Section B - Chapter 10
Neuse River Subbasin 03-04-10
Neuse River Estuary, South River, Trent River, Adams Creek and Broad River

10.1 Subbasin Overview

Subbasin 03-04-10 at a Glance

Land and Water Area

Total area:	402 mi^2
Land area:	519 mi^2
Water area:	183 mi^2

Population Statistics

2000 Est. Pop.:	77,504 people
Pop. Density:	110 persons / mi^2

Land Cover (percent)

Forest / Wetland:	56.2
Surface Water:	26.1
Urban:	6.3
Cultivated Crop:	10.5
Pasture / Managed Herbaceous:	0.9

Counties

Carteret, Craven and Pamlico

Municipalities

New Bern and Havelock

Population growth in the subbasin is concentrated around New Bern at the head of the estuary and Havelock on the south side of the estuary. Population density is highest (320-1,600 persons/mi^2) near New Bern and Havelock.

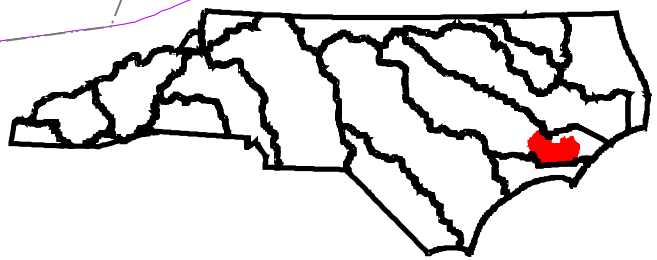
Land use in the subbasin is mostly forest and agriculture. There are 48,378 acres of managed public lands in this subbasin, mostly associated with the Croatan National Forest.

There are 19 NPDES wastewater discharge permits in this subbasin with a total permitted flow of 11.2 MGD (Figure B-10). The largest are Havelock WWTP (1.9 MGD, map #2) and New Bern WWTP (4.7 MGD, map #52). There is also one individual NPDES stormwater permit in the subbasin. New Bern and Havelock will be required to develop a stormwater program under Phase II (page 76) and have submitted model stormwater ordinances as required by the Neuse NSW strategy stormwater requirements (page 64). There are also three registered animal operations in this subbasin.

There were three benthic macroinvertebrate community samples (Figure B-10 and Table B-28) collected in 2000 as part of basinwide monitoring. All three sites were not rated, as biocriteria are being developed (page 75) to assess these swampy streams. There were also six phytoplankton monitoring sites collected in the subbasin during the assessment period. Data were also collected from 18 ambient stations. Refer to *2001 Neuse River Basinwide Assessment Report* at http://www.esb.enr.state.nc.us/bar.html and Section A, Chapter 3 for more information on monitoring.

The Division of Environmental Health Shellfish Sanitation and Recreational Water Quality Section (page 52) has classified 73,101 acres as approved, 2,499 as conditionally approved-open, 373 acres as conditionally approved-closed, and 3,422 as prohibited /restricted (page 52).

Figure B-10 Neuse River Subbasin 03-04-10



CRAVEN
BEAUFORT
PAMLICO
JONES
CARTERET
New Bern
Trent Woods
Oriental
Arapahoe
Minnesott Beach
Havelock
Broad Creek
Upper Broad Creek
Goose Creek
Neuse River
SW Prong Slocum Cr
US-17
US-70
NC-55
NC-304
NC-306
A-1
A-2
A-3
A-4
A-5
A-6
A-7
A-8
A-9
A-10
A-11
A-12
A-13
A-14
A-15
A-16
A-17
A-18
A-19
A-20
B-1
B-2
B-3
N
5 0 5 10 Miles

Legend

- Subbasin Boundary
- Ambient Monitoring Station
- LNBA Sites
- Benthic Station
- Fish Tissue Station

