

National Ground-Water Monitoring Network Tip Sheet on Defining the “Subnetwork”

Well Classification Subnetworks

Wells/springs included in the NGWMN will be flagged to designate that they belong in one of three subnetworks:

- Background Subnetwork, for monitoring points located with little or no documented anthropogenic effect,
- Suspected Changes Subnetwork, for monitoring points located in areas with suspected or anticipated anthropogenic effects, and
- Documented Changes Subnetwork, for monitoring points with known anthropogenic effects. Figure 1 is a flowchart that describes the process of determining the appropriate subnetwork.

The process of assigning wells into a subnetwork is shown in Figure 1. After a well has been identified as a NGWMN well it goes through a baseline process to collect data that may be necessary to assign the well to a subnetwork. This ‘Baseline Process’ generally requires 5 years of data to make a classification. Once that data is available (or if it is already available for existing sites), the well can be classified into a subnetwork.

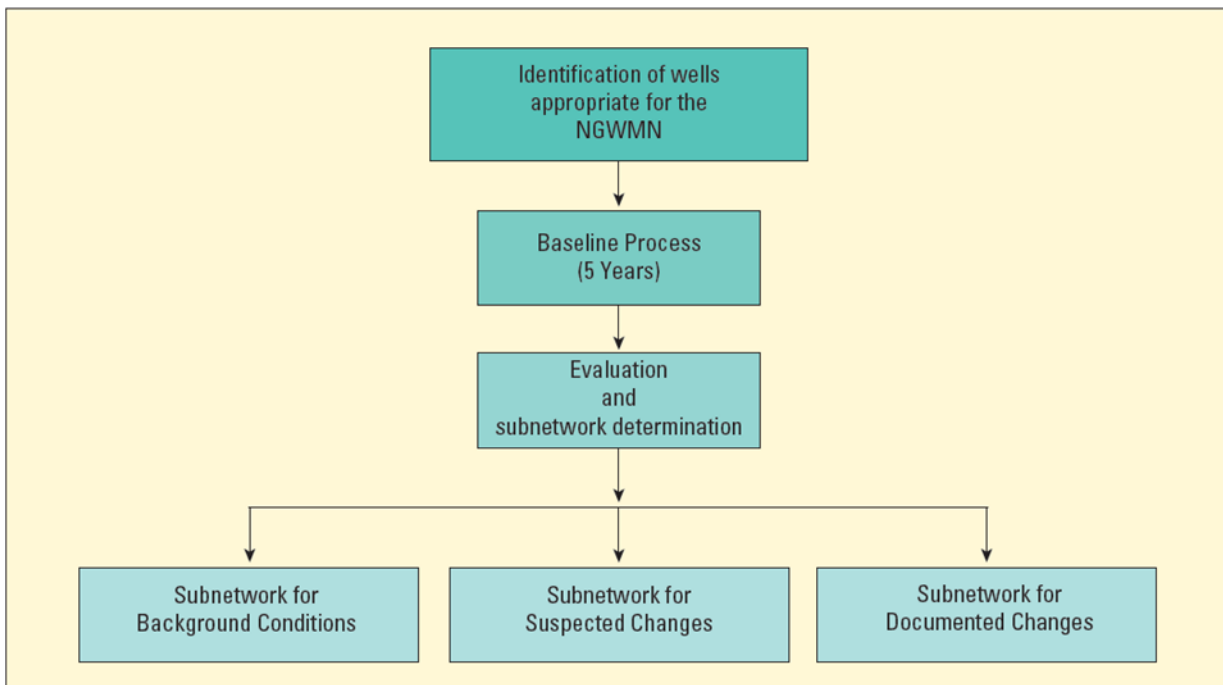


Figure 1 Flowchart for the determination of wells in each subnetwork of the NGWMN.

A subnetwork designation is required for both water-level and water-quality networks because aquifers can be affected by either withdrawals or contamination. For example, a well in an undeveloped portion of an aquifer may be considered in the Background Subnetwork for water quality, but it could be in the Documented Changes Subnetwork for water levels because of effects from regional pumping. The appropriate subnetwork

designations are determined by the data provider in consultation with NGWMN management. The subnetwork designations can change if local conditions change as determined by the data provider.

Background Subnetwork

- The Background Subnetwork includes monitoring points that provide data from aquifers or parts of aquifers with no (or minimal) anthropogenic effects.
- Ideally, this network ensures that a consistent group of wells or springs is regularly monitored to generate water-level or water-quality data from areas where no documented effects to the natural ground-water flow system or natural water-rock chemistry is documented or suspected.
- However, it is likely that total network-wide isolation from land use and developmental pressures is not possible in some areas.
- Thus in practice, background areas are those that have been minimally affected by human activities and are expected to remain as such.

Suspected Changes Subnetwork

- The Suspected Changes Subnetwork includes monitoring points that provide data from aquifers that may have suspected or anticipated anthropogenic effects.
- These may be in areas where withdrawals are occurring, but regional water-level changes have not yet occurred or where land use has changed so that water-quality effects may be occurring.
- Also, wells in this subnetwork may be in areas where changes are anticipated.

Documented Changes Subnetwork

- The Documented Changes Subnetwork includes monitoring points that provide data from aquifers that have documented anthropogenic effects.
- The aquifers may:
 - (1) be known to be heavily pumped,
 - (2) have experienced substantial recharge-altering land-use changes,
 - (3) be located in areas with managed ground-water resources (e.g., artificial recharge or enhanced storage and recovery), or
 - (4) be known to have degraded water quality from human activities.

Baseline Process

- The baseline process is required for all wells in the NGWMN to provide an initial monitoring record that is used in conjunction with other hydrogeologic or climatologic information to place a well in one of the subnetworks.
- Five years of data is generally considered adequate to make the subnetwork determination.
- Past data can be used for existing wells to categorize the wells into one of the subnetworks.
- There is some flexibility in the length of the baseline period. In some cases a determination of the category may be clear after less than 5-years of data collection (pumping effects). In cases where the data is sparse, a longer baseline period may be required.

Reference

Subcommittee on Ground Water of the Advisory Committee on Water Information, 2009 (revised 2013), A national framework for ground water monitoring in the United States: Advisory Committee on Water Information, accessed October 23, 2013, at http://acwi.gov/sogw/ngwmn_framework_report_july2013.pdf.

