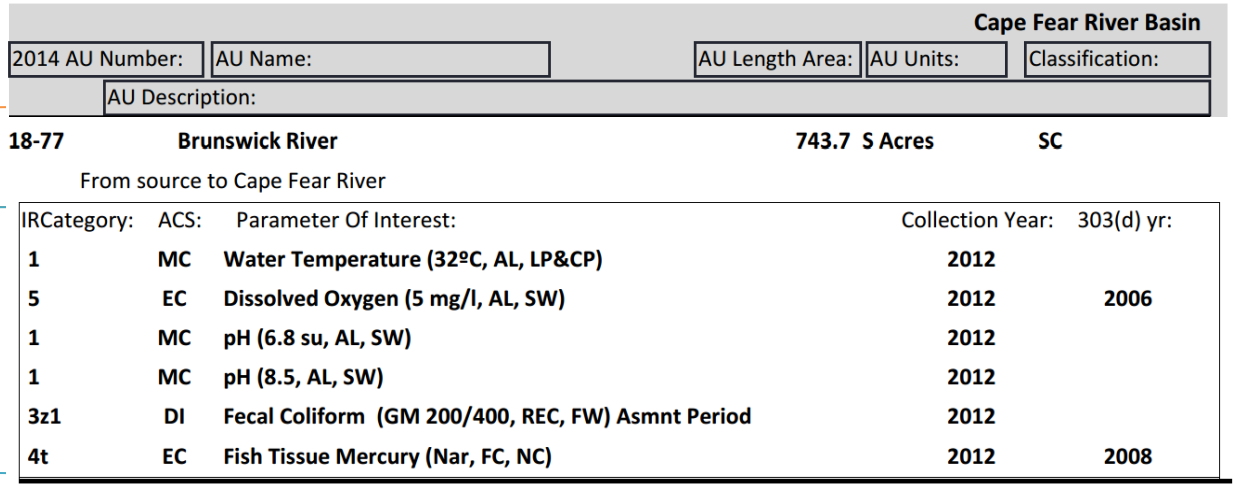
Understanding the 2014 NC Water Quality Assessment for the Integrated Report / 305(b)

The Integrated Report/305(b)

1. Assessment Unit (AU) description information

2. AU water quality parameter assessment information



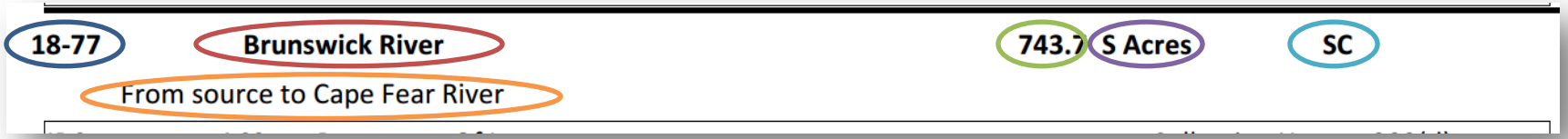
Cape Fear River Basin

2014 AU Number:	AU Name:	AU Length Area:	AU Units:	Classification:
	AU Description:			
18-77	Brunswick River	743.7	S Acres	SC
	From source to Cape Fear River			

IRCategory:	ACS:	Parameter Of Interest:	Collection Year:	303(d) yr:
1	MC	Water Temperature (32ºC, AL, LP&CP)	2012	
5	EC	Dissolved Oxygen (5 mg/l, AL, SW)	2012	2006
1	MC	pH (6.8 su, AL, SW)	2012	
1	MC	pH (8.5, AL, SW)	2012	
3z1	DI	Fecal Coliform (GM 200/400, REC, FW) Asmnt Period	2012	
4t	EC	Fish Tissue Mercury (Nar, FC, NC)	2012	2008

- The 305(b) is a list of all streams in NC that are identified by an assessment unit number (AU)
- Each AU has two types of information
  1. Stream segment (AU) description information
  2. Water quality parameter assessment information

Field Descriptions for AU Description Info



2014 AU Number

- Assessment Unit number used in 2014
- NC unique identifier for stream segments; total of 13,344 AUs