NPDES Discharges

- Major
- Minor

Use Support Rating

- Supporting
- Impaired
- Not Rated
- No Data

- County Boundary
- Primary Roads
- Municipality

NCDENR

Planning Branch
Basinwide Planning Program Unit
September 10, 2002

Table B-28 DWQ Monitoring Locations in Subbasin 03-04-10

Benthic Macroinvertebrate Community Monitoring Sites					
Map #[1]	**Waterbody**	**County**	**Location**	**1995**	**2000**
B-1	Upper Broad Cr	Craven	SR 1612/NC 55	---	Not Rated
B-2[2]	Goose Cr	Pamlico	SR 1100	Not Rated	Not Rated
B-3	SW Prong Slocum Cr	Craven	SR 1746	---	Not Rated
Phytoplankton Monitoring Sites					
Map #[1]	**Waterbody**	**County**	**Location**	**1995**	**2000**
P-1	Neuse R	Craven	US 17	---	---
P-2	Neuse R	Craven	Broad Creek	---	---
P-3	Neuse R	Pamlico	Flanners Beach	---	---
P-4	Neuse R	Pamlico	Minnesott Beach	---	---
P-5	Neuse R	Pamlico	Oriental	---	---
P-6	Neuse R	Pamlico	Mouth of Neuse	---	---
Ambient Monitoring Sites					
Map #[1]	**Waterbody**	**County**	**Location**	**Station #**	**Noted Parameters[3]**
A-1	Neuse River	Craven	US 17	J8570000	none
A-2	Trent River	Craven	nr Rhems	J8770000	none
A-3	Neuse River	Craven	Channel Marker 22	J8900800	none
A-4	Neuse River	Craven	Broad Cr nr Thurman	J8902500	none
A-5	Neuse River	Craven	Channel Marker 17	J8903500	none
A-6	Neuse River	Craven	Channel Marker 15	J8903600	none
A-7	Neuse River	Craven	Channel Marker 11	J8910000	none
A-8	Neuse River	Craven	nr Kennel Beach	J8920000	none
A-9	Neuse River	Craven	nr Arapahoe	J8925000	none
A-10	Neuse River	Craven	nr Cherry Point	J9431500	none
A-11	Neuse River	Pamlico	Channel Marker 9	J9530000	none
A-12	Neuse River	Craven	nr Pierce	J9540000	none
A-13	Neuse River	Craven	nr Janeiro	J9590000	none
A-14	Neuse River	Carteret	nr Merrimon	J9685000	none
A-15	Neuse River	Pamlico	nr Oriental	J9810000	none
A-16	Back Creek	Carteret	SR 1300	J9690000	none
A-17	Neuse River	Carteret	nr Cockle Point	J9860000	none
A-18	Neuse River	Carteret	nr Piney Point	J9900000	none
A-19[4]	Trent River	Craven	RR Bridge	J8870000	none
A-20[4]	Slocum Creek	Craven	Slocum Road	J9330000	none

[1] B = benthic macroinvertebrates; F = fish community; A = ambient monitoring station; SB = benthic macroinvertebrates special study site; SF = fish community special study site; and P= phytoplankton monitoring site.

[2] Historical data available at this site. Refer to Appendix II.

[3] Parameters are noted if in excess of state standards in greater than 10 percent of all samples.

[4] LNBA Sites (page 220). Only dissolved oxygen, chlorophyll *a* and fecal coliform were analyzed.

Use support ratings are summarized in Part 10.2 below. Recommendations, current status and future recommendations for waters that were impaired in 1998 are discussed in Part 10.3 below. Current status and future recommendations for newly impaired waters are discussed in Part 10.4 below. Supporting waters with noted water quality impacts are discussed in Part 10.5 below. Water quality issues related to the entire subbasin are discussed in Part 10.6. Unless otherwise noted, all discussions are for the aquatic life and secondary recreation use support category. Refer to Appendix III for a complete list of monitored waters by use support category and more information on supporting monitored waters.

10.2 Use Support Summary

Use support ratings (page 54) in subbasin 03-04-10 were assigned for aquatic life and secondary recreation, fish consumption, primary recreation and shellfish harvesting. All waters in the subbasin are considered impaired on an evaluated basis because of fish consumption advisories (page 93).

There were 13 stream miles (3.4 percent) and 99,059 estuarine acres (86 percent) monitored during this assessment period. Approximately 31,480.2 (32 percent) of the monitored estuarine acres are impaired in the aquatic life/secondary recreation use support category. There are also 3,268 (4 percent) estuarine acres impaired in the shellfish harvesting use support category. Refer to Table B-29 for a summary of use support ratings by use support category for waters in the subbasin. Use support ratings for waters that were monitored and impaired in at least one use support category or were impaired in 1998 are presented in Table B-30.

