

Appendix A

Additional Plug-Ins

A.1 Introduction

This appendix documents additional plug-ins that are provided with HEC-DSSVue. A "plug-in" is an executable ".jar" file that is saved in the "**Plugins**" directory that can access and perform functions on top of HEC-DSSVue. No modifications are needed to the original program to provide this additional functionality. Access and use of a plug-in should appear seamless to a user; generally their functionality is accessed through a standard menu.

Plug-ins can be updated without changing the original program. The HEC-DSSVue web site will provide updates for HEC plug-ins. Other agencies may provide their own plug-ins to meet custom needs. The HEC-DSSVue plug-in web site is:

<http://www.hec.usace.army.mil/software/hec-dss/plug-ins.htm>

A.2 Pie Charts

The **Pie Chart** plug-in for HEC-DSSVue allows you to plot a pie chart of any value of interest (e.g., flow, stage, or reservoir storage) for a single date and time at multiple locations. Either a two-dimensional (2D) or three-dimensional (3D) plot can be created. The pie chart is plotted using a default color sequence, but you can change the color of each individual slice. The transparency of the chart can also be adjusted. By default, all sections are labeled with the site name, units, and percentage of the total. The unit and percent labels can be individually turned off, or section labels can be turned off altogether. A legend is created below the chart by default, which can also be turned off. The section labels and legend are updated dynamically. The final product can be printed, or it can be saved to a graphics file to be included in presentations, documents, or web pages.

A.2.1 Creating a Pie Chart

First, load a data set into DSSVue. Select the data type to plot by clicking the drop-down list to select the C part of the DSS path. Select the time interval using the drop-down list for the D part of the path. Specific sites and dates/times can be selected by Ctrl-clicking on each row of the table, or all of the data can be used to create the plot by pressing **Ctrl-A**.

An example of creating a pie chart of daily reservoir storage data is shown in Figure A.1. For this figure, all sites and all dates/times were selected for plotting, after filtering on the C and E parts of the DSS path. Click the

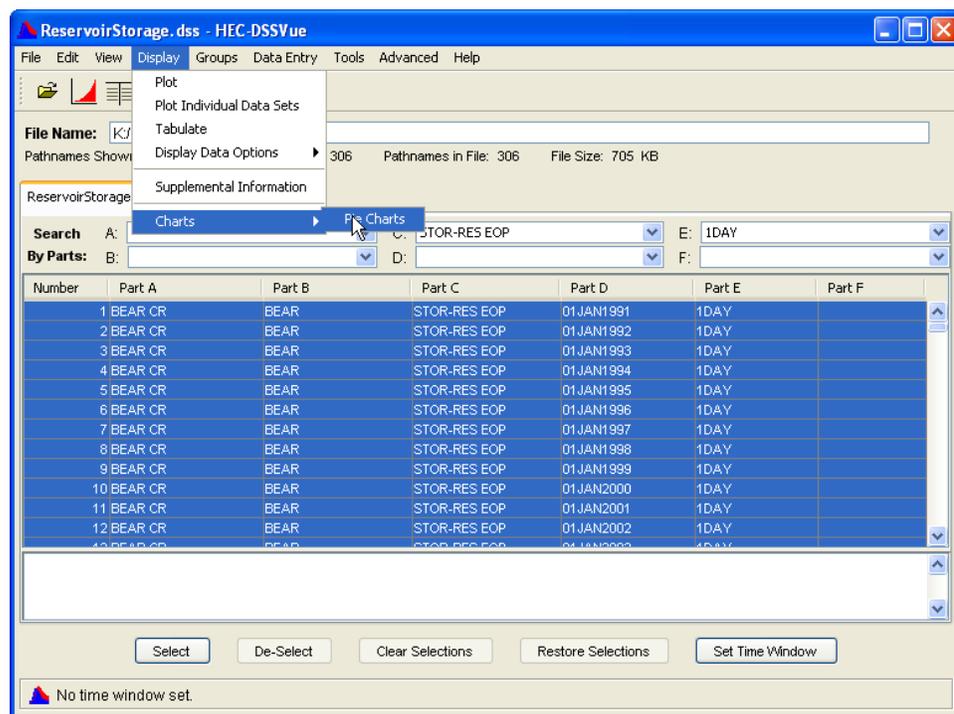


Figure A.1 Create New Pie Chart

Display menu, and then point to **Charts**, click **Pie Charts** to open the main pie chart window. A window with an empty chart panel will appear, as shown in Figure A.2 (page A-3). Click the desired options, as described below, and then click the **Create Chart** button at the bottom of the window to create a new pie chart. If you need to change the selection of data to be plotted, or otherwise do not wish to create a pie chart, the window can be closed using either the **Cancel** button at the bottom of this window, or from the **File** menu, click **Close** from the pie chart window.