AU Name

- Generally, the name from USGS Geographic Name Information System

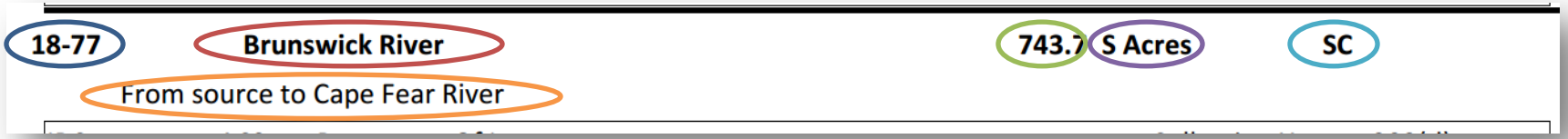
AU Length Area

- Length or area depending on AU Units

AU Units

- FW Miles- Freshwater creek, stream or river miles
- FW Acres- Reservoir or Lake acreages
- S Acres- Estuarine acres
- Atlantic Coast- Atlantic coastline miles

Field Descriptions for AU Description Info



Classification

- Water quality classification as of 12/31/2012
- Refer to http://portal.ncdenr.org/web/wq/ps/csu
- For a map of current classification http://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=6e125ad7628f494694e259c80dd64265

AU Description

- Describes the start and end points of an Assessment Unit

Field Descriptions for Parameter Info

IRCategory:	ACS:	Parameter Of Interest:	Collection Year:	303(d) yr:
1	MC	Water Temperature (32ºC, AL, LP&CP)	2012	
5	EC	Dissolved Oxygen (5 mg/l, AL, SW)	2012	2006
1	MC	pH (6.8 su, AL, SW)	2012	
1	MC	pH (8.5, AL, SW)	2012	
3z1	DI	Fecal Coliform (GM 200/400, REC, FW) Asmnt Period	2012	
4t	EC	Fish Tissue Mercury (Nar, FC, NC)	2012	2008

IRCategory

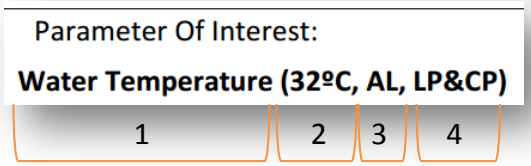
- Each water quality parameter assessed for an AU is assigned a North Carolina Integrated Reporting Category
- These categories are described in the following slide

ACS (Assessment Criteria Status)

- Applied to Parameters of Interest independently
- Values:
  - MC- Meeting Standard Criteria for parameter of interest
  - EC- Exceeding Standard Criteria for parameter of interest
  - DI- Data inconclusive to make an assessment for parameter of interest
- Assessment Criteria can be found here

IRCategory:	ACS:	Parameter Of Interest:	Collection Year:	303(d) yr:
1	MC	Water Temperature (32ºC, AL, LP&CP)	2012	
5	EC	Dissolved Oxygen (5 mg/l, AL, SW)	2012	2006
1	MC	pH (6.8 su, AL, SW)	2012	
1	MC	pH (8.5, AL, SW)	2012	
3z1	DI	Fecal Coliform (GM 200/400, REC, FW) Asmnt Period	2012	
4t	EC	Fish Tissue Mercury (Nar, FC, NC)	2012	2008

Parameter of Interest



- AUs are evaluated for each parameter in this list
- Included in this line are the following:
  1. The parameter [Water Temperature]
  2. The standard for that parameter which is specific to the stream classification [32°C]
  3. The standard type [AL] (See last page for a list of full descriptions)
  4. The area where this standard is applicable [LP&CP] (See last page for a list of full descriptions)

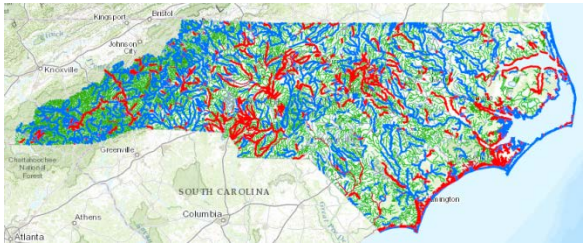
Collection Year

- The year the data were collected
- For ambient data, it is the last year of the five year cycle
- For biological data, it is the year of the last sample event

303(d) year:

- The year this AU was placed on the 303(d) Impaired Waters list for this parameter

