Appendix: Colorado Water Satellite Monitoring System (ColoradoWaterSMS) Input Type

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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 staff that has access to the State's internal server. The ColoradoWaterSMS input type provides internet web services access to real-time data and 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 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~ColoradoWaterSMS
```

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 may also be available directly from the provider agency using the agency's station identifier. In fact, the State's web services only provide `DWR` data and do not pass through provisional data from other agencies.
- 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`.
- `Interval` is `Irregular` for raw data, which is generally evenly spaced but may include more frequent observations during events. `Hour` and `Day` interval are also available as aggregated values.
- The `ColoradoWaterSMS` input type 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.
- 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 – are currently 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.