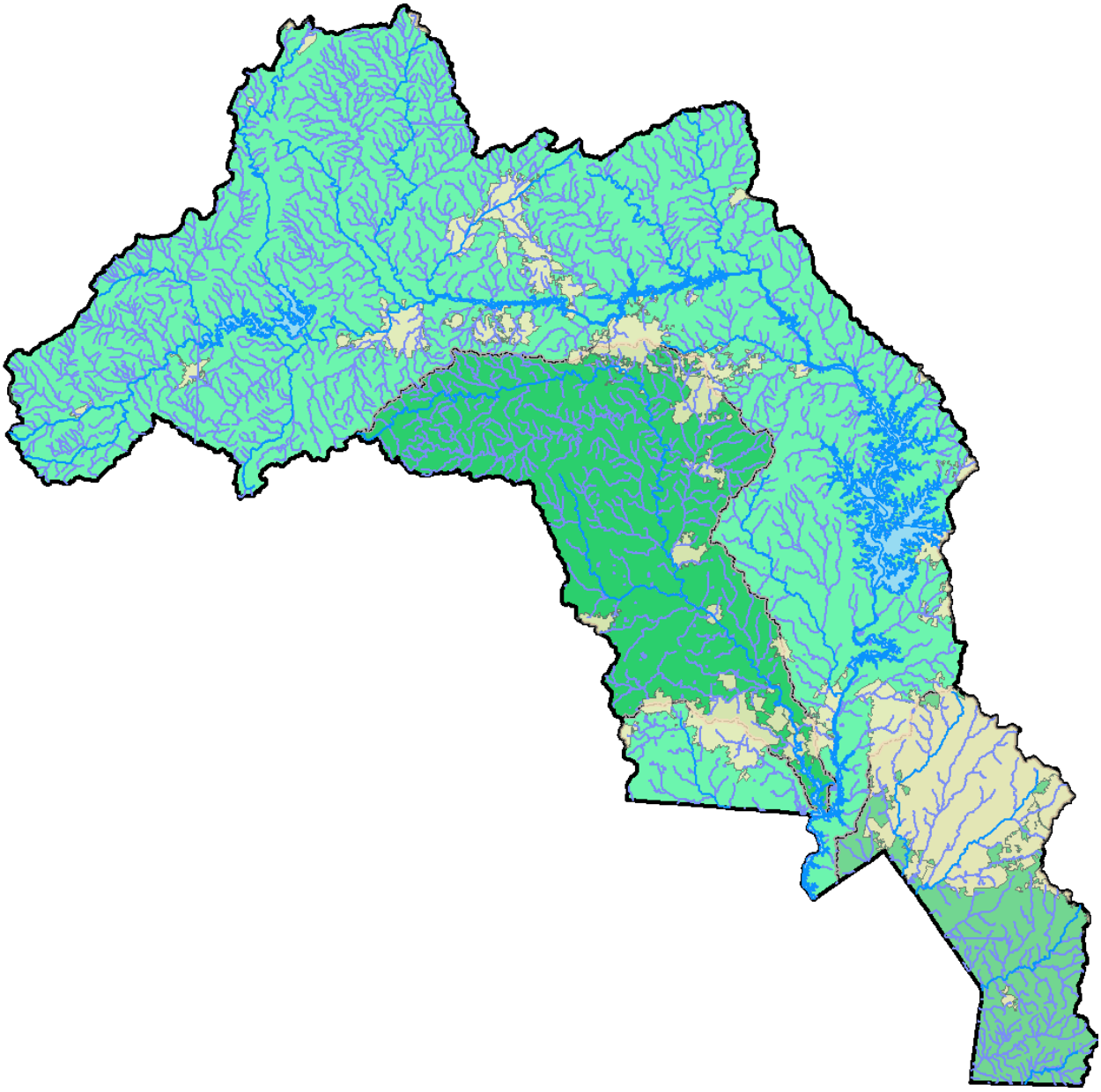


Catawba River Basin
Ambient Monitoring System Report

January 1, 2003 through December 31, 2007

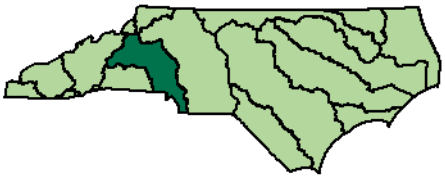


TABLE OF CONTENTS

Evaluation Levels

In order to assist the reader in developing a rapid understanding of the summary statistics provided throughout this data review, concentrations of water quality variables may be compared to an Evaluation Level (EL). Evaluation levels may be a water quality standard, an action level, an ecological threshold, or simply an arbitrary threshold that facilitates a rapid data review. Evaluation levels are further examined for frequency to determine if they have been exceeded in more than 10 percent of the observed samples. This summary approach facilitates a rapid and straightforward presentation of the data but may not be appropriate for making specific use support decisions necessary for identification of impaired waters under the Clean Water Act's requirements for 303(d) listings. The reader is advised to review the states 303(d) listing methodology for this purpose. (see http://h2o.enr.state.nc.us/tmdl/General_303d.htm).

TABLES

FIGURES

APPENDIXES

EXECUTIVE SUMMARY

A general understanding of human activities and natural forces that affect pollution loads and their potential impacts on water quality can be obtained through routine sampling from fixed water quality monitoring stations. During this assessment period (January 1, 2003 through December 31, 2007) chemical and physical measurements were obtained by DWQ from 35 stations located throughout the Catawba River Basin.

In order to evaluate acceptable water quality criteria at least 10 observations are desired. If at least 10 results were collected for a given site for a given parameter, the results are then compared to water quality evaluation levels. The water quality evaluation level may be an ecological evaluation level, a narrative or a numeric standard. If less than 10 results were collected, then no comparison to evaluation levels was made. When more than 10 percent of the results exceeded the evaluation level (10% criteria), a binomial statistical test was employed to determine how much statistical confidence there is that the results statistically exceed the 10% criteria. If at least 95% confidence was found that a 10% exceedance occurred, then that is termed a statistically significant exceedance (SSE). This method was applied for all parameters with an evaluation level, except for fecal coliform bacteria, which uses a 20% criteria in most waters as well as a geometric mean criteria. See page 12 for an explanation of fecal coliform methods. The results of the data analysis are displayed in tables, box plots, scatter plots, and maps. For complete summaries on each station, reference the AMS Station Summary Sheets located in Appendix A.

This review of water quality exceedances was performed using data that were collected between January 1, 2003 and December 31, 2007. A total of 17 sites were found with SSEs. Only two of these sites were found to have more than one SSE, Lower Creek near Morganton & Marion and Irwin Creek at the Irwin Creek WWTP in Charlotte. SSEs were found for fecal coliform screening at ten sites, pH at four sites, turbidity at four sites, and water temperature at one site. Five sites with 10% exceedances did not rise to the level of SSEs, and eight sites did not have any 10% exceedances.

Table 1 summarizes areas of potential concern in the Catawba River Basin using these criteria. While reading the table please note the following: The majority of the parameters listed are compared directly to their standards. There is one exception, however. The fecal coliform standard requires that five samples be taken in the span of 30 days, which was not done for this data. Therefore any fecal coliform reviews should be taken as a screening only. A visual summary of the evaluation level data is included as **Figure 1**.

With ten sites having SSEs for fecal coliform screening and six more having 20% exceedances, fecal coliform appears to be the most widespread issue in the basin. Fecal coliform screening data is assessed annually. The standard is assessed by collecting five samples in 30 days in waters that have more then 20% exceedance during a calendar year. All such class B (and class SB/SA in coastal basins) waters are assessed, and other waters as resources permit. There were no impacted class B waters in the Catawba River basin during the monitoring period. There have been no five in 30 assessments in the Catawba River Basin during the current monitoring period.

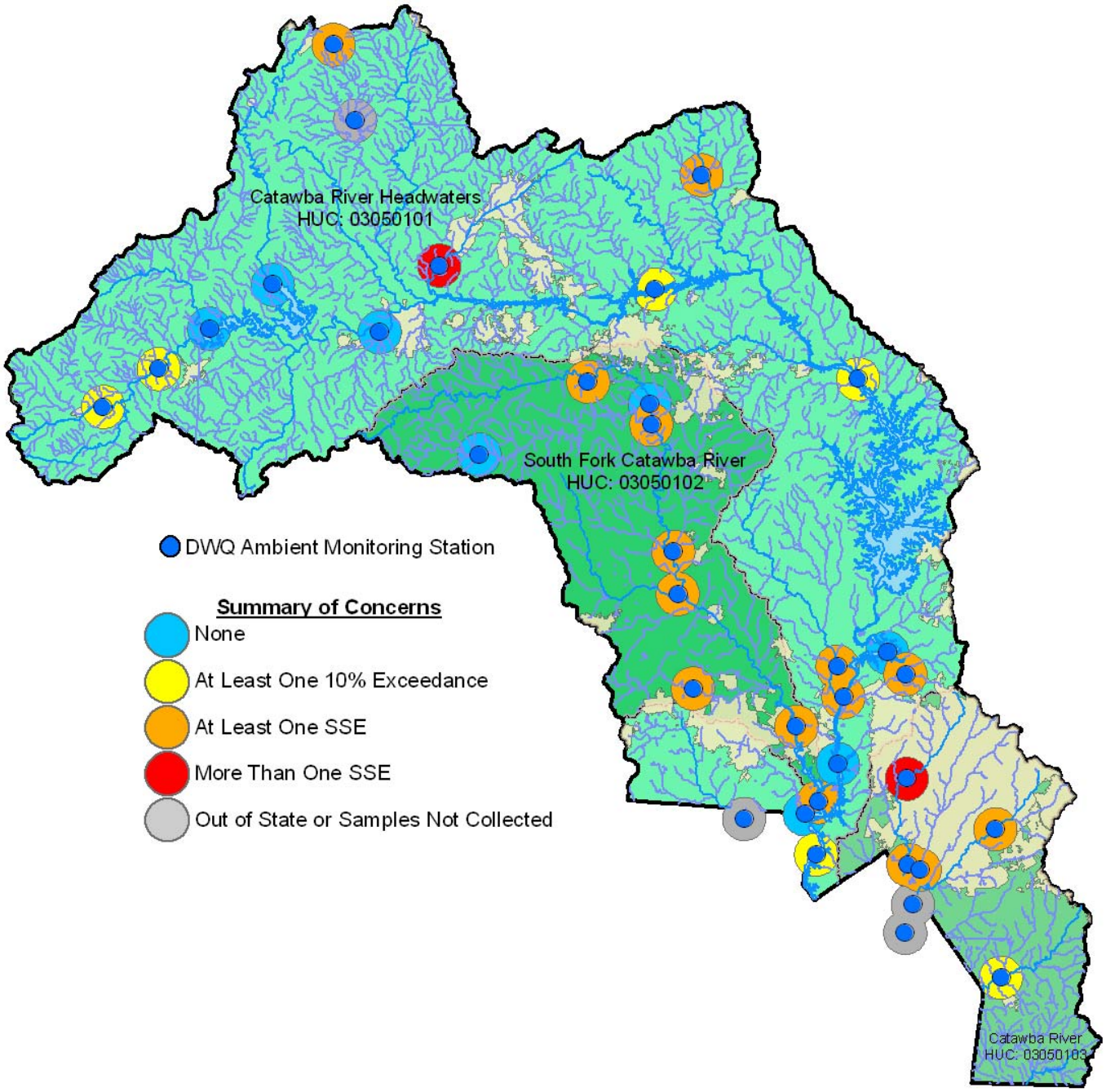
Table 1. Areas of Concern in the Catawba River Basin

Station	Location	Stream Class	Impaired[1]?	Parameter (Evaluation Level)	%Exceed	%Conf
HUC 03050101: Catawba River Headwaters						
C0145000	Catawba Riv At Sr 1234 Nr Greenlee	C	Yes[2]	Fecal coliform (>400 col/100 mL)	26.1%	88.6%
C0250000	Catawba Riv At Sr 1221 Nr Pleasant Gardens	C	Yes[2]	Fecal coliform (>400 col/100 mL)	20.4%	60.6%
C1370000	Wilson Crk At US 221 Nr Gragg	B Tr ORW	Yes[3]	pH (<6 SU)	18.8%	98.1%
C1750000	Lower Crk At Sr 1501 Nr Morganton Marion	WS-IV	Yes[4]	Fecal coliform (>400 col/100 mL)	53.8%	>99.9%
				Fecal coliform (Geomean >200)	497	
				Turbidity (>50 NTU)	21.2%	99.5%
C2600000	Lake Hickory At NC 127 Nr Hickory	WS-V&B	No	pH (<6 SU)	11.1%	70.8%
C2818000	Lower Little Riv At Sr 1313 Nr All Healing Springs	C	Yes[3]	pH (<6 SU)	13.8%	87.9%
				Fecal coliform (>400 col/100 mL)	47.5%	>99.9%
				Fecal coliform (Geomean >200)	406	
C3420000	Lake Norman At Sr 1004 Nr Mooresville	WS-IV&B CA	No	pH (<6 SU)	13.3%	84.1%
C3860000	Dutchmans Crk At Sr 1918 At Mountain Island	WS-IV	No	Fecal coliform (>400 col/100 mL)	32.1%	99.0%
				Fecal coliform (Geomean >200)	242	
C3900000	Catawba Riv At NC 27 Nr Thrift	WS-IV CA	Yes[3]	pH (<6 SU)	16.1%	95.1%
C4040000	Long Crk At Sr 2042 Nr Paw Creek	WS-IV	No	Fecal coliform (>400 col/100 mL)	26.8%	92.1%
				Fecal coliform (Geomean >200)	330	
				Turbidity (>50 NTU)	23.7%	99.9%
C7500000	Lake Wylie At NC 49 Nr Oak Grove	WS-V&B	No	Turbidity (>25 NTU)	11.1%	70.8%
HUC 03050102: South Fork Catawba River						
C4300000	Henry Fork Riv At Sr 1124 Nr Henry River	C	Yes[3]	pH (<6 SU)	18.6%	98.7%
C4380000	S Fork Catawba Riv At NC 10 Nr Startown	WS-IV	Yes[3]	pH (<6 SU)	20.3%	99.5%
				Fecal coliform (>400 col/100 mL)	21.4%	67.8%
C4800000	Clark Crk At Sr 1008 Grove St At Lincolnton	WS-IV	Yes[2]	Fecal coliform (>400 col/100 mL)	50.9%	>99.9%
				Fecal coliform (Geomean >200)	576	
				Turbidity (>50 NTU)	11.9%	76.6%
C5170000	Indian Crk At Sr 1252 Nr Laboratory	WS-IV	Yes[5]	Fecal coliform (>400 col/100 mL)	38.6%	>99.9%
				Fecal coliform (Geomean >200)	364	
C5900000	Long Crk At Sr 1456 Nr Bessemer City	C	No	Fecal coliform (>400 col/100 mL)	36.8%	99.9%
				Fecal coliform (Geomean >200)	391	
C6500000	S Fork Catawba Riv At NC 7 At Mcadenville	WS-V	Yes[2]	Fecal coliform (>400 col/100 mL)	25.9%	89.7%
				Turbidity (>50 NTU)	16.9%	96.9%
C7000000	S Fork Catawba Riv At Sr 2524 Nr South Belmont	WS-V B	Yes[2]	Water Temperature (>32 °C)	26.3%	>99.9%
HUC 03050103: Catawba River						
C8896500	Irwin Crk At Irwin Crk Wwtp Nr Charlotte	C	No	Fecal coliform (>400 col/100 mL)	42.9%	>99.9%
				Fecal coliform (Geomean >200)	396	
				Turbidity (>50 NTU)	18.6%	98.7%
C9050000	Sugar Crk At NC 51 At Pineville	C	No	Fecal coliform (>400 col/100 mL)	43.9%	>99.9%
				Fecal coliform (Geomean >200)	458	
C9210000	Little Sugar Crk At NC 51 At Pineville	C	Yes[6]	Fecal coliform (>400 col/100 mL)	50.9%	>99.9%
				Fecal coliform (Geomean >200)	499	
C9370000	Mcalpine Crk At Sr 3356 Sardis Rd Nr Charlotte	C	No	Fecal coliform (>400 col/100 mL)	41.4%	>99.9%
				Fecal coliform (Geomean >200)	400	
C9819500	Twelve Mile Crk At NC 16 Nr Waxhaw	C	Yes[2]	Fecal coliform (>400 col/100 mL)	24.1%	83.1%
				Fecal coliform (Geomean >200)	252	
				Turbidity (>50 NTU)	13.3%	85.8%

1. This column lists whether this area has been impaired (placed on the North Carolina 303(d)) for any reason. If it has, the impairments are listed in the following notes.
2. This area was impaired for turbidity violations in the draft 2008 Integrated Report.
3. This area was impaired for pH violations in the draft 2008 Integrated Report.
4. This area was impaired for turbidity violations in the 1998 Integrated Report.
5. This area was impaired for Ecological/Biological Integrity violations for both Benthos and Fish Community in the 2006 Integrated Report.
6. This area was impaired for Ecological/Biological Integrity violations for Benthos in the 1998 Integrated Report.

SSEs are shown in **blue**.

Figure 1. A Summary of Station Exceedances



INTRODUCTION

The DWQ's Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine stations strategically located for the collection of physical and chemical water quality data. The stations are located at convenient access points (e.g. bridge crossings) that are sampled on a monthly basis. These locations were chosen to characterize the effects of point source dischargers and nonpoint sources such as agriculture, animal operations, and urbanization within watersheds.

The data are used to identify long term trends within watersheds, to develop Total Maximum Daily Loads (TMDLs) and to compare measured values with water quality standards to identify possible areas of impairment. Parametric coverage is determined by freshwater or saltwater waterbody classification and corresponding water quality standards. Under this arrangement, core parameters are based on Class C waters with additional parameters added when justified (**Table 2**).

Within this document, an analysis of how monitoring results compare with water quality standards and evaluation levels is presented. A conceptual overview of water quality standards is provided at: http://www.epa.gov/waterscience/standards. Specific information on North Carolina water quality standards is provided at: http://h2o.enr.state.nc.us/csu/swstdsfaq.html. A summary of selected water quality standards are listed in **Table 3**.

Water quality data are evaluated in five year periods. Some stations have little or no data for several parameters over the period. However, for the purpose of standardization, data summaries for each station are included in this report. DWQ monitored water quality and collected samples at 35 stations throughout the basin. The locations of the sampling sites are illustrated in **Figure 2**, and listed in **Table 4**.

In January 2007 the DWQ began collection of samples from randomly determined sites. A description of the Random Sampling Program can be found here: http://h2o.enr.state.nc.us/esb/rams.html. There are four random sites located in the Catawba River Basin. At this time data analysis for these sites is incomplete.

Table 2. Parametric coverage for the Ambient Monitoring System.

Parameter
Dissolved oxygen (s)
pH (s)
Specific conductance
Temperature (s)
Total phosphorus
Ammonia as N
Total Kjeldahl as N
Nitrate+nitrite as N (s)
Total suspended solids
Turbidity (s)
Fecal coliform bacteria (s)
Chlorophyll *a* (s)

Notes:
An 's' indicates the parameter has a standard.
Chlorophyll *a* and nutrient sampling is only done in areas of concern, such as NSW, estuaries, and areas with known enrichment issues.

Table 3. Selected water quality standards

	Standards for All Freshwater			Standards to Support Additional Uses		
Parameter	Aquatic Life	Human Health	Water Supply Classifications	Trout Water	HQW	Swamp Waters
Chloride (mg/l)	230		250			
Chlorophyll *a* (ug/L)	40[2]			15[2]		
Coliform, total (MFTCC/100 ml)[3]			50[2] (WS-I only)			
Coliform, fecal (MFFCC/100 ml)[4]		200[2]				
Dissolved oxygen (mg/L)	4.0[5,6]			6.0		[2, 6]
Hardness, total (mg/L)			100			
Nitrate nitrogen (mg/L)			10			
pH (units)	6.0 - 9.0[2, 6]					[2, 6]
Solids, total suspended (mg/L)					10 Trout, 20 other[7]	
Turbidity (NTU)	50, 25[2]			10[2]		

Notes:
Standards apply to all classifications. For the protection of water supply and supplemental classifications, standards listed under Standards to Support Additional Uses should be used unless standards for aquatic life or human health are listed and are more stringent. Standards are the same for all water supply classifications (Administrative Code 15A NCAC 2B 0200, eff. August 1, 2004).
[2]Refer to 2B.0211 for narrative description of limits.
[3]Membrane filter total coliform count per 100 ml of sample.
[4]Membrane filter fecal coliform count per 100 ml of sample.
[5]An instantaneous reading may be as low as 4.0 mg/L, but the daily average must be 5.0 mg/L or more.
[6]Designated swamp waters may have a dissolved oxygen less than 5.0 mg/L and a pH as low as 4.3, if due to natural conditions.
[7]For effluent limits only, refer to 2B.0224(1)(b)(ii).

Figure 2. DWQ's Ambient Monitoring System in the Catawba River Basin.

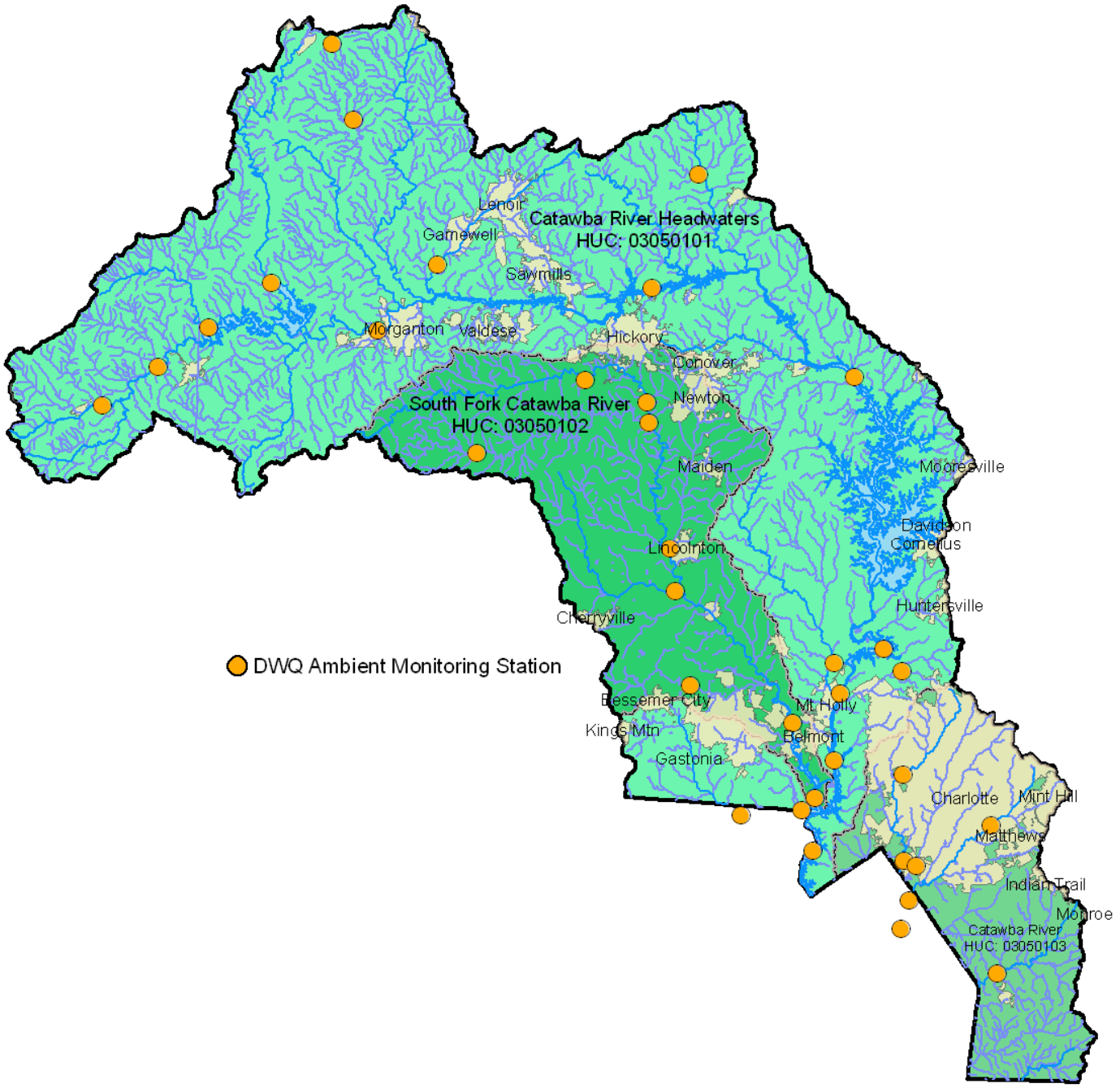


Table 4. Monitoring stations in the Catawba River Basin, 2003 - 2007.

Station	Location	Stream Class	Latitude	Longitude
Catawba River Headwaters: HUC 03050101				
C0145000[1]	Catawba River At Sr 1234 Nr Greenlee	C	35.6367	-82.1439
C0250000	Catawba River At Sr 1221 Nr Pleasant Gardens	C	35.686	-82.0608
C0550000	N Fork Catawba River At Sr 1552 Nr Hankins	C	35.7383	-81.9857
C1000000	Linville River At NC 126 Nr Nebo	B HQW	35.7954	-81.8901
C1230000	Catawba River At Sr 1304 Nr Calvin	WS-IV	35.7398	-81.7244
C1370000	Wilson Creek At US 221 Nr Gragg	B Tr ORW	36.097	-81.8074
C1385000[3]	Wilson Creek At Sr 1358 At Edgemont	B Tr ORW	36.003	-81.771
C1750000	Lower Creek At Sr 1501 Nr Morganton Marion	WS-IV	35.8251	-81.6359
C2600000[1]	Lake Hickory At NC 127 Nr Hickory	WS-V&B	35.802	-81.3043
C2818000	Lower Little River At Sr 1313 Nr All Healing Springs	C	35.9459	-81.237
C3420000[1]	Lake Norman At Sr 1004 Nr Mooresville	WS-IV&B CA	35.6956	-80.9908
C3699000[1]	Mountain Island Lake Above Gar Crk Nr Croft	WS-IV&B CA	35.3551	-80.9379
C3860000	Dutchmans Creek At Sr 1918 At Mountain Island	WS-IV	35.3365	-81.0133
C3900000	Catawba River At NC 27 Nr Thrift	WS-IV CA	35.2982	-81.0032
C4040000	Long Creek At Sr 2042 Nr Paw Creek	WS-IV	35.3285	-80.9096
C4220000[1]	Catawba River At Powerline Crossing At S Belmont	WS-IV&B CA	35.2148	-81.0097
C7400000	Catawba Creek At Sr 2302 At Sc State Line	WS-V B	35.1514	-81.0582
C7500000[1]	Lake Wylie At NC 49 Nr Oak Grove	WS-V&B	35.1013	-81.04
C8660000[2]	Crowders Creek At Sc 564 Ridge Rd Nr Bowling Green Sc	FW	35.1437	-81.1505
South Fork Catawba River: HUC 03050102				
C4300000	Henry Fork River At Sr 1124 Nr Henry River	C	35.6848	-81.4035
C4360000	Henry Fork River At Sr 1143 Nr Brookford	C	35.6583	-81.3084
C4370000	Jacob Fork At Sr 1924 At Ramsey	WS-III ORW	35.5906	-81.5671
C4380000	S Fork Catawba River At NC 10 Nr Startown	WS-IV	35.6331	-81.3053
C4800000	Clark Creek At Sr 1008 Grove St At Lincolnton	WS-IV	35.4753	-81.2672
C5170000	Indian Creek At Sr 1252 Nr Laboratory	WS-IV	35.4228	-81.2592
C5900000	Long Creek At Sr 1456 Nr Bessemer City	C	35.3052	-81.2326
C6500000	S Fork Catawba River At NC 7 At Mcadenville	WS-V	35.2601	-81.0739
C7000000	S Fork Catawba River At Sr 2524 Nr South Belmont	WS-V B	35.1667	-81.0383
Catawba River: HUC 03050103				
C8896500	Irwin Creek At Irwin Creek Wwtp Nr Charlotte	C	35.198	-80.9045
C9050000	Sugar Creek At NC 51 At Pineville	C	35.0907	-80.8996
C9210000	Little Sugar Creek At NC 51 At Pineville	C	35.085	-80.8822
C9370000	Mcalpine Creek At Sr 3356 Sardis Rd Nr Charlotte	C	35.1373	-80.7682
C9680000[2]	Mcalpine Creek At Sc Sr 2964 Nr Camp Cox Sc	FW	35.041	-80.8916
C9790000[2]	Sugar Creek At Sc 160 Nr Fort Mill Sc	FW	35.0059	-80.9022
C9819500	Twelve Mile Creek At NC 16 Nr Waxhaw	C	34.9523	-80.7558

1. Sample collection at these sites ceased during the current sampling period.

2. These sites are located in South Carolina and were not assessed for compliance with North Carolina standards.

3. This site was sampled less than 10 times during the assessment period.

PARAMETERS

Dissolved Oxygen

Dissolved oxygen is one of the most important of all the chemical measurements. Dissolved oxygen provides valuable information about the ability of the water to support aquatic life and the capacity of water to assimilate point and nonpoint discharges. Water quality standards for dissolved oxygen vary depending on the classification of the body of water. For freshwaters, 15A NCAC 02B .0211 (3)(b) specifies:

Dissolved oxygen: not less than 6.0 mg/l for trout waters; for non-trout waters, not less than a daily average of 5.0 mg/l with a minimum instantaneous value of not less than 4.0 mg/l; swamp waters, lake coves or backwaters, and lake bottom waters may have lower values if caused by natural conditions.

pH

The pH of natural waters can vary throughout the state. Low values, such as less than 7.0 Standard Units (SU), can be found in waters rich in dissolved organic matter, such as swamp lands. High values, such as greater than 7.0 su may be found during algal blooms. Point source dischargers can also influence the pH of a stream. The measurement of pH is relatively easy; however the accuracy of field measurements is limited by the abilities of the field equipment, which is generally accurate to within 0.2 SU. This is due, in part, because the scale for measuring pH is logarithmic (i.e. a pH of 8 is ten times less concentrated in hydrogen ions than a pH of 7). The water quality standards for pH in freshwaters consider values less than 6.0 SU. or greater than 9.0 SU. to warrant attention. In swamp waters, a pH below 4.3 SU. is of concern.