Each Parameter of Interest (POI) for a particular Assessment Unit (AU) receives one of the following…



- **Meets Standard Criteria (MC)**
  - **Category 1** (see slide 10)
  - Previously known as Supporting
- **Data Inconclusive (DI)**
  - **Category 3** (see slide 11)
- **No Data**
  - Waters in the state that were not monitored
    - **NOTE:** All NC waters are in category 4t for a Mercury TMDL. Most do not have any other data or information to make an assessment
- **Exceeding Standard Criteria (EC)**
  - **Category 4**: Exceed standards but have an approved management strategy (see slide 12)
  - **Category 5**: Exceed standards and are on the 303(d) list (see slide 13)
  - Previously known as Impaired

An Overall Category is then determined by the parameter with the highest category value for that AU.

- Overall Categories are mostly used for symbolizing maps

Overall Category Example

18-77 **Brunswick River** **743.7 S Acres** **SC**

From source to Cape Fear River

IRCategory:	ACS:	Parameter Of Interest:	Collection Year:	303(d) yr:
1	**MC**	**Water Temperature (32ºC, AL, LP&CP)**	**2012**	
5	**EC**	**Dissolved Oxygen (5 mg/l, AL, SW)**	**2012**	**2006**
1	**MC**	**pH (6.8 su, AL, SW)**	**2012**	
1	**MC**	**pH (8.5, AL, SW)**	**2012**	
3z1	**DI**	**Fecal Coliform (GM 200/400, REC, FW) Asmnt Period**	**2012**	
4t	**EC**	**Fish Tissue Mercury (Nar, FC, NC)**	**2012**	**2008**

- This stream is color coded on a map as Exceeding Standard Criteria due to the Dissolved Oxygen parameter of interest
- Brunswick River Overall Category would be 5
- AUs with Category 5 parameters are placed on the 303(d) List

What are the letters behind the Category #'s?

18-77 **Brunswick River** **743.7 S Acres** **SC**

From source to Cape Fear River

IRCategory:	ACS:	Parameter Of Interest:	Collection Year:	303(d) yr:
1	**MC**	**Water Temperature (32ºC, AL, LP&CP)**	**2012**	
5	**EC**	**Dissolved Oxygen (5 mg/l, AL, SW)**	**2012**	**2006**
1	**MC**	**pH (6.8 su, AL, SW)**	**2012**	
1	**MC**	**pH (8.5, AL, SW)**	**2012**	
3z1	**DI**	**Fecal Coliform (GM 200/400, REC, FW) Asmnt Period**	**2012**	
4t	**EC**	**Fish Tissue Mercury (Nar, FC, NC)**	**2012**	**2008**

- These are state designated subcategories that provide additional detail to that category.
- Each are listed in the slides below.

Category 1 Descriptions

1	The Parameter assessed was meeting standard criteria
1b	Parameter assessed was meeting standard criteria and there is a management strategy in place for the assessed parameter
1f	Fish tissue was collected in that Assessment Unit and has no advisories other than statewide Mercury advice
1nc	Parameter assessed was exceeding some standard criteria but it was determined the exceedances were due to natural conditions (documentation is required for this subcategory)
1t	Parameter assessed was meeting standard criteria and there is an approved Total Daily Maximum Load (TMDL) in place for the assessed parameter