A.2.2 Date/Time

Select the date and time from the **Date/Time** drop-down list at the top-left of the main chart window. If only one date/time was selected from the data

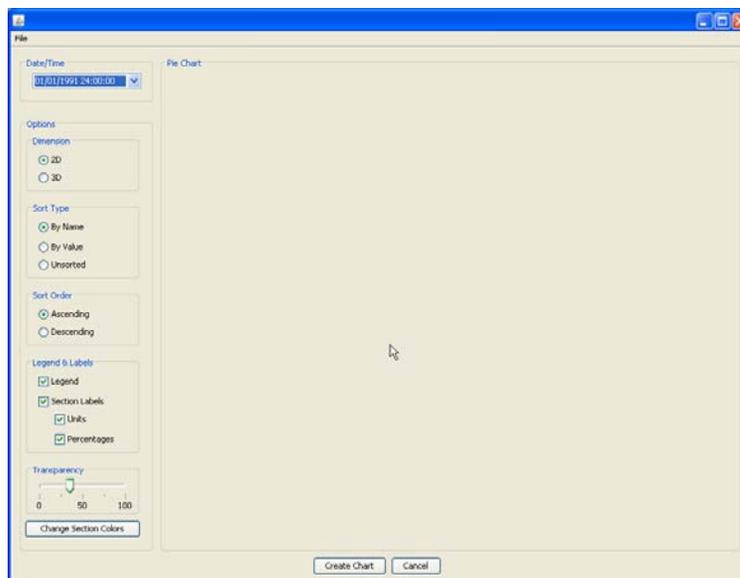


Figure A.2 Main Pie Chart Window

set before opening this window, only one date will appear in this list. Otherwise, all dates will be present, with the earliest date selected by default.

A.2.3 Chart Dimension

A two-dimensional (2D) or three-dimensional (3D) chart can be created by selecting **2D** or **3D** in the **Dimension** option box to the left of the plot panel. An example of a 2D plot is shown in Figure A.3, and a 3D plot is shown in Figure A.4 (page A-4).

