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# Missouri Basin Region Hydromet Tools Public Version User's Manual



Bighorn Reservoir, Montana

Missouri Basin Regional Office

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# Introduction

Hydromet Tools is a desktop application that allows users to graph and view series data such as gauge height, river flow, water temperature, etc. The public version of the software has three basic functions: querying data, performing simple statistical analysis, and comparing data over different periods.

Requirements:

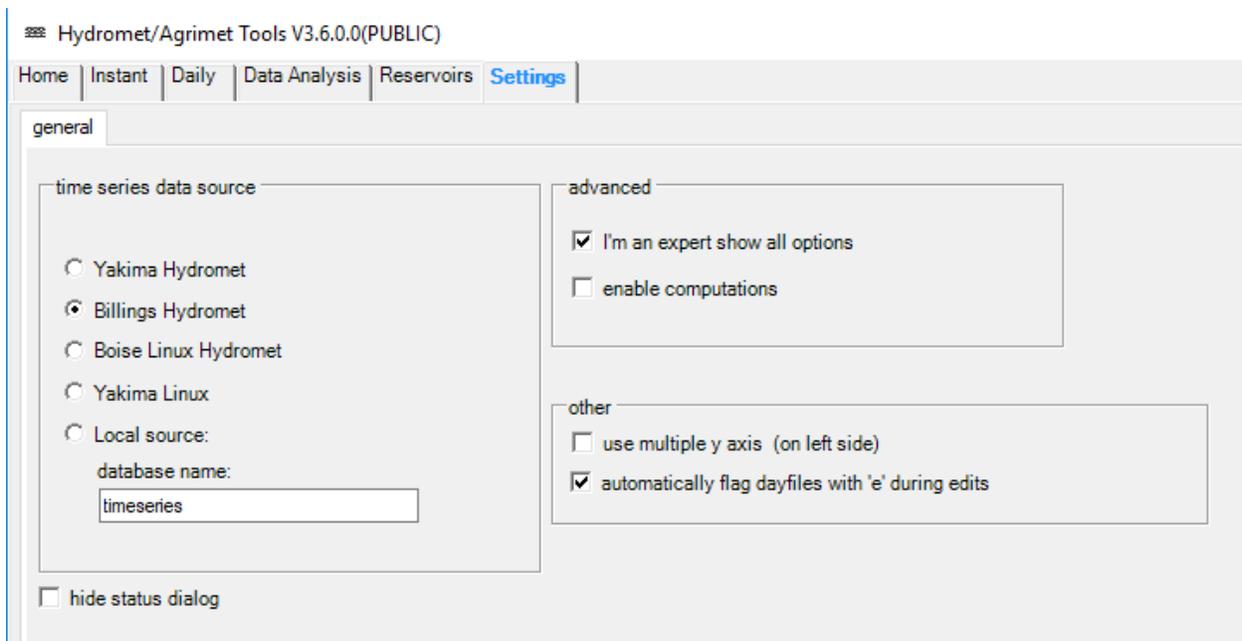
- Windows- XP or higher
- .net 2.0 or higher

Download Hydromet Tools from:

<https://github.com/usbr/HydrometTools/releases>

The public version is HydrometTools-publicsetup.exe. This version is not password protected.

Once you have the software installed, open Hydromet Tools and go to the Settings tab. Under the Settings tab, select Billings Hydromet to work with data coming from the Missouri Plains Region Hydromet respectively.