Specific Conductance

In this report, conductivity is synonymous with specific conductance. It is reported in micro-mhos per centimeter (µmhos/cm) at 25°C. Conductivity is a measure of the ability of water to conduct an electric current. The presence of ions and temperature are major factors in the ability of water to conduct a current. Clean freshwater has a low conductivity, whereas high conductivities may indicate polluted water or saline conditions. Measurements reported are corrected for temperature, thus the range of values reported over a period of time indicate the relative presence of ions in water. North Carolina freshwater streams have a natural conductance range of 17-65 µmhos/cm (USGS 1992).

Conductivity can be used to evaluate variations in dissolved mineral concentrations (ions) among sites with varying degrees of impact resulting from point source discharges. Generally, impacted sites show elevated and widely ranging values for conductivity.

Turbidity

Turbidity data may denote episodic high values on particular dates or within narrow time periods. These can often be the result of intense or sustained rainfall events; however elevated values can occur at other times.

Nutrients

Compounds of nitrogen and phosphorus are major components of living organisms and thus are essential to maintain life. These compounds are collectively referred to as “nutrients.” Nitrogen compounds include ammonia-nitrogen (NH_3-N), total Kjeldahl nitrogen (TKN) and nitrite+nitrate nitrogen (NO_2+NO_3-N). Phosphorus is measured as total phosphorus. When nutrients are introduced to an aquatic ecosystem from municipal and industrial treatment processes, or runoff from urban or agricultural land, the excessive growth of algae (algal blooms) and other plants may be accelerated.

At neutral pH in water, ammonia normally forms an ionized solution of ammonium hydroxide, with a small amount of deionized ammonia. However, as pH increases, more ammonia is left deionized. Deionized ammonia is toxic to fish and other aquatic organisms.

Fecal Coliform Bacteria

Concentrations of fecal coliform bacteria can vary greatly. The descriptive statistics used to evaluate fecal coliform bacteria data include the geometric mean and the median depending on the classification of the waterbody. For all sites in the Catawba River Basin, the standard specified in Administrative Code 15A NCAC 02B.0211 (3)(e) (May 1, 2007) is applicable:

"Organisms of the coliform group: fecal coliforms shall not exceed a geometric mean of 200/100ml (MF count) based upon at least five consecutive samples examined during any 30 day period, nor exceed 400/100ml in more than 20 percent of the samples examined during such period; violations of the fecal coliform standard are expected during rainfall events and, in some cases, this violation is expected to be caused by uncontrollable nonpoint source pollution; all coliform concentrations are to be analyzed using the membrane filter technique unless high turbidity or other adverse conditions necessitate the tube dilution method; in case of controversy over results, the MPN 5-tube dilution technique shall be used as the reference method."

All of the Catawba basin in North Carolina is composed of fresh waters. All sites where the geometric mean was greater than 200 colonies/100ml, or where greater than 20 percent of the results exceed 400 colonies/100ml (i.e. all sites that exceed the evaluation level) are indicated on the respective station summary sheets.

Fecal coliform problems are screened for using monthly sampling results on an annual basis. The standard is assessed by collecting five samples in 30 days in waters that have more then 20% exceedance during a calendar year. All such class B (and class SB/SA in coastal basins) waters are assessed, and other waters as resources permit.

WATER QUALITY MONITORING RESULTS SUMMARY

Water Quality within the basin during the evaluation period is summarized in the following tables. **Table 5** shows how often water quality evaluation levels were exceeded. **Table 6** shows average values, for comparison against HUC and basinwide averages. South Carolina stations were not included in **Table 5**.

Table 5. Frequency of Evaluation Level Exceedances

Station ID	Stream Class	Dissolved Oxygen (<4 mg/L)	pH (<6 SU) (freshwater)	pH (>9 SU) (freshwater)	Water Temperature (>29 °C) Mountain/U. Piedmont Waters	Water Temperature (>32 °C) Coastal/L. Piedmont Waters	Chlorophyll a (>15)	Turbidity (>50 NTU)	Turbidity (>25 NTU)	Turbidity (>10 NTU)	Nitrate & Nitrite (>10 mg/L)
Catawba River Headwaters: HUC 03050101											
C0145000	C	0.0%	2.2%	0.0%	0.0%	NS	NC	4.3%	NS	NS	NC, NS
C0250000	C	0.0%	0.0%	0.0%	0.0%	NS	NC	9.3%	NS	NS	NS
C0550000	C	0.0%	0.0%	0.0%	0.0%	NS	NC	5.6%	NS	NS	NS
C1000000	B HQW	0.0%	0.0%	0.0%	0.0%	NS	NC	1.9%	NS	NS	NS
C1230000	WS-IV	0.0%	0.0%	0.0%	0.0%	NS	NC	3.7%	NS	NS	NC
C1370000	B Tr ORW	0.0%[1]	18.8%	0.0%	0.0%	NS	L10	NS	NS	2.0%	NS
C1385000	B Tr ORW	L10	L10	L10	L10	L10	NC	NS	NS	L10	L10, NS
C1750000	WS-IV	0.0%	0.0%	0.0%	0.0%	NS	NC	21.2%	NS	NS	0.0%
C2600000	WS-V&B	0.0%	11.1%	2.2%	8.9%	NS	0.0%	NS	2.2%	NS	0.0%
C2818000	C	0.0%	13.8%	0.0%	0.0%	NS	NC	6.8%	NS	NS	NC, NS
C3420000	WS-IV&B CA	0.0%	13.3%	0.0%	NS	0.0%	2.4%	NS	4.4%	NS	0.0%
C3699000	WS-IV&B CA	0.0%	9.3%	0.0%	NS	0.0%	0.0%	NS	0.0%	NS	0.0%
C3860000	WS-IV	0.0%	5.2%	0.0%	NS	0.0%	NC	8.5%	NS	NS	0.0%
C3900000	WS-IV CA	0.0%	16.1%	0.0%	NS	1.8%	0.0%	NS	1.8%	NS	0.0%
C4040000	WS-IV	1.7%	0.0%	0.0%	NS	0.0%	NC	23.7%	NS	NS	NC
C4220000	WS-IV&B CA	0.0%	2.3%	0.0%	NS	4.5%	0.0%	NS	6.7%	NS	0.0%
C7400000	WS-V B	0.0%	5.2%	0.0%	NS	5.2%	L10	NS	5.3%	NS	0.0%
C7500000	WS-V&B	0.0%	2.2%	0.0%	NS	4.4%	0.0%	NS	11.1%	NS	0.0%
South Fork Catawba River: HUC 03050102											
C4300000	C	0.0%	18.6%	0.0%	NS	0.0%	NC	8.5%	NS	NS	NC, NS
C4360000	C	0.0%	6.8%	0.0%	NS	0.0%	NC	8.5%	NS	NS	NC, NS
C4370000	WS-III ORW	0.0%	0.0%	0.0%	NS	0.0%	L10	0.0%	NS	NS	0.0%
C4380000	WS-IV	0.0%	20.3%	0.0%	NS	0.0%	NC	8.5%	NS	NS	0.0%
C4800000	WS-IV	0.0%	0.0%	0.0%	NS	0.0%	NC	11.9%	NS	NS	0.0%
C5170000	WS-IV	0.0%	6.9%	0.0%	NS	0.0%	NC	5.1%	NS	NS	NC
C5900000	C	3.4%	8.5%	0.0%	NS	0.0%	NC	6.8%	NS	NS	NS
C6500000	WS-V	0.0%	3.4%	0.0%	NS	0.0%	NC	16.9%	NS	NS	0.0%
C7000000	WS-V B	0.0%	1.8%	0.0%	NS	26.3%	L10	NS	8.8%	NS	0.0%
Catawba River: HUC 03050103											
C8896500	C	0.0%	0.0%	0.0%	NS	0.0%	NC	18.6%	NS	NS	NC, NS
C9050000	C	0.0%	0.0%	0.0%	NS	0.0%	NC	10.0%	NS	NS	NS
C9210000	C	0.0%	0.0%	0.0%	NS	1.7%	NC	5.0%	NS	NS	NS
C9370000	C	1.7%	0.0%	0.0%	NS	0.0%	L10	10.0%	NS	NS	NS
C9819500	C	0.9%	1.7%	0.0%	NS	0.0%	NC	13.3%	NS	NS	NS

Notes:
NS: **No Standard** exists for this parameter in this stream class.
NC: Samples for this parameter were **Not Collected**.
L10: **Less than 10 samples** were collected for this parameter, therefore the results were not assessed.
1: In trout waters, a dissolved oxygen standard of 6 mg/L applies.

Table 6. Summary of Water Quality Parameter Averages (Arithmetic Means)

Station	Stream Class	Number of Sampling Events	D.O. (mg/L)	pH (SU)	Turbidity (NTU)	Water Temperature (°C)	Spec. conductance (umhos/cm at 25°C)	Chlorophyll a (ug/L)	Fecal coliform (# colonies per 100mL)	Total Inorganic Nitrogen (mg/L)	Total Organic Nitrogen (mg/L)	NH3 as N (mg/L)	NO2 + NO3 as N (mg/L)	TKN as N (mg/L)	Total Phosphorus (mg/L)
Entire Basin		1886	9.1	6.8	20.6	16.4	122.7	6.6	220	2.03	0.39	0.05	1.97	0.44	0.24
HUC 03050101		946	9.4	6.8	17.5	16.2	75.0	6.7	141	0.33	0.24	0.03	0.30	0.27	0.05
C0145000	C	46	10.9	6.7	17.1	12.4	51.3	NC	190	NC	NC	NC	NC	NC	NC
C0250000	C	54	10.6	6.9	20.9	13.4	48.3	NC	194	0.19	0.26	0.02	0.17	0.29	0.07
C0550000	C	54	10.4	7.5	17.8	14.3	95.9	NC	58	0.38	0.24	0.02	0.36	0.26	0.07
C1000000	B HQW	54	10.6	6.9	5.0	14.0	42.5	NC	17	0.30	0.19	0.02	0.28	0.21	0.03
C1230000	WS-IV	54	10.1	6.7	10.7	13.8	50.8	NC	38	NC	NC	NC	NC	NC	NC
C1370000	B Tr ORW	50	10.9	6.2	1.9	10.1	19.6	1.4	3	0.29	0.19	0.02	0.27	0.21	0.02
C1385000	B Tr ORW	1	9.6	6.8	1.0	19.2	21.0	NC	19	0.07	0.18	0.02	0.05	0.20	0.02
C1750000	WS-IV	52	9.6	6.8	34.4	14.3	90.3	NC	497	0.65	0.30	0.05	0.61	0.35	0.11
C2600000	WS-V&B	46	9.1	6.9	5.4	18.6	51.0	10.1	3	0.21	0.23	0.03	0.18	0.26	0.03
C2818000	C	59	9.8	6.4	24.6	13.8	47.3	NC	406	NC	NC	NC	NC	NC	NC
C3420000	WS-IV&B CA	46	8.7	6.6	9.6	18.5	53.1	7.9	20	0.29	0.23	0.03	0.26	0.26	0.04
C3699000	WS-IV&B CA	45	8.0	6.5	4.3	20.6	57.8	4.6	8	0.18	0.19	0.03	0.15	0.22	0.02
C3860000	WS-IV	59	9.6	6.7	31.4	14.8	89.8	NC	242	0.20	0.81	0.02	0.18	0.83	0.35
C3900000	WS-IV CA	57	7.6	6.4	4.7	20.2	60.0	2.6	11	0.20	0.18	0.03	0.17	0.22	0.02
C4040000	WS-IV	60	8.7	6.9	61.5	15.7	154.1	NC	330	NC	NC	NC	NC	NC	NC
C4220000	WS-IV&B CA	45	8.1	6.6	12.9	20.6	66.5	6.4	17	0.20	0.24	0.04	0.16	0.28	0.05
C7400000	WS-V B	59	8.6	7.3	8.6	21.5	79.5	17.0	7	0.32	0.26	0.02	0.30	0.28	0.03
C7500000	WS-V&B	46	8.5	7.1	8.7	21.0	74.2	9.2	4	0.21	0.27	0.03	0.18	0.30	0.04
C8660000	FW	59	9.3	6.8	22.5	15.3	182.4	NC	344	0.74	0.35	0.04	0.69	0.39	0.10
HUC 03050102		521	9.4	6.6	21.9	15.8	96.8	6.3	224	0.81	0.31	0.06	0.75	0.36	0.13
C4300000	C	59	9.8	6.5	13.2	14.2	29.8	NC	73	NC	NC	NC	NC	NC	NC
C4360000	C	59	9.7	6.5	21.7	14.7	84.8	NC	124	NC	NC	NC	NC	NC	NC
C4370000	WS-III ORW	49	11.2	6.6	2.5	13.4	22.7	2.9	58	0.08	0.18	0.02	0.06	0.20	0.02
C4380000	WS-IV	59	9.5	6.4	23.2	14.5	67.4	NC	176	0.53	0.16	0.04	0.49	0.20	0.02
C4800000	WS-IV	59	8.9	6.8	44.5	14.9	278.1	NC	576	1.75	0.40	0.10	1.66	0.49	0.27
C5170000	WS-IV	60	9.7	6.5	17.1	14.6	69.9	NC	364	NC	NC	NC	NC	NC	NC
C5900000	C	59	8.8	6.6	19.4	14.8	107.5	NC	390	0.47	0.28	0.04	0.43	0.32	0.09
C6500000	WS-V	59	9.6	6.8	37.7	15.6	114.6	NC	200	0.78	0.34	0.06	0.72	0.40	0.13
C7000000	WS-V B	58	8.0	6.9	14.6	25.0	79.5	8.0	18	0.37	0.34	0.02	0.35	0.36	0.04
HUC 03050103		419	8.3	6.9	25.8	17.7	262.4	3.0	395	5.52	0.67	0.09	5.43	0.76	0.61
C8896500	C	59	9.7	7.2	39.8	16.7	202.0	NC	396	NC	NC	NC	NC	NC	NC
C9050000	C	60	8.3	6.9	19.9	17.7	287.9	NC	458	6.27	0.56	0.06	6.21	0.62	0.65
C9210000	C	60	8.3	7.1	15.5	19.6	326.7	NC	499	6.22	0.73	0.08	6.14	0.81	0.99
C9370000	C	60	8.9	7.0	25.5	16.1	171.7	3.0	400	0.36	0.36	0.05	0.31	0.41	0.09
C9680000	FW	60	6.8	6.8	14.3	19.6	392.9	NC	307	11.44	1.08	0.20	11.24	1.28	0.99
C9790000	FW	60	7.8	7.0	29.0	18.5	321.1	NC	452	8.26	0.81	0.09	8.17	0.90	0.82
C9819500	C	60	8.2	6.8	37.0	15.3	146.8	NC	252	0.38	0.46	0.05	0.34	0.50	0.10

Notes: **NC**: Samples for this parameter were **Not Collected**.
Greyed entries have fewer then 10 samples collected.
Fecal Coliform shows geometric means for stations, and weighted arithmetic means of the geometric means for the whole basin and HUC averages.

ASSESSMENT AND INTERPRETATION METHODS

Monitoring and sampling results considered in this report represent samples collected or measurements taken at less than one-meter depth.

Percentile statistics were calculated for most of the data using JMP statistical software (version 5.01; SAS Institute, Cary, NC). Values less than the minimum reporting level (non-detects) were evaluated as equal to the reporting level. Box and whisker plots (constructed using SigmaPlot version 9) and maps are presented for most water quality parameters collected at each monitoring station. Significant trends in water quality parameters (constructed using Microsoft Excel) are illustrated as scatterplots. Significant trends are found by assessing the probability that the linear model explains the data no better then chance. If that chance is 5% or less (an observed significance probability of 0.05 or less) then that is considered evidence of a regression effect in this document. The strength of the regression effect is given as an r^2 value, the portion of the data that is explained by the linear model. There are many other types of modeling (non-linear) that can be used to explore trends, but they were not used in this document.

Assessment Considerations

Chlorophyll a

During this assessment period the DWQ Laboratory Section noted that chlorophyll a samples collected between 4/11/05 and 8/23/05 were incorrectly prepared for analysis, to the extent that the accuracy of the results is unknown. Therefore, the chlorophyll a results for this period were omitted from the dataset.

Total Metals

The North Carolina Division of Water Quality is currently reviewing water quality standards for metals. Review of historical total metals data and biological data has shown that no correlation exists between exceedance of total metals ambient standards and biological impairment. Therefore, as of May 2007 DWQ has suspended collection assessment of total metals at AMS stations.

Providing Confidence in the Exceedance of Water Quality Standards

Historically, NC DWQ has used guidance provided by the US EPA for determining when the number of results that exceed a water quality standard indicate potential water quality issues. The US EPA has suggested that management actions be implemented when 10 percent of the results exceeded a water quality standard. This interpretation is the same whether 1 out of 10, or 5 out of 50, or 25 out of 250 results exceed a standard. Evaluating exceedances in this manner is termed the “raw-score” approach. Although this “10 percent exceedance criterion” defines a point where potential water quality issues may be present, it does not consider uncertainty. Some results are subject to chance or other factors such as calibration errors or sample mishandling. Uncertainty levels change with sample size. The smaller the sample size, the greater the uncertainty.

This document uses a nonparametric procedure (Lin *et al.* 2000) to identify when a sufficient number of exceedances have occurred that indicate a true exceedance probability of 10 percent. Calculating the minimum number of exceedances needed for a particular sample size was done using the BINOMDIST function in Microsoft Excel®. This statistical function suggests that at least three exceedances need to be observed in a sample of 10 in order to be [about] 95 percent confident that the results statistically exceed the water quality standard more than 10% of the time. For example, there is less statistical confidence associated with a 1 exceedance out of 10 (74 percent) than when there are 3 exceedances out of 10 (99 percent confidence) (**Table 7**).

Table 7. Exceedance Confidence

Number of Samples	Number of Exceedances																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
10	74%	93%	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**							
12	66%	89%	**97%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**					
14	58%	84%	**96%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**			
16	51%	79%	93%	**98%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	
18	45%	73%	90%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
20	39%	68%	87%	**96%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
22	34%	62%	83%	94%	**98%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
24	29%	56%	79%	91%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
26	25%	51%	74%	89%	**96%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
28	22%	46%	69%	86%	94%	**98%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
30	18%	41%	65%	82%	93%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
32	16%	37%	60%	79%	91%	**96%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
34	13%	33%	55%	75%	88%	**95%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
36	11%	29%	51%	71%	85%	94%	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
38	10%	25%	46%	67%	83%	92%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
40	8%	22%	42%	63%	79%	90%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
42	7%	20%	38%	59%	76%	88%	95%	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
44	6%	17%	35%	55%	73%	85%	93%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
46	5%	15%	31%	51%	69%	83%	92%	**96%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
48	4%	13%	28%	47%	65%	80%	90%	**95%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
50	3%	11%	25%	43%	62%	77%	88%	94%	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
52	3%	10%	22%	40%	58%	74%	86%	93%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
54	2%	8%	20%	36%	54%	71%	83%	91%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
56	2%	7%	18%	33%	51%	67%	81%	90%	**95%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
58	2%	6%	16%	30%	47%	64%	78%	88%	94%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
60	1%	5%	14%	27%	44%	61%	75%	86%	93%	**97%**	**99%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**
62	1%	5%	12%	24%	40%	57%	72%	84%	91%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**
64	1%	4%	11%	22%	37%	54%	69%	81%	90%	95%	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**
66	1%	3%	9%	20%	34%	51%	66%	79%	88%	94%	**97%**	**99%**	**99%**	**100%**	**100%**	**100%**	**100%**
68	1%	3%	8%	18%	31%	47%	63%	76%	86%	93%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**
70	1%	2%	7%	16%	29%	44%	60%	74%	84%	91%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**	**100%**
72	0%	2%	6%	14%	26%	41%	57%	71%	82%	90%	95%	**97%**	**99%**	**100%**	**100%**	**100%**	**100%**
74	0%	2%	5%	13%	24%	38%	54%	68%	80%	88%	94%	**97%**	**99%**	**99%**	**100%**	**100%**	**100%**
76	0%	1%	5%	11%	22%	35%	51%	65%	77%	86%	93%	**96%**	**98%**	**99%**	**100%**	**100%**	**100%**
78	0%	1%	4%	10%	20%	33%	48%	62%	75%	85%	91%	**95%**	**98%**	**99%**	**100%**	**100%**	**100%**
80	0%	1%	4%	9%	18%	30%	45%	59%	72%	83%	90%	95%	**97%**	**99%**	**99%**	**100%**	**100%**

Note: Bold entries indicate that there is at least 95% confidence that at least 10% of the possible samples exceed the evaluation level.

Methods Used to Summarize Results

Methods used to summarize the results in this report encompass both tabular and graphical formats. Individual summary sheets for each station provide details on station location, stream classification, along with specifics on what parameters were measured, the number of samples taken (i.e. sample size), the number of results below reporting levels, the number of results exceeding a water quality standard or evaluation level, statistical confidence that 10% of results exceeded the evaluation level, and a general overview of the distribution of the results using percentiles. These station summary sheets provide the greatest details on a station-by-station basis. They are included as **Appendix A** to this report.

Box and whisker plots, scatterplots, and maps were used to depict data for a variety of water quality parameters throughout the basin. For the box plots, stations with fewer then 10 data points for a given parameter were not included. This occasionally occurred when a new station was added, an old station was removed, or a station was moved to a new location in the basin.

Comparisons were depicted in the following ways:

- Comparing stations – box plots
- Assessing Stations – tables
- Comparing HUCs – box plots and scatterplots
- Assessing trends - scatterplots
- Assessing the basin – maps

Box and Whisker Plots

The primary method of analyzing data in this report is through the use of box and whisker plots. **Figure 3** is an annotated example of a box and whisker plot that illustrates the distribution of the results for a particular parameter at a single site. This box plot contains both the median and mean values. Differences between the median and mean can illustrate the distribution of the results. For example, if the mean is considerably larger then the median, then there are likely a few very high concentrations raising the mean. Another useful measure is to compare the 90th percentile against the evaluation level. For most parameters, 10% exceedance of the evaluation levels is considered a violation. Therefore the 90th (or 10th in the case of minimum evaluation levels) percentile exceeding the evaluation level is an equivalent statement.

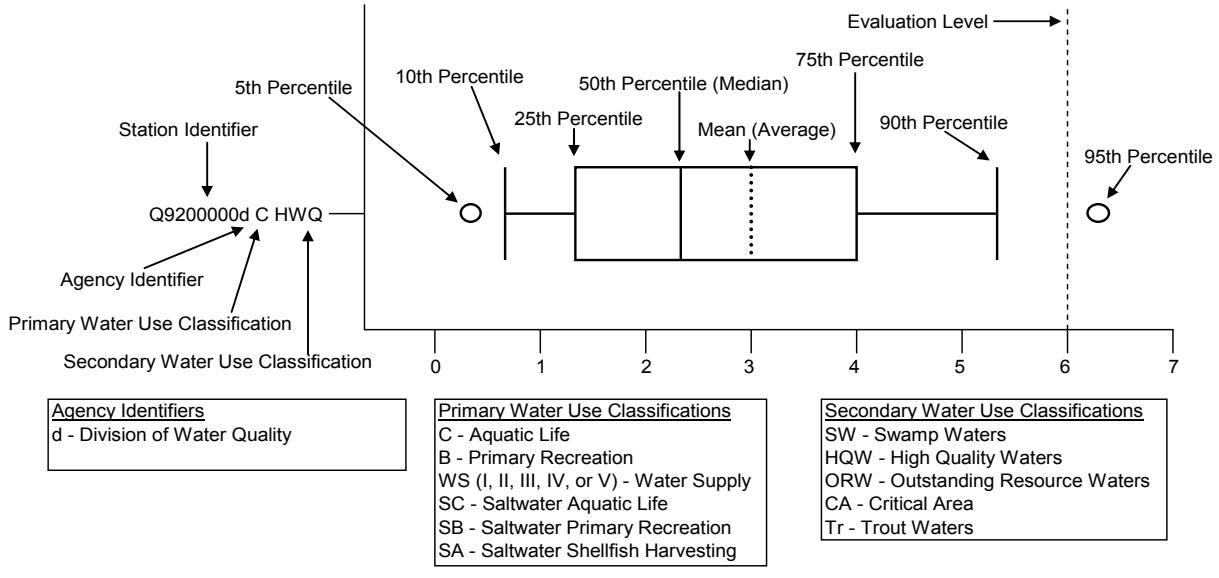


Figure 3. An Example Box Plot for a Station

Figure 4 is an example of a box and whisker plot that is comparing four HUCs for a single parameter. In this case the box plots are vertical instead of horizontal. Also note that a "mean diamond" is present on each. The center line of each diamond is the average. The short lines above and below the center are called "overlap marks" and represent a 95% confidence interval for the mean. To compare means, extend the overlap marks as shown in the figure. If the overlap mark of one diamond is closest to the mean line of another diamond then the two averages are not significantly different. If the overlap line is closer to the other diamond's overlap mark, then they are significantly different.

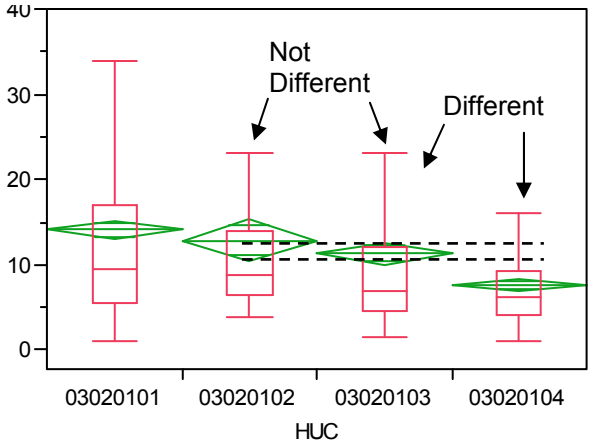
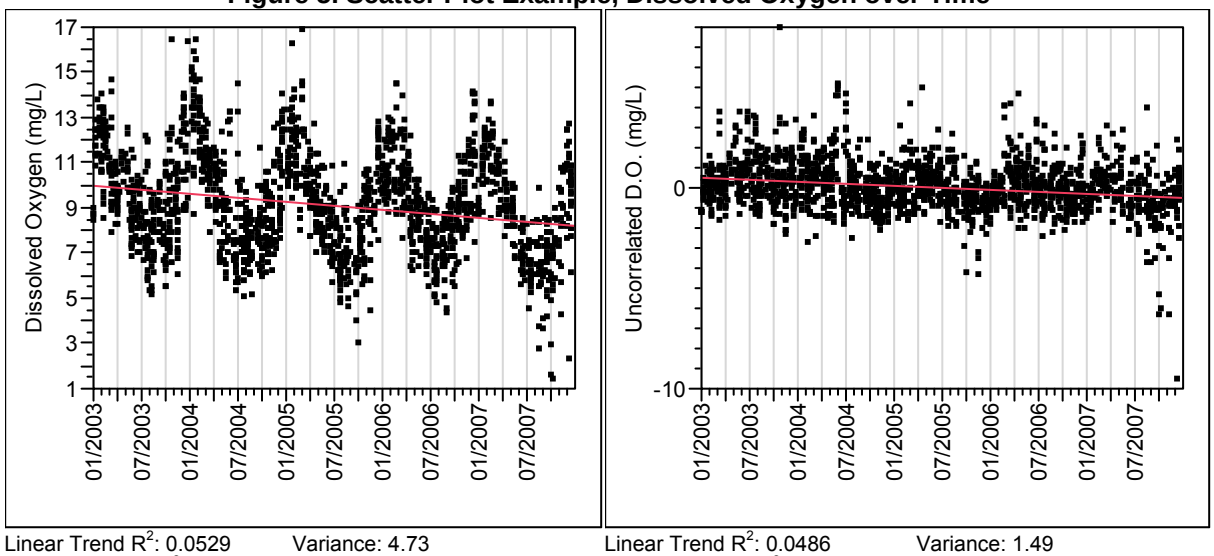


Figure 4. A Box Plot for Comparing HUCs

Scatter Plots – Change Over Time

Change over time trends are illustrated in scatterplots. If there is at least 95% confidence that a particular linear trend explains the data better then chance (Prob > F of 0.05 or less) then that linear trend was included on the graph. Note that this is different from the r^2. The percentage of variance explained by the linear model (r^2 value) is displayed for each trend. Occasionally other effects can give the appearance of a trend. This is most common when the number of samples is high and the correlation is small. In the example below on the right, drought events in 2005 and 2007 may be responsible for the slight trend present in the data.