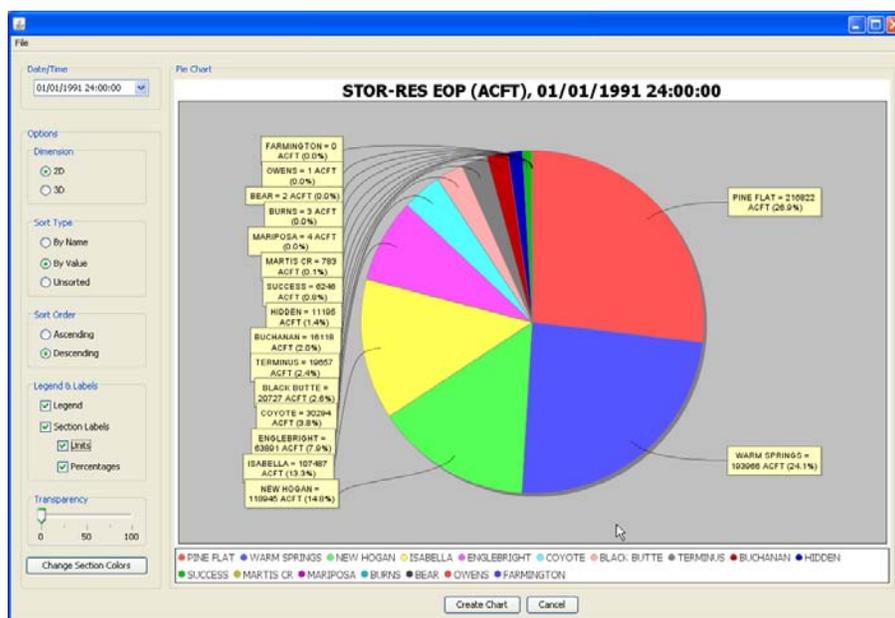


Figure A.3 2D Pie Chart, Transparency Turned Off

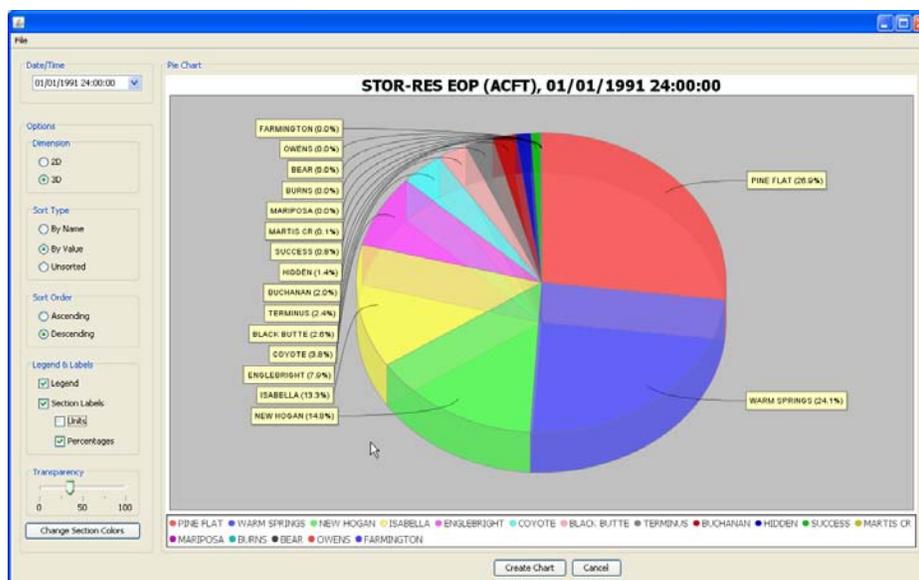


Figure A.4 3D Pie Chart, Transparency Set to Thirty-Five Percent

A.2.4 Sort Type

The **Sort Type** options to the left of the plot panel allow you to specify whether the data should be sorted by site name, by data value, or by the order the data is listed in the DSS file ("unsorted"). Click **By Name** to sort the plot alphabetically, starting with the first site name at the top of the plot. This option allows quick identification of particular sites, particularly if a large number of sites were included.

Select **By Value** to sort the data by ascending or descending data values. This option creates neat and visually appealing plots that can be used to compare sites and quickly identify important differences between sites.

Select **Unsorted** to plot the data in the order in which it appears in the DSS file. This option respects the order of the DSS file but usually will not produce charts that are as clear or useful as those created using the **By Name** or **By Value** options.

A.2.5 Sort Order

The **Sort Order** options at the left of the plot window allow you to specify whether to sort the data in ascending or descending order. The **Ascending** option sorts the data around the chart clockwise, with the first value plotted at the top of the chart. **Descending** reverses the sort order by plotting the data in increasing order counter-clockwise around the plot. If **Unsorted** is selected for **Sort Type**, the **Sort Order** option will be disabled.

A.2.6 Transparency

The transparency of the entire pie chart can be changed to enhance the clarity or visual appeal of the plot. Drag the slider in the **Transparency** option box to the left to decrease the transparency and drag to the right to increase transparency. The transparency is dynamically updated as the slider is dragged. To turn transparency off and create an opaque plot, drag the slider to the far left. The 2D plot in Figure A-3 (page A-3) has the transparency set to zero, while the 3D plot in Figure A-4 (page A-4) has the transparency set to thirty-five percent.

A.2.7 Section Colors

The color of each individual slice in the pie chart can be altered by clicking the **Change Section Colors** button. A color selection window will appear (Figure A-5). Select the site name from the drop-down list to the right of the window, and then click on a color. The color of the

