

Pasquotank River Basin Ambient Monitoring System Report

January 1, 2006 – December 31, 2010

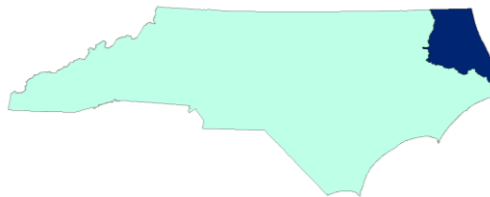


TABLE OF CONTENTS

SUMMARY	5
INTRODUCTION	7
DATA ASSESSMENT AND INTERPRETATION	11
<i>Providing Confidence in the Exceedances of Water Quality Standards</i>	11
<i>Methods Used to Summarize Results</i>	13
<i>Use Support Assessment Considerations</i>	13
PARAMETERS	13
<i>Dissolved Oxygen</i>	13
<i>pH</i>	13
<i>Specific Conductance</i>	14
<i>Turbidity</i>	14
<i>Metals</i>	14
<i>Nutrients</i>	15
<i>Bacteria</i>	15
WATER QUALITY PATTERNS IN THE PASQUOTANK RIVER BASIN	18
References	21

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 state's 303(d) listing methodology for this purpose (<http://portal.ncdenr.org/web/wq/ps/mtu/assessment>).

TABLES

Table 1. Areas of Concern in the Pasquotank River Basin.....	6
Table 2. Parameters collected for the Ambient Monitoring System.....	8
Table 3. Selected Water Quality Standards.....	8
Table 4. DWQ Monitoring stations in the Pasquotank River Basin, 2000 - 2005.	9
Table 5. Exceedance Confidence	12
Table 6. Frequency of Evaluation Level Exceedances at DWQ Stations	17

FIGURES

Figure 1. DWQ's Ambient Monitoring System in the Pasquotank River Basin.....	10
Figure 2. Geographic Distribution and Percentage of Dissolved Oxygen Exceedances.....	19
Figure 3. Geographic Distribution and Percentage of pH Exceedances	20

APPENDIX

Appendix A. AMS Station Summary Sheets.....	22
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ACRONYMS

°C – degrees Celsius
colonies/100 mL – colonies [of bacteria] per 100 milliliters
AMS – Ambient Monitoring System
DO – dissolved oxygen
DWQ – Division of Water Quality
EL – evaluation level
EPA – Environmental Protection Agency
HUC – hydrologic unit code
mg/L – milligrams per liter
N – nitrogen
NC – North Carolina
NCAC – North Carolina Administrative Code
NCRWQP – North Carolina Recreational Water Quality Program
NTU – nephelometric turbidity units
RAMS – Random Ambient Monitoring System
SOP – standard operating procedure
SR – State Road
SSE – statistically significant exceedance
SU – standard units
TMDL – total maximum daily load
µg/L – micrograms per liter
µmhos/cm – micro-ohms per centimeter (equivalent to µS/cm, microsiemens per centimeter)
US – United States
µS/cm – microsiemens per centimeter (equivalent to µmhos/cm, micro-ohms per centimeter)
USGS – United States Geological Survey

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, 2006 through December 31, 2010) chemical and physical measurements were obtained by the DWQ from 12 stations located throughout the Pasquotank River Basin.

The DWQ uses a ten percent criterion to determine whether a water body is meeting applicable water quality standards (NC Division of Water Quality, 2010). The water quality evaluation level (EL) for a given parameter may be an ecological evaluation level, a narrative or numeric standard, or an action level as specified in 15A NCAC 2B .0200. If more than 10% of the monitoring results exceed the EL in question then the water body is not meeting the standard. In order to evaluate water quality results, a minimum of 10 observations is desired.

For this report, if at least 10 results per parameter were collected for a given site, the results were compared to water quality evaluation levels. 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 EL, a binomial statistical test was employed to determine the level of statistical confidence associated with the conclusion that the results truly exceeded the 10% criterion. If at least 95% confidence was found that a 10% exceedance occurred, then that was termed a statistically significant exceedance (SSE). This criterion was applied to all parameters with an evaluation level, except for fecal coliform bacteria. The criteria for fecal coliform varied based on the classification of the water body. See the Parameters section for an explanation of fecal coliform methods. The results of the data analysis are displayed in tables and maps. For complete summaries on each station, reference the AMS Station Summary Sheets located in Appendix A.

All data were collected between January 1, 2006 and December 31, 2010. Stations with SSEs were found for dissolved oxygen < 5 mg/L (one site) and pH (three sites). One additional 10 percent exceedance for dissolved oxygen that was not an SSE also occurred.

Among the stations that were not located in waters with a supplemental Swamp (Sw) classification, Kendrick Creek at SR 1300 at Mackeys (M6920000) had the most frequent exceedances of dissolved oxygen and pH EL concentrations.

The following table gives a summary of the problem areas identified by using these criteria (Table 1). While reading the table, please note the following: The majority of the parameters listed are compared directly to water quality standards. There are two exceptions, however. The fecal coliform standard requires that 5 samples be taken in the span of 30 days, which was not done for this data. Therefore any fecal coliform violations should be taken as a recommendation to collect the data required by the standard. The second exception is the dissolved oxygen (< 5 mg/L) standard which applies to all waters, but specifically to fresh waters as a daily average. The 4 mg/L standard applies to fresh waters only as an instantaneous minimum value.

Table 1. Areas of Concern in the Pasquotank River Basin

8-Digit HUC/ Station ID	Location	Class	Parameter / Evaluation Level	% Exceed	% Conf
03010205	Aleamarle Sound and Associated Drainages				
M2750000	Pasquotank River at Elizabeth City	SB	pH (<6.8 SU)	30.4	>99.9
M5000000	Perquimans River at SR 1336 at Hertford	SC	Dissolved Oxygen (<5)*	15.8	88.8
			pH (<6.8 SU)	71.7	>99.9
M6920000	Kendrick Creek at SR 1300 at Mackeys	SC	Dissolved Oxygen (<5)*	43.9	>99.9
			pH (<6.8 SU)	78.3	>99.9

* Applies to saltwater (class SA, SB, and SC) primarily, and to freshwater (class B, C, and WS) as a daily average. Not considered critical in freshwater areas.

INTRODUCTION

The DWQ's Ambient Monitoring System 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. An educational and 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://portal.ncdenr.org/web/wq/ps/csu>. 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 one or more parameters over the period. However, for the purpose of standardization, data summaries for each station are included in this report. The DWQ monitored water quality and collected samples at 14 stations throughout the basin. The locations of the sampling sites are illustrated in Figure 1 and listed in Table 4. Since the last Basin Assessment Report was compiled for the Pasquotank basin, the DWQ has changed its process for dividing watersheds for the purposes of basinwide planning to be consistent with federal hydrologic unit codes. This change involved modification of the Pasquotank basin boundary; however, all of the long-term ambient monitoring stations in the Pasquotank basin during the previous assessment period have remained within the modified Pasquotank basin boundary. Further details regarding the basin boundary changes are available in the 2010 basinwide plan for the neighboring Tar-Pamlico river basin (NC Division of Water Quality, 2010, pp. 1-2).

In January 2007 the DWQ began collection of samples from a series of randomly determined sites. A description of the Random Ambient Monitoring System (RAMS) can be found here: <http://portal.ncdenr.org/web/wq/ess/eco/rams>. There are no RAMS stations being sampled in the Pasquotank River Basin during 2011 and 2012. Because the basinwide reports assess in five-year windows and RAMS stations will only have two years of data, they are not included in the ambient reports. Once a sufficient number of samples have been collected statewide, RAMS data will be discussed in a separate report.

Table 2. Parameters collected for the Ambient Monitoring System

Parameter
Dissolved oxygen (s)
pH (s)
Specific conductance
Temperature (s)
Total suspended solids
Turbidity (s)
Fecal coliform bacteria (s)
Nutrients (phosphorus and nitrogen species):
- Total phosphorus
- Ammonia as N
- Total Kjeldahl as N
- Nitrate+nitrite as N (s)
Chlorophyll a (s)

Notes:

An 's' indicates the parameter has a numeric standard.

Chlorophyll a and nutrient sampling are only done in areas of concern, such as NSW, estuaries, lakes, and areas with known enrichment issues.

