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Award Number: G20AC00173

New Mexico Bureau of Geology and Mineral Resources (NMBGMR), at New Mexico Tech
New Mexico Bureau of Geology and Mineral Resources Groundwater Level Monitoring
Network Year 4

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Term of award: September 15, 2020 to September 14, 2021

Date: November 18, 2021

Major Goals 2020-2021:

To support persistent data services as an existing data provider for the National Groundwater Monitoring Network (NGWMN) by adding new sites, maintaining current sites, maintaining web services, keeping the site list up to date, keeping metadata current, and providing updates to the NGWMN Data Provider page for the New Mexico Bureau of Geology and Mineral Resources (NMBGMR).

Project Summary:

New Mexico Bureau of Geology and Mineral Resources was awarded Grant No. G20AC00173 to support persistent data services. The period of work is between September 15, 2020 and September 14, 2021. Work included selecting additional sites for network inclusion, maintaining existing NGWMN sites, keeping metadata current, and providing updates to the NGWMN Data Provider page for the NMBGMR.

Work done to support the NGWMN as a data provider:

For the year 2020-2021, our team focused on Objective 2; supporting persistent data services. For Objective 2, our team consists of a staff research scientist, data manager, IT manager, database manager, and software developer. With USGS funds, the data manager worked with our in-house Aquifer Mapping Program (AMP) database to keep the NGWMN sites up to date. The data manager executed QA/QC procedures on all data, helped review all data and determined any additional well site selections. The research scientist contacted well owners for prospective wells and compiled the final report. Their time was supported by the federal U.S. Geological Survey funding. The IT manager and database manager provided persistent web services, backups, and database support. The software developer insured correct data transfer from the AMP database to the NGWMN portal and periodically checked user load on the network. Their time was supported by the federal U.S. Geological Survey funding. This team structure proved effective in maintaining a high quality standard of data submitted to the NGWMN.

We added one new site within the Rio Grande aquifer system and one new site in the Colorado Plateaus aquifers to the monitoring network this year (Figure 1). One new site (NM-00037) lacks construction information and is currently turned “off” in the NGWMN portal. We plan to camera this well within the next year in order to fill in missing construction information. As a result of reaching 5 years of depth-to-water measurements, we were able to classify three NGWMN sites into subnetworks and turn them “on” in the NGWMN portal (Table 1).