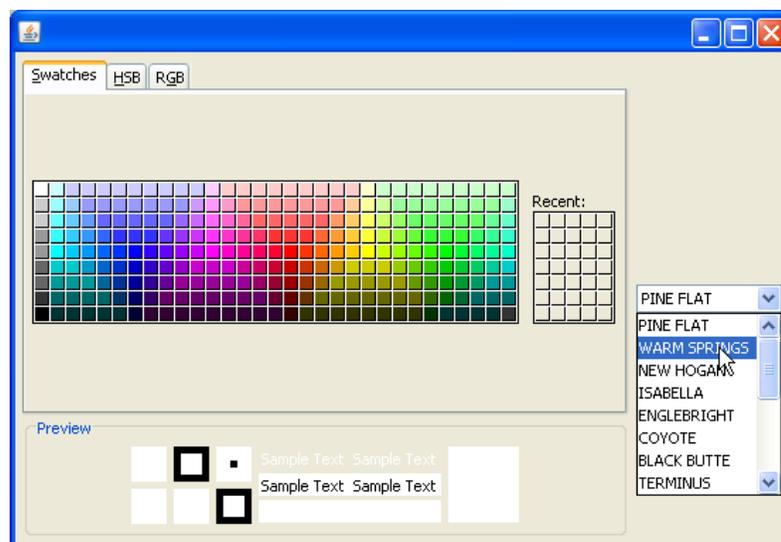


Figure A.5 Color Chooser

selected slice is dynamically updated on the pie chart. Drag the color chooser window to one side to view the changes in the main chart window. Figure A-6 (page A-6) shows an example of the chart after changing the colors of the slices representing the Pine Flat and Warm Springs sites.

A.2.8 Printing and Saving

To print the pie chart, from the **File** menu, click **Print** of the pie chart window.

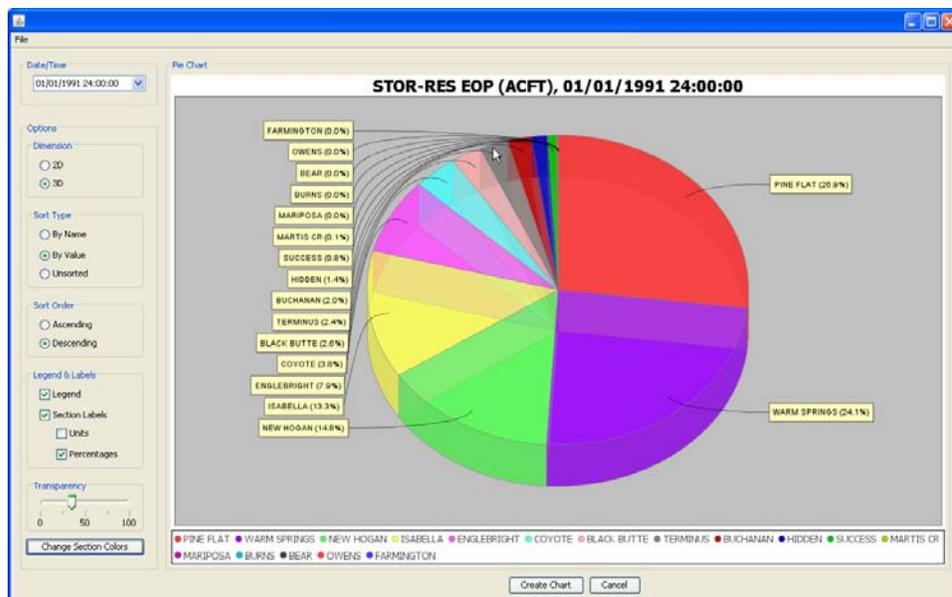


Figure A.6 Slice Color Changed (Pine Flats and Warm Springs)

To save the pie chart to a graphics file, choose **File** → **Save As** from the pie chart menu. The chart can be saved as either a JPEG or PNG file. Select the desired extension in the **Files of type** field, and then type a name in the **File name** field, or browse for an existing file to replace with the current one. Then click **Save**. The selected extension will be appended to the file name automatically.

A.3 North Carolina DWR Duration Hydrograph

The North Carolina Department of Water Resources developed a plug-in to develop duration hydrographs for data in HEC-DSS. This is an alternative approach to the built-in capability in HEC-DSSVue in the Math functions Statistics tab. This plug-in is supported by North Carolina DWR. For questions, please contact them directly. The web site is <http://www.newater.org/wrisars/dss>.

A.3.1 Introduction

The North Carolina Department of Water Resources Duration Hydrograph Plug-in can create Daily, Weekly, or Monthly Duration Hydrograph plots with Simple, Detail, or Drought Monitor style for DSS data in HEC-DSSVue. The window that will appear is shown in Figure A.7 (page A-7). Low-Flow frequency data dQ_r (e.g. 7Q10, 30Q2) for water, climatic, or water year can be calculated on-the-fly and shown in the Duration Hydrograph plot (see Figure A.8, page A-7).

