
Command Reference:

ReadUsgsNwisGroundwater()

Read 1+ time series from the USGS NWIS groundwater web service

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The `ReadUsgsNwisGroundwater()` command reads one or more time series from the United States Geological Survey (USGS) National Water Information System (NWIS) groundwater web service (see the **UsgsNwisGroundwater Datastore Appendix**). The USGS data are historical manually recorded values and data may be sparse over the full period. The command provides parameters to constrain the web service query and also allows the result to be saved as an output file. For example, if WaterML is chosen as the time series format, a WaterML file can be saved and can be read later using the `ReadWaterML()` command. See also the `WebGet()` command, which can be used to retrieve data files from the USGS website.

The USGS NWIS web service allows well and time series data type information to be filtered, both as a convenience and to ensure reasonable web service performance. Many of the choices that are available for limiting queries allow 0+ values to be provided. For example, specifying no requested parameter will return all available parameters for a location. Specifying a list of parameters (separated by commas) will return only the requested parameters.

USGS codes are used in order to generate a unique time series identifier (TSID). For example, the TSID data type is formed from the parameter code. The numerical codes currently are used to ensure uniqueness but in the future the string name may be allowed as an option. In order to have more human-friendly identifiers for time series, one strategy is to request only a specific parameter and then use the alias to specify a text equivalent to the numeric codes. For example, specify `Parameters=72019` (for depth to water level) and assign the alias with `Alias=%L.WaterLevel`.

Although the NWIS groundwater web service may return date/times with precision to minute, this command treats all data as daily values and returns a daily time series. The daily interval time series therefore may have many missing values, but often is easier to process with other TSTool commands. In the future, the command may be updated to allow the option of returning other data intervals, including irregular (which would have only non-missing values but typically must be converted to a regular interval to use with other commands).

The following dialog is used to edit the command and illustrates the syntax. Some choices are provided as a convenience. However, full listing of choices (such as all the thousands of wells that are available) is not provided due to performance issues. Additional query features will be enabled as web service integration is enhanced.

Edit ReadUsgsNwisGroundwater Command

Read one or more time series from the USGS NWIS groundwater (historical manually recorded values) web service.

WARNING - This command can be slow. Constrain the query to improve performance.

Daily time series are created - in the future other data intervals may be supported.

Common choices are provided for convenience but may not apply (additional enhancements to web services may improve intelligent choices in the future).

Refer to the USGS NWIS Groundwater Datastore documentation for more information.

Constrain the query by specifying time series metadata to match. **A location constraint must be specified.**

If not specified, the input period defaults to the input period from SetInputPeriod().

Optionally, also write time series to a file, which can be specified using a full or relative path (relative to the working directory).

The working directory is: C:\Develop\TSTool_SourceBuild\TSTool\test\regression\commands\general\ReadUsgsNwisGroundwater

USGS NWIS Documentation USGS NWIS Online

Data store: Required - data store containing data.

Location constraint (specify only one constraint)

Site number(s): List of 1+ site numbers separated by commas.

State(s): List of 1+ state abbreviations separated by commas.

HUC(s): List of 1+ (1 2-digit and/or up to 10 8-digit) HUCs separated by commas.

Bounding box: Bounding box: WestLon, SouthLat, EastLon, NorthLat

FIPS counties: => List of 1+ counties separated by commas.

Parameter(s): => Optional - list of parameter codes separated by commas (default=all).

Site status: Optional - site status (default=All).

Site types(s): Optional - list of site types separated by commas (default=all).

Agency: Optional - agency code (default=all).

Interval: Required - data interval for data.

Input start: Optional - YYYY-MM-DD, override the global input start.

Input end: Optional - YYYY-MM-DD, override the global input end.

Alias to assign: => Optional - use %L for location, etc. (default=no alias).

Format: Optional - data format (default=WaterML).

Output file to write:

Command:

```
ReadUsgsNwisGroundwater (DataStore="UsgsNwisGroundwater", Sites="400125104370001", Parameters="72019",
SiteStatus="Active", Interval="Day", Alias="%L-%T", OutputFile="Results/Test_ReadUsgsNwisGroundwater_S
ingleSite_Day_out.waterml")
```

ReadUsgsNwisGroundwater

ReadUsgsNwisGroundwater() Command Editor

The command syntax is as follows:

```
ReadUsgsNwisGroundwater (Parameter=Value, ...)
```

Command Parameters

Parameter	Description	Default
Sites	A list of site numbers to read, separated by commas.	None – one of the locational parameters must be provided to constrain the query.
States	A list of state codes (e.g., AL), separated by commas.	None – see above.
HUCs	A list of hydrologic unit codes, separated by commas. See the limitations on the NWIS site for more information.	None – see above.
BoundingBox	A bounding box consisting of west longitude, south latitude, east longitude, and north latitude, separated by spaces. Longitudes in the western hemisphere are negative.	None – see above.
Counties	A list of Federal Information Processing Standards (FIPS) county codes, separated by commas.	None – see above.
Parameters	Data parameter codes for the stations (e.g., 72019 for depth to water level), separated by commas.	All available parameters are returned.
SiteStatus	Filter for stations, one of: <ul style="list-style-type: none"> All – all stations are returned Active – only active stations are returned Inactive – only inactive stations are returned 	All
SiteTypes	Site types to return, separated by commas.	All available site types are returned.
Agency	Agency code to return (e.g., USGS).	All available agencies are returned.
Interval	The interval to use for the created time series. Groundwater measurements in NWIS may be recorded for the day or may have more precise date/time. Using an interval of Day results in a regular interval time series that is easier to process by other commands, but may not be suitable when values change significantly within a day.	None – must be specified.
InputStart	The start of the period to read data – specify if the period should be different from the global query period.	Use the global query period.
InputEnd	The end of the period to read data – specify if the period should be different	Use the global query period.

Parameter	Description	Default
	from the global query period.	
Alias	The alias to assign to the time series, as a literal string or using the special formatting characters listed by the command editor. The alias is a short identifier used by other commands to locate time series for processing, as an alternative to the time series identifier (TSID).	None – must be specified.
Format	The data format for output, one of: <ul style="list-style-type: none"> • JSON – JavaScript Object Notation (currently used only for downloads but will not result in time series in TSTool) • RDB – tab-delimited format (also see <code>ReadUsgsNwisRDB()</code> command; currently used only for downloads but will not result in time series in TSTool). • WaterML – XML format (also see the <code>ReadWaterML()</code> command). 	WaterML
OutputFile	The name of the output file to create. The path to the file can be absolute or relative to the working directory.	No output file will be created.