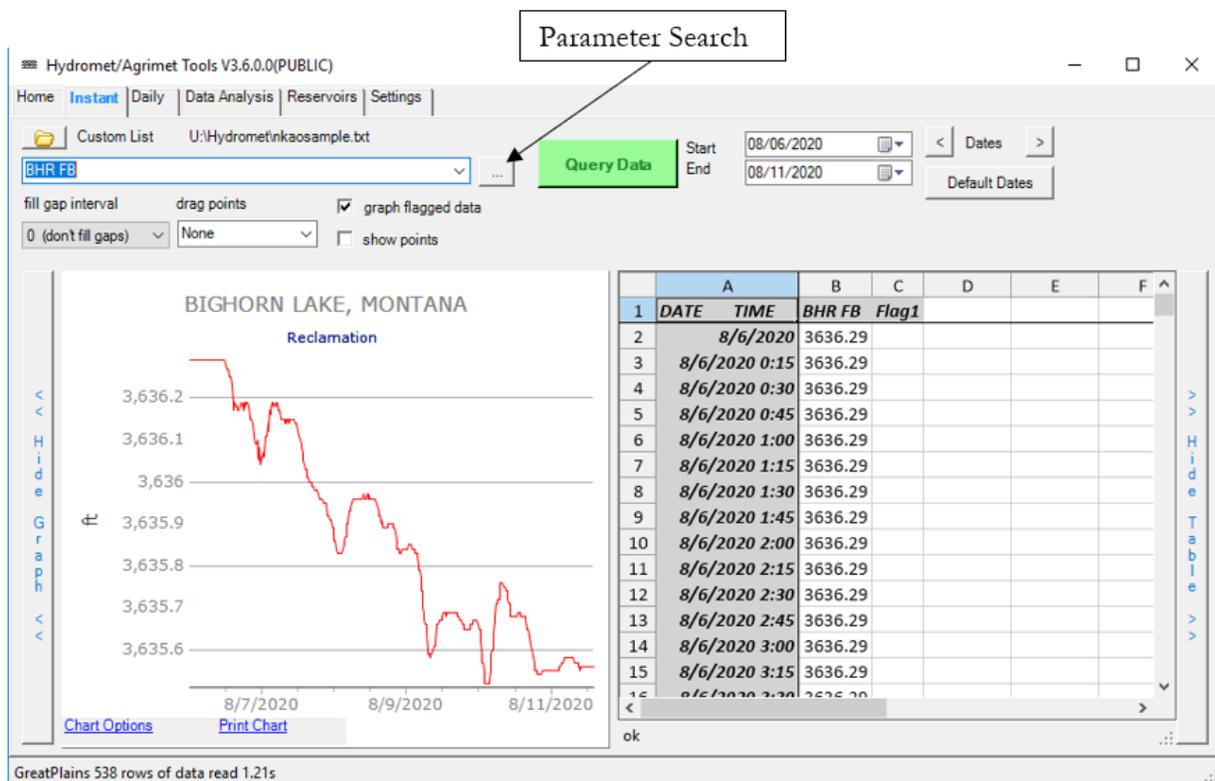


# Querying Data

The first two tabs in Hydromet Tools, Instant and Daily, are used to query data. Instant or Daily refer to the time interval of data.

Hydromet data is queried using a site and parameter code like this: 'BHR FB'. The site is the short name for a Hydromet site, such as BHR (Bighorn Lake). The site tells you where the data is coming from. The parameter code, such as FB (forebay), tells what type of data you want. The button to the right of the input with three dots on it opens a searchable list of sites. Search for keywords, locations, or site codes.

For example, enter the query BHR FB as shown below and click the Query Data button.



The forebay data is graphed on the left and tabulated on the right.

More query examples:

