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AWARD NUMBER:	G20AC00184
AGENCY NAME:	Arizona Department of Water Resources
TITLE:	Arizona, Southwestern US, Groundwater-Level Network Final Report to Provide Persistent Data Services to the NGWMN Data Portal

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TERM COVERED:	09/30/2020 – 09/29/2022
DATE OF FINAL REPORT:	12/22/2022

USGS National Ground-Water Monitoring Network Cooperative Agreement
Arizona Department of Water Resources, Southwestern US, Groundwater-Level Network
Final Report as Existing Data Provider
December 22, 2022

Overview of Work

The Arizona Department of Water Resources (ADWR) performed work as an existing data provider with the USGS National Ground-Water Monitoring Network (NGWMN) per Cooperative Agreement Number: #G20AC00184, as awarded under Objective 2 to maintain current data services to the NGWMN Portal for the grant period 9/30/2020 – 9/29/2022. This final report summarizes work performed to provide persistent data services for two years to the NGWMN Data Portal, ensuring data continues to flow, and that sites and site information are up to date.

Background

With the establishment of the Arizona Department of Water Resources (ADWR) in 1980, ADWR assumed responsibility from the U.S. Geological Survey (USGS) for the collection of groundwater levels in wells statewide. ADWR was trained by and adopted all USGS data collection protocols for well and spring site inventories, water-levels, water quality, and well discharge measurements. The Department also received a copy of the USGS Ground Water Site Inventory (GWSI) database which has been continually maintained and updated by ongoing field investigations through the statewide network of water level sites: https://gisweb.azwater.gov/waterresourcedata/GWSI.aspx.

Principal or major aquifers monitored by ADWR include: Basin and Range aquifers (Basin-fill aquifers and Basin Carbonate-rock aquifers); Colorado Plateau aquifers (Mesa Verde aquifer, Dakota-Glen Canyon aquifer system, and Coconino- De Chelly aquifer).

ADWR's initial project to become a new data provider added 5 sites in a 2016 grant. ADWR's second project with the NGWMN added 40 sites in a 2018 grant. Eight (8) of the 45 sites are within the Colorado Plateau Principal Aquifer (PA), 28 are within the Basin and Range PA, and 9 are within the Other Aquifer PA classification (see Figure 1.). Eighteen (18) sites provide daily water levels, 13 sites provide monthly measurements, and 14 sites provide quarterly measurements; 7 sites previously measured annually are now collected quarterly.