Table 3. Selected Water Quality Standards¹

Parameter	Standards for All Freshwater			Standards to Support Additional Uses	
	Aquatic Life	Human Health	Water Supply Classifications	Trout Water	Swamp Waters
Chloride (mg/L)	230		250		
Chlorophyll a (µg/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 (standard 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:

¹Standards 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. May 1, 2007).

²Refer to 2B.0211 for narrative description of limits.

³Membrane filter total coliform count per 100 ml of sample.

⁴Membrane filter fecal coliform count per 100 ml of sample.

⁵An instantaneous reading may be as low as 4.0 mg/L, but the daily average must be 5.0 mg/L or more.

⁶Designated 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.

⁷For effluent limits only, refer to 2B.0224(1)(b)(ii).

Parameter (µg/L, unless noted)	Standards for All Saltwater			Standards To Support Additional Uses	
	Aquatic Life	Human Health ¹	Class SA ²	HQW	Swamp Waters
Chlorophyll a (corrected)	40 ³				
Coliform, fecal (MFFCC/100 mL) ⁴		200 ³	14 ³		
Dissolved oxygen (mg/L)	5.0 ⁸			6.0	3, 5
PH (standard units)	6.8 - 8.5 ⁵				3, 5
Solids, total suspended (mg/L)				10 PNA ⁶ , 20 other ⁷	
Turbidity (NTU)	25 ³				

¹Standards are based on consumption of fish only unless dermal contact studies are available, see 2B.0208 for equation.

²Class SA = shellfishing waters, see 2B.0101 for description.

³See 2B.0220 for narrative description of limits.

⁴MFFCC/100ml means membrane filter fecal coliform count per 100 ml of sample.

⁵Designated swamp waters may have a dissolved oxygen less than 5.0 mg/L and a pH as low as 4.3 s.u., if due to natural conditions.

⁶PNA = Primary Nursery Areas.

⁷For effluent limits only, see 2B.0224.

⁸Swamp waters, poorly flushed tidally influenced streams, or embayments, or estuarine bottom waters may have lower values if caused by natural conditions.

Table 4. DWQ Monitoring stations in the Pasquotank River Basin, 2000 - 2005.

8-Digit HUC/ Station ID	Location	Class	Latitude	Longitude
03010205	Albemarle Sound and Associated Drainages			
M2750000	Pasquotank River at Elizabeth City	SB	36.28061	-76.17139
M3500000	Little River at SR 1367 at Woodville	C Sw	36.24051	-76.32464
M390000C	Albemarle Sound near Frog Island Mid Channel	SB	36.06250	-76.00163
M390000N	Albemarle Sound near Frog Island North Shore	SB	36.15033	-76.02095
M390000S	Albemarle Sound near Frog Island South Shore	SB	35.96945	-75.97953
M5000000	Perquimans River at SR 1336 at Hertford	SC	36.19387	-76.46611
M610000C	Albemarle Sound between Harvey Point and Mill Point Mid-Channel	SB	36.02151	-76.30602
M610000N	Albemarle Sound between Harvey Point and Mill Point North Shore	SB	36.08348	-76.29288
M610000S	Albemarle Sound between Harvey Point and Mill Point South Shore	SB	35.96353	-76.31261
M6920000	Kendrick Creek at SR 1300 at Mackeys	SC	35.92995	-76.60983
M6980000	Scuppernong River at SR 1105 near Columbia	C Sw	35.87762	-76.33761
M7175000	Alligator River at US 64 near Alligator	SC Sw ORW	35.89859	-76.00978

Note:

Primary Water Use Classifications

C: Aquatic Life
 B: Primary Recreation
 WS-I, WS-II, WS-III, WS-IV, WS-V: Water Supply
 SA: Saltwater Shellfish Harvesting
 SB: Saltwater Primary Recreation
 SC: Saltwater Aquatic Life

Secondary Water Use Classifications

Sw: Swamp Water
 HQW: High Quality Water
 ORW: Outstanding Resource Water
 Tr: Trout Waters
 CA, +: Critical Area
 NSW: Nutrient Sensitive Waters



Figure 1. DWQ's Ambient Monitoring System in the Pasquotank River Basin.

DATA ASSESSMENT AND INTERPRETATION

Monitoring and sampling results considered in this report represent samples collected or measurements taken at less than one-meter depth, except for chlorophyll *a*, which may be collected as a composite over the entire photic depth. The AMS raw data are available online from the US Environmental Protection Agency's Storage and Retrieval (STORET) Data Warehouse. Links and instructions for accessing STORET data are provided on the AMS website at <http://portal.ncdenr.org/web/wq/ess/eco/ams>.

Percentile statistics were calculated for most of the data using JMP statistical software (version 8.0.2; SAS Institute, Cary, NC). Values less than the minimum reporting level (non-detects) were evaluated as equal to the reporting level.

Providing Confidence in the Exceedances of Water Quality Standards

Historically, the DWQ has used guidance provided by the US Environmental Protection Agency (EPA) for determining when the number of results that exceed a water quality standard indicate potential water quality issues (US Environmental Protection Agency, 1997). The EPA has suggested that management actions be implemented when 10 percent of the results exceed a water quality standard. This interpretation is the same whether 1 out of 10, 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. Therefore, applying the raw-score approach to small sample sizes could result in an impairment listing of a stream that is not really impaired.

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 1 exceedance out of 10 (35 percent confidence) than when there are 3 exceedances out of 10 (93 percent confidence) (Table 5).

Table 5. 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	18
10	35%	74%	93%	99%	100%	100%	100%	100%	100%	100%	100%							
12	28%	66%	89%	97%	100%	100%	100%	100%	100%	100%	100%	100%						
14	23%	58%	84%	96%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
16	19%	51%	79%	93%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
18	15%	45%	73%	90%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20	12%	39%	68%	87%	96%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22	10%	34%	62%	83%	94%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
24	8%	29%	56%	79%	91%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
26	6%	25%	51%	74%	89%	96%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
28	5%	22%	46%	69%	86%	94%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
30	4%	18%	41%	65%	82%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
32	3%	16%	37%	60%	79%	91%	96%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
34	3%	13%	33%	55%	75%	88%	95%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
36	2%	11%	29%	51%	71%	85%	94%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
38	2%	10%	25%	46%	67%	83%	92%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
40	1%	8%	22%	42%	63%	79%	90%	96%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%
42	1%	7%	20%	38%	59%	76%	88%	95%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%
44	1%	6%	17%	35%	55%	73%	85%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%
46	1%	5%	15%	31%	51%	69%	83%	92%	96%	99%	100%	100%	100%	100%	100%	100%	100%	100%
48	1%	4%	13%	28%	47%	65%	80%	90%	95%	98%	99%	100%	100%	100%	100%	100%	100%	100%
50	1%	3%	11%	25%	43%	62%	77%	88%	94%	98%	99%	100%	100%	100%	100%	100%	100%	100%
52	0%	3%	10%	22%	40%	58%	74%	86%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%
54	0%	2%	8%	20%	36%	54%	71%	83%	91%	96%	98%	99%	100%	100%	100%	100%	100%	100%
56	0%	2%	7%	18%	33%	51%	67%	81%	90%	95%	98%	99%	100%	100%	100%	100%	100%	100%
58	0%	2%	6%	16%	30%	47%	64%	78%	88%	94%	97%	99%	100%	100%	100%	100%	100%	100%
60	0%	1%	5%	14%	27%	44%	61%	75%	86%	93%	97%	99%	99%	100%	100%	100%	100%	100%
62	0%	1%	5%	12%	24%	40%	57%	72%	84%	91%	96%	98%	99%	100%	100%	100%	100%	100%
64	0%	1%	4%	11%	22%	37%	54%	69%	81%	90%	95%	98%	99%	100%	100%	100%	100%	100%
66	0%	1%	3%	9%	20%	34%	51%	66%	79%	88%	94%	97%	99%	99%	100%	100%	100%	100%
68	0%	1%	3%	8%	18%	31%	47%	63%	76%	86%	93%	96%	98%	99%	100%	100%	100%	100%
70	0%	1%	2%	7%	16%	29%	44%	60%	74%	84%	91%	96%	98%	99%	100%	100%	100%	100%
72	0%	0%	2%	6%	14%	26%	41%	57%	71%	82%	90%	95%	97%	99%	100%	100%	100%	100%
74	0%	0%	2%	5%	13%	24%	38%	54%	68%	80%	88%	94%	97%	99%	99%	100%	100%	100%
76	0%	0%	1%	5%	11%	22%	35%	51%	65%	77%	86%	93%	96%	98%	99%	100%	100%	100%
78	0%	0%	1%	4%	10%	20%	33%	48%	62%	75%	85%	91%	95%	98%	99%	100%	100%	100%
80	0%	0%	1%	4%	9%	18%	30%	45%	59%	72%	83%	90%	95%	97%	99%	99%	100%	100%
82	0%	0%	1%	3%	8%	16%	28%	42%	56%	70%	81%	88%	94%	97%	98%	99%	100%	100%
84	0%	0%	1%	3%	7%	14%	25%	39%	53%	67%	78%	87%	93%	96%	98%	99%	100%	100%
86	0%	0%	1%	2%	6%	13%	23%	36%	51%	64%	76%	85%	91%	95%	98%	99%	100%	100%
88	0%	0%	1%	2%	5%	12%	21%	34%	48%	62%	74%	83%	90%	95%	97%	99%	99%	100%
90	0%	0%	0%	2%	5%	10%	19%	31%	45%	59%	71%	81%	89%	94%	97%	98%	99%	100%
92	0%	0%	0%	1%	4%	9%	17%	29%	42%	56%	69%	79%	87%	93%	96%	98%	99%	100%
94	0%	0%	0%	1%	4%	8%	16%	27%	39%	53%	66%	77%	86%	92%	95%	98%	99%	99%
96	0%	0%	0%	1%	3%	7%	14%	24%	37%	50%	64%	75%	84%	90%	95%	97%	99%	99%
98	0%	0%	0%	1%	3%	6%	13%	22%	34%	48%	61%	73%	82%	89%	94%	97%	98%	99%
100	0%	0%	0%	1%	2%	6%	12%	21%	32%	45%	58%	70%	80%	88%	93%	96%	98%	99%

