Incorporating Washington State Groundwater Information into the National Ground-Water Monitoring Network

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National Ground-Water Monitoring Network

https://cida.usgs.gov/ngwmn/

Defining Features of the NGWMN[1]

The National Ground-Water Monitoring Network (NGWMN) is an aggregation of wells selected from existing Federal, multistate, State, Tribal, and local ground-water monitoring networks completed in selected aquifers across the nation.

The Federal Advisory Committee On Water Information (ACWI) and the Subcommittee on Ground Water (SOGW), the United States Geological Survey (USGS) designed and implemented the NGWMN.

The NGWMN is envisioned as a voluntary, cooperative, integrated system of data collection, management, and reporting that will provide the data needed to help address present and future ground-water management questions.

The mission of the NGWMN is to develop a nationwide ground-water monitoring framework that could provide information necessary for the planning, management, and development of ground-water resources to meet current and future water needs and ecosystem requirements.

Support for the NGWMN is due to the range of economic and environmental factors faced by drinking water purveyors, energy, agricultural, and other economic sectors of the United States.

Information Architecture[1]

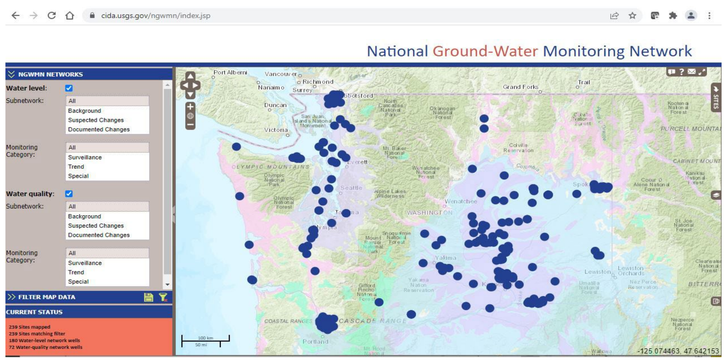
The NGWMN will provide data that can be used to assess baseline conditions and long-term trends in water levels and water quality on a national, multistate, and regional scale. The national scale of the network focuses on Principal and Major Aquifers of the United States.

When transferring data to the NGWMN database, data are partitioned into one of five possible templates: registry, water-level, construction, lithology, or water quality.

Wells designated within one of three subnetworks (Background, Suspected Changes, or Documented Changes) are assigned to a monitoring category (Trend, Surveillance, Special) depending on the purpose of the monitoring at the well.

A key component of the NGWMN is the development of a web-based portal by the USGS. The portal dynamically links with databases of participating agencies, retrieves data, and serves the data through a graphical user interface.

Screen capture of the NGWMN map interface filtered for all Washington State water-level and water quality wells



Funded Objectives

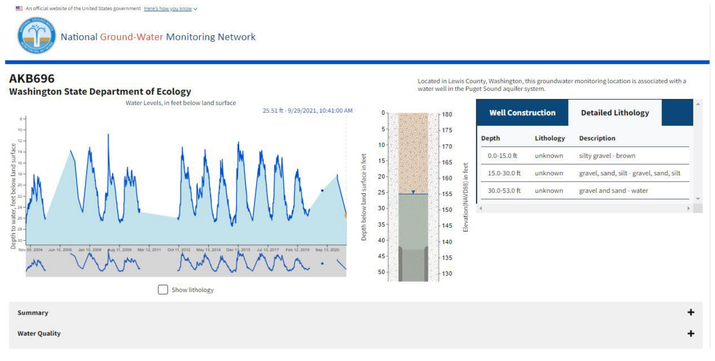
The NGWMN is providing financial support for six objectives.

- Objective 1: Support to become a new data provider
- Objective 2: Support persistent data services for existing data providers
- Objective 3: Filling data gaps in information at NGWMN sites
- Objective 4: Site maintenance
- Objective 5: Well drilling
- Objective 6: Purchase equipment to support continuous water-level data collection.

Water-level monitoring or water-quality data collection is not supported under any objective.

Aquifer connectivity test in Skagit County

Screen capture of NGWMN water-level graph and lithology for Washington well AKB696



GPS well survey in Whatcom County

Reference

1. ACWI, 2013, Establishing a Collaborative National Ground-Water Monitoring Network Program for the United States, Advisory Committee on Water Information. https://acwi.gov/sogw/NGWMN_InfoSheet_final.pdf

Washington State Department of Ecology

Washington State Department of Ecology (Ecology) monitors and manages water supply and water quality objectives for Washington state.