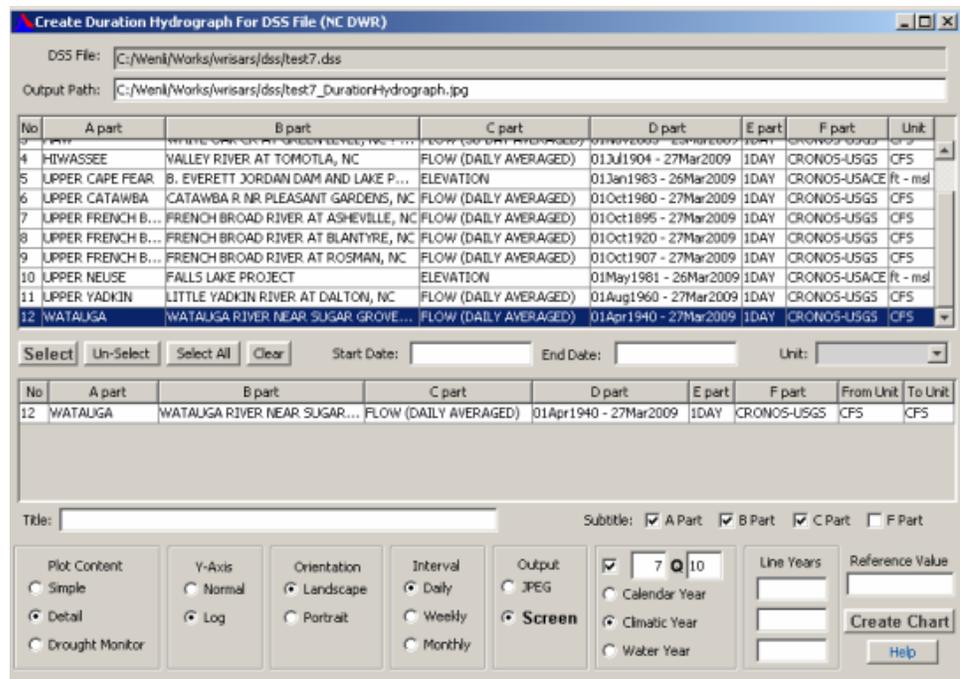


Figure A.7 Create Duration Hydrograph for DSS File (NC DWR)

