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Retrieving Ambient Water Quality Monitoring Data from STORET

North Carolina Ambient Monitoring System (AMS) data are made available to the public through the United States Environmental Protection Agency's STOrage and RETrieval data management system (a.k.a. STORET) at http://www.epa.gov/storet/ or through a link on the AMS website: http://portal.ncdenr.org/web/wq/ess/eco/ams.

Important Items to Remember when Searching for AMS Data through STORET

Organization identification is used to distinguish historic data from modern data

21NC01WQ- NCDENR-DWQ	**Historic Data through 1996**
21NC02WQ- NCDENR-DWQ (2nd)	**1997 to 2007**
21NC03WQ- NCDENR-DWQ WQX	**2008 to present**

Station Identification

All stations begin with a letter (A-Q) and end with a combination of 7 numbers (e.g. A1520000). The beginning letter represents a particular river basin as follows:

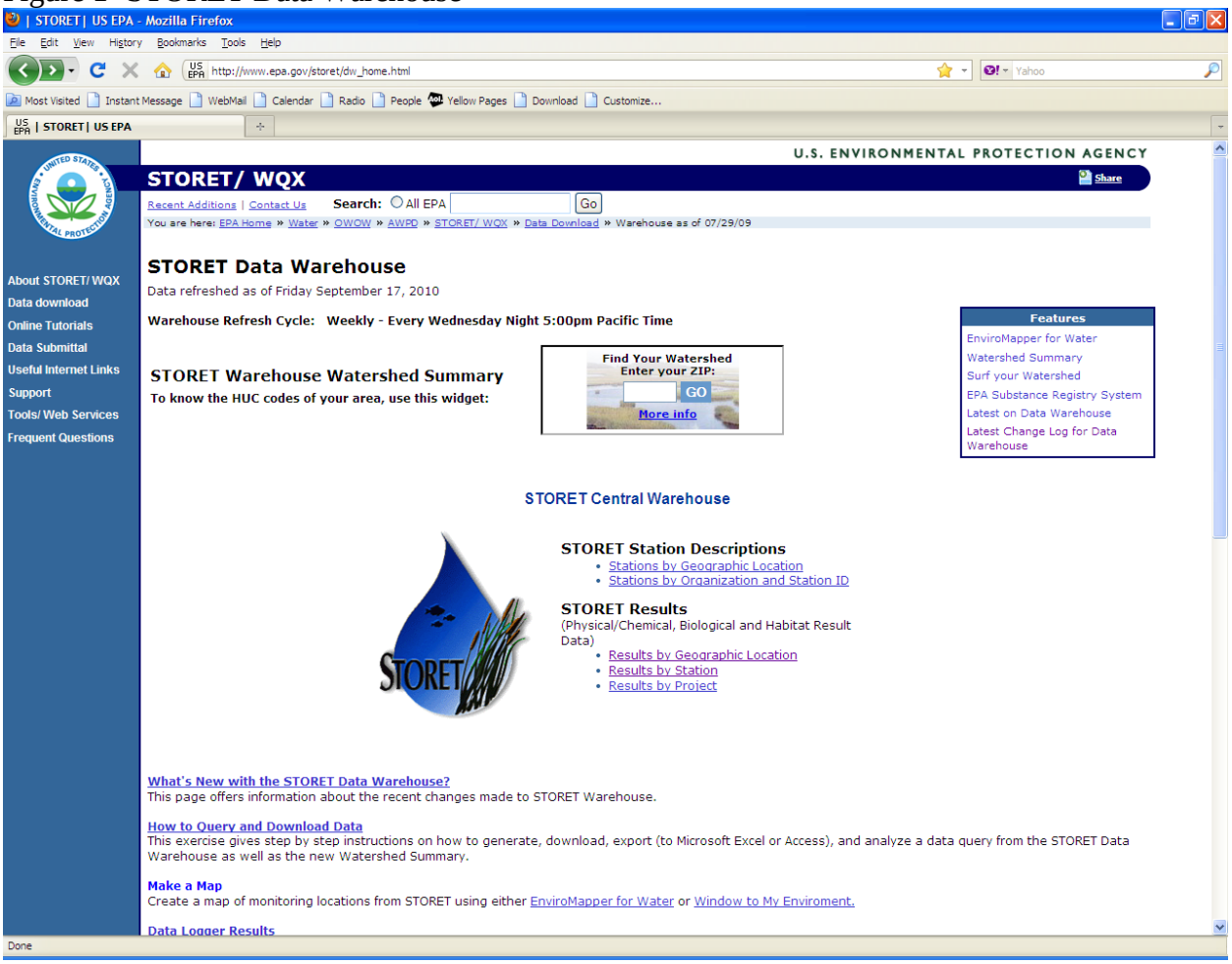
A-Broad	**G-Little Tennessee**	**M-Pasquotank**
B-Cape Fear	**H-Savannah**	**N-Roanoke**
C-Catawba	**I-Lumber**	**O-Tar/Pamlico**
D-Chowan	**J-Neuse**	**P-White Oak**
E-French Broad	**K-New**	**Q-Yadkin/Pee Dee**
F-Hiwassee	**L-Watauga**	

