
Appendix: Colorado Water Satellite Monitoring System (ColoradoWaterSMS) Data Store

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Overview

The State of Colorado's Satellite Monitoring System (SMS) database stores observations, configuration information, processed data, and alarms, related to field observations collected from real-time stations throughout the State of Colorado. This database has links to HydroBase and HydroBase also includes real-time data (see the **HydroBase Input Type Appendix**). However, the HydroBase real-time time series are only available to State of Colorado personnel that have access to the State's internal servers. The ColoradoWaterSMS data store provides internet web service access to real-time data as described here:

<http://www.dwr.state.co.us/SurfaceWater/help.aspx>

Raw observations as well as hourly and daily aggregations can be requested. Because the data are considered provisional, time series data collected from external providers are NOT available and must be retrieved from the original provider (e.g., USGS). Time series with `DataSource=DWR` and several other data cooperators that rely on the State for data access are available from this web service.

ColoradoWaterSMS Web Services and Standard Time Series Properties

The standard time series identifier format for ColoradoWaterSMS time series is of the form:

`Location.DataSource.DataType.Interval~DataStoreName`

The meaning of the parts is as follows:

- The `Location` is set to the State of Colorado's station abbreviation, ABBREV (e.g., PLAKERCO), which typically is formed from the river/basin name (PLA=Platte River), station location (KER=Kersey), and state (CO=Colorado). Note that currently the web service does not provide the original identifier and therefore the abbreviation is always used.
- The `DataSource` is set to the providing agency. For example, although data are stored in the State's database, the data provider may be USGS or another agency. If different from DWR, then the data also may be available directly from the provider agency using the agency's station identifier. The State's web services only provide DWR-managed data and do not pass through provisional data from other agencies that are able to provide the data from their systems.
- The `DataType` is set to the "variable" described in the State's web service documentation. Streamflow is the primary data type, indicated by `DISCHRG`. Reservoir/lake level is indicated by `ELEV`, and storage by `STORAGE`. It is possible that a single gage collects data at more than one location, for example at branches of a confluence. Use `TSTool` to query the data store with a data type of "*" to list available data types at a location.
- `Interval` is `Irregular` for raw data, which generally is evenly spaced but may include more frequent observations during events. `Hour` and `Day` interval are also available as aggregated values.
- The data store name (`ColoradoWaterSMS` by default) indicates that the data are being read from the ColoradoWaterSMS web service.

Limitations

The following limitations of the web service may impact users of the data.

- Data type – a description of data types is not available from the web service and therefore cannot automatically be displayed by software. A query to determine a list of data types from time series is performed once and will result in a noticeable delay when the ColoradoWaterSMS input type is initially selected. Subsequent listing of time series will be relatively fast.
- Interval – the interval for raw observations is not provided by the web service and therefore real-time data interval is shown in TSTool as *Irregular*. Stations generally report at regular N-minute intervals; however, some also provide additional event-triggered values that result in more observations in a shorter timeframe. The web service does allow requesting hour and day interval aggregations, which are computed from the raw data by DWR.
- Station – provider identifiers, spatial data (county, state, HUC, lat/long, UTM) are not currently available for time series lists. ABBREV may not be assigned for all stations, in particular for external providers.
- Data units – currently are not available from the web service. Units are hard-coded for some data types, and are left blank for other data types, pending clarification from the State.
- Data – web service requests must be made with a query period. A default query period of the most recent 14 days is used to ensure that some data are returned. Optionally, use the `SetInputPeriod()` command in TSTool to specify a longer period. Some stations may not report data in off-season periods.

Data Store Configuration File

A data store is configured by enabling ColoradoWaterSMS data stores in the main *TSTool.cfg* configuration file and creating a data store configuration file for each data store connection. Configurations are processed at software startup. An example of the TSTool configuration file is shown below. Multiple data stores can be defined using the `[DataStore:DataStoreName]` syntax. For ColoradoWaterSMS, this would allow, for example, accessing different versions of the web services.

```
# Configuration file for TSTool

[TSTool]

ColoradoWaterSMSEnabled = true

# Data store for Colorado Water SMS web service (active if ColoradoWaterSMSEnabled=true above)
[DataStore:ColoradoWaterSMS]
ConfigFile = "ColoradoWaterSMS.cfg"
```

TSTool Configuration File with ColoradoWaterSMS Data Store Properties

Properties for each data store are specified in an accompanying configuration file described below.

The following illustrates the ColoradoWaterSMS data store configuration file format, which in this example is located in the same folder as the TSTool configuration file and configures a data store named “ColoradoWaterSMS”.

```
# Configuration information for "ColoradoWaterSMS" web service data store.
# Properties are:
#
# The user will see the following when interacting with the data store:
#
# Name - data store identifier used in applications, for example as the
#       input type information for time series identifiers (usually a short string)
# Description - data store description for reports and user interfaces (short phrase)
# ServiceRootURI - web service root URI, including the server name and root path

Type = "ColoradoWaterSMSDataStore"
Name = "ColoradoWaterSMS"
Description = "Colorado Satellite Monitoring System Web Service"
ServiceRootURI = "http://www.dwr.state.co.us/SMS WebService/ColoradoWaterSMS.asmx?WSDL"
```

ColoradoWaterSMS Data Store Configuration File

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