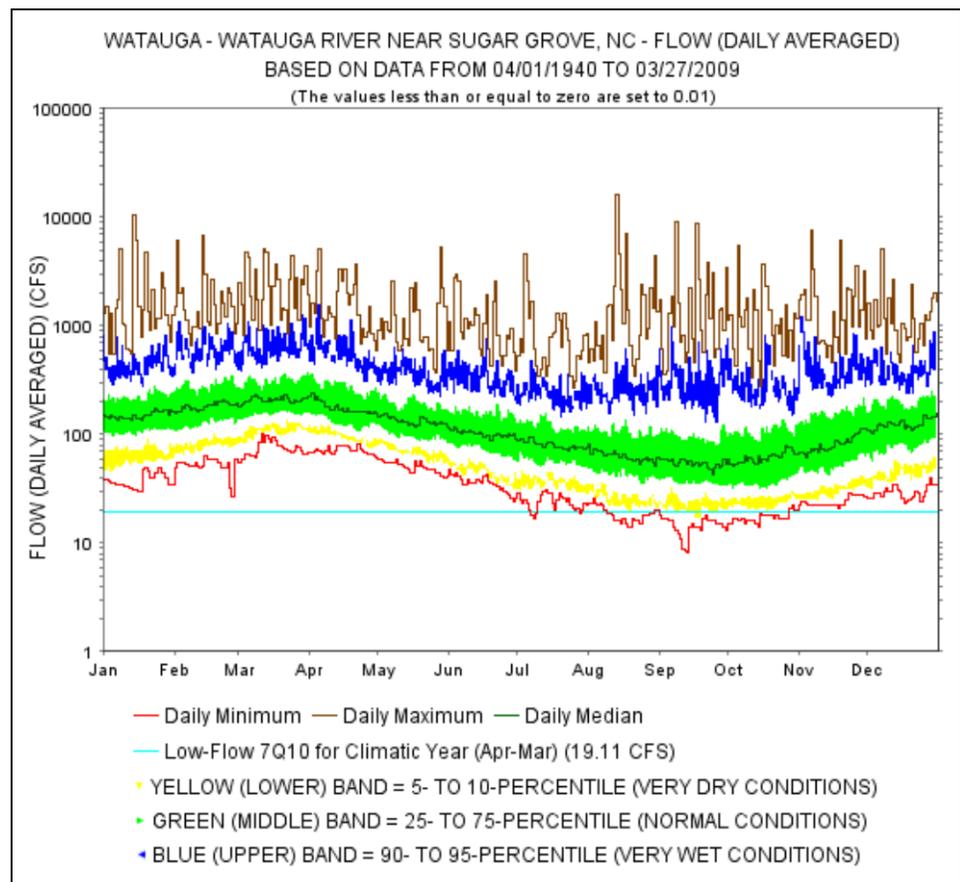


Figure A.8 Create Duration Hydrograph for DSS File (NC DWR) - Plot

A.3.2 Use

1. In HEC-DSSVue, create a new DSS file or open an existing one.
2. In the HEC-DSSVue main window, highlight or select the DSS path(s) you are interested in (if no path is selected, all paths in the DSS file will be considered as the interested paths), from the **Display** menu, click **NC DWR Duration Hydrograph** (Figure A.9).

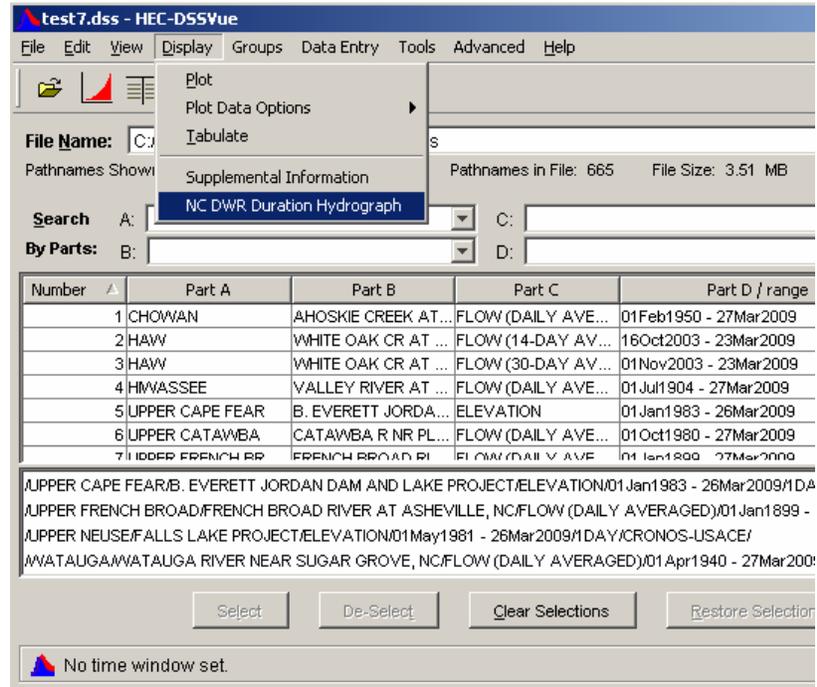


Figure A.9 Open NC DWR Duration Hydrograph

3. In the newly opened **Create Duration Hydrograph For DSS File (NC DWR)** panel, click the path(s) you want to create Duration Hydrograph this time (Figure A.10).

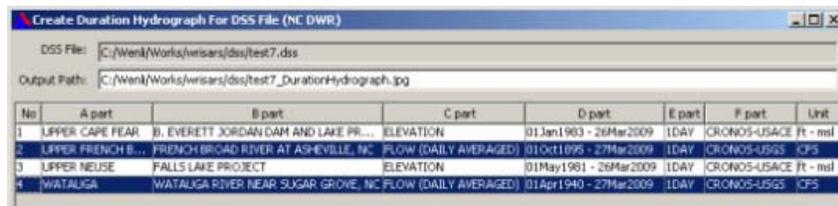


Figure A.10 Choose Pathnames to Create Duration Hydrograph

4. Select/customize the data for your Duration Hydrograph chart.
 - If you want limit the data to be used for creating the chart, enter the Start and/or End Date with yyyy-mm-dd format.
 - If you want to convert the unit for stream flow or reservoir, select one conversion method from the unit drop down list box (see Figure A.11, page A-9).

