

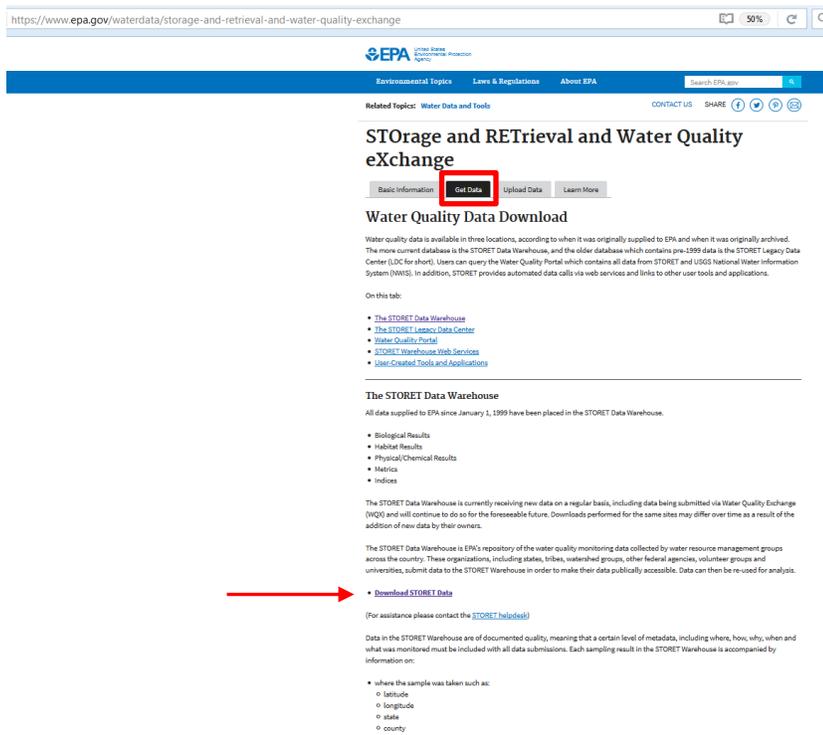
Retrieving Surface Water Quality Data

The North Carolina Division of Water Resources’ surface water monitoring data are stored within the U.S. Environmental Protection Agency’s STORage and RETrieval (STORET) data management system. The data are publicly-accessible directly through STORET at <https://www.epa.gov/waterdata/storage-and-retrieval-and-water-quality-exchange>, or through the National Water Quality Monitoring Council’s Water Quality Portal at <https://www.waterqualitydata.us/portal/> which pulls data from multiple national databases.

Getting Started in STORET

1. From the STORET homepage, click the “**Get Data**” tab, then scroll down and click on “**Download STORET Data**” (Figure 1).

Figure 1 – STORET



This will open the STORET Central Warehouse – STORET Data Report page (Figure 2), where you can select data to download.

2. From the STORET Central Warehouse – STORET Data Report 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). Once the search criteria have been entered, click **“Result Download”** at the bottom of the page.

Figure 2 – STORET Central Warehouse- STORET Data Report

Geographic Location
 Select a single type of location search that you wish to perform (state/county, latitude/longitude, or HUC). Then enter the corresponding search criteria.

State/County (Option A)
 State Name: ALL
 County Name: ALL
 Look Up

Select one or more state(s) (Option B)
 ALL, ALABAMA, ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, CONNECTICUT

Latitude/Longitude (in decimal degrees) (Option C)
 North Limit: 90
 West Limit: 180
 East Limit: 0
 South Limit: 0
 Manually Map Lat/Long Rectangle

Select and Search Organization and Station (Option 3)
 Select an Organization and a Search Type, then enter a Search String and click "Search Stations".
 (Wildcard Character Search is the 'percent symbol' = "%" and Example "%Tribal Land" to find.)

ORG ID: 21NC03WQ
 ORGANIZATION NAME: NCDENR-DWQ WQX

Search Type:
 Search by Station ID
 Search by Station Name
 Search by Station Alias
 Select Station Alias Type: STANDARD
 Look Up

Search String: J417

Search Stations

ORG ID	STATION ID	ALIAS TYPE	STATION ALIAS	STATION NAME
21NC03WQ	J4170000	N/A	N/A	NEUSE RIV AT NC 42 NR CLAYTON

Clear Selected Clear All

NOTES: To obtain data from specific station(s), choose **“Select and Search Organization and Station (Option 3)”**. Be sure to select the correct Organization ID (see program attachments at the end of this document for details). Search for a specific station in the **“Search String”** box and click **“Search Stations”**. Selected stations will appear in

the box below the “Search Stations” button. Multiple organization and station combinations can be selected by repeating this process.

