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Retrieving Surface Water Quality Data from STORET

The North Carolina Division of Water Quality’s surface water monitoring data are made available to the public through the US Environmental Protection Agency’s STOrage and RETrieval (STORET) data management system, at www.epa.gov/storet/.

Specific instructions on the retrieval of data for each program can be found on the DWQ Environmental Sciences Section STORET webpage: <http://portal.ncdenr.org/web/wq/storehome>.

Getting Started

From the STORET homepage (www.epa.gov/storet/), click on “**Download Data**” in the features menu on the right-hand side of the page. All DWQ data are stored in the modernized version of STORET. Click on “**Browse or Download Modernized STORET Data**”, the big yellow button located on the middle of the page. This will open the STORET Data Warehouse Page (Figure 1), where you can search for station descriptions and water quality results.

Search for Results

1. From the STORET Data Warehouse page (Figure 1), click on “**Results Download**” under **STORET Results**. The STORET Central Warehouse- Results Download page will open (Figure 2).

Figure 1 – STORET Data Warehouse

2. From the STORET Central Warehouse- Results Download page, you can search by **Geographic Location** (State/County, Latitude/Longitude or Drainage Basin/HUC), **Organization, Station & Project, Station Type, Date, Activity Medium, Activity Intent and Community** and/or **Characteristic** (i.e. parameter, see page 9). Once the search criteria have been entered, click “**Continue**” at the bottom of the page.

NOTE: To obtain data from specific station(s), choose “Select and Search Organization and Station (Option 3)”. Be sure to select the correct Organization ID. Search for a specific station in the “Search String” box. Selected stations will appear in the box below the “Search Stations” button. Multiple stations can be selected.

3. The Result Search Summary page will open. This page tells you how many results are in the warehouse for the search criteria entered (Figure 3). At the bottom of the page, select which fields are reported in addition to the default fields (Figure 4).

Figure 3 – Results Returned

STORET Central Warehouse

Number of Results Returned: 1,643

Search Criteria State: ALL County: ALL Station(s): 21NCMonitoring Q733 Station Type(s): ALL Activity Start Dates: ALL Intent(s): ALL Community Sampled: ALL Medium: ALL Characteristic(s): ALL	Select Report Type(s): <input checked="" type="checkbox"/> REGULAR (1643 record(s)) <input type="checkbox"/> BIOLOGICAL (0 record(s)) <input type="checkbox"/> HABITAT (0 record(s)) <input type="checkbox"/> METRIC (0 record(s)) <ul style="list-style-type: none">• Select 'Back' to modify search parameters and refine your query.• Select Batch Processing to generate the report offline based on your current selections.• You may customize the content of your report by selecting Data Elements below. <p style="text-align: center;"><input type="button" value=" <<Back"/></p> <p style="text-align: center;">Batch Processing</p> <p>Please select the appropriate user profile: <input type="text" value="Public"/></p> <p>Please enter your email address: <input type="text"/></p> <p>Please specify three characters to prefix your report name: <input type="text"/></p> <p style="text-align: center;"><input type="button" value="Immediate"/> <input type="button" value="Overnight"/></p> <p><small>Note: immediate batch processing is limited to data requests with results up to 1000000. Any immediate batch request over the limit will be automatically scheduled as Overnight Batch.</small></p> <p><small>Note: Download files will exceed maximum limits for spread sheet applications (ie. EXCEL - Worksheet size: 65,536 Rows.)</small></p>
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Figure 4 – Station Default Fields

Select Data Elements for Report(s)