- Click "Select" to select the path(s) you selected with the date limitations and the unit conversion.
- Clicking "Select All" will put all the path(s) in the upper table to the lower selected list table.
- You can click "Un-Select" to remove the path(s) from the selected list.
- Clicking "Clear" will clear all the selected path(s) in the lower table. The toolbar containing the buttons mentioned above is shown in Figure A.12.

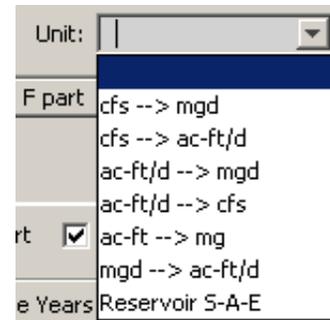


Figure A.11 Select Units for Conversion

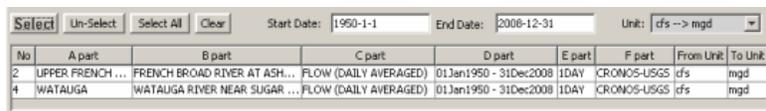


Figure A.12 Select, Un-Select, Select All, and Clear buttons

- By default, the title for the chart will be constructed from the A, B, C, and D parts of the paths as below (Figure A.13).



Figure A.13 Chart Title

- If you want to include the F Part, check the check box for "F Part". F Part information will be added after the C Part in the title.
 - You can also populate the "Title" textbox to add your own title before the default title.
- This plug-in can create Duration Hydrograph with three styles. You can choose one of them in the "Plot Content" group. The default is "Detail" style. (Figure A.14).



Figure A.14 Plot Content

- Simple: Plot the very dry, normal, and very wet three bands (min to percentile 25, percentile 25 to 75, and percentile 90 to max), see Figure A.15 (page A-10).
- Detail: Plot Minimum, maximum, and median lines, in addition to the very dry, normal, and very wet three bands (percentile 5 to 10, percentile, 25 to 75, and percentile 90 to 95), see Figure A.16 (page A-10).
- Drought Monitor: Use Drought Monitor classification and color schema to create Duration Hydrograph, see Figure A.17 (page A-10).