When searching for a Characteristic, if you enter a name and no characteristics are found then try another portion of the characteristic. For example, if you search for fecal coliform by entering “coliform,” two results are found but fecal coliform is not a choice. If you enter “fecal” then you are provided with two choices, one of which is fecal coliform. Alternatively, leave the default set to all Characteristics and filter the results after download to select the parameters of interest.

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).

Before entering your email address and beginning data processing, go to the bottom of the page to select which fields you would like reported in addition to (or instead of) the default fields (Figure 4).

Figure 3 – Results Returned

STORET Central Warehouse

You are here: EPA Home & Water & Wetlands, Oceans, & Watersheds & Monitoring and Assessing Water Quality & STORET & STORET Data Warehouses & Warehouse Reports && Data Download

Disclaimer:

Water Quality Portal is the primary repository for ALL/BULK Data Download - [click here](#)

Number of Results Returned: 1,182

Search Criteria

State: ALL
County: ALL
Station(s): 21NC03WQ J417
Station Type(s): ALL
Activity Start Dates: ALL
Intent(s): ALL
Community Sampled: ALL
Medium: ALL
Characteristic(s): ALL

Select Report Type(s):

REGULAR (1182 record(s)) BIOLOGICAL (0 record(s))
 HABITAT (0 record(s))
 METRIC (0 record(s)) INDEX (0 record(s))

Select Included Metadata:

ACTIVITY GROUP

- 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.

<<Back

Batch Processing

Please select the appropriate user profile: Public

Please enter your email address:

Please specify three characters to prefix your report name:

Immediate Overnight

Note: immediate batch processing is limited to data requests with results up to

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 11,000,000 results. During peak demand, requests may take longer to complete. Overnight processing is preferred for larger reports. A link to all results will be sent directly to the email entered.

Figure 4 – Station Default Fields

Select Data Elements for Report(s)