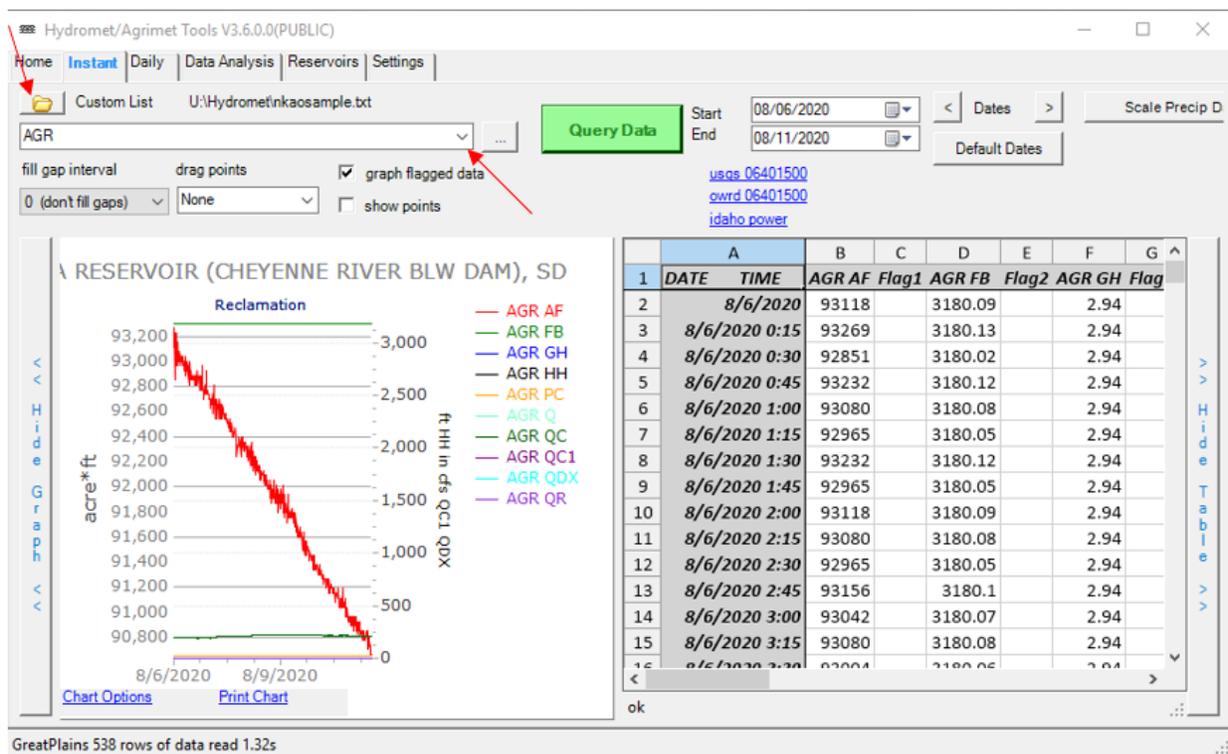
Example	Description
BHR FB	Bighorn Lake forebay
BHR FB,AF	Bighorn Lake forebay and storage (acre-feet)

BHR	Bighorn Lake. All parameters are plotted because only the site is entered.
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To quickly query multiple site and parameter combinations, you can create a text file with a list of combinations. The example created generates a list of elevations for all South Dakota reservoirs:

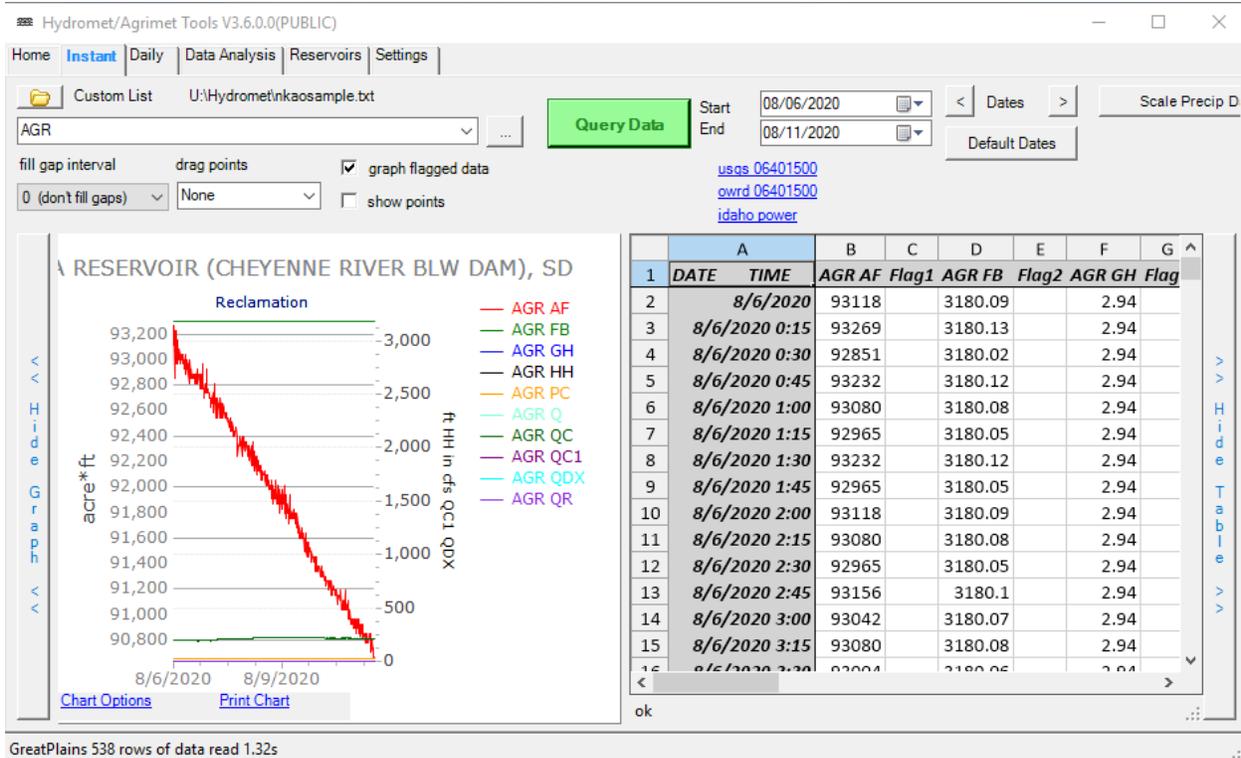
AGR FB, SHR FB, PTR FB, DFR FB, BFR FB

Save this text to a text file, then open Hydromet Tools. Select the folder icon in the upper right corner and select the created text file. Hit the dropdown icon in the input box to see the list of stations appear. This is particularly useful for operators who query the same data repeatedly.



