Appendix: ColoradoBNDSS Data Store

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Overview

The ColoradoBNDSS (Basin Needs Decision Support System) database is used by the Colorado Water Conservation Board (CWCB) to evaluate long-term water supply conditions in the State of Colorado. The database stores several primary object types (referred to as subject types), which have metadata and related time series. Subject types include:

- Basin (river basins, pending new database development)
- County
- IPP (identified projects and processes – associated with providers)
- Provider (entities that provide water to users)
- State (pending new database development)

A ColoradoBNDSS data store can be configured to allow software to access the database. It is envisioned that multiple data stores will be accessed, with each year corresponding to a database snapshot.

ColoradoBNDSS and Standard Time Series Properties

The standard time series identifier for ColoradoBNDSS time series is of the form:

```
Location.DataSource.DataType.Interval.Scenario~DataStoreName
```

More specifically, the identifier follows the convention:

```
SubjectType:SubjectID.DataSource.DataType-Subtype-Method-Submethod.Year.Scenario~DataStoreName
```

where identifier parts are described as follows:

- `SubjectType` is `County`, `Project`, or `Provider`.
- `SubjectID` is the identifier for a `SubjectType` object, for example the county name (**currently Provider and Project identifiers are numbers; however, the database will be updated to use a unique, human-readable string**).
- `DataSource` is the data source for the time series (**currently this is a verbose string; however, the database will be updated to use a unique, human-readable string**).
- `DataType` is the time series data type (e.g., `demand`).
- `Subtype` is a sub-type for the time series (e.g., `percapita`).
- `Method` is the method by which the data were determined (e.g., `estimated` or `observed`).
- `Submethod` is a modifier for the method (e.g., if different approaches are used to estimate data).
- `Year` is always the 4-digit year for the data (only annual time series are currently saved in the database).
- `Scenario` is often blank but may indicate the scenario for data (e.g., `low`, `middle`, `high`).

Limitations

ColoradoBNDSS data are often sparse. Software such as TSTool can be used to fill or extend data. The database is under development and will evolve as design changes are implemented and data are loaded.

Data Store Configuration File

A data store is configured by enabling ColoradoBNDSS data stores in the main *TSTool.cfg* configuration file, and creating a data store configuration file for each 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. Properties for each data store are specified in an accompanying configuration file described below.

```
# Configuration file for TSTool

[TSTool]

ColoradoBNDSSEnabled = true

# Startup data stores (note that data store name in config file takes precedence)

[DataStore:BNDSS2009]

ConfigFile = "BNDSS2009.cfg"
```

TSTool Configuration File with ColoradoBNDSS Data Store Properties

The following illustrates the ColoradoBNDSS data store configuration file format, which in this example is located in the same folder as the TSTool configuration file and configures the "BNDSS2009" data store. The SQL Server database in this example is a named instance. A service account is used for authentication and allows read-only access to the database.

```
# Configuration information for "BNDSS2009" data store (connection).
#
# The user will see the following when interacting with the data store:
#
# Name - database identifier for use in applications, for example as the
#     input type/name information for time series identifiers (usually a short string)
# Description - database description for reports and user interfaces (a sentence)
#
# The following are needed to make the low-level data connection:
#
# DatabaseEngine - the database software (default to SqlServer since not specified)
# DatabaseServer - IP or string address for database server
# DatabaseName - database name used by the server
# SystemLogin – service account login
# SystemPassword – service account password

Type = "ColoradoBNDSSDataStore"
Name = "BNDSS2009"
Description = "Basin Needs DSS 2009 Database"
DatabaseServer = "lonetree\CDSS"
DatabaseName = "IPP"
SystemLogin = "xxx"
SystemPassword = "xxx"
```

ColoradoBNDSS Data Store Configuration File