<input type="checkbox"/> 14- Org ID	<input type="checkbox"/> 84- Field Gear Config ID	<input type="checkbox"/> 134- Toxicity Test Type
<input type="checkbox"/> 24- Reach ID/Project ID	<input type="checkbox"/> 85- Sample Preservation*	<input checked="" type="checkbox"/> 135- Result Depth Height*
<input checked="" type="checkbox"/> 26- Org Name	<input type="checkbox"/> 70- Portable Data Logger	<input checked="" type="checkbox"/> 139- Bio Individual
<input checked="" type="checkbox"/> 28- Station ID	<input checked="" type="checkbox"/> 71- Characteristic Name*	<input type="checkbox"/> 140- Unidentified Species ID
<input checked="" type="checkbox"/> 30- Station Name	<input type="checkbox"/> 73- CAS Num	<input checked="" type="checkbox"/> 141- Group Summary Count Weight
<input checked="" type="checkbox"/> 32- Station Location Info*	<input type="checkbox"/> 74- EPA Registry Num	<input checked="" type="checkbox"/> 142- Frequency Class
<input checked="" type="checkbox"/> 100- Station Lat/Long*	<input type="checkbox"/> 75- TIS Num	<input type="checkbox"/> 143- Laboratory Accreditation Indicator*
<input type="checkbox"/> 166- Conv. Station Lat/Long*	<input checked="" type="checkbox"/> 76- Sample Fraction	<input type="checkbox"/> 144- Lab Sample Preparation ID
<input type="checkbox"/> 166- Station Types*	<input checked="" type="checkbox"/> 77- Value Type	<input type="checkbox"/> 145- Lab Sample Prep Info*
<input type="checkbox"/> 186- S/G/O Indicator	<input checked="" type="checkbox"/> 78- Statistic Type	<input type="checkbox"/> 146- Dilution Factor
<input checked="" type="checkbox"/> 191- Visit Num	<input checked="" type="checkbox"/> 79- Result Value as Text*	<input type="checkbox"/> 147- Activity Conducting Organization
<input type="checkbox"/> 200- Visit Start*	<input checked="" type="checkbox"/> 81- Result Value as Number	<input checked="" type="checkbox"/> 148- Metric Type ID
<input type="checkbox"/> 221- Visit Stop*	<input checked="" type="checkbox"/> 82- Units	<input checked="" type="checkbox"/> 149- Metric Value
<input type="checkbox"/> 241- Trip ID	<input type="checkbox"/> 83- Converted Result Value	<input type="checkbox"/> 151- Taxon Detail Citation ID
<input type="checkbox"/> 251- Trip Name	<input type="checkbox"/> 84- Converted Result Unit	<input type="checkbox"/> 156- Metric Context
<input checked="" type="checkbox"/> 261- Activity ID	<input checked="" type="checkbox"/> 87- Activity/Result Comment*	<input checked="" type="checkbox"/> 157- Metric Unit
<input checked="" type="checkbox"/> 272- Activity Start*	<input checked="" type="checkbox"/> 87- Result Measure Qualifier	<input type="checkbox"/> 158- Metric Score
<input type="checkbox"/> 291- Activity Stop*	<input type="checkbox"/> 88- Result Free Text	<input type="checkbox"/> 159- Metric Name
<input checked="" type="checkbox"/> 311- Activity Medium	<input checked="" type="checkbox"/> 89- Weight Basis	<input type="checkbox"/> 160- Metric Scale
<input type="checkbox"/> 331- Activity Matrix	<input checked="" type="checkbox"/> 90- Temperature Basis	<input type="checkbox"/> 161- Metric Comment
<input checked="" type="checkbox"/> 331- Activity Type	<input checked="" type="checkbox"/> 91- Duration Basis	<input type="checkbox"/> 162- Formula Description
<input checked="" type="checkbox"/> 331- Activity Category-Rep Num	<input type="checkbox"/> 92- Particle Size Basis	<input type="checkbox"/> 163- Metric Detail Citation ID
<input checked="" type="checkbox"/> 331- Activity Intent	<input type="checkbox"/> 93- Distance Measured From	<input checked="" type="checkbox"/> 164- Index ID
<input checked="" type="checkbox"/> 361- Community Sampled	<input type="checkbox"/> 94- Distance Measured To	<input checked="" type="checkbox"/> 165- Index Type ID
<input checked="" type="checkbox"/> 370- Subject Taxon	<input checked="" type="checkbox"/> 95- Analytical Proc. ID	<input checked="" type="checkbox"/> 166- Index Type Name
<input checked="" type="checkbox"/> 380- Biopart	<input checked="" type="checkbox"/> 96- Additional Anal Proc Info*	<input checked="" type="checkbox"/> 167- Index Type Citation
<input type="checkbox"/> 391- Field Set	<input type="checkbox"/> 100- Lab Remark	<input type="checkbox"/> 168- Index Type Scale Text
<input type="checkbox"/> 400- Actual Point Type	<input type="checkbox"/> 102- Dilution Ind	<input checked="" type="checkbox"/> 169- Index Score
<input type="checkbox"/> 411- Actual Point Sequence	<input type="checkbox"/> 103- Recovery Ind	<input type="checkbox"/> 170- Index Qualifier Code
<input type="checkbox"/> 421- Actual Point Name	<input type="checkbox"/> 105- Correction Ind	<input type="checkbox"/> 171- Index Comment
<input type="checkbox"/> 431- Actual Activity Lat/Long*	<input type="checkbox"/> 106- Other Lab Info*	<input checked="" type="checkbox"/> 172- Index Calculated Date
<input type="checkbox"/> 471- Conv Actual Activity Lat/Long*	<input type="checkbox"/> 114- Num of Reqs	<input type="checkbox"/> 173- Administrative Submission/Change Record*
<input checked="" type="checkbox"/> 490- Habitat Class Name	<input type="checkbox"/> 115- Data Quality*	
<input type="checkbox"/> 511- Well Number	<input type="checkbox"/> 119- Correction for Bias Ind	
<input type="checkbox"/> 521- Pipe Number	<input type="checkbox"/> 120- Activity/Result Document/Graphic*	
<input type="checkbox"/> 531- Additional Act Location Info*	<input type="checkbox"/> 124- Net Tow Info*	
<input checked="" type="checkbox"/> 551- Activity Depth	<input type="checkbox"/> 150- Electroshock Info*	
<input checked="" type="checkbox"/> 551- Activity Depth Unit	<input type="checkbox"/> 155- Net Non-Tow Info*	
<input type="checkbox"/> 571- Activity Upper Depth	<input type="checkbox"/> 166- General Group Info*	
<input type="checkbox"/> 581- Activity Rel Depth	<input type="checkbox"/> 170- Multi-Taxon Pop. Census Info*	
<input type="checkbox"/> 591- Activity Lower Depth	<input type="checkbox"/> 178- Group Count Type	
<input type="checkbox"/> 601- Upr Lwr Depth Unit	<input type="checkbox"/> 179- Single Taxon Frequency Class Info*	
<input type="checkbox"/> 611- Activity Depth Ref Point	<input type="checkbox"/> 188- Single Taxon Individual Info*	
<input checked="" type="checkbox"/> 621- Sample Collection ID	<input type="checkbox"/> 190- Collection Duration Info*	
<input checked="" type="checkbox"/> 631- Field Gear ID	<input type="checkbox"/> 192- Reach Measure*	