Table B-29 Summary of Use Support Ratings by Use Support Category in Subbasin 03-04-10

Use Support Rating	Basis	Aquatic Life and Secondary Recreation	Fish Consumption	Primary Recreation	Shellfish Harvesting
Supporting	Monitored	67,650 ac	0	97,123.7 ac	10.2 mi 76,329.77 ac
	All Waters	67,650 ac	0	97,123.7 ac	10.2 mi 76,329.77 ac
Impaired	Monitored	**31,340.8 ac**	0	0	**3.6 mi** **3,267.9 ac**
	All Waters	31,340.8 ac	199.6 mi 114,410.1 ac	0	3.6 mi 3,267.9 ac
Not Rated	Monitored	12.7 mi 69.1 ac	0	0	0
No Data	N/A	187.0 mi 15,350.3 ac	0	13.8 mi 9,235.3 ac	0
Total	Monitored	12.7 mi 99,059.3 ac	0	97,123.7 ac	13.8 mi 79,382.4 ac
	All Waters	199.6 mi 114,410.1 ac	199.6 mi 114,410.1 ac	13.8 mi 106,359.2 ac	13.8 mi 79,382.4 ac
	Percent Monitored	6.0% mi 86.5% ac	0%	91% ac	100% mi 100% ac

Note: All waters include monitored, evaluated and waters that were not assessed.

Table B-30 Previously or Currently Impaired Waters in Subbasin 03-04-10

Name	1998 Status	2002 Status	Use Support Category	Acres
Neuse River	Impaired	Impaired	Aquatic Life/Secondary Recreation	30,330.9
Trent River	Impaired	Impaired	Aquatic Life/Secondary Recreation	1,009.9
Neuse River		Impaired	Shellfish Harvesting	165.6
Adams Creek and Tributaries		Impaired	Shellfish Harvesting	841.5
Clubfoot Creek and Tributaries		Impaired	Shellfish Harvesting	747.2
South River and Tributaries		Impaired	Shellfish Harvesting	784.6
Broad River and Tributaries		Impaired	Shellfish Harvesting	412.1
Dawson Creek		Impaired	Shellfish Harvesting	122.1
Whittaker Creek		Impaired	Shellfish Harvesting	96.1
Pierce Creek		Impaired	Shellfish Harvesting	50.7
Orchard Creek		Impaired	Shellfish Harvesting	37.1
Bright Creek		Impaired	Shellfish Harvesting	10.9
			Total 2002 Impaired Acres	**34,608.7**

10.3 Status and Recommendations of Previously Impaired Waters

10.3.1 Neuse River and Trent River Estuaries

1998 Recommendations

The Neuse River was partially supporting from Streets Ferry to Minnesott Beach because of high chlorophyll *a* levels associated with overproduction of algae and subsequent low dissolved oxygen and fish kills. Over production of algae was associated with high nutrient loading from both point and nonpoint sources in the entire basin. It was recommended that the NSW strategy (page 64) be implemented to address the various sources of nutrients coming into the estuary.

Tributaries to the Neuse River upstream of Minnesott Beach including a portion of the Trent River, Upper Broad Creek, Goose Creek, Beard Creek, Slocum Creek and Hancock Creek were also included with the Neuse River mainstem segment described above. The estuarine portions of these tributaries were not directly monitored in the past five years but many exhibit the same water quality problems as described above because these waters are continuous with the Neuse River mainstem.

Current Status

The Neuse River (30,330.9 acres plus 1,009.9 acres of the Trent River) is currently impaired from Streets Ferry to Minnesott Beach. Thirteen ambient monitoring stations have been established in this segment of the Neuse River as part of MODMON (page 72). The Neuse Rapid Response Team, based in New Bern, has also been established to quickly investigate algal blooms and fish kills. Four phytoplankton monitoring stations have been established in this segment as well. Algal biovolumes have been in excess of 5,000 mm^3/m^3. Bottom dissolved

oxygen has regularly been below 5 mg/l, although it is not known to what extent this is driven by nutrient loading from point and nonpoint sources.

Point source wastewater discharges in The Lower Neuse Basin Association (page 220) have reported a 48 percent reduction in total nitrogen in discharges over the past four years. While this reduction of nutrient loading to the Neuse River is significant, nonpoint source management strategies are just getting underway (page 64). There have not been significant changes in nitrogen and phosphorus levels in this segment of the Neuse River. Because of the chronic overloading of nutrients into this segment of the Neuse River, there is much recycling of nutrients in the estuary, and it may be some time before current reductions in nutrient loading will be realized in terms of improved water quality.