Figure 5. Scatter Plot Example, Dissolved Oxygen over Time



Linear Trend R^2: 0.0529 Variance: 4.73
Minimum Noise R^2: 0.1596

Linear Trend R^2: 0.0486 Variance: 1.49
Minimum Noise R^2: 0.3834

In the example above, two types of change over time graphs are shown. The left graph shows *raw* dissolved oxygen results over time. The Linear Trend RSquare value estimates how much of the variation in the results can be explained by the linear trend, in this case only about 5%. The Minimum Noise RSquare is the amount of variation that definitely cannot be explained by variation over time. This is based on the variation that can be found in results from a single day, such as the variation between sites. This is likely an underestimate of noise in most cases. The greater the noise, the less likely there is a trend that has not been captured.

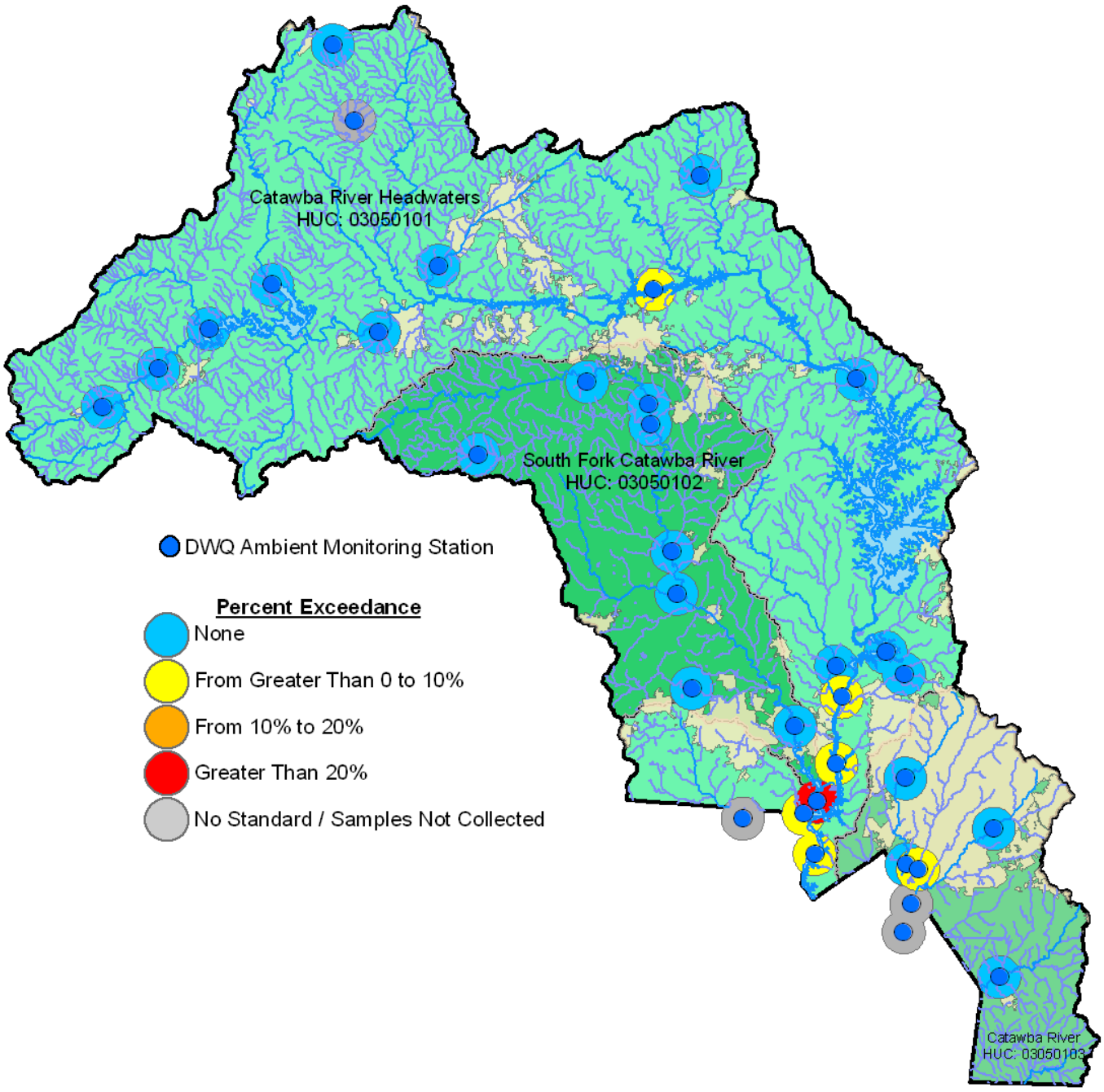
When helpful/possible, seasonal or other cyclical variation has been removed from the data via regression so that trends can be seen more easily. The graph on the left shows more variation within each year then there is between years. The variance is 4.73 mg/L. In the graph on the right, all variation that correlates to variation in water temperature

has been removed via linear regression. This reduces the variance by over half to 1.49 mg/L. Then it becomes clear visually that there are no strong temporal trends in the dissolved oxygen data that cannot be explained by changes in temperature.

Maps

Maps are used to display data for the whole basin at once, so that the relationship of stations to each other can be seen, and regional patterns become clear. The colors signify the degree of exceedance at each location. For example, the map below shows that in this case most of the stations with exceedances are close to the urban Charlotte area.

Figure 6 Example Map

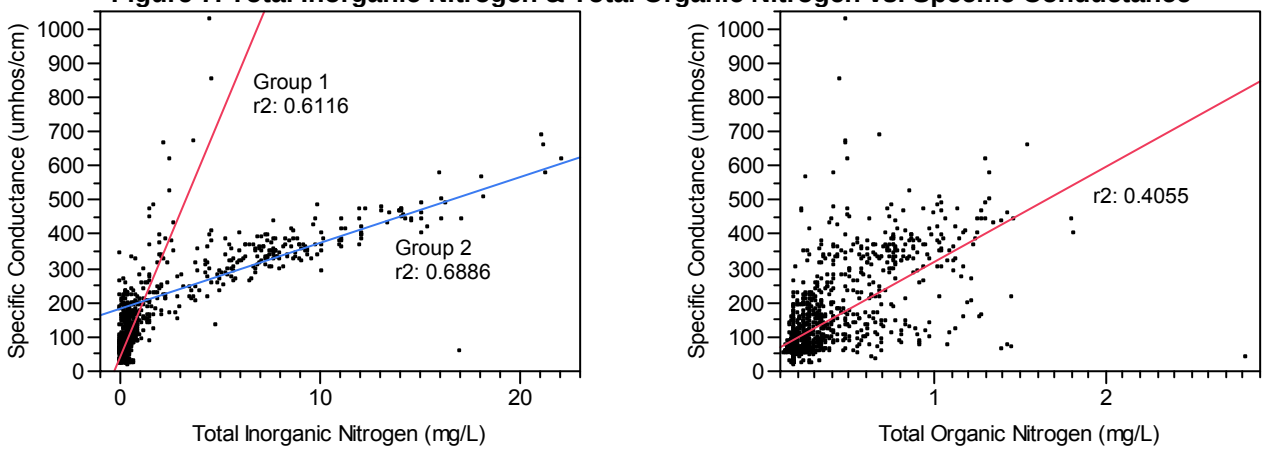


WATER QUALITY ANALYSIS

Basinwide Correlations

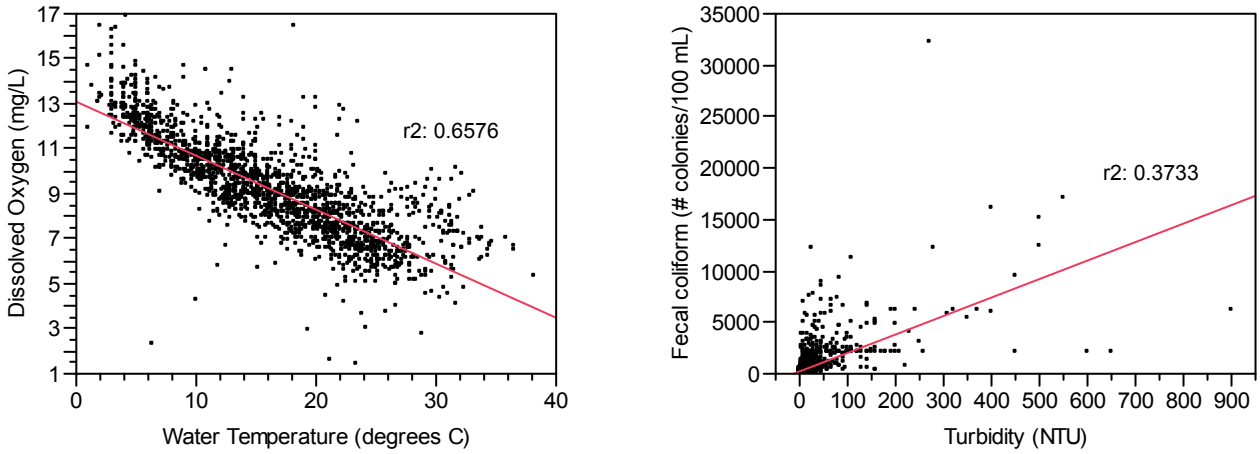
Looking for correlations between the various water quality parameters gives insight into the possible causes of water quality problems, as well as helping to differentiate natural impacts from anthropogenic ones. The following four correlations are strong linear correlations that apply to the entire Catawba River Basin.

Figure 7. Total Inorganic Nitrogen & Total Organic Nitrogen vs. Specific Conductance



A significant correlation is present between Total Inorganic Nitrogen (TIN) and Specific Conductance. Over 75% of measurements were below 200 umhos/cm, but at about 200 and above, two divergent patterns emerge. Group 2 is four stations that are all downstream of water treatment plants and urban areas. Group 1 is the rest of the stations in the basin. Both specific conductance and TIN correlate negatively with flow, which may explain why TIN and specific conductance appear to correlate. Total Organic Nitrogen correlates less well, and does not have the split pattern.

Figure 8. Dissolved Oxygen vs. Water Temperature & Fecal coliform vs. Turbidity

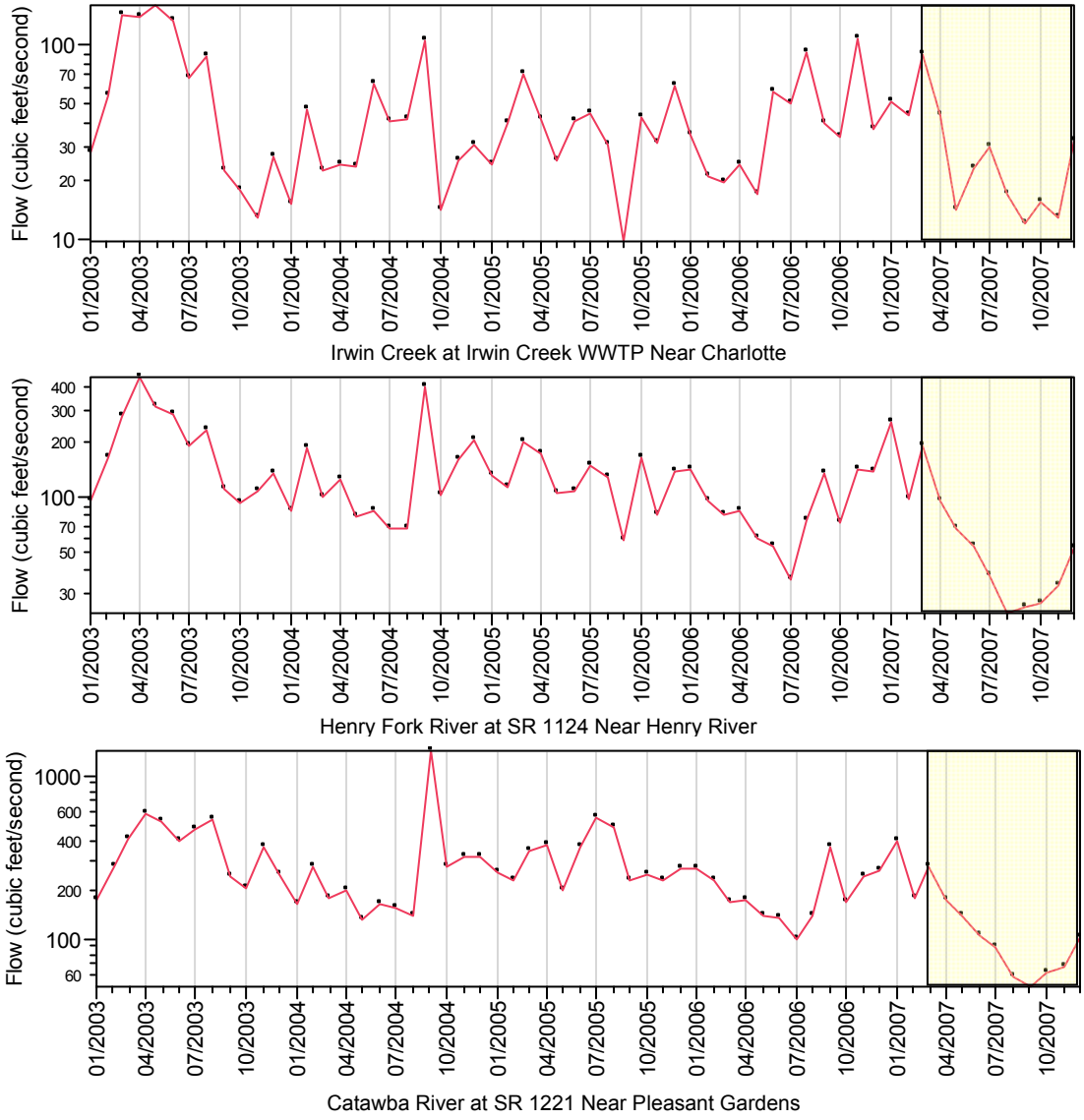


The ability of oxygen to dissolve into water is significantly impacted by water temperature. The warmer the water is, the less that can be dissolved into it. This basic physical property of water is reflected in the graph. Other causes of correlation between water temperature and dissolved oxygen include increased biological activity at higher temperatures (more oxygen consumed), and less agitation of the water during summer droughts (less oxygen mixing into the water). Turbidity and fecal coliform are both related to high flow rain events. Heavy rains wash sediment along with fecal matter into rivers and streams. High flows can also churn up sediment from stream bottoms, which can include fecal coliform.

Stream Flow and Drought

The rate at which a volume of water moves through a stream (the flow rate) can have an impact on the measurement of other parameters. In particular, droughts can have major effects on parameters such as dissolved oxygen, turbidity, pH, and others by dropping stream flow. Therefore it is useful to track changes in stream flow over the course of the assessment period, to see when drought or high flow events might be present. A significant drought affected the Catawba River Basin from March 2007 to beyond the end of the assessment period.

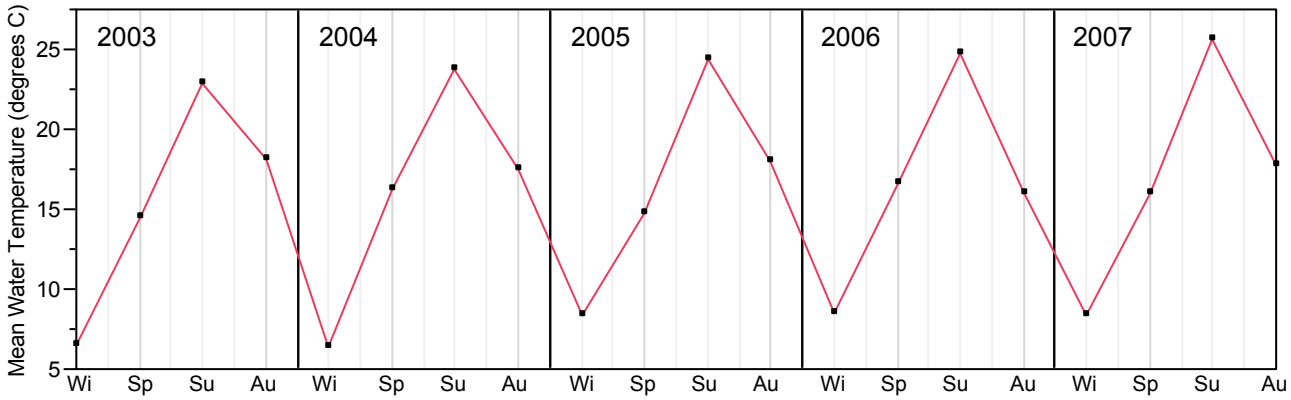
Figure 9. Average Monthly Flow at Three Locations in the Catawba River Basin



Seasonal Variation

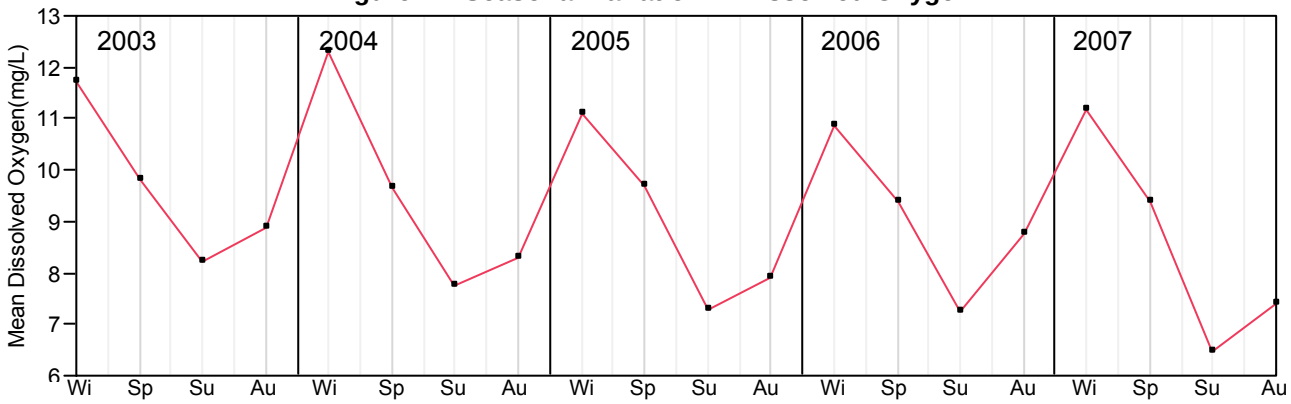
Many water quality parameters vary from season to season. By comparing seasonal averages, we can better understand the natural cycles, and more easily discern natural variation from anthropomorphic impacts in the Catawba. We assess whether a parameter has seasonal variation by checking for seasonal autocorrelation: correlation between the same season in different years for a single parameter. In the following graphs each point represents an average of all results for a parameter in one season in one year. For example, if the results for summer 2003 and summer 2004 are high and similar, and the results for winter 2003 and 2004 are low and similar, then seasonal autocorrelation is present.

Figure 10. Seasonal Variation in Water Temperature



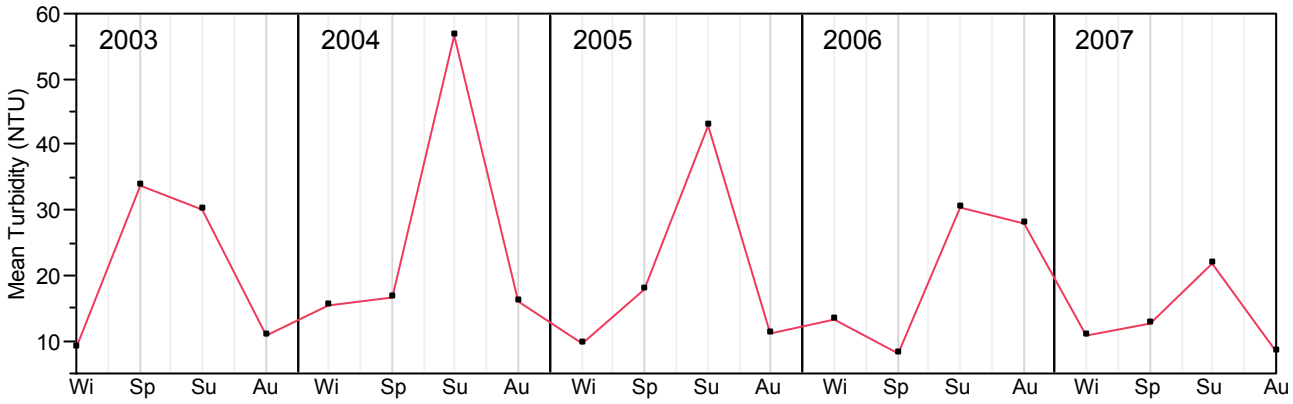
Over 77% of variation in water temperature can be explained by the seasonal cycle. That water temperature varies seasonally is not a surprise. However, it is a reminder that strong seasonal pressures are present in water quality parameters.

Figure 11. Seasonal Variation in Dissolved Oxygen



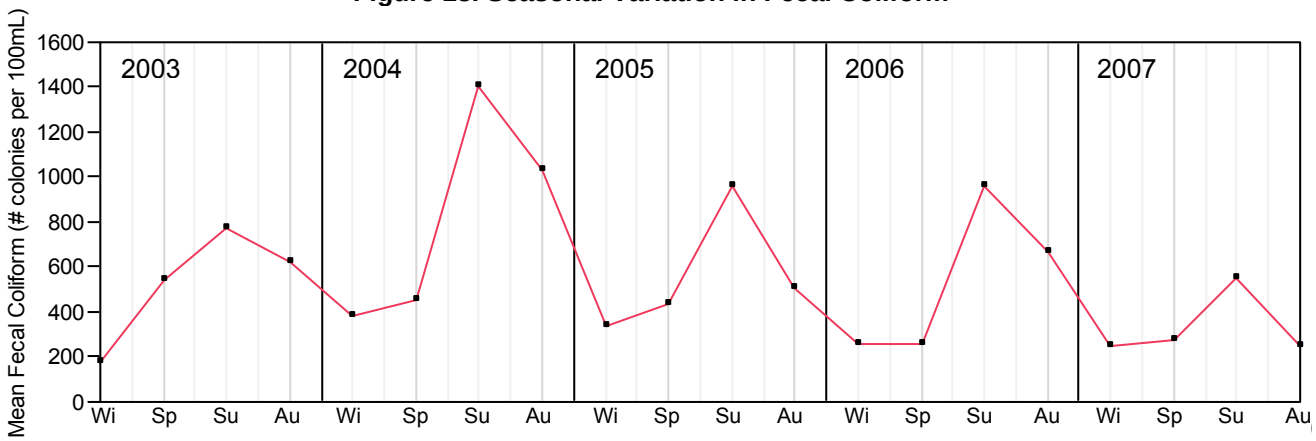
Over 71% of the variation in dissolved oxygen can be explained by the seasonal cycle. In this case, it is related to the physical properties of dissolved oxygen, utilization of dissolved oxygen in biological systems, and the effect of flow rate (as explained in the Basinwide Correlations section).

Figure 12. Seasonal Variation in Turbidity



Approximately 52% of variation in turbidity can be explained by the seasonal cycle. Turbidity responds strongly to peaks in flow (i.e. episodic heavy rains, such as thunderstorms). Such heavy rains are most common in the summer months, which may explain the summer turbidity peaks. Note that the peaks become muted during the 2007 drought.

Figure 13. Seasonal Variation in Fecal Coliform

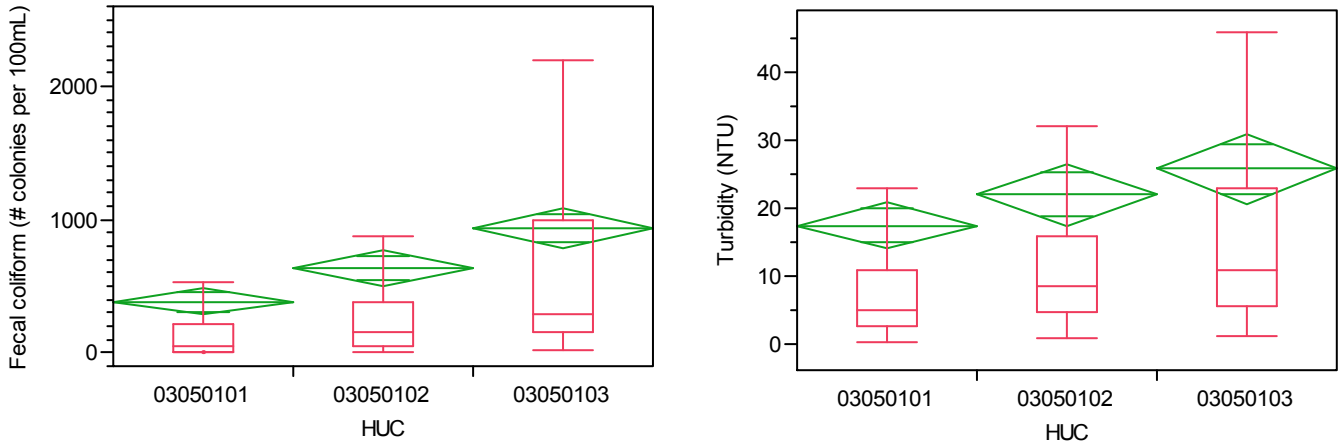


Approximately 52% of variation in fecal coliform can also be explained by the seasonal cycle. Fecal coliform responds to heavy rain as well, so the season variation pattern of fecal coliform is very similar to turbidity.

Comparing Hydrologic Regions

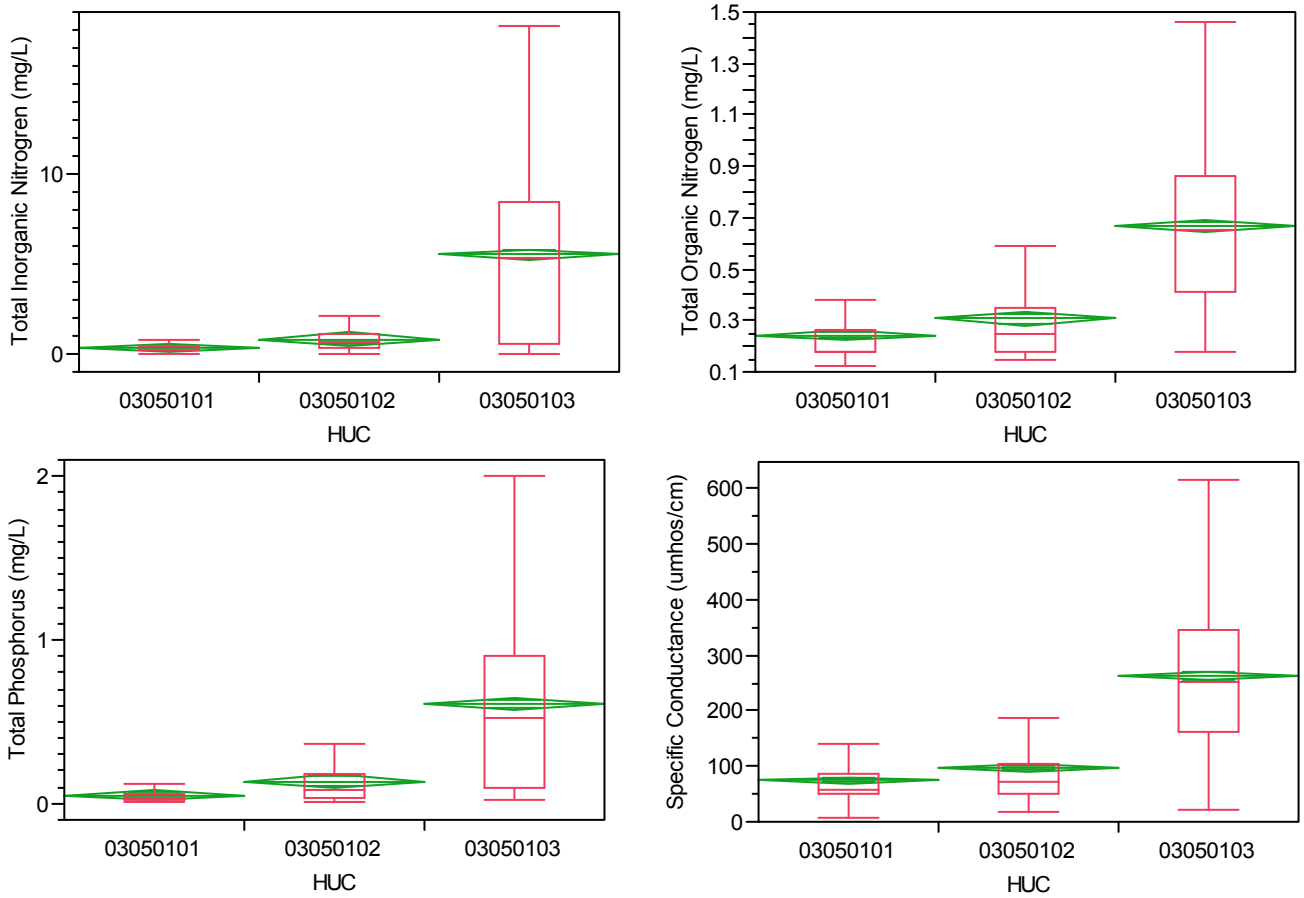
Comparisons between the three hydrologic unit codes (HUCs) are illustrated with box and whisker plots. For each box plot, the data for each station in the HUC is composited. For HUC locations, refer to **Figure 2**, and **Table 4**. Refer to **Figure 4** and **Figure 5** for a description of box and whisker plots. In the following discussion, each HUC is referred to by its last two digits, e.g. HUC 03020101 is HUC01.