Getting Started

From the STORET homepage (http://www.epa.gov/storet/), click on "**Obtaining Water Quality Data**" located in the menu on the left hand side or along the bottom of the page. The STORET Database Access page will appear.

AMS data are stored in the Modernized version of STORET. Click on "**Browse or Download Modernized STORET Data**". You may need to scroll down the page to view the appropriate yellow button. This will open the STORET Data Warehouse page (Fig. 1) where users are able to search for Station Descriptions and Water Quality Results. The direct web address to the Data Warehouse is http://www.epa.gov/storet/dw_home.html.

Figure 1- STORET Data Warehouse



Search for STORET Results by Geographic Location

1. From the STORET Data Warehouse page (Fig.1) under **STORET Results**, click on "**Results by Geographic Location**".

2. The Regular Results by Geographic Location page will open. Here the requestor can search by **Geographic Location** (State/County, Latitude/Longitude or Drainage Basin/HUC)**, Station Type, Date, Activity Medium, and/or Characteristic*** (a.k.a. Parameter or Method name). Once the search criteria are entered, click "**Continue**".

3. The Result Search Summary page will open. This tells the requestor how many results are in the warehouse for the criteria entered. At the bottom of the page, the requestor is able to select which fields are reported. In addition to the default fields (Fig. 2), the requestor should add a check mark next to at least **Station Name** and **Activity/Result Comment**.
   The minimum fields to have checked are **Station ID, Station Name, Activity Start, Activity Depth, Activity Depth Unit, Characteristic Name, Result Value as Text, Units,** and **Activity/Result Comment.**