Note: Shaded entries indicate at least 95% confidence that at least 10% of the possible samples exceed the standard/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.

Use Support Assessment Considerations

- 1) The freshwater dissolved oxygen concentrations of 5.0 mg/L and 4.0 mg/L are presented as evaluation levels. Instantaneous concentrations of 4.0 mg/L or less (5.0 mg/L in salt water) are in violation of the standard unless caused by natural (e.g. swampy) conditions. The 5.0 mg/L evaluation level is based upon a freshwater standard which specifies “not less than a daily average of 5.0 mg/L” (15A NCAC 2B.0200).
- 2) The geometric mean and median statistics were calculated for fecal coliform results for each station as appropriate for stream class.

Specific information on water quality standards and action levels can be found in 15A NCAC 2B.0200 (May 1, 2007).

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. Consistent patterns of low concentrations of dissolved oxygen can be subject to intense management review and corrective actions, although patterns of low dissolved oxygen can occur naturally in and near swamp waters, in estuarine waters under salt wedge conditions, or during droughts.

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.

For saltwaters, 15A NCAC 02B .0220 (3)(b) applies instead:

Dissolved oxygen: not less than 5.0 mg/l, except that swamp waters, poorly flushed tidally influenced streams or embayments, or estuarine bottom waters may have lower values if caused by natural conditions.

Many of the surface waters in the Pasquotank basin display physical and chemical characteristics, including low dissolved oxygen and pH values, of swamp waters, and these waters have been assigned a Swamp (Sw) supplemental classification by the DWQ.

pH

The scale for measuring pH is logarithmic (i.e. a pH of 8.0 is ten times less concentrated in hydrogen ions than a pH of 7.0). A pH value of 7.0 Standard Units (SU) is neutral, while lower values are more acidic and higher values are more basic. The pH of ambient waters varies naturally depending upon interaction

with soils and in-stream constituents, upstream inputs, and conditions in the surrounding environment. Point source discharges can also influence the pH of a stream. Values much lower than 7.0 SU may be found in waters rich in dissolved organic matter (e.g. swamp lands). Values much greater than 7.0 SU may be observed during algal blooms. The accuracy of field measurements is limited by the abilities of field equipment, which is generally accurate to within 0.2 SU, and by natural variation within a site.

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. For saltwaters, the acceptable range is narrower: 6.8 SU to 8.5 SU.

The lower pH evaluation level was exceeded more than ten percent of the time at three stations in the Pasquotank basin during the assessment timeframe. All three stations were saltwaters without a supplemental Swamp classification.

Specific Conductance

Specific conductance is a measure of the ability of water to conduct an electric current. It is reported in microsiemens per centimeter ($\mu\text{S}/\text{cm}$) at 25°C. The presence of ions and temperature are major factors in the ability of water to conduct a current. Clean freshwater has a low specific conductance, whereas high specific conductance values 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.

Specific conductance 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 specific conductance. Water bodies that contain saltwater will also have high specific conductance values. Therefore those wishing to use specific conductance as an indicator for problems must first account for salinity.

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. In coastal areas, tidal surges can also disturb shallow estuarine sediments and naturally increase turbidity.

No turbidity evaluation level exceedances occurred in the Pasquotank basin during the assessment timeframe.

Metals

A number of metals are essential micronutrients for the support of aquatic life. However, there are threshold concentrations over which metals can be harmful. Traditionally, the DWQ has considered total metals concentrations in surface waters to evaluate potential adverse effects on human and aquatic life. However, metals can exist in many forms within the water column. Scientific investigation has revealed that different forms present different levels of risk to aquatic organisms (US Environmental Protection Agency, 2007). Therefore, as of May 2007, the DWQ suspended routine collection of total metals at AMS stations, and is currently reviewing water quality standards for metals.

The stations in the Pasquotank basin had less than ten total metals results from quarterly sampling during 2006 and 2007 before the suspension. Iron, which naturally occurs in North Carolina surface waters, was detected at all of the AMS stations in the Pasquotank basin. Due to the small number of total metals samples collected during the assessment timeframe, the total metals results are not considered in the tables and figures in this report. The results are summarized in Appendix A on the Station Summary Sheets.

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 (NH₃-N), total Kjeldahl nitrogen (TKN) and nitrite+nitrate nitrogen (NO₂+NO₃-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 and other plants may occur.

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

Bacteria

Concentrations of fecal coliform bacteria can vary greatly. The descriptive statistics used to evaluate fecal coliform bacteria data include the percentage of results above evaluation level threshold values, as well as either the geometric mean or the median colony count per 100 mL, depending upon the classification of the waterbody. For all freshwater sites within North Carolina in the Chowan 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."

For waters where commercial shellfishing is done (Class SA), an additional water quality standard is applied (15A NCAC 02B .0221 (3)(d) (May 1, 2007):

Organisms of coliform group: fecal coliform group not to exceed a median MF of 14/100 ml and not more than 10 percent of the samples shall exceed and MF count of 43/100 ml in those areas most probably exposed to fecal contamination during the most unfavorable hydrographic and pollution conditions.

Fecal coliform problems are screened using annual summaries of ambient sampling results. If the screening indicates that the station may be in violation of a standard, the station is assessed using the method required by law. All class B (and class SB/SA in coastal basins) waters are assessed, and other waters as resources permit. The required assessment method is known as “5 in 30”, collecting a minimum five samples within a span of 30 days. If a water body exceeds the standard more than the specified percentage of the time during the 30-day period, or if the median or geometric mean for the 30-day period is greater than the threshold values described in the relevant standard(s), then that water body is considered impaired and is added to the impaired water list, the 303(d) list. Details regarding the analysis of fecal coliform bacteria are available in the DWQ’s Standard Operating Procedure (SOP) for analyzing Fecal Coliform using Standard Methods, 20th Edition, 9222 D (NC Division of Water Quality Laboratory Section, 2007).

While the Pasquotank River Basin contains salt waters, it does not contain Class SA waters. During the current assessment period, no site yielded a geometric mean greater than 200 colonies/100 mL, nor did the results from any site exceed 400 colonies/100 mL greater than 20 percent of the time. Geometric means and evaluation level exceedance percentages for individual sites are indicated on the respective station summary sheets.