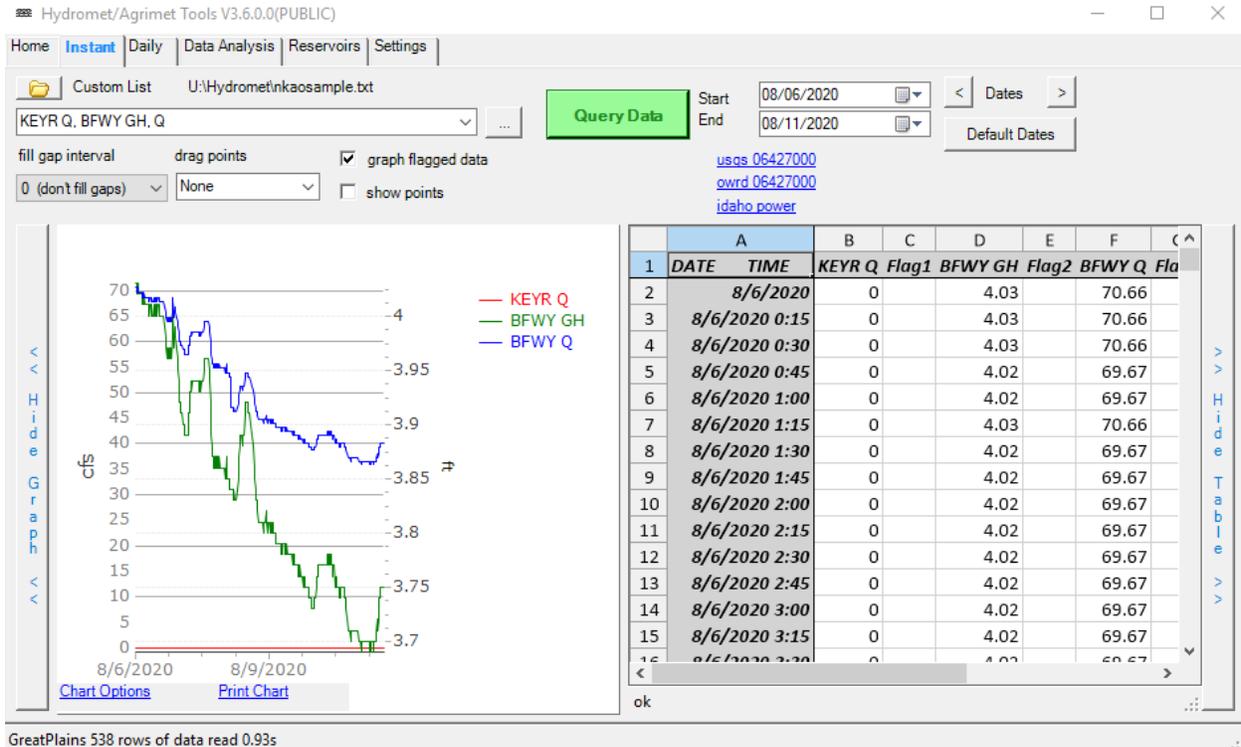
## Instant Data

Click the Instant Tab to view instant data. This is the equivalent of Dayfile data in SmarTerm. It is recording in 15, 30, or 60-minute intervals depending on the station. You can observe the graphed data on the left and edit the data on the right.



All data is queried through two types of codes, **SITE** and **PCODE**. An example of a site code is **AGR** (Angostura Reservoir) and of PCODE is **FB**(Forebay). If only AGR is entered, all of the instant parameters for the site are returned.

Hydromet Tools also has the ability to graph multiple site codes and PCODES at once. You can see on the graph below under the filename box there is a single site code followed by two PCODES, and this process is repeated multiple times.

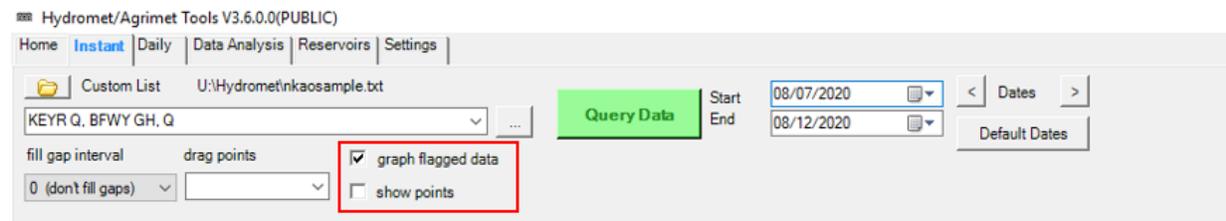


The range at which you view this data can be changed using the Start and End Dates.

