North Carolina
Water Quality Assessment and Impaired Waters List
(2002 Integrated 305(b) and 303(d) Report)

Final

February, 2003

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(Document Control No. 02IRMT04Ff)

The Division of Water Quality actively solicited public input and comment concerning the compilation of this Integrated Report through the continuing cycles of the rotating basinwide planning process. The draft Integrated Report was noticed and provided to the public for review and comment for a period of 49 days, from June 28 to August 16, 2002. Comments were received from agencies and individuals, including Clean Water for North Carolina, NC Coastal Federation, the Haw River Assembly, and the Mecklenburg County Department of Environmental Protection.

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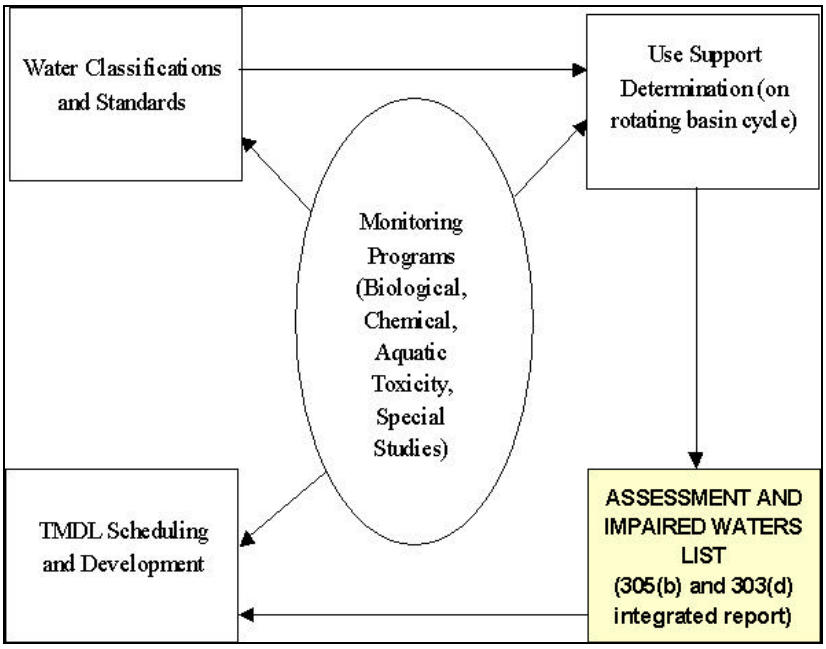
1 Introduction

The *North Carolina Water Quality Assessment and Impaired Waters List* is an integrated report that includes both the 305(b) and 303(d) reports of previous years. The *305(b) report* is compiled biennially to update the assessment of water quality in North Carolina and to meet the Section 305(b) reporting requirement of the Clean Water Act. In general, 305(b) reports have described the quality of surface waters, groundwaters, and wetlands, and existing programs to protect water quality. The 305(b) reports present how well waters support designated uses (e.g., swimming, aquatic life support, water supply), as well as likely causes (e.g., sediment, nutrients) and potential sources of impairment. The term "Use Support" refers to the process mandated by 305(b). The *303(d) list* is a comprehensive public accounting of all impaired waterbodies that is derived from the 305(b) report/Use Support. An impaired waterbody is one that does not meet water quality uses, such as water supply, fishing or propagation of aquatic life. Best professional judgement along with numeric and narrative standards criteria and anti-degradation requirements defined in 40 CFR 131 are considered when evaluating the ability of a waterbody to serve its uses.

This integrated report also contains information concerning the ancillary DWQ programs that contribute to the development of use support ratings and the integrated report. Specifically, the report briefly describes the various Monitoring Programs, the Surface Water Classifications and Standards used in North Carolina, the Assessment or Use Support Methodology, the Reporting Methodology, and the TMDL program. A schematic of how these programs interact is provided in Figure 1.

Figure 1. Schematic of Programs Described in the 2002 Assessment and Listing Methodology



1.1 Requirements Under Section 303(d) of the Clean Water Act

Section 303(d) of the federal Clean Water Act (CWA) which Congress enacted in 1972 requires States, Territories and authorized Tribes to identify and establish a priority ranking for waterbodies for which technology-based effluent limitations required by section 301 are not stringent enough to attain and maintain applicable water quality standards, establish total maximum daily loads (TMDLs) for the pollutants causing impairment in those waterbodies, and submit, from time to time, the list of impaired waterbodies and TMDLs to the U.S. Environmental Protection Agency (EPA). Current federal rules require states to submit 303(d) lists biennially, by April 1st of every even numbered year. For 2002, EPA delayed the submittal until October 1, 2002 (EPA 2001a). EPA is required to approve or disapprove the state-developed §303(d) list within 30 days. For each water quality limited segment impaired by a pollutant and identified in the §303(d) list, a Total Maximum Daily Load (TMDL) must be developed. TMDLs are not required for waters not impaired by a pollutant.

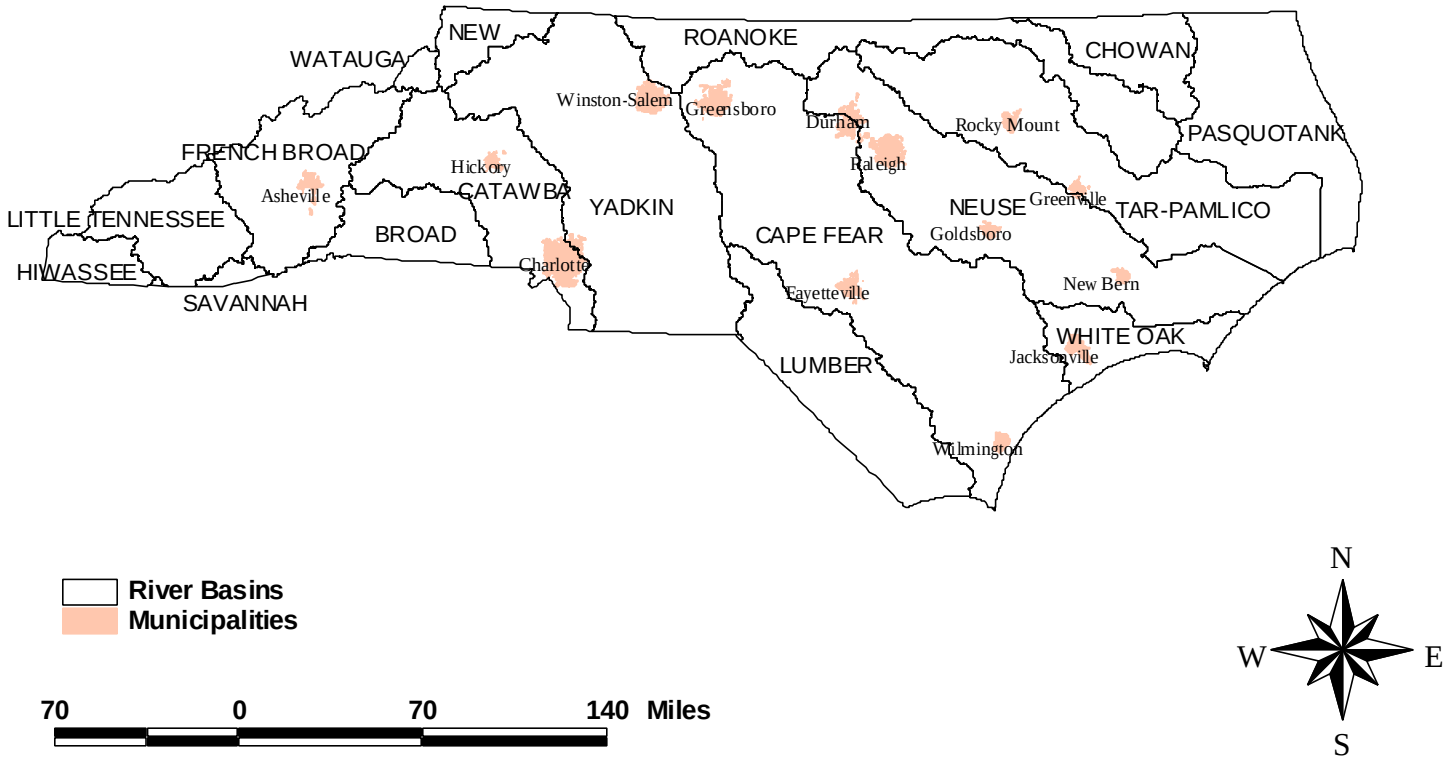
In accordance with recent Environmental Protection Agency (EPA) guidance on this matter, the State of North Carolina has elected to submit the required information for 2002 in a format similar to that specified in the *2002 Integrated Water Quality Monitoring and Assessment Report* (EPA 2001b). This integrated report is considered a hybrid report, incorporating elements of old and new EPA guidance on 305(b) and 303(d) reporting. According to the EPA, this report will satisfy Clean Water Act (CWA) requirements for both the 2002 Section 305(b) water quality report and the 2002 Section 303(d) priority ranking of impaired waterbodies, commonly referred to as the § 303(d) list.

1.2 North Carolina's Rotating Basin Approach

Basinwide water quality planning is a nonregulatory watershed-based approach to restoring and protecting the quality of North Carolina's surface waters. Basinwide water quality plans are prepared by the NC Division of Water Quality (DWQ) for each of the seventeen major river basins in the state (Figure 2). Each basinwide plan is revised at five-year intervals, as shown in Table 1. Many of the procedures described within this integrated report are actually performed as part of the basinwide process. This includes biological monitoring (Section 2.1) and use support determination (Section 4.2). Although the integrated report is prepared independently of the basinwide management plans, use support ratings determined as part of the basinwide process are the foundation of this integrated report. The use support ratings for the ***Roanoke, White Oak, Savannah, Watauga, Little Tennessee, Hiwassee, Chowan, and Pasquotank*** river basins have been updated since the 2000 §303(d) list was approved.

Table 1. North Carolina Basinwide Planning Schedule				
Basin	Data solicitation	Biological monitoring	Draft basinwide plan	Final basinwide plan
White Oak	October 1998	Spring/Summer 1999	May 2001	September 2001
Savannah	October 1998	Summer 1999	October 2001	March 2002
Watauga	October 1998	Summer 1999	September 2001	February 2002
Little Tennessee	October 1998	Summer 1999	October 2001	April 2002
Hiwassee	October 1998	Summer 1999	October 2001	March 2002
Chowan	October 1999	Spring/Summer 2000	December 2001	July 2002
Pasquotank	October 1999	Spring/Summer 2000	December 2001	July 2002
Neuse	October 1999	Spring/Summer 2000	April 2002	July 2002
Broad	October 1999	Summer 2000	July 2002	December 2002
Yadkin/Pee Dee	October 2000	Summer 2001	October 2002	March 2003
Lumber	October 2000	Spring/Summer 2001	July 2003	December 2003
Tar-Pamlico	October 2001	Spring/Summer 2002	September 2003	March 2004
Catawba	October 2001	Summer 2002	December 2003	June 2004
French Broad	October 2001	Summer 2002	August 2004	February 2005
New	October 2002	Summer 2003	December 2004	September 2005
Cape Fear	October 2002	Spring/Summer 2003	February 2005	August 2005
Roanoke	October 2003	Spring/Summer 2004	December 2005	TBD

Figure 2. North Carolina River Basins



2 Surface Water Monitoring Programs

2.1 Overview of DWQ Monitoring Programs

The Environmental Sciences Branch of DWQ collects a variety of biological, chemical, and physical data that can be used in a myriad of ways. In some waterbodies there may be adequate data from several program areas to allow a fairly comprehensive analysis of ecological integrity or water quality. In other waterbodies, data may be limited to one program area, such as only benthic macroinvertebrates data or only fisheries data, with no other information available. Such data may or may not be adequate to provide a definitive assessment of water quality, but can provide general indications of water quality. The primary programs from which data are typically drawn include benthic macroinvertebrates, fish community, fish tissue, lake assessment, ambient monitoring, and aquatic toxicity monitoring.

2.1.1 Biological Monitoring

Benthic Macroinvertebrates

Macroinvertebrates, or benthos, are organisms that live in and on the bottom of substrates of rivers and streams. These organisms are primarily aquatic insect larvae. The use of benthos data has proven to be a reliable monitoring tool, as benthic macroinvertebrates are sensitive to subtle changes in water quality. Because many taxa in a community have life cycles of six months to one year, the effects of short term pollution (such as a spill) will generally not be overcome until the following generation appears. The benthic community also integrates the effects of a wide array of potential stressors.

Sampling methods and criteria have been developed to assign bioclassifications ranging from Poor to Excellent to each benthic sample from flowing fresh waters based on the number of taxa present in the intolerant groups Ephemeroptera, Plecoptera, and Trichoptera (s) and the value of the North Carolina Biotic Index (NCBI). This index summarizes tolerance data for all taxa in each collection. These bioclassifications primarily reflect the influence of chemical pollutants. The major physical pollutant, sediment, is not assessed as well by a taxa richness analysis.

Different criteria have been developed for different ecoregions within North Carolina for flowing freshwater waterbodies. Thus, criteria are available for the mountains, piedmont and coastal plain physiographic regions. Details of the methods and criteria are presented in the assessment reports for each basin and in the Standard Operating Procedures for Benthic Macroinvertebrates (NCDENR 2001a).

Fish Community Structure

The North Carolina Index of Biotic Integrity (NCIBI) is a modification of the Index of Biotic Integrity (IBI) initially proposed by Karr (1981) and Karr et al. (1986). The IBI method was developed for assessing a stream's biological integrity by examining the structure and health of its fish community. The scores derived from this index are a measure of the ecological

health of the waterbody and may not directly correlate to water quality. For example, a stream with excellent water quality, but with poor or fair fish habitat, would not be rated excellent with this index. However, a stream which rated excellent on the NCIBI should be expected to have excellent water quality for aquatic life propagation.

The Index of Biological Integrity incorporates information about species richness and composition, trophic composition, fish abundance, and fish condition. The NCIBI summarizes the effects of all classes of factors influencing aquatic faunal communities (water quality, energy source, habitat quality, flow regime, and biotic interactions). While any change in a fish community can be caused by many factors, certain aspects of the community are generally more responsive to specific influences. Species composition measurements reflect habitat quality effects. Information on trophic composition reflects the effects of biotic interactions and energy supply. Fish abundance and condition information indicate additional water quality effects. However, these responses may overlap. For example, a change in fish abundance may be due to decreased energy supply or a decline in habitat quality, not necessarily a change in water quality. A complete description of methods is provided in the Standard Operating Procedures for Biological Monitoring: Stream Fish Community Assessment and Fish Tissue (NCDENR 2001b).

Fish Tissue

Because fish spend their entire lives in the aquatic environment, they incorporate chemicals from this environment into their body tissues. Contamination of aquatic resources have been documented for heavy metals, pesticides, and other complex organic compounds. When these contaminants reach surface waters, they may be available for bioaccumulation, either directly or through aquatic food webs, and may accumulate in fish and shellfish tissues. Results from fish tissue monitoring can serve as an important indicator of further contamination of sediments and surface water.

The Environmental Sciences Branch previously performed fish tissue surveys as part of the basinwide assessment program. Currently, the fish tissue surveys are targeted to areas of existing or suspected contamination. This shift has resulted in less basinwide coverage, but has focused resources on known contaminant issues within the state.

All fish samples were collected according to the agency Standard Operating Procedures for Biological Monitoring: Stream Fish Community Assessment and Fish Tissue (NCDENR 2001b). Analysis results are used as indicators for human health concerns, fish and wildlife concerns, and the presence and concentrations of various chemicals in the ecosystem.

Aquatic Toxicity

Acute and/or chronic toxicity tests are used to determine toxicity of discharges to sensitive aquatic species (usually fathead minnows or the water flea, *Ceriodaphnia dubia*). Results of these tests have been shown by several researchers to be predictive of discharge effects on receiving stream populations.

Many facilities are required to monitor whole effluent toxicity by their NPDES permit or by administrative letter. Facilities without monitoring requirements may have their effluents

evaluated for toxicity by the DWQ Aquatic Toxicology Laboratory. If toxicity is detected, DWQ may include aquatic toxicity testing upon permit renewal.

2.1.2 Chemical Monitoring

Ambient Monitoring System

Assessments of water quality can be made using information about the fish and benthic invertebrates communites present in a body of water or from chemical measurements of particular water quality parameters. The Ambient Monitoring System is a network of over 400 stream, lake, and estuarine stations strategically located for the collection of physical and chemical water quality data. Each station is visited on a monthly basis, as resources allow. 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 appended when needed.

On the basinwide planning cycle, water quality data collected at all sites are evaluated for the previous five year period. Some stations have little or no data for several parameters. However, for the purpose of standardization, the assessment reports include data summaries for each station, all parameters.

Quality Assurance

All data collected for water quality assessment follows established quality assurance procedures per the appropriate Standard Operating Procedures. In chemical monitoring, laboratory analyses play a key role in the assessment and protection of water quality. Laboratory analyses are needed to identify problems and to monitor the effectiveness of management strategies to abate these problems. The relative accuracy and precision of laboratory data must be considered as part of any data interpretation or analysis of trends and use support. Absolute certainty in laboratory measurements can never be achieved. However, it is the goal of quality assurance and quality control efforts to quantify an acceptable amount of uncertainty. The evaluation of data quality is thus a relative determination. What is high quality for one situation could be unacceptable in another.

The DWQ's Chemistry Laboratory has recently established rigorous internal quality assurance evaluations. These evaluations may have significant implications on interpretations of historical data and how new data are generated and reviewed. DWQ will continue to work on ensuring the quality of water analyses in North Carolina. It is obviously beneficial to generate the highest quality information to apply a statistical level of significance to water quality observations. In addition to quantification limits, lower limits of detection, method detection limits, and instrumentation detection limits must be evaluated on a continuing basis to ensure sound data and information. Because each of these detection limits can represent different levels of confidence, water quality evaluations may change from time to time based on improved laboratory instruments, analytical methods, and improved quality assurance and quality control applications.

Discharger Coalition Monitoring

The Division of Water Quality has several memoranda of agreement with various NPDES permit holders to form coalitions and conduct ambient monitoring programs within specific river basins. In lieu of monitoring upstream and downstream of particular NPDES discharge, a coalition will establish a set of fixed ambient monitoring sites within a specified area, be it a river basin or a portion of a river basin. Parametric coverage at these sites is similar to the DWQ ambient monitoring system, however additional monitoring studies may be undertaken by the coalitions. Each coalition has a quality assurance team to review laboratory reports and procedures to ensure data quality. After data has been quality assured, they are sent to DWQ.

As of 2002, there are five discharger coalitions that perform ambient monitoring in North Carolina. They are the Upper, Middle, and Lower Cape Fear River Basin Associations, the Lower Neuse Basin Association (LNBA), and the Yadkin-PeeDee River Basin Association (YPDRBA). These discharger coalitions monitor water quality at 197 stations located within the Cape Fear, Neuse, and Yadkin River Basins.

2.2 Soliciting Existing and Readily Available Water Quality Data

DWQ actively solicits outside data and information in the year before biological sampling occurs in a particular basin. The solicitation allows approximately 90 days for data to be submitted. DWQ solicits and requires the following:

- Letters, photographs, and observations regarding the uses of surface waters for boating, drinking water, swimming, aesthetics, and fishing may be submitted.
- Summary reports and memos including distribution statistics, data collection and QA/QC methods may be submitted.
- Raw data should be submitted electronically and accompanied by documentation of quality assurance methods used to collect and analyze the samples.
- If information includes summaries of chemical or biological sampling data, maps showing sampling locations must be included.
- Contact information must be provided with submittals.

Data from sources outside of DWQ are screened for data quality and quantity. If data are of sufficient quality and quantity, they may be incorporated into use support assessments. A minimum of ten samples for more than a one-year period is needed to be considered for use support assessments.

The way the solicited data are used depends on the degree of quality assurance and quality control of the collection and analysis of the data as detailed in Appendix I and shown in the table below. Level 1 data can be used with the same confidence as DWQ data to determine use support ratings. Level 2 or Level 3 data may be used to help identify causes of pollution and problem parameters. They may also be used to limit the extrapolation of use support ratings up or down a stream segment from a DWQ or other Level 1 monitoring location. Where outside data indicate a potential problem, DWQ evaluates the existing DWQ biological and ambient monitoring site locations for adjustment as appropriate. All data

collected and regularly submitted to DWQ by the discharger coalitions are considered Level 1 data unless otherwise noted in assessment documents or basinwide management plans.

Table 2. Criteria Levels for Use of Outside Data in Use Support Assessments

Criteria	Level 1	Level 2	Level 3
Monitoring frequency of at least 10 samples for more than a one-year period	Yes	Yes or No	No
Monitoring locations appropriately sited and mapped	Yes	Yes	No
State certified laboratory used for analysis according to 15A NCAC 2B .0103	Yes	Yes or No	No
Quality assurance project plan (QAPP) available describing sample collection and handling	Yes, rigorous scrutiny	Yes or No	No

Sources routinely used for data and information include, but are not limited to, the following sources:

* Previous § 303(d) lists;
* Clean Water Act § 305(b) reports;
* Clean Water Act § 319 nonpoint source assessments;
* Waterbodies where specific fishing or shellfish bans and/or advisories are currently in effect;
* Waterbodies identified by the State as impaired in its most recent Clean Lake Assessment conducted under § 314 of the CWA;
* Drinking water source water assessments under § 1453 of the Safe Drinking Water Act;
* Trend analyses and predictive models used for determining designated use, numeric and narrative standard compliance;
* Data, information, and water quality problems reported from local, State, or Federal agencies, Tribal governments, members of the public, and academic institutions.

3 Surface Water Classifications and Standards

3.1 Water Quality Classifications

All surface waters in North Carolina are assigned a primary classification. Classifications are designations applied to surface water bodies that define the best uses to be protected within these waters, as required by the Clean Water Act. The most common primary classification within North Carolina is Class C, which protects waters for the propagation of aquatic life and for secondary recreation. Other primary freshwater classifications provide for additional levels of protection for uses consisting of drinking water supplies (Class WS-I through Class WS-V) and for primary recreation (Class B). Specific numeric and narrative water quality standards are associated with each classification in order to protect its designated best uses. Classifications are assigned by the Division of Water Quality under the authority of the Environmental Management Commission.

In addition to the primary classification, one or more supplemental classifications may be assigned to specific surface waters to provide additional protection to waters with special uses or values. Most of the supplemental classifications have been developed in order to promote special protection to sensitive or highly valued resource waters. North Carolina's supplemental classifications include NSW (nutrient sensitive waters), Tr (trout waters), HQW (high quality waters), ORW (outstanding resource waters), and Sw (swamp waters). All primary (Tables 3 and 4) and secondary (Table 5) classifications are described below.

Table 3. North Carolina Freshwater Primary Classifications

Classification	Best Usage of Waters
C	Aquatic life propagation and maintenance of biological integrity (including fishing, and fish), wildlife, secondary recreation, agriculture and any other usage except for primary recreation or as a source of water supply for drinking, culinary, or food processing purposes. All freshwaters shall be classified to protect these uses at a minimum.
B	Primary recreation (which includes swimming on a frequent or organized basis) and any other best usage specified for Class C waters.
WS I - WS V	Source of water supply for drinking, culinary, or food-processing purposes for those users desiring maximum protection of their water supplies and any best usage specified for Class C waters.

Table 4. North Carolina Saltwater Primary Classifications

Classification	Best Usage of Waters
SC	Aquatic life propagation and maintenance of biological integrity (including fishing, fish and functioning primary nursery areas (PNAs)), wildlife, secondary recreation, and any other usage except primary recreation or shellfishing for market purposes.

Table 4. North Carolina Saltwater Primary Classifications	
Classification	**Best Usage of Waters**
SB	Primary recreation (which includes swimming on a frequent or organized basis) and any other usage specified for Class SC waters.
SA	Shellfishing for market purposes and any other usage specified for Class SB or SC waters.

Table 5. North Carolina Supplemental Classifications	
Classification	**Best Usage of Waters**
HQW	High Quality Waters. Waters which are rated as excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the Wildlife Resources Commission, primary nursery areas (PNAs) designated by the Marine Fisheries Commission and other functional nursery areas designed by the Marine Fisheries Commission.
NSW	Nutrient Sensitive Waters. Waters that experience or are subject to excessive growths of microscopic or macroscopic vegetation. Excessive growths are growths which the Commission determines impair the use of the water for its best usage as determined by the classification applied to such waters.
ORW	Outstanding Resource Waters. Unique and special surface waters of the state that are of exceptional state or national recreational or ecological significance that require special protection to maintain existing uses.
Sw	Swamp Waters. Waters which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography.
Tr	Trout Waters. Waters which have conditions that shall sustain and allow for trout propagation and survival of stocked trout on a year-round basis.

3.2 Assessment Unit Delineation Approach / Georeferencing System

North Carolina maintains an internal database, which for each surface water's assessment unit, provides a description between two land/water points, name, classification, USGS quad map section, and county. To locate the assessment unit (AU) on a map, one must go to a USGS quad map (either a physical copy or an electronic version available via software such as Terrain Navigator) and find where within the denoted map section the AU lies. For the public, a limited version of the internal database is available; this public version does not provide the name of the USGS quad map an AU is on, so therefore they must use the description and any local knowledge of the area to figure out where on a map the AU lies. North Carolina does not presently use the National Hydrography Dataset (NHD), although it is developing this capability.

3.3 Water Quality Standards

The North Carolina Surface Water Quality Standards are located in Title 15A of the North Carolina Administrative Code (NCAC). Section 15A NCAC 2B .0300 lists surface water bodies and their associated classifications. These classifications are assigned in order to protect the best uses of the water, as previously described in Section 3.1 of this document. Sections 15A NCAC 2B .0100 and 2B .0200 contain numeric and narrative surface water quality criteria and procedures for applying the water quality criteria to wastewater dischargers and other sources of pollution. Specific water quality criteria have been developed for each of the surface water quality primary classifications used to designate waters within North Carolina. These numeric and narrative criteria are established at levels that will ensure the protection of the designated best use of the water body.

Procedures described in Section 4 have been developed for use in comparing the applicable water quality criteria to the monitoring data and other information pertaining to a specific water body. Waters subsequently identified as impaired as a result of this process are then listed in the appropriate Category of the integrated report.

4 General Surface Water Assessment Methodology

4.1 Waters Covered and Updated

The use support ratings for the Chowan, Hiwassee, Little Tennessee, Pasquotank, Roanoke, Savannah, Watauga, and White Oak river basins have been updated since the 2000 North Carolina § 303(d) list was approved. These waters were rated using the methodology summarized in Section 4.0 of this document. The remaining basins were assessed using the methodology found in either *Water Quality Progress in North Carolina 1996-1997, 305(b) Report, June, 1999* or *Water Quality Progress in North Carolina, 1998-1999 305(b) Report, March, 2000*, depending upon the time period of their last update.

4.2 Assessing Use Support

Surface waters are classified according to their best intended uses. Determining how well a waterbody supports its uses (use support status) is an important method of interpreting water quality data and assessing water quality.

Surface waters are given the following ratings:

- fully supporting (FS),
- partially supporting (PS),
- not supporting (NS), or
- not rated (NR).

The ratings refer to whether the classified uses of the water (i.e., aquatic life protection, primary recreation and water supply) are being met. For example, waters classified for fish consumption, aquatic life protection and secondary recreation (Class C for freshwater or SC for saltwater) are rated FS if data used to determine use support meet certain criteria. However, if these criteria were not met, then the waters would be rated as PS or NS, depending on the degree of degradation. Waters rated PS or NS are considered to be impaired. Waters lacking data, or having inconclusive data, are listed as not rated (NR). More specific methods are presented in Section 4.4.

Historically a fully supporting but threatened (ST) rating was used to identify waters that were fully supporting but had some notable water quality concerns and could represent constant, degrading or improving conditions. North Carolina's past use of ST was very different from that of the US Environmental Protection Agency (EPA), which uses it to identify waters that demonstrate declining water quality (EPA Guidelines for Preparation of the Comprehensive State Water Quality Assessments [305(b) Reports] and Electronic Updates, 1997). Given the difference between the EPA and North Carolina definitions of ST and the resulting confusion that arises from this difference, North Carolina no longer subdivides the non-impaired category. However, these waters and the specific water quality concerns remain identified in the basin plans so that data, management and the need to address the identified concerns are not lost.

4.3 Interpretation of Data and Information

Data used in the use support assessments include biological data, chemical/physical data, lakes assessment data, fish consumption advisories from the NC Department of Health and Human Services, and swimming advisories and shellfish sanitation growing area classification from the NC Division of Environmental Health (as appropriate). Available land cover and land use information is also used, along with annual water supply reports from regional water treatment plant consultants. Basinwide planning staff evaluate data and information for a five-year window ending with the basinwide summer biological data collection (Table 1).

Although there is a general procedure for analyzing the data and information for determining use support ratings, each waterbody is reviewed individually, and best professional judgment is applied during these determinations. Assessments are made on either a monitored (M) or evaluated (E) basis depending on the level of information available. Refer to Section 4.4 for more information on the basis of assessments.

When interpreting the use support ratings, it is important to understand its associated limitations and degree of uncertainty. The assessments are not intended to provide precise conclusions about pollutant budgets for specific watersheds. Rather, the intent of use support assessments is to gain an overall picture of water quality, to describe how well surface waters support the uses for which they were classified, and to document the potential contribution made by different pollution sources.

4.4 Assessment Methodology

Use Support Categories and Uses

Beginning in 2000 with the Roanoke River Basinwide Water Quality Plan, DWQ assesses ecosystem health and human health risk through the development of use support ratings for six categories: aquatic life and secondary recreation (AL), fish consumption (FC), shellfish harvesting (SH), primary recreation (PR), water supply (WS), and "other" uses. These categories are tied to the uses associated with the primary classifications applied to NC rivers and streams. A single water could have more than one use support rating corresponding to one or more of the six use support categories, as shown in Table 6. For many waters, a use support category will not be applicable (N/A) to the use classification of that water (e.g., shellfish harvesting is only applied to Class SA waters). A full description of the classifications is available in the DWQ document titled: Classifications and Water Quality Standards Applicable to Surface Waters of North Carolina (15A NCAC 2b .0100 and .0200).

Prior to the Roanoke River Basinwide Water Quality Plan, DWQ assessed one overall (O) use support category. Thus, the ratings associated with the Neuse, Broad, Yadkin, Lumber, Tar-Pamlico, Catawba, French Broad, New, and Cape Fear river basins are associated with overall use support. Multiple categories will appear in future basinwide management plans.

Table 6. Use Support Categories						
Primary Classification	**Ecosystem Approach**	**Human Health Approach**				
	Aquatic Life/Secondary Recreation (AL)	**Fish Consumption (FC)**	**Primary Recreation (PR)**	**Water Supply (WS)**	**Shellfish Harvesting (SH)**	**Other**
C	X	X	N/A	N/A	N/A	X
SC	X	X	N/A	N/A	N/A	X
B	X	X	X	N/A	N/A	X
SB	X	X	X	N/A	N/A	X
SA	X	X	X	N/A	X	X
WS I – WS IV	X	X	N/A	X	N/A	X

Many types of information are used to determine use support ratings and to identify causes and sources of use support impairment. A use support data file is maintained for each of the 17 river basins. All existing data pertaining to a stream segment for each applicable use support category are entered into its record and can include, but is not limited to, use support ratings, basis of assessment, biological data, ambient monitoring data, problem parameters and potential sources. The following describes the data and methodologies used to make use support assessments for the surface water classifications using the six use support categories. These methods will continue to be refined, as additional information becomes available.

Basis of Assessment

Assessments are made on either a monitored (M) or evaluated (E) basis depending on the level of information available. Because a monitored rating is based on the most recent five-year window and site-specific data, it is treated with more confidence than an evaluated rating. Site-specific data collected prior to the most recent five-year window may be considered on an evaluated basis using best professional judgment.

FS ratings are extrapolated up tributaries from monitored streams, using best professional judgment, when no problematic dischargers or change in land use/cover are identified. The FS rating may also be applied to unmonitored tributaries where there is little land disturbance (e.g., national forests and wildlife refuges, wilderness areas or state natural areas). Problem parameters or sources (except general nonpoint sources) are not applied to unmonitored tributaries. PS or NS ratings are not extrapolated to unmonitored tributaries. Any stream considered impaired in a previous basinwide cycle that was not monitored during the current basinwide cycle will receive a rating of NR. Such waters will remain on the impaired waters list. Refer to the summary in Table 7 for the basis of assigning use support ratings.

Table 7. Summary of Basis for Assigning Use Support Ratings to Freshwater Streams		
Overall Basis	**Specific Basis**	**Description**
Monitored	Monitored (M) Monitored/Evaluated (ME)	Monitored stream segments[a] with data[b] ≤5[c] years old. Stream segment[a] is unmonitored, but is assigned a use support rating based on another segment of same stream for which data[b] ≤5[c] years old are available.
Evaluated	Evaluated (E)	Unmonitored streams that are direct or indirect tributaries to monitored stream segments rated FS. Must share similar land use to the monitored stream segment.
Not Rated	Not Rated (NR)	Insufficient or no data available to determine use support. Includes unmonitored streams that are direct or indirect tributaries to stream segments rated PS or NS.

a) A stream segment is a stream, or a portion thereof, listed in the Classifications and Water Quality Standards for a river basin. Each segment is assigned a unique identification number (assessment unit).
b) Major data sources include benthic macroinvertebrate and fish community bioclassifications and chemical/physical monitoring data.
c) From the year that basin monitoring was done.

Problem Parameters

Where an ambient parameter is identified as a potential concern, the parameter is listed in the DWQ database. Where habitat degradation is identified by DWQ biologists based on site visits, it is listed and attempts are made to identify the type of habitat degradation (e.g., sedimentation, loss of woody habitat, loss of pools, loss of riffles, channelization, lack of riparian vegetation, streambed scour and bank erosion). Habitat evaluation methods are being developed to better identify specific types of habitat degradation.

Potential Sources

General nonpoint sources and point sources of pollution are identified where there is sufficient information.

4.5 Aquatic Life and Secondary Recreation Use Support

The aquatic life and secondary recreation use support category is an ecosystem approach to assess whether aquatic life (benthic macroinvertebrates and fish) can live and reproduce in the waters of the state and whether waters support secondary recreation (i.e., wading, boating and minimal human body contact with water). This category is applied to all waters of the state. Biological data, ambient monitoring data and NPDES discharger data are all considered in assessing the aquatic life and secondary recreation use support category. The following is a description of each data type and methods used to assess how well a water is meeting the criteria for aquatic life protection and secondary recreation. Until bacteriological standards are established using *E. coli* or enterococci, interim methods will used to assess

secondary contact recreation. These methods are described in the ambient monitoring data section below.