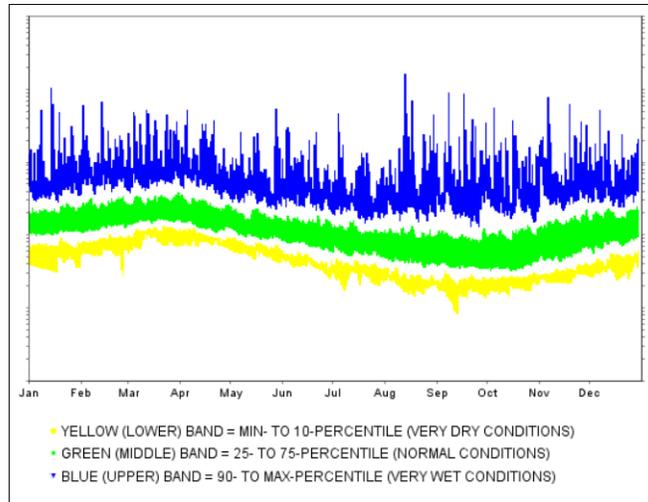


Figure A.15 Simple Plot

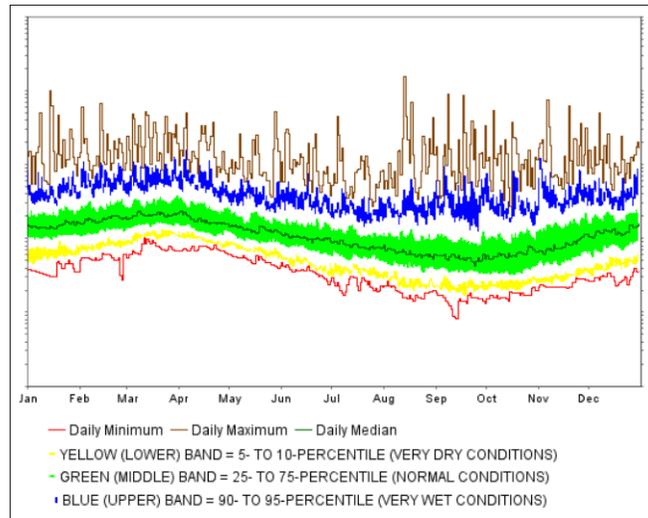


Figure A.16 Detailed Plot

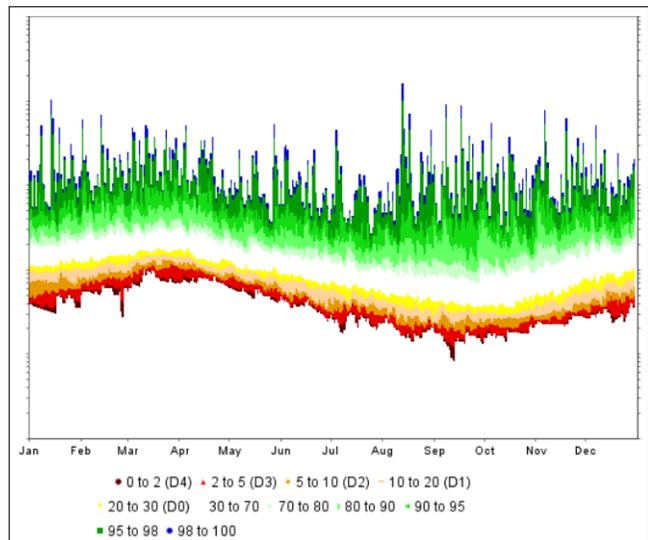


Figure A.17 Drought Monitor Plot

7. You have the option to create your chart with normal Y-Axis or Log Y-Axis. The default is "Normal". But generally it is better to choose "Log" for streamflows (Figure A.18).



Figure A.18 Y-Axis

8. You can control the image orientation by choosing the Landscape or Portrait. (Figure A.19).

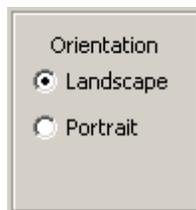


Figure A.19 Image Orientation

9. By default, the Duration Hydrograph will be created on the daily values. The Plug-in can also summarize the weekly or monthly averages and then create weekly or monthly chart. (Figure A.20).



Figure A.20 Chart Intervals

10. By default, the Duration Hydrograph image will be created to jpg files, but not show on the screen. The file path and name is shown in the "Output Path" textbox on the top of the whole Plug-in panel, see Figure A.21. You can change the "Output Path". If multiple images will be output, sequential numbers will be added before the .jpg file extension.



Figure A.21 Output Path

11. If you want to see the Duration Hydrograph image on the screen directly, choose the "Screen" output option. In this case, no jpg files will be created. (Figure A.22) You are not allowed to create more than 20 Duration Hydrograph on the screen in one run.

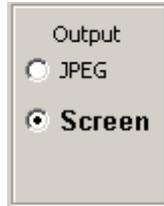


Figure A.22 View Duration Hydrograph Image

12. You can choose to add Low-Flow dQr (e.g. 7Q10, or 30Q2, etc.) line to the Duration Hydrograph image, see Figure A.23.



Figure A.23 Add Low Flow dQr

- The textbox before the bold Q is how many consecutive days. It must be an integer between 1 and 365.
 - The textbox after the bold Q is how many years of recurrence interval period. It must be an integer between 2 and 100.
 - You can use three types of year for your calculation.
 - Calendar Year** - January 1 to December 31
 - Climatic Year** - April 1 to March 31. This is used by default.
 - Water Year** - October 1 to September 31
 - dQr calculation only uses the years that have at least 365 daily data.
13. If you want to overlay some real daily data over the Duration Hydrograph, put the year numbers in the textboxes of the "Line Years" group. You can overlay one to three years of data, see Figure A.24.



Figure A.24 Line Years

14. Put a numeric value in the textbox under the "Reference Value", a horizontal line represent that value will be shown in the Duration Hydrograph chart, see Figure A.25.

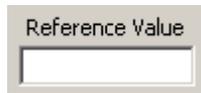


Figure A.25 Reference Value

15. Click **Create Chart** at the bottom right corner to create a Duration Hydrograph chart based on your customization.
16. If you need any help, you can click Help to open Help.