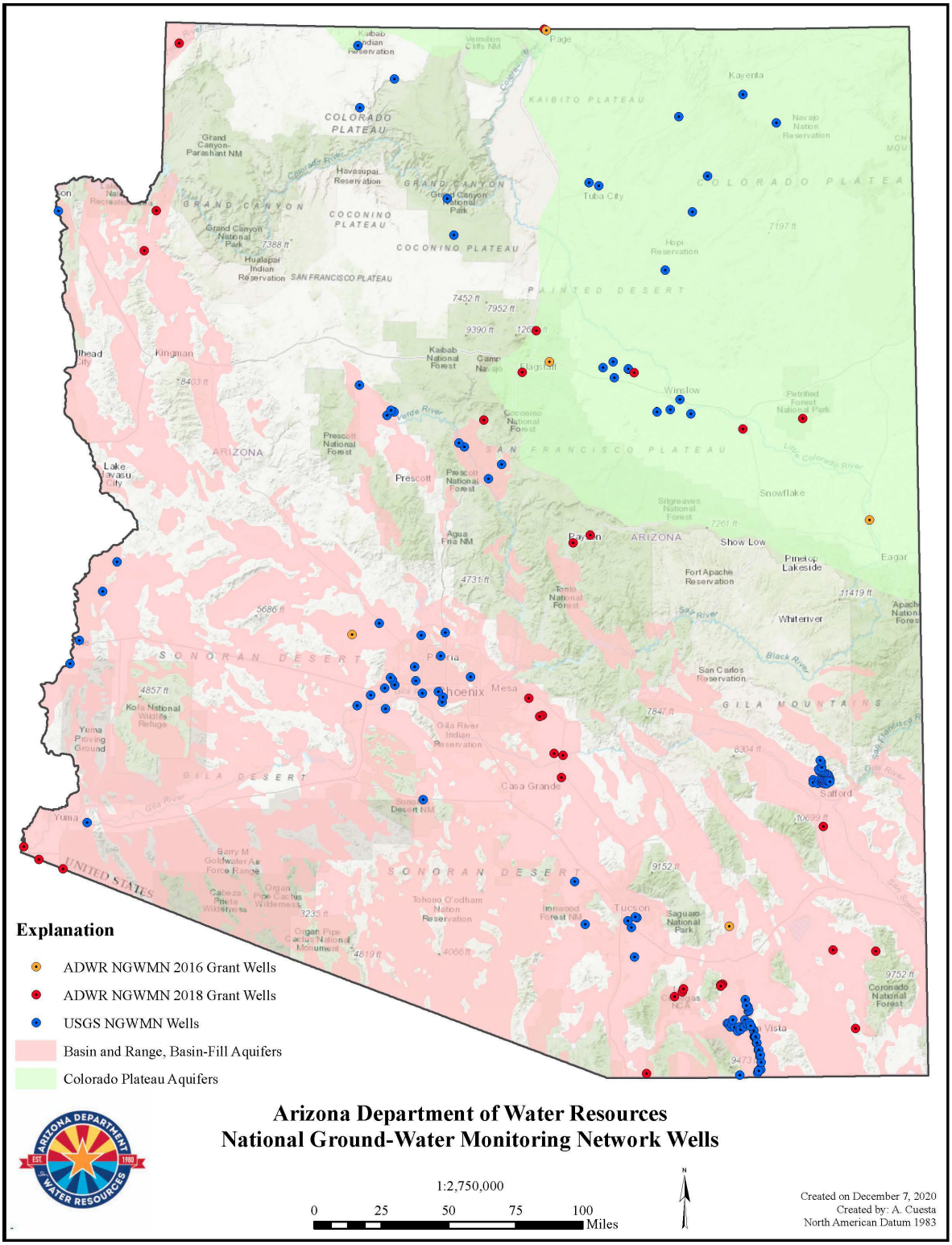

Figure 1. ADWR National Ground Water Monitoring Network (NGWMN) wells.

Work Performed Under Objective 2

Work performed under ADWR's third project with the NGWMN, 2020 Round 1 grant, is complete, fulling the requirements for this award. Work performed and any specific difficulties are outlined below.

Objective 2 Work Tasks	**Work Performed**
Maintain Web Services to the NGWMN Portal	Web services were maintained throughout the grant period.
Keep Sites in the NGWMN Well Registry Current	All sites in the Well Registry were keep current.
Perform Routine Updates to Site Information	All site information was routinely updated as standard protocol per Data Quality and Quality Assurance Processes.
Update Web Services to Meet the Current Requirements	Web services were updated to meet current requirements.
Document Persistent Data Services in Final Report	Final Report submitted to USGS on 12/22/2022.

Web services were disrupted shorty after ADWR moved servers in December 2019. The disruption was discovered by USGS staff during routine QA checks and was quickly resolved once identified. One Trend Site, SITE ID 322737114415301 had most recent water level on the Network as 11/1/2018 while on ADWR's end the most recent water was dated 10/29/2019. After investigating, it was discovered to be on ADWR Web Services end. There was an issue when ADWR migrated servers in December 2019. To ensure continuous web services, an internal ADWR report was developed and run thereafter twice monthly. ADWR hydrogeologists reviewed all report data to ensure sites are kept current with data quality standards and are displaying on NGWMN website consistent with current requirements.

Web services scripts were modified to meet current requirements for Screening and Casing from "null" to "None". Scripts were also modified for Lithology/Description from "null" to "Unknown". All ADWR sites are displaying current data as updated through the NGWMN Well Registry. No disruptions are currently being experienced serving data to the NGWMN Portal.

Seven (7) sites that originally measured water levels on an annual basis were moved to quarterly index lines. This was completed before adding them to the NGWMN well registry; however, they were not displayed until a significant number of water levels were available for the Network while meeting timeframe Network requirements. Additionally, several sites added to the NGWMN Well Registry during the second grant in 2018 were never displayed due to on-going measurement issues. Eventually, it was decided to remove these sites from the Well Registry due to the inability to obtain water level measurements. Well owner permissions, obstructions in the wells and site access topped the reasons for removing these sites from ADWR's active index well network.

Specific details on Site Selection and Classification process, Field Data Collection Techniques and Methodology, Web Services and Data Quality Assurance (Data Management Plan) are specified in ADWR's initial project Final Report (ADWR, 2018). ADWR's data collection procedures and quality assurance practices are consistent with the standards outlined in the Framework Document (SOGW, 2013).

References

Arizona Department of Water Resources, 2018, Final Technical Report to Establish ADWR as a Data Provider to the USGS National Ground Water Monitoring Network, Hydrology-Field Services Section 230 p.

Advisory Committee on Water Information: Subcommittee on Ground Water (SOGW), 2013, A National Framework for Ground Water Monitoring in the United States, 182 p. https://acwi.gov/sogw/ngwmn_framework_report_july2013.pdf.