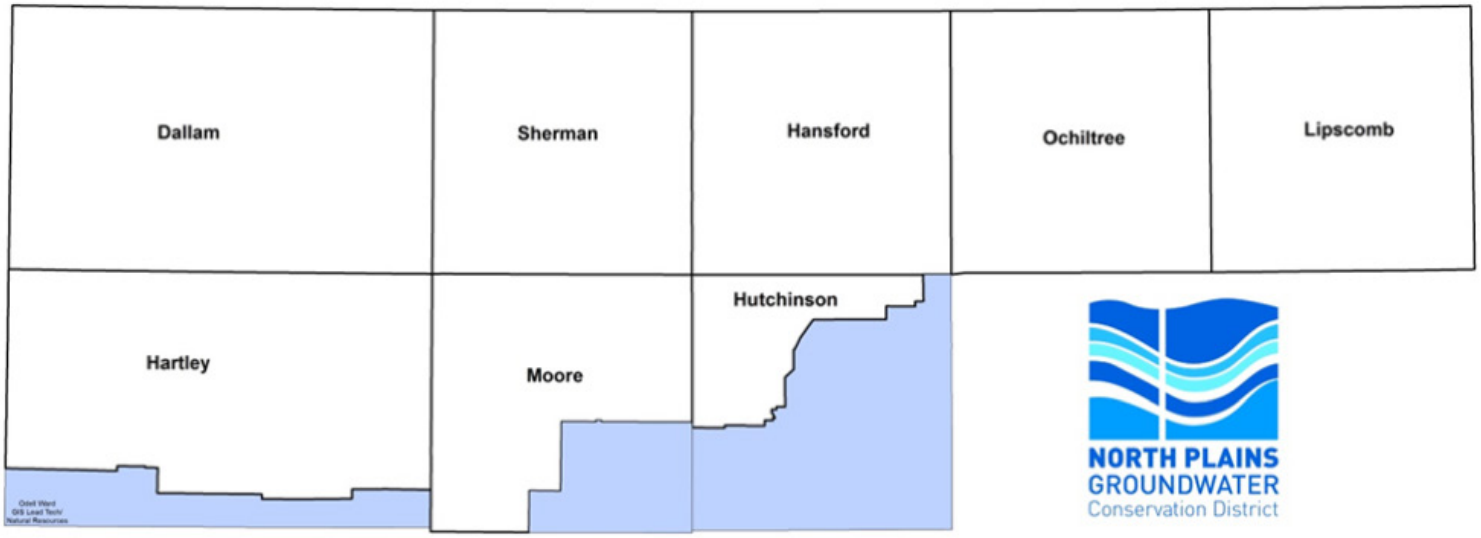
Established in 1955, the North Plains Groundwater Conservation District identifies future groundwater concerns in the northern Texas panhandle and creates solutions for anticipated problems before they develop. It does this through a variety of methods, including collecting groundwater information, performing water quality analyses, and providing a number of well system tests.

In 1982, the district began a monitoring well program to track water levels for the Ogallala aquifer in the district. Approximately 95% of water from the Ogallala aquifer within the district goes to irrigation for crops, and the aquifer has very little recharge. This makes measuring water rise and decline rates crucial for the district, so the local Board of Directors can make wise decisions concerning the district's water resources. Besides crop irrigation, the aquifer also supplies industrial usage and municipal usage for nearby cities.

North Plains Landscape (NPGCD)

Monitoring Network

The groundwater monitoring program spans across approximately 165 miles from West to East, and (in places) approximately 60 miles from North to South. It borders Oklahoma on the North and East and New Mexico on the West to cover all or portions of 8 different Texas counties.