<input type="checkbox"/> Org ID <input type="checkbox"/> Beach ID/Project ID <input checked="" type="checkbox"/> Org Name <input checked="" type="checkbox"/> Station ID <input checked="" type="checkbox"/> Station Name <input checked="" type="checkbox"/> Station Location Info* <input checked="" type="checkbox"/> Station Lat/Long* <input type="checkbox"/> Conv Station Lat/Long* <input type="checkbox"/> Station Types* <input type="checkbox"/> S/G/O Indicator <input checked="" type="checkbox"/> Visit Num <input type="checkbox"/> Visit Start* <input type="checkbox"/> Visit Stop* <input type="checkbox"/> Trip ID <input type="checkbox"/> Trip Name <input checked="" type="checkbox"/> Activity ID <input checked="" type="checkbox"/> Activity Start* <input type="checkbox"/> Activity Stop* <input checked="" type="checkbox"/> Activity Medium <input type="checkbox"/> Activity Matrix <input type="checkbox"/> Activity Type <input checked="" type="checkbox"/> Activity Category–Rep Num <input type="checkbox"/> Activity Intent <input type="checkbox"/> Community Sampled <input checked="" type="checkbox"/> Subject Taxon <input checked="" type="checkbox"/> Biopart <input type="checkbox"/> Field Set <input type="checkbox"/> Actual Point Type <input type="checkbox"/> Actual Point Sequence <input type="checkbox"/> Actual Point Name <input type="checkbox"/> Actual Activity Lat/Long* <input type="checkbox"/> Conv Actual Activity Lat/Long* <input checked="" type="checkbox"/> Habitat Class Name <input type="checkbox"/> Well Number <input type="checkbox"/> Pipe Number <input type="checkbox"/> Additional Act Location Info* <input checked="" type="checkbox"/> Activity Depth <input checked="" type="checkbox"/> Activity Depth Unit <input type="checkbox"/> Activity Upper Depth <input type="checkbox"/> Activity Rel Depth <input type="checkbox"/> *DISTINCT. Report Only Unique Record Set. <small>*Element Group. Click to see the Element list</small>	<input type="checkbox"/> Activity Lower Depth <input type="checkbox"/> Uppr Lwr Depth Unit <input type="checkbox"/> Activity Depth Ref Point <input type="checkbox"/> Sample Collection ID <input type="checkbox"/> Field Gear ID <input type="checkbox"/> Field Gear Config ID <input type="checkbox"/> Sample Preservation* <input type="checkbox"/> Portable Data Logger <input checked="" type="checkbox"/> Characteristic Name* <input type="checkbox"/> CAS Num <input type="checkbox"/> EPA Registry Num <input type="checkbox"/> ITIS Num <input checked="" type="checkbox"/> Sample Fraction <input checked="" type="checkbox"/> Value Type <input checked="" type="checkbox"/> Statistic Type <input checked="" type="checkbox"/> Result Value as Text* <input type="checkbox"/> Result Value as Number <input checked="" type="checkbox"/> Units <input type="checkbox"/> Converted Result Value <input type="checkbox"/> Converted Result Unit <input checked="" type="checkbox"/> Activity/Result Comment* <input type="checkbox"/> Result Measure Qualifier <input type="checkbox"/> Result Free Text <input type="checkbox"/> Weight Basis <input type="checkbox"/> Temperature Basis <input type="checkbox"/> Duration Basis <input type="checkbox"/> Particle Size Basis <input type="checkbox"/> Distance Measured From <input type="checkbox"/> Distance Measured To <input checked="" type="checkbox"/> Analytical Proc ID <input type="checkbox"/> Additional Anal Proc Info* <input type="checkbox"/> Lab Remark <input type="checkbox"/> Dilution Ind <input type="checkbox"/> Recovery Ind <input type="checkbox"/> Correction Ind <input type="checkbox"/> Data Quality* <input type="checkbox"/> Other Lab Info* <input type="checkbox"/> Num of Reps <input type="checkbox"/> Data Quality* <input type="checkbox"/> Correction for Bias Ind	<input type="checkbox"/> Activity/Result Document/Graphic* <input type="checkbox"/> Net Tow Info* <input type="checkbox"/> Electroshock Info* <input type="checkbox"/> Net Non–Tow Info* <input type="checkbox"/> General Group Info* <input type="checkbox"/> Multi–Taxon Pop Census Info* <input type="checkbox"/> Group Count Type <input type="checkbox"/> Single Taxon Frequency Class Info* <input type="checkbox"/> Single Taxon Individual Info* <input type="checkbox"/> Collection Duration Info* <input type="checkbox"/> Reach Measure* <input type="checkbox"/> Toxicity Test Type <input type="checkbox"/> Result Depth Height* <input type="checkbox"/> Bio Individual <input type="checkbox"/> Unidentified Species ID <input type="checkbox"/> Group Summary Count Weight <input type="checkbox"/> Frequency Class <input type="checkbox"/> Laboratory Accreditation Indicator* <input type="checkbox"/> Lab Sample Preparation ID <input type="checkbox"/> Lab Sample Prep Info* <input type="checkbox"/> Dilution Factor <input type="checkbox"/> Activity Conducting Organization <input checked="" type="checkbox"/> Metric Type ID <input checked="" type="checkbox"/> Metric Value <input type="checkbox"/> Taxon Detail Citation ID <input type="checkbox"/> Metric Context <input checked="" type="checkbox"/> Metric Unit <input type="checkbox"/> Metric Name <input checked="" type="checkbox"/> Metric Score <input type="checkbox"/> Metric Comment <input type="checkbox"/> Metric Scale <input type="checkbox"/> Administrative Submission/Change Record*
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*NOTE: The Minimum fields to have checked in addition to the default fields include: **Station Name** and **Activity/Result Comment**. If you're unsure of exactly which fields to select, click "Select All". Unnecessary information can always be deleted later.*