Biological Data

There are two main types of biological data used in this assessment: benthic macroinvertebrate and fish community. Where recent data for both benthic macroinvertebrates and fish communities are available, both are evaluated in assessing use support. It is important to note that where both ambient chemical/physical monitoring data and biological data are available, biological data are generally given greater weight. This is particularly true when ambient chemical and biological data are conflicting. When these two indicators conflict, additional information is gathered (e.g., land use and land use changes, aerial photographs, etc) and best professional judgment is used to determine an appropriate use support rating.

In special situations, where there are currently insufficient biological data available, the basinwide planner will make a request of the DWQ Environmental Sciences Branch to determine whether a biological survey is appropriate. If a biological survey is appropriate, the use support rating will be determined by the bioclassification resulting from the survey. If a biological survey is not appropriate, then the stream will receive a not rated (NR) rating.

Benthic Macroinvertebrate Bioclassifications

Criteria have been developed to assign bioclassifications ranging from Poor to Excellent to most benthic macroinvertebrate samples based on the number of taxa present in the pollution intolerant aquatic insect groups of Ephemeroptera, Plecoptera, and Trichoptera (s) and the Biotic Index (BI), which summarizes tolerance data for all taxa in each collection. The benthic macroinvertebrate bioclassifications are translated into use support ratings according to the following scheme:

Bioclassification	Use Support Rating
Excellent	Fully Supporting (FS)
Good	Fully Supporting (FS)
Good-Fair	Fully Supporting (FS)
Fair	Partially Supporting (PS)
Poor	Not Supporting (NS)

In order to establish confidence in Fair bioclassifications and the borderline nature of some bioclassification scores, a second biological sample is collected. Sites are resampled within 12-24 months after a Fair rating is obtained if this Fair rating will result in a lower use support rating or if data are from a site never sampled before. This procedure began in 1999 and is used to validate the Fair bioclassification. Such sites will not be given a use support rating until the second sample is obtained. Table 8 shows how a final use support rating is obtained for sites that are resampled.

Table 8. New Benthic Macroinvertebrate Classifications (1999 and Beyond) and Data Causing a Decline in Use Support Ratings

Pre-1999 Bioclassification	1st sample Bioclassification	Draft Use Support Rating	2nd sample Bioclassification	Final Use Support Rating
N/A	Fair	NR; resample	Good-Fair, Good or Excellent	FS
N/A	Fair	NR; resample	Fair	PS
N/A	Fair	NR; resample	Poor	NS
N/A	Poor	NS	N/A	NS
Good-Fair, Good or Excellent	Fair	NR; resample	Good-Fair, Good or Excellent	FS
Good-Fair, Good or Excellent	Fair	NR; resample	Fair	PS
Good-Fair, Good or Excellent	Fair	NR; resample	Poor	NS
Good-Fair, Good or Excellent	Poor	NS	N/A	NS

N/A – Not Applicable NR = Not Rated

The use of benthic macroinvertebrate data can be limited in some waters. The accumulation of swamp stream data over nearly a decade suggests that not all swamp streams support similar fauna. The development of swamp stream criteria is complex, and one set of criteria is not appropriate for all swamp streams. Benthic macroinvertebrate data will not be used in waters characterized or classified by DWQ as swamp waters until the bioclassification criteria for these waters can be used with confidence. Benthic macroinvertebrate data are also not used to develop use support ratings for estuarine waters. Until bioclassification criteria for swamp and estuarine waters are developed, a designation of Not Rated (NR) will be used, and these waters will be listed as NR for aquatic life and secondary recreation use support assessments.

Benthic macroinvertebrate data are used to provide bioclassifications for high elevation trout streams. The benthic macroinvertebrate data, while not a direct measure of the trout population, are a robust measure of stream integrity. Loss of canopy, increase in stream temperature, increased nutrients, toxicity and increased sedimentation will affect the benthic macroinvertebrate and fish communities. For these reasons, the benthic macroinvertebrate bioclassifications provide a valuable assessment of the integrity of trout waters.

A designation of Not Impaired (NI) may be used for flowing waters that are too small to be assigned a bioclassification (less than 4 meters in width), but meet the criteria for a Good-

Fair or higher bioclassification using the standard qualitative and EPT criteria. This designation will translate into a use support rating of FS.

Fish Community Bioclassification

The North Carolina Index of Biotic Integrity (NCIBI) is a method for assessing a stream's biological integrity by examining the structure and health of its fish community. The NCIBI incorporates information about species richness and composition, indicator species, trophic function, abundance and condition, and reproductive function. The NCIBI is translated into use support ratings according to the following scheme:

NCIBI	Use Support Rating
Excellent	Fully Supporting (FS)
Good	Fully Supporting (FS)
Good-Fair	Fully Supporting (FS)
Fair	Partially Supporting (PS)
Poor	Not Supporting (NS)

The NCIBI was recently revised by DWQ (NCDENR, 2001b). Currently, the focus of using and applying the NCIBI is restricted to wadeable streams that can be sampled by a crew of four persons. Infrequently, larger wadeable streams can be sampled if there is a crew of six persons. The bioclassifications and criteria have also been recalibrated against regional reference site data (NCDENR, 2000a, 2000b and 2001b).

NCIBI criteria are applicable only to wadeable streams in the following river basins: Broad, Catawba, Savannah, Yadkin-Pee Dee, Cape Fear, Neuse, Roanoke, Tar-Pamlico, French Broad, Hiwassee, Little Tennessee, New and Watauga. Additionally, the NCIBI criteria are only applicable to streams in the piedmont portion of the Cape Fear, Neuse, Roanoke and Tar-Pamlico River basins. The definition of the "piedmont" for these four river basins is based upon a map of North Carolina watersheds (Fels, 1997). Specifically:

- In the Cape Fear River basin - all waters except for those draining the Sandhills in Moore, Lee and Harnett counties and the entire basin downstream of Lillington, NC.
- In the Neuse River basin -- the entire basin above Smithfield and Wilson, NC, except for the south and southwest portions of Johnston County and the eastern two-thirds of Wilson County.
- In the Roanoke River basin -- the entire basin in North Carolina upstream of Roanoke Rapids, NC and a small area between Roanoke Rapids and Halifax, NC.
- In the Tar-Pamlico River basin -- the entire basin above Rocky Mount, NC, except for the lower southeastern one-half of Halifax County and the extreme eastern portion of Nash County.

NCIBI criteria have not been developed for:

- Streams in the Broad, Catawba, Yadkin-Pee Dee, Savannah, French Broad, Hiwassee, Little Tennessee, New and Watauga River basins which are characterized as wadeable first to third order streams with small watersheds, naturally low fish species

diversity, coldwater temperatures, and high gradient plunge-pool flows. Such streams are typically thought of as "Southern Appalachian Trout Streams".

- Wadeable streams in the Sandhills ecoregion of the Cape Fear, Lumber and Yadkin-Pee Dee River basins.
- Wadeable streams and swamps in the coastal plain region of the Cape Fear, Chowan, Lumber, Neuse, Pasquotank, Roanoke, Tar-Pamlico and White Oak River basins.
- All non-wadeable and large streams and rivers throughout the state.

In order to establish confidence in Fair bioclassifications and the borderline nature of some bioclassification scores, a second biological sample is collected. Sites are resampled within 12-24 months after a Fair rating is obtained if this Fair rating will result in a lower use support rating or if data are from a site never sampled before. This procedure began in 1999 and is used to validate the Fair bioclassification. Such sites will not be given a use support rating until the second sample is obtained. The table below (Table 9) shows how a final use support rating is obtained for sites that are resampled.

Table 9. New Fish Community Classifications (1999 and Beyond) and Data Causing a Decline in Use Support Ratings

Pre-1999 Bioclassification	1st sample Bioclassification	Draft Use Support Rating	2nd sample Bioclassification	Final Use Support Rating
N/A	Fair	NR; resample	Good-Fair, Good or Excellent	FS
N/A	Fair	NR; resample	Fair	PS
N/A	Fair	NR; resample	Poor	NS
N/A	Poor	NS	N/A	NS
Good-Fair, Good or Excellent	Fair	NR; resample	Good-Fair, Good or Excellent	FS
Good-Fair, Good or Excellent	Fair	NR; resample	Fair	PS
Good-Fair, Good or Excellent	Fair	NR; resample	Poor	NS
Good-Fair, Good or Excellent	Poor	NS	N/A	NS

N/A – Not Applicable NR = Not Rated

Ambient Monitoring Data

When reviewing ambient data, a five-year window that ends on August 31 of the year of biological sampling is used. For example, if biological data are collected in a basin in 2000, then the five-year window for the ambient data would be September 1, 1995 to August 31, 2000. Selected ambient parameters are used to assess aquatic life/secondary recreation use support. These parameters are *ammonia, dissolved oxygen, pH, chloride, arsenic, cadmium, chromium, nickel* and *lead*. These parameters are measured against standards for a minimum of ten samples as follows:

Standards Violation	Rating
Criterion exceeded ≤10%	Fully Supporting (FS)
Criterion exceeded 11-25%	Partially Supporting (PS)
Criterion exceeded >25%	Not Supporting (NS)

Data for copper, iron and zinc are not used according to the scheme outlined above. These metals have action level standards because they are generally not bioaccumulative and have variable toxicity to aquatic life depending on chemical form, solubility and stream characteristics. In order for an action level standard to be violated, there must be a toxicological test that documents an impact on a sensitive aquatic organism. The action level standard is used to screen waters for potential problems with copper, iron and zinc.

Metals data for copper and iron are screened at the 85th percentile of five years of ambient data ending on August 31 of the year of biological sampling. Sites, other than estuarine and swamp waters, with an 85th percentile of =20 µg/l of copper and/or =2000 µg/l of iron are identified and flagged for instream chronic toxicity testing by DWQ. Chronic toxicity testing in estuarine and swamp waters is not ecologically meaningful. Criteria are still being developed for zinc. If a stream does not have biological data that would deem a FS rating, then the stream can be rated PS or NS for aquatic life if instream chronic toxicity is found. Criteria for evaluating instream chronic toxicity are three chronic pass/fail tests over three months using *Ceriodaphnia*. Three fails result in a NS rating, and two fails result in a PS rating.

It is important to note that some waters may exhibit characteristics outside the numerical standards due to natural conditions (e.g., many swamp waters are characterized by low pH and dissolved oxygen). These natural conditions do not constitute a violation of water quality standards.

As an interim methodology for assessing secondary recreation use support, fecal coliform bacteria geometric means has been used to screen waters for potential health risks from human body contact. Monitored waters will be screened using a geometric mean of 200 colony forming units/100mL and the *Implementation Guidance for Ambient Water Quality Criteria for Bacteria (May 2002 Draft)* to assess where potential health risks warrant further actions by the Department to protect the public. An updated methodology for assessing secondary recreation use support is under development.

Through collaboration with the Division of Environmental Health, the local health departments and the DENR Regional Offices, priority will be given to those waters with a

greater potential for human body contact. Upon finalization of the new bacteriological standard for North Carolina waters, these interim methodologies will be revised and finalized to implement the new standard.

NPDES Discharger Data

Aquatic Toxicity Data
For facilities that perform Whole Effluent Toxicity (WET) tests according to state NPDES discharge permit requirements, a review of the results of a five-year window that ends on August 31 of the year of biological sampling is used. For example, if biological data are collected in a basin in 2000, then the five-year window for aquatic toxicity data would be September 1, 1995 to August 31, 2000. If a stream with a WET test facility has not been sampled for instream chronic toxicity, biological community data, or has no ambient data, and that facility has failed three or more WET tests in the most recent two years, the stream is not rated. If failures continue, the facility will take action to correct the failures and DWQ will assess stream impacts before the next basin sampling cycle begins with either a biological survey or instream chronic toxicity testing, if possible.

Discharge Effluent Data
NPDES effluent data are reviewed by analyzing monthly averages of water quality parameters over a two-year period of data ending on August 31 of the year of biological sampling. Prior to May 31, 2000, facilities were screened for criterion 40 percent in excess of state water quality standards for conventional pollutant limitations or 20 percent in excess of state water quality standards for toxic pollutants for two or more months during two consecutive quarters, or chronic violations of either conventional or toxic pollutant limitations for four or more months during two consecutive quarters.

After May 31, 2000, facilities are screened for criterion 20 percent in excess of state water quality standards for both conventional and toxic pollutants for two or more months during two consecutive quarters, or chronic violations of either conventional or toxic pollutant limitations for four or more months during two consecutive quarters. Streams with discharges that are in excess of permit limits will not be rated if no biological or ambient monitoring data are available. Therefore, streams will not be rated PS or NS based on effluent data alone. Appropriate DWQ staff will be given a list of these facilities for follow-up.

4.6 Fish Consumption Use Support

The fish consumption use support category is based on a human health approach to assess whether humans can safely consume fish from a water. This use support category is applied to all waters of the state. The use support rating is assigned using fish consumption advisories issued by the NC Department of Health and Human Services.

If a limited fish consumption advisory is posted at the time of use support assessment, the water is rated PS. If a no consumption advisory is posted at the time of use support assessment, the water is rated NS.

The statewide limited fish consumption advisory for bowfin due to elevated levels of mercury in fish tissue is an exception. *(This advisory was modified in Spring 2002. This modification will be reflected in future use support methods.*) It is recognized that bowfin only live and reproduce in waters of the piedmont and coastal plain. Therefore, the use support ratings will be based on the combination of the current statewide fish consumption advisory for bowfin and the documented presence of bowfin in each river basin as found in Freshwater Fisheries of North Carolina (Menhinick, 1991). In river basins where there are documented populations of bowfin (Roanoke, Chowan, Pasquotank, White Oak, Lumber, Neuse, Tar-Pamlico, Cape Fear, Yadkin and Catawba), all waters will be rated PS for the fish consumption category. In river basins where there are no documented populations of bowfin (Little Tennesee, Hiwassee, Savannah, Watauga, New, French Broad and Broad), the waters will be rated FS for the fish consumption category unless there is a site-specific advisory.

In order to separate this from other fish consumption advisories and to identify actual bowfin populations with high levels of mercury, only waters with fish tissue monitoring data are presented on the use support maps and in the use support summary tables of the basin plans. A review of the present methods for assessing the fish consumption use support category is being conducted, and methods may be modified in the future.

4.7 Primary Recreation Use Support

In addition to the use support categories applicable to Class C and SC waters, the primary recreation use support category will be assessed for all Class B, Class SA and Class SB waters where data are available. This use support category is a human health approach to assess whether waters support primary recreation activities such as swimming, water-skiing, skin diving, and similar uses involving human body contact in an organized or frequent basis. The use support rating is based on swimming advisories issued by local health departments and by the NC Division of Environmental Health (DEH) beach monitoring program.

Freshwaters

Each January, the geometric mean of fecal coliform concentrations for ambient stations in Class B waters for the previous sampling year is obtained, and a screen is conducted for waters with geometric means greater than 200 colonies per 100 ml. If the geometric mean is greater than 200 colonies per 100 ml during the previous year, fecal coliform bacteria are noted as a problem parameter, and a request is made of the DWQ regional office to sample this water 5 times within 30 days in June during non-runoff events, if possible. If this data, as required to assess the NC standard, indicate a geometric mean greater than 200 colonies per 100 ml, then the data are sent to DEH for consideration of posting swimming advisories. The DWQ regional office should continue to sample the stream 5 times within 30 days during the months of July and August and send the data to DEH.

When reviewing fecal coliform data and swimming advisories, a five-year window that ends on August 31 of the year of biological sampling is used. For example, if biological data are collected in a basin in 2000, then the five-year window for the fecal coliform data and swimming advisories would be September 1, 1995 to August 31, 2000. Monitored Class B

waters are rated FS if the geometric mean over the five-year window is less than or equal to 200 colonies per 100 ml. If a water was posted with an advisory for at least two months within the five-year window, it is rated as PS unless DEH staff believes that the cause of elevated fecal bacteria is not persistent. Those waters posted as "Do Not Swim" for more than two months in the five-year window are rated NS. Class B waters without fecal coliform data or swimming advisories are not rated.

DWQ attempts to determine if there are any inland swimming areas monitored by county or local health departments. County or local health departments are asked to list those waters with swimming advisories posted for at least two months in the previous five years (ending on August 31 of the year of biological sampling).

Estuarine waters

Each January, the geometric mean for ambient stations in Class SB and SA waters for the previous sampling year is obtained, and a screen is conducted for waters with geometric means greater than 200 colonies per 100 ml. If the geometric mean is greater than 200 colonies per 100 ml during the previous year, fecal coliform bacteria are noted as a problem parameter, and a request is made of the DWQ regional office to sample this water 5 times within 30 days in June during non-runoff events, if possible. If this data, as required to assess the NC standard, indicate a geometric mean greater than 200 colonies per 100 ml, then the data are sent to DEH for consideration of posting swimming advisories. The DWQ regional office should continue to sample the stream 5 times within 30 days during the months of July and August and send the data to DEH.

DEH fecal coliform data are used to assess estuarine (SA and SB) waters. Each January, DEH submits a letter to DWQ stating which coastal waters were posted with an advisory reporting an increased risk from swimming during the prior year. When reviewing DEH fecal coliform data and swimming advisories, a five-year window that ends on August 31 of the year of biological sampling is used. For example, if biological data are collected in a basin in 2000, then the five-year window for the DEH fecal coliform data and swimming advisories would be September 1, 1995 to August 31, 2000. If a water was posted with an advisory for at least two months within the five-year window, it is rated as PS unless DEH staff believes that the cause of elevated fecal bacteria is not persistent. Those waters posted as "Do Not Swim" for more than two months in the five-year window are rated NS. If DEH has no data on a water, that water will not be rated.

4.8 Shellfish Harvesting Use Support

The shellfish harvesting use support category is a human health approach to assess whether shellfish can be commercially harvested and is therefore applied only to Class SA waters. The following data sources are used to determine use support ratings for shellfish waters and to determine causes and sources of impairment for these waters.

Department of Environmental Health (DEH) Shellfish Sanitation Surveys

DEH is required to classify all shellfish growing areas as to their suitability for shellfish harvesting (Table 10). Estuarine waters are delineated according to DEH shellfish

management areas (e.g., Outer Banks, Area H-5) which include Class SA, SB and SC waters. DEH samples growing areas regularly and reevaluates the areas by conducting shellfish sanitation surveys every three years to determine if their classification is still applicable. DEH classifications may be changed after the most recent sanitary survey. Classifications are based on DEH fecal coliform bacteria sampling, locations of pollution sources, and the availability of the shellfish resource.

Table 10. DEH Growing Area Classifications

Classification	DEH Criteria
Approved (APP)	**Fecal Coliform Standard for Systematic Random Sampling:** The median fecal coliform Most Probable Number (MPN) or the geometric mean MPN of the water shall not exceed 14 per 100 milliliters (ml), and the estimated 90th percentile shall not exceed an MPN of 43 MPN per 100 ml for a 5-tube decimal dilution test. **Fecal Coliform Standard for Adverse Pollution Conditions Sampling:** The median fecal coliform or geometric mean MPN of the water shall not exceed 14 per 100 ml, and not more than 10 percent of the samples shall exceed 43 MPN per 100 ml for a 5-tube decimal dilution test.
Conditionally Approved-Open (CAO)	Sanitary Survey indicates an area can meet approved area criteria for a reasonable period of time, and the pollutant event is known and predictable and can be managed by a plan. These areas tend to be open more frequently than closed.
Conditionally Approved-Closed (CAC)	Sanitary Survey indicates an area can meet approved area criteria for a reasonable period of time, and the pollutant event is known and predictable and can be managed by a plan. These areas tend to be closed more frequently than open.
Restricted (RES)	Sanitary Survey indicates limited degree of pollution, and the area is not contaminated to the extent that consumption of shellfish could be hazardous after controlled depuration or relaying.
Prohibited (PRO)	No Sanitary Survey; point source discharges; marinas; data does not meet criteria for Approved, Conditionally Approved or Restricted Classification.

Assigning Use Support Ratings to Shellfish Harvesting Waters (Class SA)

It is important to note that DEH classifies all actual and potential growing areas (which includes all saltwater and brackish water areas) for their suitability for shellfish harvesting. Thus, the DWQ Class SA waters must be separated out and rated for shellfish harvesting use support. The acreage of FS, PS and NS waters are calculated using GIS showing DWQ and DEH classifications as attribute information. However, the DEH "Closed" polygon coverage includes CAC, RES and PRO classifications, and it is not currently possible to separate out the PRO from the RES areas. Therefore, these areas are a combined polygon coverage, and DWQ rates these waters as NS.

DWQ use support ratings may be assigned to separate segments within DEH management areas. In assessing use support, the DEH classifications and management strategies are only applicable to those areas that DWQ Class SA (shellfish harvesting waters). This will result in a difference of acreage between DEH areas classified as CAC, PRO, RES and DWQ waters rated as PS or NS. For example, if DEH classifies a 20-acre area CAC, but only 10 acres are Class SA, only those 10 acres of Class SA waters are assessed and rated PS.

Sources of fecal coliform bacteria are more difficult to separate out for Class SA areas. DEH describes the potential sources in the sanitary surveys, but they do not describe specific areas affected by these sources. Therefore, in the past, DEH identified the same sources for all Class SA sections of an entire management area (e.g., urban runoff and septic systems). Until a better way to pinpoint sources is developed, this procedure will continue to be used. A point source discharge is only listed as a potential source when NPDES permit limits are exceeded.

DWQ and DEH are developing the database and expertise necessary to assess shellfish harvesting use support using a frequency of closures-based approach. This database will allow DWQ to better assess the extent and duration of closures in Class SA waters. These tools will not be available for use support determinations in Class SA waters for the 2001 White Oak, 2002 Pasquotank and Neuse and 2003 Lumber River basin use support assessments. DWQ believes it is important to identify frequency of closures in these waters, so an interim methodology will be used based on existing databases and GIS shapefiles. There will likely be changes in reported acreages in future assessments using the permanent methods and tools that result from this project. DWQ and DEH hope to have these tools fully developed for using the frequency of closure-based methods for the 2005 Cape Fear River use support assessment and basin plan.

Interim Frequency of Closure-Based Assessment Methodology

The interim method will be used for the 2001 White Oak, 2002 Pasquotank and Neuse and 2003 Lumber River basin use support assessments. Shellfish harvesting use support ratings for Class SA waters using the interim methodology are summarized below in Table 11.

Table 11. Interim Frequency of Closure-Based Use Support Ratings		
Percent of Time Closed within Basin Data Window	**DEH Growing Area Classification**	**DWQ Use Support Rating**
N/A	Approved*	FS
Closed ≤10% of data window	Portion of CAO closed ≤10%	FS
Closed >10% to ≤25% of data window	Portion of CAO closed >10% to ≤25% of data window	PS
Closed >25% of data window	Portion of CAO closed >25% of data window	NS
N/A	CAC and P/R**	NS

* Approved waters are closed only during extreme meteorological events (hurricanes).

** CAC and P/R waters are rarely opened to shellfish harvesting.

For CAO areas, DWQ will work with DEH to determine the number of days and acreages that CAO Class SA waters were closed to shellfish harvesting during a five-year window of data that ends on August 31 of the year of biological sampling. For example, if biological data are collected in a basin in 2000, then the five-year window for closure data would be September 1, 1995 to August 31, 2000. For each growing area with CAO Class SA waters, DEH and DWQ staff will define subareas within the CAO area that were opened and closed at the same time. The number of days these CAO areas were closed will be determined using DEH proclamation summary sheets and the original proclamations.

The number of days that APP areas in the growing area were closed due to pre-emptive closures because of named storms is not counted. For example, all waters in growing area E-9 were pre-emptively closed for Hurricane Fran on September 5, 1996. APP waters were reopened September 20, 1996. Nelson Bay (CAO) was reopened September 30, 1996. This area was considered closed for 10 days after the APP waters were reopened.

Proposed Permanent Frequency of Closure-Based Assessment Methodology

Over the next few years DWQ, DEH, Division of Coastal Management (DCM) and Division of Marine Fisheries (DMF) will be engaged in developing a fully functional database with related georeferenced (GIS) shellfish harvesting areas. The new database and GIS tools will be valuable for the above agencies to continue to work together to better serve the public. DWQ proposes to use information generated by these new tools to do frequency of closure-based shellfish harvesting use support assessments in Class SA waters, starting with the 2005 Cape Fear River basin use support assessment.

Using the new database with georeferenced areas and monitoring sites, DEH will be able to report the number of days each area was closed excluding closures related to named storms. The percent of the five-year data window that individual Class SA waters are closed will be used to make use support determinations for areas that are classified by DEH as CAO. PRO,

RES and CAC areas will be rated NS and CAO areas will be rated FS, PS or NS based on the methodology outlined above in the interim methods. Growing areas that have been reclassified by DEH during the data window from a lower classification to APP will be rated Supporting. Areas that are reclassified from APP to CAO during the data window will be rated as described above in the interim methods, taking into account the total days closed during the data window, including when the area was classified as APP.

4.9 Water Supply Use Support

This use support category is used to assess all Class WS waters and is a human health approach to assess whether a water can be used for water supply purposes. Many drinking water supplies in NC are drawn from human-made reservoirs that often have multiple uses.

Water supply use support is assessed using information from the seven regional water treatment plant (WTP) consultants. Each January, the WTP consultants submit a spreadsheet listing closures and water intake switch-overs for all water treatment plants in their region. This spreadsheet describes the length and time of the event, contact information for the WTP, and the reason for the closure or switch.

The WTP consultants' spreadsheets are reviewed to determine if any closures/switches were due to water quality concerns. Those closures/switches due to water quantity problems and reservoir turnovers are not considered for use support. The frequency and duration of closures/switches due to water quality concerns are considered when assessing use support. In general, North Carolina's surface water supplies are currently rated FS. Specific criteria for rating waters PS and NS are yet to be determined.

4.10 Other Use Support

This category of use will be assessed infrequently but could be applied to any water in the state. Examples of uses that could fall into this category are aesthetics and industrial and agricultural water supply. This category allows for the assessment of any use that is not considered for aquatic life and secondary recreation, primary recreation, fish consumption, shellfish harvesting or water supply.

4.11 Nutrient Enrichment Issues

Water quality standards that are related to eutrophication concerns have been designed to provide an opportunity for the proactive management and protection of designated uses. In North Carolina, substantial monitoring programs have been developed to gather information on a number of water quality variables to determine if water quality standards are being achieved. Specific numerical and narrative criteria have been constructed by regulation (15A NCAC 2B.0200) to guide these decisions. Thus, many biological, chemical and physical variables can be used to quantitatively evaluate the degree of attainment of water quality standards. However, in order to determine if a water body is meeting designated uses related to eutrophication concerns, a comprehensive assessment of many factors that may limit the attainment of a particular use must be performed. Biological integrity, a designated use, can

be directly evaluated through the monitoring data obtained from benthic macroinvertebrate studies. However, this method of assessment is not a suitable tool for all bodies of water. Lakes, estuaries, swamps and other very slow moving waters are not easily evaluated with this technique. Yet, these are the very same waterbodies that are most susceptible to excessive amounts of biological productivity (hypereutrophication), which may lead to severe use impairment. An assessment of phytoplankton (algae) communities may be utilized in natural lake systems to evaluate biological integrity. However, as a stand-alone assessment tool this approach is not suitable for all man-made reservoirs. In many cases reservoirs are constructed by need in areas that have already been impacted by land use changes and development. Thus, biological ecoregion approaches may not be applicable to use support especially in artificial reservoirs that were not designed to mimic natural systems.

If designated uses are not being supported, that is, if waters are impaired as a result of eutrophication, then proactive management measures must be augmented with more aggressive restoration measures in order to provide for rehabilitation of the designated uses. Because a use restoration strategy has the potential for basinwide economic and social impacts, decisions related to eutrophication use impairment must be carefully weighed.

Several water quality variables may help to describe the level of eutrophication. These include pH, chlorophyll a, dissolved oxygen, phosphorus, nitrogen, turbidity, total dissolved gases, and other quantitative indicators. Some of these have specific water quality standards. But in order to appropriately evaluate the attainment of use support a clear weight of evidence approach must be used. This approach can be flexibly applied depending on the amount and quality of available information. The approach uses multiple quantitative water quality variables, third party reports, analysis of water quality complaints, algal bloom reports, macrophyte observations, reports from lake associations, fish kill reports, taste and odor observations, aesthetic complaints, the episode frequency of noxious algal activity and reports and comments from the Wildlife Resources Commission. The weight of evidence approach must be carefully and professionally evaluated. In following this approach, use support suitability for agriculture, aquatic life propagation, maintenance of biological integrity, wildlife, recreation, water supply for drinking, culinary or food processing purposes, can be holistically evaluated.

It may be generally agreed that excessive amounts of the hypereutrophication causal variables, nitrogen and phosphorus, are the principal culprits in eutrophication related use impairment. Indeed, these causal variables are important concerns, however, climate and hydrology factors and the biological response factors (chlorophyll, phytoplankton, fish kills etc.) are also essential to evaluate because they may control the frequency of episodes related to potential use impairment. The basis for regulatory control of nutrient over-enrichment must rely on biological responses to nutrient delivery as well as environmental effects. It is not appropriate to determine eutrophication related use impairment with the quantitative assessment of an individual water quality variable (i.e. chlorophyll *a*). Nor is it appropriate to utilize a fixed index composed of several water quality variables, which does not have the flexibility to adapt to numerous hydrological situations. Without presentation of detailed technical explanations and examples, it must be acknowledged that there are highly complex and dynamic ecosystem interactions which link measures of water quality variables and

biological response variables to the determination of waterbody use support. And because of this dynamic complexity a weight of evidence approach must be used as a protocol in determining use support attainment utilizing all sources of readily available information.

Presented below is an example of determining use support in lakes. The Farmer Lake example demonstrates that although a few observations of water quality variables may have exceeded a particular water quality standard, the designated uses of the reservoir are being fully supported.

Farmer Lake Example

Farmer Lake has been determined to be supporting its designated uses and has exceeded the chlorophyll a water quality standard twice out of fifteen observations (13%).

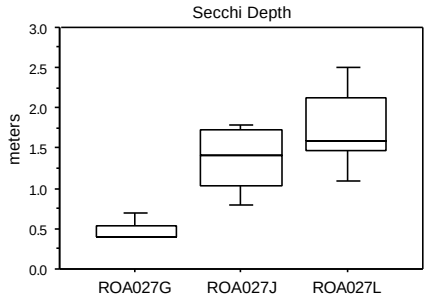
Farmer Lake, a 368-acre water supply reservoir for the City of Yanceyville was built in 1983 in Caswell County. The lake is used extensively for fishing with a boat ramp located near the dam. Farmer Lake has a maximum depth of 40 feet (12 meters). The watershed land uses include agriculture and forested land.

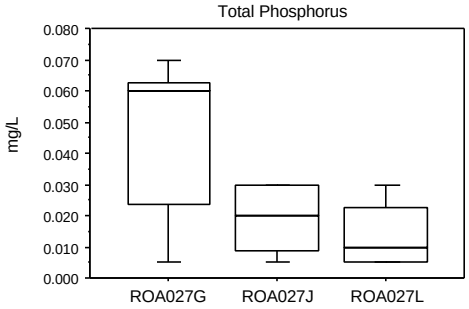
Farmer Lake was most recently monitored by DWQ in June, July and August 1999. In July and August, the chlorophyll *a* value for the upstream lake sampling site (ROA027G) was greater than the state water quality standard of 40 µg/L. Metals were within applicable state water quality standards. Calculated NCTSI scores for Farmer Lake indicated that this lake was mesotrophic in June and eutrophic in July and August.

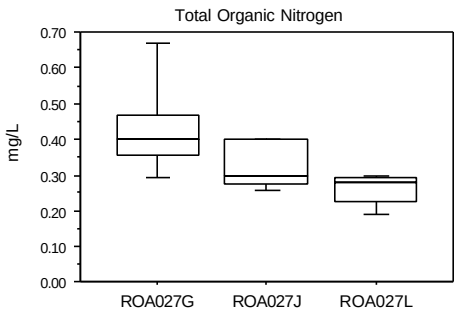
Historical data collected at Farmer Lake from 1991 through 1999 for the four constituents of the NCTSI (Secchi depth, total phosphorus, total organic nitrogen and chlorophyll *a*) are summarized using box and whisker plots. Mean Secchi depths demonstrated an increase from the upstream lake sampling site to the sampling site near the dam, while mean total phosphorus and mean total organic nitrogen have decreased from the upper end of the lake to near the dam. Mean chlorophyll *a* values have been greatest at the upper end of the lake as compared with both the mid-lake sampling site and the sampling site near the dam. Since 1991, there have been nine observations for dissolved oxygen that were greater than the water quality standard for total dissolved gases of 110%. However, the maximum observed value was 120.

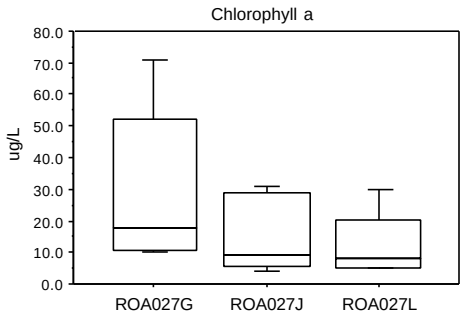
There have been no reports of noxious algae blooms or fish kills in Farmer Lake. There have also been no public complaints regarding taste or odor problems in water taken from this lake. The watershed has been relatively stable with no new development (Bill Carter, Director of Public Utilities, Town of Yanceyville, pers com.). Even though 13% of the chlorophyll *a* observations have been greater than the water quality standard, the lake is considered to fully support designated uses. Proactive investigation of nutrient enrichment at the most upstream location should be further evaluated as resources and priorities allow.

Farmer Lake Data Analysis, 1991 – 1999 (n = 5 per station).