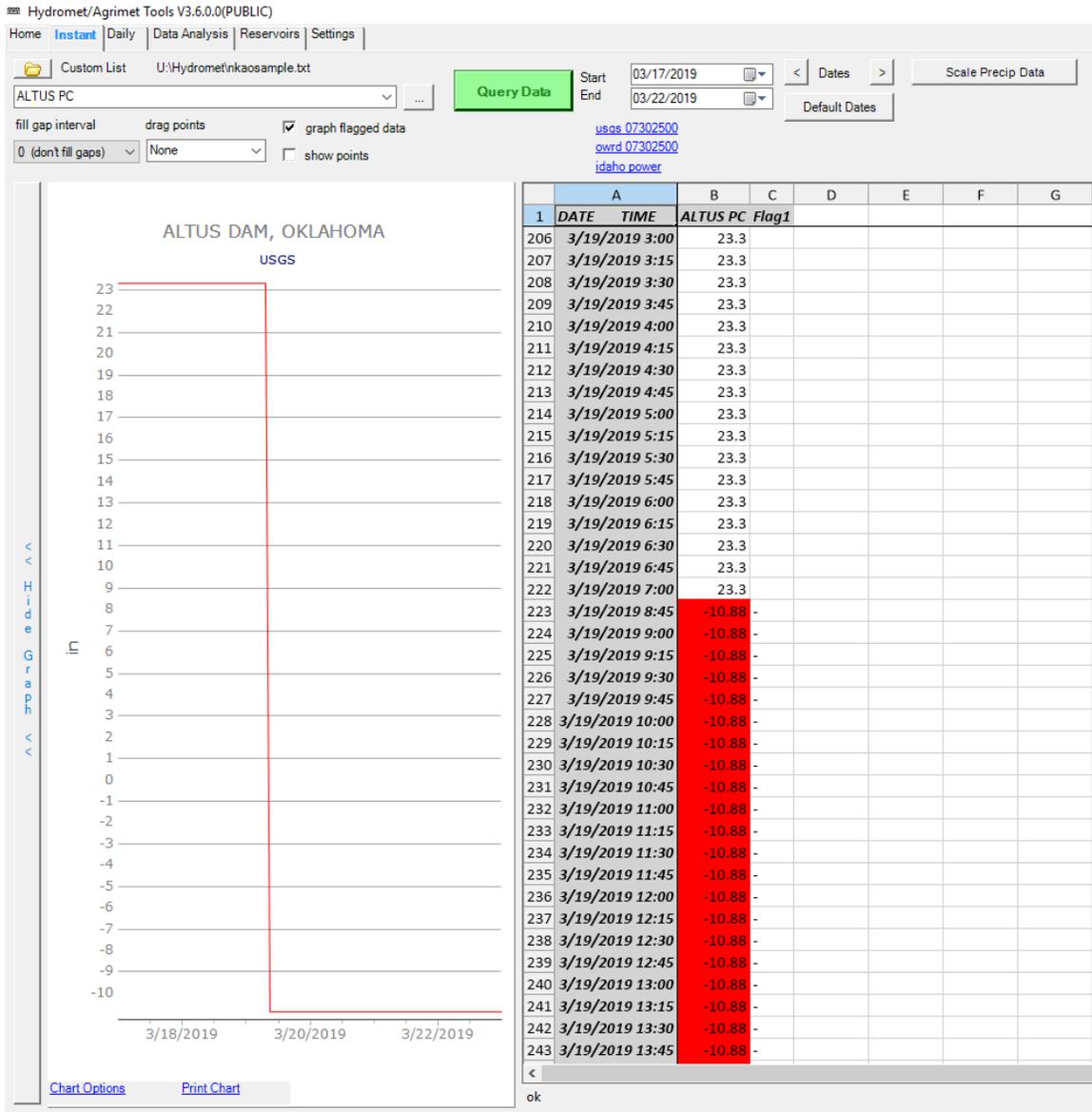


*Graph flagged data* means data that is outside the acceptable ranges still gets graphed.

*Show points* shows data points on your graph.



For example: This is a graph depicting *flagged data* starting at 3/19/2019 08:45.