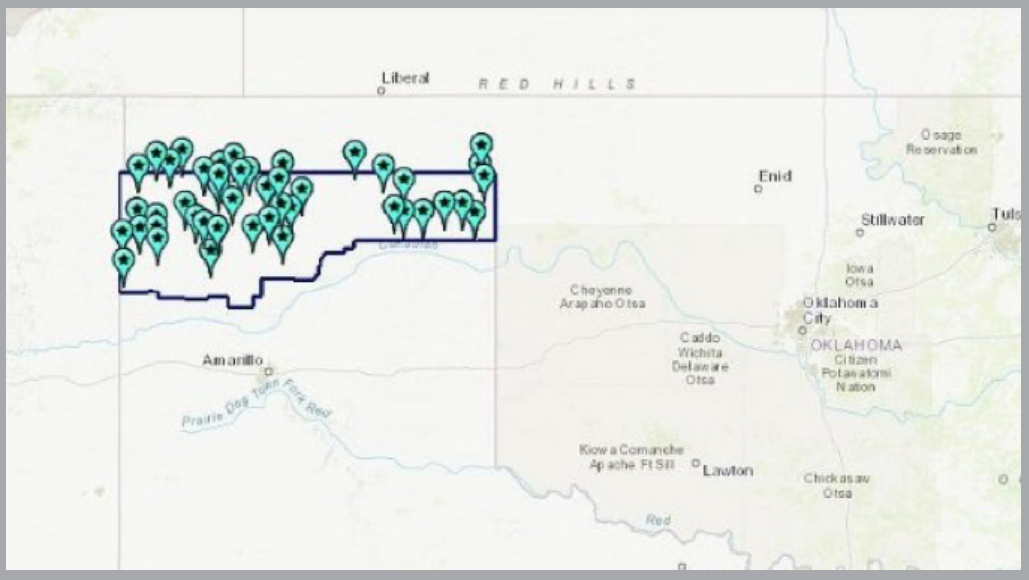
Districts Within Network (NPGCD)

Since 1982, measurements were taken once a year manually. In 2006, the district upgraded their technology to measure more frequently for more insightful data.

The NPGCD began working with SUTRON, a product brand of OTT HydroMet, around 2016 after realizing a need for telemetry, or remote communication, capabilities. Over time the district installed approximately 48 monitoring wells with telemetry. 37 sensors are OTT ecoLog 500's for groundwater monitoring and they are equipped with cellular units. For 11 remote stations where it was nearly impossible to get consistent cellular coverage, Iridium Wellcaps were added to send daily data through Iridium satellite communication. OTT PLS pressure sensors were also added to each of the 11 Wellcaps.

The entire program consists of 433 observation wells, of which 48 are monitored on a daily basis through OTT HydroMet equipment. Each of the 48 sites gives insight on decline rates during pumping season by measuring depth of water, temperature of water, and battery life of the sensor. The NPGCD has established an online interactive map of each station so citizens can check water level rates, which are updated every 24 hours. This near real-time data is possible through telemetry, allowing data to travel from each station to the NPGCD's local servers.

OTT HydroMet was selected for both their telemetry options and an easy and efficient setup. When the first 12 SUTRON logging transmitters were installed, several OTT HydroMet team members flew directly on-site to aid installation and provide maintenance tips. When asked why the NPGCD chose OTT HydroMet, Program Coordinator Odell Ward said, "Telemetry data allows producers within the district to better see how other wells affect their wells and the time frame for recovery after the pumping season ends. You can have data sent into the server and then get it out publicly within 24 hours."



Texas Panhandle Real-Time Network (NPGCD)

A SUTRON Iridium Wellcap (NPGCD)

Value of Monitoring

The value of near real-time data is only growing. The NPGCD particularly appreciates how transparent and visible the data has become for the producers of the NPGCD.

The constantly updated online map serves as a tool for the public to track their aquifer data without having to wait for a yearly report. This process of disseminating is more streamlined due to the monitoring program implemented by the NPGCD.

The provided information is essential for anyone from local farmers and property owners to local government agencies and helps further the NPGCD's goal of maintaining way of life through 'conservation, protection, and preservation of groundwater resources'.

> It's great how readily accessible this data is. Someone can come in and see their own area, and how it compares to other areas in terms of water decline rates and recovery (if any). You can consider putting in a new well, plan upcoming costs, and more.
>
> – Odell Ward, Program Coordinator

Technologies used

OTT ecoLog 500

Water Level Logger

Water level sensor with built-in datalogger for surface and groundwater applications.

SUTRON Well Cap

Groundwater Cap

Versatile groundwater telemetry system.

OTT PLS

Pressure Level Sensor

Robust ceramic pressure transducer for water level measurement.

References

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