Figure 14. Fecal Coliform and Turbidity By HUC



Fecal coliform and Tubidity both show a pattern that is repeated among most of the parameters measured in this basin. HUC01 is the largest HUC and contains significant amounts of undeveloped land. HUC02 is much smaller, and contains the city of Gastonia, while HUC03 is contains the city of Charlotte and is almost entirely urban. The more urban the HUC, the higher the fecal coliform or turbidity. This pattern also holds true for specific conductance, total inorganic nitrogen (TIN), total organic nitrogen (TON), and total phosphorus (TP). There are not large differences between the HUCs for dissolved oxygen or pH.

Figure 15. TIN, TON, TP, and Specific Conductance by HUC



Parameter Assessment, Comparison, & Trends

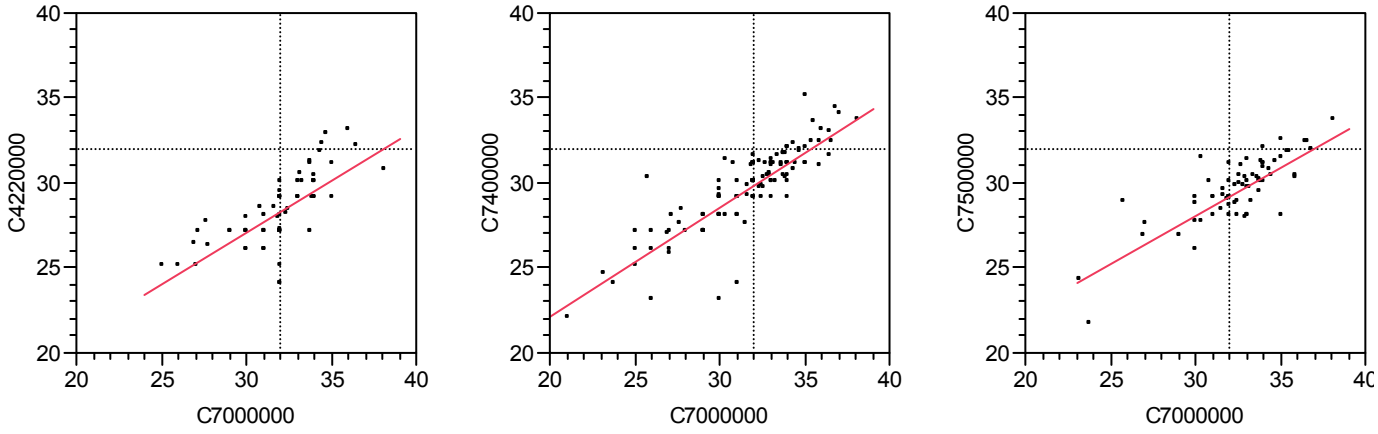
Figure 27 through **Figure 36** are box plots that compare stations (grouped by HUC for ease of viewing) for each of the following parameters: dissolved oxygen, pH, specific conductance, turbidity, chlorophyll a, fecal coliform, ammonia, total kjeldahl nitrogen, total nitrates and nitrites, and total phosphorus. Stations that appear to have significant issues are discussed in this section. The box plots are included in **Appendix B**.

Water Temperature at C7000000

Station C7000000 is located on the South Fork Catawba River arm of Lake Wylie at the SR 2524 bridge near South Belmont. The average water temperature at this station is 25 degrees Celcius, and it has exceeded the temperature standard of 32 degrees Celcius over 26% of the time in the past five years (surface temperature).

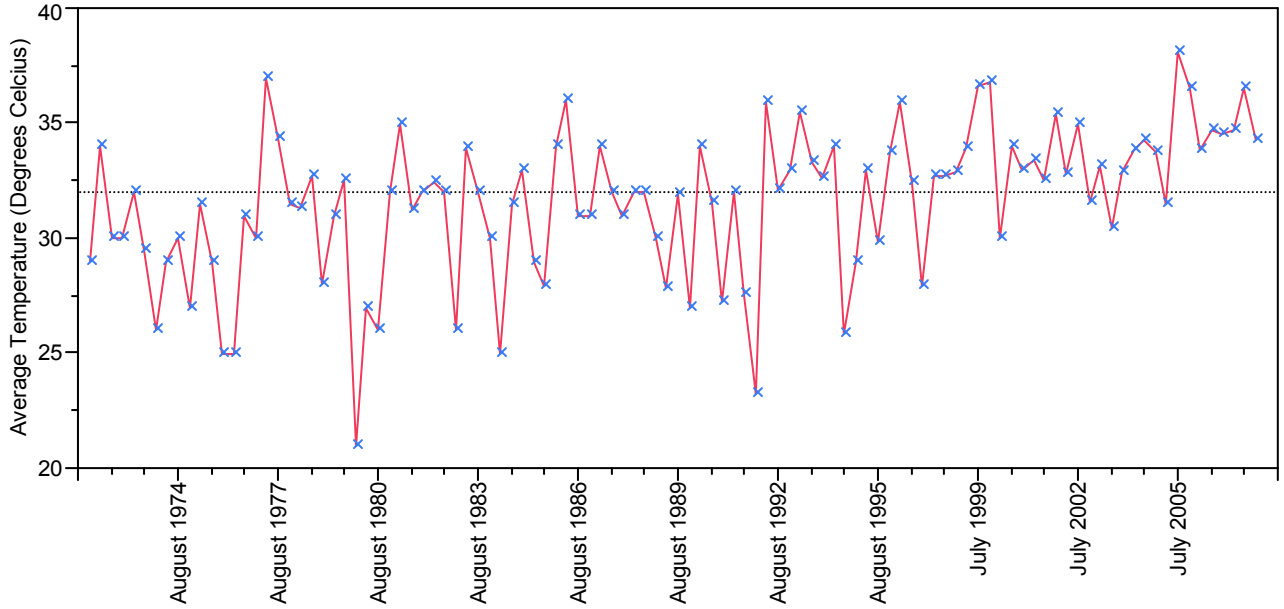
Figure 16 below compares the temperature at C7000000 with three other Lake Wylie sites that were sampled on the same days. In each case, there is strong correlation between C7000000 and the compared site. At low temperatures, C7000000 and the compared sites tend to have similar temperatures. At high temperatures, C7000000 tends to be hotter then the compared sites. This indicates there is something else also heating up C7000000. C7000000 is downstream of the thermal discharge from Allen Steam Plant, operated by Duke Energy. Duke Energy is allowed to discharge water at temperatures above the standard of 32 degrees by virtue of their demonstration that the temperature of the water still assures the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in the receiving water. This demonstration was filed in a “316(a) Thermal Variance”.

Figure 16. C7000000 Temperature vs. Other Lake Wylie Stations



A review of historical data has been done, focusing on data from June, July, and August, including temperatures recorded below the surface. The following graph shows data from June, July, and August only. Each point shows the highest water temperature recorded during that sampling event at any depth. All depths were included because the surface water may have cooled due to evaporation. For months that we sampled the site on more than one day, the results were averaged together to provide an easy to read graph.

Figure 17. Average Maximum June, July, and August Water Temperatures at Station C7000000



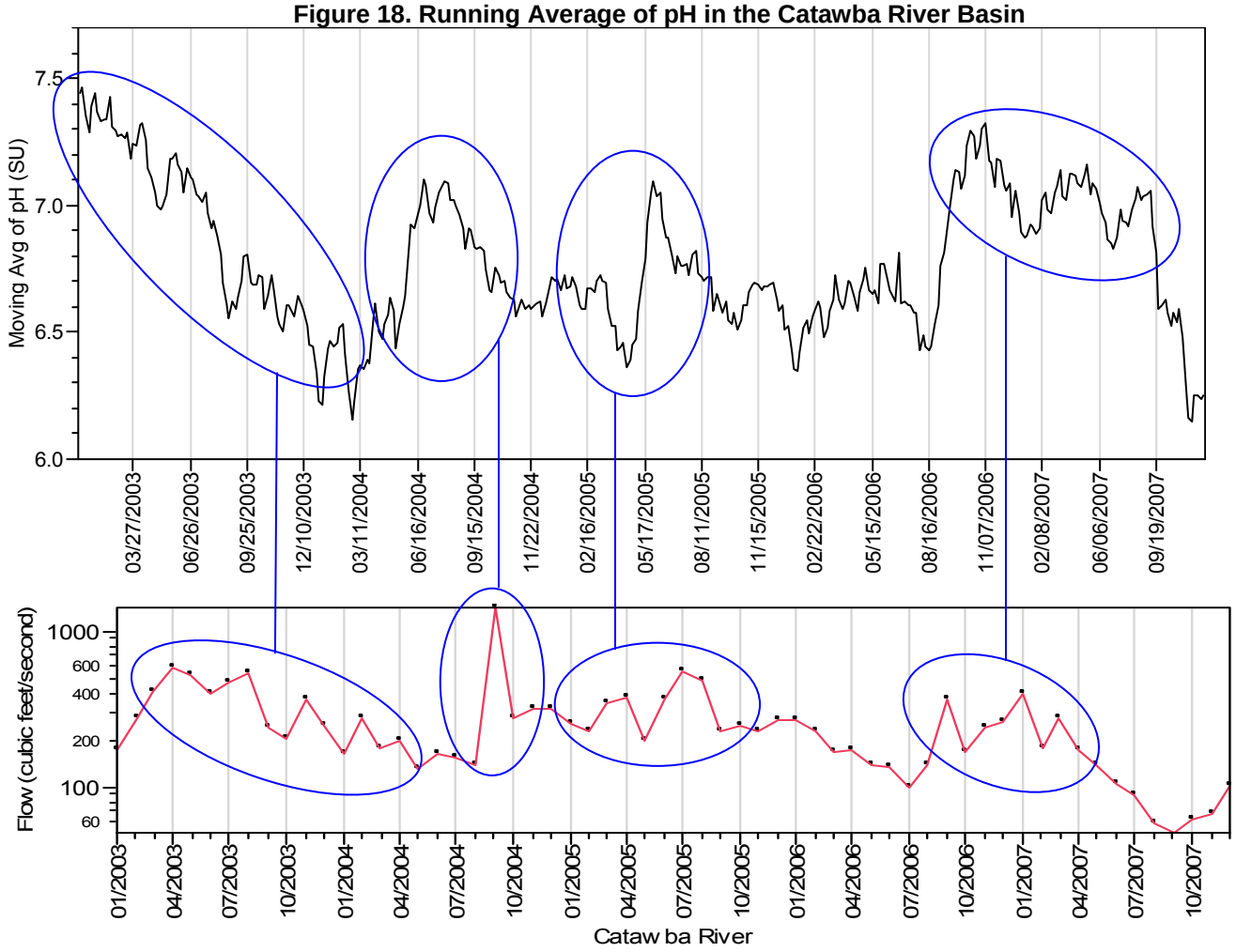
As shown in **Figure 17**, the pattern remains more or less stable from the beginning of the data set through the early 1990s. Beginning in the mid 1990s however, lower temperatures begin to disappear from the dataset. By 2000, nearly all summer temperatures are above the standard. This may be caused by a rise in the temperature of the water released from the plant, or it may be caused by a general rise in water temperature. The temperature of the water at C7000000 appears to be rising faster then the temperature of water at other Lake Wylie stations, but all of them are rising. See **Table 8**.

Table 8. Average Maximum Summer Temperatures at Four Lake Wylie Stations

Station	1970's	1980's	Δ(70's-80's)	1990's	Δ(80's-90's)	2000's	Δ(90's-00's)
C4220000	27.6	27.9	+0.3	28.9	+1.0	30.0	+1.1
C7000000	**30.6**	**30.8**	**+0.2**	**32.3**	**+1.5**	**33.8**	**+1.5**
C7400000	28.6	29.2	+0.6	30.4	+1.2	31.0	+0.6
C7500000	29.6	28.9	+0.3	29.8	+0.9	30.1	+0.3

pH

Figure 18. Running Average of pH in the Catawba River Basin

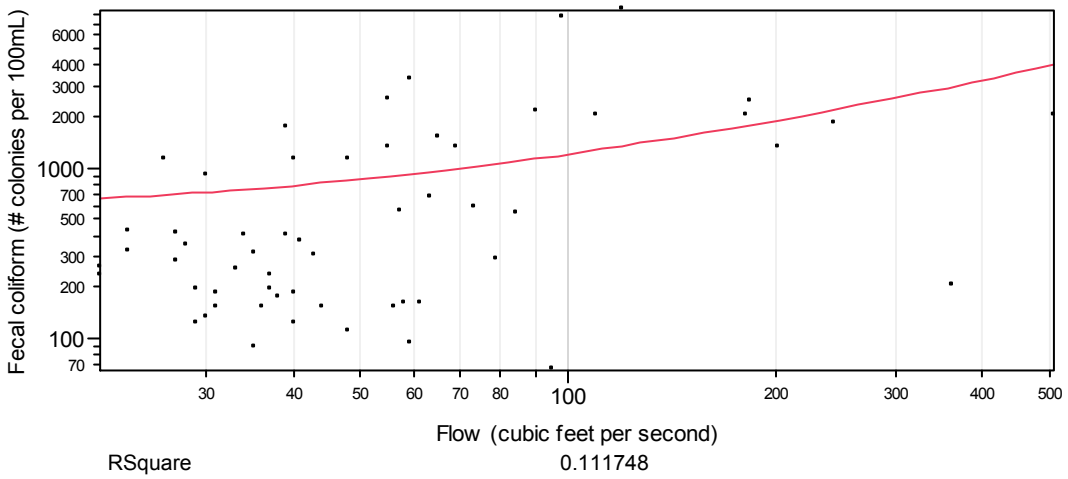


As a whole, the basin appears to have gone through several periods of gradual drop in pH followed by a sudden increase. This indicates a flow-related pattern, with spikes caused by sudden flow increases. Therefore, during periods of low flow, low pH's occur. A comparison of the pH graph to a flow graph from the Catawba River supports this explanation.

Fecal Coliform

Sixteen stations in the basin (see **Table 6**) have a fecal coliform geomean greater then 200 colonies (the evaluation level). All seven stations in HUC03 exceed the evaluation level. Potential causes of fecal coliform include runoff from farmland, urban areas, and residential areas. Viewed at one location, Sugar Creek, there appears to be some correlation between high flow and high fecal, which supports runoff as a cause of high fecal counts.

Figure 19. Flow vs Fecal Coliform at C9050000 (Sugar Creek at NC 51 at Pineville)

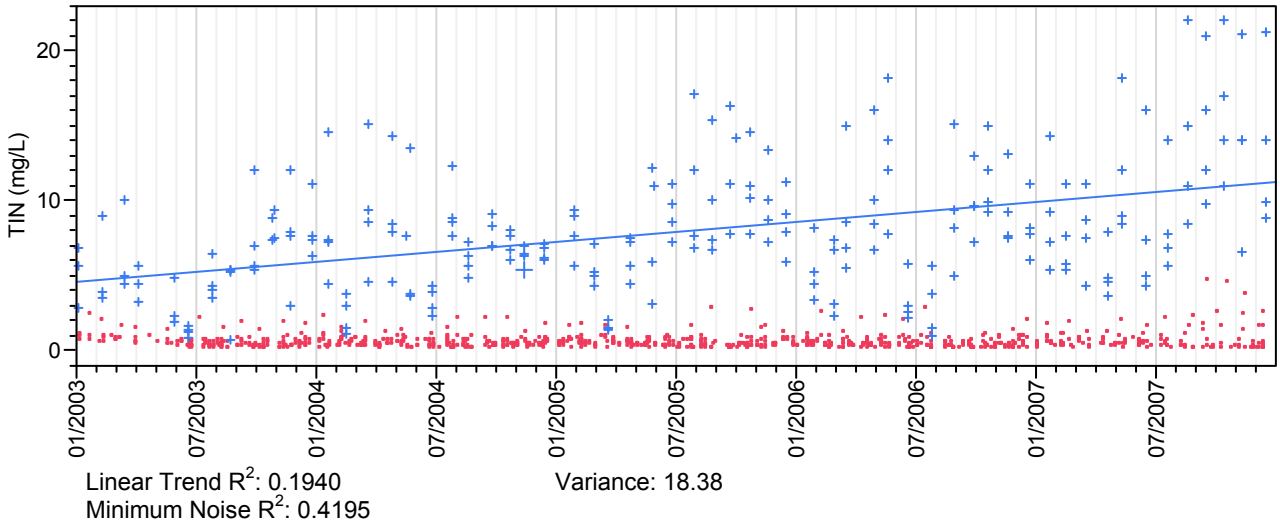


Fecal coliform results are screened for problems using monthly sampling results on an annual basis. The standard is assessed by collecting five samples in 30 days in waters that have more then 20% exceedance during a calendar year. All of the waters that exceed that evaluation level are class C or class WS, no class B waters were impacted. In keeping with North Carolina's methodology, these stations will be assessed for the standard as resources permit.

Nutrients

Inorganic Nitrogen – Typically total inorganic nitrogen (TIN) is utilized by algae for growth, but due to many other confounding factors, it is not possible to correlate inorganic nitrogen to chlorophyll a concentrations directly. High levels of inorganic nitrogen can indicate proximity to a source, such as agricultural land or a wastewater treatment plant, or it may indicate loading from sources farther upstream (**Table 6**). The average TIN in HUC03 is over 5 mg/L, whereas in the rest of the basin it is less than one. There are several wastewater treatment plants upstream of the stations in HUC03, which explains the high concentrations of TIN. In the graph below, these stations are displayed in blue, while the rest of the basin is displayed in red.

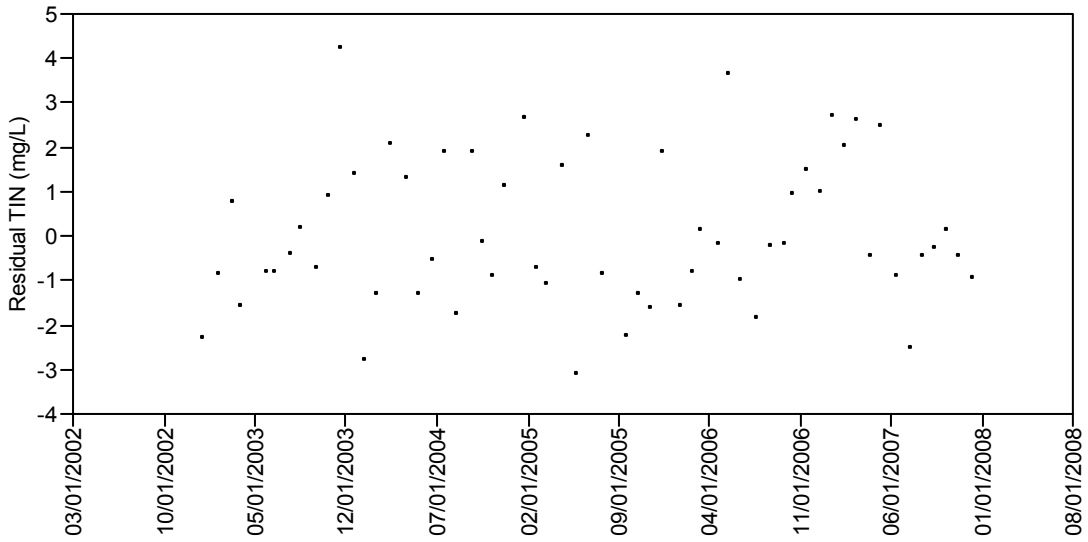
Figure 20. Total Inorganic Nitrogen over Time



A quick glance at a graph of TIN over time indicates that it may be increasing in parts of HUC03 (in blue). However, it may also be just an effect of drought or of a drop in flow. If there is a point source of TIN (as there are in HUC03) then drops in flow cause the relative concentration of TIN to go up. Unfortunately we do not have flow data for all stations to

test this possibility thoroughly. We do have a few sites with flow data however, including one with a good range of TIN numbers.

Figure 21. C9050000 – Sugar Creek - Total Inorganic Nitrogen over Time, Adjusted for Flow



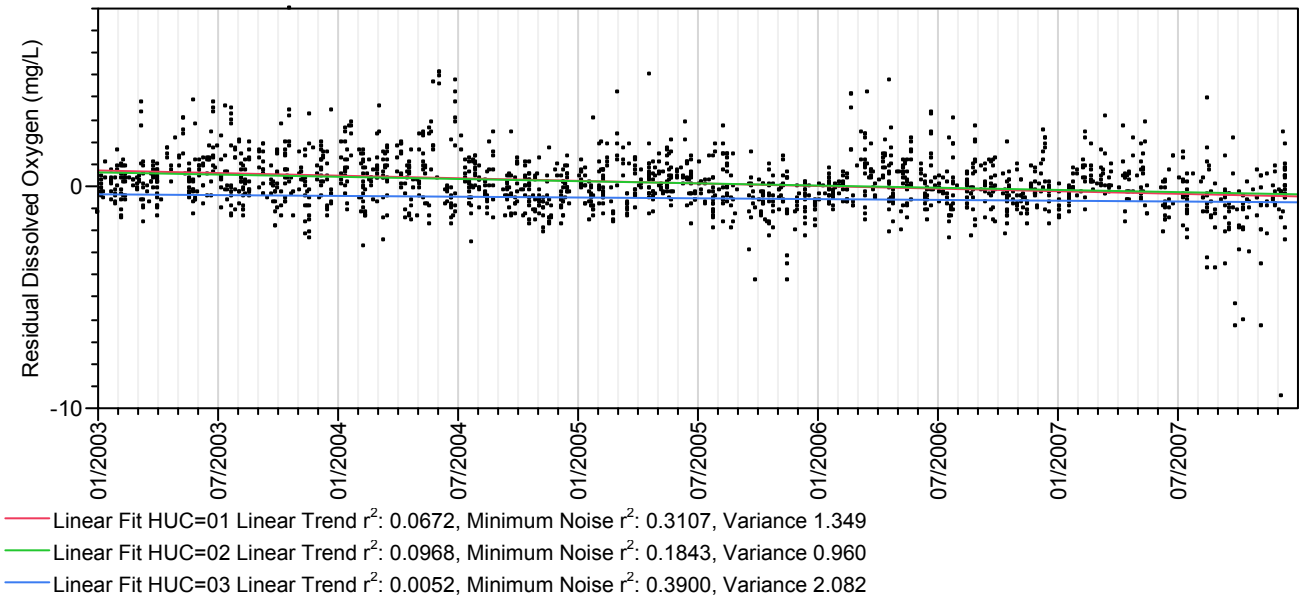
In the above graph, the effect of flow has been removed via linear regression of flow vs TIN. Once flow is accounted for, there is no significant trend in the TIN concentrations over time, just random scatter. The best regression line was not significantly better then random scatter at explaining the results, so no line is shown, and no trend is indicated.

Organic Nitrogen – In ambient waters, organic nitrogen is typically nitrogen that is sequestered in algae or other organic matter. It is less accessible to algae for growth. It does correlate to chlorophyll a concentrations somewhat, and may be found in waters where a bloom is ongoing. There were no areas of high organic nitrogen concentration recorded during the monitoring period, although HUC03 was greater than the rest of the basin (**Table 6**).

Total Phosphorus – Phosphorus is also utilized by algae for growth, and is incorporated into the algal cells. Therefore it is somewhat problematic to interpret its results, as it may mean there is an ongoing algae bloom, or that there is phosphorus available to fuel a bloom. There were no areas of high phosphorus concentration recorded during the monitoring period, although HUC03 was greater than the rest of the basin (**Table 6**).

Dissolved Oxygen

Figure 22. Dissolved Oxygen over Time, Adjusted for Temperature

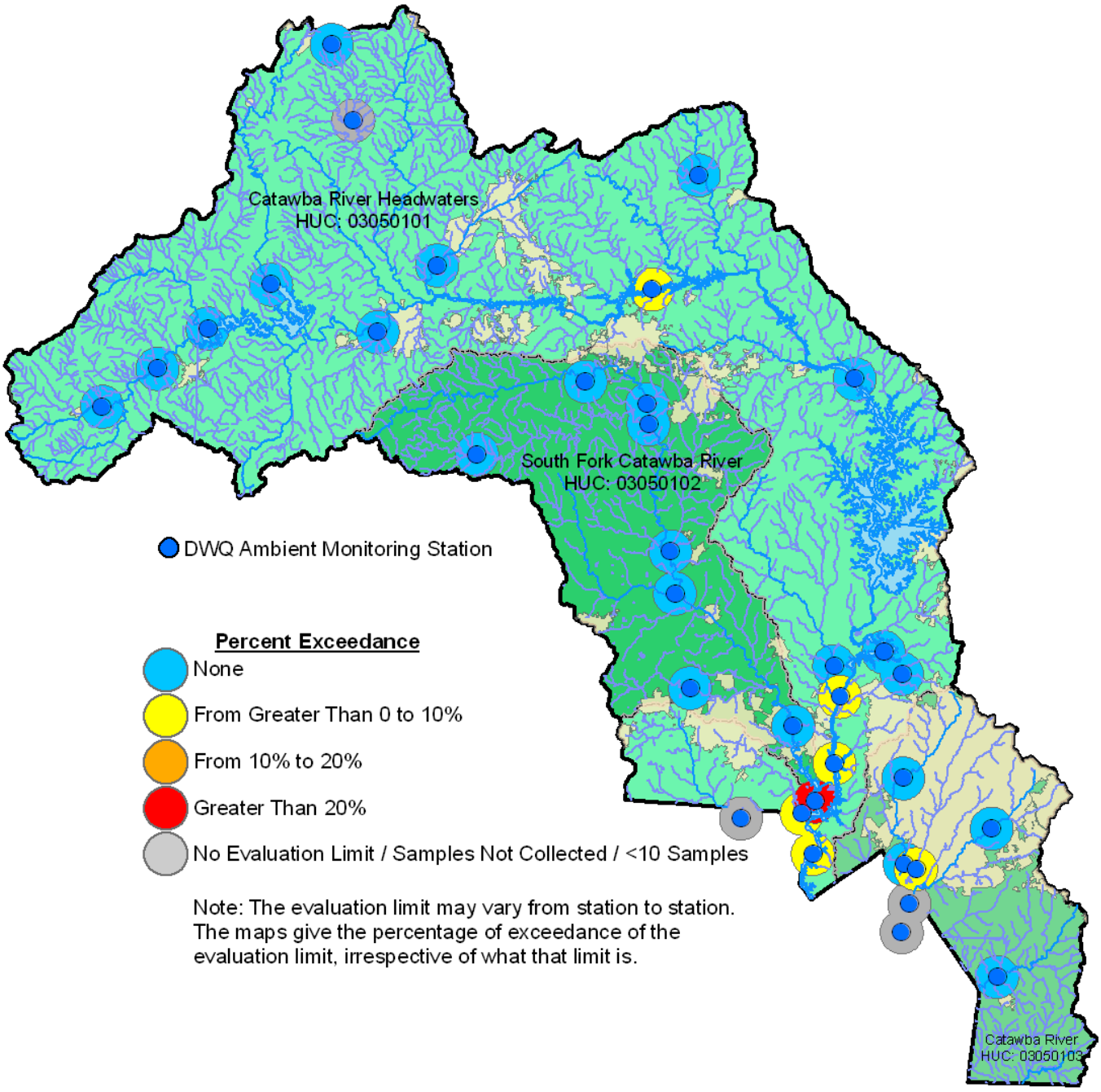


Dissolved oxygen correlates strongly with water temperature, as noted in the Basinwide correlation section. **Figure 8** shows a regression line between dissolved oxygen and temperature. The effect of temperature is removed by subtracting the actual DO values from those predicted by the regression line from **Figure 8**. By removing variation due to temperature, it becomes clear visually that there is little linear or sustained change in dissolved oxygen concentrations. There is less then 1 mg/L average change over the five year period in all three of the basins. These very slight trends shown here are likely caused by the drought-influenced drop in dissolved oxygen in the summers of 2005 and 2007.