Farmer Lake Historical NCTSI Data. (Lake means)					
Date	NCTSI	TP	TON	CHLA	SECCHI
8/3/1999	1.0[E]	0.03	0.33	44	1.6
7/7/1999	0.1[E]	0.01	0.36	30	1.4
6/10/1999	-0.3[M]	0.03	0.29	8	1.2
8/23/1994	0.7[E]	0.04	0.40	7	0.8
8/29/1991	0.6[E]	0.04	0.31	11	1.1

Farmer Lake individual values					
Date m/d/yr	Sampling Station	Secchi meters	TP mg/L	TON mg/L	CHL a µg/L
8/03/1999	ROA027G	0.4	0.07	0.40	71
8/03/1999	ROA027J	1.8	0.01	0.40	31
8/03/1999	ROA027L	2.5	<0.01	0.19	30
7/07/1999	ROA027G	0.7	0.03	0.40	46
7/07/1999	ROA027J	1.4	<0.01	0.40	28
7/07/1999	ROA027L	2.0	<0.01	0.29	17
6/10/1999	ROA027G	0.4	0.06	0.29	10
6/10/1999	ROA027J	1.7	0.02	0.30	6
6/10/1999	ROA027L	1.6	0.01	0.30	8
8/23/1994	ROA027G	0.4	0.06	0.67	11
8/23/1994	ROA027J	0.8	0.03	0.28	4
8/23/1994	ROA027L	1.1	0.02	0.24	5
8/29/1991	ROA027G	0.5	0.07	0.38	18
8/29/1991	ROA027J	1.1	0.03	0.26	9

5 The Surface Water Integrated List

Guidance from EPA places each waterbody assessment unit, or segment, into one unique assessment category (EPA 2001b). Although EPA specifies five unique assessment categories, North Carolina elects to use seven categories in order to maintain continuity with the 2000 North Carolina §303(d) list. Each category is described in detail below:

Category 1: Attaining the water quality standard and no use is threatened. This category consists of those waters where all applicable use support categories are rated "Fully Supporting." Data and information are available to support a determination that the water quality standards are attained and no use is threatened. Future monitoring data will be used to determine if the water quality standard continues to be attained.

Category 2: Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened. This category consists of those waters where at least one of the applicable use support categories are rated "Fully Supporting" and the other use support categories are rated "Not Rated." Also included in this category are waters where at least one of the applicable use support categories except Fish Consumption are rated "Fully Supporting," the remaining applicable use support categories except Fish Consumption are rated "Not Rated," and the Fish Consumption category is rated "Partially Supporting-Evaluated." Data and information are available to support a determination that some, but not all, uses are attained. Attainment status of the remaining uses is unknown because there is insufficient or no data or information. Future monitoring data will be used to determine if the uses previously found to be in attainment remain in attainment, and to determine the attainment status of those uses for which data and information was previously insufficient to make a determination.

Category 3: Insufficient or no data and information to determine if any designated use is attained. This category consists of those waters where all applicable use support categories except Fish Consumption are rated "Not Rated" and the Fish Consumption category is rated "Partially Supporting-Evaluated." Measured data or information to support an attainment determination for any use is not available. Supplementary data and information, or future monitoring, will be required to assess the attainment status.

Category 4: Impaired or threatened for one or more designated uses but does not require the development of a TMDL. This category contains three distinct sub-categories:

Category 4a: TMDL has been completed. This category consists of those waters for which EPA has approved or established a TMDL and water quality

standards have not yet been achieved. Monitoring data will be considered when evaluating Category 4A waterbodies for potential delisting.

Category 4b: Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. This category consists of those waters for which TMDLs will not be attempted because other required regulatory controls (e.g., NPDES permit limits, Stormwater Program rules, etc.) are expected to attain water quality standards by the next regularly scheduled listing cycle. Future monitoring will be used to verify that the water quality standard is attained as expected.

Category 4c: Impairment is not caused by a pollutant. This category consists of waters that are impaired by pollution, not by a pollutant. EPA defines pollution as "The man-made or man-induced alteration of the chemical, physical, biological and radiological integrity of the water." EPA believes that in situations where the impairment is not caused by a pollutant, a TMDL is generally not the appropriate solution to the problem. Future monitoring will be used to confirm that there continues to be no pollutant-caused impairment and to support water quality management actions necessary to address the cause(s) of the impairment.

Category 5: Impaired for one or more designated uses by a pollutant(s), and requires a TMDL. This category consists of those waters that are impaired by a pollutant and the proper technical conditions exist to develop TMDLs. As defined by the EPA the term pollutant means "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into the water." When more than one pollutant is associated with the impairment of a single waterbody in this category, the water will remain in Category 5 until TMDLs for all listed pollutants have been completed and approved by the EPA.

Category 6: Impaired based on biological data. This category consists of waters historically referred to as “biologically impaired” waterbodies; these waterbodies have no identified cause(s) of impairment although aquatic life impacts have been documented. Identification of the cause(s) of impairment will precede movement of these waters to Category 5 or Category 4c of the integrated list. EPA has recognized in the past that in specific situations the data is not available to develop TMDLs. Data collection and analysis will be performed in an attempt to determine the cause(s) of impairment.

Category 7: Impaired, but the proper technical conditions do not yet exist to develop a TMDL. As described in the Federal Register, "proper technical conditions refers to the availability of the analytical methods, modeling techniques and data base necessary to develop a technically defensible TMDL. These elements will vary in

their level of sophistication depending on the nature of the pollutant and characteristics of the segment in question" (43 FR 60662, December 28, 1978). These are waters that would otherwise be in Category 5 of the integrated list. As previously noted, EPA has recognized that in some specific situations the data, analyses, or models are not available to establish a TMDL. North Carolina seeks EPA technical guidance in developing technically defensible TMDLs for these waters. Open water fecal coliform impaired shellfishing waters are included in this category.

For this integrated list, Categories 1 and 2 are considered fully supporting any assessed uses. This portion of the integrated list is extensive (thousands of segments), thus a printed copy is not included in this document. A table of waters on Categories 1 through 3 is available for downloading on the DWQ website (http://h2o.enr.state.nc.us/tmdl/General_303d.htm). Categories 4, 5, 6, and 7 contain those assessment units that have been determined to be impaired in North Carolina. **Therefore, Categories 4, 5, 6, and 7 constitute the 2002 North Carolina §303(d) List for the State of North Carolina**.

For ease of reference, the following translator has been included to display the relationship between the 2000 North Carolina §303(d) List and the 2002 integrated list.

Table 12. 2000 303(d) List and 2002 Integrated List Translator

2000 North Carolina §303(d) List	Corresponding 2002 Integrated List
Part 1	Category 5
Part 2	Category 4c
Part 3	Category 4a
Part 4	Category 4b
Part 5	Category 6
Part 6	Category 7

5.1 Prioritization of Impaired Waters

North Carolina has developed a priority ranking scheme that reflects the relative value and benefits those waterbodies provide to the State. The priority ranking system is designed to take into account the severity of the impairment, especially threats to human health and endangered species, and the designated uses of the waterbody as required by CWA § 303(d)(1)(A). Since other agencies and local governments also use this ranking to direct resources and funding, the priority ranking system has intentionally not included factors to reflect the availability of DWQ resources to address either TMDL development schedules or restoration.

A priority of High, Medium or Low has been assigned to all waterbodies in Categories 5, 4B, 6, and 7 of the integrated list. The priority scheme is outlined in Figure 3. The priorities and factors are presented in Tables 13 and 14.

Figure 3. TMDL and Monitoring Priority Ranking Scheme (adapted from EPA 841-D-99-001)

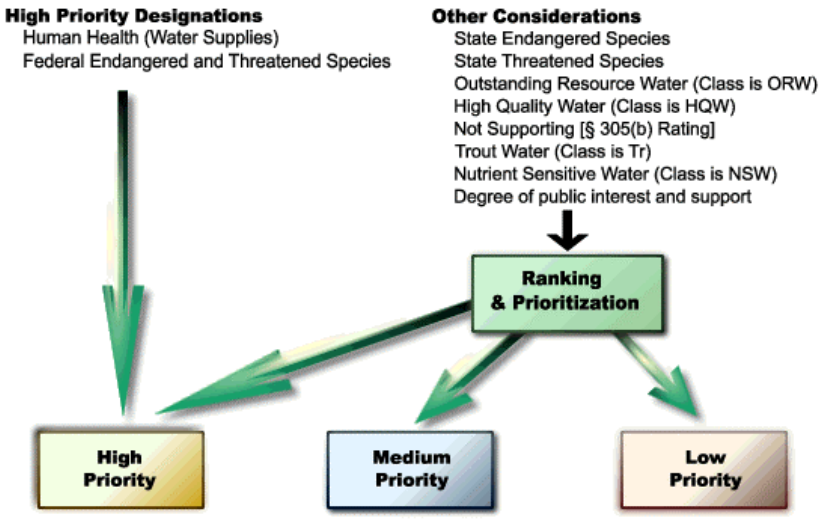


Table 13 TMDL and Monitoring Priority Categories

Cumulative Score	Priority
Less than 3	Low
Greater than or equal to 3	Medium
Greater than or equal to 6	High

Table 14 Factors Used to Determine Priority

Factor	Score	Minimum Priority
Water Supply	+6	High
Federal Endangered Species	+6	High
Federal Threatened Species	+6	High
State Endangered Species	+3	Medium
State Threatened Species	+3	Medium
Outstanding Resource Water (Class is ORW)	+3	Medium
High Quality Water (Class is HQW)	+3	Medium
Trout Water (Class is Tr)	+2	Low
Nutrient Sensitive Water (Class is NSW)	+2	Low
Not Supporting [§ 305(b) Rating]	+2	Low

A high priority is assigned to all waterbodies that are classified as water supplies. A high priority is also automatically assigned to all waterbodies harboring species listed as

endangered or threatened under the federal Endangered Species Act (ESA). All federally endangered or threatened species are listed in Table 15. Using the best available information, North Carolina Natural Heritage Program has verified that none of these species have been extirpated from North Carolina.

A medium priority has minimally been assigned to waters harboring State listed endangered and threatened species. As a way of addressing anti-degradation concerns, classified outstanding resource waters and high quality waters start at the medium priority. The remaining waters are prioritized according to severity of the impairment (non-supporting waters receive +2) and other classified use factors.

5.2 TMDL Development Schedule

Category 5 waters, those for which a TMDL is needed, are at many different stages on the path to an approved TMDL. Some require additional data collection to adequately define the problem in TMDL terms. Some require more outreach to increase stakeholder involvement. Others need to have a technical strategy budgeted, funded, and scheduled. Some are ready for EPA submittal. North Carolina has listed waters targeted for TMDL development within the next two years. Targeted waters are listed in Table 16.

North Carolina has prioritized TMDL development for waters impaired due to bacteria. The approach of prioritizing TMDL development based on pollutant has been successfully used in other states. Limited resources are used more effectively with a focus on a particular pollutant. Waters impaired by other pollutants (i.e, not bacteria) are not excluded from the schedule, as shown in Table 16. However, the majority of waters prioritized for the next two years are associated with bacterial (i.e., fecal coliform) contamination.

The movement of waters from Category 6 (Impaired based on biological data) to either Category 5 or 4c will require a large allocation of resources. North Carolina has used biological data to place the majority of waters on the §303(d) list. Additional consideration and data collection is necessary if the establishment of a TMDL for waters on Category 6 is to be expected. It is important to understand that the identification of waters in Category 6 does not mean that they are low priority waters. The assessment of these waters is a high priority for the State of North Carolina. However, it may take significant resources and time to determine the cause of impairment. Assigning waters to Category 6 is a declaration of the need for more data and time to adequately define the problems and whether they are affected by pollution, pollutants, or a combination. Scheduling these waters for TMDL development prior to determining the causes of impairment is misleading and counterproductive.

During this listing cycle, significant resources and a grant from the Clean Water Management Trust Fund were utilized to study multiple waters that were considered impaired based on biological data. One goal of this project was to determine the cause of impairment for these waters. Several of these studies have been completed and causes have been identified. These waters will now move from Category 6 to other locations within the integrated list. Waters for which studies have been completed, the likely causes of impairment, and the new listing category are shown in Table 17. The cause of impairment reflected on Table 17 will

Table 15. North Carolina Federally Endangered and Threatened Species					
Common Name	**Scientific Name**	**Description**	**When Listed**	**Federal Register Citation**	**Extirpated Since 11/1975?**
MAMMALS					
Manatee, West Indian	*Trichechus manatus*	Endangered	1,3	32 FR 4001; March 11, 1967	No
FISHES					
Chub, spotfin	*Cyprinella monacha*	Threatened	28	42 FR 45528;September 9, 1977	No
Shiner, Cape Fear	*Notropis mekistochalas*	Endangered	290	52 FR 36038; September 25, 1987	No
Silverside, Waccamaw	*Menidia extensa*	Threatened	265	52 FR 11286; April 8, 1987	No
Sturgeon, shortnose	*Acipenser brevirostrum*	Endangered	1	32 FR 4001; March 11, 1967	No
CLAMS					
Elktoe, Appalachian	*Alasmidonta raveneliana*	Endangered	563	59 FR 60334; November 23, 1994	No
Heelsplitter, Carolina	*Lasmigona decorata*	Endangered	505	58 FR 34931; June 30, 1993	No
Mussel, dwarf wedge	*Alasmidonta heterodon*	Endangered	377	55 FR 9451; March 14, 1990	No
Pearlymussel, little-wing	*Pegias fabula*	Endangered	342	53 FR 45865; November 14, 1988	No
Spinymussel, Tar River	*Elliptio (Canthryia) steinstansana*	Endangered	188	50 FR 26575; June 27, 1985	No
FLOWERING PLANTS					
Sensitive joint-vetch	*Aeschynomene virginica*	Threatened	470	57 FR 21574; May 20, 1992	No

Table 16. Waters Scheduled for TMDL Development (a)

(North Carolina expects to submit TMDLs for the following water/pollutant combinations in the next two years)

Cape Fear

Name	Cause of Impairment	Assessment Unit	Description
North Buffalo Creek	Fecal coliform	16-11-14-1a	From source to above WWTP
East Fork Deep River	Fecal coliform	17-2-(0.3)	From source to a point 0.4 mile downstream of SR1541
Northeast Creek	Fecal coliform	16-41-1-17-(0.7)a 16-41-1-17-(0.7)b	From NC Hwy 55 to 0.5 miles downstream of Panther Creek
Roberson Creek	Chlorophyll-a	16-38-(5)	From a point 0.3 miles upstream of mouth to B. Everett Jordan Lake
Richland Creek	Fecal coliform	17-7-(0.5) 17-7-(4)	From source to Randleman Reservoir, Deep River
Muddy Creek	Fecal coliform	17-9-(1) 17-9-(2)	From source to Randleman Reservoir, Deep River

Catawba

Name	Cause of Impairment	Assessment Unit	Description
Clark Creek	Fecal coliform	11-129-6-(9.5)	From a point 0.9 miles upstream of Walker Cr to South Fork Catawba R
Clark Creek	Copper	11-129-5-(9.5)	From a point 0.9 miles upstream of Walker Cr to South Fork Catawba R
Crowders Creek	Fecal coliform	11-135e 11-135f 11-135g	From SR1108 to NC/SC state line

French Broad

Name	Cause of Impairment	Assessment Unit	Description
Hurricane Creek	Sediment	5-44	From source to Pigeon R
Newfound Creek	Fecal coliform	6-84b 6-84c 6-84d	From SR1296 to French Broad R

Neuse

Name	Cause of Impairment	Assessment Unit	Description
Pigeon House Branch	Fecal coliform	27-33-18	From source to Crabtree Cr
Pigeon House Branch	Copper	27-33-18	From source to Crabtree Cr
Pigeon House Branch	Low Dissolved Oxygen	27-33-18	From source to Crabtree Cr

Roanoke

Name	Cause of Impairment	Assessment Unit	Description
Marlowe Creek	Copper	22-58-12-6	From source to Storys Cr

Table 16. Waters Scheduled for TMDL Development (a)

(North Carolina expects to submit TMDLs for the following water/pollutant combinations in the next two years)

Yadkin

Name	Cause of Impairment	Assessment Unit	Description
Grants Creek	Turbidity	12-110	From source to Yadkin R
Rich Fork	Fecal coliform	12-119-7	From source to Abbotts Cr
Hamby Creek	Fecal coliform	12-119-7-4	From source to Rich Fork
McKee Creek	Fecal coliform	13-17-8-4	From source to Reedy Cr
Clear Creek	Fecal coliform	13-17-8-4-1	From source to McKee Cr
Fourth Creek	Turbidity	12-108-20-(1)b	From SR 2308 Iredell Co 1.5 mile upstream
Faulkner Creek	Sediment	12-72-6	From source to Ararat R
Goose Creek	Fecal coliform	13-17-18	From source to Rocky R
Salem Creek	Fecal coliform	12-94-12-(4)	From Winston-Salem water supply dam to Muddy Cr
Hitchcock Creek	Fecal coliform	13-39-(10)b	From below Fox Yarns to to Pee Dee River

(a) Compliance with this schedule depends upon DWQ and EPA resources during the next two years. This list includes TMDLs that have been approved since October 1, 2002.

Table 17. Identified Causes for Streams Impaired due to Biological Data

Catawba

Name	Study Area	Cause(s) of Impairment	New List Location
Clark Creek	From source to Pinch Gut Cr	• Hydromodification (intentional channelization)	4c
		• Toxicants	5
		• Chlorine	5

French Broad

Name	Study Area	Cause(s) of Impairment	New List Location
Morgan Mill Creek	From trout farm (US64) to Peter Weaver Cr	• Habitat Degradation (sediment deposition, substrate instability)	4c
		• Hydromodification (inadequate colonization potential due to dams)	4c
		• Organic enrichment	5
Peter Weaver Creek	From Morgan Mill Cr to French Broad R	• Habitat degradation (sediment deposition, substrate instability)	4c
		• Hydromodification (inadequate colonization potential due to dams)	4c
		• Organic enrichment	5

Little Tennessee

Name	Study Area	Cause(s) of Impairment	New List Location
Cullasaja River	From source to	• Hydromodification	4c

Table 17. Identified Causes for Streams Impaired due to Biological Data

		Macon Co SR 1545	(inadequate colonization potential due to dams)	
	Mill Creek	From source to Mirror Lake, Cullasaja R	• Hydromodification (inadequate colonization potential due to dams)	4c
			• Hydromodification (excessive water velocity due to urban stormwater)	4c
			• Toxicants	5
Neuse				

Name	Study Area	Cause(s) of Impairment	New List Location
Toms Creek	From source to Neuse River	• Chlorine	5
		• Habitat degradation (unstable substrate, sediment deposition)	4c

not be reflected in the current Catawba, French Broad and Neuse basinwide management plans. As these plans are updated, the cause of impairment will be reflected for each impaired waterbody.

Waters prioritized for TMDL development in the 2000 §303(d) List are shown in Table 18. Monitoring, delisting, or TMDL development actions have taken place in many of these watersheds. Those waterbodies that do not have an approved TMDL or where field study is ongoing will be targeted for TMDL development during the next two years. Approved TMDLs that were not targeted for this cycle are listed in Table 19.

Delisting Waters

In general, waters will move from the impaired waters categories (i.e., Categories 4, 5, 6 or 7) when data show that a water is supporting its uses. In some cases, mistakes have been discovered in the original listing decision and the mistakes are being corrected. Waters appearing on the impaired waters categories will be moved to Categories 1, 2 or 3 under the following circumstances:

- An updated 305(b) use support rating of supporting, as described in the basinwide management plans.
- Applicable water quality standards are being met (i.e., no longer impaired for a given pollutant) as described in either basinwide management plans or in technical memoranda.
- The basis for putting the water on the list is determined to be invalid (i.e., was mistakenly identified as impaired in accordance with 40 CFR 130.7(b)(6)(iv) and/or National Clarifying Guidance for State and Territory 1998 Section 303(d) Listing Decisions. Robert Wayland, III, Director. Office of Wetlands, Oceans, and Watersheds. Aug 27, 1997.)
- A water quality variance has been issued for a specific standard (e.g., chloride).
- Removal of fish consumption advisories or modification of fish eating advice.

- Typographic listing mistakes identifying the wrong water body.

Delisted waters are shown in Table 20. Waters were not delisted in the following river basins: Broad, Catawba, Chowan, Little Tennessee, Lumber, Neuse, New, Pasquotank, Tar-Pamlico, Yadkin, Watauga, White Oak.

Table 18. Status of Waters Targeted for TMDL Development in the 2000 § 303(d) List as of October 1, 2002

Cape Fear

Name	Cause of Impairment	Assessment Unit	Status
North Buffalo Creek	Ammonia	16-11-14-1b	NPDES permit modified. Waterbody moved to Category 4b.
South Buffalo Creek	Ammonia	16-11-14-2c	Delisted for ammonia. Water remains in Category 6.
East Fork Deep River	Fecal coliform	17-2-(0.3)	Field study ongoing.
Haw River	Fecal coliform	16-(1)d	Delisted based on new monitoring data.
Little Troublesome Creek	Fecal coliform	16-7b	TMDL approved.
New Hope Creek	Fecal coliform	16-41-1-(11.5)	Field study ongoing.
North Buffalo Creek	Fecal coliform	16-11-14-1a	TMDL being developed.
Northeast Creek	Fecal coliform	16-41-1-17-(0.7)a 16-41-1-17-(0.7)b	Field study ongoing.

Catawba

Name	Cause of Impairment	Assessment Unit	Status
Irwin Creek	Fecal coliform	11-137-1	TMDL approved.
Little Sugar Creek	Fecal coliform	11-137-8a 11-137-8b 11-137-8c	TMDL approved.
McAlpine Creek	Fecal coliform	11-137-9a 11-137-9b 11-137-9c 11-137-9d	TMDL approved.
Sugar Creek	Fecal coliform	11-137b 11-137c	TMDL approved.

French Broad

Name	Cause of Impairment	Assessment Unit	Status
Pigeon River	Fish advisory-dioxins	5-(7)a 5-(7)b 5-(7)c 5-(7)d	Advisory lifted.
Waterville Lake	Fish advisory-dioxins		Waterbody moved to category 4b. Levels are decreasing.

Neuse

Name	Cause of Impairment	Assessment Unit	Status
Creeping Swamp	Chlorophyll-a	27-97-5-3	Review of historical chlorophyll-a data ongoing.

Table 18. Status of Waters Targeted for TMDL Development in the 2000 § 303(d) List as of October 1, 2002

New

Name	Cause of Impairment	Assessment Unit	Status
Little Peak Creek	Copper	10-1-35-4	No action .
Little Peak Creek	pH	10-1-35-4	"
Ore Knob Branch	Copper	10-1-35-3	"
Ore Knob Branch	Iron	10-1-35-3	"
Ore Knob Branch	pH	10-1-35-3	"
Ore Knob Branch	Zinc	10-1-35-3	"
Peak Creek	pH	10-1-35-(2)b	"

Pasquotank

Name	Cause of Impairment	Assessment Unit	Status
Phelps Lake	Fish advisory-Mercury		Field study and TMDL delayed.

Table 19. Other Approved TMDLs This Listing Cycle

Cape Fear

Name	Cause of Impairment	Assessment Unit	Status
Town Branch	Fecal coliform	16-17	TMDL approved.

Neuse

Name	Cause of Impairment	Assessment Unit	Status
Neuse River Estuary	Chlorophyll-a/ Nitrogen	F8 F9	Phase II TMDL approved. Waterbody remains on category 4a.

Yadkin

Name	Cause of Impairment	Assessment Unit	Status
Fourth Creek	Fecal coliform	12-108-20-(1)b	TMDL approved.
Grants Creek	Fecal coliform	12-110	TMDL approved
Rocky River	Fecal coliform	13-17a	TMDL approved

Table 20. Delisted Waters
(Waters moved from Categories 4 through 7 to Categories 1 through 3)

French Broad	**Name**	**Cause of Impairment**	**Assessment Unit**	**Status**
	Pigeon River	Fish advisory-Dioxin	5-(7)a 5-(7)b 5-(7)c 5-(7)d	Fish advisory lifted. Water remains on category 6. *(DHHS news release, August 2001)*
	Hurricane Creek	Sediment	5-44	New biological data indicate supporting rating. *(Herring memo, January 2003)*
Hiwassee	**Name**	**Cause of Impairment**	**Assessment Unit**	**Status**
	Brasstown Creek	Biologically impaired	1-42	Updated use rating based on new biological data. *(Hiwassee River Basinwide Water Quality Plan, March 2002)*
	Valley River	Biologically impaired	1-52b	Updated use rating based on new biological data. *(Hiwassee River Basinwide Water Quality Plan, March 2002)*
	Webb Creek	Biologically impaired	1-52-32	Updated use rating based on new biological data. *(Hiwassee River Basinwide Water Quality Plan, March 2002)*
Roanoke	**Name**	**Cause of Impairment**	**Assessment Unit**	**Status**
	Belews Lake	Fish advisory – selenium	22-BELEWS LAKE	Advisory lifted *(Roanoke Riber Basinwide Water Quality Plan, July 2001*)
	Roanoke River	Fish advisory-dioxin	23-(25) 23-(25.5), 23-(26)	Advisory lifted (*DHHS News Release, 2001)*
Savannah	**Name**	**Cause of Impairment**	**Assessment Unit**	**Status**
	Norton Mill Creek	Biologically impaired	3-3	Updated use rating based on new biological data. (*Savannah River Basinwide Water Quality Plan, March 2002)*

Table 20. Delisted Waters
(Waters moved from Categories 4 through 7 to Categories 1 through 3)

White Oak	Name	Cause of Impairment	Assessment Unit	Status
	Little Northeast Creek	Chlorophyll-a		The chlorophyll-a impairment in Northeast Creek was previously extrapolated upstream to include Little Northeast Creek. DWQ has no data that would suggest chlorophyll-a impairment on Little Northeast Creek.

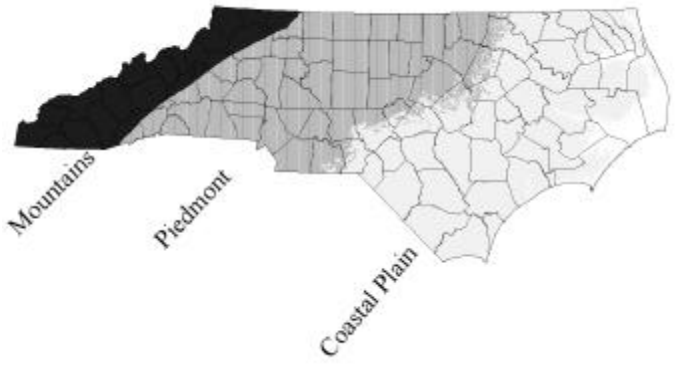
6 Groundwater Assessment

Groundwater is a critically important resource for the State of North Carolina because more than one-half of the citizens rely on it as a source of drinking water. Virtually all private residential drinking water supplies depend upon groundwater as do over one million of the State's citizens that use community water systems. In many rural counties, more than 90 percent of the citizens rely on groundwater as their sole source of drinking water.

North Carolina's groundwater, although generally abundant, is not inexhaustible and is not evenly distributed or of uniform quality. The groundwater resource, regardless of depth, is vulnerable to contamination introduced at the land surface. Shallow groundwater is the most vulnerable to contamination. Once contaminated, groundwater quality is extremely difficult to restore and the cleanup process is usually expensive and slow.

The natural quality of groundwater in North Carolina is generally very good. With the exception of a few coastal areas, potable groundwater occurs throughout the state. The natural mineral content of the water in the Mountain region and much of the Piedmont is very low, having generally less than 100 mg/l (milligrams per liter) total dissolved solids. In the eastern Piedmont and western part of the Coastal Plain region, the total dissolved solids content ranges from about 100 to 300 mg/l. In the eastern-most part of the Coastal Plain, the mineral content of the water increases with depth toward the coast because of its brackish content.

Groundwater protection standards have been established by North Carolina at a level adequate to allow its use for drinking water without the necessity for treatment. Most residences not connected to public water supplies rely on untreated groundwater for their drinking water source. In addition, most public water supplies in North Carolina that use groundwater do not treat the water, except for disinfection prior to use. State standards for groundwater quality protection must be used by every agency in North Carolina that has responsibilities for managing facilities and substances that can impair groundwater quality.



This report is a multi-program effort between the agencies in North Carolina that have groundwater protection roles. The following agencies in the Department of Environment and Natural Resources contributed the information that is shown in Tables 21 through 24:

-The Groundwater Section; Division of Water Quality
-The Public Water Supply Section; Division of Environmental Health
- The Underground Storage Tank Section; Division of Waste Management
- The Hazardous Waste Section; Division of Waste Management
- The Superfund Section; Division of Waste Management

6.1 North Carolina Groundwater Protection Program

The Groundwater Section is the primary agency for groundwater quality protection in North Carolina and its mission is to promote stewardship of North Carolina's groundwater resources for the protection of human health and the environment by preventing pollution, managing and restoring degraded groundwater, and protecting the resource.

The Groundwater Section's major program objectives are:
1. Develop and implement programs to prevent groundwater pollution from occurring;
2. Identify, assess, and manage polluted groundwaters for the protection of public health and the environment;
3. Determine the conditions under which groundwater resources occur, assess the quality and potential for use of those resources, and make that information available to groundwater users; and
4. Maintain a comprehensive database for the assessment and management of groundwater contamination sites.

Within this broad operational framework, the Groundwater Section has set a goal to maintain and enhance groundwater quality for the beneficial use by the citizens of North Carolina. Where the groundwater is degraded, the state strategy is to manage, and where possible, restore the quality of degraded groundwaters to the highest practical level commensurate with the need to protect human health and the environment.

Natural groundwater in North Carolina is generally of good quality but is subject to contamination from man's activities. As the population has continued to grow, it has become necessary to establish rules to protect the groundwater resource and its use. The primary purpose of the North Carolina Groundwater Section is to develop and implement rules and programs that will protect the groundwater resources for use by present and future citizens.

6.2 Groundwater Section Priority Program Tasks

The Groundwater Section has identified four program areas as primary issues of concern for protecting groundwater quality:

1. Resource evaluation. Protect vulnerable groundwater through characterizing discharge and recharge areas, quantifying impacts on streams and deeper aquifers and determining areas that are highly vulnerable to contamination
2. Pollution management. Determine accurate locations of groundwater contamination sources and areas where groundwater is or may be used as a water supply, and make data easily available for public review and program use in protecting groundwater quality.
3. Waste disposal. Issue permits for the protection of groundwater quality from municipal, industrial, commercial, and animal waste storage and disposal and assure maintenance of groundwater quality standards.
4. Well program. Implement contractor certification rules; assure proper well construction; add consumer protection to the resource emphasis; and provide education and outreach to assist local health departments in protecting private drinking water wells.

6.3 Major Groundwater Section Program Initiatives for 2002

The Groundwater Section established program initiatives for the current year to make progress toward the mission of protecting human health and the environment.

6.3.1. Resource Evaluation

In order to provide appropriate protection for groundwater, the State's aquifers must be accurately defined, their characteristics determined, and the quality and availability of the resource must be known. Knowledge of the shallow groundwater system where contaminants are leaked and spilled is necessary to establish appropriate levels of protection for groundwater and surface water resources. It is also necessary to understand the relationship between shallow groundwater and recharge to the drinking water aquifers and discharge to the State's streams. To provide appropriate levels of protection for present and future use of groundwater, the Groundwater Section has begun a program to define the aquifers that need quality protection, determine their vulnerability, and recommend methods for protection of existing high quality groundwater resources.

The state groundwater research station well network is not sufficient in the aquifers of the Piedmont and Mountains of North Carolina. With recent State funding approval for staff and supplies, the Section has initiated an aggressive program to characterize Piedmont and Mountains area hydrogeology in cooperation with the U.S. Geological Survey. The USGS is providing federal staff and money as cost share of 50 percent of the funding requirement. Four research stations will be completed in 2002 and reports of these sites will be completed in early 2003.

Because of program priorities, state agencies have only previously developed limited data about the groundwater system in the shallow aquifers in either the Coastal Plain, Piedmont or Mountains. The Groundwater Section believes that there is a clear need to characterize the shallow groundwater system throughout the state where it is most vulnerable to contamination, before this critical part of the resource becomes irrevocably contaminated.

6.3.2. Pollution Management

North Carolina has more than 14,000 documented soil and groundwater pollution sites. Approximately 70 percent of these groundwater contamination incidents result from petroleum underground storage tank leaks. However, the vast majority of the known contaminated water supply wells have been contaminated by sources other than from underground storage tanks.

A Section study completed in 1998 shows that when water supply wells become contaminated, about half of the well owners have no alternate source for a safe drinking water supply. These well owners are forced to use bottled water, have costly filter systems installed, or go to a neighbor or relative's house for baths and showers.

Many of the contaminated sites under the Groundwater Section's jurisdiction include non-petroleum contaminant plumes which are larger and sink deep into the subsurface, thus requiring intensive drilling and sampling programs for assessment. These are the most perplexing and challenging sites to assess and clean up. As a result, the level of expertise and the overall costs for the assessment and cleanup of these types of sites far exceeds what is typical for an average petroleum underground storage tank release. The Section is focusing increased attention toward identifying parties responsible for groundwater contamination and on the review and approval of corrective action plans.

6.3.3 Waste Disposal

Given the impact of population and industrial growth along with expanding livestock feeding operations in North Carolina, the Groundwater Section is evaluating the impact of increased wastes from this growth. Facilities disposing of wastes by methods which may degrade groundwater are being evaluated and ranked for potential impact and long term non-compliance.

Experience clearly demonstrates that waste disposal facilities can develop non-compliant conditions resulting from over application to the surface, transfer equipment failure, or storage lagoon leakage. The Groundwater Section requires many operations with individual permits that have established review/regulatory boundaries to monitor groundwater quality to assure protection of standards. The Section has developed a protocol for the review of facilities with general permits and is performing reviews to determine the need for additional monitoring at waste management facilities where permit violations have occurred.

6.3.4 Well Program

The ultimate goal goal of the State Well Program is to protect the citizens who use groundwater as a drinking water supply and to eliminate channels for pollution into the subsurface.

The 2002 well program initiatives include:

(1) certifying well contractor competence through testing and continuing education;

(2) partnering with county heath departments to keep them informed of the assistance that state staff can provide in identifying and resolving well problems that have adverse health implications;
(3) cooperative well inspection and training programs for state and local health department staff, and evaluating various regulatory issues that impact well construction or well abandonment activities;
(4) presentations to county officials about the advantages of adopting an ordinance and assistance in implementing water well protection programs ;
(5) technical assistance to well contractors, upon request, for state staff to conduct complimentary (i.e. non-enforcement related) well inspections at any sites the contractor chooses;
(6) concurrently with technical assistance outlined in (5) above, a program of random regulatory compliance inspections, including a select number of wells constructed by every well contractor, that would help ensure that those well contractors who construct safe and proper wells are not put at a financial disadvantage because of other unscrupulous well contractors;
(7) letters to trade organizations that deal with the well construction industry (such as home builders/ realtor/ plumbing associations, etc.) that would benefit from information (including short seminars) on what state and local well rules require for a proper and safely constructed well, along with help to resolve unexpected or emergency well problems encountered in conducting business; and
(8) preparation of brochures, pamphlets or other documents that would be targeted to specific technical/regulatory issues and audiences

Examples of public education and technical assistance information include general consumer advice on choosing a well contractor; what the consumer should know about wells; how to disinfect bacteria in a well; proper installation of sanitary well seals; and advice on dealing with objectionable concentrations of iron, hardness, hydrogen sulfide, bacteria, and other materials in the well water.

