Chapter 24 -
Cape Fear River Subbasin 03-06-24
Includes Masonboro Sound, Topsail Sound and the Intracoastal Waterway

24.1 Water Quality Overview

Subbasin 03-06-24 at a Glance

Land and Water Area (sq. mi.)

Total area:	162
Land area:	142
Water area:	20

Population Statistics

1990 Est. Pop.:	49,998 people
Pop. Density:	352 persons / mi^2

Land Cover (%)

Forest / Wetland:	63.0
Surface Water:	17.5
Urban:	8.3
Cultivated Crop:	6.7
Pasture / Managed Herbaceous:	4.5

Use Support Ratings

Estuarine Waters:	In Acres
Fully Supporting:	13,359 ac.
Partially Supporting:	1,391 ac.
Not Supporting:	0.0 ac.
Not Rated:	0.0 ac.

This subbasin is located in the tidal and estuarine region of the coast and contains portions of Wilmington and the towns of Wrightsville Beach and Carolina Beach. A map of the subbasin, including water quality sampling locations, is presented in Figure B-24.

Biological ratings for these sample locations are presented in Table B-24. The current sampling resulted in impaired ratings for 1,391 acres of estuarine waters. A summary of use support ratings for estuarine waters is presented in Table A-32. Refer to Appendix III for a complete listing of monitored waters and use support ratings.

Suburban development is the major land use and nonpoint source pollution is the major water quality problem. There are 4 permitted dischargers in the subbasin, but none larger than 0.5 MGD.

Water quality appears to be high in most of the sounds and creeks in this subbasin. Masonboro Sound, Middle Sound, Topsail Sound and Stump Sound are all classified as Outstanding Resource Waters (ORW). Many creeks (Turkey, Cedar Snag, Butler, Howe and John) and channels (Howard, Long Point, Green and Nixon) also have been designated ORW. The Masonboro Island National Estuarine Research Reserve is also located in this subbasin.

The greatest water quality problem in this subbasin appears to be the rapid urbanization of this area and the increasing runoff that comes with this development. DWQ sampling suggests that water quality also appears to decline at either end of this subbasin (Snows Cut and Everett Bay), where the only flushing comes from areas of poorer water quality (Cape Fear River and New River, respectively).

For more detailed information on water quality in this subbasin, refer to *Basinwide Assessment Report – Cape Fear River Basin – June 1999*, available from DWQ Environmental Sciences Branch at (919) 733-9960.