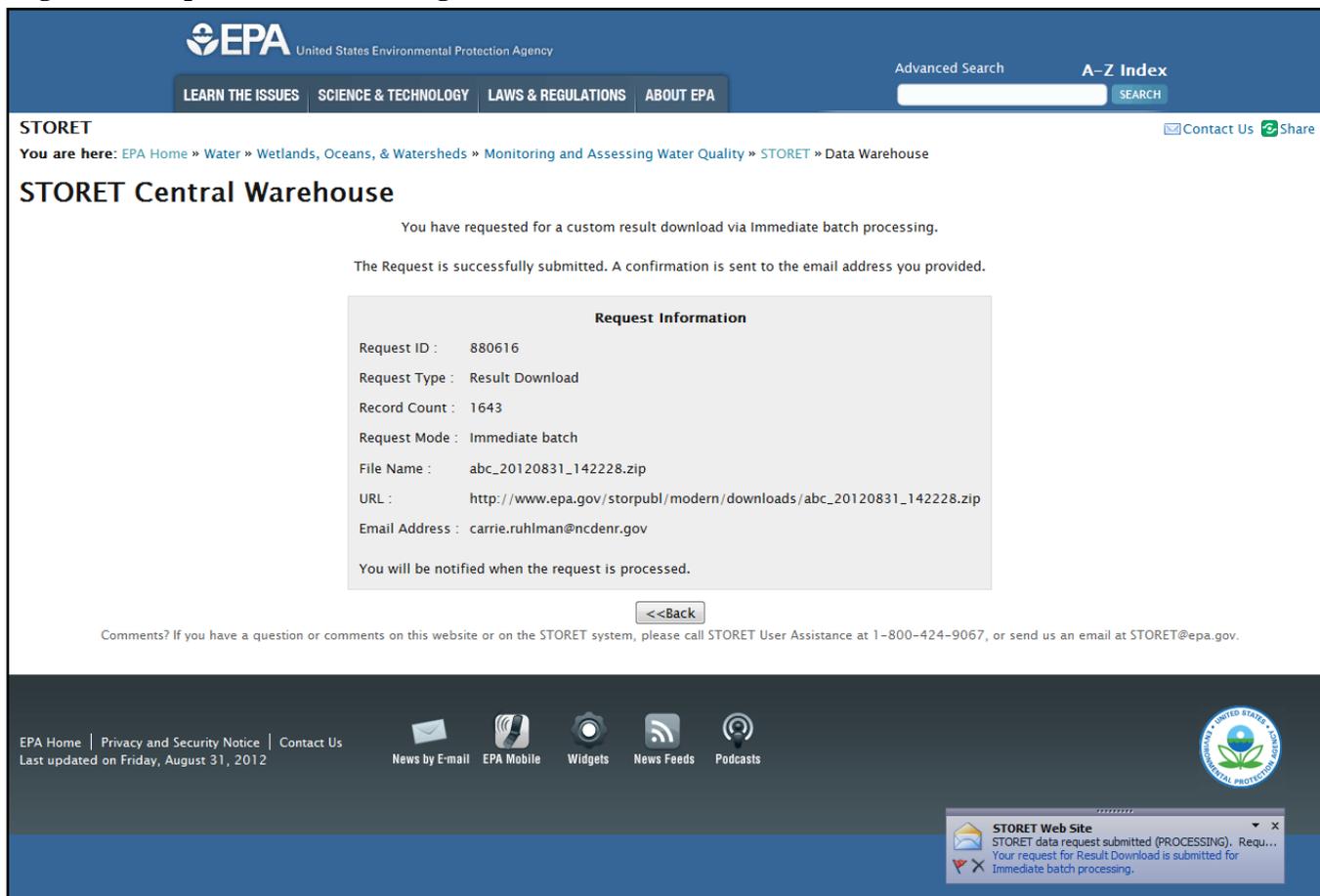
All data requests are completed by batch processing, which requires the requestor to enter a **valid email address** and a **three-character prefix** for the report (Figure 3). Click either "Immediate" or "Overnight" under **Batch Processing**. Immediate processing is available for searches up to 1,000,000 results. During peak demand, requests may take longer to complete. Overnight processing is preferred for larger reports and reports are available the next day. All results are sent directly to the email entered.