Table 21. Major Sources of Groundwater Contamination			
Contaminant Source	Ten Highest-Priority Sources (✓) [1]	Factors Considered in Selecting a Contaminant Source [2]	Contaminants [3]
Agricultural Activities			
Agricultural chemical facilities			
Animal feedlots			
Drainage wells			
Fertilizer applications			
Irrigation practices			
Pesticide applications			
On farm agricultural mixing and loading procedures			
land application of manure (unregulated)			
Storage and Treatment Activities			
Land application (regulated or permited)	✓	A,D,F	C,E,H,J,L
Material stockpiles			
Storage tanks (above ground)			
Storage tanks (underground)	✓	A, B, C, D, F	C, D
Surface impoundments	✓	A, D, E, F	A, B, C, D, E, H, J
Waste piles	✓	A, D	C, D, H
Waste tailings			
Disposal Activities			
Deep injection wells			
Landfills	✓	A, D	B, C, D, H
Septic systems	✓	A, B, C, D, E, F	C, D, E, H, J, K, L
Shallow injection wells			
Other			
Hazardous waste generators			
Hazardous waste sites	✓	A, D	A, B, C, D, H
Industrial facilities	✓	A, D	A, B, C, D, H
Material transfer operations			
Mining and mine drainage			
Pipelines and sewer lines			
Salt storage and road salting			
Salt water intrusion			
Spills	✓	A, B, C, D, E, F	A, B, C, D, E, H, J
Transportation of materials			
Urban runoff			
Small-scale manufacturing and repair shops			
Other sources (please specify) Land application of animal wastes (regulated)	✓	A, B, C, D, E, F,H	E, H, J, K, L

(1) The ten contaminant sources identified as highest priority in the State. These sources are not ranked.
(2) Key to Factors Considered in Selecting a Contaminant Source:
   A. Human health and/or environmental risk (toxicity)
   B. Size of the population risk
   C. Location of the sources relative to drinking water sources
   D. Number and/or size of contaminant sources
   E. Hydrogeologic sensitivity
   F. State findings, other findings
   G. Documented from mandatory reporting
   H. Geographic distribution/occurrence
   I. Other criteria
(3) Key to Contaminants
   A. Inorganic pesticides
   B. Organic pesticides
   C. Halogenated solvents
   D. Petroleum compounds
   E. Nitrate
   F. Flouride
   G. Salinity/brine
   H. Metals
   I. Radionuclides
   J. Bacteria
   K. Protozoa
   L. Viruses
   M. Other

Table 22. Summary of State Groundwater Protection Programs			
Programs or Activities	**Check (✓)**	**Implementation Status**	**Responsible State Agency**
Active SARA Title III Program	✓	existing	Div. of Emergency Management
Ambient ground water monitoring system	✓	existing	Groundwater Section/ USGS
Aquifer vulnerability assessment	✓	existing	Groundwater Section
Aquifer mapping	✓	existing	USGS
Aquifer characterization	✓	existing	USGS
Comprehensive data management system	✓	under development	DENR
EPA-endorsed Core Comprehensive State Ground Water Protection Program (CSGWPP)	✓	Submitted to EPA in 1995	Groundwater Section
Ground water discharge permits	✓	existing	Groundwater Section
Ground water Best Management Practices	✓	existing	Groundwater Section
Ground water legislation	✓	partial	Groundwater Section
Ground water classification	✓	existing	Groundwater Section
Ground water quality standards	✓	existing	Groundwater Section
Interagency coordination for ground water protection initiatives	✓	existing	Groundwater Section
Nonpoint source controls	✓	existing	Div. of Water Quality
Pesticide State Management Plan	✓	existing	NC Dept. of Agriculture
Pollution Prevention Program	✓	existing	Div. of Environmental Assistance
Resource Conservation and Recovery Act (RCRA) Primacy	✓	existing	Div. of Waste Mgmt.
Source Water Assessment Program [4]	✓	existing	Div. Of Env. Health
State Superfund	✓	existing	Div. of Waste Mgmt.
State RCRA Program incorporating more stringent requirements than RCRA Primacy	✓	existing	Div. of Waste Mgmt.
State septic system regulations	✓	existing	Div. of Env. Health
Underground storage tank installation requirements	✓	existing	Div. of Waste Mgmt.
Underground Storage Tank Remediation Fund	✓	existing	Div. of Waste Mgmt.
Underground Storage Tank Permit Program	✓	existing	Div. of Waste Mgmt.
Underground Injection Control Program	✓	existing	Groundwater Section
Vulnerability assessment for drinking water/wellhead protection	✓	existing	Div. of Env. Health/ Groundwater Section
Well abandonment regulations	✓	existing	Groundwater Section
Wellhead Protection Program (EPA-approved)	✓	existing	Div. of Env. Health
Well installation regulations	✓	existing	Groundwater Section/ Div. of Env. Health

Table 23. Groundwater Contamination Summary

Hydrogeological Setting: Varies
Spatial Description (optional):
Map Available (optional):
Data Reporting Period: 1973-2002

Source Type	Number of sites	Number of sites that are listed and/or have confirmed releases	Number with confirmed ground water contamination	Contaminants	Number of site investigations (optional)	Number of sites that have been stabilized or have had the source removed (optional)	Number of sites with corrective action plans (optional)	Number of sites with active remediation (optional)	Number of sites with cleanup completed (optional)
NPL	26	26	26	Metals, PCBs, organics, pesticides					
CERCLIS (non-NPL)	961	Unknown	Unknown	Same as above					
DOD/DOE	5	5	5	Same as above					
LUST	17,046	17,046	6,285	Gasoline, diesel					8,009
RCRA Corrective Action	107	73	72	Varied					
Underground Injection **Groundwater Remediation Sites**	347	63	61	petroleum, chlorinated solvents, and others	63			44	
State Sites	1,803*	524	493	Metals, PCBs organics, pesticides		401	92	92	401
Nonpoint Sources									

Table 23. Groundwater Contamination Summary

Hydrogeological Setting: Varies
Spatial Description (optional):
Map Available (optional):
Data Reporting Period: 1973-2002

Source Type	Number of sites	Number of sites that are listed and/or have confirmed releases	Number with confirmed ground water contamination	Contaminants	Number of site investigations (optional)	Number of sites that have been stabilized or have had the source removed (optional)	Number of sites with corrective action plans (optional)	Number of sites with active remediation (optional)	Number of sites with cleanup completed (optional)
Other (specify) Dry-cleaners	138+	138	Unknown	Chlorinated solvents					
FUDs	200+	unknown	Unknown	PCBs, organic pesticide, metal					
Landfill sites	232	118	98	Organic/metals					
Totals	20,865	17,993	7,040		63	401	92	136	8,410

*State Sites include: NPS, CERCLIS, and DOD/DOE totals

NPL – National Priority List
CERCLIS (non-NPL) – Comprehensive Environmental Response, Compensation, and Liability Information System
DOE – Department of Energy
DOD – Department of Defense
LUST – Leaking Underground Storage Tanks
RCRA – Resource Conservation and Recovery Act

Table 24. Aquifer Monitoring Data

Hydrogeological Setting: Varies

Spatial Description (optional):

Map Available (optional):

Data Reporting Period: 1973 – 2002

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells								
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l. No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 (or MDL) to less than or equal to 10 mg/L[1] Other parameters are detected at concentrations exceeding the MDL but are less than or equal to the MCLs	Parameters are detected at concentrations exceeding the MCLs	Number of wells removed from service	Number of wells requiring Special Treatment	Background parameters exceed MCLs
			ND	Number of wells in sensitive or vulnerable areas (optional)	ND/ Nitrate $\leq$ 5mg/l	Number of wells in sensitive or vulnerable areas (optional)					
Ambient Monitoring Network (Optional)		VOC									
		SOC									
		NO_3									
		Other									
Untreated Water Quality Data from Public Water Supply Wells		VOC									
		SOC									
		NO_3									
		Other									
Finished Water Quality Data From Public Water Supply Wells	4,969 4,969 10,013	VOC	2,790				696	19			
		SOC	2,735				498	10			
		NO_3	7,757				371	30			

Table 24. Aquifer Monitoring Data

Hydrogeological Setting: Varies

Spatial Description (optional):

Map Available (optional):

Data Reporting Period: 1973 – 2002

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells								
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l. No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 (or MDL) to less than or equal to 10 mg/L[1] Other parameters are detected at concentrations exceeding the MDL but are less than or equal to the MCLs	Parameters are detected at concentrations exceeding the MCLs	Number of wells removed from service	Number of wells requiring Special Treatment	**Background parameters exceed MCLs**
			ND	Number of wells in sensitive or vulnerable areas (optional)	ND/ Nitrate $\leq$ 5mg/l	Number of wells in sensitive or vulnerable areas (optional)					
		Other									
Untreated Water Quality Data from Private or Unregulated Wells (optional)		VOC									
		SOC									
		NO_3									
		Other									
Other Sources		VOC									
		SOC									
		NO_3									

Table 24. Aquifer Monitoring Data

Hydrogeological Setting: Varies

Spatial Description (optional):

Map Available (optional):

Data Reporting Period: 1973 – 2002

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells								
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l. No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 (or MDL) to less than or equal to 10 mg/L[)] Other parameters are detected at concentrations exceeding the MDL but are less than or equal to the MCLs	Parameters are detected at concentrations exceeding the MCLs	Number of wells removed from service	Number of wells requiring Special Treatment	Background parameters exceed MCLs
			ND	Number of wells in sensitive or vulnerable areas (optional)	ND/ Nitrate $\leq$ 5mg/l	Number of wells in sensitive or vulnerable areas (optional)					
		Other									

Major uses of the aquifer or hydrologic unit (optional)[(16)]	___ Public water supply ___ Irrigation ___ Commercial ___ Mining ___ Baseflow ___ Private water supply ___ Thermoelectric ___ Livestock ___ Industrial ___ Maintenance
Uses affected by water quality problems (optional)[(16)]	___ Public water supply ___ Irrigation ___ Commercial ___ Mining ___ Baseflow ___ Private water supply ___ Thermoelectric ___ Livestock ___ Industrial ___ Maintenance

7 References

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North Carolina Department of Environment and Natural Resources (NCDENR). Division of Water Quality. Water Quality Section. 2002. Savannah River Basinwide Water Quality Plan.

EPA 2001a. Effective Date of Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management

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Appendix I – Procedure for Soliciting and Evaluating Outside Data for *Use Support* Purposes

EPA rules to implement section 303(d) of the Clean Water Act require states to "assemble and evaluate all existing and readily available water quality-related data and information" when developing the biennial 303(d) list (EPA 1999). Many other agencies, universities, industries, municipalities, and environmental groups perform studies on North Carolina's surface waters. This information can be used for determining use support ratings for waters of the state.

All data, reports, models and other information not collected by the Division of Water Quality-Water Quality Section are considered outside data. The procedure for soliciting and evaluating outside information is outlined below.

Step 1. Mail solicitations to other government agencies, basinwide and NPDES stakeholders and issue a press release. Both the solicitations and the press release explicitly state that the information may be used in the 303(d) listing process. Generally, solicitations and press releases indicating agency interest in outside data will be issued in October of the year prior to the summer lake and biological sampling performed by the Environmental Sciences Branch of the Water Quality Section. Solicitations are mailed for those basins scheduled to be evaluated in the coming summer. The agency is interested in all information that citizens may provide. While water quality data is preferred, qualitative statements are also welcome. A copy of a recent solicitation is attached. In the future, the schedule for soliciting outside information will be posted on the Water Quality Section website.

Step 2. Accept responses to solicitation received by the due date. Generally, solicitations will be mailed in October with a deadline in January of the new year. Thus, approximately 60 days will pass between the notice of solicitation and the deadline. Compelling information received after the deadline may be processed at the discretion of the Division.

Step 3. Is the response a basinwide comment? Although the solicitations state that basinwide comments are not actively sought, some may take the opportunity to comment on the basinwide process. Basinwide comments may include comments regarding current basin plans or the public review process, or may include complaints regarding general policies in a particular basin or statewide. These comments are forwarded to the Basinwide and Estuary Planning Unit.

Step 4. Is the information related to a lake or saltwater system? Use support for lake, estuarine, and saltwater systems is performed by the Environmental Sciences Branch Use Support Coordinators (includes the Intensive Survey and Biological Assessment Units). Any information obtained on these types of waters is forwarded to this unit for evaluation.

Step 5. Is the information quantitative? Both quantitative and qualitative information is accepted in the consideration of outside information. However, each type of information is evaluated differently. Quantitative information generally includes some field work involving

the collection of data, whether chemical or biological. Qualitative information includes statements about water quality perception (e.g., the fishing is bad).

Quantitative Information

Step 1. Were raw data submitted? This step is to identify the data requiring additional processing by Water Quality Section Personnel.

If raw data were submitted, follow track a; if not, follow track b.

Step 2a. If raw data were submitted, were they submitted in an electronic format? If raw data were not received in an electronic format, the stakeholder will be contacted to attempt to get data in electronic format. Depending upon the response of the stakeholder, this may be the last step in the evaluation of the outside data.

Step 3a. Process data for use support. If raw data are in an electronic format, process the data to determine relevant benchmarks for use support.

Steps 4a and 2b. Conduct a Level of Confidence Review (LOC Review) of data/report. The LOC review will determine how to integrate the outside data/report into use support. This step is especially important when evaluating a waterbody for which data indicate some impairment. Before placing this waterbody on the state's 303(d) list, there should be a high level of confidence in the information suggesting the waterbody is impaired. The description of the LOC review is shown below.

Steps 5a and 3b. Distribute information based on LOC review. If information is considered Level 1, forward to use support coordinator. If information is considered Level 2, forward to both use support coordinator and ESB: Biological Assessment Unit for further monitoring.

Qualitative Information

Step 1. Review qualitative information.

Step 2. Determine if Water Quality Section or other outside information exist for waterbody(ies) in question. Search the available quantitative information to determine if other comments/information have been obtained for the waterbody(ies) in question. If WQS or other outside quantitative information exists, continue to Step 3. If not, forward qualitative information to ESB: Biological Assessment Unit for future monitoring.

Step 3. Review and summarize relevant information.

Step 4. Does the relevant quantitative information support or refute the qualitative information? If the two are in agreement, forward the qualitative comment and review to the use support coordinator. If the two are not in agreement, conduct additional review or monitoring to determine the status of the waterbody(ies) in question.

References

Environmental Protection Agency (EPA). 1999. Proposed Revisions to the Water Quality Planning and Management Regulation; Proposed Rule. Fed Reg. 64:46012-46055 (August 23, 1999)

Appendix II Example of Data Solicitation

Catawba River Basin
French Broad River Basin
Tar-Pamlico River Basin

NCDENR

Solicitation for Water Quality Information

September 2001

Send information to:

Mr. Tom Reeder
NCDENR
DWQ PLANNING BRANCH
1617 MAIL SERVICE CENTER
RALEIGH NC 27699-1617
(919) 733-5083 ext.557

All information must be postmarked by **January 11, 2002** in order for NCDENR-DWQ to consider it for use in the basinwide water quality plans. For questions about the basinwide planning schedule, please contact Darlene Kucken at (919) 733-5083 (ext. 354).

The North Carolina Department of Environment and Natural Resources, Division of Water Quality (NCDENR-DWQ) invites all interested parties to submit water quality information relevant to the Catawba, French Broad and Tar-Pamlico River Basins. These basins include the Catawba, South Fork, French Broad, Pigeon, and Tar Rivers. Submitted information will be used to assess the health of the waters in the basin. This information is relevant to the development of the basinwide water quality plans and as a reporting requirement to the US EPA under Section 303(d) of the Federal Clean Water Act.

Letters, photographs, and observations regarding the uses of surface waters for ***boating, drinking water, swimming, aesthetics, and fishing*** may be mailed to NCDENR-DWQ at this time. ***Scientific information*** may also be submitted; guidelines for submitting scientific information are presented below. Materials will not be returned. The name and telephone number of a contact person must also be provided.

Additional opportunities to comment on the basinwide process or programs will occur during public workshops and meetings to be held in each basin beginning in the Spring of 2003. Notices of these opportunities will be mailed in advance of the meetings.

Guidelines for submitting scientific data or reports:

- **Summary reports** and memos including pollutant distribution statistics will be welcomed. Only information collected between October 1997 and December 2001 will be considered.
- **Raw data** should be submitted electronically and accompanied by a Quality Assurance Project Plan (QAPP) that includes documentation of quality assurance methods used to collect and analyze the samples and the analytical methods used.
- Instream National Pollutant Discharge Elimination System **(NPDES) monitoring** data should be electronically submitted.
- **Maps** showing sampling locations must be included. Maps may be scanned and transmitted electronically.

Electronic Database Needs

- All information and data, including special studies, should pertain to the period from October 1997 through December 2001.
- Qualifiers must be in separate fields and must be defined (e.g. < is non-detected value)
- Pollutant name, with units, must be defined. STORET codes may also be used.
- All sampling locations must be shown on maps or latitude and longitude must be provided.
- For co-located samples at multiple depths, depths must be specified in a separate field.
- Electronic data will be accepted in ASCII, spreadsheet (e.g., Excel, Quattro Pro, Lotus), or database (e.g., Access, dBase, or SAS) platforms.

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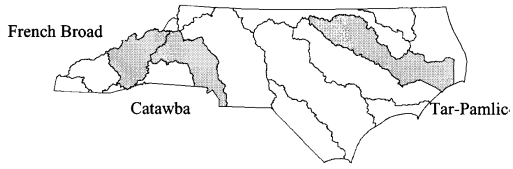


Tell us what you know about water quality in the Catawba, French Broad and Tar-Pamlico River Basins

Appendix III. Sources of Data and Information (Non-exclusive List)

Data and information were received from the following sources during the solicitation period of the basinwide planning cycle. These data were considered for use in the use support process in the ***Roanoke, White Oak, Savannah, Watauga, Little Tennessee, Hiwassee, Chowan, and Pasquotank*** river basins. This list is presented to help characterize the breadth of sources considered in the development of the integrated list. The list that follows in non-exclusive since other agency information and data is regularly sought throughout the basinwide process.

Basin	Contact agency or person
Little Tennessee	Save Our Rivers, Inc.
Little Tennessee	Little Tennessee Watershed Association
Little Tennessee	Tennessee Valley Authority
Little Tennessee	Tapoco Project
Roanoke	Virginia Power
Roanoke	City of Henderson
Savannah	South Carolina Department of Health and Environmental Control, Bureau of Water
Watauga	Robert Marsh (private citizen)
White Oak	US Marine Corps
White Oak	Trinity Center
Cape Fear	City of High Point
Cape Fear	City of Burlington
Cape Fear	Lower Cape Fear River Program

Appendix IV. Delisting Memoranda

Division of Water Quality
Biological Assessment Unit
8 January, 2003

MEMORANDUM

To: Jimmie Overton

Through: Trish Finn MacPherson

From: Kathy Herring

Subject: Hurricane Creek TMDL Survey, French Broad River Subbasin 05, Haywood County

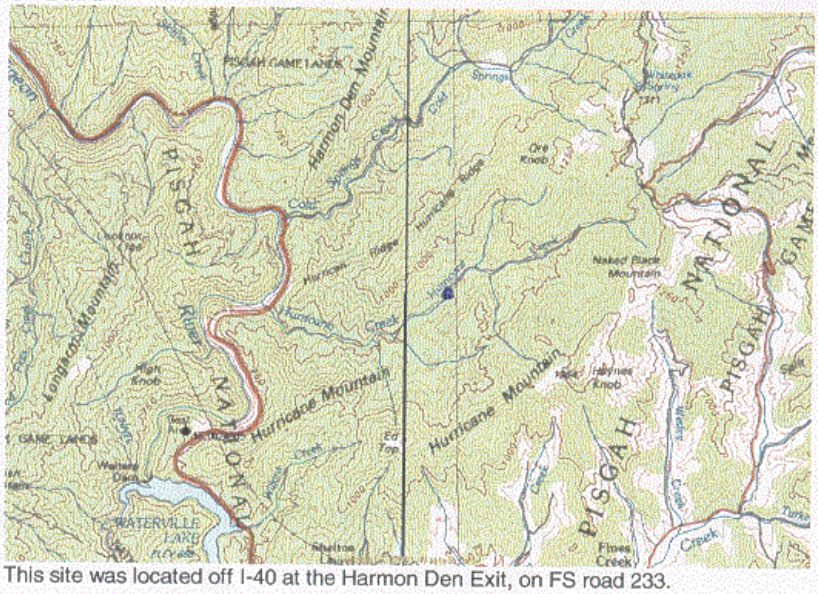
BACKGROUND

Michelle Woolfolk of the Modelling/TMDL Unit of the Division of Water Quality has requested BAU to conduct an assessment to determine whether Hurricane Creek belongs on the 303 (d) impaired streams list. The information and data collected from this assessment will be used to determine if a TMDL needs to be developed for this watershed. This stream was sampled because it was placed on the impaired streams list at the request of the USFS because of concerns of recreational use in the privately owned portions of the watershed.

METHODS

Benthic macroinvertebrates were collected using the abbreviated EPT collection method. EPT collections use only four samples: 1 kick, 1 sweep, 1 leafpack, and visual collections. Only the Ephemeroptera, Plecoptera, and Trichoptera are collected and identified. These samples are rated based solely on EPT taxa richness.

SITE MAP



This site was located off I-40 at the Harmon Den Exit, on FS road 233.

SITE DESCRIPTION AND RESULTS

Hurricane Creek, FS Rd off I-40

The majority of this stream is in the Pisgah National Forrest, but there are pockets of land along the stream that are privately owned and frequented by 4-wheeler activity. The stream was 4 meters wide with a mostly boulder substrate. There was a fair amount of sand indicating the effect of land disturbing activity in the watershed. There was an area downstream of the sample reach that was used for fording the stream. Based on an EPT taxa richness of 32, this site received a rating of Good.

Table 1. Hurricane Creek FS RD 233 of I-40 near Harmon Den Exit

Date Sampled	7/23/02
Ephemeroptera	15
Plecoptera	5
Trichoptera	12
EPT Richness	32
EPT Abundance	112
EPT Biotic Index	1.94
Bioclass	Good
Width	4
Average Depth	0.2
Substrate (%)	
Boulder	50
Rubble	20
Gravel	10
Sand	20
Silt	0

Hurricane Creek FS Road, Haywood County

SUMMARY

This stream was placed on the 303 (d) impaired streams list due to sediment. There is more sediment here than would be expected in a mountain stream in a protected area such as the Pisgah National Forest. Also, the benthic community in a stream in a protected area such as a national forest would be expected to rate Excellent unless there were habitat or pH problems, which is not the case here. However, its rating was Good indicating some possible sediment impacts.

cc: Michelle Woolfolk – Modelling/TMDL Unit

Appendix 1. Taxa List with Indication of Relative Abundance (A=Abundant, C=Common, R=Rare), Hurricane Creek, FS RD 233, Haywood County, 7/23/02

Appendix 1. Taxa List with Indication of Relative Abundance (A=Abundant, C=Common, R=Rare), Hurricane Creek, FS RD 233, Haywood County, 7/23/02

EPHEMEROPTERA	
BAETIS BIMACULATUS	C
BAETIS FLAVISTRIGA	C
BAETIS TRICAUDATUS	R
DRUNELLA WAYAH	A
EPHEMERELLA CATAWBA	R
EPEORUS DISPAR	C
EPEORUS RUBIDUS	C
EPHEMERA SPP	R
EURYLOPHELLA SPP	R
HEPTAGENIA SPP	C
ISONYCHIA SPP	C
LEUCROCUTA SPP	C
PARALEPTOPHLEBIA SPP	C
STENONEMA MERIRIVULANUM	R
STENONEMA PUDICUM	C
PLECOPTERA	
ACRONEURIA ABNORMIS	A
ISOPERLA HOLOCHLORA	R
LEUCTRA SPP	C
PTERONARCYS SPP	A
TALLAPERLA SPP	A
TRICHOPTERA	
ARCTOPSYCHE IRRORATA	R
DIPLECTRONA MODESTA	R
GLOSSOSOMA SPP	A
GOERA SPP	R
HYDROPSYCHE VENULARIS	R
LEPIDOSTOMA SPP	C
PYCNOPSYCHE SPP	A
RHYACOPHILA CAROLINA	R
RHYACOPHILA FUSCULA	R
SYMPHITOPSYCHE MACLEODI	C
SYMPHITOPSYCHE MOROSA	R
SYMPHITOPSYCHE SPARNA	C

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Michael F. Easley, Governor | Carmen Hooker Buell, Secretary | Debbie Crane, Director

For release: Immediate | Date: October 10, 2001
Contact: Bill Furney, (919) 733-9190 or Luanne Williams, (919) 715-6429

State Lifts Dioxin Advisory for Game Fish in Roanoke River, Albemarle Sound, and Welch Creek

RALEIGH – A long-standing dioxin advisory for game fish has been lifted for the lower Roanoke River, Welch Creek and the western Albemarle Sound, North Carolina's Acting Health Director announced today. By lifting the advisory, the state has removed restrictions on the amount that people can eat of the many game fish species, such as striped and largemouth bass, crappie and bream, caught in these areas.

The state's Division of Water Quality has monitored fish-tissue sampling in these areas since 1989 to determine the levels of dioxin in fish tissues. Fish consumption advisories for the river and creek have been in place since 1990 and for the sound since 1991. The state's decision to lift the advisory comes after several consecutive years of sampling that have shown that dioxin levels in the game fish have fallen below 4 parts per trillion, the state's threshold of concern for public health.

While the state is removing the dioxin advisory for game fish, an advisory remains in place for bottom-dwelling fish such as carp and catfish. Because sampling still indicates dioxin levels slightly higher than 4 parts per trillion in these species of fish, the public is being advised to limit or avoid eating catfish or carp from the area.

The remaining advisory covers Welch Creek; the Roanoke River from the U.S. Highway 17 bridge near Williamston to the mouth of the Albemarle Sound; and Albemarle Sound from Bull Bay to Harvey Point and west to mouth of the Roanoke River and the mouth of the Chowan River at the US Highway 17 bridge. The advisory reads, "Catfish and carp from these waters may contain low levels of dioxins. Women of childbearing age and children should not eat any catfish or carp from this area until further notice. All other persons should eat no more than one meal per person per month of catfish and carp from this area."

Dioxins are a family of chemicals considered harmful to humans. Dioxins occur naturally in the environment but are also produced as a by-product of some manufacturing processes and are found in municipal waste systems.

Acting State Health Director Leah Devlin announced the decision, saying this sampling data indicates that environmental conditions have improved and public health risks have decreased in the Roanoke River. "It pleases me to be able to rescind this dioxin advisory so that people can catch and eat game fish from this area without concern for their well-being," Devlin said. She said the state will continue to monitor dioxin levels in the river's bottom-dwelling fish species.

"Improvement in water quality has resulted in lower dioxin levels in fish and is the reason for lifting the game fish advisory," said Bill Ross, secretary of the N.C. Department of Environment and Natural Resources. "Positive actions in the private sector to meet North Carolina's stringent water quality standard for dioxin have driven much of the improvement," he added.

For questions regarding fish advisories, contact the Occupational and Environmental Epidemiology Branch of the N.C. Division of Public Health at (919) 733-3410, or visit the the N.C. Department of Health and Human Services's Fish Consumption Advisory web site at www.schs.state.nc.us/epi/fish.

###

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Department of Health and Human Services

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Date: August 28, 2001

Dioxin Posting on Pigeon River Rescinded; Walters Lake Advisory Partially Rescinded

RALEIGH-The fish consumption advisory on the Pigeon River in Haywood County has been completely lifted and the Walters Lake advisory has been partially lifted, Interim State Health Director Leah Devlin announced today.

The lifting of the Pigeon River advisory indicates that all fish from the river can now be eaten safely. The original advisory, enacted by the State Health Director in 1988, had advised the public not to eat fish from the Pigeon River below the Champion International paper mill located in Canton because of dioxin contamination. The advisory was reduced in 1994 to include only carp and catfish.

Walters Lake, also known as Waterville reservoir, is located downstream from the mill. Fish tissue samples from the river and lake for the past two years show that only carp from Walters Lake are still contaminated above the recommended level for dioxin. Therefore, a limited advisory for carp in Walters Lake remains in effect. The limited advisory recommends that women of child-bearing age and children not eat any carp from Walters Lake. All other persons can consume one meal of carp per month from the lake.

There are no longer any restrictions on eating gamefish such as largemouth bass, smallmouth bass, crappie, bream and trout or any species of catfish from the lake.

"This is good news," said Dr. Devlin. "The environment has truly gotten cleaner in this area and the conditions continue to improve, and that's why we were able to further revise these advisories."

"North Carolina has a very stringent water quality standard for dioxin," said Bill Ross, Secretary of the N.C. Department of Environment and Natural Resources. "That standard has driven improvements at the mill, which have paid off with the continued downgrading of these advisories. Eliminating the discharge of dioxin into our state's waters has created a cleaner environment."

Improved pollution controls at the Canton paper mill were enacted during the late 1980s. The Canton mill, formerly owned by Champion International, was purchased by mill employees and renamed Blue Ridge Paper Products Inc. in 1999.

For questions regarding fish advisories, contact the Occupational and Environmental Epidemiology Branch of the N.C. Department of Health and Human Services at 919-733-3410 or visit the NC DHHS Fish Consumption Advisory web site at http://www.schs.state.nc.us/epi/fish.

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Debbie Crane
Director

Appendix V. Proposed Use Support Methodology for Primary and Secondary Recreation

This human health related use support category evaluates waters for the support of primary recreation activities such as swimming, water-skiing, skin diving, and similar uses usually involving human body contact with water where such activities take place in an organized manner or on a frequent basis. Waters of the state designated for supporting these uses are classified as Class B, SB and SA waters. This use support category also evaluates whether waters support secondary recreation activities such as wading, boating, and other uses not involving human body contact with water, and activities involving human body contact with water where such activities take place on an infrequent, unorganized or incidental basis. Waters of the state designated for supporting these uses are classified as Class C, SC and WS waters. The use support ratings applied to this category are based on the North Carolina water quality standard for fecal coliform bacteria where data are available or where swimming advisories are posted by local and state health agencies.

Water quality standards for fecal coliform bacteria are intended to ensure safe use of waters for recreation (refer to Administrative Code Section 15A NCAC 2B .0200). The North Carolina fecal coliform bacteria standard for freshwater is not to exceed the geometric mean of 200 colonies per 100 ml of at least five samples over a 30-day period and not to exceed 400 colonies per 100 ml in more than 20 percent of the samples during the same period. The 200 colonies per 100 ml standard is intended to ensure that waters are safe enough for water contact through recreation.

Beginning in the summer of 1997, the Division of Environmental Health (DEH) began testing coastal recreation waters (beaches) for fecal coliform bacteria levels to assess the relative safety of these waters for swimming. The Shellfish Sanitation Section of DEH routinely tests approximately 275 coastal sites once a week during the tourist recreational season (April to September), less often the rest of the year. These tests give researchers and the public a gauge of bacteria levels along the North Carolina coast. If an area has elevated bacteria levels, health officials will advise that people not swim there by posting a swimming advisory in the area and by notifying the local media and county health department.

The Division of Water Quality (DWQ) does not have a comprehensive weekly monitoring program to assess inland waters for fecal coliform bacteria levels. North Carolina has more than 37,000 miles of inland waters, and resources are not sufficient to perform comprehensive weekly bacteria monitoring. Rather, DWQ conducts monthly ambient water quality monitoring at approximately 375 locations across the state. These monthly samplings include fecal coliform bacteria testing of selected lakes, rivers and streams. Ambient water quality samples are routinely collected and sent to DWQ laboratories for analysis using EPA approved laboratory methods, with the exception that sample holding times are not typically within the prescribed six-hour limit. These data collection and analysis restrictions may impact the quality assurance of the sample results.

Because use support decisions are made in conjunction with the development of DWQ's basinwide water quality management strategies, all available information and data are evaluated for use support ratings using a five-year assessment period. A five-year data window that ends on August 31 of the year of biological sampling is used. For example, if biological data are collected in a basin in 2000, then the five-year window for the fecal coliform data and swimming advisories would be September 1, 1995 to August 31, 2000. However, an annual screening review of all DWQ ambient fecal coliform data is conducted by DWQ to assess the need for additional monitoring or the need for immediate action by the local or state health agencies to protect public health. In most cases, management strategies to correct waters considered to be impaired due to elevated fecal coliform bacteria levels may require substantial resources and time. Therefore, impairment decisions for bacteria must be made using sound science and data.

Decades of monitoring experience have demonstrated that bacteria concentrations may fluctuate widely in surface waters over a period of time. Thus, a five-year data window and multiple sampling efforts are used to evaluate waters against the North Carolina water quality standard for recreational use support. This level of sampling is needed before waters should be considered impaired, and therefore, in need of TMDL's or other management strategies. This procedure however, does not preclude any health agency from immediately posting health advisories to warn recreational users of a temporary increase in health risks related to bacterial contamination or other health related episodes.

Each January, DWQ staff will review bacteria data collections from ambient monitoring stations statewide for the previous sampling year. Locations with annual geometric means greater than 200 colonies per 100 ml, or when more than 20 percent of the samples are greater than 400 colonies per 100 ml, are identified for potential follow-up monitoring conducted five times within 30 days as specified by the state fecal coliform bacteria standard. In addition, appropriate health agencies are notified of these locations. If an initial five times within 30 days sampling indicates a geometric mean greater than 200 colonies per100 ml, or more than 20 percent of these samples exceed 400 colonies per100 ml, then the location will continue to be sampled for bacteria persistence. If bacteria concentrations exceed either portion of the state standard, the data are sent to DEH and the local county health director to determine the need for posting swimming advisories. DWQ regional offices will also be notified.

Due to limited resources and the higher risk to human health, primary recreation waters (Class B, SB and SA) will be given monitoring priority for additional five times within 30 days sampling. Follow-up water quality sampling for Class C waters will be performed as resources permit. Any waters on the 303(d) list of impaired waters for fecal coliform will receive a low priority for additional monitoring because these waters will be further assessed for TMDL development.

Recreational use support decisions are based on a review of both DWQ and DEH monitoring data for the five-year data window. A formal solicitation for readily available and suitable fecal coliform bacteria monitoring data from other sources is conducted in accordance with EPA Section 303(d) guidance. Recreational use support assessments include an annual

review of all readily available DWQ ambient monitoring data and may include additional sampling of five times within 30 days. The use support impairment status of any given water and the resulting listing of that water on the state 303(d) list will be determined using two procedures.

