South Platte River Basin Salinity Monitoring Program

Water Quality Department

Northern Water conducts timeseries data collection for specific conductivity (salinity) of the Lower South Platte River Basin, Colorado. Timeseries data collection refers to continuous data collected by a sensor that is installed in a waterbody for an extended period. The current salinity monitoring program is a continuation of the salinity monitoring program started in 2000 under the grant-funded project: A Study of Salinity in the Lower South Platte Basin, or the Salinity Assessment Project. The primary objective of the program is to assess the salinity levels as water flows through the Lower South Platte River. The data is being used to determine baseline water quality conditions prior to the construction of Galeton Reservoir, a key component of the Northern Integrated Supply Project (NISP). The timeseries data provides a general measure of water quality in the lower South Platte River and provides for long-term trending of conditions over time.

South Platte River north of Kersey, Colorado

MONITORING LOCATIONS

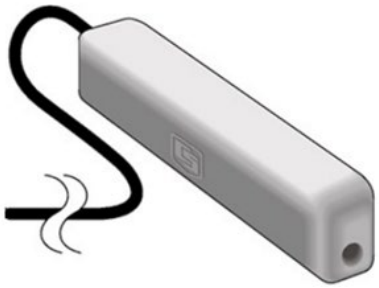
The South Platte Salinity Monitoring Program currently consists of three stations located on the Cache la Poudre River and nine stations located on the Lower South Platte River.

Table 1 - South Platte Salinity Monitoring Program Stations

Station	Description	Latitude	Longitude
CLAFTCCO	Poudre River at Canyon Mouth Gauge	40.6643	-105.2233
CLAGRECO	Poudre River at Fern Street Gauge in Greeley	40.4177	-104.6393
CLARIVCO (PR-FCD-RIV)	Poudre River downstream of Fossil Creek and New Cache Ditch	40.5018	-104.9664
ONEJURCO	South Platte River at Julesburg (Channel #1)	40.9736	-102.2508
PLABALCO	South Platte River near Balzac	40.3520	-103.5418
PLAHENCO	South Platte River at Henderson	39.9224	-104.8689
PLAJUMCO	South Platte River at Jumbo Reservoir Diversion	40.8232	-102.8748
PLAKERCO	South Platte River at Highway 53 near Kersey	40.4130	-104.5639
PLALUPCO	South Platte River at Fort Lupton	40.0943	-104.8189
PLAMASCO	South Platte River at County Road 87 near Masters	40.3064	-104.2441
PLASTLCO	South Platte River at Sterling	40.6191	-103.1886
PLAWELCO	South Platte River downstream Road 144 near Weldona	40.3214	-103.9200

FREQUENCY, PARAMETERS AND EQUIPMENT

Each monitoring station is equipped with a Campbell Scientific CS547A Water Conductivity and Temperature Probe and a Campbell Scientific CR800 Data Logger. A calibration check and cleaning are performed on the conductivity probe twice per month or as conditions allow. Salinity values are checked against a YSI specific conductivity sensor that is calibrated in the lab before entering the field. Annual calibrations are conducted on CS547A probes, followed by a three-point calibration check. Specific conductivity data are logged and transferred by telemetry to Northern Water's database in real-time. The data are reported every 15 minutes.



Campbell Scientific CS547A Water Conductivity and Temperature Probe

YSI ProPlus with conductivity sensor

Campbell Scientific CR800 Data Logger

TIMESERIES DATA QUALITY ASSURANCE QUALITY CONTROL (QAQC)

The real-time salinity data are provisional. These data are validated in Northern Water's WISKI database and finalized during the winter. QAQC is conducted based on Northern Water's Timeseries Data SOP. The final data are available on Northern Water's website. All available data is compiled by station and updated yearly in a downloadable Legacy Salinity Data Package.