- The Results Data Request Information page will then open. This page confirms that the custom batch processing request was received. The requestor will also receive an email confirming that the request has been submitted. The subject of this email will be “STORET data request submitted (PROCESSING)”.

NOTE: Emails from STORET may be sent to your junk mail. Please check your junk mailbox regularly when requesting data from STORET.

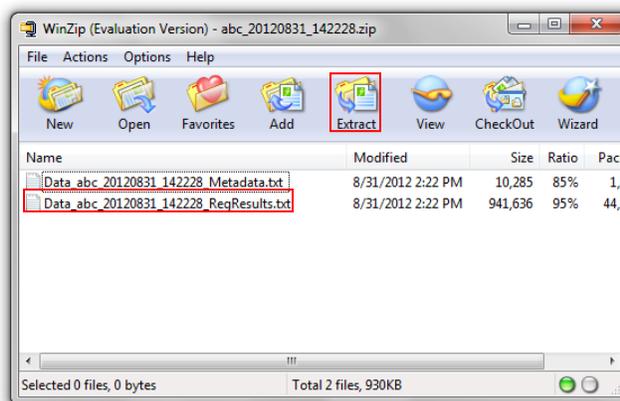
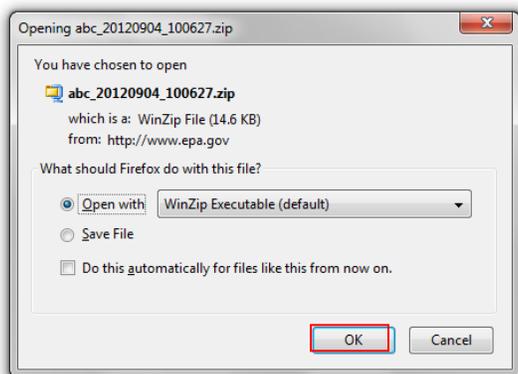
NOTE: The (PROCESSING) email includes search criteria and a record count to confirm the information requested.

Figure 5 – Request Information Page



Once your request is completed, you will receive another email with a link to download your data file. The subject of this email will be “STORET data request status (COMPLETED)” (Figure 6). Click on the link in this email. When prompted to open or save the file, click “open”. This is a compressed file that can be opened using WinZip® or another file compression software. The compressed file will include the data requested as a text file (Data_XYZ_yyymmdd_hhmmss_RegResults.txt) and an additional text file containing the metadata (Data_XYZ_yyymmdd_hhmmss_Metadata.txt). Extract the results file to a location of your choosing.

Figure 6 – STORET data request email and subsequent steps to retrieve data



Downloads with less than 65,000 records can be opened in Excel[®]. Larger downloads must be opened in Access[®] or other statistical software packages.

NOTE: See View Your Saved Results in Excel[®] below for help opening text files in Excel[®].

Search for Station Descriptions

1. From the STORET Data Warehouse page (Figure 1), click “**Stations Download**” under **STORET Station Descriptions**.

NOTE: Results are not available from this search, only station information.

2. The STORET Central Warehouse- Stations Download page will open. Here you can search by **Geographic Location** (State/County, Latitude/Longitude or Drainage Basin/HUC), **Organization, Station & Project, Station Type, Date, Activity Medium, Activity Intent and Community** and/or **Characteristic** (i.e. parameter; see page 9). Once the search criteria have been entered, click “**Continue**” at the bottom of the page.