Basinwide Assessment

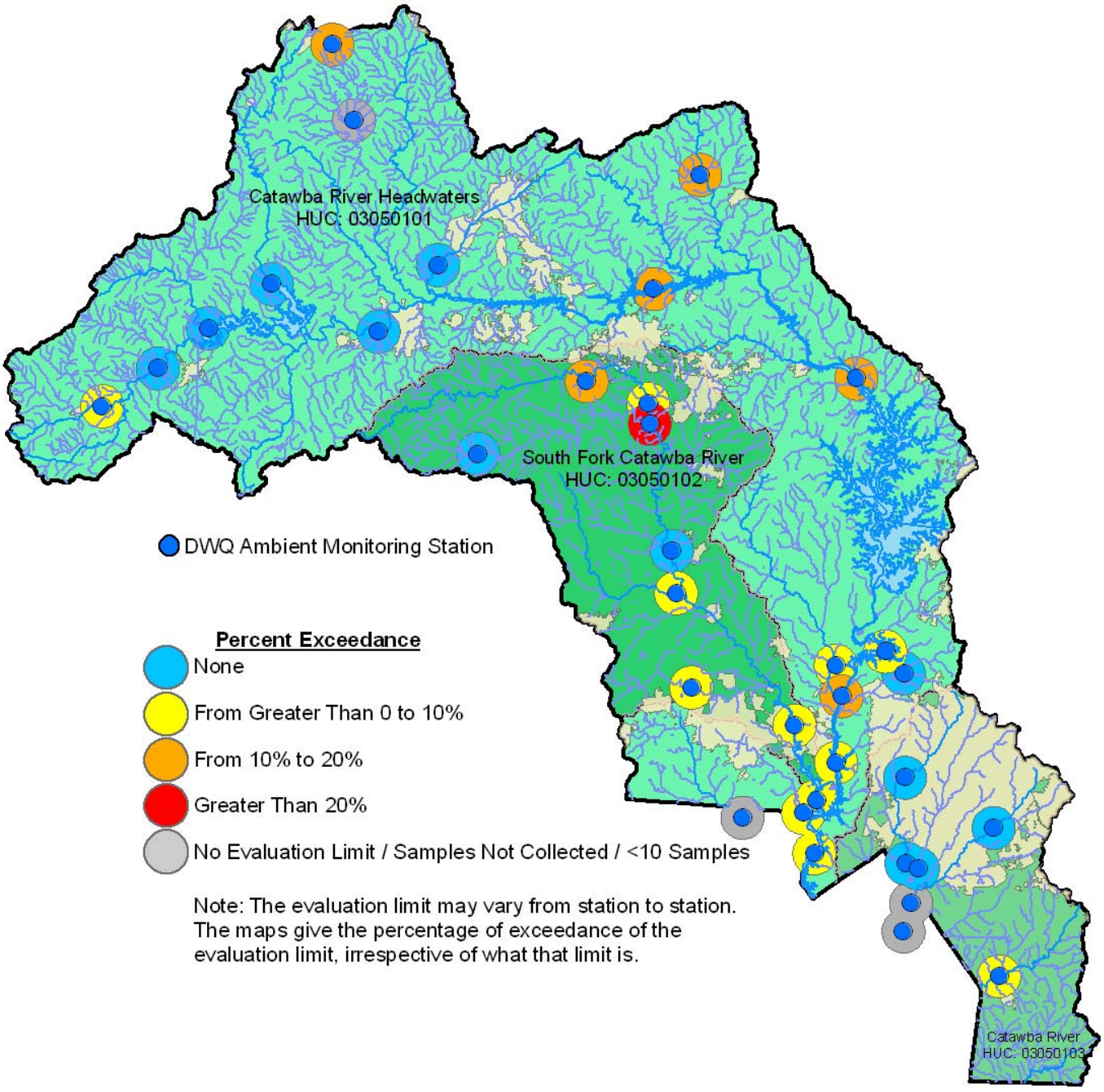
The following maps help to assess the basin as a whole.

Figure 23. Water Temperature in the Catawba River Basin



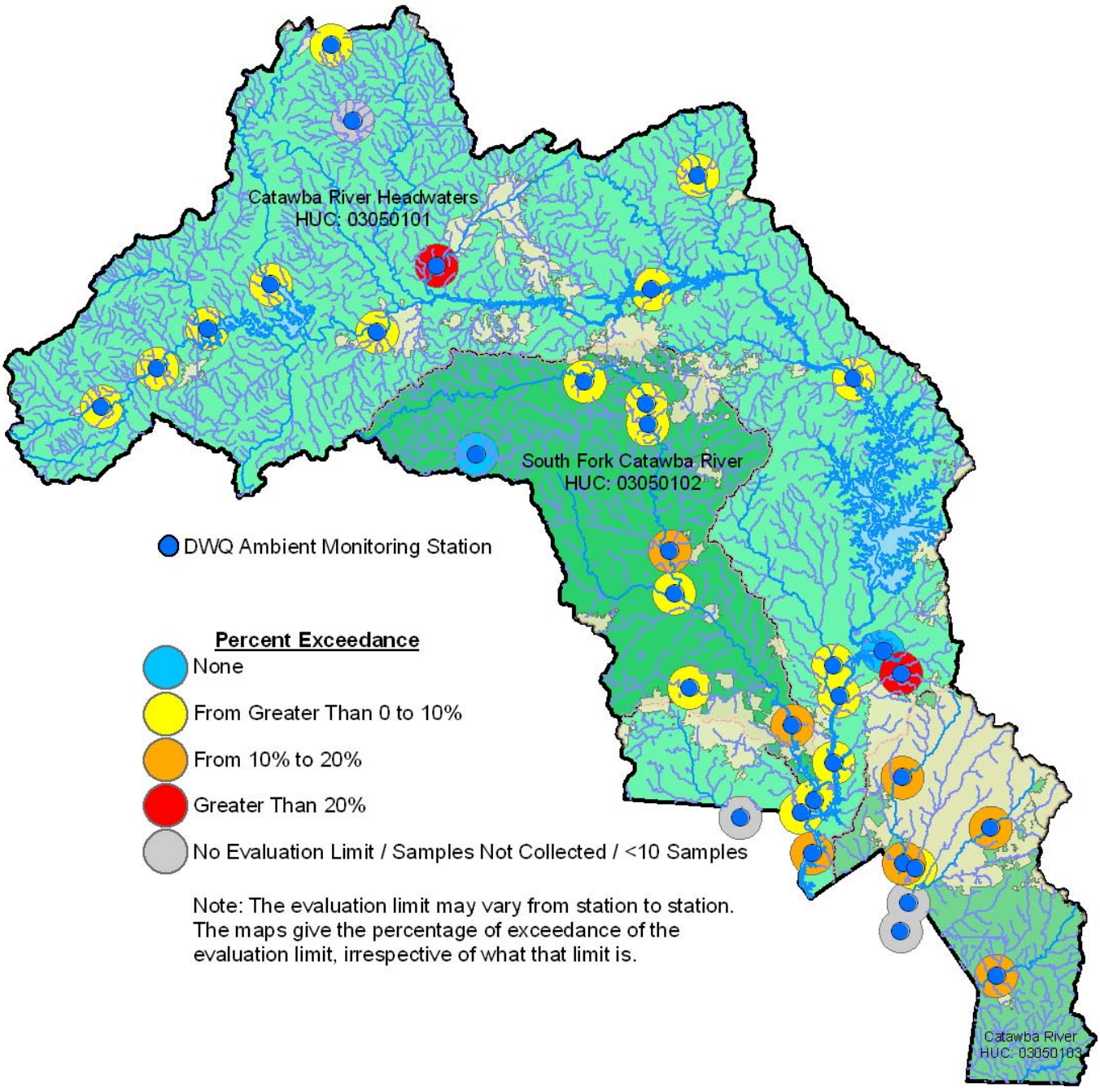
Stations with water temperature exceedances are concentrated on Lake Wylie. Lake Wylie is close to several urban areas, including multiple electricity generation stations, both of which may impact water temperature. The station circled in red is located on the South Fork Catawba River arm of Lake Wylie, and is discussed in detail in the "Station Assessment & Comparison" Section on page 25.

Figure 24. pH in the Catawba River Basin



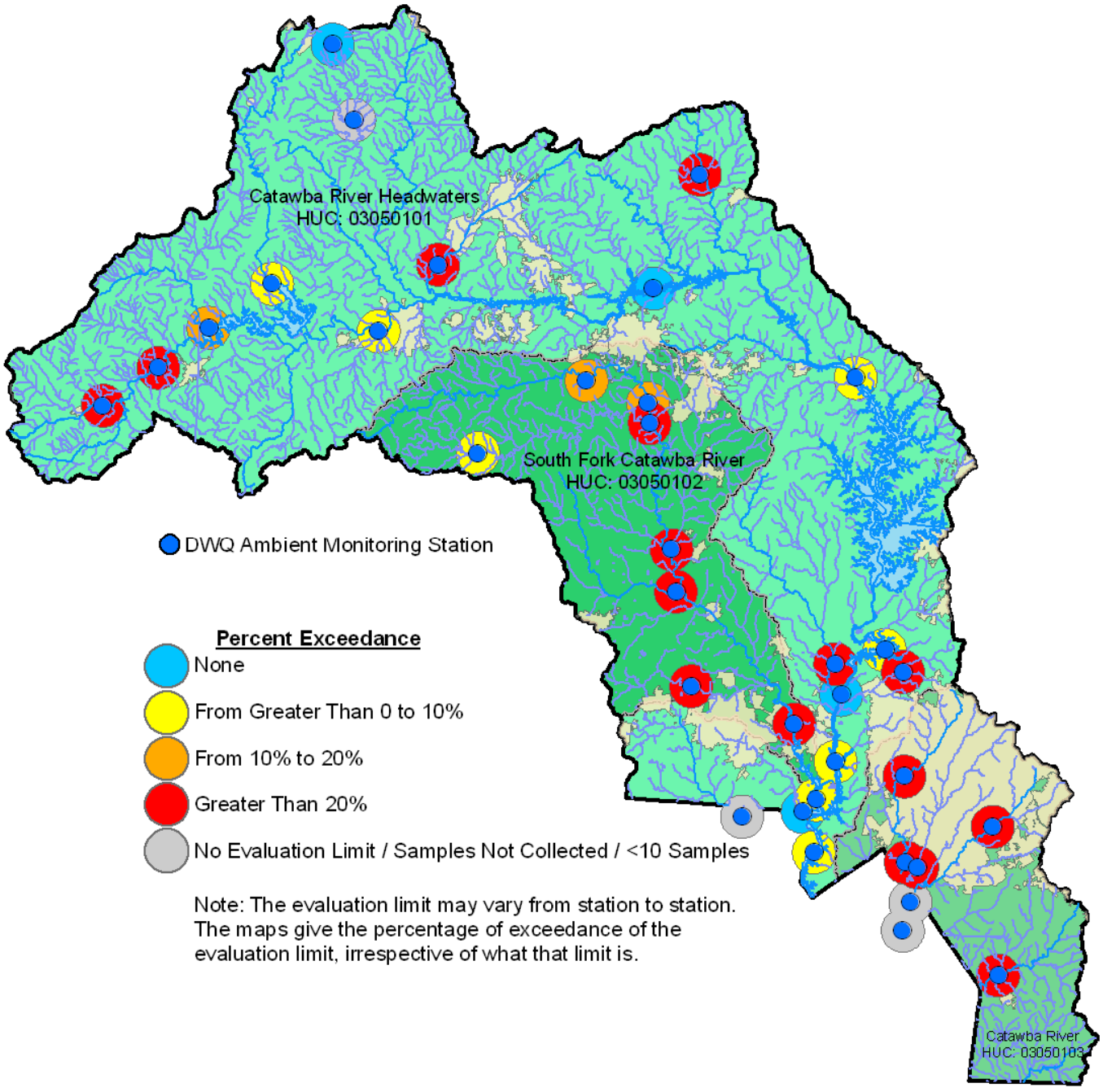
Stations with pH exceedances are spread widely throughout the basin. Several of the stations with greater than 10% exceedances are in rural areas, which may indicate that the exceedances are related to agriculture or possibly natural conditions.

Figure 25. Turbidity in the Catawba River Basin



Most stations in the basin have occasionally exceeded the turbidity standard. One episode of heavy rain is enough to cause an exceedance in areas where there are not thick vegetative buffers surrounding the rivers and streams, either by introduction of new sediment into the stream or by scouring the banks of the stream. In and downstream of urban areas, turbidity exceedances may also be due to the turbidity of wastewater treatment plant effluent, or storm sewer runoff.

Figure 26. Fecal Coliform in the Catawba River Basin



Areas with elevated concentrations of fecal coliform appear to be widespread throughout the basin. Some of these high concentrations may be related to wastewater treatment plants, or runoff from agricultural, suburban, or urban areas. Because it appears these sites may potentially be in violation of the standard, we recommend that “5 in 30” sampling (5 samples collected within 30 days) be done at as many of these sites as possible. Fecal coliform results are screened for problems using monthly sampling results on an annual basis. The standard is assessed by collecting five samples in 30 days in waters that have more then 20% exceedance during a calendar year. All of the waters in the Catawba basin that exceed that evaluation level are class C or class WS, no class B waters were impacted. In keeping with North Carolina’s methodology, these stations will be assessed for the standard as resources permit.

Appendix A: Station Summary Sheets

Location: CATAWBA RIV AT SR 1234 NR GREENLEE
Station #: C0145000 **Hydrologic Unit Code:** 03050101
Latitude: 35.63669 **Longitude:** -82.14385 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-(8)

Time period: 01/30/2003 to 12/14/2006

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	45	0	<4	0	0		7.2	8.4	9.6	10.7	12.3	13.8	16.4
	45	0	<5	0	0		7.2	8.4	9.6	10.7	12.3	13.8	16.4
pH (SU)	45	0	<6	1	2.2		5.9	6.5	6.5	6.7	6.9	7	7.2
	45	0	>9	0	0		5.9	6.5	6.5	6.7	6.9	7	7.2
Spec. conductance (umhos/cm at 25°C)	44	0	N/A				31	34	42	51	56	68	87
Water Temperature (°C)	45	0	>29	0	0		2	4	7	13.7	17.5	19	21.6
Other													
TSS (mg/L)	16	3	N/A				2.3	2.5	2.5	4	7.3	38.5	63
Turbidity (NTU)	46	3	>50	2	4.3		0.7	1.1	1.6	2.6	7.6	32.1	450
Metals (ug/L)													
Aluminum, total (Al)	16	4	N/A				50	50	57	100	632	1062	1300
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		2	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		25	25	25	25	25	25	25
Copper, total (Cu)	16	13	>7	0	0		2	2	2	2	2	3	3
Iron, total (Fe)	16	0	>1000	3	18.8	93.2	70	88	118	225	595	1430	1500
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	12	>50	0	0		10	10	10	10	10	17	18

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
46	190	12	26	88.6

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CATAWBA RIV AT SR 1221 NR PLEASANT GARDENS
Station #: C0250000 **Hydrologic Unit Code:** 03050101
Latitude: 35.68597 **Longitude:** -82.06075 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-(8)

Time period: 01/30/2003 to 12/12/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	49	0	<4	0	0		6	8	9.1	10.5	12	13.4	15.5
	49	0	<5	0	0		6	8	9.1	10.5	12	13.4	15.5
pH (SU)	50	0	<6	0	0		6	6.5	6.7	6.9	7	7.3	7.4
	50	0	>9	0	0		6	6.5	6.7	6.9	7	7.3	7.4
Spec. conductance (umhos/cm at 25°C)	47	0	N/A				33	39	43	48	51	58	71
Water Temperature (°C)	50	0	>29	0	0		3	4.9	7.4	14.1	18.7	20.9	24.7
Other													
TSS (mg/L)	20	5	N/A				2.3	2.4	2.6	5.6	15.2	61.4	74
Turbidity (NTU)	54	0	>50	5	9.3		1.5	1.8	2.7	4.2	9.1	45.5	500
Nutrients (mg/L)													
NH3 as N	48	40	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.08
NO2 + NO3 as N	48	1	N/A				0.02	0.1	0.15	0.18	0.21	0.23	0.25
TKN as N	48	27	N/A				0.2	0.2	0.2	0.2	0.24	0.3	2.9
Total Phosphorus	48	1	N/A				0.02	0.02	0.02	0.03	0.05	0.1	1
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				56	62	84	230	1095	3480	7000
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	14	>7	0	0		2	2	2	2	2	4	4
Iron, total (Fe)	17	0	>1000	4	23.5	97.8	180	180	215	410	1145	3120	4400
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	17	23

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
54	194	11	20	60.6

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: N FORK CATAWBA RIV AT SR 1552 NR HANKINS
Station #: C0550000 **Hydrologic Unit Code:** 03050101
Latitude: 35.73832 **Longitude:** -81.98572 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-24-(13)

Time period: 01/30/2003 to 12/12/2007

	#	#	Results not meeting EL				Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	49	0	<4	0	0		6.4	7.8	9.1	10.5	11.6	13.1	15.5
	49	0	<5	0	0		6.4	7.8	9.1	10.5	11.6	13.1	15.5
pH (SU)	50	0	<6	0	0		6.7	7	7.2	7.5	7.7	7.9	8.5
	50	0	>9	0	0		6.7	7	7.2	7.5	7.7	7.9	8.5
Spec. conductance (umhos/cm at 25°C)	47	0	N/A				59	71	78	92	107	132	171
Water Temperature (°C)	50	0	>29	0	0		4	5.6	8.4	14.9	19.6	22	25.9
Other													
TSS (mg/L)	20	6	N/A				2.3	2.5	2.5	4.1	10.5	24.6	51
Turbidity (NTU)	54	1	>50	3	5.6		1	1.4	2.4	3.2	10.2	35	400
Nutrients (mg/L)													
NH3 as N	48	36	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.07
NO2 + NO3 as N	48	0	N/A				0.11	0.22	0.26	0.33	0.43	0.6	0.75
TKN as N	48	30	N/A				0.2	0.2	0.2	0.2	0.24	0.39	1.5
Total Phosphorus	48	0	N/A				0.02	0.03	0.04	0.06	0.08	0.11	0.56
Metals (ug/L)													
Aluminum, total (Al)	17	1	N/A				50	56	70	110	580	2020	5300
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	12	>7	0	0		2	2	2	2	2	4	5
Iron, total (Fe)	17	0	>1000	3	17.6	91.7	130	154	205	240	745	2140	4300
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	13	>50	0	0		10	10	10	10	11	15	17

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
54	57	9	17	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LINVILLE RIV AT NC 126 NR NEBO
Station #: C1000000 **Hydrologic Unit Code:** 03050101
Latitude: 35.79539 **Longitude:** -81.89013 **Stream class:** B HQW
Agency: NCAMBNT **NC stream index:** 11-29-(19)

Time period: 01/30/2003 to 12/12/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	49	0	<4	0	0		7.2	8.2	9.2	10.4	11.8	13.5	14.5
	49	0	<5	0	0		7.2	8.2	9.2	10.4	11.8	13.5	14.5
pH (SU)	50	0	<6	0	0		6.1	6.4	6.7	6.9	7.1	7.3	7.4
	50	0	>9	0	0		6.1	6.4	6.7	6.9	7.1	7.3	7.4
Spec. conductance (umhos/cm at 25°C)	47	0	N/A				29	33	37	42	48	51	57
Water Temperature (°C)	50	0	>29	0	0		2	4.1	8	14.4	20	22.6	26.5
Other													
TSS (mg/L)	21	17	N/A				2.2	2.4	2.5	2.5	3.5	6.2	6.2
Turbidity (NTU)	54	14	>50	1	1.9		1	1	1	1.6	3.3	5.6	140
Nutrients (mg/L)													
NH3 as N	48	47	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	48	0	N/A				0.1	0.14	0.19	0.28	0.38	0.41	0.51
TKN as N	48	38	N/A				0.2	0.2	0.2	0.2	0.2	0.22	0.68
Total Phosphorus	48	17	N/A				0.01	0.02	0.02	0.02	0.03	0.04	0.2
Metals (ug/L)													
Aluminum, total (Al)	17	6	N/A				50	50	50	62	93	172	220
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	15	>7	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	17	0	>1000	0	0		88	89	120	150	225	312	400
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	16	>50	0	0		10	10	10	10	10	11	14

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
54	17	1	2	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CATAWBA RIV AT SR 1304 NR CALVIN
Station #: C1230000 **Hydrologic Unit Code:** 03050101
Latitude: 35.73983 **Longitude:** -81.72436 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-(32.7)

Time period: 01/22/2003 to 12/12/2007

	#	#	Results not meeting EL				Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	48	0	<4	0	0		5.6	7.5	8.8	9.9	11.2	12.7	14.6
	48	0	<5	0	0		5.6	7.5	8.8	9.9	11.2	12.7	14.6
pH (SU)	50	0	<6	0	0		6.1	6.4	6.5	6.7	6.9	6.9	7.1
	50	0	>9	0	0		6.1	6.4	6.5	6.7	6.9	6.9	7.1
Spec. conductance (umhos/cm at 25°C)	49	0	N/A				40	43	47	51	55	57	62
Water Temperature (°C)	52	0	>29	0	0		5	6.1	10.1	14	17.9	20.6	22.6
Other													
TSS (mg/L)	19	6	N/A				2.5	2.5	3	6	8.8	23	62
Turbidity (NTU)	54	0	>50	2	3.7		1.1	1.3	2	4.5	8	30	130
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				65	66	125	200	390	1660	1900
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	14	>7	0	0		2	2	2	2	2	3	4
Iron, total (Fe)	17	0	>1000	2	11.8	76.2	120	152	210	340	640	1820	1900
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	0	0		17	18	20	42	50	85	95
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	13	15

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
54	38	3	6	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: WILSON CRK AT US 221 NR GRAGG
Station #: C1370000 **Hydrologic Unit Code:** 03050101
Latitude: 36.09695 **Longitude:** -81.80743 **Stream class:** B Tr ORW
Agency: NCAMBNT **NC stream index:** 11-38-34

Time period: 01/22/2003 to 12/05/2007

	# results	# ND	Results not meeting EL				Percentiles						
			EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	46	0	<6	0	0		7.8	9	9.5	10.8	11.8	13.6	14.6
pH (SU)	48	0	<6	9	18.8	98.1	3.7	5.3	6.1	6.3	6.6	6.7	7.2
	48	0	>9	0	0		3.7	5.3	6.1	6.3	6.6	6.7	7.2
Spec. conductance (umhos/cm at 25°C)	47	0	N/A				14	17	18	19	21	23	28
Water Temperature (°C)	49	0	>29	0	0		1	3.4	6	11	14	15.7	18.1
Other													
Chloride (mg/L)	5	0	>230	0	0		1	1	1	1	1	1	1
Chlorophyll a (ug/L)	1	0	>15	0	0		1	1	1	1	1	1	1
Fluoride (mg/L)	5	5	>1.8	0	0		0	0	0	0	0	0	0
TSS (mg/L)	20	17	N/A				2.5	2.5	2.5	2.5	3.2	6.2	12
Turbidity (NTU)	50	27	>10	1	2		0.2	1	1	1	1.3	3	11
Nutrients (mg/L)													
NH3 as N	45	44	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.08
NO2 + NO3 as N	45	6	N/A				0.02	0.02	0.13	0.25	0.39	0.53	0.67
TKN as N	45	38	N/A				0.2	0.2	0.2	0.2	0.2	0.25	0.35
Total Phosphorus	45	21	N/A				0.01	0.02	0.02	0.02	0.02	0.04	0.08
Metals (ug/L)													
Aluminum, total (Al)	17	1	N/A				50	52	68	100	120	224	360
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>0.4	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	15	>7	0	0		2	2	2	2	2	4	5
Iron, total (Fe)	17	12	>1000	0	0		50	50	50	50	58	100	150
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	12	>50	0	0		10	10	10	10	14	27	29

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
50	3	0	0	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: WILSON CRK AT SR 1358 AT EDGEMONT
Station #: C1385000 **Hydrologic Unit Code:** 03050101
Latitude: 36.00300 **Longitude:** -81.77100 **Stream class:** B Tr ORW
Agency: NCAMBNT **NC stream index:** 11-38-34

Time period: 07/21/2005 to 07/21/2005

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Min	Percentiles 10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	1	0	<6	0	0		9.6	9.6	9.6	9.6	9.6	9.6	9.6
pH (SU)	1	0	<6	0	0		6.8	6.8	6.8	6.8	6.8	6.8	6.8
	1	0	>9	0	0		6.8	6.8	6.8	6.8	6.8	6.8	6.8
Spec. conductance (umhos/cm at 25°C)	1	0	N/A				21	21	21	21	21	21	21
Water Temperature (°C)	1	0	>29	0	0		19.2	19.2	19.2	19.2	19.2	19.2	19.2
Other													
Turbidity (NTU)	1	1	>10	0	0		1	1	1	1	1	1	1
Nutrients (mg/L)													
NH3 as N	1	1	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	1	0	N/A				0.05	0.05	0.05	0.05	0.05	0.05	0.05
TKN as N	1	1	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus	1	1	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
1	19	0	0	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LOWER CRK AT SR 1501 NR MORGANTON MARION
Station #: C1750000 **Hydrologic Unit Code:** 03050101
Latitude: 35.82512 **Longitude:** -81.63587 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-39-(6.5)

Time period: 01/22/2003 to 12/12/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	47	0	<4	0	0		6.7	7.5	8.5	9.3	10.5	12.1	13.4
	47	0	<5	0	0		6.7	7.5	8.5	9.3	10.5	12.1	13.4
pH (SU)	49	0	<6	0	0		6.3	6.5	6.7	6.9	7	7	7.2
	49	0	>9	0	0		6.3	6.5	6.7	6.9	7	7	7.2
Spec. conductance (umhos/cm at 25°C)	48	0	N/A				62	76	83	86	98	111	131
Water Temperature (°C)	51	0	>29	0	0		3	5.8	10.3	15.3	19	21.9	22.8
Other													
TSS (mg/L)	20	1	N/A				5.4	6.4	12	17	33.5	141.7	150
Turbidity (NTU)	52	0	>50	11	21.2	99.5	3	7.3	10.2	16.5	36	77	230
Nutrients (mg/L)													
NH3 as N	51	5	N/A				0.02	0.02	0.03	0.03	0.06	0.09	0.23
NO2 + NO3 as N	51	0	>10	0	0		0.32	0.44	0.52	0.6	0.7	0.81	0.85
TKN as N	51	7	N/A				0.2	0.2	0.23	0.29	0.4	0.62	1.1
Total Phosphorus	51	0	N/A				0.03	0.04	0.05	0.08	0.14	0.22	0.5
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				210	314	530	760	1750	6320	7600
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	7	>7	1	5.9		2	2	2	2	3	7	8
Iron, total (Fe)	17	0	>1000	12	70.6	100	730	778	965	1400	2100	7320	7800
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	1	5.9		65	83	92	110	130	178	250
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	4	>50	0	0		10	10	10	12	16	31	31

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
52	497	28	54	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LAKE HICKORY AT NC 127 NR HICKORY
Station #: C2600000 **Hydrologic Unit Code:** 03050101
Latitude: 35.80201 **Longitude:** -81.30426 **Stream class:** WS-V&B
Agency: NCAMBNT **NC stream index:** 11-(59.5)

Time period: 01/09/2003 to 01/02/2007

	# results	# ND	Results not meeting EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	45	0	<4	0	0		6.5	7.3	8	8.8	10.3	11.1	12.5
	45	0	<5	0	0		6.5	7.3	8	8.8	10.3	11.1	12.5
pH (SU)	45	0	<6	5	11.1	70.8	5.7	5.9	6.2	6.6	7.4	7.9	9.1
	45	0	>9	1	2.2		5.7	5.9	6.2	6.6	7.4	7.9	9.1
Spec. conductance (umhos/cm at 25°C)	45	0	N/A				41	45	47	51	54	57	61
Water Temperature (°C)	45	0	>29	4	8.9		6	7.8	11.2	18.5	26.8	28.9	30.5
Other													
Chlorophyll a (ug/L)	41	0	>40	0	0		1	2	3	10	15	19	30
TSS (mg/L)	18	3	N/A				2.5	2.5	2.7	4	4.2	6.4	10
Turbidity (NTU)	46	0	>25	1	2.2		1.3	2	2.8	3.3	4.9	11.9	30
Nutrients (mg/L)													
NH3 as N	43	24	N/A				0.02	0.02	0.02	0.02	0.03	0.05	0.08
NO2 + NO3 as N	43	9	>10	0	0		0.02	0.02	0.04	0.19	0.29	0.34	0.49
TKN as N	43	10	N/A				0.2	0.2	0.2	0.24	0.3	0.35	0.55
Total Phosphorus	43	1	N/A				0.02	0.02	0.03	0.03	0.04	0.04	0.06
Metals (ug/L)													
Aluminum, total (Al)	18	0	N/A				58	62	81	125	252	508	1300
Arsenic, total (As)	18	18	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	18	18	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	18	18	>50	0	0		10	24	25	25	25	25	25
Copper, total (Cu)	18	16	>7	0	0		2	2	2	2	2	3	6
Iron, total (Fe)	18	0	>1000	0	0		57	75	103	175	380	559	1000
Lead, total (Pb)	18	18	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	18	2	>200	0	0		10	10	11	17	34	40	41
Mercury, total (Hg)	18	18	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	18	18	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	18	16	>50	0	0		10	10	10	10	10	13	19

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
46	3	0	0	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LOWER LITTLE RIV AT SR 1313 NR ALL HEALING SPRINGS
Station #: C2818000 **Hydrologic Unit Code:** 03050101
Latitude: 35.94585 **Longitude:** -81.23698 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-69-(0.5)

Time period: 01/14/2003 to 12/04/2007

	#	#		Results not meeting EL			Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		7	7.7	8.3	9.7	11.2	12.4	15
	58	0	<5	0	0		7	7.7	8.3	9.7	11.2	12.4	15
pH (SU)	58	0	<6	8	13.8	87.9	5.7	5.8	6.1	6.4	6.6	7.2	7.8
	58	0	>9	0	0		5.7	5.8	6.1	6.4	6.6	7.2	7.8
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				39	42	44	47	51	53	56
Water Temperature (°C)	58	0	>29	0	0		2	5.7	8.4	15.2	19.3	21	24.4
Other													
TSS (mg/L)	20	1	N/A				2.5	3	3.2	4	6	20.1	22
Turbidity (NTU)	59	0	>50	4	6.8		2.2	3.3	3.8	6.4	13	37	450
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				130	146	180	210	285	538	730
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	14	>7	0	0		2	2	2	2	2	3	4
Iron, total (Fe)	17	0	>1000	0	0		270	286	315	400	560	904	1000
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	15	>50	0	0		10	10	10	10	10	22	32