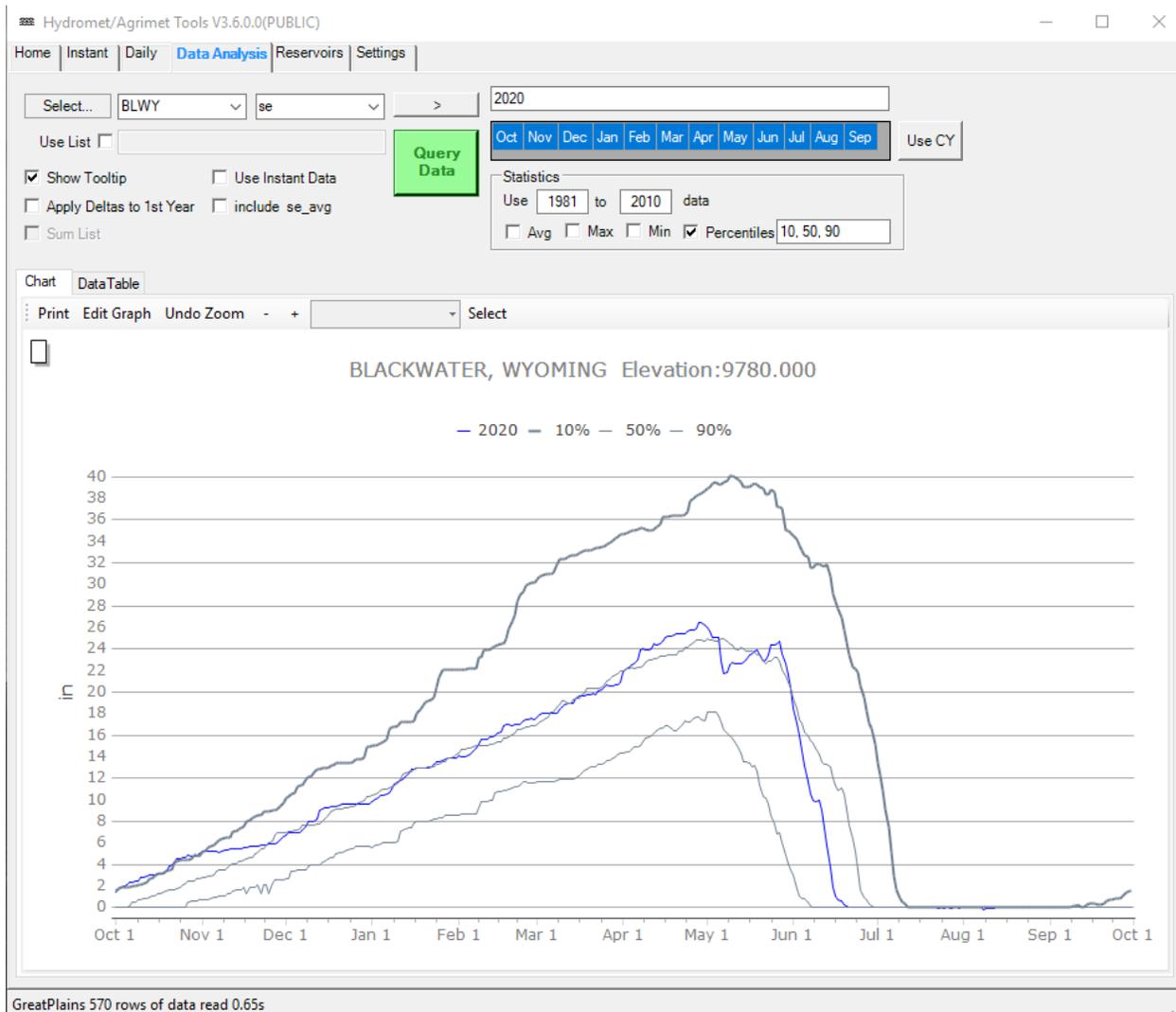
## Daily Data

Daily data is retrieved the same way instant data is. Daily data is very similar to instant data except it's the daily values graphed instead of 15 minute intervals. In Hydromet SmarTerm, daily data is called Archives. Most of the daily data is calculated using the instant data. Other daily data is computed from daily data or manually entered.

# Data Analysis

The DataAnalysis tab is useful for looking at trends and statistics for the data that you're looking at. Before using the DataAnalysis tab, it would help to be familiar with the data codes that you would need for the data that you're trying to analyze.

As an example, let's look at trends and statistics for the Blackwater, Wyoming SNOTEL gage. Let's put in BLWY and SE in the station and parameter code textboxes as shown below. Let's also check the Percentiles check box to also plot the normal range of streamflow values for the data. The result should show something similar to the screen shown below.