South Platte Salinity Monitoring Program Active Sensor Location Map

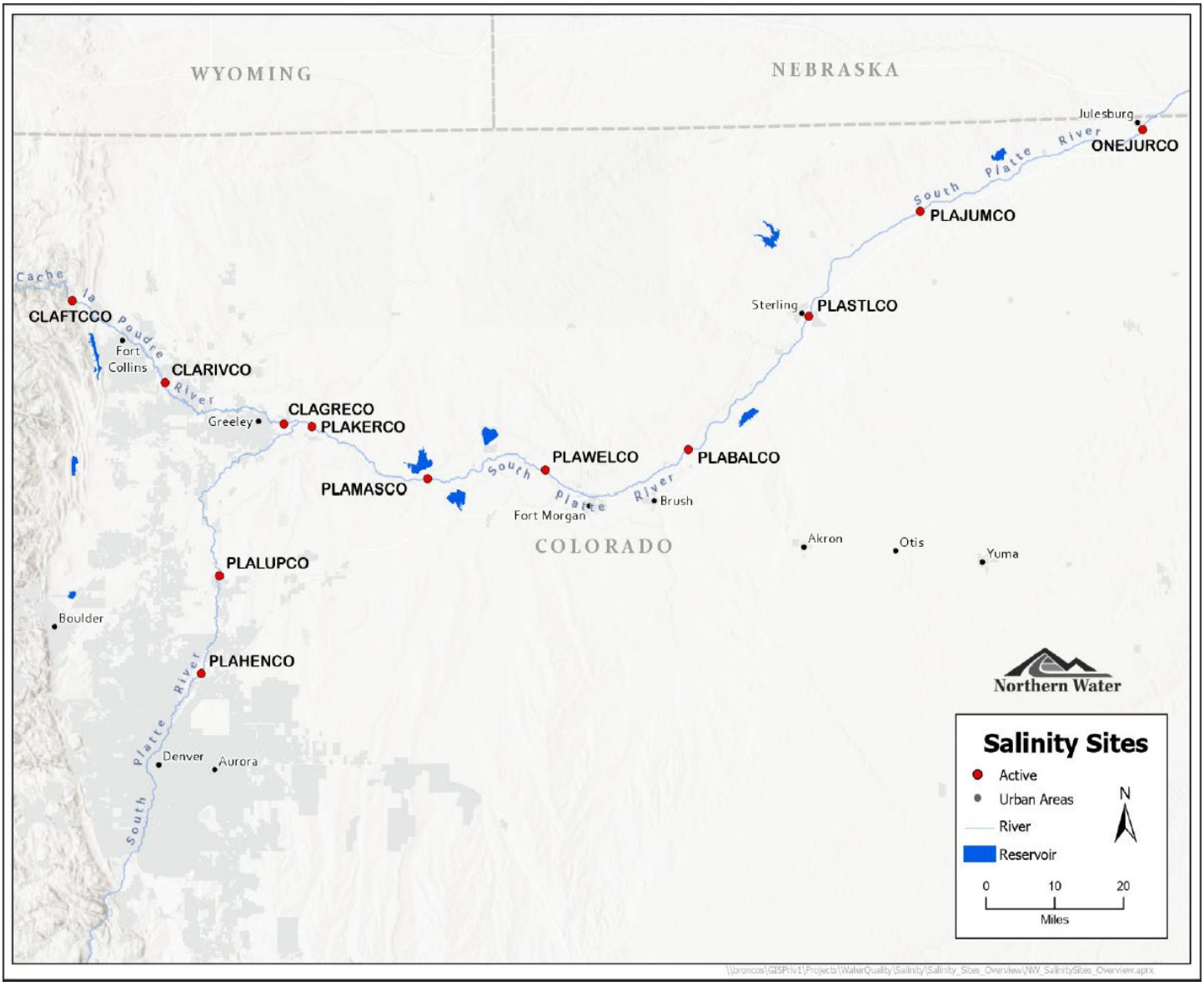


Figure 1 - Active Salinity Monitoring Sites

APPENDIX 1 – HISTORY OF PROGRAM CHANGES

Changes to Program Monitoring Locations

Year	Description
2007	Several stations were permanently removed in 2007 due to the completion of the initial grant funded study that began in 2000. These stations were: CLAGRLCO, BIGLOVCO, SVLONGCO, SVBLOCO, and PLAMORCO
2011	PLAJUMCO station removed due to construction. This station to be reinstalled when possible.
2014	Due to flooding in September 2013, stations on the Lower South Platte River tributaries, including the Big Thompson River, Little Thompson River, Saint Vrain River, Boulder Creek, and an additional two stations on the Poudre River, were destroyed. A decision was made to permanently remove them from the monitoring program. These stations were: CLABOXCO, LTCANYCO, LTMIL257, BIGLASCO, BOCNORCO, BOLONGCO, BTCANYCO, SV-SVSCU, and SVCPLACO.
2018	ONEJURCO station was damaged by ice in early 2018 and taken offline. This station to be reinstalled when possible.
2019	PLAKERCO station removed due to construction on the bridge near Kersey where the station was installed. This station to be reinstalled when an alternate location is found.
2019	ONEJURCO station reinstalled in March 2019 in the same location.
2021	PLABALCO station was removed in June 2021 due to construction. The station to be reinstalled when construction is complete.
2022	PLAJUMCO station reinstalled July 2022 in the same location.
2022	CLAFTCCO station moved downstream approximately 0.05 river miles to meet the criteria for Northern Water's Standard Operating Procedure for temperature monitoring.
2023	PLAKERCO station was reinstalled upstream of the new bridge. The new station is approximately 100 feet from the historic monitoring location.
2023	PLABALCO station reinstalled August 2023 in the same location.
2023	QAQC of all legacy salinity data (2000-2022) completed and QAQC SOP developed. Data package including all final data records released.