2002 Recommendations
Continued monitoring and implementation of the Neuse River NSW strategy (page 64), as well as implementation of the Neuse total nitrogen TMDL (page 76), are recommended. Because of the complex nature of estuarine waters, longer periods of data collection and monitoring of management strategies will be needed before water quality goals are met.

Because of the water quality impairment noted above, portions of the Trent River and Brice Creek near New Bern are NCWRP targeted local watersheds (page 203).

Current Water Quality Initiatives
The City of New Bern WWTP has received a CWMTF grant to upgrade the WWTP (page 215).

10.3.2 Impaired Class SA Waters

Portions of Class SA waters were partially supporting in the 1998 basin plan because they were classified as prohibited to shellfish harvesting by DEH SS (page 52). No specific recommendations were made to address bacterial contamination in these waters in the 1998 basin plan. Because of changes in use support methodology, there are changes in acreages and areas that are impaired in the shellfish harvesting use support category. These waters are discussed below in part 10.4.

10.4 Status and Recommendations of Waters Newly Impaired Waters

10.4.1 Adams Creek, Clubfoot Creek, South River, Broad River, Dawson Creek, Whitaker Creek, Orchard Creek, Pierce Creek and Bright Creek

Current Status
Adams Creek and tributaries (841.5 ac), Clubfoot Creek and tributaries (747.2 ac), South River and tributaries (784.6 ac), Broad River and tributaries (412.1 ac), Dawson Creek (122.1 ac), Whitaker Creek (96.1 ac), Pierce Creek (50.7 ac), Orchard Creek (37.1 ac), and Bright Creek (10.9 ac) are currently impaired. These areas are prohibited or conditionally approved-closed because of bacteria levels (page 92) that do not meet approved area criteria.

Clear-cutting in the Clubfoot Creek watershed has been noted. There is also a large amount of agricultural land use in the watershed.

The South River and tributaries (2,288 ac) downstream of the above described area is conditionally approved-open to shellfish harvesting because bacteria levels do not always meet (page 92) approved area criteria. This area was temporarily closed 4.2 percent of the five-year assessment period and is currently supporting the shellfish harvesting use support category. Open Grounds Farm, adjacent to the South River, has recently removed cattle operations and installed flashboard risers on many ditches on the property. Both of these BMPs help reduce sources and delivery of bacterial contaminants to shellfish harvesting waters.

2002 Recommendations
DEH SS will continue to monitor bacteriological water quality in these waters. DWQ, DEH, DCM and DMF are currently developing tools to better track water quality changes, make use support decisions, and support research in shellfish harvesting waters of North Carolina (page 84).

Because of the water quality impairment noted above and the water quality initiatives noted below, South River and Adams Creek are NCWRP targeted local watersheds (page 203).

Current Water Quality Initiatives
The UNC Institute for Marine Science has received a CWMTF grant for a restoration project on Open Grounds Farm (page 215). There is also a Clean Water Act Section 319 project on Open Grounds Farm within the South River local watershed.

10.5 Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are supporting designated uses (unless otherwise noted) based on DWQ's use support assessment and are not considered to be impaired. However, notable water quality problems and concerns have been documented for some waters based on this assessment. While these waters are not considered impaired, attention and resources should be focused on these waters to prevent additional degradation or facilitate water quality improvement.

10.5.1 Slocum Creek

Current Status and 2002 Recommendations
The area of Slocum Creek adjacent to Cherry Point has been exposed to jet fuel spills over years of fueling operations at the base. The site is currently a Superfund site. There is also an accumulation of water treatment alum sludge from past operations. DWQ recommends not disturbing the sludge until such time as it can safely be removed and disposed of.

10.6 Additional Water Quality Issues Within Subbasin 03-04-10

This section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes or reservoirs. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources.

10.6.1 Impacts of Post-Hurricane De-Snagging on Instream Habitats

Many streams in the subbasin have noted impacts from the recent hurricanes. The biological community in the streams can recover rapidly if instream habitat is maintained. De-snagging operations should carefully remove debris from stream channels to restore natural flow and leave enough instream habitats so the biological community can recover. Refer to page 86 for more information on this issue.