In addition, for all tidal salt waters, the following is applicable 15A NCAC 02B .0220 (3)(e) (May 1, 2007):

Enterococcus, including Enterococcus faecalis, Enterococcus faecium, Enterococcus avium, and Enterococcus gallinarium: not to exceed a geometric mean of 35 enterococci per 100 ml based upon a minimum of five samples within any consecutive 30 days.

The DWQ does not collect *Enterococcus* samples. The NC Recreational Water Quality Program (NCRWQP), administered by the NC Department of Environment and Natural Resources' Division of Environmental Health, collects *Enterococcus* samples. The NCRWQP mission is to protect the public health by monitoring the quality of NC's coastal recreational waters and notifying the public when bacteriological standards for safe bodily contact are exceeded. The program monitors 240 stations statewide, and meets all the requirements of the EPA national beach rule. Coastal waters monitored include ocean beaches, sounds, bays and estuarine rivers. Thirty-eight locations in the Pasquotank basin were monitored for *Enterococcus* bacteria by the NCRWQP during the current assessment period.

Enterococcus bacteria is an indicator organism found in the intestines of warm-blooded animals. While it may not cause illness itself, its presence is correlated with that of organisms that can cause illness. The program tests 240 ocean and sound-side areas. Swimming season begins on April 1st and ends September 30th. All ocean beaches and high-use sound-side beaches (Tier 1) are tested weekly. Lower-use beaches (Tier 2 and Tier 3) are tested twice a month. All sites are tested twice a month in October and monthly from November through March. The NCRWQP currently uses a single sample test to determine compliance with their rules (15A NCAC 18A .3402):

- (a) *The Enterococcus level in a Tier I swimming area shall not exceed either:*
 - (1) *A geometric mean of 35 enterococci per 100 milliliter of water, that includes a minimum of at least five samples collected within 30 days; or*
 - (2) *A single sample of 104 enterococci per 100 milliliter of water.*
- (b) *The enterococcus level in a tier II swimming area shall not exceed a single sample of 276 enterococci per 100 milliliter of water.*
- (c) *The enterococcus level in a tier III swimming area shall not exceed two consecutive samples of 500 enterococci per 100 milliliter of water"*

The NC Recreational Water Quality Program monitored *Enterococcus* levels at several locations in the Pasquotank basin during 2006 – 2010. Results of this monitoring can be found on the NCWRP website: http://www.deh.enr.state.nc.us/shellfish/Water_Monitoring/RWQweb/home.htm.

Table 6. Frequency of Evaluation Level Exceedances at DWQ Stations

8-Digit HUC/ Station ID	Class	% of Results that Exceeded the Evaluation Limit							
		Dissolved Oxygen (<5 mg/L) ¹	Dissolved Oxygen (<4 mg/L) ²	pH (<4.3 in Sw) pH (<6 in B, C) pH (<6.8 in SB, SC)	pH (>9 in B, C) pH (>8.5 in SB, SC)	Water Temperature (>32 °C)	Chlorophyll a (>40 µg/L)	Turbidity (>50 NTU)	Fecal Coliform (>400 colonies/100 mL)
03010205	Albemarle Sound and Associated Drainages								
M2750000	SB	0.0	NA	30.4	1.8	0.0	1.7	0.0	0.0
M3500000	C Sw	NA	NA	0.0	0.0	0.0	10.0	0.0	8.6
M390000C	SB	0.0	NA	0.0	1.7	0.0	1.7	0.0	0.0
M390000N	SB	0.0	NA	0.0	5.4	0.0	NS	0.0	0.0
M390000S	SB	0.0	NA	0.0	3.4	0.0	NS	0.0	0.0
M5000000	SC	15.8	NA	71.7	0.0	1.7	3.3	0.0	1.7
M610000C	SB	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0
M610000N	SB	0.0	NA	3.4	1.7	0.0	NS	0.0	0.0
M610000S	SB	0.0	NA	0.0	1.7	0.0	NS	0.0	0.0
M6920000	SC	43.9	NA	78.3	0.0	0.0	1.7	0.0	5.0
M6980000	C Sw	NA	NA	0.0	0.0	0.0	1.7	0.0	6.7
M7175000	SC Sw ORW	NA	NA	0.0	1.7	0.0	1.7	0.0	0.0

Notes:

NA: Not Applicable. The evaluation level is not applicable to this station.

NS: Not Sampled. No samples (or less than 10 samples) were collected during the assessment period.

¹ Applies to saltwater (class SA, SB, and SC) primarily, and to freshwater (class B, C, and WS) as a daily average. Swamp waters (supplemental class Sw) may have lower values if caused by natural conditions.

² Applies to freshwater (class B, C, and WS) only as an instantaneous value. Swamp waters (supplemental class Sw) may have lower values if caused by natural conditions.

WATER QUALITY PATTERNS IN THE PASQUOTANK RIVER BASIN

Maps were used to depict data for a variety of water quality parameters throughout the basin so that the relationship of stations to each other could be seen and regional patterns could become clear. While figures portray information visually, specific and accurate details can only be conveyed in tables. Individual station summary sheets should be consulted when exact information is needed.

Maps were utilized specifically to display the geographic distribution of evaluation level exceedances for dissolved oxygen and pH (Figure 2 and Figure 3, respectively). Station symbol colors signified the degree of water quality exceedance at each location.

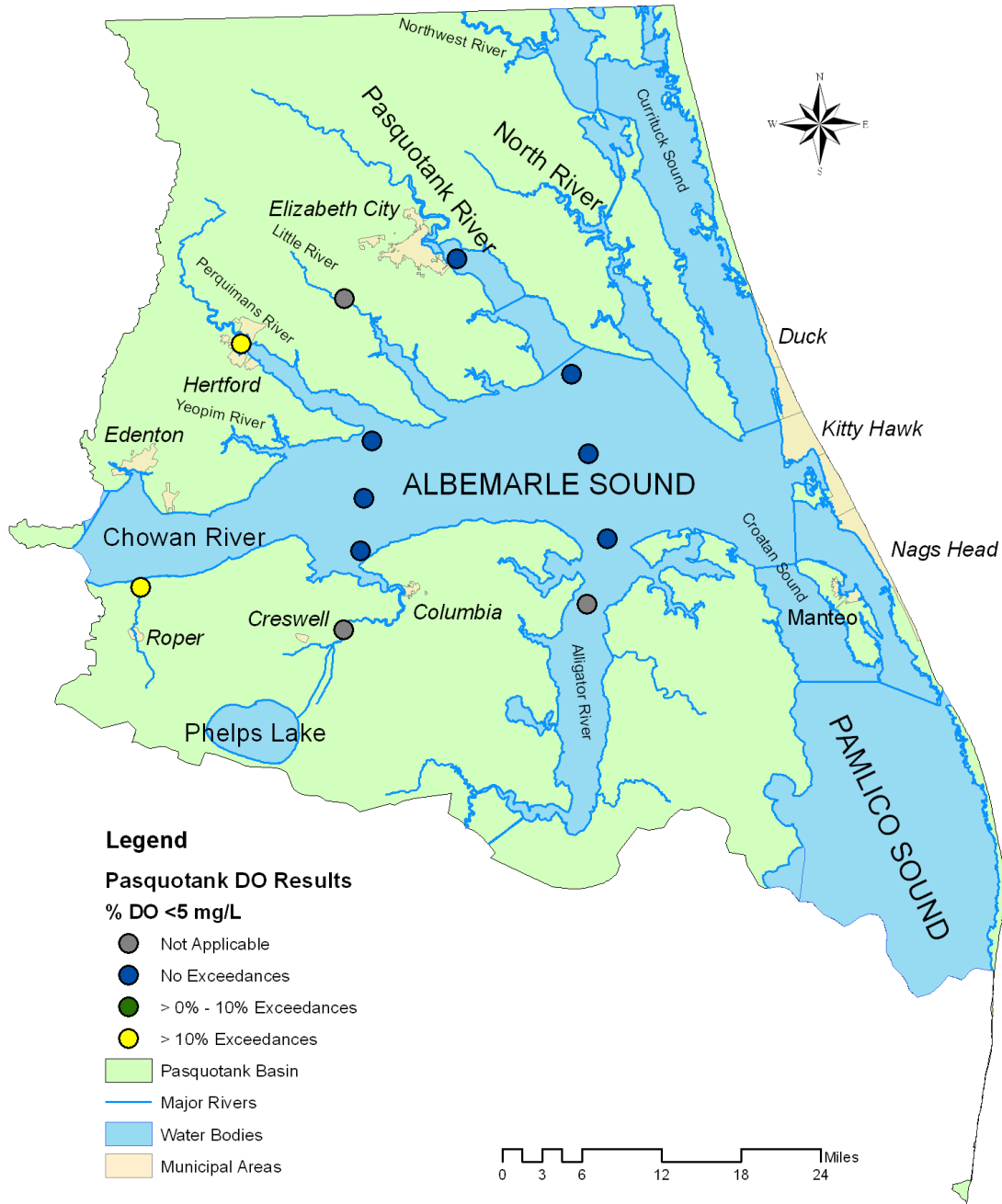


Figure 2. Geographic Distribution and Percentage of Dissolved Oxygen Exceedances (less than 5.0 mg/L in saltwater; NA in swamp waters)