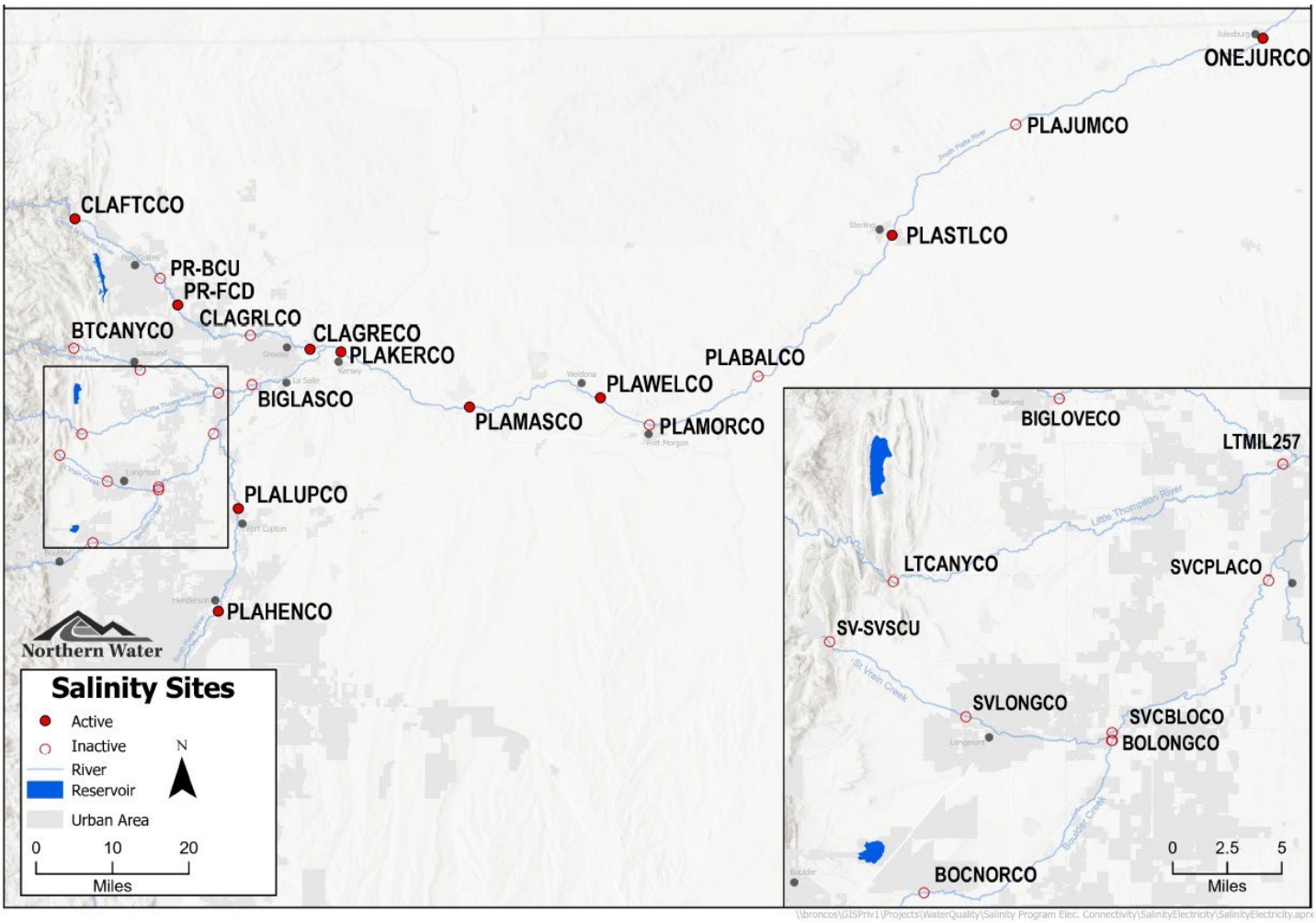


Figure 2 - Active and Historic Salinity Monitoring Sites as of June 2022.

Changes to Sampling Schedule, Monitoring Frequency and Sample Collection

Year	Description
2017	Campbell Scientific CR-10X data loggers replaced with Campbell Scientific CR800 Dataloggers.
2023	The frequency of cleaning and calibration checks increased from once to twice per month.