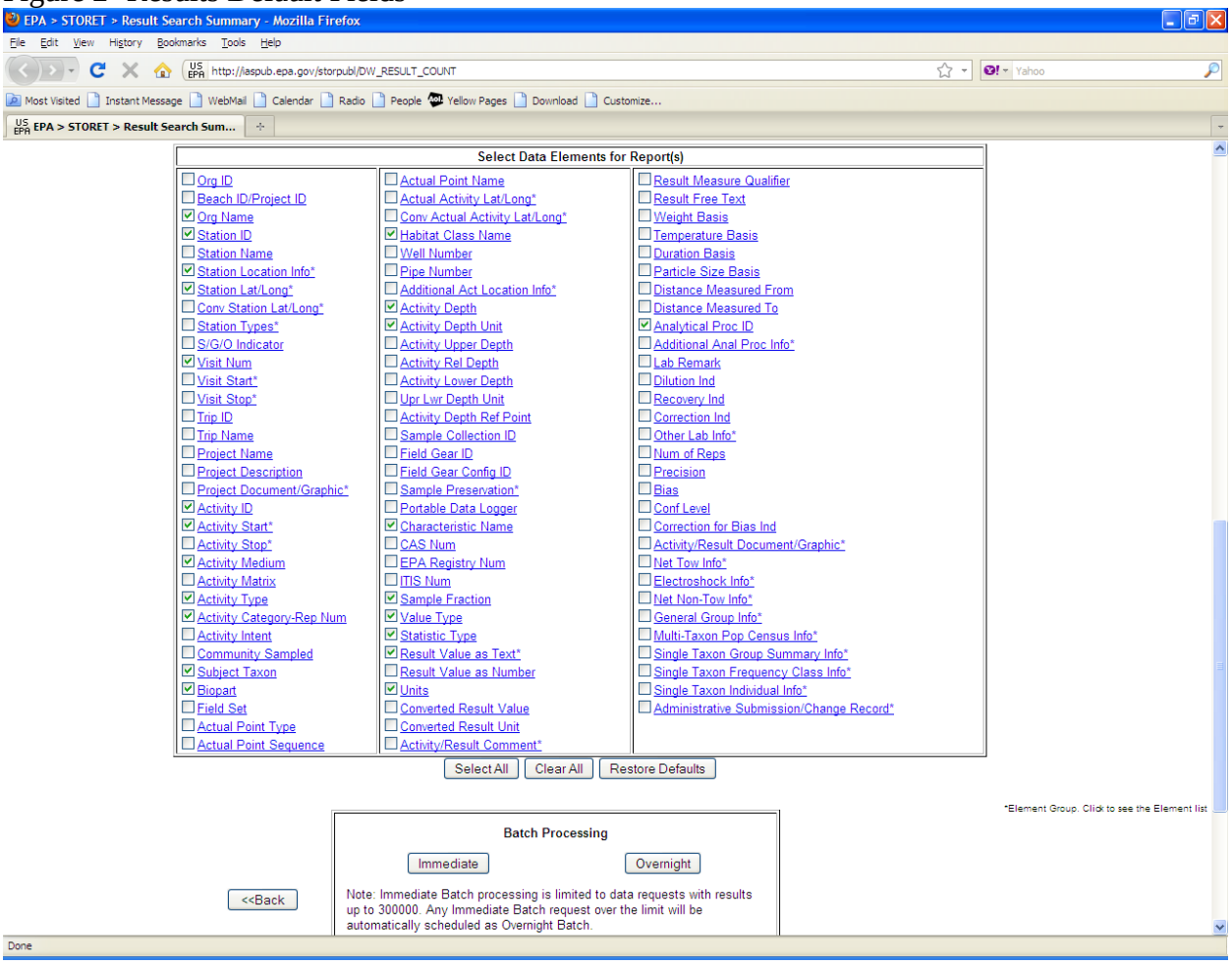
4. All data requests are completed by batch processing which requires the requestor to enter a **valid email address** and a **three-character prefix**. Click "**Immediate**" or "**Overnight**" Batch Processing. Immediate reports are for small searches (<300,000) and are available in 1-15 minutes. Overnight reports are for a maximum of 600,000 results and available the next day.

5. The Result Data Request Information page will open. This page confirms the custom batch processing request. The requestor will also receive an email confirming the request has been submitted.

6. Once the request is completed, the requestor will receive an email with a link to download your file. Save the file to your computer. This is a compressed file, which can be opened using WinZip® or another file compression software. The compressed file will include the data requested as a text file (Data_XYZ_yyyymmdd_hhmmss_RegResults.txt) and an additional text file containing the metadata (Data_XYZ_yyyymmdd_hhmmss_Metadata.txt).

7. Downloads with less than 65,000 records can be opened in Excel®. Larger downloads can be opened in Access® or other statistical software packages. **See *View Your Saved Results with Excel®* below for help with opening text files in Excel®.