*DISTINCT. Report Only Unique Record Set. *REGISTRY SYNONYMS. Report Characteristic(synonyms). *NO METADATA. Result Data Only (national query).

*Element Group. Click to see the Element list

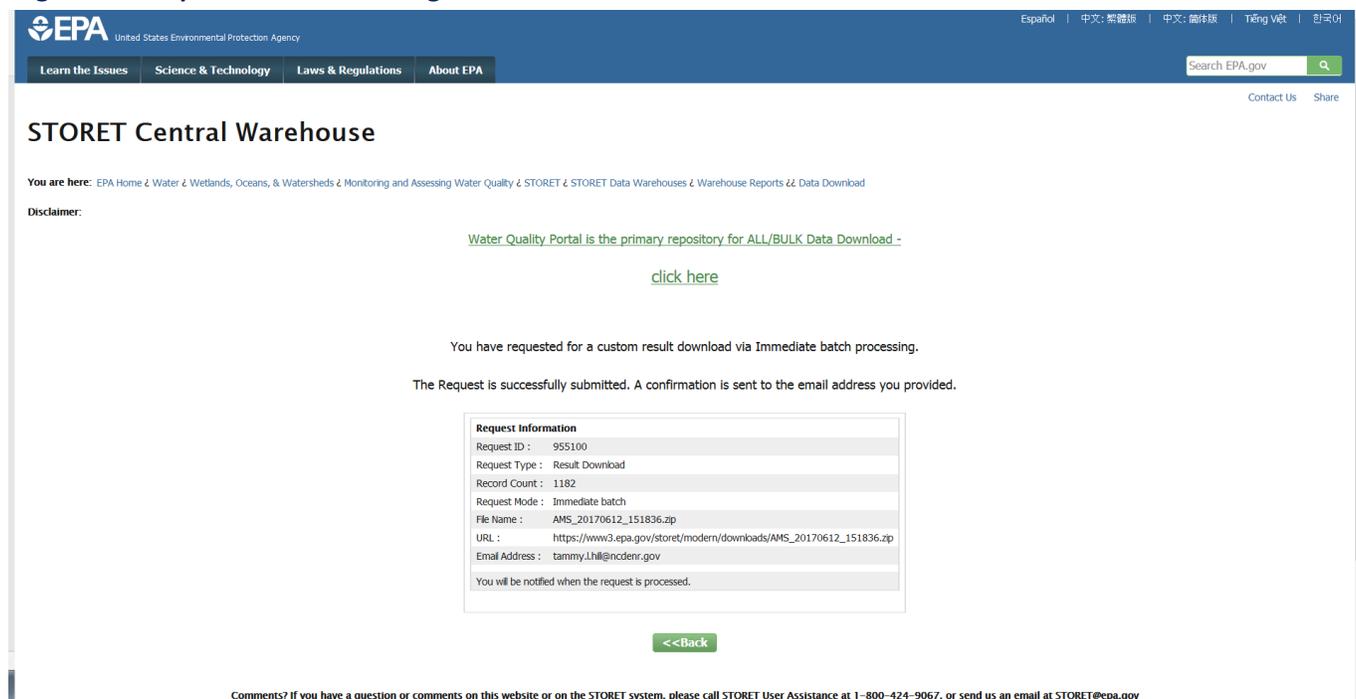
*NOTE: Fields may or may not be relevant depending upon the intended use of the data. Minimum suggested fields to have checked in addition to the default fields include: **Station Name** and **Additional Anal Proc Info**. If unsure of exactly which fields to select, click “**Select All**”. Unnecessary information can be removed later.*

4. The Results Data Request Information page (Figure 5) will then open. This page confirms that the custom result download 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.