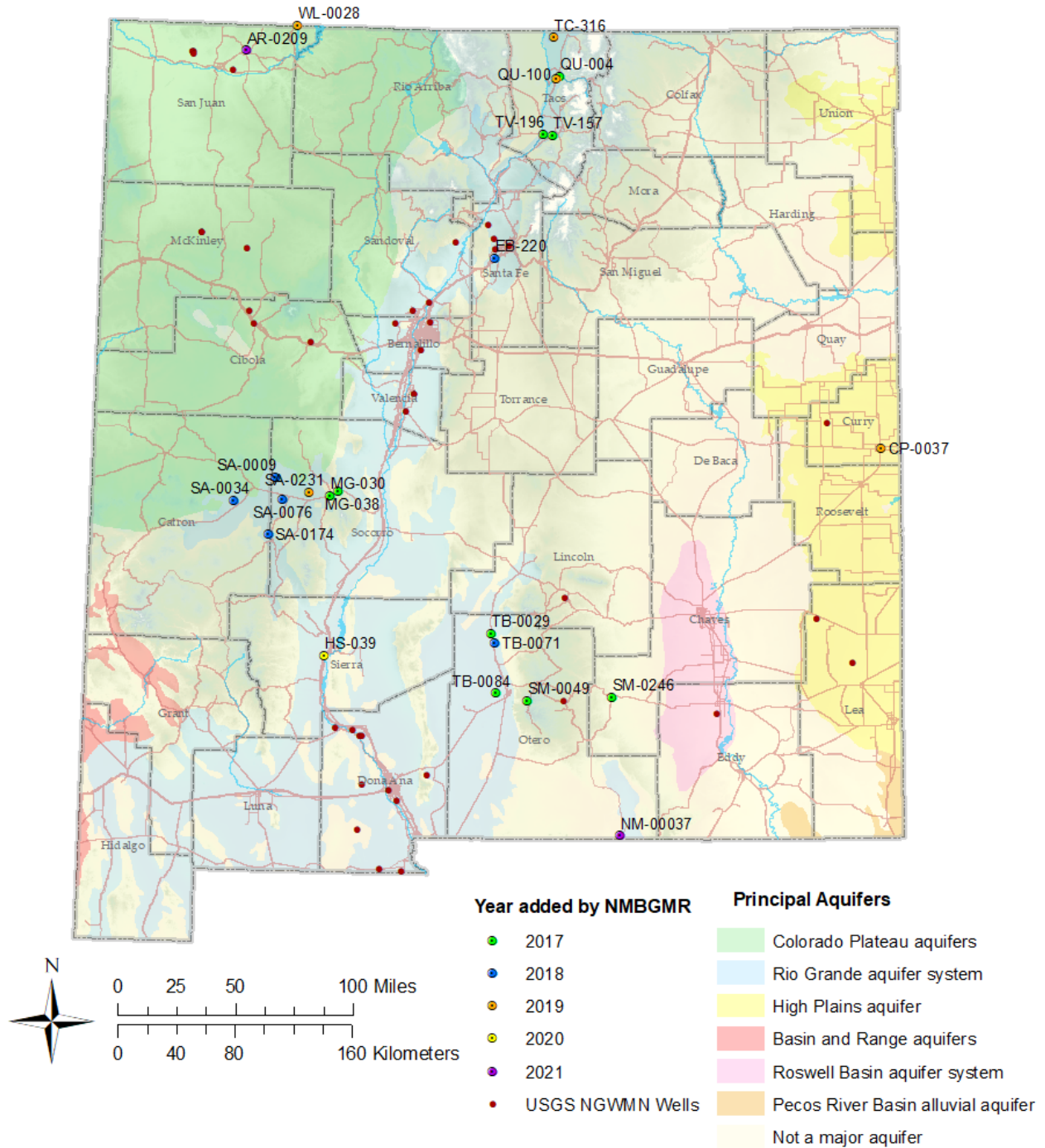


Figure 1. Principle aquifers, USGS NGWMN sites and NMBGMR sites selected for inclusion in the NGWMN in 2020-2021 (purple).

Table 1. Updates to NGWMN sites

| Point ID | National Aquifer | Well depth (ft) | Subnetwork | Monitoring Category | Monitoring Frequency | Action |
|----------|----------------------------|-----------------|-----------------|---------------------|----------------------|---|
| AR-0209 | Colorado Plateaus aquifers | 20 | Background | Trend | Annual | Added to network, turned “on” and categorized |
| CP-0037 | High Plains aquifer | 356 | Known Changes | Trend | Annual | Turned “on” and categorized |
| NM-00037 | Rio Grande aquifer system | unknown | Not categorized | Not categorized | Annual | Added to network |
| WL-0028 | Colorado Plateaus aquifers | 160 | Background | Trend | Annual | Turned “on” |

The NMBGMR team continued to work closely with the USGS NM Water Science Center in Albuquerque and the NM Office of the State Engineer. Together, we identified sites that overlap with existing monitoring efforts so as to avoid duplicating submissions to the NGWMN. Working with these federal and state entities ensures we ultimately achieve representative water level monitoring coverage throughout the state.

Completed data collection:

As with our inaugural year (2017-2018), a variety of data collection and database maintenance tasks were performed. Field work was done to collect manual measurements using standardized methods. Field sheets and notebooks were copied or scanned upon return to the office and stored on the NMBGMR network server where they are backed-up daily. Within two weeks, quality checks were performed and then the data was entered into the AMP database. All well locations, well construction information, and manual water level data are maintained in the AMP database and the data fields are aligned with those in the NGWMN database. We maintained a reliable database link between the AMP database and the NGWMN database. All efforts to provide data to the NGWMN complement the NMBGMR mission to provide water level data to the public.

The NMBGMR team consisted of a research scientist and a data manager. USGS funds supported selection and classifying of wells in the network and documentation of work in the final report.

Updates made to web services:

The database link between the AMP and NGWMN databases enables relevant data tables to relate directly to the NGWMN tables. This information smoothly relates to the data requirements in the NGWMN database. Three full-time staff are dedicated to providing support for core IT infrastructure for the NMBGMR. IT staff worked with the AMP team on the NGWMN thanks to financial support provided by the USGS.

Problems encountered in serving data to the NGWMN data portal:

None

Notice of changes in databases or web services that would impact future integration with data portal:

None

Conclusions:

The NMBGMR is successfully connected to the USGS NGWMN, and is now showing 22 sites on the USGS website. The NMBGMR will continue to grow and add new sites, as well as improve data quality at existing sites. We look forward to continuing to work with the USGS toward this important endeavor for a national coverage of groundwater monitoring.