Based on the image above, you can see that the 2020 snow water equivalent has been roughly in line with the 50<sup>th</sup> percentile snow water equivalent. From here, you can click on the DataTable tab to view the data and if needed, export the data into a csv file for Excel. You can also:

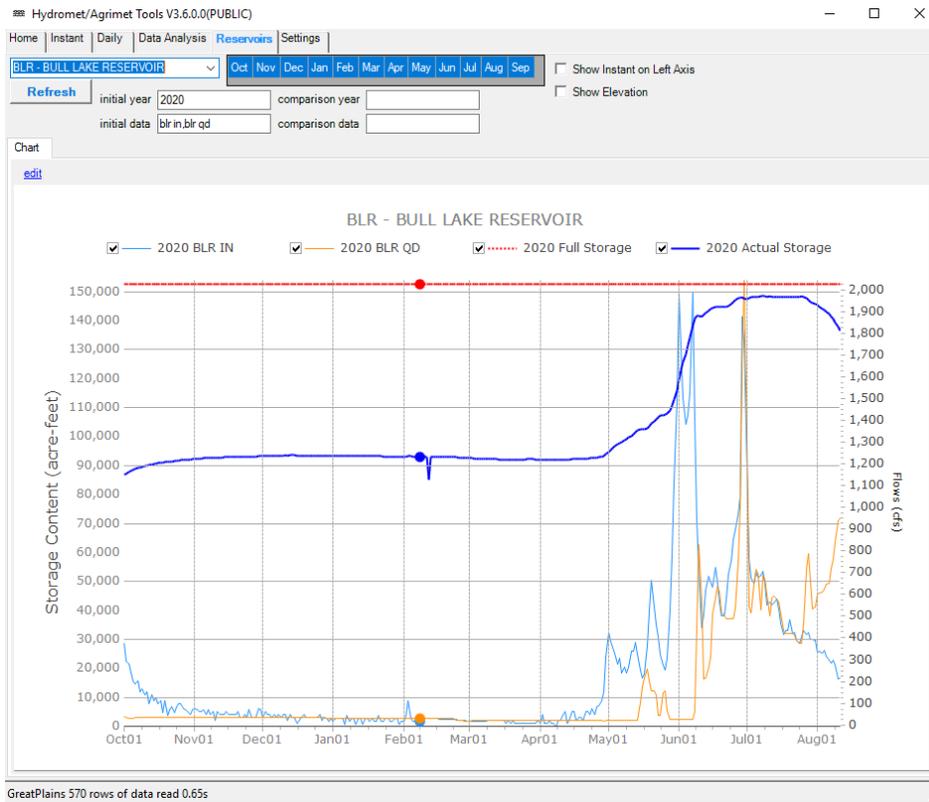
- add other years to the analysis list above the month selector (separate years with spaces; Ex: 2020 2019)
- look at a range of years to analyze (type in years with a *dash* in between; Ex: 1980-2000)
- change the time period for when the stats are calculated
- also include the average, minimum, or maximum
- change the percentile values that you want to calculate and plot
- clip data to certain consecutive months
- switch to displaying and tabulating data to calendar years instead of water years

You may also check the Use List option to input multiple data codes to analyze. As an example, you can try typing in BHR FB, BBR FB on the textbox to perform the same analysis for both datasets.

## Reservoirs

The Reservoirs tab is useful for viewing reservoir data (inflows, outflows, storage content, and elevation). On the Reservoirs tab all you need to do is select a reservoir from the drop-down menu and the tab will update with the data for your selected option.

For this exercise, let's select Bighorn Reservoir. The result should look like the screen shown below. It shows the inflows, outflows, and the storage content for the current water year.



From here, you can:

- select to show elevation instead of storage content
- select to show the instantaneous (15-minute) data for the storage or elevation
- type in a different water year to plot in the initial year text box
- type in another water year to plot and compare in the comparison year text box
- opt to only show data for certain consecutive months