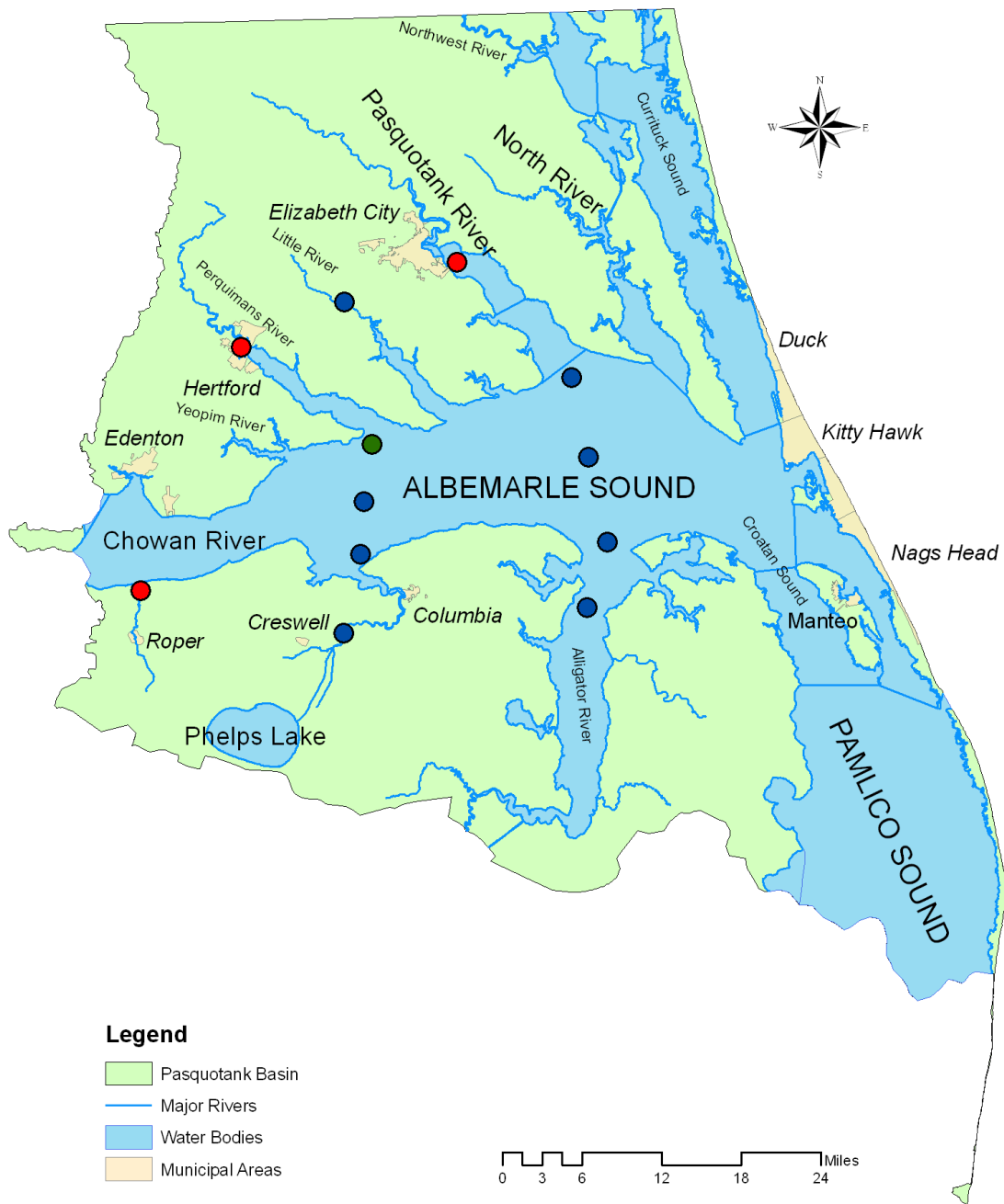


Figure 3. Geographic Distribution and Percentage of pH Exceedances (less than 6.0 in freshwater; less than 6.8 in saltwater)

References

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Appendix A: Station Summary Sheets

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

Location: PASQUOTANK RIV AT ELIZABETH CITY
Station #: M2750000
Latitude: 36.28061 **Longitude:** -76.17139
Agency: NCAMBNT

Hydrologic Unit Code: 3010205
Stream class: SB
NC stream index: 30-3-(12)

Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	56	0	<5	0	0		5.4	7.2	8.1	9.6	11.3	12.3	12.7
pH (SU)	56	0	<6.8	17	30.4	> 99.9	5.3	6.2	6.5	7.1	7.6	8	8.6
	56	0	>8.5	1	1.8		5.3	6.2	6.5	7.1	7.6	8	8.6
Salinity (ppt)	56	0	N/A				0.08	0.33	0.64	2.23	4.87	7.27	8.99
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				187	662	1198	3956	8359	12755	15433
Water Temperature (°C)	56	0	>32	0	0		3.8	6.4	9	18.7	25.9	29	31.5
Other													
Chlorophyll a (ug/L)	57	5	>40	1	1.8		1	2	4	12	18	26	43
TSS (mg/L)	20	10	N/A				3.2	5.5	6.2	6.2	8	12	29
Turbidity (NTU)	58	0	>25	0	0		1.4	2.3	3.3	5	7.2	12	14
Nutrients (mg/L)													
NH3 as N	58	35	N/A				0.02	0.02	0.02	0.02	0.04	0.06	0.18
NO2 + NO3 as N	58	22	N/A				0.02	0.02	0.02	0.06	0.2	0.3	0.44
TKN as N	57	0	N/A				0.52	0.57	0.75	0.91	1.05	1.2	1.4
Total Phosphorus	58	0	N/A				0.02	0.03	0.04	0.06	0.07	0.11	0.18
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				190	190	275	590	800	850	850
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>20	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	2	>3	2	40		2	2	2	2	3	3	3
Iron, total (Fe)	5	0	N/A				260	260	290	780	1200	1200	1200
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	4	>86	0	0		10	10	10	10	23	36	36
Fecal Coliform Screening(#/100mL)													
# results:	58												
Geomea	5.5												
# > 400:	0												
% > 400: %Conf:	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
 Results not meeting EL: number and percentages of observations not meeting evaluation
 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Stations with less than 10 results for a given parameter were not evaluated for statistical

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

Location: LITTLE RIV AT SR 1367 AT WOODVILLE

Station #: M3500000

Hydrologic Unit Code: 3010205

Latitude: 36.24051

Longitude: -76.32464

Stream class: C Sw

Agency: NCAMBNT

NC stream index: 30-5-(1)