NOTE: To obtain data from specific station(s), choose “Select and Search Organization and Station (Option 3)”. Be sure to select the correct Organization ID. Search for a specific station in the “Search String” box. Selected stations will appear in the box below the “Search Stations” button. Multiple stations can be selected.

3. The Station Search Summary page will open and provide the number of stations associated with your search. At the bottom of the Station Search Summary page, the Select Data Elements for Report section (Figure 7) allows the requestor to select which fields are included in the report. STORET has default fields, which will show up in your report. However, to ensure that you receive all the information you need, it is suggested that you choose “**Select All**”.
4. The remaining steps are the same as steps 4-7 of STORET Results, except that the compressed file (Figure 6) will contain only one text file with all station information (Data_XYZ_yymmdd_hhmmss_Stations.txt).

Figure 7 – Data Elements for Report

<p>Intent(s): ALL</p> <p>Community Sampled: ALL</p> <p>Medium: ALL</p> <p>Characteristic(s): ALL</p>	<p><input type="button" value="Immediate"/> <input type="button" value="Overnight"/></p> <p>Note: immediate batch processing is limited to data requests with results up to 60000. Any immediate batch request over the limit will be automatically scheduled as Overnight Batch.</p> <p>Note: Download files will exceed maximum limits for spread sheet applications (ie. EXCEL - Worksheet size: 65,536 Rows.)</p>		
<p>Select Data Elements for Report</p>			
<table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Org ID <input checked="" type="checkbox"/> Beach ID / Project ID <input checked="" type="checkbox"/> Station ID <input checked="" type="checkbox"/> Station Name <input type="checkbox"/> Org Name <input checked="" type="checkbox"/> Primary Type <input type="checkbox"/> Secondary Type <input type="checkbox"/> S/G/O Indicator <input type="checkbox"/> Well Number <input type="checkbox"/> Well Name <input type="checkbox"/> Pipe Number <input type="checkbox"/> NAICS Code <input type="checkbox"/> Spring Info* <input type="checkbox"/> Location Point Type <input type="checkbox"/> Point Sequence Number <input type="checkbox"/> Point Name <input checked="" type="checkbox"/> Latitude / Longitude* <input type="checkbox"/> Conv Latitude / Longitude* <input type="checkbox"/> Lat / Long Info* <input type="checkbox"/> *DISTINCT. Report Only Unique Record Set. <small>*Element Group. Click to see the Element list</small> </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Elevation (w/ Units) <input type="checkbox"/> Additional Elevation Info* <input type="checkbox"/> Country Name <input checked="" type="checkbox"/> State <input checked="" type="checkbox"/> County <input type="checkbox"/> Hydrologic Unit Code <input type="checkbox"/> Hydrologic Unit Name <input type="checkbox"/> Generated Hydrologic Unit Code <input type="checkbox"/> Generated Hydrologic Unit Name <input type="checkbox"/> RF1 Info* <input type="checkbox"/> NRCS Watershed ID <input type="checkbox"/> Estuary Info* <input type="checkbox"/> Great Lake Name <input type="checkbox"/> Ocean Name <input type="checkbox"/> Natv American Land Name <input type="checkbox"/> FRS Key Identifier <input type="checkbox"/> Description Text <input type="checkbox"/> Station Document / Graphic* <input type="checkbox"/> Administrative Submission / Change Record* </td> </tr> </table> <p style="text-align: center;"> <input type="button" value="Select All"/> <input type="button" value="Clear All"/> <input type="button" value="Restore Defaults"/> </p>		<input checked="" type="checkbox"/> Org ID <input checked="" type="checkbox"/> Beach ID / Project ID <input checked="" type="checkbox"/> Station ID <input checked="" type="checkbox"/> Station Name <input type="checkbox"/> Org Name <input checked="" type="checkbox"/> Primary Type <input type="checkbox"/> Secondary Type <input type="checkbox"/> S/G/O Indicator <input type="checkbox"/> Well Number <input type="checkbox"/> Well Name <input type="checkbox"/> Pipe Number <input type="checkbox"/> NAICS Code <input type="checkbox"/> Spring Info* <input type="checkbox"/> Location Point Type <input type="checkbox"/> Point Sequence Number <input type="checkbox"/> Point Name <input checked="" type="checkbox"/> Latitude / Longitude* <input