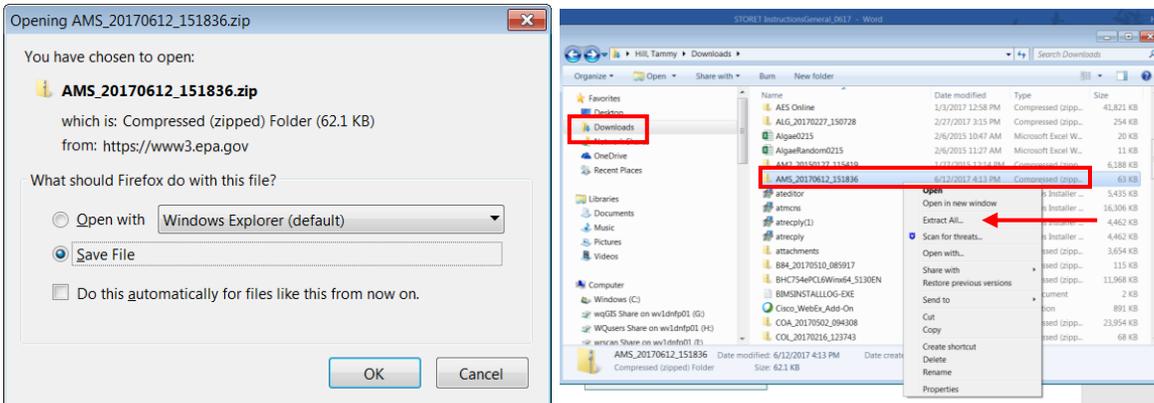
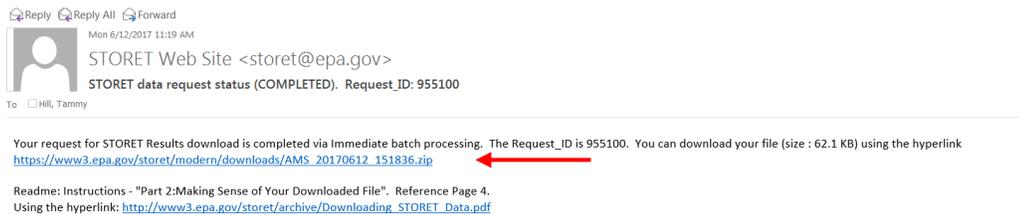
NOTE: The (PROCESSING) email includes search criteria and a record count to confirm the information requested.

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 “save”. 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_yyyymmdd_hhmmss_RegResults.txt) and an additional text file containing the metadata (Data_XYZ_yyyymmdd_hhmmss_Metadata.txt). Navigate to your Downloads folder and extract the files to the location of your choosing.

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



Downloads can be opened in Excel®, Access®, or other statistical software packages.

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

View Your Saved Results in Excel®

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

1. You will be asked if the file is delimited or fixed – choose **“Delimited”**. Check **“My data has headers.”** Click **“Next”**
2. Choose Delimited as **“Tab”**, click **“Next”**
3. General format works for most fields. To preserve text formatting, define some fields as **“Text”** (i.e., HUC, Result Value as Number).
4. Click **“Finish”**

Each dataset received from STORET is in a stacked format (i.e., each row contains one result for an individual sample with a unique combination of sample date, time, location, and parameter). Depending on the 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 programs can split data into separate columns for defined groups.



Ambient Monitoring System



STORET Organization

Organization identification is used to distinguish historic data from modern data.

21NC01WQ-NCDENR-DWQ	Historic data through 1996
21NC02WQ-NCDENR-DWQ (2nd)	1997 through 2007
21NC03WQ-NCDENR-DWQ WQX	January 1, 2008 to current

Station Identification

All stations begin with a letter (A-Q) and end with a combination of 7 numbers (e.g. A8190000). The beginning letter represents a specific river basin as follows:

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

STORET Characteristic Search

Some parameters do not have the same Characteristic name in each Organization ID, and some Characteristic naming conventions have changed over time, so you may have to select multiple Characteristics to query all results. See the table below for help identifying which Characteristic name(s) to select. Alternatively, leave the default set to all Characteristics and filter the results after download to select the parameters of interest.