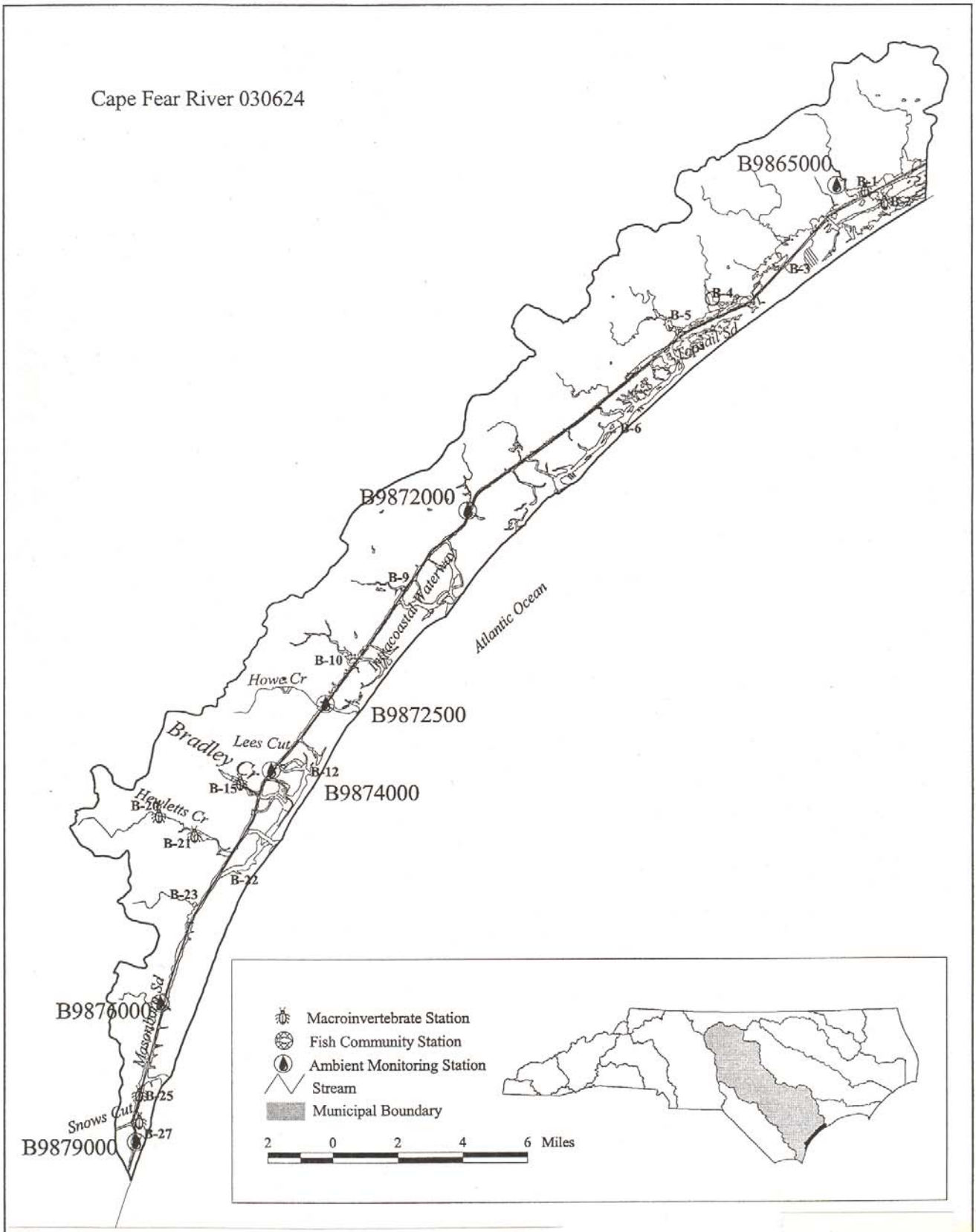

Figure B-24 Sampling Locations within Subbasin 03-06-24

Table B-24 Biological Assessment Sites in Cape Fear River Subbasin 03-06-24

BENTHOS				***Bioclassification***	
Site #	**Stream**	**County**	**Location**	**1993**	**1998**
B-15	Bradley Creek	New Hanover	US 76	Heavy	Heavy
B-21	Hewletts Creek	New Hanover	at bend	Moderate	Moderate

24.2 Impaired Waters

Portions of Myrtle Sound, Masonboro Sound, Wrightsville Beach, Topsail Sound and Stump Sound were identified as impaired in the 1996 Cape Fear River Basinwide Water Quality Plan. Portions of Myrtle Sound, Masonboro Sound, Wrightsville Beach, Topsail Sound and Stump Sound are currently partially supporting (PS) according to recent DWQ and DEH monitoring. Current status of each of these waters is discussed below. Prior recommendations, future recommendations and projects aimed at improving water quality for these waters are also discussed when applicable. 303(d) listed waters are summarized in Part 24.3 and waters with other issues, recommendations or projects are discussed in Part 24.4.

Impaired Estuarine Waters

Current Status

Portions of Myrtle Sound, Masonboro Sound, Wrightsville Beach, Topsail Sound and Stump Sound have been closed to shellfishing by the Division of Marine Fisheries (DMF) based on recommendations by Division of Environmental Health Shellfish Sanitation Section. DEH regulations specify closure of growing areas when fecal coliform bacteria levels exceed 14 colonies per 100 ml of water. Urban runoff after rainfall events is the major source of fecal coliform bacteria contamination with several marinas, canal systems, construction, one WWTP and septic tanks as minor sources.