Time period: 01/26/2006 to 12/06/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	55	0	N/A				0.2	0.5	0.9	1.9	4.3	8	12.1
pH (SU)	58	0	<4.3	0	0		5.8	6.1	6.3	6.5	6.8	7	7.4
	58	0	>9	0	0		5.8	6.1	6.3	6.5	6.8	7	7.4
Salinity (ppt)	57	0	N/A				0.02	0.07	0.11	0.13	0.22	1.08	3.35
Spec. conductance (umhos/cm at 25°C)	57	0	N/A				61	151	219	273	448	2009	6063
Water Temperature (°C)	58	0	>32	0	0		0.7	4.4	9.5	15.2	22.5	25	28.1
Other													
Chlorophyll a (ug/L)	20	1	>40	2	10	39.2	1	1	2	8	12	42	460
Hardness (mg/L)	4	0	N/A				24	24	32	78	117	123	123
TSS (mg/L)	19	7	N/A				3.8	6.2	6.2	8.5	12	16	21
Turbidity (NTU)	58	0	>50	0	0		1.6	2.5	4.2	7.5	11	23.6	45
Nutrients (mg/L)													
NH3 as N	57	12	N/A				0.02	0.02	0.02	0.11	0.35	0.93	1.2
NO2 + NO3 as N	56	35	N/A				0.02	0.02	0.02	0.02	0.16	0.48	1.3
TKN as N	54	0	N/A				0.84	1.1	1.3	1.6	2.3	2.9	3.2
Total Phosphorus	57	0	N/A				0.03	0.09	0.2	0.28	0.48	0.65	1
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				200	200	270	380	480	530	530
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>2	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>50	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	5	>7	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	5	0	>1000	5	100		1300	1300	1350	1400	2800	3700	3700
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>12	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	3	>50	0	0		10	10	10	10	13	13	13

Fecal Coliform Screening(#/100mL)

# results:	Geomea	# > 400:	% > 400: %Conf:
58	77.5	5	8.6

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

Results not meeting EL: number and percentages of observations not meeting evaluation

%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Stations with less than 10 results for a given parameter were not evaluated for statistical

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

Location: ALBEMARLE SOUND NR FROG ISLAND MID CHANNEL
Station #: M390000C **Hydrologic Unit Code:** 3010205
Latitude: 36.06250 **Longitude:** -76.00163 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30
Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<5	0	0		7.4	8.1	8.5	9.8	11.5	12.4	13.7
pH (SU)	58	0	<6.8	0	0		7.2	7.4	7.5	7.8	7.9	8.2	8.9
	58	0	>8.5	1	1.7		7.2	7.4	7.5	7.8	7.9	8.2	8.9
Salinity (ppt)	58	0	N/A				0.19	1.01	2.83	4.54	6.89	9.09	10.28
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				374	1896	5165	8129	12033	15845	17466
Water Temperature (°C)	58	0	>32	0	0		3.9	5.4	8.1	18.3	25.8	27.8	30.3
Other													
Chlorophyll a (ug/L)	57	0	>40	1	1.8		1	4	6	9	12	18	44
TSS (mg/L)	18	5	N/A				6.2	6.2	6.6	9.8	12.2	23.3	26
Turbidity (NTU)	58	0	>25	2	3.4		1.9	3	3.8	5	10	13.1	35
Nutrients (mg/L)													
NH3 as N	58	56	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	58	50	N/A				0.02	0.02	0.02	0.02	0.02	0.05	0.47
TKN as N	57	0	N/A				0.32	0.4	0.44	0.51	0.58	0.67	0.78
Total Phosphorus	58	0	N/A				0.02	0.02	0.02	0.03	0.04	0.06	0.09
Metals (ug/L)													
Aluminum, total (Al)	6	0	N/A				200	200	252	410	490	520	520
Arsenic, total (As)	6	6	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	6	6	>5	0	0		1	1	1.8	2	4	10	10
Chromium, total (Cr)	6	6	>20	0	0		10	10	21	25	25	25	25
Copper, total (Cu)	6	5	>3	1	16.7		2	2	2	2	2	4	4
Iron, total (Fe)	6	0	N/A				220	220	332	490	568	710	710
Lead, total (Pb)	6	6	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	5	5	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	6	6	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	6	5	>86	0	0		10	10	10	10	11	13	13
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
58	1.1	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
 Results not meeting EL: number and percentages of observations not meeting evaluation
 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Stations with less than 10 results for a given parameter were not evaluated for statistical

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

Location: ALBEMARLE SOUND NR FROG ISLAND N SHORE
Station #: M390000N **Hydrologic Unit Code:** 3010205
Latitude: 36.15033 **Longitude:** -76.02095 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30
Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	56	0	<5	0	0		7.5	8.2	8.8	9.6	11.6	12.4	13.6
pH (SU)	56	0	<6.8	0	0		7.1	7.3	7.5	7.7	8	8.1	9.3
	56	0	>8.5	3	5.4		7.1	7.3	7.5	7.7	8	8.1	9.3
Salinity (ppt)	56	0	N/A				0.14	0.5	2.15	4.14	6.69	9.14	11.24
Spec. conductance (umhos/cm at 25°C)	56	0	N/A				293	958	3944	7420	11704	15460	18990
Water Temperature (°C)	56	0	>32	0	0		3.9	6.4	8.2	17.8	25.3	28.2	30.2
Other													
Chlorophyll a (ug/L)	3	0	>40	1	33.3		15	15	15	16	82	82	82
TSS (mg/L)	19	2	N/A				6.2	6.5	8.5	11	14	18	22
Turbidity (NTU)	58	0	>25	2	3.4		2.3	4	5.2	6.6	8.7	14.3	28
Nutrients (mg/L)													
NH3 as N	57	55	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.03
NO2 + NO3 as N	57	48	N/A				0.02	0.02	0.02	0.02	0.02	0.08	0.26
TKN as N	55	0	N/A				0.34	0.41	0.46	0.52	0.57	0.65	1.2
Total Phosphorus	57	0	N/A				0.02	0.02	0.03	0.04	0.05	0.06	0.09
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				200	200	290	450	605	760	760
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1	2	6	10	10
Chromium, total (Cr)	5	4	>20	1	20		10	10	10	25	25	25	25
Copper, total (Cu)	5	3	>3	1	20		2	2	2	2	3	4	4
Iron, total (Fe)	5	0	N/A				200	200	335	490	895	1100	1100
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	3	3	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	4	>86	0	0		10	10	10	10	14	18	18
Fecal Coliform Screening(#/100mL)													
# results:	58	Geomea	1.4	# > 400:	0	% > 400:	0	%Conf:					

Key:

result: number of observations
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 EL: Evaluation Level; applicable numeric or narrative water quality standard or action
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 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Stations with less than 10 results for a given parameter were not evaluated for statistical

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

Location: ALBEMARLE SOUND NR FROG ISLAND S SHORE
Station #: M390000S **Hydrologic Unit Code:** 3010205
Latitude: 35.96945 **Longitude:** -75.97953 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30
Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	<5	0	0		7.4	7.9	8.4	9.5	11.6	12.4	13.6
pH (SU)	58	0	<6.8	0	0		6.8	7.4	7.5	7.7	7.9	8.1	8.8
	58	0	>8.5	2	3.4		6.8	7.4	7.5	7.7	7.9	8.1	8.8
Salinity (ppt)	58	0	N/A				0.32	0.78	2.77	4.78	6.5	8.49	10.47
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				631	1481	5092	8510	11410	14650	17795
Water Temperature (°C)	58	0	>32	0	0		3.9	5.7	8.2	17.8	25.6	27.8	29.7
Other													
TSS (mg/L)	20	5	N/A				6.2	6.2	6.3	9.9	13	14.9	15
Turbidity (NTU)	58	0	>25	1	1.7		1.9	2.9	3.5	4.8	9	12	27
Nutrients (mg/L)													
NH3 as N	58	56	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.03
NO2 + NO3 as N	58	47	N/A				0.02	0.02	0.02	0.02	0.02	0.08	0.24
TKN as N	57	0	N/A				0.33	0.39	0.46	0.53	0.58	0.65	1
Total Phosphorus	58	1	N/A				0.02	0.02	0.02	0.03	0.04	0.05	0.08
Metals (ug/L)													
Aluminum, total (Al)	4	0	N/A				290	290	308	365	468	500	500
Arsenic, total (As)	4	4	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	4	4	>5	0	0		1	1	1.2	2	8	10	10
Chromium, total (Cr)	4	4	>20	0	0		10	10	14	25	25	25	25
Copper, total (Cu)	4	3	>3	0	0		2	2	2	2	3	3	3
Iron, total (Fe)	4	0	N/A				260	260	295	430	640	700	700
Lead, total (Pb)	4	4	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	3	3	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	4	4	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	4	3	>86	0	0		10	10	10	10	12	13	13
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
58	1.1	0	0										

Key:

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

Location: PERQUIMANS RIV AT SR 1336 AT HERTFORD
Station #: M5000000 **Hydrologic Unit Code:** 3010205
Latitude: 36.19387 **Longitude:** -76.46611 **Stream class:** SC
Agency: NCAMBNT **NC stream index:** 30-6-(3)
Time period: 01/26/2006 to 12/06/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<5	9	15.8	88.8	2.7	4.1	5.6	6.7	9.3	10.5	11.4
pH (SU)	60	0	<6.8	43	71.7	>99.9	5.3	5.8	6.1	6.4	6.8	7	7.4
	60	0	>8.5	0	0		5.3	5.8	6.1	6.4	6.8	7	7.4
Salinity (ppt)	59	0	N/A				0.04	0.09	0.16	0.85	2.95	4.44	6.48
Spec. conductance (umhos/cm at 25°C)	59	0	N/A				100	187	331	1601	5287	7939	11367
Water Temperature (°C)	60	0	>32	1	1.7		1.9	8.3	12	19	26.4	29	32.6
Other													
Chlorophyll a (ug/L)	59	7	>40	1	1.7		1	1	2	6	12	19	51
TSS (mg/L)	20	14	N/A				2.5	4.6	6.2	6.2	7.4	12	14
Turbidity (NTU)	60	0	>25	1	1.7		1.6	2	2.9	3.8	4.8	6.2	35
Nutrients (mg/L)													
NH3 as N	60	12	N/A				0.02	0.02	0.02	0.05	0.1	0.19	0.6
NO2 + NO3 as N	60	11	N/A				0.02	0.02	0.03	0.09	0.31	0.49	1.2
TKN as N	58	0	N/A				0.51	0.62	0.83	0.97	1.22	1.6	2
Total Phosphorus	60	0	N/A				0.03	0.04	0.05	0.09	0.16	0.21	0.44
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				200	200	210	400	670	880	880
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>20	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	4	>3	0	0		2	2	2	2	2	3	3
Iron, total (Fe)	5	0	N/A				410	410	570	830	1900	1900	1900
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	2	>86	0	0		10	10	10	10	13	15	15
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
60	17.2	1	1.7										

Key:

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

Location: ALBEMARLE SOUND BETWEEN HARVEY PT AND MILL PT MID CHANNEL
Station #: M610000C **Hydrologic Unit Code:** 3010205
Latitude: 36.02151 **Longitude:** -76.30602 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30
Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<5	0	0		7.2	7.8	8.4	9.4	11.4	12.4	13.8
pH (SU)	58	0	<6.8	0	0		7	7.3	7.4	7.6	7.8	8	8.5
	58	0	>8.5	0	0		7	7.3	7.4	7.6	7.8	8	8.5
Salinity (ppt)	58	0	N/A				0.04	0.05	1	2.87	4.4	6.63	8.93
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				106	126	1930	5228	7868	11620	15396
Water Temperature (°C)	58	0	>32	0	0		3.9	5.9	8.6	17.4	25.6	28	29.4
Other													
Chlorophyll a (ug/L)	59	0	>40	0	0		2	4	6	10	13	18	40
TSS (mg/L)	20	7	N/A				5.8	6.2	6.9	9.6	12	18.6	28
Turbidity (NTU)	59	0	>25	1	1.7		1.5	2.4	3.3	5	8.9	14	29
Nutrients (mg/L)													
NH3 as N	59	55	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	59	42	N/A				0.02	0.02	0.02	0.02	0.04	0.13	0.24
TKN as N	59	0	N/A				0.35	0.4	0.43	0.48	0.52	0.59	0.78
Total Phosphorus	59	0	N/A				0.02	0.02	0.03	0.04	0.05	0.07	0.09
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				190	190	300	530	835	860	860
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>20	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	3	>3	1	20		2	2	2	2	3	4	4
Iron, total (Fe)	5	0	N/A				210	210	440	1000	1200	1400	1400
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	4	>86	0	0		10	10	10	10	11	12	12
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
59	1.4	0	0										

Key:

result: number of observations
 # ND: number of observations reported to be below detection level (non-detect)
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 Results not meeting EL: number and percentages of observations not meeting evaluation
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Ambient Monitoring System Station Summaries
 NCDENR, Division of Water Quality
 Basinwide Assessment Report

Location: ALBEMARLE SOUND BETWEEN HARVEY PT AND MILL PT N SHORE
Station #: M610000N **Hydrologic Unit Code:** 3010205
Latitude: 36.08348 **Longitude:** -76.29288 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30
Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<5	0	0		7.1	7.7	8.4	9.5	11.4	12.2	13.5
pH (SU)	58	0	<6.8	2	3.4		6.5	7.2	7.4	7.6	7.9	8.1	8.7
	58	0	>8.5	1	1.7		6.5	7.2	7.4	7.6	7.9	8.1	8.7
Salinity (ppt)	58	0	N/A				0.05	0.07	1.18	2.9	4.3	7.05	8.14
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				95	149	2208	5274	7699	12289	13972
Water Temperature (°C)	58	0	>32	0	0		4	6.4	8.6	17.8	25.6	28.2	29.5
Other													
TSS (mg/L)	19	10	N/A				2.5	4.5	6.2	6.5	12	14	20
Turbidity (NTU)	59	0	>25	1	1.7		1.4	2.8	3.6	6	8.3	15	28
Nutrients (mg/L)													
NH3 as N	58	51	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.03
NO2 + NO3 as N	58	42	N/A				0.02	0.02	0.02	0.02	0.03	0.11	0.31
TKN as N	58	0	N/A				0.36	0.4	0.44	0.49	0.53	0.6	0.75
Total Phosphorus	58	0	N/A				0.02	0.02	0.03	0.04	0.06	0.07	0.11
Metals (ug/L)													
Aluminum, total (Al)	6	0	N/A				120	120	128	260	535	820	820
Arsenic, total (As)	6	6	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	6	6	>5	0	0		1	1	1.8	2	2	2	2
Chromium, total (Cr)	6	6	>20	0	0		10	10	21	25	25	25	25
Copper, total (Cu)	6	3	>3	2	33.3		2	2	2	2	6	6	6
Iron, total (Fe)	6	0	N/A				150	150	180	320	1125	1500	1500
Lead, total (Pb)	6	6	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	5	5	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	6	6	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	6	6	>86	0	0		10	10	10	10	10	10	10
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
58	1.5	0	0										

Key:

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

Location: ALBEMARLE SOUND BETWEEN HARVEY PT AND MILL PT S SHORE
Station #: M610000S **Hydrologic Unit Code:** 3010205
Latitude: 35.96353 **Longitude:** -76.31261 **Stream class:** SB
Agency: NCAMBNT **NC stream index:** 30

Time period: 01/04/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<5	0	0		6.9	7.8	8.3	9.7	11.4	12.2	13.6
pH (SU)	58	0	<6.8	0	0		6.9	7.1	7.4	7.6	7.8	8	8.8
	58	0	>8.5	1	1.7		6.9	7.1	7.4	7.6	7.8	8	8.8
Salinity (ppt)	58	0	N/A				0.03	0.05	1.12	2.24	4.21	6.21	6.77
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				90	128	2088	4096	7607	10932	11847
Water Temperature (°C)	58	0	>32	0	0		4	6.5	8.8	17.8	25.8	28.1	30.2
Other													
TSS (mg/L)	20	8	N/A				3.7	5.3	6.2	6.6	11.5	18.3	23
Turbidity (NTU)	59	0	>25	0	0		1.7	2.7	3.4	6	9	11	20
Nutrients (mg/L)													
NH3 as N	58	54	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.03
NO2 + NO3 as N	58	39	N/A				0.02	0.02	0.02	0.02	0.05	0.19	0.35
TKN as N	58	0	N/A				0.33	0.4	0.44	0.49	0.59	0.66	0.89
Total Phosphorus	58	2	N/A				0.02	0.02	0.03	0.04	0.05	0.06	0.11
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				100	100	150	390	575	750	750
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	4	>5	0	0		1	1	1.5	2	2.7	3.4	3.4
Chromium, total (Cr)	5	5	>20	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	1	>3	1	20		2	2	2	2	4	4	4
Iron, total (Fe)	5	0	N/A				120	120	170	640	1250	1500	1500
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	4	>86	0	0		10	10	10	10	10	10	10
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
59	1.5	0	0										