Monitored Class B, SB and SA waters are rated supporting for primary recreation if the geometric mean over the five-year data window is less than or equal to 200 colonies per 100 ml, or if less than 20 percent of these samples did not exceed 400 colonies per100 ml. These waters will be rated impaired if either portion of these state standards are not met, or if additional five times within 30 days sampling exceeded either portion of the state standard. Monitored Class C, SC and WS waters are rated impaired if a fecal coliform standard was exceeded for that waterbody for the five-year data window and subsequent monitoring of five times within 30 days exceeded the 200 colonies per 100 ml geomean, or greater than 20 percent of these samples exceeded 400 colonies per 100 ml over the five-year data window. These waters are rated supporting for secondary recreation if neither portion of the state standard is exceeded. Waters without sufficient fecal coliform data or swimming advisories are not rated, and waters with no data are noted as having no data.

DWQ attempts to determine if there are any inland swimming areas monitored by county or local health departments or estuarine (Class SA and SB) waters as assessed by DEH. Each January, DEH, county or local health departments are asked to list those waters which were posted with swimming advisories in the previous year. When reviewing DEH fecal coliform data and local swimming advisories, the same five-year window that ends on August 31 of the year of biological sampling is used. If a water was posted with a swimming advisory for at least two months within the five-year data window, it is further evaluated for the persistence of elevated fecal coliform bacteria levels. Those waters posted with swimming advisories for more than two months in the five-year data window are rated impaired unless county or state health agencies believe that the cause of the swimming advisory is not persistent. If DEH has no data on an estuarine water, that water will not be rated for recreational uses.

Appendix VI: Decision Factors Used in 305(b) Reporting and 303(d) Listing Process

ID	Decision Factor
-99	Lakes assessment
0	No code listed
100	QUALITATIVE (EVALUATED) ASSESSMENT - UNSPECIFIED
110	Information from local residents
120	Surveys of fish and game biologists / other professionals
130	Land use information and location of sources
140	Incidence of spills and / or fish kills
150	Monitoring data more than 5 years old
170	Best professional judgement
175	Occurrence of conditions judged to cause impairment
180	Screening models (desktop models; models not calibrated or verified)
190	Biological / habitat data extrapolated from upstream or downstream waterbody (tribbing)
191	Physical / chemical data extrapolated from upstream or downstream waterbody (tribbing)
192	Physical / Chemical data from outside source (lesser degree of confidence in quality)
200	PHYSICAL / CHEMICAL MONITORING
210	Fixed station physical / chemical monitoring, conventional pollutants only
220	Non-fixed station physical / chemical monitoring, conventional pollutant only
222	Non-fixed-station monitoring, conventional, during key seasons and flows
230	Fixed station physical / chemical, conventional plus toxic pollutants
231	Highest quality fixed-station P / C, conventional plus toxicants
240	Non-fixed station physical / chemical, conventional plus toxicants
242	Non-fixed station physical / chemical, conv plus toxicants, key seasons, flows
250	Chemical monitoring of sediments
260	Fish tissue analysis
270	PWS chemical monitoring (ambient water)
275	PWS chemical monitoring (finished water)
300	BIOLOGICAL MONITORING
310	Ecological / habitat surveys
315	Regional reference site approach
320	Benthic macroinvertebrate surveys
321	RBP III or equivalent benthos surveys
322	RBP I or II or equivalent benthos surveys
330	Fish surveys
331	RBP V or equivalent fish surveys
340	Primary producer surveys (phytoplankton, periphyton, and / or macrophyton)
350	Fixed station biological monitoring
400	PATHOGEN MONITORING
410	Shellfish surveys
420	Water column surveys (e.g., fecal coliform)
430	Sediment analysis
440	PWS pathogen monitoring (ambient water)
450	PWS pathogen monitoring (finished water)
500	TOXICITY TESTING
510	Effluent toxicity testing, acute
520	Effluent toxicity testing, chronic
530	Ambient toxicity testing, acute
540	Ambient toxicity testing, chronic
550	Toxicity testing of sediments
600	MODELING
610	Calibrated models (calibration data are less than 5 years old)
700	INTEGRATED INTENSIVE SURVEY (field work exceeds a 24hr period, multimedia)
710	Combined sampling of water column, sediment, biota for chemical analysis
720	Biosurveys of multiple taxonomic groups (e.g., fish, invertebrates, algae)
800	ASSESSMENTS BASED ON DATA FROM OTHER SOURCES
810	(VOL.) Chem. / phys. monitoring data by quality-assured volunteer program
820	(VOL.) Benthic macroinvertebrate surveys by quality-assured volunteers
830	(VOL.) Bacteriological water column sampling by quality-assured volunteers
840	(Effl.) Discharger self-monitoring data
850	(Ambt.) Discharger self-monitoring data
860	Other Agencies / Organizations provided monitoring data
870	Drinking water supply closures or advisories (source-water quality based
900	DISCREPANCY IN AQUATIC LIFE ASSESSMENT RESULTS
910	Physical / Chemical ALUS; Discrepancy among different data types
920	Biological / Habitat ALUS; Discrepancy among different data types
930	Toxicity Testing ALUS; Discrepancy among different data types
940	Evaluated (qualitative) ALUS; Discrepancy among different data types
950	Tributary to PS / NS stream

The Surface Water Impaired Waters List
(Categories 4 through 7 only)

Broad River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Walnut Creek From source to Green River	9-29-44	C	O	30802	8.3		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Catheys Creek From dam at old Duke Power Co. Raw Water Supply Reservoir to S. Broad R.	9-41-13-(6)	C	O	30802	3.8		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture
Hollands Creek From Duke Power Co. old Auxiliary Raw Water Supply Intake to Catheys Creek	9-41-13-7-(3)	C	O	30802	2.5		Cause Unknown	Low	Municipal Pretreatment (indirect
Brushy Creek From SR 1323 Cleveland Co to First Broad	9-50-29b	C	O	30804	8.4		Cause Unknown	Low	Non-irrigated Crop Production
Beaverdam Creek From source to First Broad River	9-50-32	C	O	30804	10.9		Cause Unknown	Low	Agriculture Construction
Lick Branch From source to Buffalo Creek	9-53-11	C	O	30805	3.2		Historical listing for 'sediment' based on biological impairment	Low	Industrial Point Sources Agriculture

Number of waterbody-pollutant/pollution combinations for Broad: 6

Total waterbody-pollutant/pollution combination miles: *37.1* **acres:**

Cape Fear River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little Troublesome Creek From Reidsville WWTP to Haw River	16-7b	C NSW	O	30601	5		Fecal Coliform		5/21/02
Town Branch From source to Haw River	16-17	C NSW	O	30602	3.6		Fecal Coliform		8/19/02

Cape Fear River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
North Buffalo Creek From WWTP to Buffalo Creek	16-11-14-1b	C NSW	O	30602	8.1		Ammonia	Low	Major Municipal Point Source
South Buffalo Creek From US 70 to Buffalo Creek	16-11-14-2c	C NSW	O	30602	4		Ammonia	Medium	Major Municipal Point Source
Northeast Cape Fear From source to SR 1937, Wayne County	18-74-(1)a	C Sw	O	30621	3.3		Chlorides	Low	Industrial Point Source

Cape Fear River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Cape Fear (DEH Area)	B10	SC	O			5000	Low Dissolved Oxygen	High	
Haw River From NC 87 to NC 49	16-(1)d	C NSW	O	30602	19.2	0	Fecal Coliform	Low	Agriculture Urban Runoff/Storm Sewers
Haw River From NC 87 to NC 49	16-(1)d	C NSW	O	30602	19.2		Turbidity	Low	Agriculture Urban Runoff/ Storm Sewers
North Buffalo Creek From source to above WWTP	16-11-14-1a	C NSW	O	30602	8.7		Fecal Coliform	Medium	Major Industrial Point Source Urban Runoff/Storm Sewers
Robeson Creek From a point 0.3 mile upstream of mouth to B. Everett Jordan Lake, Haw River	16-38-(5)	WS-IV NSW CA	O	30604	0.6		Chlorophyll-a	High	Minor Municipal Point Source Urban Runoff/Storm Sewers
Pittsboro Lake Chatham County	16-PITTSBORO L	C-NSW	O	30604		38	Aquatic Weeds	Medium	
New Hope River Arm of B. Everett Jord From source at confluence of Morgan Cr. and New Hope Cr. Arms of B. Everett Jordan Lake (an east-west line across the southern tip of the formed peninsula) to Chatham County SR 1008	16-41-(0.5)	WS-IV B NSW CA	O	30605		1205	Chlorophyll a	High	
New Hope Creek From a point 0.3 mile upstream of Durham County SR 2220 to a point 0.8 mile downstream of Durham County SR 1107	16-41-1-(11.5)	WS-IV NSW	O	30605	24.5		Fecal Coliform	High	Urban Runoff/Storm Sewers Major Municipal Point Source
New Hope Creek From a point 0.8 mile downstream of Durham County SR1107 to confluence with Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake.	16-41-1-(14)	WS-IV NSW CA	O	30605		1377	Chlorophyll a	High	
Third Fork Creek From a point 2.0 miles upstream of N.C. Hwy. 54 to New Hope Creek	16-41-1-12-(2)	WS-IV NSW	O	30605	3.6		Turbidity	High	
Northeast Creek From N.C. Hwy. 55 to Durham Co. WWTP	16-41-1-17-(0.7)a	WS-IV NSW	O	30605	2.6		Fecal Coliform	High	

Cape Fear River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Northeast Creek Durham Co. WWTP to a point 0.5 mile downstream of Panther Creek	16-41-1-17-(0.7)b	WS-IV NSW	O	30605	5.8		Fecal Coliform	High	
Morgan Creek (including the Morgan Cr From Chatham County SR 1726 (Durham County SR1109) to New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake.	16-41-2-(9.5)	WS-IV NSW CA	O	30605		851	Chlorophyll a	High	
Deep River From SR 1113 (Guilford) to SR 1921 (Randolph)	17-(4)b	WS-IV CA *	O	30608	6.8		Fecal Coliform	High	Urban Runoff/Storm Sewers
East Fork Deep River From source to a point 0.4 mile downstream of Guilford County SR 1541	17-2-(0.3)	WS-IV *	O	30608	6.5		Fecal Coliform	High	Urban Runoff/Storm Sewers Industrial Permitted
East Fork Deep River From source to a point 0.4 mile downstream of Guilford County SR 1541	17-2-(0.3)	WS-IV *	O	30608	6.5		Turbidity	High	Urban Runoff/Storm Sewers Industrial Permitted
East Fork Deep River From a point 0.4 mile downstream of Guilford County SR 1541 to High Point Lake, Deep River	17-2-(0.7)	WS-IV CA *	O	30608	0.6		Turbidity	High	Urban Runoff/Storm Sewers Industrial Permitted
Richland Creek From source to a point 0.4 mile upstream of Guilford County SR 1154	17-7-(0.5)	WS-IV *	O	30608	6.4		Fecal Coliform	High	Urban Runoff/Storm Sewers
Richland Creek From a point 0.4 mile upstream of Guilford County SR 1154 to Randleman Reservoir, Deep River	17-7-(4)	WS-IV CA *	O	30608	2.6		Fecal Coliform	High	Major Municipal Point Source Urban Runoff/Storm Sewers
Muddy Creek From source to a point 0.5 mile upstream of mouth	17-9-(1)	WS-IV *	O	30608	5.6		Fecal Coliform	High	
Muddy Creek From a point 0.5 mile upstream of mouth to Randleman Reservoir, Deep River	17-9-(2)	WS-IV CA *	O	30608	0.5		Fecal Coliform	High	
Greenfield Lake Entire Lake	18-76-1	C Sw	O	30617		115	Aquatic Weeds (Watermeal, duckweed, Brazilian elodea)	High	

Cape Fear River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Greenfield Lake Entire Lake	18-76-1	C Sw	O	30617		115	Nutrients	High	
Atlantic Ocean	99-(2)	SB	O	30617		23230	Fish Advisory-Mercury	Low	
Atlantic Ocean	99-(3)	SB	O	30617		110980	Fish Advisory-Mercury	Low	
South River From source to NC 13	18-68-12-(0.5)a	C Sw	O	30618	7.2		Fish Advisory-Mercury	Low	
South River From US 13 to Big Swamp	18-68-12-(0.5)b	C Sw	O	30618	29.5		Fish Advisory-Mercury	Low	
South River From Big Swamp to Black River	18-68-12-(8.5)	C Sw ORW +	O	30618	34.2		Fish Advisory-Mercury	Medium	
Bay Tree Lake (Black Lake) Bladen County	18-BAY TREE LA	C-SW	O	30618		1400	Fish Advisory-Mercury	Low	
Black River From South River to Cape Fear River	18-68b	C Sw ORW +	O	30620	34.5		Fish Advisory-Mercury	High	

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Haw River From source to SR 2109, Guilford	16-(1)a	C NSW	O	30601	7.7		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Haw River From SR 2109 to SR 2426, Guilford	16-(1)b	C NSW	O	30601	20.1		Habitat Degradation	Low	Agriculture
Troublesome Creek From source to Rockingham County SR 2423	16-6-(0.3)	WS-III NSW	O	30601	15.6		Habitat Degradation	High	Agriculture
Little Troublesome Creek From source to Reidsville WWTP	16-7a	C NSW	O	30601	3.3	0	Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Little Troublesome Creek From Reidsville WWTP to Haw River	16-7b	C NSW	O	30601	5	0	Historical listing for 'sediment' based on biological impairment	Medium	Urban Runoff/Storm Sewers
Haw River From NC 87 to NC 49	16-(1)d	C NSW	O	30602	19.2		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers
Reedy Fork (Hardys Mill Pond) From Buffalo Creek to Haw River	16-11-(9)b	C NSW	O	30602	8.6		Cause Unknown	Low	Major Municipal Point Source Major Industrial Point Source Urban Runoff/Storm Sewers Non-urban development
North Buffalo Creek From source to above WWTP	16-11-14-1a	C NSW	O	30602	8.7		Historical listing for 'sediment' based on biological impairment	Medium	Major Industrial Point Source Urban Runoff/Storm Sewers
North Buffalo Creek From WWTP to Buffalo Creek	16-11-14-1b	C NSW	O	30602	8.1		Habitat Degradation	Medium	Major Industrial Point Source Major Municipal Point Source Urban Runoff/Storm Sewers
South Buffalo Creek From source to McConnell Rd, Guilford	16-11-14-2a	C NSW	O	30602	14.8		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
South Buffalo Creek From McConnell Rd to US 70, Guilford	16-11-14-2b	C NSW	O	30602	3.3		Historical listing for 'sediment' based on biological impairment	Medium	Urban Runoff/Storm Sewers

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
South Buffalo Creek From US 70 to Buffalo Creek	16-11-14-2c	C NSW	O	30602	4		Historical listing for 'sediment' based on biological impairment	Medium	Major Municipal Point Source Urban Runoff/Storm Sewers
Brush Creek From source to L. Higgins	16-11-4-(1)a	WS-III NSW	O	30602	5.6		Habitat Degradation	High	Urban Runoff/Storm Sewers
Horsepen Creek From source to U.S. Hwy. 220	16-11-5-(0.5)	WS-III NSW	O	30602	6		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Horsepen Creek From U.S. Hwy. 220 to Lake Brandt, Reedy Fork	16-11-5-(2)	WS-III NSW CA	O	30602	1.6		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Little Alamance Creek (Gant Lake, May From source to Big Alamance Creek	16-19-11	C NSW	O	30603	12.3		Cause Unknown	Medium	Urban Runoff/Storm Sewers
Marys Creek From source to Haw River	16-26	C NSW	O	30604	9.7		Habitat Degradation	Low	Agriculture
Robeson Creek From a point 0.7 mile downstream of Chatham County SR 2159 to a point 0.3 mile upstream of mouth	16-38-(3)	WS-IV NSW	O	30604	5.6		Historical listing for 'sediment' based on biological impairment	High	Minor Municipal Point Source Urban Runoff/Storm Sewers
Robeson Creek From a point 0.3 mile upstream of mouth to B. Everett Jordan Lake, Haw River	16-38-(5)	WS-IV NSW CA	O	30604	0.6		Habitat Degradation	High	Minor Municipal Point Source Urban Runoff/Storm Sewers
New Hope Creek From Sandy Creek to a point 0.3 mile upstream of Durham County SR 2220	16-41-1-(0.5)b	C NSW	O	30605	0.5		Habitat Degradation	Low	Urban Runoff/Storm Sewers
New Hope Creek From a point 0.3 mile upstream of Durham County SR 2220 to a point 0.8 mile downstream of Durham County SR 1107	16-41-1-(11.5)	WS-IV NSW	O	30605	24.5		Historical listing for 'sediment' based on biological impairment	High	Major Municipal Point Source Urban Runoff/Storm Sewers
Third Fork Creek From source to a point 2.0 miles upstream of N.C. Hwy. 54	16-41-1-12-(1)	C NSW	O	30605	5.1		Cause Unknown	Low	

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Northeast Creek From a point 0.5 mile downstream of Panther Creek to New Hope Creek Arm of B. Everett Jordan Lake	16-41-1-17-(4)	WS-IV NSW CA	O	30605	1.5		Habitat Degradation	High	Urban Runoff/Storm Sewers Non-urban development
Little Creek From source to a point 0.7 mile downstream of Durham County SR 1110	16-41-1-15-(0.5)	WS-IV NSW	O	30606	5.4		Habitat Degradation	High	Urban Runoff/Storm Sewers
Little Creek From a point 0.7 mile downstream of Durham County SR 1110 to New Hope Creek	16-41-1-15-(3)	WS-IV NSW CA	O	30606	0.7		Habitat Degradation	High	Urban Runoff/Storm Sewers
Bolin Creek From U.S. Hwy. 501 Business to Little Creek	16-41-1-15-1-(4)	WS-IV NSW	O	30606	1		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Booker Creek (Eastwood Lake) From source to dam at Eastwood Lake	16-41-1-15-2-(1)	B NSW	O	30606	3.6		Cause Unknown	Low	Urban Runoff/Storm Sewers
Booker Creek From dam at Eastwood Lake to U.S. Hwy. 15	16-41-1-15-2-(4)	C NSW	O	30606	1.2		Cause Unknown	Low	Urban Runoff/Storm Sewers
Booker Creek From U.S. Hwy. 15 to Little Creek	16-41-1-15-2-(5)	WS-IV NSW	O	30606	0.8		Cause Unknown	High	Urban Runoff/Storm Sewers
Morgan Creek From Meeting of the Waters to Chatham County SR 1726 (Durham County SR 1109)	16-41-2-(5.5)b	WS-IV NSW	O	30606	4.5		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Morgan Creek (including the Morgan Cr From Chatham County SR 1726 (Durham County SR 1109) to New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake	16-41-2-(9.5)	WS-IV NSW CA	O	30606	0.6		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Meeting Of The Waters From source to Morgan Creek	16-41-2-7	WS-IV NSW	O	30606	1.4		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Kenneth Creek From source to Wake-Harnett County Line	18-16-1-(1)	C	O	30607	3.7		Cause Unknown	Low	Major Municipal Point Source Urban Runoff/Storm Sewers

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Kenneth Creek From Wake-Harnett County Line to Neills Creek	18-16-1-(2)	WS-IV	O	30607	3.6		Cause Unknown	High	Major Municipal Point Source Urban Runoff/Storm Sewers
Gulf Creek From source to clay pit below SR 1924, Chatham	18-5-(1)a	WS-IV	O	30607	2.7		Cause Unknown	High	
Gulf Creek From clay pit below SR 1924, Chatham to 0.2 miles above Cape Fear River	18-5-(1)b	WS-IV	O	30607	2.9		Historical listing for 'sediment' based on biological impairment	High	Resource Extraction
Gulf Creek From a point 0.2 mile upstream of mouth to Cape Fear River	18-5-(2)	WS-IV CA	O	30607	0.2		Habitat Degradation	High	Resource Extraction
Deep River From dam at High Point Lake to Guilford County SR 1334	17-(3.3)	WS-IV *	O	30608	1.3		Cause Unknown	High	Urban Runoff/Storm Sewers
Deep River From Guilford County SR 1334 to dam at Oakdale Cotton Mills, Inc. (Town of Jamestown water supply intake)	17-(3.7)	WS-IV CA *	O	30608	0.9		Cause Unknown	High	Urban Runoff/Storm Sewers
Deep River From dam at Oakdale Cotton Mills, Inc. to SR 1113, Guilford Co.	17-(4)a	WS-IV CA *	O	30608	2		Cause Unknown	High	Urban Runoff/Storm Sewers
Deep River From SR 1113 (Guilford) to SR 1921 (Randolph)	17-(4)b	WS-IV CA *	O	30608	6.8		Cause Unknown	High	Urban Runoff/Storm Sewers
East Fork Deep River From source to a point 0.4 mile downstream of Guilford County SR 1541	17-2-(0.3)	WS-IV *	O	30608	6.5		Habitat Degradation	High	Urban Runoff/Storm Sewers Industrial Permitted
East Fork Deep River From a point 0.4 mile downstream of Guilford County SR 1541 to High Point Lake, Deep River	17-2-(0.7)	WS-IV CA *	O	30608	0.6		Habitat Degradation	High	Urban Runoff/Storm Sewers Industrial Permitted
Richland Creek From source to a point 0.4 mile upstream of Guilford County SR 1154	17-7-(0.5)	WS-IV *	O	30608	6.4		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Richland Creek From a point 0.4 mile upstream of Guilford County SR 1154 to Randleman Reservoir, Deep River	17-7-(4)	WS-IV CA *	O	30608	2.6		Historical listing for 'sediment' based on biological impairment	High	Major Municipal Point Source Urban Runoff/Storm Sewers
Hickory Creek From source to a point 0.6 mile upstream of mouth	17-8.5-(1)	WS-IV *	O	30608	3.9		Habitat Degradation	High	
Hickory Creek From a point 0.6 mile upstream of mouth to Randleman Reservoir, Deep River	17-8.5-(3)	WS-IV CA *	O	30608	0.6		Habitat Degradation	High	Agriculture Non-urban development
Haskett Creek From source to SR 2149	17-12a	C	O	30609	5.9		Cause Unknown	Low	Urban Runoff/Storm Sewers
Haskett Creek From SR 2149 to Deep River	17-12b	C	O	30609	1.3		Cause Unknown	Low	Urban Runoff/Storm Sewers
Cabin Creek From Cotton Creek to SR 1281, Moore	17-26-5-(1)b	WS-III	O	30610	2.3		Cause Unknown	High	Minor Municipal Point Source
Cotton Creek From source to Star WWTP	17-26-5-3a	WS-III	O	30610	0.5		Cause Unknown	High	
Cotton Creek From Star WWTP to Lick Creek	17-26-5-3b	WS-III	O	30610	2.2		Cause Unknown	High	Minor Municipal Point Source
Cotton Creek From Lick Creek to Cabin Creek	17-26-5-3c	WS-III	O	30610	3.9		Cause Unknown	High	Minor Municipal Point Source
Rocky River From source to Rocky River Reservoir	17-43-(1)a	WS-III	O	30612	10.6		Habitat Degradation	High	Agriculture Pasture grazing, Riparian and/or upland)
Loves Creek From source to US 421	17-43-10a	C	O	30612	3.1		Cause Unknown	Low	

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Loves Creek From US 421 to Siler City WWTP	17-43-10b	C	O	30612	2.8		Cause Unknown	Low	Urban Runoff/Storm Sewers
Loves Creek From Siler City WWTP to Rocky River	17-43-10c	C	O	30612	0.5		Cause Unknown	Low	Major Municipal Point Source Urban Runoff/Storm Sewers
Crane Creek (Crains Creek) From source to Lake Surf	18-23-16a	WS-III	O	30614	28.3		Habitat Degradation	High	Agriculture
Cross Creek (Big Cross Creek) (Texas From source to a point 0.5 mile upstream of water supply intake at Murchison Road in Fayetteville	18-27-(1)	WS-IV	O	30615	9		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Cross Creek (Big Cross Creek) From a point 0.5 mile upstream of water supply intake to water supply intake at Murchison Road in Fayetteville	18-27-(2.5)	WS-IV CA	O	30615	0.5		Habitat Degradation	High	Urban Runoff/Storm Sewers
Cross Creek (Big Cross Creek) From water supply intake at Murchison Road in Fayetteville to Cape Fear River	18-27-(3)	C	O	30615	3.5		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Little Cross Creek (Bonnie Doone Lake, From source to a point 0.5 mile upstream of backwaters of Glenville Lake	18-27-4-(1)	WS-IV	O	30615	7		Habitat Degradation Cause Unknown	High	Urban Runoff/Storm Sewers
Little Cross Creek (Glenville Lake) From a point 0.5 mile upstream of backwaters of Glenville Lake to dam at Glenville Lake	18-27-4-(1.5)	WS-IV CA	O	30615	0.5		Habitat Degradation	High	Urban Runoff/Storm Sewers
Little Cross Creek From dam at Glenville Lake to Cross Creek	18-27-4-(2)	C	O	30615	0.3		Habitat Degradation	Low	Urban Runoff/Storm Sewers
Browns Creek (Cross Pond) From source to Cape Fear River	18-45	C	O	30616	8.5		Cause Unknown	Medium	Collection System Failure Urban Runoff/Storm Sewers
Cape Fear River From raw water supply intake at Federal Paper Board Corporation (Riegelwood) to Bryant Mill Creek	18-(63)a	C Sw	O	30617	3.8		Cause Unknown	High	Major Industrial Point Source

Cape Fear River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Black River (Little Black River) (Popes	18-68-12-1a	C Sw	O	30618	31.6		Cause Unknown, Historical listing for sediment based on biological impairment	Low	
Stewarts Creek From source to Six Runs Creek	18-68-2-10	C Sw	O	30619	15		Cause Unknown	Low	Natural Sources
Muddy Creek From source to Northeast Cape Fear River	18-74-25	C Sw	O	30622	14		Cause Unknown	Low	
Rock Fish Creek (New Kirk Pond) From Swift-Eckrich to SR 1165, Duplin	18-74-29b	C Sw	O	30622	5.3		Habitat Degradation	Low	Major Industrial Point Source Habitat Modification (other than Bank or Shoreline Modification/D
Rock Fish Creek (New Kirk Pond) From SR 1165, Duplin to Little Rockfish Cr.	18-74-29c	C Sw	O	30622	3.4		Historical listing for 'sediment' based on biological impairment	Low	Major Industrial Point Source Habitat Modification (other than Bank or Shoreline Modification/D
Burgaw Creek From Osgood Branch to Northeast Cape Fear River	18-74-39b	C Sw	O	30623	9.5		Cause Unknown, Historical listing of "sediment" based on biological data	High	Minor Municipal Point Source Urban Runoff/Storm Sewers
Burnt Mill Creek From source to Smith Creek	18-74-63-2	C Sw	O	30623	4.8		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers Dredging

Cape Fear River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Southport (DEH Area)	B1	SC	O			1125	Fecal Coliform	High	Municipal Point Sources Urban Runoff/Storm Sewers Marinas
Buzzard Bay (DEH Area)	B2	SA	O			115	Fecal Coliform	Low	Natural Sources Waterfowl
The Basin (DEH Area)	B3	SA	O			1	Fecal Coliform	Low	Onsite Wastewater Systems (Septic Tanks)
Cape Fear (DEH Area)	B4	SA	O			970	Fecal Coliform	High	Major Industrial Point Source Minor Industrial Point Source Package Plants (Small Flows) Urban Runoff/Storm Sewers
Myrtle Sound (DEH Area)	B5	SA	O			113	Fecal Coliform	Low	Urban Runoff/Storm Sewers Marinas
Masonboro Sound (DEH Area)	B6	SA ORW	O			282	Fecal Coliform	Medium	Agriculture Urban Runoff/Storm Sewers Marinas
Wrightsville Beach (DEH Area)	B7	SB #	O			175	Fecal Coliform	High	Collection System Failure Urban Runoff/Storm Sewers Onsite Wastewater Systems (Se Marinas
Topsail Sound (DEH Area)	B8	SA ORW	O			676	Fecal Coliform	High	Urban Runoff/Storm Sewers Onsite Wastewater Systems (Se Marinas Waterfowl
Stump Sound (DEH Area)	B9	SA ORW	O			145	Fecal Coliform	Medium	Municipal Point Sources Onsite Wastewater Systems (Se Natural Sources

Number of waterbody-pollutant/pollution combinations for Cape Fear: 117

Total waterbody-pollutant/pollution combination miles: *682.5* **acres:** *147913*

Catawba River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Irwin Creek From source to Sugar Creek	11-137-1	C	O	30834	11.8		Fecal Coliform		3/28/02
Little Sugar Creek From source to Archdale Rd	11-137-8a	C	O	30834	11.8		Fecal Coliform		3/28/02
Little Sugar Creek From Arcdale Rd to NC 51	11-137-8b	C	O	30834	5.3		Fecal Coliform		3/28/02
Little Sugar Creek From NC 51 to state line	11-137-8c	C	O	30834	3.6		Fecal Coliform		3/28/02
McAlpine Creek From source to SR 3356, (Sardis Rd)	11-137-9a	C	O	30834	8.3		Fecal Coliform		3/28/02
McAlpine Creek From SR 3356 to NC 51	11-137-9b	C	O	30834	6.3		Fecal Coliform		3/28/02
McAlpine Creek From NC 51 to NC 521	11-137-9c	C	O	30834	4.7		Fecal Coliform		3/28/02
McAlpine Creek From NC Hwy 521 to NC/SC stateline	11-137-9d	C	O	30834	1.1		Fecal Coliform		3/28/02
Sugar Creek From SR 1156 Mecklenburg, to HWY 51	11-137b	C	O	30834	11.9		Fecal Coliform		3/28/02
Sugar Creek From Hwy 51 to NC/SC border	11-137c	C	O	30834	1.2		Fecal Coliform		3/28/02

Catawba River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Mackey Creek From US 70 to Catawba River	11-15-(3.5)b	C	O	30830	0.6		Effluent Toxicity	Low	Industrial Point Sources
Clark Creek Newton WWTP to SR2007	11-129-5(0.3)c(1)	C	O	30835	2.5		Biological impairment due to Chlorine	Low	Municipal Point Sources

Catawba River Basin

Category *4c*

Waters impaired by pollution. TMDLs are not appropriate.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Clark Creek From SR2012 to confluence with Pinch Gut Creek	11-129-5(0.3)c(1)	C	O	30835	2.3		Biological impairment due to Hydromodification	Low	Intentional Channelization
Clark Creek From 1149 to SR 2012 Catawba Co	11-129-5-(0.3)b	C	O	30835	4.6		Biological impairment due to Hydromodification	Low	Intentional Channelization

Catawba River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Harper Creek From source to Wilson Creek	11-38-34-14	C Tr ORW	O	30831	9		Sediment	Low	
Lower Creek From Zack's Fork to Caldwell Co SR 1143	11-39-(0.5)b	C	O	30831	4.8		Turbidity	Low	Urban Runoff/Storm Sewers
Lower Creek From Caldwell County SR 1143 to a point 0.7 mile downstream of Bristol Creek	11-39-(6.5)	WS-IV	O	30831	6.6		Turbidity	High	Municipal Point Sources Urban Runoff/Storm Sewers Non-urban development
Lower Creek From a point 0.7 mile downstream of Bristol Creek to Rhodhiss Lake, Catawba River	11-39-(9)	WS-IV CA	O	30831	1.3		Turbidity	High	Municipal Point Sources Urban Runoff/Storm Sewers Non-urban development
Long Creek From source to a point 0.6 mile downstream of Mecklenburg County SR 2074	11-120-(0.5)	C	O	30834	5.1		Turbidity	Low	Land Development Urban Runoff/Storm Sewers
Long Creek From a point 0.6 mile downstream of Mecklenburg County SR 2074 to a point 0.4 mile upstream of Mecklenburg County SR 1606	11-120-(2.5)	WS-IV	O	30834	8.4		Turbidity	High	Land Development Urban Runoff/Storm Sewers
Long Creek From a point 0.4 mile upstream of Mecklenburg County SR 1606 to Lake Wylie, Catawba River	11-120-(7)	WS-IV CA	O	30834	1.8		Turbidity	High	Land Development Urban Runoff/Storm Sewers
Irwin Creek From source to Sugar Creek	11-137-1	C	O	30834	11.8		Turbidity	Low	Industrial Point Sources Municpal Point Sources Urban Runoff/Storm Sewers
Little Sugar Creek From NC 51 to state line	11-137-8c	C	O	30834	3.6		Turbidity	Low	Municipal Point Sources Urban Runoff/Storm Sewers
McAlpine Creek From source to SR 3356, (Sardis Rd)	11-137-9a	C	O	30834	8.3		Turbidity	Low	Urban Runoff/Storm Sewers
McAlpine Creek From SR 3356 to NC 51	11-137-9b	C	O	30834	6.3		Turbidity	Low	Urban Runoff/Storm Sewers

Catawba River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
McAlpine Creek From NC 51 to NC 521	11-137-9c	C	O	30834	4.7		Turbidity	Low	Urban Runoff/Storm Sewers
McAlpine Creek From NC Hwy 521 to NC/SC stateline	11-137-9d	C	O	30834	1.1		Turbidity	Low	Urban Runoff/Storm Sewers
Sugar Creek From SR 1156 Mecklenburg, to HWY 51	11-137b	C	O	30834	11.9		Turbidity	Low	Urban Runoff/Storm Sewers
Sugar Creek From Hwy 51 to NC/SC border	11-137c	C	O	30834	1.2		Turbidity	Low	Urban Runoff/Storm Sewers
Henry Fork From SR 1143 to South Fork	11-129-1-(12.5)c	C	O	30835	8		Turbidity	Low	
Clark Creek From source to Sweetwater Road	11-129-5-(0.3)b	C	O	30835	3.5		Biological impairment due to Toxicity	Low	Industrial and commercial areas
Clark Creek From a point 0.9 mile upstream of Walker Creek to South Fork Catawba R.	11-129-5-(9.5)	WS-IV	O	30835	1.7		Copper	High	Industrial Point Sources Urban Runoff/Storm Sewers
Clark Creek From a point 0.9 mile upstream of Walker Creek to South Fork Catawba R.	11-129-5-(9.5)	WS-IV	O	30835	1.7		Fecal Coliform	High	Industrial Point Sources Urban Runoff/Storm Sewers
Clark Creek From a point 0.9 mile upstream of Walker Creek to South Fork Catawba R.	11-129-5-(9.5)	WS-IV	O	30835	1.7		Turbidity	High	Industrial Point Sources Urban Runoff/Storm Sewers
Crowders Creek SR 1108 to NC 321	11-135e	C	O	30837	1.4		Fecal Coliform	Low	Urban Runoff/Storm Sewers
Crowders Creek NC 321- SR 2424	11-135f	C	O	30837	1.4		Fecal Coliform	Low	Industrial Point Sources Urban Runoff/Storm Sewers