Based on DEH monitoring, 1,391 estuarine acres are currently partially supporting (PS). These waters are on the state's year 2000 303(d) list (not yet EPA approved). Recommendations for improving water quality in these waters are discussed below. Refer to Table A-32 for overall use support ratings for estuarine areas and Figure A-16 for a map of DEH shellfish growing areas.

There are 14,750 acres of Class SA waters in subbasin 03-06-24. The best use of Class SA waters is for harvesting shellfish. Approximately 10% (1,391 acres) are currently impaired. Many acres have shellfish harvesting limited because of polluted runoff after rain events. Productive shellfish harvest areas are near shore and at high risk for bacterial contamination from urban runoff. There is a significant correlation between impervious surfaces in a watershed and amount of fecal coliform bacteria found in receiving waters (Mallin et al., 2000).

2000 Recommendations

In the Cape Fear River basin, there are a variety of activities that contribute to the degradation and impairment of shellfish waters. These include, but are not limited to, urban stormwater runoff, failing septic tanks, channelized waters, draining wetlands and marinas. Management of various land use activities is needed to decrease fecal coliform bacteria levels in shellfish growing areas, thereby, decreasing the acreage closed to harvesting. Refer to Section A, Chapter 4, Part 4.14 for further recommendations regarding shellfish growing areas.

DWQ will work with DEH, DCM, DMF and local governments to better identify the extent and sources of impairment to shellfish harvesting in Class SA waters.

24.3 303(d) Listed Waters

There are 1,391 acres of estuarine waters in the subbasin that are impaired and on the state's year 2000 303(d) list (not yet EPA approved). The impaired estuarine areas are discussed above. For information on 303(d) listing requirements and approaches, refer to Appendix IV.

24.4 Other Issues, Recommendations and Projects

All the waters of the subbasin are affected by nonpoint sources. DENR, other state agencies and environmental groups have programs and initiatives underway to address water quality problems associated with nonpoint sources. DWQ will notify local agencies of water quality concerns in this subbasin and work with these various agencies to conduct further monitoring, as well as assist agency personnel with locating sources of funding for water quality protection.

Conditionally Approved Open Shellfish Harvest Areas

Conditionally approved open shellfish harvest areas are currently fully supporting (FS). There are concerns that the amount of time that these areas are open for shellfishing is decreasing. Increased development around these waters will likely increase the number of days that these areas are closed to shellfishing. Development must be curbed in order to maintain current open acreage of shellfishing waters. Maintenance and restoration of shellfishing waters will require the concerted efforts of local governments, environmental organizations, shellfishermen, and state and federal agencies. DWQ will work with other agencies, organizations and local governments, where possible, to improve water quality and shellfishing in coastal waters.

1999 Hurricanes

In September and October 1999, three hurricanes made landfall near the mouth of the Cape Fear River. Although streams throughout the basin were impacted, the streams in the lower Cape Fear River subbasins were severely impacted. The extent of water quality problems and recovery of ecosystems in this subbasin will not be known for some time. Refer to Section A, Chapter 4, Part 4.11 for more information.

Constructed Wetlands for Landfill Leachate

This project is a non-discharge solution to leachate disposal that will greatly reduce the nitrogen load to receiving waters. For more information on this project, refer to Section C, Chapter 1, Part 1.5.6.

The New Hanover County Tidal Creeks Project and City of Wilmington Watersheds Project

Since 1993, the UNC-Wilmington Center for Marine Science has been conducting research on bacterial pollution, algal blooms, effect of tides on water quality parameters, nutrient limitation of phytoplankton productivity, and nutrient loading in five tidal creeks in New Hanover County. Annual reports are published on the projects' progress. In autumn 1997, the Center began an ongoing project analyzing environmental quality of the City of Wilmington's drainage basins. Refer to Section C, Chapter 1, Part 1.4.5 for more information on these projects.