Figure 2- Results Default Fields



Other additional fields of interest may include- **Activity ID, Sample Collection ID, Field Gear ID, Field Gear Config ID, Sample Preservation, and Other Lab Info**.

Search for Regular Results by Station

1. From the STORET Data Warehouse page (Fig. 1) under **STORET Results**, click "**Results by Station**".

2. The Results by Station page will open. Here the requestor can select an **Organization** and then search for the station(s) to pull data from. **Remember that AMS data are located under three organizations. In order to receive the full record of data for a station, the requestor will need to select the station(s) from all three organizations. The selected stations will appear in the box at the bottom of the Station Search area.**
   Also the requestor can search by selecting additional criteria in **Date, Activity Medium, and/or Characteristic*** (a.k.a. Parameter or Method name). Once the search criteria are entered, click "**Continue**".

3. The Results Search Summary will open and the remaining steps are the same as searching STORET Results by Geographic Location (3 thru 7).

Search for Station Descriptions

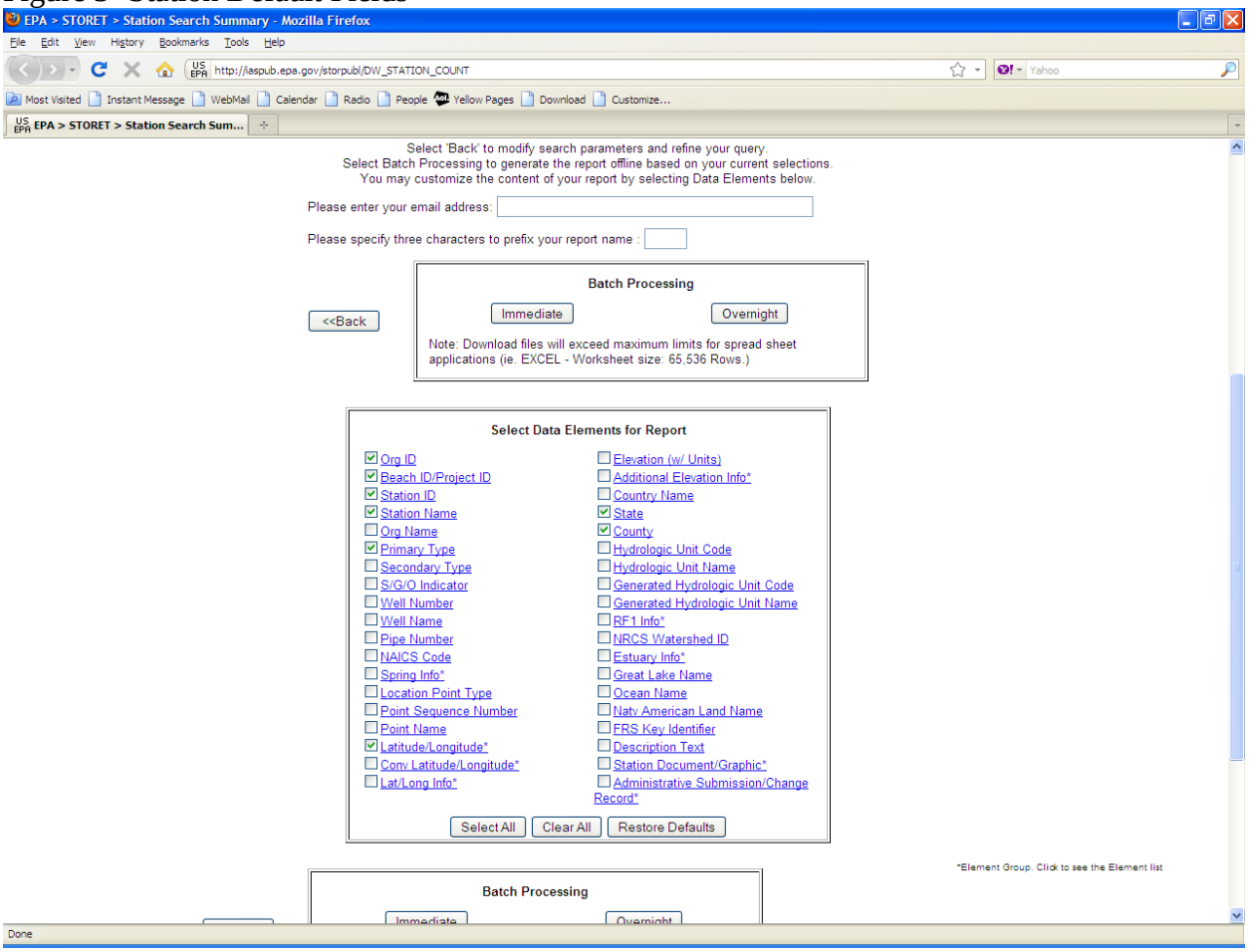
1. From the STORET Data Warehouse page (Fig.1) under **STORET Station Descriptions**, click "**Stations by Geographic Location**". Note: Station Results are not available from this search.

