

# USGS Data Retrieval Plug-in

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## Introduction

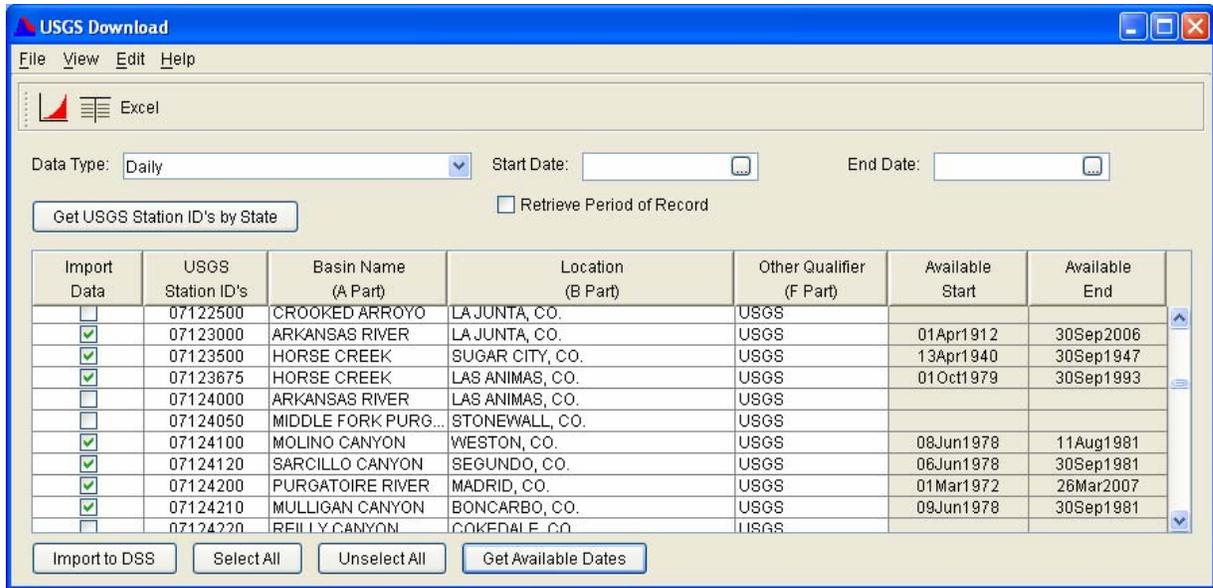
The USGS data retrieval plug-in is an optional capability that will retrieve daily, hourly and annual peak flows from the US Geological Survey NWIS web site and store that data into an HEC-DSS file. The plug-in can be used with HEC-DSSVue Version 1.2 and other applications. Daily, real-time and peak data availability can be obtained from the USGS water web site at: <http://waterdata.usgs.gov/nwis>. Hourly data information can be obtained from the USGS IDA (Instantaneous Data Archive) at <http://ida.water.usgs.gov>. The IDA is in a developmental phase and only a limited number of stations have historical short-term data available.

An HEC-DSSVue plug-in is a set of Java software that is compiled and put into a Java “.jar” file. By simply placing this file into the HEC-DSSVue Plugins directory, it is automatically loaded and accessible from the HEC-DSSVue program. The purpose of a plug-in is similar to the jython scripting capability that is available in HEC-DSSVue. However, since plug-ins are written in the Java language, which is used by HEC-DSSVue, there are extended capabilities and controls available. The plug-in code can access the HEC-DSSVue API (Application Program Interface) directly. Typical uses for plug-ins are: complex mathematical operations; specialized formatting of data for entry into another application (such as a program that uses a “card format”); and, retrieval of data from a web site.

## Usage

Plug-ins can be used by HEC-DSSVue Version 1.2 and later. To activate the USGS plug-in, the USGS.jar file is downloaded and placed in directory “Program Files\HEC\HEC-DSSVue\Plugins”, if it has not been installed already. To un-install a plug-in, simply remove it from the Plugins directory. When you run HEC-DSSVue, it detects plug-ins in the Plugins directory and automatically loads them.

To use the USGS plug-in you must be connected to the internet. Run HEC-DSSVue, open the HEC-DSS file that you want to store the retrieved data in and then select the USGS button on the main toolbar. This will open the USGS Download plug-in interface with an empty station identifier table. From here, you can either open a previously saved table, manually enter the station information for the stations that you want, or automatically populate the table with a list of stations available on a state by state basis. An example of the USGS data retrieval plug-in screen is given in Figure 1.



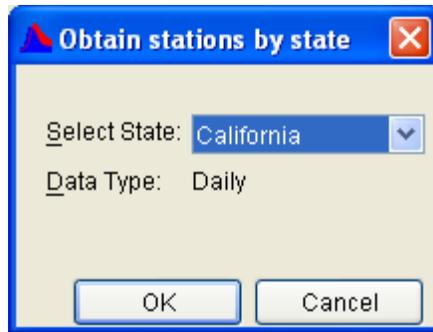
**Figure 1 USGS Plug-in Screen**

### **Station ID Table**

To open a previously saved table, select the **File** menu and then **Open**. Browse to the directory and file that you want to access and then press the **Open** button. Optionally, you can select a file from the most recently used file list at the bottom of the **File** menu. To save a table, select the **File** menu and then **Save**. Browse to the directory where you want to save your table and then enter the file name and press the **Save** button.