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
59	406	28	47	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LAKE NORMAN AT SR 1004 NR MOORESVILLE
Station #: C3420000 **Hydrologic Unit Code:** 03050101
Latitude: 35.69560 **Longitude:** -80.99076 **Stream class:** WS-IV&B CA
Agency: NCAMBNT **NC stream index:** 11-(75)

Time period: 01/09/2003 to 01/02/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Min	Percentiles 10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	45	0	<4	0	0		5.3	6.1	7.2	8.1	10.3	11.5	12.5
	45	0	<5	0	0		5.3	6.1	7.2	8.1	10.3	11.5	12.5
pH (SU)	45	0	<6	6	13.3	84.1	5.7	5.9	6.1	6.3	7.2	7.9	8.6
	45	0	>9	0	0		5.7	5.9	6.1	6.3	7.2	7.9	8.6
Spec. conductance (umhos/cm at 25°C)	45	0	N/A				41	46	50	53	56	60	63
Water Temperature (°C)	45	0	>32	0	0		6	8	11.5	19.8	26.2	28.7	31.1
Other													
Chlorophyll a (ug/L)	41	0	>40	1	2.4		1	2	3	6	9	18	41
TSS (mg/L)	17	1	N/A				4.2	4.8	6.9	8	13	30	30
Turbidity (NTU)	45	0	>25	2	4.4		2.4	3.8	5.1	6	9.9	18.8	60
Nutrients (mg/L)													
NH3 as N	42	18	N/A				0.02	0.02	0.02	0.02	0.04	0.06	0.08
NO2 + NO3 as N	42	2	>10	0	0		0.02	0.07	0.21	0.27	0.34	0.41	0.45
TKN as N	42	12	N/A				0.2	0.2	0.2	0.24	0.28	0.37	0.5
Total Phosphorus	42	0	N/A				0.02	0.02	0.03	0.03	0.04	0.05	0.1
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				140	164	260	350	795	1232	2400
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	12	>7	0	0		2	2	2	2	2	3	4
Iron, total (Fe)	17	0	>1000	1	5.9		130	218	340	450	725	1140	2300
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	0	0		18	26	32	35	56	60	63
Mercury, total (Hg)	17	17	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	16	>50	0	0		10	10	10	10	10	13	27

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
45	20	3	7	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: MOUNTAIN ISLAND LAKE ABOVE GAR CRK NR CROFT
Station #: C3699000 **Hydrologic Unit Code:** 03050101
Latitude: 35.35514 **Longitude:** -80.93793 **Stream class:** WS-IV&B CA
Agency: NCAMBNT **NC stream index:** 11-(114)

Time period: 01/28/2003 to 01/02/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Min	Percentiles 10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	43	0	<4	0	0		4.6	5.8	6.6	7.5	9.6	10.3	10.9
	43	0	<5	1	2.3		4.6	5.8	6.6	7.5	9.6	10.3	10.9
pH (SU)	43	0	<6	4	9.3		5.7	5.9	6.1	6.4	6.8	7.4	7.8
	43	0	>9	0	0		5.7	5.9	6.1	6.4	6.8	7.4	7.8
Spec. conductance (umhos/cm at 25°C)	43	0	N/A				51	53	54	57	60	64	79
Water Temperature (°C)	43	0	>32	0	0		7.4	10.4	12.6	20.2	29	31.4	31.5
Other													
Chlorophyll a (ug/L)	39	0	>40	0	0		1	2	3	4	5	8	20
TSS (mg/L)	17	2	N/A				2.5	2.5	2.9	4	5.5	16.2	25
Turbidity (NTU)	45	0	>25	0	0		1.8	2.3	3	3.5	4.2	7.4	22
Nutrients (mg/L)													
NH3 as N	41	24	N/A				0.02	0.02	0.02	0.02	0.02	0.05	0.09
NO2 + NO3 as N	41	1	>10	0	0		0.02	0.04	0.09	0.17	0.21	0.24	0.27
TKN as N	41	20	N/A				0.2	0.2	0.2	0.2	0.23	0.28	0.33
Total Phosphorus	41	14	N/A				0.02	0.02	0.02	0.02	0.02	0.03	0.07
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				60	63	98	160	260	486	830
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	6	>7	0	0		2	2	2	3	4	4	4
Iron, total (Fe)	17	0	>1000	0	0		70	72	105	170	310	470	870
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	0	0		15	16	18	26	38	44	58
Mercury, total (Hg)	17	17	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	17	>50	0	0		10	10	10	10	10	10	10

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
44	8	1	2	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: DUTCHMANS CRK AT SR 1918 AT MOUNTAIN ISLAND
Station #: C3860000 **Hydrologic Unit Code:** 03050101
Latitude: 35.33646 **Longitude:** -81.01328 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-119-(0.5)

Time period: 01/22/2003 to 12/10/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		5	7	7.6	9.3	11.7	12.7	14
	58	0	<5	0	0		5	7	7.6	9.3	11.7	12.7	14
pH (SU)	58	0	<6	3	5.2		5.5	6.1	6.5	6.7	7	7.2	7.9
	58	0	>9	0	0		5.5	6.1	6.5	6.7	7	7.2	7.9
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				39	74	82	87	94	109	156
Water Temperature (°C)	59	0	>32	0	0		3	4	9.2	14.8	21.6	24.9	26.2
Other													
TSS (mg/L)	20	3	N/A				3	4	5	8.5	19.8	66.4	450
Turbidity (NTU)	59	0	>50	5	8.5		3.3	4	7.4	13	28	45	370
Nutrients (mg/L)													
NH3 as N	1	1	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	1	0	>10	0	0		0.18	0.18	0.18	0.18	0.18	0.18	0.18
TKN as N	1	0	N/A				0.83	0.83	0.83	0.83	0.83	0.83	0.83
Total Phosphorus	1	0	N/A				0.35	0.35	0.35	0.35	0.35	0.35	0.35
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				150	158	205	520	1600	7040	16000
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	9	>7	1	5.9		2	2	2	2	3	10	22
Iron, total (Fe)	17	0	>1000	10	58.8	100	660	732	880	1400	2150	7600	16000
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	2	11.8	76.2	85	86	92	100	120	372	540
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	19	41

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	242	18	32	99

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CATAWBA RIV AT NC 27 NR THRIFT
Station #: C3900000 **Hydrologic Unit Code:** 03050101
Latitude: 35.29818 **Longitude:** -81.00323 **Stream class:** WS-IV CA
Agency: NCAMBNT **NC stream index:** 11-(117)

Time period: 01/28/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	56	0	<4	0	0		4	5.1	5.7	7.5	9	10.1	11.1
	56	0	<5	4	7.1		4	5.1	5.7	7.5	9	10.1	11.1
pH (SU)	56	0	<6	9	16.1	95.1	5.5	5.8	6	6.3	6.8	7.1	7.6
	56	0	>9	0	0		5.5	5.8	6	6.3	6.8	7.1	7.6
Spec. conductance (umhos/cm at 25°C)	55	0	N/A				52	53	56	58	63	69	78
Water Temperature (°C)	56	0	>32	1	1.8		7.5	10.5	13.5	20.9	27	30.9	32.4
Other													
Chlorophyll a (ug/L)	50	10	>40	0	0		1	1	1	2	2	5	27
TSS (mg/L)	20	6	N/A				2.5	2.5	3	5	6.2	10.7	12
Turbidity (NTU)	57	0	>25	1	1.8		1.3	2.1	2.6	3.5	5.2	6.7	29
Nutrients (mg/L)													
NH3 as N	53	15	N/A				0.02	0.02	0.02	0.03	0.04	0.06	0.12
NO2 + NO3 as N	53	1	>10	0	0		0.02	0.07	0.1	0.17	0.21	0.25	0.49
TKN as N	53	32	N/A				0.2	0.2	0.2	0.2	0.22	0.26	0.31
Total Phosphorus	53	22	N/A				0.02	0.02	0.02	0.02	0.02	0.03	0.04
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				90	98	120	180	300	400	400
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	1	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	10	25	25	25	25	25
Copper, total (Cu)	17	4	>7	0	0		2	2	2	3	4	4	5
Iron, total (Fe)	17	0	>1000	0	0		120	128	155	170	305	474	490
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	0	0		13	14	20	28	40	50	56
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	17	>50	0	0		10	10	10	10	10	10	10

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	11	0	0	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LONG CRK AT SR 2042 NR PAW CREEK
Station #: C4040000 **Hydrologic Unit Code:** 03050101
Latitude: 35.32846 **Longitude:** -80.90962 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-120-(2.5)

Time period: 01/22/2003 to 12/10/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	1	1.7		3.7	6.1	7.3	8.2	10.5	11.9	14.4
	58	0	<5	3	5.2		3.7	6.1	7.3	8.2	10.5	11.9	14.4
pH (SU)	58	0	<6	0	0		6	6.3	6.5	6.9	7.2	7.4	7.7
	58	0	>9	0	0		6	6.3	6.5	6.9	7.2	7.4	7.7
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				51	104	138	165	176	198	207
Water Temperature (°C)	59	0	>32	0	0		3	4.9	11.6	15.7	21.8	24.6	25.9
Other													
TSS (mg/L)	20	5	N/A				2.5	2.6	4	6.2	21	62.4	92
Turbidity (NTU)	59	0	>50	14	23.7	99.9	1.7	2.9	4.7	13	50	160	900
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				60	87	185	1000	4300	6180	7700
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	7	>7	5	29.4	99.5	2	2	2	4	9	12	14
Iron, total (Fe)	17	1	>1000	8	47.1	100	50	218	630	1000	4150	6000	6400
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	1	5.9		56	57	98	120	160	198	230
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	7	>50	1	5.9		10	10	10	14	23	39	61

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	330	15	27	92.1

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CATAWBA RIV AT POWERLINE CROSSING AT S BELMONT X REF C4210000
Station #: C4220000 **Hydrologic Unit Code:** 03050101
Latitude: 35.21480 **Longitude:** -81.00971 **Stream class:** WS-IV&B CA
Agency: NCAMBNT **NC stream index:** 11-(122)

Time period: 01/28/2003 to 01/03/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	44	0	<4	0	0		4.7	5.9	7	8.2	9.1	9.9	11.1
	44	0	<5	1	2.3		4.7	5.9	7	8.2	9.1	9.9	11.1
pH (SU)	43	0	<6	1	2.3		5.9	6	6.2	6.4	7.1	7.5	8.6
	43	0	>9	0	0		5.9	6	6.2	6.4	7.1	7.5	8.6
Spec. conductance (umhos/cm at 25°C)	44	0	N/A				55	57	59	63	73	82	92
Water Temperature (°C)	44	0	>32	2	4.5		6.6	10.3	13.1	21.4	28.6	31.5	32.8
Other													
Chlorophyll a (ug/L)	39	4	>40	0	0		1	1	2	3	11	17	23
TSS (mg/L)	16	1	N/A				2.5	2.7	4	7.1	11.2	37.7	72
Turbidity (NTU)	45	0	>25	3	6.7		2.7	4	5	7.4	10.5	15	200
Nutrients (mg/L)													
NH3 as N	41	16	N/A				0.02	0.02	0.02	0.03	0.04	0.07	0.15
NO2 + NO3 as N	41	4	>10	0	0		0.02	0.02	0.12	0.17	0.22	0.25	0.3
TKN as N	41	11	N/A				0.2	0.2	0.2	0.25	0.34	0.4	0.82
Total Phosphorus	41	0	N/A				0.02	0.02	0.03	0.04	0.06	0.08	0.22
Metals (ug/L)													
Aluminum, total (Al)	16	0	N/A				190	197	222	410	588	1071	1400
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		10	20	25	25	25	25	25
Copper, total (Cu)	16	2	>7	2	12.5	78.9	2	2	2	3	4	9	10
Iron, total (Fe)	16	0	>1000	2	12.5	78.9	250	257	302	420	625	1330	1400
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	16	0	>200	0	0		20	24	29	42	54	110	190
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	15	>50	0	0		10	10	10	10	10	21	46

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
44	17	2	5	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: HENRY FORK RIV AT SR 1124 NR HENRY RIVER
Station #: C4300000 **Hydrologic Unit Code:** 03050102
Latitude: 35.68483 **Longitude:** -81.40346 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-129-1-(12.5)

Time period: 01/08/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		5.8	7.6	8.4	9.7	11.1	12.5	13.7
	59	0	<5	0	0		5.8	7.6	8.4	9.7	11.1	12.5	13.7
pH (SU)	59	0	<6	11	18.6	98.7	5.1	5.7	6.1	6.5	6.9	7.3	7.8
	59	0	>9	0	0		5.1	5.7	6.1	6.5	6.9	7.3	7.8
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				23	27	28	29	32	34	36
Water Temperature (°C)	59	0	>32	0	0		1.3	4.4	8.2	15.1	20.3	23.4	25.9
Other													
TSS (mg/L)	20	6	N/A				2.5	2.5	2.6	6.2	14.5	63.5	101
Turbidity (NTU)	59	0	>50	5	8.5		1.4	2.1	3.1	5.7	10.3	20	140
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				62	88	140	220	645	2740	5300
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	14	>7	0	0		2	2	2	2	2	3	4
Iron, total (Fe)	17	0	>1000	3	17.6	91.7	240	248	315	480	855	2900	5300
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	15	>50	0	0		10	10	10	10	10	11	17

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
55	73	7	13	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: HENRY FORK RIV AT SR 1143 NR BROOKFORD
Station #: C4360000 **Hydrologic Unit Code:** 03050102
Latitude: 35.65832 **Longitude:** -81.30838 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-129-1-(12.5)

Time period: 01/08/2003 to 12/13/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Min	Percentiles 10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		6.2	7.1	8.1	9.7	11.2	12.4	13.9
	59	0	<5	0	0		6.2	7.1	8.1	9.7	11.2	12.4	13.9
pH (SU)	59	0	<6	4	6.8		5.3	6	6.3	6.5	6.8	7.3	7.6
	59	0	>9	0	0		5.3	6	6.3	6.5	6.8	7.3	7.6
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				42	52	62	75	92	127	249
Water Temperature (°C)	59	0	>32	0	0		2	4.9	8.2	15.4	20.7	24.2	27.2
Other													
TSS (mg/L)	20	2	N/A				2.5	3.1	5.3	11	23.5	87.6	90
Turbidity (NTU)	59	0	>50	5	8.5		2.3	3	4.4	8.6	15	45	400
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				60	108	240	590	1445	4100	4500
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	8	>7	0	0		2	2	2	2	4	5	6
Iron, total (Fe)	17	0	>1000	10	58.8	100	330	354	605	1100	1900	4960	5200
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	8	>50	0	0		10	10	10	10	14	24	32

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	124	9	16	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: JACOB FORK AT SR 1924 AT RAMSEY
Station #: C4370000 **Hydrologic Unit Code:** 03050102
Latitude: 35.59055 **Longitude:** -81.56712 **Stream class:** WS-III ORW
Agency: NCAMBNT **NC stream index:** 11-129-2-(4)

Time period: 01/14/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	43	0	<4	0	0		7.6	8.4	9.4	11.2	12.5	13.8	16.8
	43	0	<5	0	0		7.6	8.4	9.4	11.2	12.5	13.8	16.8
pH (SU)	47	0	<6	0	0		6	6.2	6.4	6.6	6.7	6.8	7
	47	0	>9	0	0		6	6.2	6.4	6.6	6.7	6.8	7
Spec. conductance (umhos/cm at 25°C)	45	0	N/A				19	19	20	22	25	27	30
Water Temperature (°C)	48	0	>32	0	0		3	4.9	8	14.4	19.6	21.4	22.7
Other													
Chlorophyll a (ug/L)	1	0	>40	0	0		3	3	3	3	3	3	3
TSS (mg/L)	19	17	N/A				2.2	2.3	2.5	2.5	2.6	6.2	9.5
Turbidity (NTU)	49	9	>50	0	0		1	1	1.1	1.7	3.2	5.1	12
Nutrients (mg/L)													
NH3 as N	44	43	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.04
NO2 + NO3 as N	44	4	>10	0	0		0.02	0.02	0.04	0.05	0.07	0.1	0.24
TKN as N	44	43	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus	44	22	N/A				0.01	0.02	0.02	0.02	0.02	0.03	0.05
Metals (ug/L)													
Aluminum, total (Al)	17	2	N/A				50	50	56	95	140	294	590
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	16	>7	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	17	0	>1000	0	0		72	75	91	160	230	348	620
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	11	>200	0	0		10	10	10	10	12	14	16
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	16	>50	0	0		10	10	10	10	10	14	32

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
49	53	1	2	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: S FORK CATAWBA RIV AT NC 10 NR STARTOWN
Station #: C4380000 **Hydrologic Unit Code:** 03050102
Latitude: 35.63311 **Longitude:** -81.30531 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-129-(0.5)

Time period: 01/08/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		5.5	6.7	8	9.4	10.8	12.3	14.2
	59	0	<5	0	0		5.5	6.7	8	9.4	10.8	12.3	14.2
pH (SU)	59	0	<6	12	20.3	99.5	5.5	5.8	6.1	6.4	6.7	7.2	7.8
	59	0	>9	0	0		5.5	5.8	6.1	6.4	6.7	7.2	7.8
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				37	45	51	57	70	103	190
Water Temperature (°C)	59	0	>32	0	0		1.8	4.7	8.5	14.5	20.3	24.3	26.7
Other													
TSS (mg/L)	20	1	N/A				2.5	2.8	4.2	10.4	41.5	53.9	180
Turbidity (NTU)	59	0	>50	5	8.5		1.9	2.8	4.2	9.2	22	50	220
Nutrients (mg/L)													
NH3 as N	1	0	N/A				0.04	0.04	0.04	0.04	0.04	0.04	0.04
NO2 + NO3 as N	1	0	>10	0	0		0.49	0.49	0.49	0.49	0.49	0.49	0.49
TKN as N	1	1	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphorus	1	0	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
Metals (ug/L)													
Aluminum, total (Al)	16	0	N/A				92	119	198	585	1550	4210	6800
Arsenic, total (As)	16	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	16	16	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	16	16	>50	0	0		10	20	25	25	25	25	25
Copper, total (Cu)	16	7	>7	0	0		2	2	2	2	3	5	6
Iron, total (Fe)	16	0	>1000	8	50	100	360	402	540	965	2075	4190	7200
Lead, total (Pb)	16	16	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	16	0	>200	1	6.2		42	44	50	60	89	146	260
Mercury, total (Hg)	15	15	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	16	16	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	16	13	>50	0	0		10	10	10	10	10	18	24

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	176	12	21	67.8

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CLARK CRK AT SR 1008 GROVE ST AT LINCOLNTON
Station #: C4800000 **Hydrologic Unit Code:** 03050102
Latitude: 35.47532 **Longitude:** -81.26719 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-129-5-(9.5)

Time period: 01/22/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		6	6.5	7.5	8.8	10.4	11.6	12.6
	59	0	<5	0	0		6	6.5	7.5	8.8	10.4	11.6	12.6
pH (SU)	58	0	<6	0	0		6	6.2	6.5	6.8	7.1	7.3	7.8
	58	0	>9	0	0		6	6.2	6.5	6.8	7.1	7.3	7.8
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				79	138	179	224	326	480	1023
Water Temperature (°C)	59	0	>32	0	0		3.7	6.4	9.7	14.4	19.9	23.1	25.2
Other													
TSS (mg/L)	20	1	N/A				3	4.3	6.4	13	26.2	54.2	130
Turbidity (NTU)	59	0	>50	7	11.9	76.6	2.5	5.4	10	17	31	110	550
Nutrients (mg/L)													
NH3 as N	58	1	N/A				0.02	0.04	0.06	0.09	0.11	0.15	0.32
NO2 + NO3 as N	58	0	>10	0	0		0.16	0.89	1.18	1.55	2	2.42	4.5
TKN as N	58	0	N/A				0.28	0.33	0.38	0.42	0.54	0.79	1.3
Total Phosphorus	58	0	N/A				0.13	0.16	0.16	0.21	0.3	0.54	0.86
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				170	186	280	680	1650	4640	6400
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	6	>7	2	11.8	76.2	2	2	2	3	4	9	13
Iron, total (Fe)	17	0	>1000	11	64.7	100	580	628	845	1300	2200	5600	7200
Lead, total (Pb)	17	16	>25	1	5.9		10	10	10	10	10	14	28
Manganese, total (Mn)	17	0	>200	1	5.9		59	65	84	110	125	178	290
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	10	>50	1	5.9		10	10	10	10	12	46	110

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	576	29	51	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: INDIAN CRK AT SR 1252 NR LABORATORY
Station #: C5170000 **Hydrologic Unit Code:** 03050102
Latitude: 35.42280 **Longitude:** -81.25920 **Stream class:** WS-IV
Agency: NCAMBNT **NC stream index:** 11-129-8-(6.5)

Time period: 01/22/2003 to 12/13/2007

	#	#	Results not meeting EL				Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		5.9	7.3	8.2	9.8	10.9	12.4	13.4
	59	0	<5	0	0		5.9	7.3	8.2	9.8	10.9	12.4	13.4
pH (SU)	58	0	<6	4	6.9		5.5	6	6.2	6.5	6.7	7.2	7.5
	58	0	>9	0	0		5.5	6	6.2	6.5	6.7	7.2	7.5
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				52	59	62	66	71	83	149
Water Temperature (°C)	59	0	>32	0	0		2.8	5.7	9.3	14.6	19.6	23	25.2
Other													
TSS (mg/L)	20	3	N/A				2.5	3	5	7.2	11.8	17.8	20
Turbidity (NTU)	59	0	>50	3	5.1		3	4.3	5.9	10	16	29	160
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				120	136	175	390	545	752	880
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	11	>7	0	0		2	2	2	2	2	4	5
Iron, total (Fe)	17	0	>1000	9	52.9	100	580	612	805	1100	1400	1540	1700
Lead, total (Pb)	17	16	>25	0	0		10	10	10	10	10	13	25
Manganese, total (Mn)	17	0	>200	0	0		61	64	70	84	96	120	120
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	16	>50	0	0		10	10	10	10	10	11	14

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	364	22	39	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LONG CRK AT SR 1456 NR BESSEMER CITY
Station #: C5900000 **Hydrologic Unit Code:** 03050102
Latitude: 35.30518 **Longitude:** -81.23264 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-129-16-(4)

Time period: 01/06/2003 to 12/12/2007

	# results	# ND	Results not meeting EL				Percentiles						
			EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	2	3.4		2.9	5.8	7.4	8.4	10.4	12.3	14.6
	59	0	<5	2	3.4		2.9	5.8	7.4	8.4	10.4	12.3	14.6
pH (SU)	59	0	<6	5	8.5		5.2	6	6.1	6.6	7	7.2	7.7
	59	0	>9	0	0		5.2	6	6.1	6.6	7	7.2	7.7
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				45	87	92	103	120	143	179
Water Temperature (°C)	59	0	>32	0	0		3.3	6.1	9.3	16.1	19.8	22.6	23.8
Other													
TSS (mg/L)	20	3	N/A				2.5	2.5	3.8	6.2	9.4	42.4	290
Turbidity (NTU)	59	0	>50	4	6.8		2.1	3.9	5.3	8.5	14	34	250
Nutrients (mg/L)													
NH3 as N	58	23	N/A				0.02	0.02	0.02	0.02	0.04	0.07	0.23
NO2 + NO3 as N	58	0	N/A				0.02	0.25	0.38	0.45	0.52	0.57	0.67
TKN as N	58	13	N/A				0.2	0.2	0.2	0.26	0.32	0.56	1.5
Total Phosphorus	58	0	N/A				0.02	0.03	0.04	0.05	0.07	0.15	0.78
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				76	111	140	290	615	3560	9400
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	12	>7	1	5.9		2	2	2	2	2	7	13
Iron, total (Fe)	17	0	>1000	8	47.1	100	540	588	700	1000	1300	4320	8000
Lead, total (Pb)	17	16	>25	0	0		10	10	10	10	10	10	12
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	22	30

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	391	21	37	99.9

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: S FORK CATAWBA RIV AT NC 7 AT MCADENVILLE
Station #: C6500000 **Hydrologic Unit Code:** 03050102
Latitude: 35.26014 **Longitude:** -81.07390 **Stream class:** WS-V
Agency: NCAMBNT **NC stream index:** 11-129-(15.5)

Time period: 01/06/2003 to 12/06/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		5.4	6.9	8.2	9.2	11.1	12.6	14.8
	58	0	<5	0	0		5.4	6.9	8.2	9.2	11.1	12.6	14.8
pH (SU)	59	0	<6	2	3.4		5.5	6.2	6.4	6.7	7.1	7.6	7.7
	59	0	>9	0	0		5.5	6.2	6.4	6.7	7.1	7.6	7.7
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				50	77	84	102	124	176	291
Water Temperature (°C)	59	0	>32	0	0		3.3	5.9	9.2	15.9	22.4	25.5	27.8
Other													
TSS (mg/L)	20	3	N/A				2.5	2.6	6	14.5	27.5	330	500
Turbidity (NTU)	59	0	>50	10	16.9	96.9	3.4	5	8.5	17	31	85	380
Nutrients (mg/L)													
NH3 as N	59	7	N/A				0.02	0.02	0.03	0.05	0.08	0.11	0.23
NO2 + NO3 as N	59	0	>10	0	0		0.26	0.48	0.61	0.7	0.79	0.94	1.4
TKN as N	59	1	N/A				0.2	0.23	0.28	0.36	0.46	0.63	1.5
Total Phosphorus	59	0	N/A				0.04	0.06	0.07	0.09	0.16	0.22	0.68
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				130	146	180	850	1800	12400	18000
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	6	>7	2	11.8	76.2	2	2	2	3	4	16	26
Iron, total (Fe)	17	0	>1000	10	58.8	100	570	642	690	1400	2450	15400	17000
Lead, total (Pb)	17	14	>25	0	0		10	10	10	10	10	13	22
Manganese, total (Mn)	17	0	>200	2	11.8	76.2	37	47	50	63	88	526	710
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	11	>50	2	11.8	76.2	10	10	10	10	14	55	69

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
58	200	15	26	89.7

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: S FORK CATAWBA RIV AT SR 2524 NR SOUTH BELMONT
Station #: C7000000 **Hydrologic Unit Code:** 03050102
Latitude: 35.16666 **Longitude:** -81.03825 **Stream class:** WS-V B
Agency: NCAMBNT **NC stream index:** 11-(123.5)

Time period: 01/28/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	Percentiles: 10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<4	0	0		5.2	6.2	6.8	7.9	9.2	10.2	10.7
	57	0	<5	0	0		5.2	6.2	6.8	7.9	9.2	10.2	10.7
pH (SU)	57	0	<6	1	1.8		5.8	6.2	6.4	7	7.5	7.8	8.4
	57	0	>9	0	0		5.8	6.2	6.4	7	7.5	7.8	8.4
Spec. conductance (umhos/cm at 25°C)	55	0	N/A				54	64	69	77	90	103	122
Water Temperature (°C)	57	0	>32	15	26.3	100	9.6	13.9	18.8	26.2	33	34.5	38.1
Other													
Chlorophyll a (ug/L)	2	0	>40	0	0		8	8	8	8	8	8	8
TSS (mg/L)	20	2	N/A				4	4.1	5.8	6.5	11.2	32.7	50
Turbidity (NTU)	57	0	>25	5	8.8		4.6	5.1	6	8.5	11.5	26.4	150
Nutrients (mg/L)													
NH3 as N	1	0	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	1	0	>10	0	0		0.35	0.35	0.35	0.35	0.35	0.35	0.35
TKN as N	1	0	N/A				0.36	0.36	0.36	0.36	0.36	0.36	0.36
Total Phosphorus	1	0	N/A				0.04	0.04	0.04	0.04	0.04	0.04	0.04
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				170	178	260	330	885	2140	5100
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	1	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	10	25	25	25	25	25
Copper, total (Cu)	17	1	>7	13	76.5	100	2	4	7	8	9	10	10
Iron, total (Fe)	17	0	>1000	4	23.5	97.8	270	318	365	480	1050	2380	5500
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	0	0		33	35	38	45	60	82	110
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	14	25

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	18	3	5	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CATAWBA CRK AT SR 2302 AT SC STATE LINE
Station #: C7400000 **Hydrologic Unit Code:** 03050101
Latitude: 35.15135 **Longitude:** -81.05824 **Stream class:** WS-V B
Agency: NCAMBNT **NC stream index:** 11-(123.5)

Time period: 01/28/2003 to 12/13/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		5.4	6.5	7.5	8.7	9.7	10.3	11.4
	58	0	<5	0	0		5.4	6.5	7.5	8.7	9.7	10.3	11.4
pH (SU)	58	0	<6	3	5.2		5.9	6.1	6.4	7.2	8.2	8.4	8.9
	58	0	>9	0	0		5.9	6.1	6.4	7.2	8.2	8.4	8.9
Spec. conductance (umhos/cm at 25°C)	55	0	N/A				8	64	70	78	88	104	123
Water Temperature (°C)	58	0	>32	3	5.2		7.7	10.3	14.4	21.8	30.3	31.7	33.6
Other													
Chlorophyll a (ug/L)	1	0	>40	0	0		17	17	17	17	17	17	17
TSS (mg/L)	20	3	N/A				3	4.1	5	6.6	8.1	17.4	22
Turbidity (NTU)	57	0	>25	3	5.3		3.1	3.7	4.1	5.6	7.8	17	60
Nutrients (mg/L)													
NH3 as N	1	1	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	1	0	>10	0	0		0.3	0.3	0.3	0.3	0.3	0.3	0.3
TKN as N	1	0	N/A				0.28	0.28	0.28	0.28	0.28	0.28	0.28
Total Phosphorus	1	0	N/A				0.03	0.03	0.03	0.03	0.03	0.03	0.03
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				140	164	205	260	480	1024	1800
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	1	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	10	25	25	25	25	25
Copper, total (Cu)	17	1	>7	0	0		2	3	3	4	5	6	6
Iron, total (Fe)	17	0	>1000	1	5.9		170	218	285	360	475	956	1900
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	10	0	>200	0	0		18	19	28	30	50	70	71
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	13	>50	0	0		10	10	10	10	10	15	17