Key:

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

Location: KENDRICK CRK AT SR 1300 AT MACKEYS
Station #: M6920000 **Hydrologic Unit Code:** 3010205
Latitude: 35.92995 **Longitude:** -76.60983 **Stream class:** SC
Agency: NCAMBNT **NC stream index:** 30-9-(2)

Time period: 01/26/2006 to 12/06/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	<5	25	43.9	> 99.9	1	2.2	3.8	5.3	7.6	9	9.9
pH (SU)	60	0	<6.8	47	78.3	> 99.9	5.2	5.9	6.1	6.5	6.7	6.9	7.2
	60	0	>8.5	0	0		5.2	5.9	6.1	6.5	6.7	6.9	7.2
Salinity (ppt)	59	0	N/A				0.04	0.09	0.1	0.14	0.67	1.65	2.57
Spec. conductance (umhos/cm at 25°C)	59	0	N/A				101	182	215	292	1271	3055	4701
Water Temperature (°C)	60	0	>32	0	0		2.4	7.9	12.2	17.7	24.7	26.9	30.2
Other													
Chlorophyll a (ug/L)	58	0	>40	1	1.7		1	1	2	7	15	23	50
TSS (mg/L)	20	12	N/A				5	5	6.2	6.2	12	16.8	21
Turbidity (NTU)	60	0	>25	4	6.7		2.3	3.4	4.7	8.4	13.8	19.9	40
Nutrients (mg/L)													
NH3 as N	60	14	N/A				0.02	0.02	0.02	0.07	0.14	0.23	0.28
NO2 + NO3 as N	60	9	N/A				0.02	0.02	0.1	0.34	0.88	2.93	7.1
TKN as N	58	0	N/A				0.49	0.61	0.77	1.1	1.3	1.62	2
Total Phosphorus	60	0	N/A				0.03	0.04	0.05	0.08	0.09	0.12	0.3
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				480	480	740	1300	1450	1500	1500
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>20	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	5	>3	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	5	0	N/A				1800	1800	1850	2700	3000	3100	3100
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	2	>8.3	3	60		10	10	10	11	12	12	12
Zinc, total (Zn)	5	0	>86	0	0		15	15	20	25	32	33	33
Fecal Coliform Screening(#/100mL)													
# results:	Geomea	# > 400:	% > 400:	%Conf:									
60	39.1	3	5										

Key:

result: number of observations
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 %Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal Stations with less than 10 results for a given parameter were not evaluated for statistical

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

Location: SCUPPERNONG RIV AT SR 1105 NR COLUMBIA
Station #: M6980000 **Hydrologic Unit Code:** 3010205
Latitude: 35.87762 **Longitude:** -76.33761 **Stream class:** C Sw
Agency: NCAMBNT **NC stream index:** 30-14-4-(1)
Time period: 01/26/2006 to 12/06/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	57	0	N/A				0.2	0.6	1.4	3.1	4.9	6.4	8.5
pH (SU)	60	0	<4.3	0	0		5.5	5.9	6	6.2	6.4	6.7	7
	60	0	>9	0	0		5.5	5.9	6	6.2	6.4	6.7	7
Salinity (ppt)	59	0	N/A				0.04	0.07	0.09	0.16	0.97	2.37	4.79
Spec. conductance (umhos/cm at 25°C)	59	0	N/A				99	158	198	319	1832	4332	8531
Water Temperature (°C)	60	0	>32	0	0		2.8	8.5	11.7	17.7	23.9	27.3	29.5
Other													
Chlorophyll a (ug/L)	59	4	>40	1	1.7		1	1	2	4	9	22	46
Hardness (mg/L)	4	0	N/A				57	57	62	75	88	92	92
TSS (mg/L)	20	9	N/A				2.5	2.5	5.1	6.2	7.4	9.9	13
Turbidity (NTU)	60	0	>50	0	0		1.4	2.4	3.7	6.2	11	15.8	33
Nutrients (mg/L)													
NH3 as N	59	3	N/A				0.02	0.05	0.12	0.19	0.27	0.4	1.2
NO2 + NO3 as N	59	9	N/A				0.02	0.02	0.06	0.29	1	1.7	5.2
TKN as N	55	0	N/A				0.67	0.99	1.2	1.4	1.8	2.1	2.9
Total Phosphorus	59	0	N/A				0.03	0.06	0.08	0.11	0.14	0.18	0.46
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				340	340	430	760	1150	1300	1300
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>2	0	0		1	1	1.5	2	2	2	2
Chromium, total (Cr)	5	5	>50	0	0		10	10	18	25	25	25	25
Copper, total (Cu)	5	5	>7	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	5	0	>1000	5	100		1800	1800	2100	2500	2550	2600	2600
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	4	4	>12	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>88	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	3	>50	0	0		10	10	10	10	13	15	15

Fecal Coliform Screening(#/100mL)

# results:	Geomea	# > 400:	% > 400: %Conf:
60	41.9	4	6.7

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

Location: ALLIGATOR RIV AT US 64 NR ALLIGATOR

Station #: M7175000

Hydrologic Unit Code: 3010205

Latitude: 35.89859

Longitude: -76.00978

Stream class: SC Sw ORW

Agency: NCAMBNT

NC stream index: 30-16-(7)

Time period: 01/26/2006 to 11/16/2010

	# results	# ND	EL	Results not meeting EL			Percentiles						
				#	%	%Conf	Min	10th	25th	50th	75th	90th	Max
Field													
D.O. (mg/L)	58	0	N/A				7	7.7	8.1	9.4	11.4	12.2	13.4
pH (SU)	58	0	<4.3	0	0		6.4	7.1	7.2	7.4	7.6	7.7	8.7
	58	0	>8.5	1	1.7		6.4	7.1	7.2	7.4	7.6	7.7	8.7
Salinity (ppt)	58	0	N/A				1.08	1.38	2.67	3.84	6.53	7.58	8.17
Spec. conductance (umhos/cm at 25°C)	58	0	N/A				2008	2529	4905	6900	11446	13172	14136
Water Temperature (°C)	58	0	>32	0	0		3.8	5.8	8.5	18.4	25.8	28.2	29.5
Other													
Chlorophyll a (ug/L)	56	0	>40	1	1.8		2	5	6	6	9	11	42
TSS (mg/L)	19	4	N/A				6.2	6.2	8	11	14	38	44
Turbidity (NTU)	58	0	>25	1	1.7		2.7	3.2	4.1	6.4	9.2	16.1	27
Nutrients (mg/L)													
NH3 as N	58	58	N/A				0.02	0.02	0.02	0.02	0.02	0.02	0.02
NO2 + NO3 as N	58	34	N/A				0.02	0.02	0.02	0.02	0.05	0.09	0.16
TKN as N	57	0	N/A				0.38	0.48	0.52	0.59	0.68	0.76	0.94
Total Phosphorus	58	3	N/A				0.02	0.02	0.02	0.02	0.03	0.04	0.05
Metals (ug/L)													
Aluminum, total (Al)	5	0	N/A				210	210	260	350	870	1200	1200
Arsenic, total (As)	5	5	>10	0	0		5	5	5	5	5	5	5
Cadmium, total (Cd)	5	5	>5	0	0		1	1	1	2	2	2	2
Chromium, total (Cr)	5	5	>20	0	0		10	10	10	25	25	25	25
Copper, total (Cu)	5	5	>3	0	0		2	2	2	2	2	2	2
Iron, total (Fe)	5	0	N/A				160	160	220	470	935	1300	1300
Lead, total (Pb)	5	5	>25	0	0		10	10	10	10	10	10	10
Mercury, total (Hg) (ng/L)	3	3	>25	0	0		0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nickel, total (Ni)	5	5	>8.3	0	0		10	10	10	10	10	10	10
Zinc, total (Zn)	5	1	>86	0	0		10	10	10	11	24	32	32
Fecal Coliform Screening(#/100mL)													
# results:	58												
Geomea	1.2												
# > 400:		0											
% > 400: %Conf:				0									

Key:

result: number of observations

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Results not meeting EL: number and percentages of observations not meeting evaluation

%Conf : States the percent statistical confidence that the actual percentage of exceedances is at least 10% (20% for Fecal

Stations with less than 10 results for a given parameter were not evaluated for statistical