To manually enter station information, select the USGS Station ID cell on a blank row. Enter the USGS station ID number and then fill in the basin or river name, location name, parameter and version in the subsequent columns or accept the defaults provided after entering the station ID. If you need to add additional rows, select the **Edit** menu and then **Insert Rows**. Fill in the identifiers for any remaining stations that you want. Once you have completed your table, save it using **Save** from the **File** menu.

To automatically populate the station table with a list of stations by state from the USGS web site, select **Get Station ID's by State...** from the **File** menu or from the button on the main screen. This will display a dialog box for you to select the state for data locations that you are interested in, as shown in Figure 2. The stations available are often different for historical and current data, so you need to choose the data type you want before requesting the list of stations. The list will be downloaded when you press **OK**. The amount of time required for this will depend on the speed of your connection to the internet and the number of stations in the state that you selected. After the list has been downloaded, a message box will be displayed that indicates how many stations IDs were retrieved.



**Figure 2 State Selection**

You can sort the station table by pressing on the column header of the column that you want to sort by. A second press of the column header will perform an inverse sort.

You may find the list of stations easier to use if you delete those stations that you are not interested in. To do this, highlight the rows in the table that you want to delete and then select **Delete** from the **Edit** menu. You can save your table by selecting **Save** from the **File** menu.

### **Obtaining Available Data Date Range for Stations**

You can query for the starting date and ending date of available data for selected stations. To do this, select the check boxes for the stations that you want and then press the **Get Available Dates** button. Each station has to be queried independently, so select only those stations that you are interested in. The date range for the selected stations will be displayed in the two right most columns of the table.

### **Retrieving Data**

To retrieve data from the USGS web site and import into HEC-DSS, select the data type you want (either Daily, Instantaneous (Hourly), Real Time or Annual Peaks) from the drop down selector near the top panel of the screen. If you want daily, you can enter a start date and end date for the time frame that you are interested in or select the **Retrieve Period of Record** check box to retrieve the period of record data. The date should be entered in the form of DDMMMYYYY (e.g., 03FEB2005). Selecting the small box in the date field will provide a calendar tool to aid in setting the date. Even though you may specify dates, only data that is available within those dates from the web site can be retrieved. If you want real time data, enter the number of days back that you want to retrieve data for. The USGS offers data for the last 31 days for real time data.

Use caution when selecting a time period for instantaneous historical data, as you might unintentionally request excessive number of values. For example, if data is given in 15 minute intervals, a year's worth of data will be 35,040 values, which can take a long time to retrieve.

After the data type and time span have been set, select the stations from the table that you want data for by checking the box in the **Import Data** column for those stations. If you

want to retrieve data for all stations in your table, press the **Select All** button. The data retrieval process will begin when you press the **Import** button. This operation will take some time, depending on your connection speed to the internet and how much data you have requested. A **Retrieve Progress** dialog box will display the progress of the process. After data has been retrieved, the main catalog screen in HEC-DSSVue will be automatically updated.

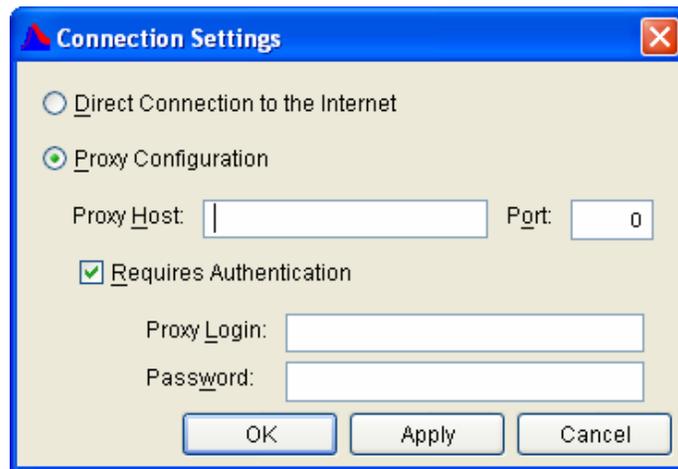
Daily data is stored with an E part of “1DAY”. The interval for real-time data will be set based on the frequency of the data retrieved. If the frequency varies, the data will be store in an irregular interval format. You may want to use the interval modification functions available from the **Time Conversion** tab in the **Math Functions** screen to change the data to a desired interval.

### **Plotting, Tabulating and Displaying Data in Microsoft Excel**

Data can be directly plotted, tabulated or sent to Microsoft Excel from the plug-in by selecting the desired data sets and then pressing the appropriate tool bar button. You do not need to import the data first; it will be automatically imported and stored in the HEC-DSS file for you. To send the data to Microsoft Excel, you must have installed the Excel plug-in, available from the HEC-DSSVue plug-in web page, or you must have an Excel capable version (currently under development) of the program.

### **Setting Proxy Information**

Some offices require proxy information to be set to access the internet. Proxy information can be set by selecting the **Options** item from the **Edit** menu. This will display the screen shown in Figure 3. Fill in the appropriate values and then press the OK button. The information will be retained between sessions.



**Figure 3 Proxy Screen**

## **Limitations**

The USGS plug-in currently has limited error detection capabilities. If you think that there are problems, you should check the HEC-DSSVue log screen for messages. The log screen is usually minimized in your task bar.

The USGS plug-in will indicate when data cannot be retrieved, but it may not give the reason why. You should check the USGS web page with a browser to ensure that what you are requesting is available. The web address is: <http://waterdata.usgs.gov/nwis> for daily and real-time data, or <http://ida.water.usgs.gov/ida> for hourly data.