In support of this effort, Ecology engages in annual water-level measurement and reporting for a statewide network of groundwater wells.

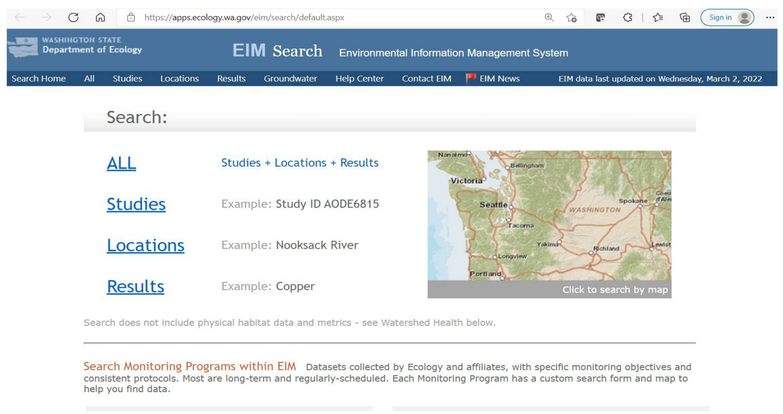
Environmental Information Management system

https://ecology.wa.gov/eim

EIM, our Environmental Information Management system, is the repository for environmental information collected, submitted, and distributed by Ecology.

EIM search fields include: location, study, results, time-series, well water-level, and bioassay.

Screen capture of the EIM interface text and map search options



Drilling in Klickitat County

Ecology involvement with the NGWMN

2016 - 2018

- Established water-level, construction, and lithology web service.
- Maintained persistent web services between the NGWMN and Ecology.
- Submitted 61 Washington State groundwater wells to the NGWMN.

2018 - 2020

- Maintained persistent services between the NGWMN and Ecology databases.
- Established the water quality web service.
- High resolution GPS survey of 23 Washington State wells that are in the NGWMN.
- Performed aquifer connectivity tests at 12 Washington State wells in the NGWMN.
- Drilled and installed 11 new dedicated groundwater monitoring wells in Washington State.
- Submitted 80 additional wells to the NGWMN including 10 water quality wells.

Completed well in Jefferson County

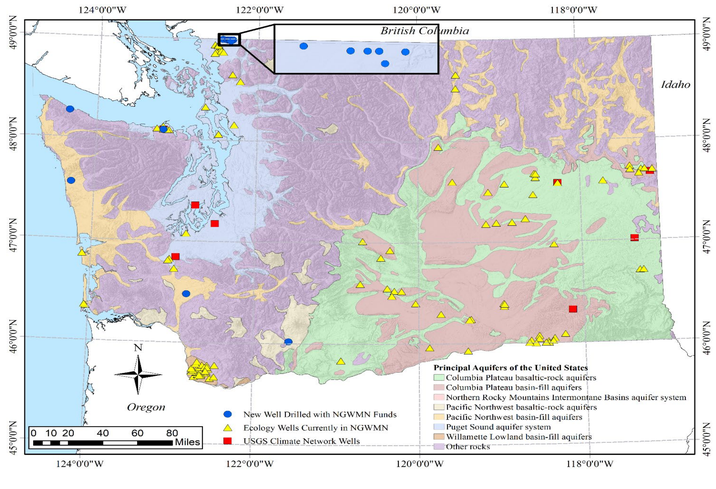
2020 - 2022

- Maintain persistent services between the NGWMN and Ecology databases.
- Review and evaluate well submissions and assess new candidate well sites.
- Submitted 15 additional wells to the NGWMN including 6 water quality wells.
- Add and remove wells as appropriate to align with NGWMN well network criteria.

Future Plans

- Drill additional dedicated groundwater monitoring wells in Eastern Washington to fill spatial gaps in the network.
- Evaluate rehabilitation of existing groundwater monitoring wells.
- Review and evaluate existing deep nested piezometers in Eastern Washington.
- Add existing dedicated water quality monitoring wells in the Lower Yakima Valley.

Ecology submitted NGWMN wells, newly drilled wells, and USGS climate wells within seven principal aquifers of Washington State



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NATIONAL GROUND-WATER MONITORING NETWORK