2. The Stations by Geographic Location page will open. Here the requestor can search by **State/County**, **Latitude/Longitude**, or **Drainage Basin/HUC**. Enter criteria based upon which type of search is to be performed. The search can be narrowed by entering **Station Type, Characteristic*** (a.k.a. Parameter or Method name), and/or **Organization**. Once the search criteria are entered, click "**Continue**".

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 requestor is able to select which fields are reported. STORET has default fields (Fig. 3) that will show up with your download. Other fields the requestor may wish to display are **Lat/Long Info, Estuary Info,** and/or **Hydrologic Unit Code/ Name**.

4. The remaining steps are the same as searching STORET Results by Geographic Location (4 thru 7) except the compressed file (6) will contain only one text file with all the station information (Data_XYZ_yyyymmdd_hhmmss_Stations.txt).

Figure 3- Station Default Fields



*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.

Some parameters do not have the same characteristic name in each Organization ID. See Table 1 for help identifying which characteristic name to select for those that vary by Organization ID.

Table 1- Characteristic Names by Organization ID for Select Parameters

Parameter Name	21NC01WQ	21NC02WQ	21NC03WQ
Ammonia (NH3)	Ammonia-nitrogen as N	Ammonia-nitrogen as N	Ammonia-nitrogen
NO2+NO3	Inorganic Nitrogen (nitrate and nitrite) as N	Inorganic Nitrogen (nitrate and nitrite) as N	Inorganic Nitrogen (nitrate and nitrite)
TKN	Kjeldahl nitrogen	Kjeldahl nitrogen	Kjeldahl nitrogen
TP	Phosphate-phosphorus as P	Phosphate-phosphorus as P	Phosphorus
Chlorophyll a	Chlorophyll a	Chlorophyll a, free of pheophytin	Chlorophyll a
Color	Color, True	Color, True	True Color
Hardness	Hardness, Ca + Mg	Hardness, Ca + Mg	Hardness, Ca, Mg
TSS	Solids, Total	Solids, Total Suspended (TSS)	Total Suspended Solids
Total Solids	Solids, Total	Solids, Total	Total Solids

**View Your Saved Results with Excel®

To view your results in Excel®, open Excel® and go to File> Open. Find the text file on your computer (make sure **txt** files are displayed in the file of type). Open the text file and the **text import wizard** should open.
Step 1- you will be asked if the file is delimited or fixed- choose "**delimited**", click "**Next**".
Step 2- choose Delimited as "**Tab**", click "**Next**".
Step 3- click "**Finish**".
The data should appear in an excel worksheet.

Other Data Resources

The STORET Data Warehouse page (Fig. 1) also has additional reference resources, which may be of interest. Below the search selection area, there is a link to "**Data Quality Documentation**". This will open the Metadata page, which provides the supporting data documentation. There is a list of reports that may be opened using Adobe Acrobat®. The reports include all the national organizations, so the user will need to scroll down to the organization they are interested in.