type="checkbox"/> Conv Latitude / Longitude* <input type="checkbox"/> Lat / Long Info* <input type="checkbox"/> *DISTINCT. Report Only Unique Record Set. <small>*Element Group. Click to see the Element list</small>	<input type="checkbox"/> Elevation (w/ Units) <input type="checkbox"/> Additional Elevation Info* <input type="checkbox"/> Country Name <input checked="" type="checkbox"/> State <input checked="" type="checkbox"/> County <input type="checkbox"/> Hydrologic Unit Code <input type="checkbox"/> Hydrologic Unit Name <input type="checkbox"/> Generated Hydrologic Unit Code <input type="checkbox"/> Generated Hydrologic Unit Name <input type="checkbox"/> RF1 Info* <input type="checkbox"/> NRCS Watershed ID <input type="checkbox"/> Estuary Info* <input type="checkbox"/> Great Lake Name <input type="checkbox"/> Ocean Name <input type="checkbox"/> Natv American Land Name <input type="checkbox"/> FRS Key Identifier <input type="checkbox"/> Description Text <input type="checkbox"/> Station Document / Graphic* <input type="checkbox"/> Administrative Submission / Change Record*
<input checked="" type="checkbox"/> Org ID <input checked="" type="checkbox"/> Beach ID / Project ID <input checked="" type="checkbox"/> Station ID <input checked="" type="checkbox"/> Station Name <input type="checkbox"/> Org Name <input checked="" type="checkbox"/> Primary Type <input type="checkbox"/> Secondary Type <input type="checkbox"/> S/G/O Indicator <input type="checkbox"/> Well Number <input type="checkbox"/> Well Name <input type="checkbox"/> Pipe Number <input type="checkbox"/> NAICS Code <input type="checkbox"/> Spring Info* <input type="checkbox"/> Location Point Type <input type="checkbox"/> Point Sequence Number <input type="checkbox"/> Point Name <input checked="" type="checkbox"/> Latitude / Longitude* <input type="checkbox"/> Conv Latitude / Longitude* <input type="checkbox"/> Lat / Long Info* <input type="checkbox"/> *DISTINCT. Report Only Unique Record Set. <small>*Element Group. Click to see the Element list</small>	<input type="checkbox"/> Elevation (w/ Units) <input type="checkbox"/> Additional Elevation Info* <input type="checkbox"/> Country Name <input checked="" type="checkbox"/> State <input checked="" type="checkbox"/> County <input type="checkbox"/> Hydrologic Unit Code <input type="checkbox"/> Hydrologic Unit Name <input type="checkbox"/> Generated Hydrologic Unit Code <input type="checkbox"/> Generated Hydrologic Unit Name <input type="checkbox"/> RF1 Info* <input type="checkbox"/> NRCS Watershed ID <input type="checkbox"/> Estuary Info* <input type="checkbox"/> Great Lake Name <input type="checkbox"/> Ocean Name <input type="checkbox"/> Natv American Land Name <input type="checkbox"/> FRS Key Identifier <input type="checkbox"/> Description Text <input type="checkbox"/> Station Document / Graphic* <input type="checkbox"/> Administrative Submission / Change Record*		

View Your Saved Results in Excel®

After saving text files, open Excel®. Go to “Open” file. Find the text file on your computer (make sure txt files are displayed in the file type dropdown menu). Open the text file and the text import wizard should automatically start.

1. You will be asked if the file is delimited or fixed – choose “**delimited**”, click “**Next**”
2. Choose Delimited as “**Tab**”, click “**Next**”
3. Click “**Finish**”

Each dataset received from STORET is in a stacked format (i.e., each column contains groups of information). Depending on intended use of the data, it may be necessary to change the table’s orientation. This can be accomplished in Excel using the “invert table” function or in JMP with the “split” function. Both of these programs can split data into a separate column for each group.

Characteristic Search Tips

When searching for a Characteristic, if you enter a name and no characteristics are found then try another portion of the characteristic. Example- Search for **fecal coliform**- If you enter “**coliform**” two results are found but fecal coliform is not a choice. If you enter “**fecal**” then you are provided with two choices to include fecal coliform.

Each program has provided a list of common characteristic names associated with their data as additional data reference sheets. These data reference sheets are posted under each program on the DWQ Environmental Sciences Section STORET webpage: <http://portal.ncdenr.org/web/wq/storethome>.