Catawba River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Crowders Creek SR 2424 to NC/SC line	11-135g	C	O	30837	0.8		Fecal Coliform	Low	Industrial Point Sources Urban Runoff/Storm Sewers

Catawba River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Coperning Creek From source to Marion WWTP	11-32-1-4a	C	O	30830	4.2		Cause Unknown	Low	Urban Runoff/Storm Sewers
Coperning Creek From Marion WWTP to North Muddy Creek	11-32-1-4b	C	O	30830	0.5		Cause Unknown	Low	Municipal Point Sources Urban Runoff/Storm Sewers
Lower Creek From Zack's Fork to Caldwell Co SR 1143	11-39-(0.5)b	C	O	30831	4.8		Habitat Degradation	Low	Urban Runoff/Storm Sewers
Lower Creek From Caldwell County SR 1143 to a point 0.7 mile downstream of Bristol Creek	11-39-(6.5)	WS-IV	O	30831	6.6		Historical listing for 'sediment' based on biological impairment	High	Municipal Point Sources Urban Runoff/Storm Sewers Non-urban development
Lower Creek From a point 0.7 mile downstream of Bristol Creek to Rhodhiss Lake, Catawba River	11-39-(9)	WS-IV CA	O	30831	1.3		Habitat Degradation	High	Municipal Point Sources Non-urban development Urban Runoff/Storm Sewers
Zacks Fork Creek From source to Lower Creek	11-39-1	C	O	30831	8.2		Cause Unknown	Low	Agriculture
Spainhour Creek From source to Lower Creek	11-39-3	C	O	30831	4.3		Cause Unknown	Low	Urban Runoff/Storm Sewers
Greasy Creek From source to Lower Creek	11-39-4	C	O	30831	4.5		Cause Unknown	Low	
Bristol Creek From source to Lower Creek	11-39-8	WS-IV	O	30831	5.6		Habitat Degradation	High	Non-urban development
McDowell Creek From source to U.S. Hwy. 21	11-115-(1)	C	O	30833	1.1		Cause Unknown	Low	
McDowell Creek From US Hwy 21 to SR 2136 Mecklenburg Co	11-115-(1.5)a	WS-IV	O	30833	5		Cause Unknown, Historical listing for 'sediment' based on biological impairment	High	

Catawba River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
McDowell Creek From SR 2136 Mecklenburg Co to 0.7 mile upstream from mouth	11-115-(1.5)b	WS-IV	O	30833	3		Cause Unknown	High	
McDowell Creek From a point 0.7 mile upstream of mouth to Mountain Island Lake, Catawba River	11-115-(5)	WS-IV CA	O	30833	0.7		Cause Unknown	High	
Irwin Creek From source to Sugar Creek	11-137-1	C	O	30834	11.8		Cause Unknown	Low	Industrial Point Sources Municipal Point Sources Urban Runoff/Storm Sewers
Mccullough Branch From source to Sugar Creek	11-137-7	C	O	30834	2.6		Cause Unknown	Low	Surface mining
Little Sugar Creek From source to Archdale Rd	11-137-8a	C	O	30834	11.8		Cause Unknown	Low	Municipal Point Sources Urban Runoff/Storm Sewers
Little Sugar Creek From Arcdale Rd to NC 51	11-137-8b	C	O	30834	5.3		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Municipal Point Sources Urban Runoff/Storm Sewers
Little Sugar Creek From NC 51 to state line	11-137-8c	C	O	30834	3.6		Cause Unknown	Low	Municipal Point Sources Urban Runoff/Storm Sewers
McAlpine Creek From source to SR 3356, (Sardis Rd)	11-137-9a	C	O	30834	8.3		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	
McAlpine Creek From SR 3356 to NC 51	11-137-9b	C	O	30834	6.3		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
McAlpine Creek From NC 51 to NC 521	11-137-9c	C	O	30834	4.7		Cause Unknown	Low	Urban Runoff/Storm Sewers
McAlpine Creek From NC Hwy 521 to NC/SC stateline	11-137-9d	C	O	30834	1.1		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers

Catawba River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Sugar Creek From source to below WWTP, SR 1156, Mecklenburg	11-137a	C	O	30834	0.2		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Municipal Point Sources Urban Runoff/Storm Sewers
Sugar Creek From SR 1156 Mecklenburg, to HWY 51	11-137b	C	O	30834	11.9		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Sugar Creek From Hwy 51 to NC/SC border	11-137c	C	O	30834	1.2		Cause Unknown	Low	Urban Runoff/Storm Sewers
Mauney Creek From source to Hoyle Creek	11-129-15-5	WS-IV	O	30835	4.3		Cause Unknown	High	Municipal Point Sources
Clark Creek From Pinch Gut Creek to SR-1274, Catawba	11-129-5-(0.3)c(2)	C	O	30835	2.4		Cause Unknown	Low	Industrial Point Sources Agriculture Urban Runoff/Storm Sewers
Clark Creek From SR-1274 to 0.9 mi ab Walker Cr.	11-129-5-(0.3)d	C	O	30835	4		Cause Unknown	Low	Industrial Point Sources Agriculture Urban Runoff/Storm Sewers
Dallas Branch From ab Dallas WWTP to Long Creek	11-129-16-7b	C	O	30836	0.8		Cause Unknown	Low	Municipal Point Sources
Catawba Creek Source to SR-2446, Gaston	11-130a	C	O	30837	6.1		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Catawba Creek From SR 2446 to SR-2439, Gaston	11-130b	C	O	30837	2.9		Cause Unknown	Low	Municipal Point Sources Urban Runoff/Storm Sewers
Catawba Creek From SR 2439 to Lake Wylie	11-130c	C	O	30837	4.5		Cause Unknown	Low	
Mcgill Creek From source to Crowders Creek	11-135-2	C	O	30837	2.4		Cause Unknown	Low	

Catawba River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Ut to Crowders Creek From source to Crowders Creek	11-135-8.5	C	O	30837	0.4		Cause Unknown	Low	
Crowders Creek From source to SR 1118	11-135a	C	O	30837	1.8		Cause Unknown	Low	Urban Runoff/Storm Sewers
Crowders Creek SR 1118 to SR 1125	11-135b	C	O	30837	1.7		Cause Unknown	Low	Urban Runoff/Storm Sewers
Crowders Creek Sr 1125 to SR1131	11-135c	C	O	30837	4.5		Cause Unknown	Low	Urban Runoff/Storm Sewers
Crowders Creek SR 1131 to SR 1108	11-135d	C	O	30837	4.2		Cause Unknown	Low	Urban Runoff/Storm Sewers
Crowders Creek SR 1108 to NC 321	11-135e	C	O	30837	1.4		Cause Unknown	Low	Urban Runoff/Storm Sewers
Crowders Creek NC 321- SR 2424	11-135f	C	O	30837	1.4		Cause Unknown	Low	Industrial Point Sources Urban Runoff/Storm Sewers

Number of waterbody-pollutant/pollution combinations for Catawba: 77

Total waterbody-pollutant/pollution combination miles: *343.5* **acres:**

Chowan River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Chowan River	25a	B NSW	FC		39.8		Fish Advisory-Mercury	Low	Industrial, Municipal Atmospheric Deposition
From North Carolina-Virginia State Line to the subbasin 03-01-01/03-01-03 boundary									
Chowan River	25a	B NSW	AL	30101	1.8		Low Dissolved Oxygen	Low	Agriculture Intensive Animal Feeding Operat
1.8 miles of 25a as defined from NC/VA state line to Near Riddicksville									
Potecasi Creek	25-4-8	C NSW	AL	30102	45.6		Low Dissolved Oxygen	Low	Agriculture
From source to Meherrin River									
Potecasi Creek	25-4-8	C NSW	AL	30102	45.6		pH	Low	
From source to Meherrin River									
Chowan River	25b	B NSW	O	30103	12.2		Nutrients	Low	Industrial Point Sources Municipal Point Sources
From below Holiday Island near Harrellsville to subbasin 03-01-03/03-01-04 boundary									
Chowan River	25c	B NSW	O	30104	7.8		Nutrients	Low	
From the Subbasin 03-01-03/03-01-04 boundary to mouth defined by a line extending in a southerly direction from Reedy Point on the north shore of Albemarle Sound to a point of land on the south side of the mouth of Black Walnut Swamp									

Chowan River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Wiccacon River (Hoggard Swamp) From source to Chowan River	25-14	C NSW	AL	30101	22.5		Cause Unknown	Low	
Bells Branch From source to Potecasi Creek	25-4-8-10	C NSW	O	30102	4.8		Cause Unknown	Low	
Painter Swamp From source to Potecasi Creek	25-4-8-5	C NSW	O	30102	3.7		Cause Unknown	Low	

Number of waterbody-pollutant/pollution combinations for Chowan: 9

Total waterbody-pollutant/pollution combination miles: *183.8* **acres:**

French Broad River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Waterville Lake	5-WATERVILLE L	C	O	40305		340	Fish Advisory-Dioxins	Low	

French Broad River Basin

Category 4c

Waters impaired by pollution. TMDLs are not appropriate.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Morgan Mill Creek From trout farm (US 64) to Peter Weaver Cr.	6-10-1b	B Tr	O	40301	0.3		Biological impairment due to Hydromodification	Low	Sediment Deposition Substrate Instability
Peter Weaver Creek From Morgan Mill Cr. to French Broad River	6-10b	C Tr	O	40301	0.8		Biological impairment due to Hydromodification	Low	Sediment Deposition Substrate Instability

French Broad River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Morgan Mill Creek From trout farm (US 64) to Peter Weaver Cr.	6-10-1b	B Tr	O	40301	0.3		Biological impairment due to Organic Enrichment	Low	Aquaculture Livestock
Peter Weaver Creek From Morgan Mill Cr. to French Broad River	6-10b	C Tr	O	40301	0.8		Biological impairment due to Organic Enrichment	Low	Aquaculture Livestock
Mud Creek From source to Byers Cr	6-55a	C	O	40302	15.2		Turbidity	Low	Agriculture Urban Runoff/Storm Sewers
Newfound Creek From SR 1296 to SR 1297	6-84b	C	O	40302	1.3		Fecal Coliform	Low	Pasture Grazing-Riparian and/o Non-urban development
Newfound Creek From SR 1297 to SR 1378	6-84c	C	O	40302	2.3		Fecal Coliform	Low	Agriculture Pasture Grazing-Riparian and/or Non-urban development
Newfound Creek SR 1378 to French Broad R	6-84d	C	O	40302	6.6		Fecal Coliform	Low	Agriculture Pasture Grazing-Riparian and/or Non-urban development

French Broad River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
West Fork French Broad From above to below trout farms	6-2-(0.5)b	C Tr	O	40301	0.5		Cause Unknown	Low	Aquaculture
Gash Creek From source to French Broad River	6-47	C	O	40302	3.7		Habitat Degradation	Medium	Non-urban development
Mill Pond Creek From source to French Broad River	6-51	WS-IV	O	40302	3.6		Cause Unknown	High	Land Disposal
Clear Creek From source to Lewis Creek	6-55-11-(1)	B Tr	O	40302	11.7		Habitat Degradation	Low	Specialty Crop Production
Clear Creek From Lewis Creek to Mud Creek	6-55-11-(5)	C	O	40302	6.3		Cause Unknown, Habitat Degradation	Low	Specialty Crop Production
Bat Fork From source to Johnson Drainage Ditch	6-55-8-1	C	O	40302	4.8		Cause Unknown, Habitat Degradation	Low	Agriculture Urban Runoff/Storm Sewers Non-urban Development
Mud Creek From source to Byers Cr	6-55a	C	O	40302	15.2		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers
Mud Creek From Byers Cr to French Broad River	6-55b	C	O	40302	3.2		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Medium	Agriculture Specialty Crop Production Urban Runoff/Storm Sewers
South Hominy Creek From source to Hominy Creek	6-76-5	C Tr	O	40302	6.4		Habitat Degradation	Medium	Agriculture Specialty Crop Production
Hominy Creek From NC 151 to NC 112	6-76b	C	O	40302	3.1		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Specialty Crop Production Urban Runoff/Storm Sewers Non-urban Development
Hominy Creek From NC 112 to French Broad R	6-76c	C	O	40302	8.7		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers Non-urban development

French Broad River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Ross Creek (Lake Kenilworth) From I-240 to Swannanoa River	6-78-23b	B	O	40302	1.7		Habitat Degradation	Low	Urban Runoff/Storm Sewers
Mills River From SR 1337 to 0.5 mile upstream of NC Hwy 191	6-54-(1)b	WS-II Tr	O	40303	1.4		Cause Unknown	High	Specialty Crop Production
Mills River From a point 0.5 mile upstream of N.C. Hwy. 191 to City of Hendersonville water supply intake located 0.1 mile downstream of N.C. Hwy. l91	6-54-(4.5)	WS-II Tr CA	O	40303	0.6		Cause Unknown	High	Specialty Crop Production
Mills River From City of Hendersonville water supply intake to a point 0.7 mile upstream of mouth of Mills River	6-54-(5)	WS-III	O	40303	1.9		Cause Unknown	High	Specialty Crop Production
Mills River From a point 0.7 mile upstream of mouth of Mills River to French Broad River	6-54-(6.5)	WS-III CA	O	40303	0.7		Cause Unknown	High	Specialty Crop Production
Brandy Branch From source to Mills River	6-54-6	WS-III	O	40303	1.9		Cause Unknown	High	
Little Ivy Creek From SR 1547 to Ivy Creek	6-96-10b	WS-II	O	40304	2.6		Cause Unknown	High	Agriculture Non-urban development
Pigeon River From Canton water supply intake to Clyde at SR 1642	5-(7)a	C	O	40305	7		Cause Unknown	Low	
Richland Creek From Lake Junaluska Dam to Pigeon River	5-16-(16)	C	O	40305	2.4		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers Non-urban development
Hyatt Creek Source to SR 1159, Haywood Co	5-16-6a	C	O	40305	0.9		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	
Hyatt Creek From SR-1159, to Richland Ck	5-16-6b	C	O	40305	2.6		Historical listing for 'sediment' based on biological impairment	Low	

French Broad River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Right Fork Cane Creek From source to Cane Creek	7-2-59-1	C Tr	O	40306	1.1		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	

Number of waterbody-pollutant/pollution combinations for French Broad: 32

Total waterbody-pollutant/pollution combination miles: *119.6* **acres:** *340*

Little Tennessee River Basin

Category *4c*

Waters impaired by pollution. TMDLs are not appropriate.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Cullasaja River (Ravenel Lake) From source to Macon County SR 1545	2-21-(0.5)	WS-III Tr	AL	40401	3.2		Biological impairment due to Hydromodification	High	Dams
Mill Creek From source to Mirror Lake, Cullasaja River	2-21-3	WS-III Tr	AL	40401	1.4		Biological impairment due to Hydromodification	High	Excessive water velocity due to Inadequate colonization potential

Little Tennessee River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Mill Creek From source to Mirror Lake, Cullasaja River	2-21-3	WS-III Tr	AL	40401	1.4		Biological impairment due to Toxicity	High	
Whiteoak Creek From SR 1397 to SR 1423	2-57-45b	C Tr	O	40403	1		Nutrients	Low	Minor Non-municipal
Santeetlah Lake West Buffalo Creek Arm of Santeetlah Lake from SR 1148 to Santeetlah Lake, Cheoah River	2-190-12b	B Tr	PR	40404		280	Nutrients	Low	Aquaculture

Little Tennessee River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
LITTLE TENNESSEE RIVER (Including From North Carolina-Georgia State line to the confluence of Mulberry Creek	2-(1)a	C	AL	40401	2.2		Cause Unknown	High	Sources outside state jurisdictio
Beech Flats Prong From source to Aden Branch	2-79-55-2a	C Tr HQW	AL	40402	2.3		Cause Unknown	Medium	Road construction

Number of waterbody-pollutant/pollution combinations for Little Tennessee: 7

Total waterbody-pollutant/pollution combination miles: *11.5* **acres:** *280*

Lumber River Basin

Category 4a

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Drowning Creek From source to Naked Creek	14-2-(1)	WS-II Sw	O	30750	20.5		Fish Advisory-Mercury		9/15/00
Drowning Creek From a point 0.4 mile upstream of U.S. Hwy. 1 to Lumber River	14-2-(10.5)	C Sw HQW	O	30750	6.9		Fish Advisory-Mercury		9/15/00
Drowning Creek From Naked Creek to Horse Creek	14-2-(6.5)	WS-II Sw	O	30750	5.4		Fish Advisory-Mercury		9/15/00
Drowning Creek From Horse Creek to a point 0.4 mile upstream of U.S. Hwy. 1 (Town of Southern Pines water supply intake)	14-2-(9)	WS-II Sw CA	O	30750	0.6		Fish Advisory-Mercury		9/15/00
Aberdeen Creek [Pages Lake] From backwaters of Pages Lake (Aberdeen Lake) at normal lake elevation to dam of Pages Lake (Aberdeen Lake)	14-2-11-(5)	B	O	30750		40	Fish Advisory-Mercury		9/15/00
Watsons Lake Entire lake	14-2-11-2	B	O	30750		0.8	Fish Advisory-Mercury		9/15/00
Pit Links Lake Moore County	14-PIT LINKS LAK	B	O	30750		1	Fish Advisory-Mercury		9/15/00
Lumber River From a point 0.5 mile upstream of Powell Branch to Raw Water Supply Intake for City of Lumberton	14-(10.3)	WS-IV Sw HQW C	O	30751	0.7		Fish Advisory-Mercury		9/15/00
Lumber River From Raw Water Supply Intake for City of Lumberton to U.S. Hwy. 301 Bypass	14-(11)	B Sw HQW	O	30751	0.5		Fish Advisory-Mercury		9/15/00
Lumber River HWY 301 to SR2289 /SR-2289, Robeson Co.	14-(13)a	C Sw	O	30751	2.7		Fish Advisory-Mercury		9/15/00
Lumber River From SR 2289 to Lumber R above Alpha Cellulose, SR 2202	14-(13)b	C Sw	O	30751	0.7		Fish Advisory-Mercury		9/15/00

Lumber River Basin

Category 4a

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Lumber River Lumber R. above Alpha Cell. at 2202 to above WWTP, Robeson Co.	14-(13)c	C Sw	O	30751	0.6		Fish Advisory-Mercury		9/15/00
Lumber River Above WWTP to below WWTP at SR-1620/72 Robeson Co.	14-(13)d	C Sw	O	30751	1.3		Fish Advisory-Mercury		9/15/00
Lumber River SR 1620 to NC 74, Robeson Co	14-(13)e	C Sw	O	30751	16.6		Fish Advisory-Mercury		9/15/00
Lumber River From NC 74 to NC 904	14-(13)f	C Sw	O	30751	18.4		Fish Advisory-Mercury		9/15/00
Lumber River From N.C. Hwy. 904 to North Carolina-South Carolina State Line	14-(28)	B Sw	O	30751	3.8		Fish Advisory-Mercury		9/15/00
Lumber River From NC Hwy 71 to SR 1303	14-(4.5)b	B Sw HQW	O	30751	2.5		Fish Advisory-Mercury		9/15/00
Lumber River SR-1303 to SR-1153, Robeson Co./SR-1153	14-(4.5)c	B Sw HQW	O	30751	2.4		Fish Advisory-Mercury		9/15/00
Lumber River SR-1153 to Seaboard Coast Line RR Bridge near Pembroke	14-(4.5)d	B Sw HQW	O	30751	5.9		Fish Advisory-Mercury		9/15/00
Lumber River From Seaboard Coast Line RR bridge to .5 mi upstream of Powell Br.	14-(7)a	WS-IV&B Sw HQ	O	30751	20		Fish Advisory-Mercury		9/15/00
Porter Swamp From source to Lumber River	14-27	C Sw	O	30751	16.4		Fish Advisory-Mercury		9/15/00
Big Swamp From source to NC 211	14-22a	C Sw	O	30753	15.4		Fish Advisory-Mercury		9/15/00

Lumber River Basin

Category 4a

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Big Swamp From NC 211 to Lumber River	14-22b	C Sw	O	30753	9.5		Fish Advisory-Mercury		9/15/00
Ashpole Swamp From source to Hog Swamp	14-30a	C Sw	O	30754	18.8		Fish Advisory-Mercury		9/15/00
Ashpole Swamp From Hog Swamp to North Carolina-South Carolina border	14-30b	C Sw	O	30754	6.9		Fish Advisory-Mercury		9/15/00
Waccamaw River From source at dam at Lake Waccamaw to 0.1 mi below Lake Waccamaw	15-(1)a	C Sw	O	30756	0.2		Fish Advisory-Mercury		9/15/00
Waccamaw River From 0.1 mile below dam to off SR 1930	15-(1)b	C Sw	O	30756	6.8		Fish Advisory-Mercury		9/15/00
Waccamaw River From site off SR 1930 to SR 1928	15-(1)c	C Sw	O	30756	3.5		Fish Advisory-Mercury		9/15/00
Big Creek From source to Lake Waccamaw	15-2-6	C Sw	O	30756	5		Fish Advisory-Mercury		9/15/00
Waccamaw River From SR 1928 to NC 130	15-(1)d	C Sw	O	30757	8.9		Fish Advisory-Mercury		9/15/00
Waccamaw River From NC 130 to NC 904	15-(1)e	C Sw	O	30757	18.1		Fish Advisory-Mercury		9/15/00
Waccamaw River From N.C. Hwy. 904 to North Carolina-South Carolina State Line	15-(18)	B Sw	O	30757	8.4		Fish Advisory-Mercury		9/15/00
White Marsh Welch Creek to Richardson Swamp	15-4a	C Sw	O	30758	5.7		Fish Advisory-Mercury		9/15/00

Lumber River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
White Marsh From Richardson Swamp to Waccamaw River	15-4b	C Sw	O	30758	12.6		Fish Advisory-Mercury		9/15/00
White Marsh From source to Welch Creek	15-4c	C Sw	O	30758	5.2		Fish Advisory-Mercury		9/15/00

Lumber River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Atlantic Ocean	99-(1)	SB	O			56960	Fish Advisory-Mercury	Low	
The waters of the Atlantic Ocean contiguous to that portion of the Waccamaw River Drainage Area of the Lumber River Basin extending from the Cape Fear River Basin to the North Carolina-South Carolina State Line									

Lumber River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Calabash (DEH Area)	A1	SA	O			1138	Fecal Coliform	High	Urban Runoff/Storm Sewers Onsite Wastewater Systems (Se Marinas
Shallotte River (DEH Area)	A2	SA	O			571	Fecal Coliform	Medium	Urban Runoff/Storm Sewers Onsite Wastewater Systems (Se
Lockwoods Folly River (DEH Area)	A3	SA	O			913	Fecal Coliform	Low	Urban Runoff/Storm Sewers Onsite Wastewater Systems (Se Marinas

Number of waterbody-pollutant/pollution combinations for Lumber: 39

Total waterbody-pollutant/pollution combination miles: *250.9* **acres:** *59623.8*

Neuse River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Neuse River (DEH Area)	F8	SC Sw NSW	O			9450	Chlorophyll-a		3/19/02
Neuse River (DEH Area)	F9	SB Sw NSW	O			19500	Chlorophyll-a		3/19/02
Crabtree Creek From Cary WWTP to Richlands Cr, Wake	27-33-(3.5)b	B NSW	O	30402	5		Low Dissolved Oxygen		4/11/94
Contentnea Cr (Buckhorn Reservoir) From source to a point 0.6 mile upstream of Marsh Swamp	27-86-(1)	WS-V NSW	O	30407	9.1		Low Dissolved Oxygen		4/11/94

Neuse River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Toms Creek (Mill Creek) From source to Neuse River	27-24	C NSW	O	30402	4		Biological impairment due to Chlorine	Low	

Neuse River Basin

Category *4c*

Waters impaired by pollution. TMDLs are not appropriate.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Flat River From dam at Lake Michie to a point 0.2 miles upstream of Durham County SR 1004	27-3-(8)	WS-IV NSW	O	30401	2.8		Low Dissolved Oxygen	Low	Agriculture Flow Regulation/Modification
Toms Creek (Mill Creek) From source to Neuse River	27-24	C NSW	O	30402	4		Biological impairment due to Habitat Degradation	Low	
Lake Raleigh Wake County	27-LAKE RALEIG	B-NSW	O	30402		90	Drained	Low	

Neuse River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Atlantic Ocean	99-(5)	SB NSW	O			44800	Fish Advisory-Mercury	Low	
The waters of the Atlantic Ocean contiguous to that portion of the Neuse River Basin that extends from the southwest tip of Ocracoke Island to the southwest side of Drum Inlet									
Little Lick Creek	27-9-(0.5)	WS-IV NSW	O	30401	6.5		Low Dissolved Oxygen	High	Construction Urban Runoff/Storm Sewers
From source to a point 0.4 mile upstream of Durham County SR 1811									
Crabtree Creek	27-33-(3.5)b	B NSW	O	30402	5		Turbidity	Low	Land Development Urban Runoff/Storm Sewers
From Cary WWTP to Richlands Cr, Wake									
Pigeon House Branch	27-33-18	C NSW	O	30402	2.9		Copper	Medium	Urban Runoff/Storm Sewers Industrial Permitted
From source to Crabtree Creek									
Pigeon House Branch	27-33-18	C NSW	O	30402	2.9		Fecal Coliform	Medium	Urban Runoff/Storm Sewers Industrial Permitted
From source to Crabtree Creek									
Pigeon House Branch	27-33-18	C NSW	O	30402	2.9		Low Dissolved Oxygen	Medium	Urban Runoff/Storm Sewers Industrial Permitted
From source to Crabtree Creek									
Big Lake	27-BIG LAKE_WA	B NSW	O	30402		62	Aquatic Weeds (Hydrilla sp.)	Low	
Entire Lake									
Reedy Creek Lake	27-REEDY CREE	B-NSW	O	30402		20	Aquatic Weeds(Hydrilla sp.)	Low	
Wake County									
Lake Wackena	27-LAKE WACKE	C-NSW	O	30405		165	Aquatic Weeds	Low	
Wayne County									
Little Contentnea Creek	27-86-26	C Sw NSW	O	30407	27		Low Dissolved Oxygen	Low	Irrigated Crop Production Specialty Crop Production Intensive Animal Feeding Operat Aquaculture Holding/Management Area
From source to Contentnea Creek									
Creeping Swamp	27-97-5-3	C Sw NSW	O	30409	6.6		Chlorophyll-a	Medium	Nonirrigated Crop Production Channelization
From source to Clayroot Swamp									

Neuse River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Trent River From source to mouth of Deep Gully	27-101-(1)	C Sw NSW	O	30411	71.8		Low Dissolved Oxygen	Medium	Agriculture Intensive Animal Feeding Operat Off-farm Animal Holding/Manage

Neuse River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Lick Creek From source to Wake County SR 1809	27-11-(0.5)	WS-IV NSW	O	30401	9.9		Historical listing for 'sediment' based on biological impairment	High	Construction Urban Runoff/Storm Sewers
New Light Creek From source to Wake County SR 1911	27-13-(0.1)	WS-IV NSW	O	30401	8		Cause Unknown	High	Agriculture
New Light Creek From Wake County SR 1911 to Falls Lake, Neuse River	27-13-(2)	WS-IV NSW CA	O	30401	0.6		Cause Unknown	High	Agriculture
North Fork Little River From Source to SR 1519, Orange Co.	27-2-21-3a	WS-II NSW	O	30401	6.5		Cause Unknown	High	Agriculture
South Flat River Source to SR 1009	27-3-3a	WS-III NSW	O	30401	3		Cause Unknown	High	Agriculture Off-farm Animal Holding/Management Area
Knap Of Reeds Creek From dam at Butner Lake to a point 1.9 miles downstream of Granville County SR 1120	27-4-(6)	WS-IV NSW	O	30401	6		Cause Unknown	High	Urban Runoff/Storm Sewers Source Unknown
Knap Of Reeds Creek From a point 1.9 miles downstream of Granville County SR 1120 to Falls Lake, Neuse River	27-4-(8)	WS-IV NSW CA	O	30401	0.8		Cause Unknown	High	Urban Runoff/Storm Sewers Source Unknown
Ellerbe Creek From source to I-85 Bridge	27-5-(0.3)	C NSW	O	30401	5.8		Cause Unknown	Medium	Urban Runoff/Storm Sewers
Ellerbe Creek From I-85 Bridge to a point 0.2 mile upstream of Durham County SR 1636	27-5-(0.7)	WS-IV NSW	O	30401	5.9		Cause Unknown	High	Urban Runoff/Storm Sewers
Ellerbe Creek From a point 0.2 mile upstream of Durham County SR 1636 to Falls Lake, Neuse River	27-5-(2)	WS-IV NSW CA	O	30401	0.5		Cause Unknown	High	Minor Non-municipal Urban Runoff/Storm Sewers
Little Lick Creek (including portion of Lit From a point 0.4 mile upstream of Durham SR 1811 to Falls Lake, Neuse River	27-9-(2)	WS-IV NSW CA	O	30401	0.5		Cause Unknown	High	Construction Urban Runoff/Storm Sewers

Neuse River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Perry Creek (Greshams Lake) From source to dam at Greshams Lake	27-25-(1)	B NSW	O	30402	3.6		Cause Unknown	Low	Minor Non-Municipal Urban Runoff/Storm Sewers
Perry Creek From dam at Greshams Lake to Neuse River	27-25-(2)	C NSW	O	30402	2.3		Cause Unknown	Low	Minor Non-Municipal Urban Runoff/Storm Sewers
Crabtree Creek From source to backwaters of Crabtree Lake	27-33-(1)	C NSW	O	30402	5.8		Cause Unknown	Medium	Land Development Urban Runoff/Storm Sewers
Crabtree Creek From mouth of Richlands Creek to US 1	27-33-(10)a	C NSW	O	30402	8.6		Cause Unknown	Medium	Land Development Urban Runoff/Storm Sewers
Crabtree Creek From backwaters of Crabtree Lake to Ca	27-33-(3.5)a	B NSW	O	30402	0.2		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Hare Snipe Creek From dam at Lake Lynn to Crabtree Creek	27-33-12-(2)	C NSW	O	30402	2.5		Cause Unknown	Low	Urban Runoff/Storm Sewers
Mine Creek From source to Shelly Lake	27-33-14a	C NSW	O	30402	3.3		Cause Unknown	Low	Land Development Urban Runoff/Storm Sewers
Mine Creek From Shelly Lake to Crabree Creek	27-33-14b	C NSW	O	30402	1.5		Cause Unknown	Medium	Land Development Urban Runoff/Storm Sewers
Marsh Creek From source to Crabtree Creek	27-33-20	C NSW	O	30402	6.4		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Black Creek From source to Crabtree Lake, Crabtree Cr.	27-33-5	C NSW	O	30402	3.6		Cause Unknown	Low	Urban Runoff/Storm Sewers
Walnut Creek From dam at Lake Johnson to backwaters of Lake Raleigh	27-34-(1.7)	C NSW	O	30402	1.3		Cause Unknown	Low	Urban Runoff/Storm Sewers

Neuse River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Walnut Creek (Lake Raleigh) From backwaters of Lake Raleigh to dam at Lake Raleigh	27-34-(3.5)	B NSW	O	30402	0.7		Cause Unknown	Low	Urban Runoff/Storm Sewers
Walnut Creek From dam at Lake Raleigh to SR 2544	27-34-(4)a	C NSW	O	30402	7.2		Historical listing for 'sediment' based on biological impairment	Medium	Urban Runoff/Storm Sewers
Walnut Creek from SR 2544 (Sunnybrook Rd) to Neuse	27-34-(4)b	C NSW	O	30402	3.4		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Swift Creek From source to Holly Springs Rd. Wake	27-43-(1)a	WS-III NSW	O	30402	2.2		Historical listing for 'sediment' based on biological impairment	High	Land Development Agriculture Urban Runoff/Storm Sewers
Swift Creek From Holly Springs Rd to .6 mile upstream	27-43-(1)b	WS-III NSW	O	30402	7		Historical listing for 'sediment' based on biological impairment	High	Urban Runoff/Storm Sewers
Little Creek From source to Swift Creek	27-43-12	C NSW	O	30402	12		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers
Williams Creek From source to Swift Creek	27-43-2	WS-III NSW	O	30402	4.8		Cause Unknown	High	Construction Urban Runoff/Storm Sewers
Stoney Creek From source to Neuse River	27-62	C NSW	O	30405	10.2		Cause Unknown	Medium	Urban Runoff/Storm Sewers
Bear Creek From source to Neuse River	27-72	C Sw NSW	O	30405	15.8		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Buffalo Creek From dam at Robertsons Pond to a point 200 feet upstream from West Haywood Street near Wendell	27-57-16-(2)	B NSW	O	30406	5.6		Historical listing for 'sediment' based on biological impairment	Medium	Agriculture
Buffalo Creek (Wendell Lake) From a point 200 feet upstream from West Haywood Street near Wendell to Little River	27-57-16-(3)	C NSW	O	30406	20.9		Historical listing for 'sediment' based on biological impairment	High	Agriculture Construction

Neuse River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Contentnea Cr (Buckhorn Reservoir) From source to a point 0.6 mile upstream of Marsh Swamp	27-86-(1)	WS-V NSW	O	30407	9.1		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Contentnea Creek From a point 0.6 mile upstream of Marsh Swamp to a point 0.6 mile downstream of Shepard Branch	27-86-(4.5)	WS-IV NSW	O	30407	7.2		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Contentnea Creek (Wiggins Mill Reserv From a point 0.6 mile downstream of Shepard Branch to dam at Wilson Water Supply Intake (Wiggins Mill Reservoir)	27-86-(5.8)	WS-IV NSW CA	O	30407	4		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Contentnea Creek From dam at Wilson Water Supply to NC	27-86-(7)a	C Sw NSW	O	30407	18.2		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Nonirrigated Crop Production Pasture grazing-Riparian and/or Intensive Animal Feeding Holding/Management Area
Nahunta Swamp From source to Contentnea Creek	27-86-14	C Sw NSW	O	30407	27.1		Cause Unknown	Low	Municipal Point Sources Agriculture
Little Creek (West Side) From source to Moccasin Creek	27-86-2-4	C NSW	O	30407	4.5		Cause Unknown	Medium	Agriculture
Beaverdam Creek From source to Turkey Creek	27-86-3-8	C NSW	O	30407	5.7		Historical listing for 'sediment' based on biological impairment	Low	Municipal Point Source Agriculture
Turner Swamp From source to Contentnea Creek	27-86-9.5	C Sw NSW	O	30407	4.6		Cause Unknown	Low	
Core Creek From source to Neuse River	27-90	C Sw NSW	O	30408	18.5		Historical listing for 'sediment' based on biological impairment	High	Nonirrigated Crop Production Intensive Animal Feeding Operat Off-farm Animal Holding/manage Channelization
Swift Creek Source to Palmetto Swamp	27-97-(0.5)a	C Sw NSW	O	30409	25.9		Cause Unknown	High	Agriculture Channelization
Swift Creek Palmetto Swamp to Bear Br	27-97-(0.5)b	C Sw NSW	O	30409	10.9		Historical listing for 'sediment' based on biological impairment	Low	Nonirrigated Crop Production Channelization