- **Meets Criteria (MC)**
  - Previously known as Supporting

Category 3 Descriptions

3a1	Greater than 10% of sample results exceeded standard criteria but did **not** have 90% statistical confidence of sample results
3a2	Greater than 10% of sample results exceeded standard criteria and had 90% statistical confidence of sample results, (only were there are more than 10 samples)
3a3	Benthos or fish community data are inconclusive
3a4	Fecal coliform Geomean>200 and/or 20% of samples >400 colonies; however, the 5 samples in 30 days (5n30) criterion was not met
3a5	Low DO- Greater than 10% of sample results exceeded standard criteria, a natural conditions assessment is needed
3a6	Low pH- Greater than 10% of sample results exceeded standard criteria, a natural conditions assessment is needed
3a8	Enterro sampled during the assessment period is meeting standard criteria
3a9	Temperature criteria exceeded in Class Tr (trout) waters with no assessment of thermal discharges
3b1	Greater than 10% of sample results exceeded standard criteria, did **not** have 90% statistical confidence of sample results, a management strategy is in place for parameter
3c1	Greater than 10% of sample results exceeded standard criteria, did **not** have 90% statistical confidence of sample results, a non-pollutant is the reason for exceedance
3cr	61 or more days under the Recreational Monitoring Advisory set by Division of Marine Fisheries
3e	Metals exceeding standard more than once in last three year. Criteria is not used for category 5 assessments in NC
3t1	Greater than 10% of sample results exceeded standard criteria, did **not** have 90% statistical confidence of sample results, approved TMDL is in place for parameter
3t3	No data or information to make assessment, approved TMDL is in place for parameter
3v1	Greater than 10% of sample results exceeded standard criteria, did **not** have 90% statistical confidence of sample results, exceedance due to permitted facility with a variance
3z1	Data not assessed against a NC water quality standard

- **Data Inconclusive (DI)**

Category 4 Descriptions

4b	Exceeding Criteria, an enforceable management strategy is in place and a TMDL is not required for parameter
4c	Exceeding Criteria, a non-pollutant is the reason for the exceedance
4cr	Recreational Monitoring Swimming Advisory Posted by Division of Marine Fisheries
4cs	Shellfish growing area designated as Not Approved. AU has an approved fecal coliform bacteria TMDL
4s	Biological data is exceeding criteria, another aquatic life parameter is in category 4 or 5
4t	Exceeding Criteria but has an approved TMDL for parameter
4v	Exceeding Criteria, exceedance due to permitted facility with a variance

- **Exceeding Criteria (EC)**
  - Previously known as Impaired
  - Category 4 assessments are exceeding criteria, but NOT on the 303(d) List

Category 5 Descriptions

5	Exceeding Criteria, NO approved TMDL in place for parameter
5e	Greater than 10% criteria exceeded, and did **not** have 90% statistical confidence of sample results. EPA listed the AU based on EPA guidance
5r	Exceeding Criteria, no approved TMDL in place for parameter, ongoing restoration activities are in place to address parameter exceedance

- **Exceeding Criteria (EC)**
  - Exceed criteria and on the 303(d) list
  - Previously known as Impaired

- For more information on water quality assessment refer to the 2014 Water Quality Assessment Methodology document.

- The following page shows all parameters of interest for the 2014 Water Quality Assessment.

Parameters of interest -(Standard Type or Number, Applicable Uses, Applicable area, water body type or Class

Parameter of Interest	Description and Application
Aluminum (µg/l, AL, FW)	N/A
Arsenic (10 µg/l, HH, NC)	Numeric water column criteria to protect human in health in all NC waters
Arsenic (50 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
Benthos Excellent (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Fair (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Good (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Good-Fair (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Moderate (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Natural (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Not Impaired (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Not Rated (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Poor (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Benthos Severe (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Berylium (6.5 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
Cadmium (0.4 µg/l, AL, Tr)	Numeric water column criteria to protect aquatic life in waters with Trout supplemental classification
Cadmium (2 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Cadmium (5 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
Chloride (230 mg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Chloride (250 mg/l, WS, WS)	Numeric water column criteria to protect for raw drinking water in NC waters with a water supply classification
Chlorine (17 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
Chlorophyll a (15 µg/l, AL, Tr)	Numeric water column criteria to protect aquatic life in waters with Trout supplemental classification
Chlorophyll a (40 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
Chromium (20 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
Chromium (50 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Copper (3 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters