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	7	0	0	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LAKE WYLIE AT NC 49 NR OAK GROVE
Station #: C7500000 **Hydrologic Unit Code:** 03050101
Latitude: 35.10128 **Longitude:** -81.04000 **Stream class:** WS-V&B
Agency: NCAMBNT **NC stream index:** 11-(123.5)

Time period: 01/28/2003 to 01/03/2007

	#	#		Results not meeting EL			Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	45	0	<4	0	0		4.3	6.6	7.4	8.7	9.5	10.8	11.1
	45	0	<5	1	2.2		4.3	6.6	7.4	8.7	9.5	10.8	11.1
pH (SU)	45	0	<6	1	2.2		5.4	6.1	6.2	6.9	7.8	8.3	8.8
	45	0	>9	0	0		5.4	6.1	6.2	6.9	7.8	8.3	8.8
Spec. conductance (umhos/cm at 25°C)	45	0	N/A				58	62	67	72	80	90	102
Water Temperature (°C)	45	0	>32	2	4.4		6.9	10.3	13.8	21.2	29.4	30.9	33.7
Other													
Chlorophyll a (ug/L)	39	0	>40	0	0		1	2	4	7	14	20	22
TSS (mg/L)	16	2	N/A				2.5	2.5	3	4.4	6	18.7	25
Turbidity (NTU)	45	0	>25	5	11.1	70.8	1.8	2.4	3	3.8	7.3	30	50
Nutrients (mg/L)													
NH3 as N	42	23	N/A				0.02	0.02	0.02	0.02	0.04	0.06	0.07
NO2 + NO3 as N	42	6	>10	0	0		0.02	0.02	0.07	0.18	0.28	0.32	0.43
TKN as N	42	2	N/A				0.2	0.21	0.23	0.29	0.35	0.42	0.51
Total Phosphorus	42	0	N/A				0.02	0.02	0.03	0.03	0.04	0.06	0.09
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				61	82	145	230	305	1460	2500
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	0	>7	0	0		3	3	3	4	4	5	6
Iron, total (Fe)	17	0	>1000	2	11.8	76.2	60	92	215	280	420	1440	2000
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Manganese, total (Mn)	17	0	>200	1	5.9		13	15	20	32	44	95	230
Mercury, total (Hg)	17	17	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>25	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	15	>50	0	0		10	10	10	10	10	12	18

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
45	4	2	4	

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: CROWDERS CRK AT SC 564 RIDGE RD NR BOWLING GREEN SC
Station #: C8660000 **Hydrologic Unit Code:** 03050101
Latitude: 35.14374 **Longitude:** -81.15046 **Stream class:** FW
Agency: NCAMBNT **NC stream index:**

Time period: 01/06/2003 to 12/12/2007

	# results	# ND	EL	Results not meeting EL #	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	N/A				5.6	6.8	7.7	9	10.8	12.1	14.2
pH (SU)	59	0	N/A				6.1	6.2	6.5	6.9	7.1	7.4	7.8
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				68	126	138	157	188	251	519
Water Temperature (°C)	59	0	N/A				3.8	6	10	15.9	21	24.2	25.4
Other													
TSS (mg/L)	20	2	N/A				2.5	3	4	6.2	10.2	51.3	600
Turbidity (NTU)	59	0	N/A				2.1	3.4	5.1	9.4	18	45	260
Nutrients (mg/L)													
NH3 as N	59	7	N/A				0.02	0.02	0.02	0.03	0.04	0.07	0.33
NO2 + NO3 as N	59	0	N/A				0.25	0.34	0.39	0.57	0.84	1.4	2.5
TKN as N	59	7	N/A				0.2	0.2	0.27	0.33	0.42	0.77	1.2
Total Phosphorus	59	0	N/A				0.03	0.04	0.06	0.08	0.1	0.14	0.59
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				97	107	135	350	465	8120	33000
Arsenic, total (As)	17	17	N/A				5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	N/A				1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	N/A				10	22	25	25	25	25	25
Copper, total (Cu)	17	11	N/A				2	2	2	2	3	8	25
Iron, total (Fe)	17	0	N/A				410	466	535	790	1090	6960	24000
Lead, total (Pb)	17	16	N/A				10	10	10	10	10	12	20
Manganese, total (Mn)	4	0	N/A				160	160	168	195	200	200	200
Mercury, total (Hg)	16	16	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	16	N/A				10	10	10	10	10	10	11
Zinc, total (Zn)	17	9	N/A				10	10	10	10	12	32	80

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
59	344	22	37	99.9

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: IRWIN CRK AT IRWIN CRK WWTP NR CHARLOTTE
Station #: C8896500 **Hydrologic Unit Code:** 03050103
Latitude: 35.19801 **Longitude:** -80.90453 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-137-1

Time period: 01/06/2003 to 12/06/2007

	#	#		Results not meeting EL			Percentiles						
	results	ND	EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<4	0	0		6.1	6.9	7.9	9.4	11.4	12.6	16.4
	58	0	<5	0	0		6.1	6.9	7.9	9.4	11.4	12.6	16.4
pH (SU)	59	0	<6	0	0		6	6.2	6.8	7.1	7.6	8	8.8
	59	0	>9	0	0		6	6.2	6.8	7.1	7.6	8	8.8
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				62	107	170	223	249	263	279
Water Temperature (°C)	59	0	>32	0	0		3	6.1	11.4	17.8	23.4	25.3	28.2
Other													
TSS (mg/L)	20	9	N/A				2.5	2.5	2.5	7.1	69	226	270
Turbidity (NTU)	59	0	>50	11	18.6	98.7	1.2	1.8	2.6	5.2	24	170	600
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				64	65	86	250	5450	10160	18000
Arsenic, total (As)	17	16	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	16	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	5	>7	6	35.3	99.9	2	2	2	3	18	30	44
Iron, total (Fe)	17	0	>1000	6	35.3	99.9	110	166	310	500	6800	11160	19000
Lead, total (Pb)	17	13	>25	3	17.6	91.7	10	10	10	10	12	32	49
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	16	>88	0	0		10	10	10	10	10	11	14
Zinc, total (Zn)	17	6	>50	4	23.5	97.8	10	10	10	19	54	176	200

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	396	24	43	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: SUGAR CRK AT NC 51 AT PINEVILLE
Station #: C9050000 **Hydrologic Unit Code:** 03050103
Latitude: 35.09067 **Longitude:** -80.89962 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-137

Time period: 01/02/2003 to 12/12/2007

	# results	# ND	Results not meeting EL	#	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	59	0	<4	0	0		5.8	6.2	6.9	8.2	9.5	10.7	12.2
	59	0	<5	0	0		5.8	6.2	6.9	8.2	9.5	10.7	12.2
pH (SU)	59	0	<6	0	0		6.1	6.4	6.7	6.9	7.2	7.5	7.6
	59	0	>9	0	0		6.1	6.4	6.7	6.9	7.2	7.5	7.6
Spec. conductance (umhos/cm at 25°C)	55	0	N/A				138	158	240	306	342	359	438
Water Temperature (°C)	59	0	>32	0	0		3.1	7.5	12	19	23.4	26	28.5
Other													
TSS (mg/L)	19	3	N/A				2.5	3.8	5	6.2	18	62	68
Turbidity (NTU)	60	0	>50	6	10	60.6	2.1	3.8	5.1	8.9	22.8	54	150
Nutrients (mg/L)													
NH3 as N	60	17	N/A				0.02	0.02	0.02	0.02	0.05	0.09	0.84
NO2 + NO3 as N	60	0	N/A				1	2.53	3.85	6.9	7.98	9.28	12
TKN as N	60	0	N/A				0.22	0.43	0.48	0.6	0.71	0.89	1.6
Total Phosphorus	60	0	N/A				0.17	0.32	0.41	0.62	0.79	1.09	1.5
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				87	129	200	280	780	2780	3100
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	1	>7	7	41.2	100	2	3	4	7	9	12	15
Iron, total (Fe)	17	0	>1000	4	23.5	97.8	320	320	525	670	1340	3120	3600
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	0	>50	0	0		16	17	22	24	32	38	44

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	458	25	44	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: LITTLE SUGAR CRK AT NC 51 AT PINEVILLE
Station #: C9210000 **Hydrologic Unit Code:** 03050103
Latitude: 35.08502 **Longitude:** -80.88218 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-137-8

Time period: 01/02/2003 to 12/12/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	60	0	<4	0	0		5.8	6.2	6.8	8.4	9.6	10.5	11.5
	60	0	<5	0	0		5.8	6.2	6.8	8.4	9.6	10.5	11.5
pH (SU)	60	0	<6	0	0		6.3	6.5	6.8	7	7.4	7.5	8.2
	60	0	>9	0	0		6.3	6.5	6.8	7	7.4	7.5	8.2
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				99	211	283	333	379	411	476
Water Temperature (°C)	60	0	>32	1	1.7		7	8.3	12.9	20.6	25.3	27.6	32.2
Other													
TSS (mg/L)	19	2	N/A				2.5	2.5	4.8	7	17	50	200
Turbidity (NTU)	60	0	>50	3	5		1.8	3.1	4.1	5.8	17.8	28.8	140
Nutrients (mg/L)													
NH3 as N	60	10	N/A				0.02	0.02	0.02	0.04	0.1	0.2	0.62
NO2 + NO3 as N	60	0	N/A				0.86	2.36	4.33	5.7	7.55	10.88	14
TKN as N	60	0	N/A				0.25	0.61	0.71	0.79	0.91	1	1.8
Total Phosphorus	60	0	N/A				0.25	0.39	0.63	0.95	1.2	1.69	2.6
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				110	134	160	200	760	3460	9300
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	0	>7	5	29.4	99.5	4	4	4	6	7	11	11
Iron, total (Fe)	17	0	>1000	3	17.6	91.7	290	322	355	450	910	3760	12000
Lead, total (Pb)	17	16	>25	0	0		10	10	10	10	10	11	14
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	0	>50	0	0		17	19	23	28	33	45	50

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	499	29	51	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: MCALPINE CRK AT SR 3356 SARDIS RD NR CHARLOTTE
Station #: C9370000 **Hydrologic Unit Code:** 03050103
Latitude: 35.13725 **Longitude:** -80.76817 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-137-9

Time period: 01/21/2003 to 12/06/2007

	# results	# ND	Results not meeting EL	#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	60	0	<4	1	1.7		3	6.3	6.6	8.2	11.2	12.8	16.3
	60	0	<5	1	1.7		3	6.3	6.6	8.2	11.2	12.8	16.3
pH (SU)	60	0	<6	0	0		6.2	6.3	6.5	7	7.3	7.6	8.1
	60	0	>9	0	0		6.2	6.3	6.5	7	7.3	7.6	8.1
Spec. conductance (umhos/cm at 25°C)	59	0	N/A				56	85	140	186	212	222	265
Water Temperature (°C)	60	0	>32	0	0		2.8	4.1	11.6	16.8	23.1	24.8	26.9
Other													
Chlorophyll a (ug/L)	1	0	>40	0	0		3	3	3	3	3	3	3
TSS (mg/L)	19	3	N/A				2.5	3.5	4	6	9	49	94
Turbidity (NTU)	60	0	>50	6	10	60.6	3.1	4.4	6.8	10	19	63	270
Nutrients (mg/L)													
NH3 as N	55	20	N/A				0.02	0.02	0.02	0.02	0.07	0.11	0.23
NO2 + NO3 as N	55	3	N/A				0.02	0.07	0.21	0.32	0.41	0.54	0.69
TKN as N	55	3	N/A				0.2	0.2	0.28	0.38	0.43	0.73	1.2
Total Phosphorus	55	0	N/A				0.02	0.04	0.05	0.06	0.08	0.18	0.36
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				87	129	165	420	715	1380	2900
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	7	>7	1	5.9		2	2	2	2	4	6	12
Iron, total (Fe)	17	0	>1000	7	41.2	100	670	782	850	1000	1250	2020	4500
Lead, total (Pb)	17	17	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	14	>50	0	0		10	10	10	10	10	27	42

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
58	400	24	41	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: MCALPINE CRK AT SC SR 2964 NR CAMP COX SC
Station #: C9680000 **Hydrologic Unit Code:** 03050103
Latitude: 35.04101 **Longitude:** -80.89162 **Stream class:** FW
Agency: NCAMBNT **NC stream index:**

Time period: 01/02/2003 to 12/12/2007

	# results	# ND	Results not meeting EL EL	#	%	%Conf	Percentiles Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	60	0	N/A				3.9	5.3	5.7	6.5	7.9	8.7	10.1
pH (SU)	60	0	N/A				6.2	6.4	6.6	6.8	7	7.2	7.4
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				119	262	318	398	452	517	685
Water Temperature (°C)	60	0	N/A				7	12.4	14.3	20.8	23.8	26.6	29.5
Other													
TSS (mg/L)	19	1	N/A				6	6.2	8.8	12	34	62	64
Turbidity (NTU)	60	0	N/A				3	5.1	6.4	8.9	15.8	37	65
Nutrients (mg/L)													
NH3 as N	60	0	N/A				0.03	0.05	0.06	0.1	0.17	0.44	2.3
NO2 + NO3 as N	60	0	N/A				0.68	4.7	7.25	11	14.75	18	22
TKN as N	60	0	N/A				0.39	0.8	1	1.2	1.4	1.89	3.6
Total Phosphorus	60	0	N/A				0.29	0.37	0.47	0.72	1.5	1.8	4.2
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				190	214	235	370	890	2460	4300
Arsenic, total (As)	17	17	N/A				5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	N/A				1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	N/A				10	22	25	25	25	25	25
Copper, total (Cu)	17	0	N/A				3	4	4	5	6	8	11
Iron, total (Fe)	17	0	N/A				520	560	735	870	1750	3560	5000
Lead, total (Pb)	17	17	N/A				10	10	10	10	10	10	10
Manganese, total (Mn)	3	0	N/A				100	100	100	180	330	330	330
Mercury, total (Hg)	16	16	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	N/A				10	10	10	10	10	10	10
Zinc, total (Zn)	17	0	N/A				15	20	29	36	48	62	67

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
57	307	20	35	99.8

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: SUGAR CRK AT SC 160 NR FORT MILL SC
Station #: C9790000 **Hydrologic Unit Code:** 03050103
Latitude: 35.00592 **Longitude:** -80.90221 **Stream class:** FW
Agency: NCAMBNT **NC stream index:**

Time period: 01/02/2003 to 12/12/2007

	# results	# ND	EL	Results not meeting EL #	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	60	0	N/A				5.7	6.2	6.6	7.7	8.6	9.9	10.9
pH (SU)	60	0	N/A				6.2	6.6	6.7	6.9	7.2	7.5	7.6
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				52	175	282	340	377	440	572
Water Temperature (°C)	60	0	N/A				5.6	9.7	13.2	19.5	23.8	26.4	30.6
Other													
TSS (mg/L)	19	0	N/A				7.3	8.2	9.5	14	50	99	370
Turbidity (NTU)	60	0	N/A				4.4	7.4	10.2	14	37	69	180
Nutrients (mg/L)													
NH3 as N	55	1	N/A				0.02	0.03	0.04	0.06	0.12	0.2	0.48
NO2 + NO3 as N	55	0	N/A				1.1	2.86	6	7.7	10	14	17
TKN as N	55	0	N/A				0.28	0.64	0.75	0.87	1.1	1.2	1.6
Total Phosphorus	55	0	N/A				0.36	0.44	0.52	0.74	0.98	1.28	2.5
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				260	292	365	510	920	5120	10000
Arsenic, total (As)	17	17	N/A				5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	N/A				1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	N/A				10	22	25	25	25	25	25
Copper, total (Cu)	17	0	N/A				4	4	5	5	8	12	14
Iron, total (Fe)	17	0	N/A				650	666	760	1000	1900	7160	15000
Lead, total (Pb)	17	16	N/A				10	10	10	10	10	12	20
Manganese, total (Mn)	3	0	N/A				69	69	69	120	340	340	340
Mercury, total (Hg)	16	16	N/A				0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	16	N/A				10	10	10	10	10	10	11
Zinc, total (Zn)	17	0	N/A				16	17	22	26	28	40	60

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
56	452	23	41	100

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Ambient Monitoring System Station Summaries
NCDENR, Division of Water Quality
Basinwide Assessment Report

Location: TWELVE MILE CRK AT NC 16 NR WAXHAW
Station #: C9819500 **Hydrologic Unit Code:** 03050103
Latitude: 34.95225 **Longitude:** -80.75581 **Stream class:** C
Agency: NCAMBNT **NC stream index:** 11-138

Time period: 01/21/2003 to 12/06/2007

	# results	# ND	Results not meeting EL: EL	#	%	%Conf	Percentiles: Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	60	0	<4	4	6.7		1.4	5	6.6	7.6	10.8	12.3	14.4
	60	0	<5	5	8.3		1.4	5	6.6	7.6	10.8	12.3	14.4
pH (SU)	60	0	<6	1	1.7		5.3	6.2	6.4	6.8	7.1	7.4	7.7
	60	0	>9	0	0		5.3	6.2	6.4	6.8	7.1	7.4	7.7
Spec. conductance (umhos/cm at 25°C)	59	0	N/A				20	104	127	145	158	176	340
Water Temperature (°C)	60	0	>32	0	0		1.8	6	9.7	15.9	21.5	23.4	28.9
Other													
TSS (mg/L)	19	3	N/A				2.5	3	6	6.2	13	56	310
Turbidity (NTU)	60	0	>50	8	13.3	85.8	3.6	7.6	10	18	35	64.5	650
Nutrients (mg/L)													
NH3 as N	60	15	N/A				0.02	0.02	0.02	0.03	0.05	0.1	0.25
NO2 + NO3 as N	60	6	N/A				0.02	0.02	0.19	0.36	0.49	0.59	0.79
TKN as N	60	0	N/A				0.2	0.26	0.33	0.45	0.64	0.8	1.2
Total Phosphorus	60	0	N/A				0.02	0.04	0.06	0.08	0.11	0.16	0.56
Metals (ug/L)													
Aluminum, total (Al)	17	0	N/A				85	241	455	570	1200	6080	16000
Arsenic, total (As)	17	17	>10	0	0		5	5	5	5	10	10	10
Cadmium, total (Cd)	17	17	>2	0	0		1	2	2	2	2	2	2
Chromium, total (Cr)	17	17	>50	0	0		10	22	25	25	25	25	25
Copper, total (Cu)	17	6	>7	3	17.6	91.7	2	2	2	3	5	10	18
Iron, total (Fe)	17	0	>1000	15	88.2	100	810	898	1250	1500	1700	8160	18000
Lead, total (Pb)	17	16	>25	0	0		10	10	10	10	10	11	15
Mercury, total (Hg)	16	16	>0.012	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	17	17	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	17	13	>50	0	0		10	10	10	10	10	18	39

Fecal Coliform Screening(#/100mL)

# results:	Geomean	# > 400:	% > 400:	%Conf:
58	252	14	24	83.1

Key:
result: number of observations
ND: number of observations reported to be below detection level (non-detect)
EL: Evaluation Level; applicable numeric or narrative water quality standard or action level
Results not meeting EL: number and percentages of observations not meeting evaluation level
%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Coliform)
Stations with less than 10 results for a given parameter were not evaluated for statistical confidence