Neuse River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Swift Creek From Bear Branch to Neuse River	27-97-(6)	C Sw NSW	O	30409	8		Cause Unknown	Low	Agriculture Channelization
Clayroot Swamp From source to Swift Creek	27-97-5	C Sw NSW	O	30409	12.6		Cause Unknown	Medium	Agriculture Channelization
Brice Creek From source to Craven County SR 1004	27-101-40-(1)	C Sw NSW	O	30410	21.4		Cause Unknown	High	Nonirrigated Crop Production
Beaver Creek From source to Trent River	27-101-15	C Sw NSW	O	30411	8		Cause Unknown	Low	Nonirrigated Crop Production Off-farm Animal Holding/Manage Forest management (pumped dr

Neuse River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Neuse River (DEH Area)	F1	SA NSW	O			900	Fecal Coliform	Low	Agriculture Municipal Point Sources Urban Runoff/Storm Sewers Marinas
Merrimon (DEH Area)	F2	SA NSW	O			1475	Fecal Coliform	Medium	Agriculture Silviculture
West Bay (DEH Area)	F3	SA NSW	O			12	Fecal Coliform	Low	Natural Sources
Cedar Island (DEH Area)	F4	SA ORW NSW	O			13	Fecal Coliform	Low	Marinas
Oriental (DEH Area)	F5	SA NSW	O			851	Fecal Coliform	Low	Municipal Point Sources Agriculture Urban Runoff/Storm Sewers Onsite Wastewater Systems
Bay River (DEH Area)	F6	SA NSW	O			337	Fecal Coliform	Low	Municipal Point Sources Off-farm Animal Holding/Manage Urban Runoff/Storm Sewers Onsite Wastewater Systems

Number of waterbody-pollutant/pollution combinations for Neuse: 74

Total waterbody-pollutant/pollution combination miles: *512.6* **acres:** *77675*

New River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little Buffalo Creek From source to Buffalo Creek	10-2-20-1	C Tr +	O	50702	3.8		Nutrients	Low	Minor Municipal Point Sources Urban Runoff/Storm Sewers

New River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Peak Creek From Ore Knob Branch to South Fork New River	10-1-35-(2)b	B Tr +	O	50701	2.9		pH	Medium	Abandoned Mining
Ore Knob Branch From source to Peak Creek	10-1-35-3	B Tr +	O	50701	0.9		Copper	Medium	Adandoned Mining
Ore Knob Branch From source to Peak Creek	10-1-35-3	B Tr +	O	50701	0.9		Iron	Medium	Adandoned Mining
Ore Knob Branch From source to Peak Creek	10-1-35-3	B Tr +	O	50701	0.9		pH	Medium	Adandoned Mining
Ore Knob Branch From source to Peak Creek	10-1-35-3	B Tr +	O	50701	0.9		Zinc	Medium	Adandoned Mining
Little Peak Creek From source to Peak Creek	10-1-35-4	B Tr +	O	50701	2.4		Copper	Medium	Agriculture Abandoned mining
Little Peak Creek From source to Peak Creek	10-1-35-4	B Tr +	O	50701	2.4		pH	Medium	Agriculture Abandoned mining

New River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Naked Creek From Jefferson WWTP to South Fork New River	10-1-32b	C +	O	50701	2		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	Minor Municipal Point Source Land Development Urban Runoff/Storm Sewers
Little Buffalo Creek From source to Buffalo Creek	10-2-20-1	C Tr +	O	50702	3.8		Cause Unknown	Low	Minor Municipal Point Source Urban Runoff/Storm Sewers

Number of waterbody-pollutant/pollution combinations for New: 10

Total waterbody-pollutant/pollution combination miles: *20.9* **acres:**

Pasquotank River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Roanoke Sound	30-21g	SA	PR	30156		21.4	Fecal Coliform		
The waters of Roanoke sound which include those waters around the Villa Condominium STP Outfall beginning at a point 35 degrees 57' 54" N- 75 degrees 38' 46" W, thence 200 yards in a southwesterly direction to a point in the sound at 35 degrees 57' 48" N-75 degrees 38'39" W, thence 400 yards in a southeasterly direction to a point in the sound at									

Pasquotank River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little River	30-5-(2)	SC	O			512	Low Dissolved Oxygen	Low	Agriculture Onsite Wastewater Systems (Se
From source to a line in the Little River extending from 0.2 miles upstream of the mouth of Deep Creek on the west shore across to 0.3 miles upstream of Trueblood Point on the east shore.									
Atlantic Ocean	99-(7)	SB	FC		110		Fish Advisory-Mercury	Low	
The waters of the Atlantic Ocean contiguous to that portion of Pasquotank River Basin that extends from the North Carolina-Virginia State Line to the northeast tip of Ocracoke Island									
Spencer Creek	30-20-3	SA	SH	30151		86.8	Fecal Coliform	High	
From source to Croatan Sound									
Callaghan Creek	30-20-4	SA	SH	30151		24.8	Fecal Coliform	High	
From source to Croatan Sound									
Stumpy Point Bay	30-22-8b	SA	SH	30151		185.8	Fecal Coliform	High	
All those waters bounded by a line beginning at a point 35 degrees 41' 55" N-75 degrees 46' 09" W, thence in a southeasterly direction to a point 400 yards offshore at 35 degrees 41' 46" N- 75 degrees 45' 54" W, thence in a southwesterly direction in a st									
Stumpy Point Bay	30-22-8c	SA	SH	30151		245.5	Fecal Coliform	High	
All those waters within an area bounded by a line beginning at a point on the east shore at 35 degrees 41' 44" N- 75 degrees 44' 18" W, thence to a point in the bay at 35 degrees 41' 28" N- 75 degrees 44' 45" W, thence to a point in the bay at 35 degrees									
Little River	30-5-(1)	C Sw	AL	30152	11.8		Low Dissolved Oxygen	Low	Nonirrigated Crop Production Off-farm Animal Holding/Manage Land Development Onsite Wastewater Systems
From source to mouth of Halls Creek									
Scuppernong River	30-14-4-(1)	C Sw	AL	30153	15.2		Low Dissolved Oxygen	Low	Municipal Point Sources Nonirrigated Crop Production Specialty Crop Production Off-farm Animal
From source to mouth of Riders Creek (First Creek)									
Scuppernong River	30-14-4-(1)	C Sw	AL	30153	15.2		pH	Low	Municipal Point Sources Nonirrigated Crop Production Specialty Crop Production Off-farm Animal
From source to mouth of Riders Creek (First Creek)									
Phelps Lake	30-14-4-6-1	B SW ORW	FC	30153		16600	Fish Advisory- Mercury	Low	
Washington County									
Kendrick Creek (Mackeys Creek)	30-9-(1)	C Sw	AL	30153	13.2		Low Dissolved Oxygen	Low	Municipal Point Sources Nonirrigated Crop Production Off-farm Animal Holding/Manage
From source to U.S. Hwy. 64 at Roper									

Pasquotank River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Kendrick Creek (Mackeys Creek) From source to U.S. Hwy. 64 at Roper	30-9-(1)	C Sw	AL	30153	13.2		pH	Low	Municipal Point Sources Nonirrigated Crop Production Off-farm Animal Holding/Manage

Pasquotank River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Main Canal From source to Kendrick Creek	30-9-4	C Sw	O	30153		5	Cause Unknown	Low	Nonirrigated Crop Production Intensive Animal Feeding Ops Off-farm Animal Holding/ Manag

Pasquotank River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Croatan Sound	30-20-(2)b	SA	SH	30151		160.2	Fecal Coliform	High	
The waters of Croatan Sound enclosed in a line beginning at a point near north shore of Spencer Creek at 35 degrees 51' 45" N- 75 degrees 44' 53" W; and thence 250 yards in an easterly direction to a point at 35 degrees 51' 45" n- 75 degrees 44' 43" west									
Croatan Sound	30-20-(2)c	SA	SH	30151		280.1	Fecal Coliform	High	
The waters of Croatan Sound which include all waters within a line beginning at a point on the shore at 35 degrees 53' 56" N- 75 degrees 41' 36" W, thence WSW 800 yards to a point in the sound at 35 degrees 53' 38" N- 75 degrees 41' 53 W, thence 1975 yard									
Croatan Sound	30-20-(2)d	SA	SH	30151		146.1	Fecal Coliform	High	
The waters of Croatan Sound which include all waters on the North whore of Baum Creek to a straight line to Fl. Beacon number 2 at 35 degrees 50' 27" n-75 degrees 40' 06" W, thence in a straight line to a point on an island at 35 degrees 50' 05" N- 75 de									
Croatan Sound	30-20-(2)e	SA	SH	30151		78.1	Fecal Coliform	High	
The waters of Croatan sound which include all waters below Oyster Creek southeast to Cut Through. DEH closed area Croatan Sound 5-e									
Croatan Sound	30-20-(2)f	SA	SH	30151		16.4	Fecal Coliform	High	
DEH Closure Area at Mann's Harbor									
Baum Creek	30-20-5	SA	SH	30151		10.9	Fecal Coliform	High	
From source to Croatan Sound									
Oyster Creek	30-20-6	SA	SH	30151		62.8	Fecal Coliform	High	
From source to Croatan Sound									
Cut Through	30-20-8b	SA	SH	30151		124	Fecal Coliform	High	
From Roanoke Sound to DEH closure line									
Pond Island	30-21-4b	SA	SH	30151		37.8	Fecal Coliform	High	
The waters surrounding the Island within 1,000 feet from shore within subbasin 03-01-56									
Johns Creek	30-21-5	SA	SH	30151		10.7	Fecal Coliform	High	
From source to Roanoke Sound									
Sand Beach Creek	30-21-5-1	SA	SH	30151		38.7	Fecal Coliform	High	
From source to Johns Creek									

Pasquotank River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Rockhall Creek Entire Creek	30-21-6	SA	SH	30151		5.8	Fecal Coliform	High	
Broad Creek DEH closed area	30-21-7b	SA	SH	30151		119.2	Fecal Coliform	High	
Eagle Nest Bay Entire Bay	30-22-2	SA	SH	30155		55.5	Fecal Coliform	High	
Mill Creek From source to Pamlico Sound	30-22-22	SA	SH	30155		16.2	Fecal Coliform	High	
Peters Ditch From source to Pamlico Sound	30-22-23	SA	SH	30155		2.4	Fecal Coliform	High	
Askins Creek From source to Pamlico Sound	30-22-24	SA	SH	30155		4.9	Fecal Coliform	High	
Cape Creek From source to Pamlico Sound	30-22-27	SA	SH	30155		15.8	Fecal Coliform	High	
Brooks Creek From source to Pamlico Sound	30-22-28	SA	SH	30155		24.8	Fecal Coliform	High	
Joe Saur Creek From source to Pamlico Sound	30-22-29	SA	SH	30155		17.9	Fecal Coliform	High	
The Slash From source to Sandy Bay	30-22-30-1	SA	SH	30155		30.9	Fecal Coliform	High	
Sandy Bay DEH Closure Area	30-22-30a	SA	SH	30155		28.4	Fecal Coliform	High	

Pasquotank River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Austin Creek (Clubhouse Creek) From source to Pamlico Sound	30-22-31	SA	SH	30155		7.9	Fecal Coliform	HIgh	
Beach Slue Entire area of Beach Slue	30-22-9	SA	SH	30155		76.9	Fecal Coliform	High	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area of a boundary beginning at a point on land west of the Hatteras Ferry Landing at 35 degrees 12' 30" N- 75 degrees 42' 24" W, thence to a point in the ferry channel at 35 degrees 12' 37" N-75 de	30-22b	SA	SH	30155		12.7	Fecal Coliform	High	
Pamlico Sound The waters of the Pamlico Sound which include the DEH closed area with mouth 1.17 miles southwest of Durant Point.	30-22c	SA	SH	30155		13.7	Fecal Coliform	High	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area with mouth 321 meters east of east mouth of Austin Creek	30-22d	SA	SH	30155		3.1	Fecal Coliform	High	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area: all creeks, canals, and tributaries along Hatteras Island between Brooks Point to west mouth of Joe Saur Creek.	30-22e	SA	SH	30155		472.9	Fecal Coliform	High	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area: All waters south of a line beginning at a point on the shore north of Buxton at 35 degrees 16' 44" N- 75 degrees 31' 05" W, thence in a westerly direction through Bald Point to a point on the	30-22f	SA	SH	30155		171.8	Fecal Coliform	High	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area at the mouth of Askins Creek	30-22g	SA	SH	30155		0.7	Fecal Coliform	HIgh	
Pamlico Sound The waters of Pamlico Sound which include the DEH closed area at the mouth of Mill Creek. This includes all waters south of a line from Big Island to the Outer Banks and all waters east of line from Big Island to Gibbs Point.	30-22h	SA	SH	30155		28.8	Fecal Coliform	High	
Pond Island The waters surrounding the Island within 1,000 feet from shore within subbasin 03-01-51	30-21-4a	SA	SH	30156		167.2	Fecal Coliform	High	
Roanoke Sound DEH closed area on east side of Roanoke Island extending from mouth of Shallowbag Bay to Johns Creek along the shoreline	30-21b	SA	SH	30156		136	Fecal Coliform	High	

Pasquotank River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Roanoke Sound	30-21c	SA	SH	30156		105.3	Fecal Coliform	High	
DEH closed area west of Pond Island in subbasin 03-01-51									
Roanoke Sound	30-21d	SA	SH	30156		386.3	Fecal Coliform	High	
DEH closed area adjacent to Mill Landing on east side of Roanoke Island									
Roanoke Sound	30-21f	SA	SH	30156		1142.4	Fecal Coliform	High	
DEH closed area northeast of a line from Rhodams Point to Mann Point including Buzzard Bay									
Roanoke Sound	30-21g	SA	SH	30156		21.4	Fecal Coliform	High	
The waters of Roanoke sound which include those waters around the Villa Condominium STP Outfall beginning at a point 35 degrees 57' 54" N- 75 degrees 38' 46" W, thence 200 yards in a southwesterly direction to a point in the sound at 35 degrees 57' 48" N-									
Roanoke Sound	30-21h	SA	SH	30156		388.6	Fecal Coliform	High	
DEH closed area east of Pond Island adjacent to HWY 264 bridge									
Roanoke Sound	30-21i	SA	SH	30156		88.4	Fecal Coliform	High	
DEH closed area adjacent to Mill Landing in subbasin 03-01-56									
Roanoke Sound	30-21j	SA	SH	30156		34.3	Fecal Coliform	High	
DEH closed area in southern portion of Roanoke Sound adjacent to Big Tim Island									

Number of waterbody-pollutant/pollution combinations for Pasquotank: 54

Total waterbody-pollutant/pollution combination miles: *178.6* **acres:** *22227.3*

Roanoke River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
ROANOKE RIVER From 18 mile marker at Jamesville to Albemarle Sound (Batchelor Bay)	23-(53)	C Sw	FC	30209	18.3		Fish Advisory-Dioxins		11/4/96
Welch Creek From source to Roanoke River	23-55	C Sw	FC	30209	13.3		Fish Advisory-Dioxins		11/4/96

Roanoke River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
DAN RIVER	22-(31.5)	WS-IV	AL	30203	14.2		Turbidity	High	Dredge Mining
From a point 0.7 mile upstream of Jacobs Creek to a point 0.8 mile downstream of Matrimony Creek									
Hyco River, including Hyco Lake below	22-58-(0.5)	WS-V&B	FC	30205		3750	Fish Advisory-Selenium	Low	Major Industrial Point Source
From source in Hyco Lake to dam of Hyco Lake, including tributary arms below elevation 410									
Marlowe Creek	22-58-12-6	C	O	30205	10.9		Copper	Low	Municipal Pretreatment (industri Minor Non-municipal
From Source to Storys Creek									
Smith Creek	23-10	C	AL	30207	10.4		Dissolved Oxygen	Low	Erosion and Sedimentation Agriculture
From source to North Carolina-Virginia State Line									
Roanoke Rapids Lake	23-(22.5)	WS-IV&B CA	AL	30208		4893	Aquatic Weeds (Hydrilla sp. And Eurasian water milfoil)	High	
From the Lake Gaston Dam to Roanoke Rapids Dam									
ROANOKE RIVER	23-(26a)	C	FC	30208	50.1		Fish Advisory-Mercury	Low	Atmospheric Deposition
From a line across the river 50 ft downstream of NC Hwy 48 bridge to the confluence of Sandy Run Cr at the Bertie/Northampton/Halifax Co. line									
ROANOKE RIVER	23-(26b)	C	FC	30208	70.3		Fish Advisory-Mercury	Low	Atmospheric Deposition
From the confluence of Sandy Run Cr at the Bertie/Northampton/Halifax Co. line to the 18 mile marker at Jamesville									
ROANOKE RIVER	23-(53)	C Sw	FC	30209	18.3		Fish Advisory-Mercury	Low	Atmospheric Deposition
From 18 mile marker at Jamesville to Albemarle Sound (Batchelor Bay)									
Welch Creek	23-55	C Sw	FC	30209	13.3		Fish Advisory-Mercury	Low	Atmospheric Deposition
From source to Roanoke River									
ALBEMARLE SOUND (Batchelor Bay)	24	B Sw	FC	30209		2586	Fish Advisory-Dioxin	Low	
West of a line extending from a point of land 0.3 mile north of mouth of Morgan Swamp in a southerly direction to a point of land on the eastside of the mouth of Roanoke River									
ALBEMARLE SOUND (Batchelor Bay)	24	B Sw	FC	30209		2586	Fish Advisory-Mercury	Low	Atmospheric Deposition
West of a line extending from a point of land 0.3 mile north of mouth of Morgan Swamp in a southerly direction to a point of land on the eastside of the mouth of Roanoke River									

Roanoke River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Cashie River	24-2-(11)	C Sw	FC	30209	5.8		Fish Advisory-Mercury	Low	Atmospheric Deposition
From the Thoroughfare (The Gut between Cashie and Roanoke Rivers) to N.C. Hwy. 45									
Cashie River	24-2-(15)	B Sw	FC	30209	1.2		Fish Advisory-Mercury	Low	Atmospheric Deposition
From N.C. Hwy. 45 to Albemarle Sound (Batchelor Bay)									
Cashie River	24-2-(1)a	C Sw	FC	30210	15.2		Fish Advisory-Mercury	Low	Atmospheric Deposition
From Bertie County SR 1225 to a point 1 mile upstream from Bertie Co. SR 1500									
Cashie River	24-2-(1)b	C Sw	FC	30210	30.1		Fish Advisory-Mercury	Low	Atmospheric Deposition
From source to Bertie County SR 1225									
Cashie River	24-2-(9)	B Sw	FC	30210	2.3		Fish Advisory-Mercury	Low	Atmospheric Deposition
From a point 1.0 mile upstream from Bertie County SR 1500 to the Thoroughfare (The Gut between Cashie and Roanoke Rivers)									

Roanoke River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Town Fork Creek From source to Timmons Cr.	22-25a	C	AL	30201	8		Cause Unknown	Medium	Hydromodification Agriculture Minor Non-Municipal
Smith River From North Carolina-Virginia State Line to a point 0.8 mile downstream of Rockingham County SR 1714 (Aiken Road)	22-40-(1)	WS-IV	AL	30203	2.8		Cause Unknown	High	Sources outside State jurisdictio
Smith River From a point 0.8 mile downstream of Rockingham County SR 1714 (Aiken Road) to Fieldcrest Mills Water Supply Intake	22-40-(2.5)	WS-IV CA	AL	30203	0.5		Cause Unknown	High	Urban Runoff/Storm Sewers Sources outside State jurisdictio
Smith River From Fieldcrest Mills Water Supply Intake to Dan River	22-40-(3)	C	AL	30203	1.8		Cause Unknown	Medium	Urban Runoff/ Storm Sewers
Marlowe Creek From source to Storys Creek	22-58-12-6	C	AL	30205	10.9		Cause Unknown	Low	Minor Industrial Point Sources Collection System Failure Urban Runoff/Storm Sewers
Nutbush Creek (Including Nutbush Cre From source to Crooked Run	23-8-(1)	C	AL	30206	4.6		Cause Unknown	Low	Major Municipal Point Source Urban Runoff/Storm Sewers
Smith Creek From source to North Carolina-Virginia State Line	23-10	C	AL	30207	10.4		Cause Unknown	Low	Agriculture Erosion and Sedimentation
Quankey Creek From Little Quankey Creek to Roanoke River	23-30b	C	AL	30208	3.4		Cause Unknown	Low	Hydromodification Minor Municipal Point Source Collection System Failures

Number of waterbody-pollutant/pollution combinations for Roanoke: 26

Total waterbody-pollutant/pollution combination miles: *316.1* **acres:** *13815*

Tar Pamlico River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Pamlico River (DEH Area)	G11		O			3455	Chlorophyll-a		8/1/95

Tar Pamlico River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Atlantic Ocean	99-(6)	SB	O			30080	Fish Advisory-Mercury	Low	
The waters of the Atlantic Ocean contiguous to that portion of the Tar-Pamlico River Basin that extends from the northeast tip of Ocracoke Island to the southwest tip of Ocracoke Island									
Chicod Creek	28-101	C NSW	O	30305	13		Fecal Coliform	Low	Agriculture
From source to Tar River									
Chicod Creek	28-101	C NSW	O	30305	13		Low Dissolved Oxygen	Low	
From source to Tar River									

Tar Pamlico River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Fishing Creek From source to SR1649	28-11a	C NSW	O	30301	2		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	
Fishing Creek From SR1649 to Oxford WWTP	28-11b	C NSW	O	30301	0.4		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Low	
Fishing Creek From Oxford WWTP to SR 1608	28-11c	C NSW	O	30301	0.9		Cause Unknown, Historical listing for 'sediment' based on biological impairment	Medium	Municipal Point Sources Urban Runoff/Storm Sewers
Fishing Creek From SR1608 to Coon Creek	28-11d	C NSW	O	30301	1.04		Cause Unknown	Medium	Municipal Point Sources Urban Runoff/Storm Sewers
Fishing Creek From Coon Creek to Tar River	28-11e	C NSW	O	30301	6.1		Cause Unknown	Low	Urban Runoff/Storm Sewers
Stony Creek (Boddies Millpond) From source to Tar River	28-68	C NSW	O	30302	23.3		Cause Unknown, Historical listing for 'sediment' based on biological impairment	High	Source Unknown
Sandy Creek From dam at Southerlands Pond to NC Hwy 401	28-78-1-(8)a	B NSW	O	30302	3.8		Cause Unknown	Medium	
Sandy Creek From Hwy 401 to NC Hwy 561	28-78-1-(8)b	B NSW	O	30302	12.2		Cause Unknown	Medium	
Conetoe Creek From source to Pitt County SR 1404	28-87-(0.5)	C NSW	O	30303	15.3		Cause Unknown	Low	Municipal Point Sources Nonirrigated Crop Production Channelization
Chicod Creek From source to Tar River	28-101	C NSW	O	30305	13		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Kennedy Creek From source to Tar River	28-104	C NSW	O	30307	0.8		Cause Unknown	High	Municipal Pretreatment

Tar Pamlico River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Jack Creek	29-12-4-(1)	C NSW	O	30307	1.1		Cause Unknown	Low	
From source to a point three-fourths mile above mouth									

Tar Pamlico River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Goose Creek (DEH Area)	G1	SA NSW	O			300	Fecal Coliform	Low	
Pamlico River (DEH Area)	G2	SA NSW	O			500	Fecal Coliform	Low	
Swanquarter (DEH Area)	G3	SA ORW	O			867	Fecal Coliform	High	
Wysocking Bay (DEH Area)	G4	SA	O			255	Fecal Coliform	Low	
Long Shoal (DEH Area)	G5	SA	O			2054	Fecal Coliform	Medium	Agriculture Onsite Wastewater Systems (Se Marinas
Ocracoke (DEH Area)	G6	SA	O			135	Fecal Coliform	Low	Land Development
Lower Pungo River (DEH Area)	G8	SB NSW	O			714	Fecal Coliform	Low	

Number of waterbody-pollutant/pollution combinations for Tar Pamlico: 23

Total waterbody-pollutant/pollution combination miles: *105.94* **acres:** *38360*

White Oak River Basin

Category *4b*

NPDES controls expected to result in meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
New River From U.S Hwy 17 bridge to Atlantic Coast Line Railroad Trestle	19-(10.5)	SB HQW NSW	O	30502		49	Chlorophyll-a	High	
New River From Atlantic Coast Line Railroad Trestle to Mumford Point	19-(11)	SC HQW NSW	O	30502		574	Chlorophyll-a	High	
New River Portion of following north of a line extending across the New River from the North mouth of Morgan Bay to the Mouth of Southwest Creek From Mumford Point to a line extending across the river from Grey Point to point of land approximately 2200 yards downst	19-(15.5)	SC NSW	O	30502		945	Chlorophyll-a	High	
New River From Blue Creek to US Hwy 17 Bridge	19-(7)	SB NSW	O	30502		116	Chlorophyll-a	High	
Wilson Bay Entire Bay	19-14	SC HQW NSW	O	30502		109	Chlorophyll-a	High	
Northeast Creek From NC Hwy 24 to downstream side of mouth of Scales Creek	19-16-(3.5)	SC NSW	O	30502		680	Chlorophyll-a	Medium	
Northeast Creek From the downstream side of mouth of Scales Creek to New River	19-16-(4.5)	SC NSW	O	30502		451	Chlorophyll-a	Medium	
Southwest Creek From Mill Run to New River	19-17-(6.5)	C HQW NSW	O	30502	2.6		Chlorophyll-a	Medium	Natural Sources

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Atlantic Ocean	99-(4)	SB	FC		91		Fish Advisory-Mercury	Low	
The waters of the Atlantic Ocean contiguous to that portion of the White Oak River Basin that extends from the northern boundary of White Oak River Basin (southwest side of Drum Inlet) to the southern boundary of White Oak River Basin (northern boundary o									
Mill Creek	19-41-11-1	SA	SH	30501	0	14.6	Fecal Coliform	High	
From source to Bear Creek									
Bear Creek	19-41-11a	SA	SH	30501	0	113.4	Fecal Coliform	High	
From source to DEH closed area line									
Bear Creek	19-41-11b	SA	SH	30501	0	195.6	Fecal Coliform	High	
From DEH closed area line to intracoastal waterway.									
Goose Creek	19-41-14	SA	SH	30501	0	2.6	Fecal Coliform	High	
From source to Intracoastal Waterway									
Bell Swamp	19-41-16-1	SA	SH	30501	0	0.7	Fecal Coliform	High	
From source to Queen Creek									
Pasture Branch	19-41-16-2	SA	SH	30501	0	0.7	Fecal Coliform	High	
From source to Queen Creek									
Halls Creek	19-41-16-3	SA	SH	30501	0	26.9	Fecal Coliform	High	
From source to Queen Creek									
Parrot Swamp	19-41-16-4a	SA	SH	30501	0	75	Fecal Coliform	High	
From source to DEH closure line.									
Parrot Swamp	19-41-16-4b	SA	SH	30501	0	45.4	Fecal Coliform	High	
From DEH closure line to Queen Creek									
Dicks Creek	19-41-16-5	SA	SH	30501	0	21.9	Fecal Coliform	High	
From source to Queen Creek									

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Queen Creek	19-41-16a	SA	SH	30501	0	233.6	Fecal Coliform	High	
DEH closed area from source to DEH Conditionally Approved closed line at Queens Creek Road Bridge.									
Queen Creek	19-41-16b	SA	SH	30501	0	161.2	Fecal Coliform	High	
From DEH Conditionally Approved closed line at Queens Creek Road Bridge to DEH Conditionally Approved Open line at northeast mouth of Parrot Swamp.									
Queen Creek	19-41-16c	SA	SH	30501	0	270.6	Fecal Coliform	High	
From DEH Conditionally Approved Open Line at Northeast mouth of Parrot Swamp to Intercoastal Waterway									
Queen Creek	19-41-16d	SA	SH	30501	0	3	Fecal Coliform	High	
DEH closed area at mouth of Dicks Creek									
Bear Island ORW Area	19-41-18b	SA ORW	SH	30501	0	69.6	Fecal Coliform	High	
All waters within an area north of Bear Island defined by a line from the western most point on Bear Island and running along the eastern shore of Sanders Creek to the northeast mouth of Goose Creek on the mainland, east to the southwest mouth of Queen Cr									
Browns Creek	19-41-8	SA	SH	30501	0	52.8	Fecal Coliform	Medium	
From source to Intracoastal Waterway									
WHITE OAK RIVER	20-(18)a	SA	SH	30501	0	468.2	Fecal Coliform	High	
DEH closed area from Hunters Creek to DEH closure line.									
WHITE OAK RIVER	20-(18)b	SA	SH	30501	0	1422.2	Fecal Coliform	High	
From DEH closure line to DEH Conditionally Approved Closed line.									
WHITE OAK RIVER	20-(18)c	SA	SH	30501	0	2124.2	Fecal Coliform	High	
From DEH Conditionally Approved Closed line to the DEH Conditionally Approved Open line									
WHITE OAK RIVER	20-(18)d	SA	SH	30501	0	46.6	Fecal Coliform	High	
DEH closed area adjacent to the east side of the White Oak River Restricted Area									
Pitts Creek (Hargetts Creek)	20-21	SA	SH	30501	0.3	0	Fecal Coliform	High	
From source to White Oak River									