Parameter of Interest	Description and Application
Copper (7 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Dioxin (0.000005 ng/l, WS & HH, NC)	Numeric water column criteria to protect human in health in all NC waters
Dissolved Oxygen (4 mg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Dissolved Oxygen (5 mg/l DA, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Dissolved Oxygen (5 mg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
Dissolved Oxygen (6 mg/l, AL, Tr)	Numeric water column criteria to protect aquatic life in waters with Trout supplemental classification
Dissolved Oxygen (NA, AL, swamp)	N/A
Ecological/biological Integrity Benthos (Nar, AL, FW)	N/A
Ecological/biological Integrity FishCom (Nar, AL, FW)	N/A
Enterrococcus (GM 35, REC, SW) 5n30	Numeric water column criteria to protect recreation in all NC salt waters
Enterrococcus (GM 35, REC, SW) Asmnt Period	Numeric water column criteria to evaluate recreation in all NC salt waters
Fecal Coliform (GM 200/400 5 in 30, REC, FW)	Numeric water column criteria to protect recreataion all NC fresh waters
Fecal Coliform (GM 200/400, REC, FW) Asmnt Period	Numeric water column criteria to evaluate recreataion all NC fresh waters
Fecal Coliform (GM 14 or 43, SH, SA)	Numeric fecal coliform criteria to protect shellfish harvesting in Class SA waters
Fish Community Excellent (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Fish Community Fair (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Fish Community Good (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Fish Community Good-Fair (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Fish Community Not Rated (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Fish Community Poor (Nar, AL, FW)	Based on narrative criteria to protect aquatic life in fresh water
Flouride (1.8 mg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Iron (1000 µg/l, Natural, FW)	N/A
Lead (25 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
Manganese (200 µg/l Aes, WS, FW)	N/A

Parameter of Interest	Description and Application
MBAS (500 µg/l, WS, WS)	Numeric water column criteria to protect for raw drinking water in NC waters with a water supply classification
Mercury (0.012 µg/l, FC, FW)	Numeric water column criteria to protect for fish consumption in NC fresh waters
Mercury (0.025 µg/l, FC, SW)	Numeric water column criteria to protect for fish consumption in NC salt waters
Nickel (25 µg/l, WS, WS)	Numeric water column criteria to protect for raw drinking water in NC waters with a water supply classification
Nickel (8.3 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
Nickel (88 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
NO2+NO3-N (10 mg/l, WS, WS)	Numeric water column criteria to protect for raw drinking water in NC waters with a water supply classification
PCB (0.001 µg/l, AL, NC)	Numeric water column criteria to protect aquatic life in all NC waters
PCB (0.064 ng/l, HH, NC)	Numeric water column criteria to protect human in health in all NC waters
pH (4.3 su, AL, Sw)	Numeric water column criteria to protect aquatic life in waters with Swamp supplemental classification
pH (6 su, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
pH (6.8 su, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
pH (8.5, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
pH (9.0, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
pH (NA, AL, swamp)	N/A
Recreation Advisory Postings (Pathogen Indicator, REC, NC)	Numeric criteria to protect recreation in waters classified for recreation in NC
Selenium (5 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Selenium (71 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters
Shellfish Growing Area-Approved (Fecal, SH, SA)	Based fecal coliform criteria to protect shellfish harvesting in Class SA waters
Shellfish Growing Area-Conditionally Approved Open (Fecal, SH, SA)	Based fecal coliform criteria to protect shellfish harvesting in Class SA waters
Shellfish Growing Area-Prohibited (Fecal, SH, SA)	Based fecal coliform criteria to protect shellfish harvesting in Class SA waters

Parameter of Interest	Description and Application
Shellfish Growing Area-Shellfish Growing Area-Conditionally Approved Closed (Fecal, SH, SA)	Based fecal coliform criteria to protect shellfish harvesting in Class SA waters
Turbidity (10 NTU, AL, Tr)	Numeric water column criteria to protect aquatic life in waters with Trout supplemental classification
Turbidity (25 NTU, AL, FW acres & SW)	Numeric water column criteria to protect aquatic life in NC fresh water reservoirs and salt waters
Turbidity (50 NTU, AL, FW miles)	Numeric water column criteria to protect aquatic life in all NC fresh flowing streams
Water Temperature (20ºC, AL, Tr)	Numeric water column criteria to protect aquatic life in waters with Trout supplemental classification
Water Temperature (29ºC, AL, MT&UP)	Numeric water column criteria to protect aquatic life in mountain and Upper Peidmont waters
Water Temperature (32ºC, AL, LP&CP)	Numeric water column criteria to protect aquatic life in Lower Peidmont and Coastal plain waters
Zinc (50 µg/l, AL, FW)	Numeric water column criteria to protect aquatic life in all NC fresh waters
Zinc (86 µg/l, AL, SW)	Numeric water column criteria to protect aquatic life in all NC salt waters