

Award Number: G20AC00175

Agency Name: Mississippi Department of Environmental Quality, Office of Land and Water Resources

Title: Final Report of Work for “USGS NGWMN: Proposal for the Office of Land and Water Resources, a division of MSDEQ FY2020”

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Overview

The Office of Land and Water Resources (OLWR), a division of the Mississippi Department of Environmental Quality (MDEQ) was awarded funding under Objective 2 (Award number G20AC00175) as an existing data provider of the National Groundwater Monitoring Network (NGWMN). This report documents the activities of OLWR as part of the above-mentioned Cooperative Agreement award.

Description of Work Performed Under Objective 2

Under Cooperative Agreement Award G20AC00175 the OLWR proposed to maintain a data connection to the NGWMN web portal and update metadata of existing sites as needed. Additionally, the OLWR proposed to remove or add sites as wells are added or removed for observation. A comprehensive list of objectives and outcomes performed as part of this agreement can be found in Table 1 below.

Table 1: Proposed Activities and Outcomes	
Proposed Activities	Outcomes
Maintain web services connection	Connection for all web services were maintained throughout the award period.
Keep list of sites and associated metadata in the NGWMN Well Registry up to date	Water levels at 59 sites were updated. Four wells were removed from the registry. Metadata at 16 sites was updated.
Classify new sites into subnetworks and monitoring categories	4 wells were added to the registry and classified into subnetworks and monitoring categories.
Populate data elements for new sites	Well construction data for 3 sites and lithology data for 1 site were added to Web Services tables.
Update web services to serve new data requested by USGS	No updates requested.
Review NGWMN Data Provider pages for necessary updates	No updates necessary during award period.
Document persistent data services in a final report	Final Report submitted to USGS on 11/1/2021.

Due to limitations of the OLWR's legacy database that currently houses water level, lithology, and construction data all data provided to the NGWMN is stored in separate Excel Workbook files outside of the legacy database. Updates and changes to data are entered into this Workbook quarterly. Once data has been checked for accuracy, data entered into these data tables is uploaded and converted to the appropriate xml format using a tool in ArcGIS. This information is then served out externally via a dedicated server. A week after the data is published as a web service, staff check values entered for successful data transfer into the NGWMN data portal. In addition to routine maintenance, OLWR staff enter data obtained during field observations into web services data tables. This data includes observation of metadata collected in the field as well as data collected from paper records. Observations and measurements taken during this period were managed according to the standards set forth in the data management plan which was submitted with the original funding request (Attachment 1). A complete list of changes made to the well registry and web services can be found in Appendix A.

During this award period, the OLWR continued development of MSWIS (the Mississippi Water Information System), a website backed by a SQL database to house all information collected by the OLWR. Upon completion MSWIS will serve as the repository for all OLWR data including water level, lithology, and construction data of observation wells. No portion of funds from this Cooperative Agreement were used to fund development of MSWIS and no final changes have been made to this database in regards to water level measurements. Well construction data has been moved into MSIWS, and staff have verified that any changes made to construction data as a result of activities associated with this Cooperative Agreement are accurate in the new SQL database. MSWIS does not currently serve data to the NGWMN data portal, but future phases of MSWIS development will allow the OLWR to serve data to the NGWMN data portal via web services. As future phases of development are completed, staff will continue to verify accurate data transfer. In addition to the work stated previously, OLWR staff have compiled a final report to document all activities performed under Objective 2.

Appendix A: Changes to Web Services and Registry

Changes to Web Services and Registry			
Site ID	Principal Aquifer	Action	Reason for change
001D0001	Coastal Lowlands aquifer system	Site display turned off	Well has been plugged and abandoned
001D0087	Coastal Lowlands aquifer system	Updated well construction web services	Review of well schedule/web services
013L0008	Southeastern Coastal Plain aquifer system	Updated well construction web services	Error in initial data migration
015A0058	Mississippi Embayment aquifer system	Updated well construction web services	Error in initial data migration
035D0103	Coastal Lowlands aquifer system	Updated well construction web services	Error in initial data migration
035H0034	Coastal Lowlands aquifer system	Added to registry	New observation well
041N0038	Coastal Lowlands aquifer system	Updated casing material	Data collected during fieldwork
043J0002	Mississippi Embayment aquifer system	Updated casing material	Data collected during fieldwork
047L0141	Coastal Lowlands aquifer system	Site display turned off	Well has been plugged and abandoned
047O0307	Coastal Lowlands aquifer system	Updated well construction web services	Review of driller's log/web services
049N0092	Mississippi Embayment aquifer system	Added to registry	Well was missing from registry
049N0158	Mississippi Embayment aquifer system	Site display turned off	Well was reactivated by owner
051L0043	Mississippi Embayment aquifer system	Updated well depth	Review of driller's log/web services
055H0008	Southeastern Coastal Plain aquifer system	Updated well construction web services	Review of well schedule/web services
057E0005	Southeastern Coastal Plain aquifer system	Updated location data	Error in initial data migration
057K0039	Southeastern Coastal Plain aquifer system	Updated casing material and location data	Error in initial data migration, casing information collected during fieldwork
059P0395	Coastal Lowlands aquifer system	Updated casing material	Data collected during fieldwork
059Q0403	Coastal Lowlands aquifer system	Updated well construction web services	Review of well schedule/web services
093U0001	Southeastern Coastal Plain aquifer system	Corrected USGS site ID	data entry error in web services
095D0034	Southeastern Coastal Plain aquifer system	Site display turned off	Well was destroyed by tornado
125E0003	Mississippi Embayment aquifer system	Added to Registry	Well was missing from registry
137C0152	Mississippi Embayment aquifer system	Updated well construction web services	Review of driller's log/web services
141E0039	Southeastern Coastal Plain aquifer system	Updated well construction web services	Review of driller's log/web services
151D0067	Mississippi Embayment aquifer system	Updated well construction web services	Error in initial data migration
151S0049	Mississippi Embayment aquifer system	Changed display status to on	Were able to re-establish access to well
155H0004	Mississippi Embayment aquifer system	Added to registry	Well was missing from registry

Attachment 1 Original Data Management Plan

Data Management Plan

Type of Data: The OLWR is collecting water level data to assess hydrogeologic conditions of Aquifers on the Principal Aquifer scale. Water levels are collected yearly at 167 wells.

Data and Metadata Standards: Data will be collected according to common field practices and standards set by the USGS for collecting water level data. Data will be collected using either a steel tape or electronic tape (e-tape). Measurements with a steel tape will match within .02 ft, and measurements with an e-tape will be tested three times before being recorded. These instruments will be calibrated yearly.

All data collected is manually entered into a separate Excel spreadsheet and then converted into an ArcMap layer file. The ArcMap file (.mxd) will be translated to an .xml format by ArcMap. These separate web services will be titled “Lithology”, “Water Level”, and “Well Construction”. The final data format conforms to the metadata standard ISO 19115 series. All data entered will be reviewed for accuracy by a second party before final submission.

Policies for Access and Sharing: All Personally Identifiable Information (PII) has been removed from the data that will be collected as part of this project. The data will be made available through the NGWMN Data Portal without restriction.

Provisions for re-use, re-distribution: Any data obtained through the data portal may be redistributed if the source of the data is properly cited.

Plans for Archiving and Preservation of Access: All original data collected as part of this project is stored in multiple databases. The original data will be stored on a Windows computer that is backed up weekly. The original data will also be stored on an internal server that is backed up to physical tapes which are stored offsite. The final dataset submitted to USGS will be saved on an external server with connection to the NGWMN database. This server will also be backed up weekly.