Appendix B: Station Box & Whisker Plots

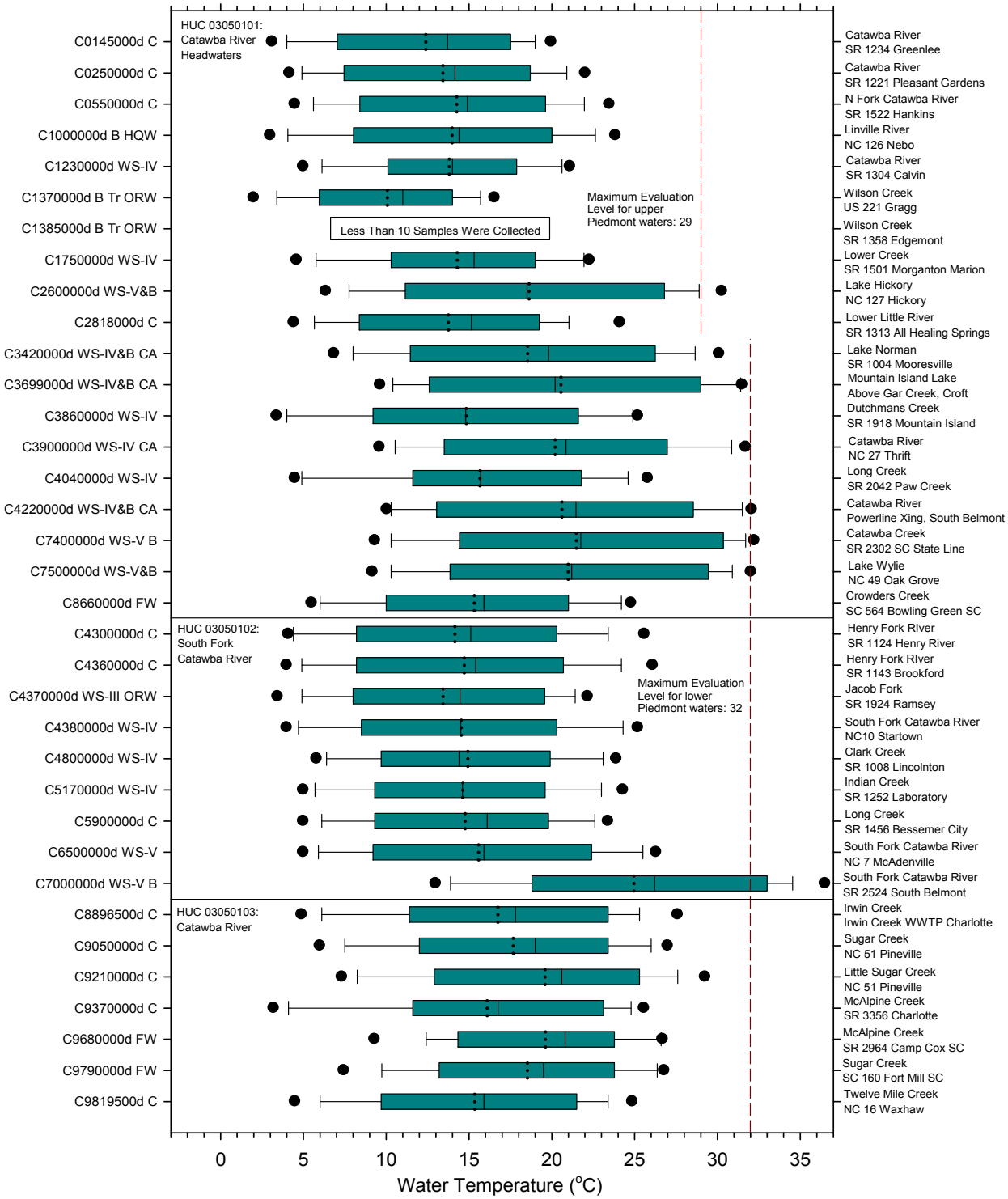


Figure 27. Box Plots of Temperature in the Catawba River Basin

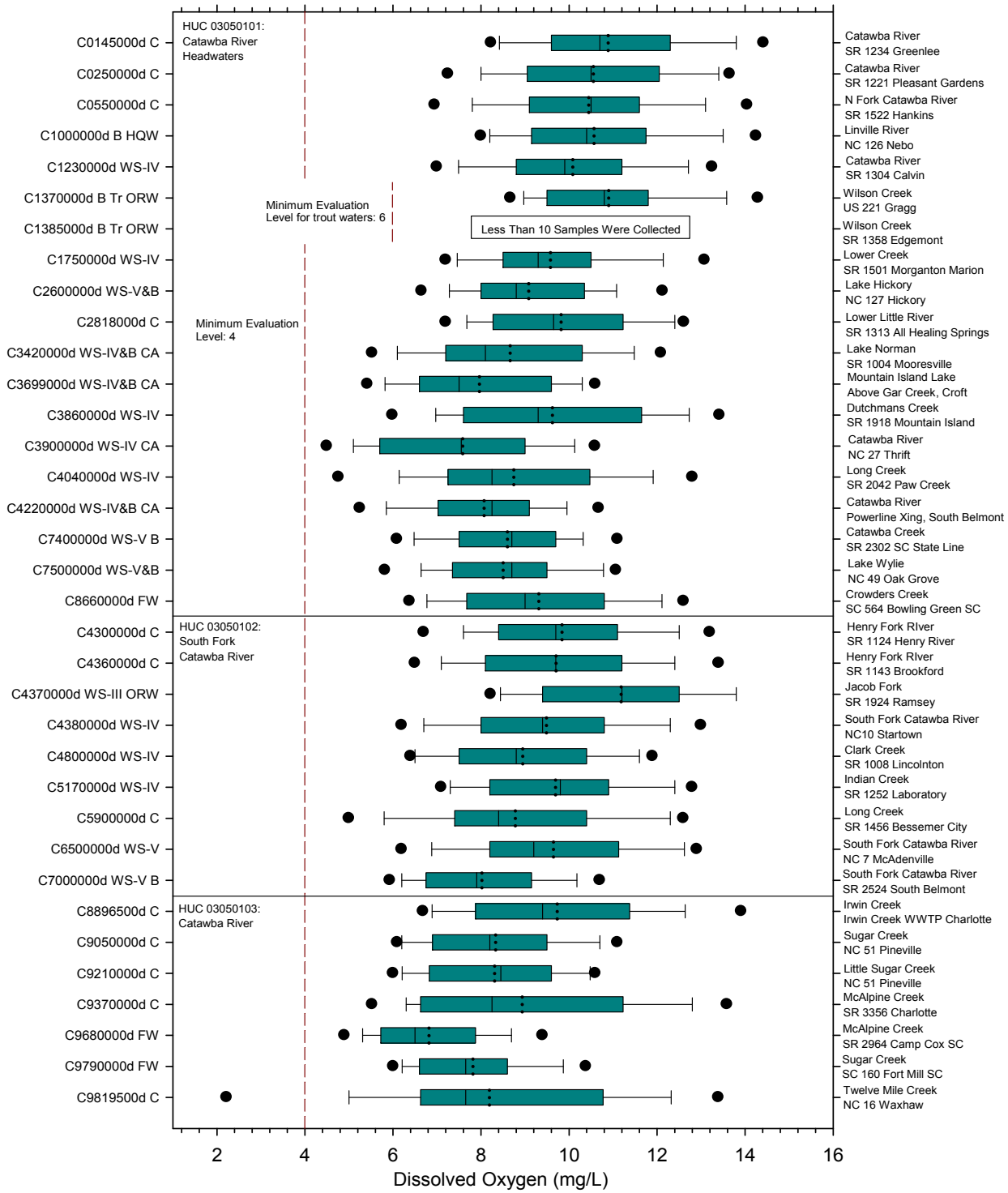


Figure 28. Box Plots of Dissolved Oxygen in the Catawba River Basin

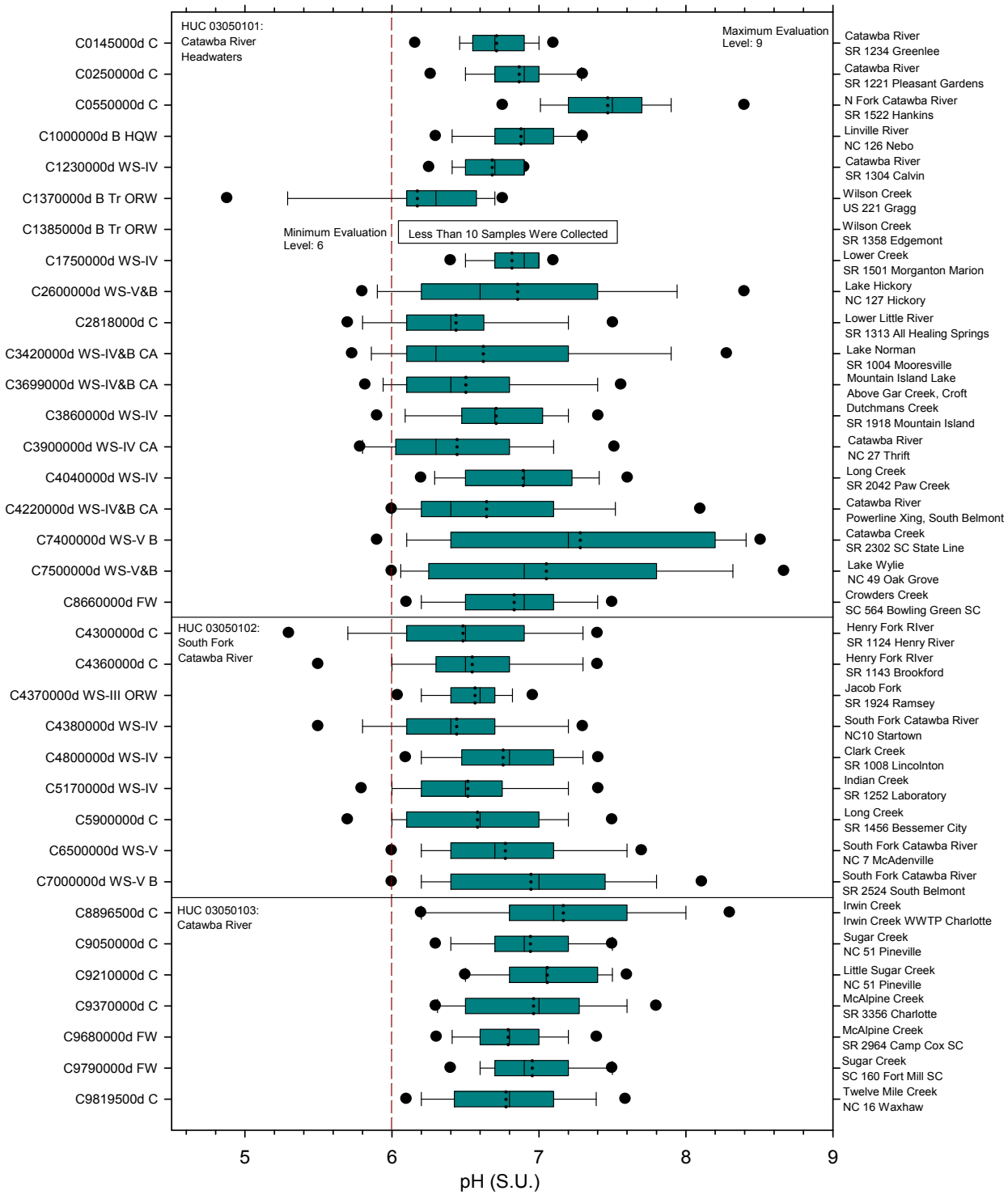


Figure 29. Box Plots of pH in the Catawba River Basin

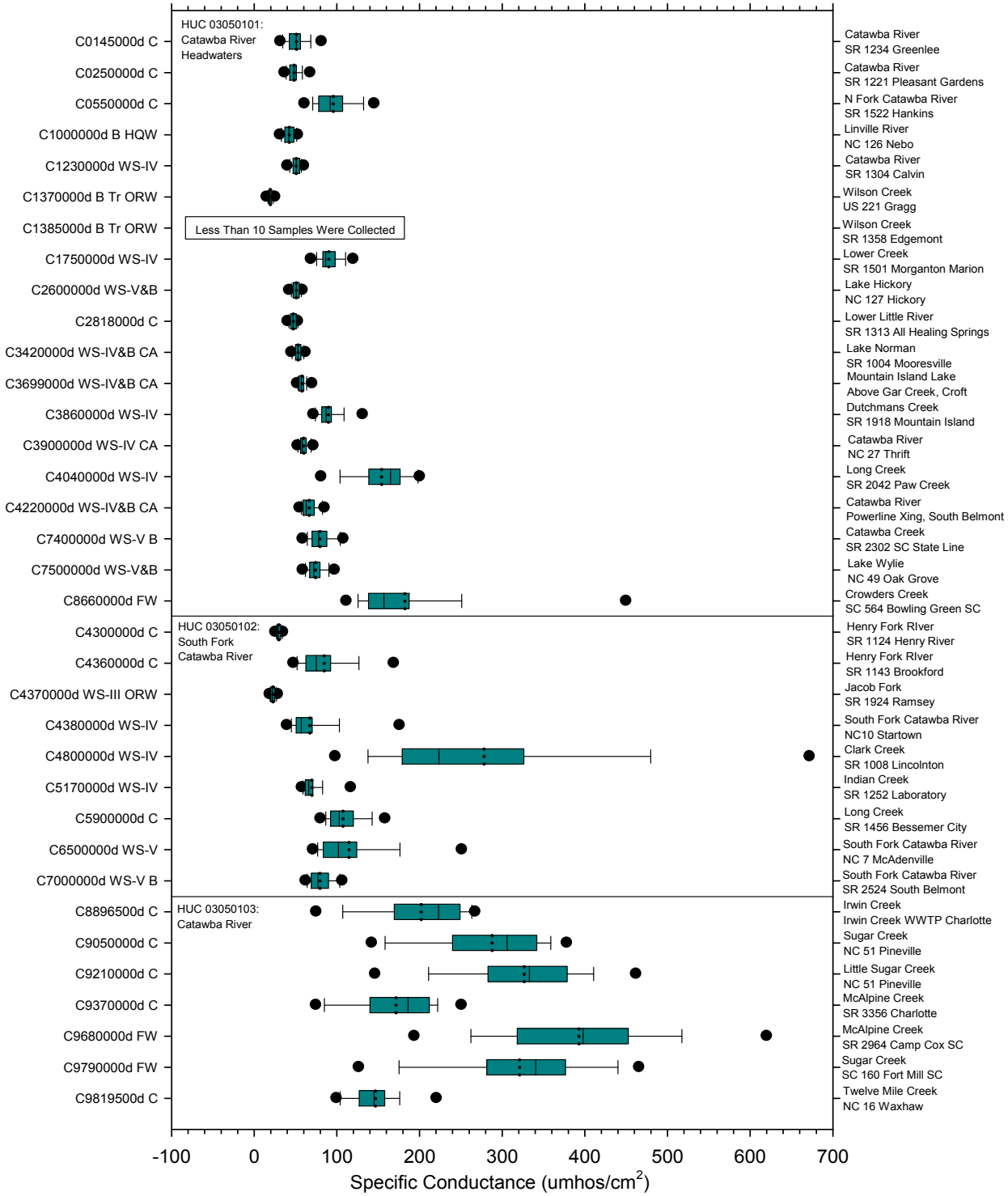


Figure 30. Box Plots of Specific Conductance in the Catawba River Basin

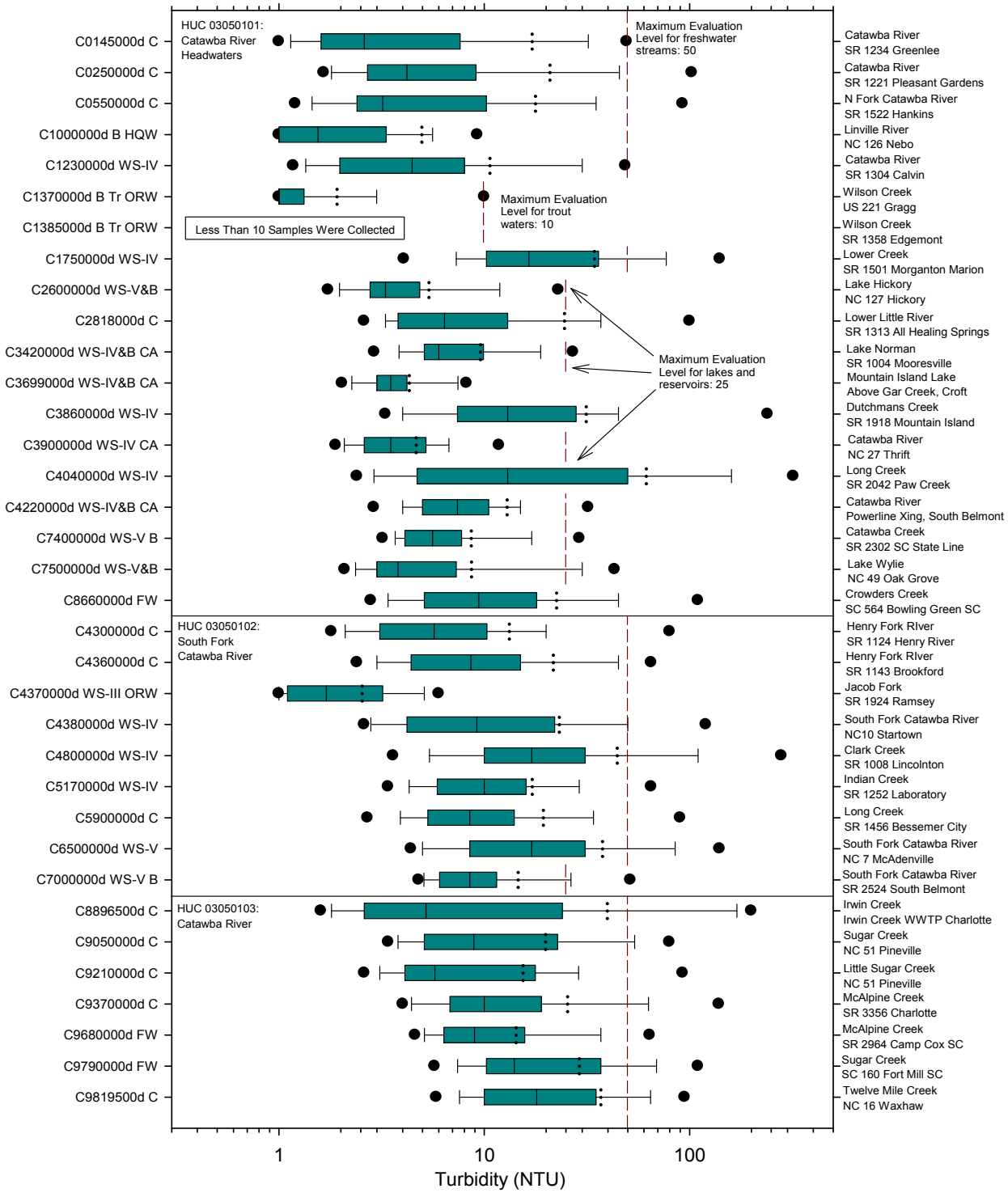


Figure 31. Box Plots of Turbidity in the Catawba River Basin

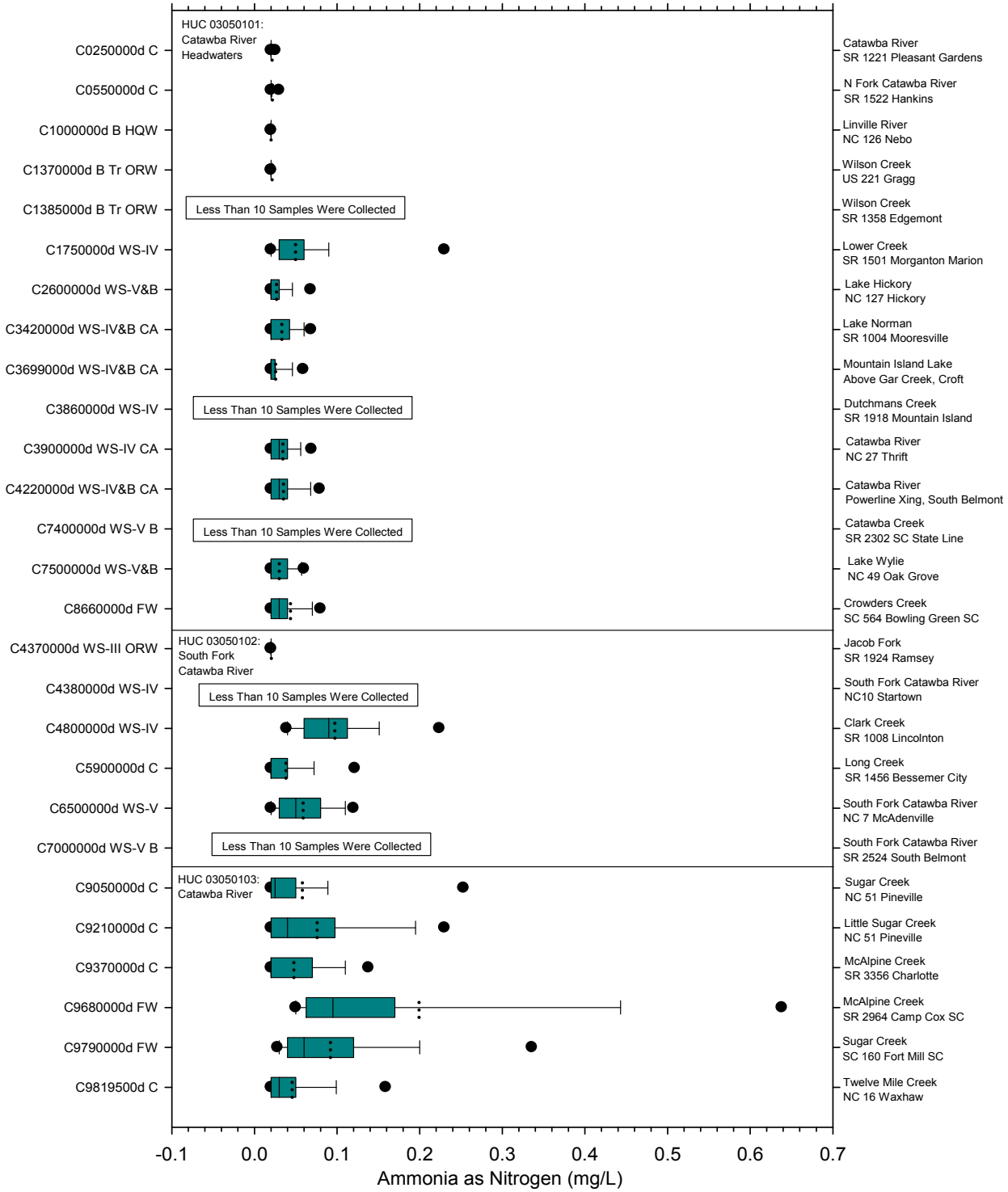


Figure 32. Box Plots of Ammonia as Nitrogen in the Catawba River Basin

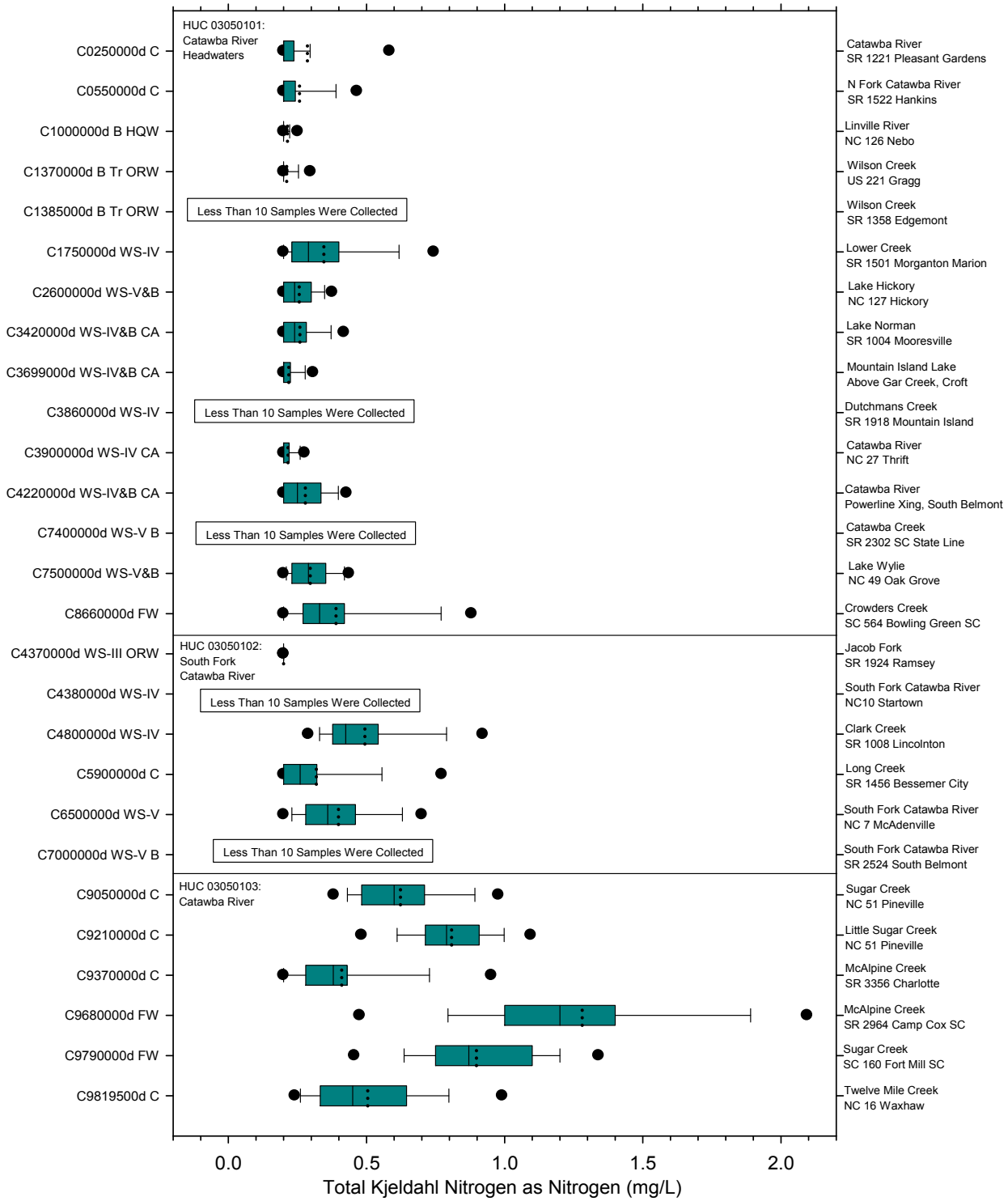


Figure 33. Box Plots of Total Kjeldahl Nitrogen in the Catawba River Basin

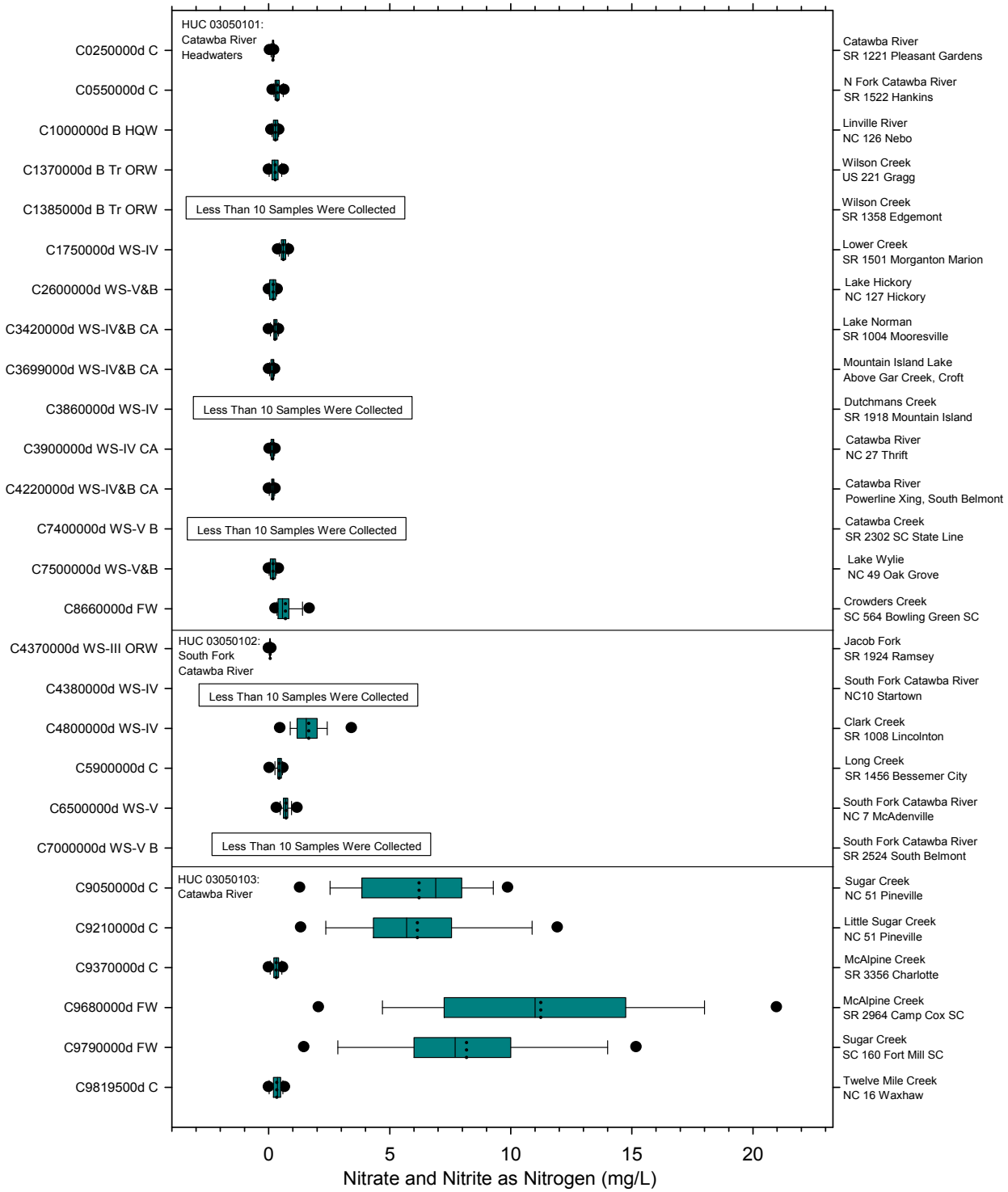


Figure 34. Box Plots of Total Nitrate & Nitrite as Nitrogen in the Catawba River Basin

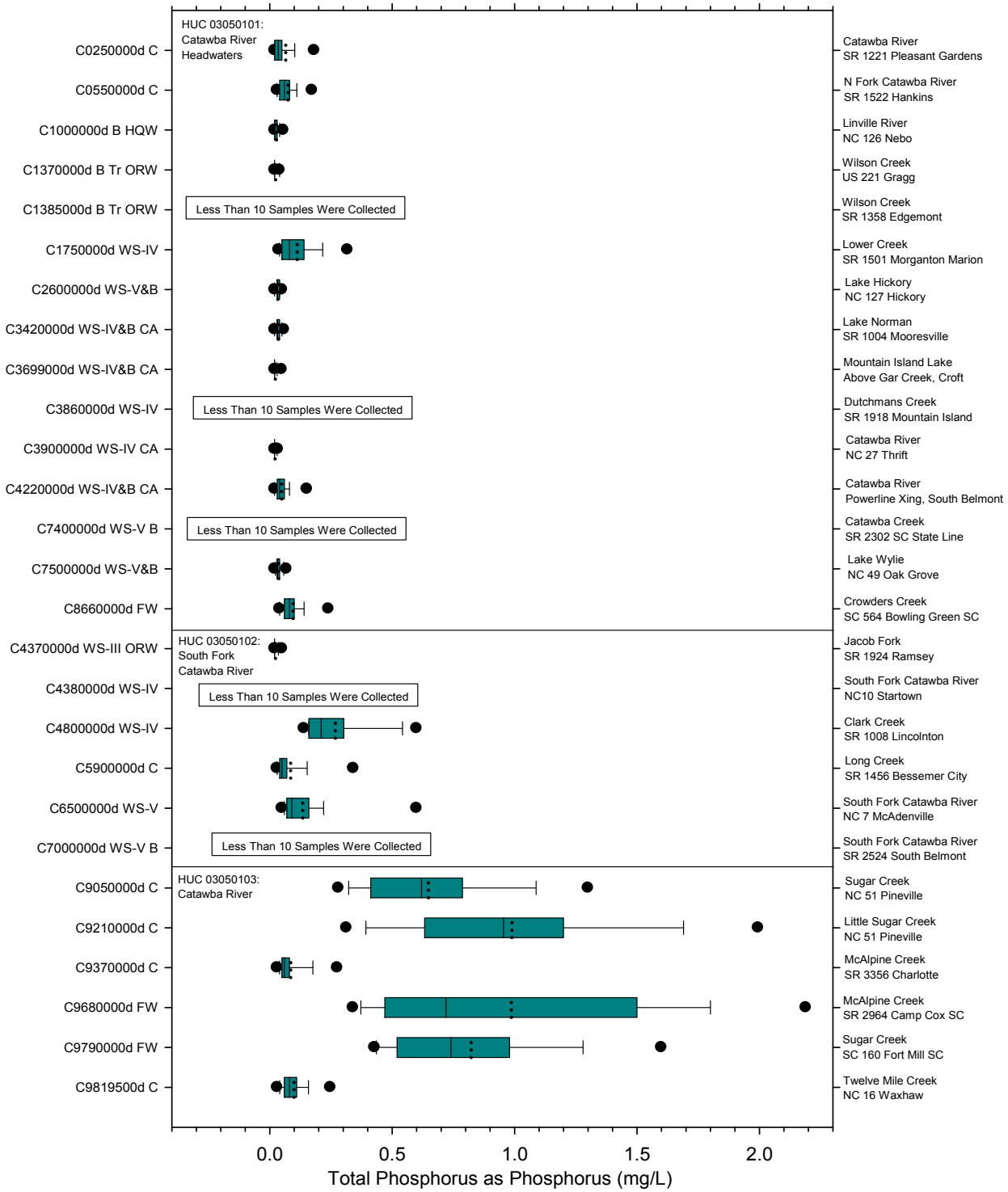


Figure 35. Box Plots of Total Phosphorus in the Catawba River Basin

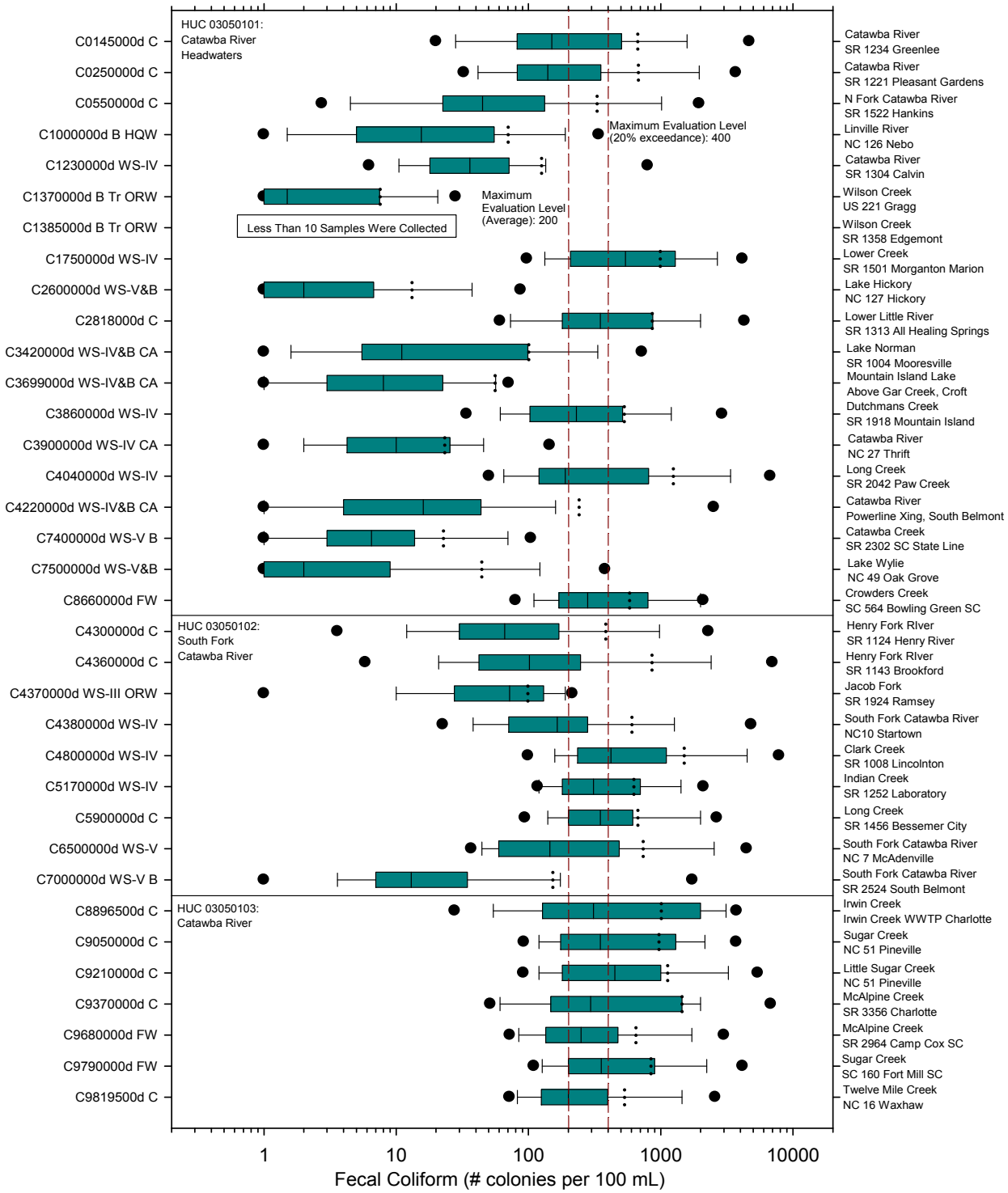


Figure 36. Box Plots of Fecal Coliform in the Catawba River Basin

Appendix C: References

North Carolina Division of Water Quality, North Carolina Administrative Code Section 15A 2B .0200 (Red Book), May 1, 2007.
North Carolina Division of Water Quality, Planning Section Website, 303d and 305b Lists, http://h2o.enr.state.nc.us/tmdl/General_303d.htm.
North Carolina Division of Water Quality, 2004 Catawba River Basinwide Assessment Report.
Pi-Erh Lin, Duane Meeter, and Xu-Feng Niu, A Nonparametric Procedure for Listing and Delisting Impaired Waters Based on Criterion Exceedances, Florida State University,Tallahassee, FL., October 2000.