Parameter	21NC01WQ	21NC02WQ	21NC03WQ
Ammonia (NH ₃)	Ammonia, Ammonia-nitrogen as N	Ammonia-nitrogen as N	Ammonia-nitrogen as N
Nitrate/Nitrite	Inorganic Nitrogen (nitrate and nitrite) as N	Inorganic Nitrogen (nitrate and nitrite) as N	Inorganic Nitrogen (nitrate and nitrite) as N
TKN	Kjeldahl nitrogen	Kjeldahl nitrogen	Kjeldahl nitrogen as N
Total Phosphorus	Phosphate-phosphorus as P	Phosphate-phosphorus as P	Phosphorus as P
Chlorophyll <i>a</i>	Chlorophyll <i>a</i>	Chlorophyll <i>a</i> , free of pheophytin	Chlorophyll <i>a</i>
Color	Color, True	Color, True	True Color
TSS	Solids, Total Suspended (TSS)	Solids, Total Suspended (TSS)	Total Suspended Solids
DO	Dissolved oxygen (DO)	Dissolved oxygen (DO)	Dissolved oxygen (DO)
Conductivity	Specific Conductance	Specific Conductance	Specific Conductance
Temperature	Temperature, water	Temperature, water	Temperature, water

AMS Information

<http://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/ecosystems-branch/ambient-monitoring-system>



Monitoring Coalition Program



STORET Organization

Organization identification is used to distinguish data generated through the Monitoring Coalition Program.

<u>Organization ID</u>	<u>Organization Name</u>
21NCMonitoring	NCDENR - DWR

Station Identification

All Coalition stations begin with a letter and end with a combination of 7 numbers.

The letters represent river basins as follows:

B – Cape Fear J – Neuse K – New O – Tar/Pamlico Q – Yadkin/Pee Dee

STORET Characteristic Search

When searching for a Characteristic, if you enter a name and no characteristics are found, try another portion of the parameter name. For example, if you search for fecal coliform by entering “coliform,” two results are found but fecal coliform is not a choice. If you enter “fecal” then you are provided with two choices, one of which is fecal coliform. Some Characteristic naming conventions have changed over time, so you may have to select multiple Characteristics to query all results. Alternatively, leave the default set to all Characteristics and filter the results after download to select the parameters of interest.

The following table gives the characteristic name(s) for common parameters:

Parameter Name	Characteristic Name(s) in STORET
Ammonia Nitrogen	Ammonia-nitrogen, Ammonia-nitrogen as N
Nitrate/Nitrite	Inorganic Nitrogen (nitrate and nitrite), Inorganic Nitrogen (nitrate and nitrite) as N
TKN	Kjeldahl nitrogen, Kjeldahl nitrogen as N
TP	Phosphorus, Phosphorus as P
Chlorophyll a	Chlorophyll, Chlorophyll a
pH	pH
TSS	Total Suspended Solids
DO	Dissolved oxygen (DO)
Conductivity	Specific Conductance
Temperature	Temperature, water
Turbidity	Turbidity
Fecal Coliform	Fecal coliform

Monitoring Coalition Information

<http://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/ecosystems-branch/monitoring-coalition-program>



Random Ambient Monitoring System



STORET Organization

Organization identification is used to distinguish data generated through the Random component of the Ambient Monitoring System.

21NC03WQ-NCDENR-DWR WQX January 1, 2007 to current Project= NCRNDM

Station Identification

All stations begin with a letter (A-Q) and end with a combination of 7 numbers (e.g. A8190000). The beginning letter represents a specific river basin as follows:

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

STORET Characteristic Search

When searching for a Characteristic, if you enter a name and no characteristics are found, try another portion of the parameter name. For example, if you search for fecal coliform by entering "coliform," two results are found but fecal coliform is not a choice. If you enter "fecal" then you are provided with two choices, one of which is fecal coliform. Alternatively, leave the default set to all Characteristics and filter the results after download to select the parameters of interest.

Activity Groups

Activity Groups are assigned to RAMS results to group the surface water and quality control (QC) samples together by sampling day and region collecting the samples (e.g., the Activity Group for Asheville Regional Office for 5/14/2008 is AROSP20080514). RAMS sampling includes the following QC samples: Volatile Organics (Trip Blanks) and Low-level Mercury (Field Blanks). Activity Group will need to be checked on the Result Search Summary for the Activity Groups to be downloaded with the results.

RAMS Information

<http://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/ecosystems-branch/random-ambient-monitoring-system>