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Cales Creek From source to White Oak River	20-22	SA	SH	30501	0	6.5	Fecal Coliform	High	
Hadnot Creek From source to White Oak River	20-23	SA	SH	30501	0	43.4	Fecal Coliform	High	
Schoolhouse Branch From source to Hadnot Creek	20-23-1	SA	SH	30501	0.7	0	Fecal Coliform	HIgh	
Steep Hill Branch From source to Hadnot Creek	20-23-2	SA	SH	30501	0.8	0	Fecal Coliform	High	
Caleb Branch (City Weeks Branch) From source to Hadnot Creek	20-23-3	SA	SH	30501	1.8	0	Fecal Coliform	High	
Godfry Branch From source to White Oak River	20-24	SA	SH	30501	0	3.4	Fecal Coliform	High	
Holland Mill Creek From source to White Oak River	20-26	SA	SH	30501	0	24.1	Fecal Coliform	High	
Cartwheel Branch From source to Holland Mill Creek	20-26-1	SA	SH	30501	0	3.7	Fecal Coliform	High	
Hampton Bay Entire Bay	20-27	SA	SH	30501	0	82.1	Fecal Coliform	High	
Stevens Creek From source to White Oak River	20-28	SA	SH	30501	0	5.7	Fecal Coliform	High	
Pettiford Creek Bay Entire Bay	20-29	SA	SH	30501	0	239.3	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Pettiford Creek From source to Pettiford Creek Bay	20-29-1	SA	SH	30501	0	35.2	Fecal Coliform	High	
Mill Creek From source to Pettiford Creek	20-29-1-1	SA	SH	30501	1.7	0	Fecal Coliform	High	
Starkey Creek From source to Pettiford Creek Bay	20-29-2	SA	SH	30501	0	29.2	Fecal Coliform	High	
Mullet Gut From source to Starkey Creek	20-29-2-1	SA	SH	30501	0	1.1	Fecal Coliform	High	
Dubling Creek From source to White Oak River	20-30	SA	SH	30501	0	53.3	Fecal Coliform	High	
Boathouse Creek From source to White Oak River	20-31	SA	SH	30501	0	15.8	Fecal Coliform	High	
New River From Source to Blue Creek	19-(1)	C NSW	FC	30502	28.4		Fish Advisory-Mercury	High	
NEW RIVER From Everett Bay to DEH closure line	19-(27)b	SA	SH	30502		18.1	Fecal Coliform	Medium	
NEW RIVER From Fannie Creek and Wheeler Creek to DEH closure line.	19-(27)c	SA	SH	30502		49.9	Fecal Coliform	Medium	
Brinson Creek From Source to New River	19-12	SC NSW	FC	30502	2.9		Fish Advisory-Mercury	Medium	
Northeast Creek From Source to HWY 24	19-16-(0.5)	SC NSW	FC	30502	10.3		Fish Advisory-Mercury	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little Northeast Creek From source to Northeast Creek	19-16-2	C NSW	O	30502	8.3		Low Dissolved Oxygen	Medium	Urban Runoff/Storm Sewers
Mill Creek From source to Stones Bay	19-30-1	SA	SH	30502		35.3	Fecal Coliform	High	
Muddy Creek From source to Stones Bay	19-30-2	SA	SH	30502		17.1	Fecal Coliform	High	
Stones Creek From source to Stones Bay	19-30-3	SA	SH	30502		73.5	Fecal Coliform	High	
Millstone Creek From source to Stones Creek	19-30-3-1	SA	SH	30502		6.4	Fecal Coliform	High	
Stones Bay From Stones Creek to DEH closure line	19-30b	SA	SH	30502		31.7	Fecal Coliform	High	
Everett Creek From source to New River	19-32	SA	SH	30502		76.3	Fecal Coliform	Medium	
Fannie Creek From source to New River	19-34	SA	SH	30502		9.9	Fecal Coliform	Medium	
Wheeler Creek From source to New River	19-35	SA	SH	30502		11.1	Fecal Coliform	Medium	
Courthouse Bay DEH Area in south arm of bay.	19-36b	SA	SH	30502		1.9	Fecal Coliform	Medium	
Goose Bay Entire Bay	19-39-2	SA ORW	SH	30502		38.6	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Mill Creek From source to Alligator Bay	19-39-3-1	SA	SH	30502		18.2	Fecal Coliform	Medium	
Alligator Bay Bay south of ICWW	19-39-3a	SA ORW	SH	30502		260.2	Fecal Coliform	High	
Alligator Bay DEH closure area at mouth of Mill Creek.	19-39-3b	SA ORW	SH	30502		28.9	Fecal Coliform	High	
Alligator Bay Bay north of ICWW except DEH closure area at mouth of Mill Creek.	19-39-3c	SA ORW	SH	30502		265.9	Fecal Coliform	High	
Chadwick Bay Entire Bay	19-39-4	SA	SH	30502		578.8	Fecal Coliform	Medium	
Biglins Creek From source to Fullard Creek	19-39-4-1-1	SA	SH	30502		6.1	Fecal Coliform	Medium	
Charles Creek From source to Fullard Creek	19-39-4-1-2	SA	SH	30502		38.5	Fecal Coliform	Medium	
Bumps Creek From source to Fullard Creek	19-39-4-1-3	SA	SH	30502		13.9	Fecal Coliform	Medium	
Fullard Creek (Salt Branch) From source to DEH closure line at west side of mouth of Charles Creek.	19-39-4-1a	SA	SH	30502		71.2	Fecal Coliform	Medium	
Fullard Creek (Salt Branch) From DEH closure line at west side of mouth of Charles Creek to Chadwick Bay.	19-39-4-1b	SA	SH	30502		85.1	Fecal Coliform	Medium	
Fullard Creek (Salt Branch) Small embayments at northeast mouth of Fullard Creek.	19-39-4-1c	SA	SH	30502		7.9	Fecal Coliform	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Mile Hammock Bay Closed DEH rectangular area on north side of bay	19-41-2b	SA	SH	30502		7.8	Fecal Coliform	Medium	
Salliers Bay Entire Bay	19-41-3	SA	SH	30502		55.7	Fecal Coliform	Medium	
Holover Creek From source to Salliers Bay	19-41-3-1	SA	SH	30502	0	5.2	Fecal Coliform	Medium	
Gillets Creek From source to Intracoastal Waterway	19-41-4	SA	SH	30502	0	3	Fecal Coliform	Medium	
Freeman Creek From source to Intracoastal Waterway	19-41-5	SA	SH	30502	0	65.4	Fecal Coliform	Medium	
Browns Swamp From source to Freeman Creek	19-41-5-1	SA	SH	30502	1.18	0	Fecal Coliform	Medium	
Clay Bank Branch From source to Freeman Creek	19-41-5-2	SA	SH	30502	1	0	Fecal Coliform	Medium	
Mirey Branch From source to Freeman Creek	19-41-5-3	SA	SH	30502	0.6	0	Fecal Coliform	Medium	
Spooner Creek From source to Bogue Sound	20-36-10	SA	SH	30503	0	24.1	Fecal Coliform	High	
Hunting Island Creek From source to Bogue Sound	20-36-2	SA	SH	30503	0	2.65	Fecal Coliform	High	
Sanders Creek From source to Goose Creek	20-36-4-1	SA	SH	30503	0.7	0	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Goose Creek From source to DEH closure line Bogue Sound	20-36-4a	SA	SH	30503	0	67	Fecal Coliform	High	
Archer Creek (Piney Cr.) From source to Bogue Sound	20-36-5	SA ORW	SH	30503	0	18	Fecal Coliform	High	
Sanders Creek From source to Bogue Sound	20-36-6	SA ORW	SH	30503	0	35	Fecal Coliform	High	
East Prong Sanders Cr.	20-36-6-1	SA	SH	30503	0	2.7	Fecal Coliform	High	
Sikes Branch From source to East Prong Sanders Creek	20-36-6-1-1	SA	SH	30503	0	1.2	Fecal Coliform	High	
Broad Creek From source to Bogue Sound	20-36-7	SA	SH	30503	0	91.5	Fecal Coliform	Medium	
West Prong Broad Creek From source to Broad Creek	20-36-7-1	SA	SH	30503	0	8.4	Fecal Coliform	Medium	
Hannah Branch From source to West Prong Broad Creek	20-36-7-1-1	SA	SH	30503	0.8	0	Fecal Coliform	Medium	
Sandy Branch From source to Hannah Branch	20-36-7-1-1-1	SA	SH	30503	0.7	0	Fecal Coliform	Medium	
Wolf Branch From source to West Prong Broad Creek	20-36-7-1-2	SA	SH	30503	1.1	0	Fecal Coliform	Medium	
East Prong Broad Creek From source to Broad Creek	20-36-7-2	SA	SH	30503	0	8	Fecal Coliform	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Gales Creek From source to Bogue Sound	20-36-8	SA	SH	30503	0	45.6	Fecal Coliform	Medium	
East Prong Gales Creek From source to Gales Creek	20-36-8-1	SA	SH	30503	0.8	0	Fecal Coliform	Medium	
Jumping Run From source to Bogue Sound	20-36-9	SA	SH	30503	0	1.52	Fecal Coliform	High	
NEWPORT RIVER From Little Creek Swamp to DEH closure line	21-(17)a	SA	SH	30503	0	17.7	Fecal Coliform	High	
NEWPORT RIVER From DEH closure line to DEH Conditionally Approved Closed line	21-(17)b	SA	SH	30503	0	962.8	Fecal Coliform	High	
NEWPORT RIVER From DEH Conditionally approved closed line to DEH Conditionally approved open line extending from Penn Point to west mouth of Core Creek	21-(17)c	SA	SH	30503	0	2662.8	Fecal Coliform	High	
NEWPORT RIVER DEH closed area north of Morehead City Harbor restricted area including Crab Point Therefore and Calico Creek Marsh to Hwy 70 Bridge.	21-(17)e	SA	SH	30503	0	653.6	Fecal Coliform	High	
NEWPORT RIVER DEH closed area around Gallant Point south to Hwy 70 Bridge including Beaufort Channel	21-(17)g	SA	SH	30503	0	166.1	Fecal Coliform	High	
Little Creek Swamp From source to Newport River	21-18	SA	SH	30503	5.5	0	Fecal Coliform	High	
Mill Creek From source to Newport River	21-19	SA	SH	30503	6.1	0	Fecal Coliform	High	
Big Creek From source to Newport River	21-20	SA	SH	30503	0	0.3	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little Creek From source to Newport River	21-21	SA	SH	30503	2	0	Fecal Coliform	High	
Harlowe Canal From Neuse River Basin Boundary (at Craven-Carteret County Line) to Harlowe Creek (at N.C. Hwy. # 101)	21-22-1	SA	SH	30503		5.1	Fecal Coliform	High	
Alligator Creek From source to Harlowe Creek	21-22-2	SA	SH	30503		2.1	Fecal Coliform	High	
Harlowe Creek DEH closed area from source (at N.C. Hwy #101) to DEH closure line south of mouth.	21-22a	SA	SH	30503	0	19.3	Fecal Coliform	High	
Harlowe Creek From DEH closure line south of mouth of Alligator Creek to DEH Conditionally Approved Closed line near Newport River	21-22b	SA	SH	30503	0	93.9	Fecal Coliform	High	
Harlowe Creek From DEH Conditionally Approved Closed line near Newport River to Newport River	21-22c	SA	SH	30503	0	99.4	Fecal Coliform	High	
Oyster Creek From source to Newport River	21-23	SA	SH	30503		50	Fecal Coliform	High	
Eastman Creek From source to Core Creek	21-24-1	SA	SH	30503		13.2	Fecal Coliform	High	
Bell Creek From source to DEH closed line	21-24-2a	SA	SH	30503		18.4	Fecal Coliform	High	
Bell Creek From DEH closed line to Core Creek	21-24-2b	SA	SH	30503		46.2	Fecal Coliform	High	
Core Creek (Intracoastal Waterway Ada From Neuse River Basin boundary to DEH closed line	21-24a	SA	SH	30503		29.4	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Core Creek (Intracoastal Waterway Ada From DEH closed line to DEH Conditionally Approved Closed line	21-24b	SA	SH	30503		227.5	Fecal Coliform	High	
Russell Creek From source to Newport River	21-26	SA	SH	30503		15.6	Fecal Coliform	High	
Wading Creek From source to Newport River	21-27	SA	SH	30503	0	15.9	Fecal Coliform	High	
Gable Creek From source to Newport River	21-28	SA	SH	30503	0	49.8	Fecal Coliform	High	
Willis Creek From source to Newport River	21-29	SA	SH	30503	0	14.7	Fecal Coliform	High	
Crab Point Bay Entire Bay	21-30	SA	SH	30503	0	134.2	Fecal Coliform	High	
Feltons Creek From source to North River	21-35-1-1	SA	SH	30504	0	4.2	Fecal Coliform	Medium	
Gibbs Creek From source to North River	21-35-1-10	SA	SH	30504	0	65.4	Fecal Coliform	Medium	
Turner Creek From source to Davis Bay	21-35-1-11-1	SA	SH	30504	0	51.6	Fecal Coliform	Medium	
Davis Bay (Cheney Bay) DEH closed area in southern Category of bay	21-35-1-11a	SA	SH	30504	0	12.9	Fecal Coliform	Medium	
Davis Bay (Cheney Bay) DEH Conditionally Approved Closed area northern part of bay	21-35-1-11b	SA	SH	30504	0	188.6	Fecal Coliform	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Sleepy Creek From source to The Straits	21-35-1-12-1	SA	SH	30504	0	155.4	Fecal Coliform	Medium	
Whitehurst Creek From source to The Straits	21-35-1-12-2	SA	SH	30504	0	86.4	Fecal Coliform	Medium	
Westmouth Bay DEH closed area on south side of Bay	21-35-1-12-3b	SA	SH	30504	0	6.8	Fecal Coliform	Medium	
The Straits Conditionally approved open section in north west portion adjacent to North River	21-35-1-12b	SA	SH	30504	0	101.8	Fecal Coliform	Medium	
Brooks Creek From source to North River	21-35-1-13	SA	SH	30504	0	20.1	Fecal Coliform	Medium	
Deep Creek From source to North River	21-35-1-2	SA	SH	30504	0	21.6	Fecal Coliform	Medium	
Crabbing Creek From source to North River	21-35-1-3	SA	SH	30504	0	2.3	Fecal Coliform	Medium	
Lynch Creek From source to North River	21-35-1-4	SA	SH	30504	0	6.8	Fecal Coliform	Medium	
Thomas Creek From source to North River	21-35-1-5	SA	SH	30504	0	5.1	Fecal Coliform	Medium	
Fulcher Creek From source to DEH closure line From DEH closure line to North River	21-35-1-6a	SA	SH	30504	0	10.7	Fecal Coliform	Medium	
Fulcher Creek From DEH closure line to North River	21-35-1-6b	SA	SH	30504	0	41	Fecal Coliform	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Ward Creek From source to North River	21-35-1-7	SA	SH	30504	0	582.1	Fecal Coliform	Medium	
Gilliklin Creek From source to Ward Creek	21-35-1-7-1	SA	SH	30504	0	5.7	Fecal Coliform	Medium	
North Leopard Creek From source to Ward Creek	21-35-1-7-2	SA	SH	30504	0	95.4	Fecal Coliform	Medium	
South Leopard Creek From source to Ward Creek	21-35-1-7-3	SA	SH	30504	0	78.1	Fecal Coliform	Medium	
Newby Creek From source to DEH closure line	21-35-1-8	SA	SH	30504	0	8.7	Fecal Coliform	Medium	
Goose Bay Entire Bay	21-35-1-9	SA	SH	30504	0	265.9	Fecal Coliform	Medium	
North River From source to DEH closure line south of Crabbing Creek	21-35-1a	SA	SH	30504	0	291.3	Fecal Coliform	Medium	
North River From DEH closure line south of Crabbing Creek to Back Sound excluding DEH conditionally approved closed and closed areas between Davis Bay and North River Marsh	21-35-1b	SA	SH	30504	0	5868.1	Fecal Coliform	Medium	
North River DEH conditionally approved closed area between Davis Bay and North River Marsh	21-35-1c	SA	SH	30504	0	101.5	Fecal Coliform	Medium	
North River DEH closed area between Davis Bay and North River Marsh	21-35-1d	SA	SH	30504	0	161.8	Fecal Coliform	Medium	
North River DEH conditionally approved closed area at mouth of Newby Creek	21-35-1e	SA	SH	30504	0	19.1	Fecal Coliform	Medium	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Nelson Bay From a line extending from mouth of Broad Creek due east across Nelson Bay to Core Sound	21-35-7-10-(5)	SA	SH	30504	0	860.7	Fecal Coliform	Medium	
Lewis Creek From source to Nelson Bay	21-35-7-10-6	SA	SH	30504	0	20.7	Fecal Coliform	Medium	
Pasture Creek From source to Nelson Bay	21-35-7-10-7	SA	SH	30504	0	6	Fecal Coliform	Medium	
Willis Creek From source to Core Sound	21-35-7-11	SA ORW	SH	30504	0	51.3	Fecal Coliform	High	
Oyster Creek From source to Core Sound	21-35-7-18	SA ORW	SH	30504	0	128.2	Fecal Coliform	High	
Smyrna Creek From source to Jarrett Bay	21-35-7-22-1	SA	SH	30504	0	27	Fecal Coliform	High	
Ditch Cove From source to Jarrett Bay	21-35-7-22-2	SA ORW	SH	30504	0	32.1	Fecal Coliform	High	
Broad Creek From source to Jarrett Bay	21-35-7-22-3	SA ORW	SH	30504	0	36.6	Fecal Coliform	High	
Great Creek From source to Jarrett Bay	21-35-7-22-4	SA ORW	SH	30504	0	71.9	Fecal Coliform	High	
Howland Creek From source to Jarrett Bay	21-35-7-22-5	SA ORW	SH	30504	0	26.3	Fecal Coliform	High	
Williston Creek From source to Jarrett Bay	21-35-7-22-6	SA	SH	30504	0	24.5	Fecal Coliform	High	

White Oak River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Wade Creek From source to DEH closure line	21-35-7-22-7a	SA	SH	30504	0	24.6	Fecal Coliform	High	
Wade Creek From DEH closure line to Jarrett Bay	21-35-7-22-7b	SA	SH	30504	0	116.9	Fecal Coliform	High	
Jarrett Bay From head of bay to DEH conditionally approved open line	21-35-7-22a	SA ORW	SH	30504	0	37.6	Fecal Coliform	High	
Jarrett Bay From DEH conditionally approved open line to Core Sound	21-35-7-22b	SA ORW	SH	30504	0	1111.1	Fecal Coliform	High	
Jarrett Bay DEH closed area at embayment at mouth Williston Creek	21-35-7-22c	SA ORW	SH	30504	0	57.9	Fecal Coliform	High	
Middens Creek From source to DEH closure line	21-35-7-24a	SA	SH	30504	0	20.4	Fecal Coliform	High	
Glover Creek From source to Styron Bay	21-35-7-3-1	SA	SH	30504	0	9.9	Fecal Coliform	Medium	
Annis Run From source to Styron Bay	21-35-7-3-2	SA	SH	30504	0	3.6	Fecal Coliform	Medium	
Cedar Creek From source to Styron Creek	21-35-7-3-3-1	SA	SH	30504	0	15.7	Fecal Coliform	Medium	
Styron Creek From source to DEH closure line at mouth of Cedar Creek	21-35-7-3-3a	SA	SH	30504	0	8.2	Fecal Coliform	Medium	
Styron Bay DEH closed area	21-35-7-3b	SA ORW	SH	30504	0	10.5	Fecal Coliform	High	

White Oak River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Intracoastal Waterway	19-41-(0.5)d	SA	SH	30501	0	281.6	Fecal Coliform	Medium	
From subbasin boundary to southwest mouth of Bear Creek									
Intracoastal Waterway	19-41-(0.5)e	SA	SH	30501	0	81	Fecal Coliform	Medium	
From southwest mouth of Bear Creek to mouth of Goose Creek									
Intracoastal Waterway	19-41-(14.5)a	SA ORW	SH	30501	0	211	Fecal Coliform	High	
From the northeast mouth of Goose Creek to the southwest mouth of Queen Creek									
Intracoastal Waterway	19-41-(15.5)a	SA	SH	30501	0	165.3	Fecal Coliform	High	
From the southwest mouth of Queen Creek to Whiteoak River									
Intracoastal Waterway	19-39-(0.5)	SA ORW	SH	30502	0	230.7	Fecal Coliform	High	
From northeastern boundary of Cape Fear River Basin to Daybeacon #17 including all unnamed bays, guts, and channels									
Intracoastal Waterway	19-39-(3.5)a	SA	SH	30502	0	67.4	Fecal Coliform	Medium	
From Daybeacon #17 to DEH conditionally approved open line at north mouth of Chadwick Bay including all unnamed bays, guts, and channels									
Intracoastal Waterway	19-39-(3.5)b	SA	SH	30502	0	30.6	Fecal Coliform	Medium	
From DEH conditionally approved open line at north mouth of Chadiwick Bay to New River									
Rogers Bay	19-39-1	SA	SH	30502	0	50.6	Fecal Coliform	Medium	
Entire Bay									
Intracoastal Waterway	19-41-(0.5)b	SA	SH	30502	0	16	Fecal Coliform	Medium	
From DEH closure line at southwest mouth of Salliers Bay to DEH Conditionally Approved Open area line northeast of mouth of Salliers Bay									
Intracoastal Waterway	19-41-(0.5)c	SA	SH	30502	0	153.8	Fecal Coliform	Medium	
From DEH Conditionally Approved Open area line northeast of mouth of Salliers Bay to subbasin boundary									
Bogue Sound (Including Intracoastal W	20-36-(0.5)b	SA ORW	SH	30503	0	55.4	Fecal Coliform	High	
DEH closed area at mouth of Hunting Island Creek									

White Oak River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Bogue Sound (Including Intracoastal W	20-36-(0.5)c	SA ORW	SH	30503	0	33.6	Fecal Coliform	High	
DEH closed area at mouth of Sanders Creek									
Bogue Sound (Including Intracoastal W	20-36-(0.5)d	SA ORW	SH	30503	0	3.9	Fecal Coliform	High	
DEH closed area 870 meters west of mouth of Broad Creek									
Bogue Sound (Including Intracoastal W	20-36-(8.5)b	SA	SH	30503	0	108.7	Fecal Coliform	High	
DEH closed area from a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point extending east approximately 1500 meters along sound side of outer banks near Salter Path									
Bogue Sound (Including Intracoastal W	20-36-(8.5)c	SA	SH	30503	0	367.3	Fecal Coliform	High	
DEH Conditionally Approved Closed area near Jumping Run Creek									
Bogue Sound (Including Intracoastal W	20-36-(8.5)d	SA	SH	30503	0	7.5	Fecal Coliform	High	
DEH closed area in unnamed bay approximately 2500 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point									
Bogue Sound (Including Intracoastal W	20-36-(8.5)e	SA	SH	30503	0	3.4	Fecal Coliform	High	
DEH closed area in unnamed bay approximately 3500 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point									
Bogue Sound (Including Intracoastal W	20-36-(8.5)f	SA	SH	30503	0	75.4	Fecal Coliform	High	
DEH closed area in unnamed bay area near Hoophole Woods approximately 7400 meters east of line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point									
Bogue Sound (Including Intracoastal W	20-36-(8.5)g	SA	SH	30503	0	45.5	Fecal Coliform	High	
DEH closed area at mouth of Spooner Creek									
Bogue Sound (Including Intracoastal W	20-36-(8.5)h	SA	SH	30503	0	83.8	Fecal Coliform	High	
DEH closed area at mouth of Peltier Creek									
Bogue Sound (Including Intracoastal W	20-36-(8.5)I	SA	SH	30503	0	37.5	Fecal Coliform	High	
DEH closed area near Hoophole Creek west of Atlantic Beach									
Bogue Sound (Including Intracoastal W	20-36-(8.5)j	SA	SH	30503	0	108.6	Fecal Coliform	High	
DEH closed areas west at Atlantic Beach Bridge and Cedar Hammock									

White Oak River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Bogue Sound (Including Intracoastal W	20-36-(8.5)k	SA	SH	30503	0	340.9	Fecal Coliform	High	
DEH closed area from Newport River Restricted area to Fort Macon Creek									
Money Island Slough	20-36-13-1	SA	SH	30503	0	7.9	Fecal Coliform	High	
From source to Money Island Bay									
Money Island Bay	20-36-13a	SA	SH	30503	0	102.7	Fecal Coliform	High	
Closed DEH area in western portion of Bay									
Fort Macon Creek	20-36-16	SA	SH	30503	0	25.6	Fecal Coliform	High	
From source to Bogue Sound									
NEWPORT RIVER	21-(17)f	SA	SH	30503	0	220.4	Fecal Coliform	High	
DEH closed area from Hwy 70 Bridge to a line extending form the south point of Radio Island to Fort Macon including Morehead City Channel									
NEWPORT RIVER	21-(17)h	SA	SH	30503	0	188.5	Fecal Coliform	High	
DEH closed area south of Hwy 70 Bridge and west of Pivers Island including Bulkhead Channel									
Back Sound	21-35-(0.5)d	SA	SH	30503	0	42.6	Fecal Coliform	High	
DEH closed area at west mouth of Taylor Creek around Pivers Island									
Back Sound	21-35-(0.5)e	SA	SH	30504	0	170.6	Fecal Coliform	High	
DEH closed area at the east mouth of Taylor Creek near the mouth of the North River									
Back Sound	21-35-(0.5)f	SA	SH	30504	0	63.7	Fecal Coliform	High	
DEH closed areas in and around Carrot Island									
Back Sound	21-35-(1.5)c	SA ORW	SH	30504	0	7	Fecal Coliform	High	
Four DEH closed areas on the south shore of Harkers Island.									
Core Sound	21-35-7b	SA ORW	SH	30504	0	81	Fecal Coliform	High	
Conditionally approved open area at the mouth of Jarrett Bay									

White Oak River Basin

Category 7

The proper technical conditions do not yet exist to develop TMDLs

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Core Sound	21-35-7c	SA ORW	SH	30504	0	165.6	Fecal Coliform	High	
Conditionally approved open area at the mouth of Nelson Bay									
Core Sound	21-35-7d	SA ORW	SH	30504	0	87.3	Fecal Coliform	High	
Conditionally approved open area at the mouth Oyster Creek									

Number of waterbody-pollutant/pollution combinations for White Oak: 208

Total waterbody-pollutant/pollution combination miles: *169.28* **acres:** *30983.37*

Yadkin River Basin

Category *4a*

TMDL has been approved by EPA. Not yet meeting standards.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Grants Creek From source to Yadkin River	12-110	C	O	30704	17.9		Fecal Coliform	Low	9/27/02
Fourth Creek From SR 2308 Iredell Co 1.5 mile upstream	12-108-20-(1)b	C	O	30706	9.5		Fecal Coliform		12/1/01
Rocky River From source to SR 2420, Mecklenburg	13-17a	C	O	30711	9.2		Fecal Coliform	Low	9/19/02

Yadkin River Basin

Category *4c*

Waters impaired by pollution. TMDLs are not appropriate.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Pee Dee River (including Blewett Falls From Norwood Dam to mouth of Turkey Top Creek	13-(15.5)	WS-V&B	O	30710	15.2		Low Dissolved Oxygen	High	Agriculture
Long Lake (Albermarle City Lake) Stanly County	13-LONG LAKE_S	C	O	30713		74	Drained	Low	
Hamlet City Lake Richmond County	13-HAMLET CITY	C	O	30716		100	Drained	Low	

Yadkin River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Faulkner Creek From source to Ararat River	12-72-6	C	O	30703	6		Sediment	Low	Agriculture Urban Runoff/Storm Sewers
Grants Creek From source to Yadkin River	12-110	C	O	30704	17.9		Turbidity	Low	Municipal Point Sources Agriculture Construction Urban Runoff/Storm Sewers
Salem Creek (Middle Fork Muddy Cree From Winston-Salem Water Supply Dam (Salem Lake) to Muddy Creek	12-94-12-(4)	C	O	30704	11.7		Fecal Coliform	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Salem Creek (Middle Fork Muddy Cree From Winston-Salem Water Supply Dam (Salem Lake) to Muddy Creek	12-94-12-(4)	C	O	30704	11.7		Turbidity	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Fourth Creek From SR 2308 Iredell Co 1.5 mile upstream	12-108-20-(1)b	C	O	30706	9.5		Turbidity	Low	Agriculture
Rich Fork From source to Abbotts Creek	12-119-7	C	O	30707	20.7		Fecal Coliform	Low	Municipal Pretreatment (industri Agriculture Silviculture Construction Urban Runoff/Storm Sewers
Hamby Creek From source to Rich Fork	12-119-7-4	C	O	30707	12.5		Fecal Coliform	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Pee Dee River From Turkey Top Creek to a point 0.8 mile downstream of mouth Savannah Creek	13-(23.5)	WS-IV&B	O	30708	5.7		pH	High	Agriculture
Brown Creek From NC 74 to Pee Dee	13-20b	C	O	30710	22		Low Dissolved Oxygen	Low	Agriculture
Mckee Creek From source to Reedy Creek	13-17-8-4	C	O	30711	6.5		Fecal Coliform	Low	Minor Non-municipal Agriculture Land Development Urban Runoff/Storm Sewers
Mckee Creek From source to Reedy Creek	13-17-8-4	C	O	30711	6.5		Sediment	Low	Minor Non-municipal Agriculture Land Development Urban Runoff/Storm Sewers

Yadkin River Basin

Category 5

Waters for which TMDLs are required.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Clear Creek From source to McKee Creek	13-17-8-4-1	C	O	30711	1.6		Fecal Coliform	Low	Agriculture Land Development Urban Runoff/Storm Sewers
Rocky River From source to SR 2420, Mecklenburg	13-17a	C	O	30711	9.2		Turbidity	Low	Agriculture Urban Runoff/Storm Sewers
Goose Creek From source to Rocky River	13-17-18	C	O	30712	17		Fecal Coliform	High	Construction Urban Runoff/Storm Sewers
Hitchcock Creek (Midway Pond-steeles From below Fox Yarns, Richmond Co to Pee Dee River	13-39-(10)b	C	O	30716	6.1		Fecal Coliform	Low	Agriculture Urban Runoff/Storm Sewers Construction
Hitchcock Creek (Midway Pond-steeles From below Fox Yarns, Richmond Co to Pee Dee River	13-39-(10)b	C	O	30716	6.1		pH	Low	Agriculture Urban Runoff/Storm Sewers Construction
Ledbetter Lake Richmond County	13-LEDBETTER L	WS-III	O	30716		100	Fish Advisory-Mercury	High	
Rockingham City Lake Richmond County	13-ROCKINGHAM	WS-III CA	O	30716		27	Aquatic Weeds	High	

Yadkin River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Ut Mulberry Creek Ab WWTP to Mulberry Ck	12-42-10b	C	O	30701	0.5		Cause Unknown	Low	
Little Beaver Creek From NC 288 to Fisher River	12-63-13b	C	O	30702	1.4		Cause Unknown	Low	Spills
Endicott Creek (Branch) From dam at Raven Knob Lake to Fisher River	12-63-5-(3)	WS-II Tr	O	30702	0.5		Cause Unknown	High	Agriculture
Ararat River From Mount Airy WWTP to SR 2026, at A	12-72-(4.5)b	C	O	30703	10.3		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Heatherly Creek From source to WWTP	12-72-14-5a	C	O	30703	1.7		Cause Unknown	Low	Agriculture
Heatherly Creek WWTP to Toms Creek	12-72-14-5b	C	O	30703	1.7		Cause Unknown	Low	Municipal Pretreatment (indirect Urban Runoff/Storm Sewers
Lovills Creek (Lovell Creek) From Town of Mount Airy Water Supply Dam to Ararat River	12-72-8-(3)	C	O	30703	4.2		Cause Unknown	Low	Urban Runoff/Storm Sewers
Grants Creek From source to Yadkin River	12-110	C	O	30704	17.9		Historical listing for 'sediment' based on biological impairment	Low	Municipal Point Sources Agriculture Construction Urban Runoff/Storm Sewers
Ut Grants Creek From source to Grants Creek	12-110UT1		O	30704			Cause Unknown	Low	
Town Creek From SR 1526 to Crane Cr	12-115-3b	C	O	30704	8.1		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Construction Urban Runoff/Storm Sewers
Ut Second Creek AB WWTP to Second Creek	12-117UT2		O	30704			Cause Unknown	Low	

Yadkin River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Salem Creek (Middle Fork Muddy Cree From Winston-Salem Water Supply Dam (Salem Lake) to Muddy Creek	12-94-12-(4)	C	O	30704	11.7		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Reynolds Creek From Sequoia WWTP, Forsyth to Muddy	12-94-9b	C	O	30704	1.7		Cause Unknown	Low	Agriculture Urban Runoff/Storm Sewers
Fourth Creek From SR 2308 Iredell Co 1.5 mile upstream	12-108-20-(1)b	C	O	30706	9.5		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Fourth Creek From 1.5 mile upstream of Rowan County	12-108-20-(3.5)	C	O	30706	7.7		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Brushy Fork From source to Buck Branch	12-119-5-(1)	WS-III	O	30707	9.3		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Brushy Fork From Buck Branch to Tom-A-Lex Lake, Abbotts Creek	12-119-5-(7)	WS-III CA	O	30707	0.5		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Hunts Fork From source to Rich Fork	12-119-7-3	C	O	30707	7.5		Cause Unknown	Low	Construction Urban Runoff/Storm Sewers
Hamby Creek From source to Rich Fork	12-119-7-4	C	O	30707	12.5		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
North Hamby Creek From source to Hamby Creek	12-119-7-4-1	C	O	30707	6.1		Cause Unknown	Low	Urban Runoff/Storm Sewers
Lick Creek From source to East Branch Lick Creek Yadkin River	12-126-(0.5)	C	O	30708	7.2		Cause Unknown	Low	Agriculture
Lick Creek From East Branch Lick Creek to a point 1.0 mile upstream of Davidson County SR 2501	12-126-(3)	WS-IV	O	30708	7.4		Cause Unknown	High	Municipal Point Sources Agriculture Urban Runoff/Storm Sewers

Yadkin River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Little Mountain Creek From source to a point 0.5 mile upstream of Stanly County SR 1545	13-5-1-(1)	C	O	30708	2		Cause Unknown	Low	Agriculture
Little Mountain Creek From a point 0.5 mile upstream of Stanly County SR 1545 to Mountain Cr.	13-5-1-(2)	WS-IV	O	30708	5		Cause Unknown	High	Agriculture
Ut Lick Creek NC47, Davidson City	UT_LICK_CR_47		O	30708			Cause Unknown	Low	Urban Runoff/Storm Sewers
Brown Creek From NC 74 to Pee Dee	13-20b	C	O	30710	22		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
Dye Creek (Branch) From source to SR-1147, Iredell County	13-17-2a	C	O	30711	3.3		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers
Dye Creek (Branch) From SR-1147 Iredell County to Pee Dee	13-17-2b	C	O	30711	1.8		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture Urban Runoff/Storm Sewers
Clarke Creek From source to Rocky River	13-17-4	C	O	30711	5.4		Cause Unknown	Low	Off Farm Animal Holding/Manag
Coddle Creek From a point 0.2 mile upstream of N.C. Hwy. 73 to Rocky River	13-17-6-(5.5)	C	O	30711	13.7		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
Clear Creek From source to McKee Creek	13-17-8-4-1	C	O	30711	1.6		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Land Development Urban Runoff/Storm Sewers
Rocky River From source to SR 2420, Mecklenburg	13-17a	C	O	30711	9.2		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Urban Runoff/Storm Sewers
Goose Creek From source to Rocky River	13-17-18	C	O	30712	17		Historical listing for 'sediment' based on biological impairment	High	Construction Urban Runoff/Storm Sewers

Yadkin River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Crooked Creek From source to Rocky River	13-17-20	C	O	30712	13.1		Cause Unknown	Low	Urban Runoff/Storm Sewers
North Fork Crooked Creek from source to SR 1514, Union Crooked	13-17-20-1a	C	O	30712	7.5		Cause Unknown	Low	Urban Runoff/Storm Sewers
North Fork Crooked Creek from SR 1004 Union Co to Crooked Creek	13-17-20-1c	C	O	30712	1.7		Cause Unknown	Low	Urban Runoff/Storm Sewers
South Fork Crooked Creek from source to SR 1515 Union Co	13-17-20-2a	C	O	30712	5		Cause Unknown	Low	Agriculture Construction Urban Runoff/Storm Sewers
South Fork Crooked Creek From SR 1414 Union Co Crooked Creek	13-17-20-2b	C	O	30712	8.7		Cause Unknown	Low	Agriculture Construction Urban Runoff/Storm Sewers
Little Long Creek From source to Long Creek	13-17-31-4	C	O	30713	6.7		Cause Unknown	Low	Urban Runoff/Storm Sewers
Richardson Creek From Monroe Water Supply dam to SR1	13-17-36-(5)a	C	O	30714	6.9		Historical listing for 'sediment' based on biological impairment	Medium	Municipal Pretreatment (indirect Agriculture
Richardson Creek From SR 1006 to SR 1649	13-17-36-(5)b	C	O	30714	5.6		Historical listing for 'sediment' based on biological impairment	Low	Municipal Pretreatment (indirect Agriculture
Lanes Creek From SR 1929 Union Co to Marchville W	13-17-40-(1)b	WS-V	O	30714	9.9		Historical listing for 'sediment' based on biological impairment	High	Agriculture
Lanes Creek From Marshville Water Supply Dam (located 0.1 mile downstream of Beaverdam Creek) to Rocky River	13-17-40-(12)	C	O	30714	26.9		Cause Unknown	Low	Agriculture
Waxhaw Branch From source to Lanes Creek	13-17-40-6	WS-V	O	30714	5.7		Cause Unknown	High	Agriculture

Yadkin River Basin

Category 6

Impaired due to biological data. Monitoring for Cause of Impairment will place waters on either Category 4c or 5.

Waterbody and description	Assessment unit	Class	Impaired use	Subbasin	Miles	Acres	Cause of impairment	Priority	Potential sources or TMDL Approval Date
Cartledge Creek From source to Pee Dee River	13-35	C	O	30716	10.5		Cause Unknown	Low	Agriculture
Hitchcock Creek (Midway Pond-steeles From dam at Roberdel Lake (rockingham	13-39-(10)a	C	O	30716	3.9		Cause Unknown	Low	Agriculture Construction Urban Runoff/Storm Sewers
Hitchcock Creek (Midway Pond-steeles From below Fox Yarns, Richmond Co to	13-39-(10)b	C	O	30716	6.1		Historical listing for 'sediment' based on biological impairment	Low	Agriculture Construction Urban Runoff/Storm Sewers
Marks Creek (Everetts Lake) From NC 177 Richmond Co to NC-SC	13-45-(2)b	C	O	30716	13.3		Historical listing for 'sediment' based on biological impairment	Low	Urban Runoff/Storm Sewers
North Fork Jones Creek From Wadesboro Water Supply Intake to Jones Creek	13-42-1-(0.5)	C	O	30717	8.4		Historical listing for 'sediment' based on biological impairment	Low	Agriculture
South Fork Jones Creek From Anson SR 1821 to Jones Creek	13-42-2b	C	O	30717	0.8		Historical listing for 'sediment' based on biological impairment	Low	Agriculture

Number of waterbody-pollutant/pollution combinations for Yadkin: 74

Total waterbody-pollutant/pollution combination miles: *571.6* **acres:** *301*

Report summary

Number of waterbody-pollutant/pollution combinations : 756 *Total waterbody-pollutant/pollution combination miles: 3503.92* *acres: 391518.47*