CHAPTER 7

FUTURE INITIATIVES

7.1 OVERVIEW OF CAPE FEAR BASINWIDE GOALS AND OBJECTIVES

Near-term objectives, or those achievable at least in part during the next five years, include implementing the strategies, or TMDLs (total maximum daily loads) outlined in Chapter 6 to reduce point and nonpoint source loadings of BOD, nutrients and other pollutants. These steps are necessary to progress towards restoring impaired waters, protecting high resource value and biologically sensitive waters and maintaining the quality of other waters currently supporting their uses.

The long-term goal of basinwide management is to protect the water quality standards and uses of the basin's surface waters while accommodating reasonable economic growth.

Attainment of these goals and objectives will require determined, widespread public support; the combined cooperation of state, local and federal agencies, agriculture, forestry, industry and development interests; and considerable financial expenditure on the parts of all involved. However, with the needed support and cooperation, NCDWQ believes that these goals are attainable through the basinwide water quality management approach.

7.2 FUTURE ACTIVITIES IN THE CAPE FEAR RIVER BASIN

7.2.1 Specific Areas in Need of Management Strategies

There are a number of areas within the Cape Fear River Basin in need of future management strategy development. The Division of Water Quality has identified areas it would like to target for study during the next basin planning cycle. These areas may be modified based on comments received from the public on the basin plan. In addition, this list contains a number of items that would require much staff time to adequately evaluate, and therefore some of these issues will probably not be addressed in the next basin plan. The Division would anticipate holding meetings approximately three years prior to the due date of the second Cape Fear Basin Plan to inform the public of any changes in priorities in the basin and to obtain feedback on them. The following areas are tentatively prioritized:

Cape Fear River Below Lock and Dam 1 and Northeast Cape Fear River Below Castle Hayne The Cape River below Lock and Dam #1 has documented measurements of dissolved oxygen of 4 mg/l or less. Many sources may be contributing to these low values. Additional monitoring data should be collected to evaluate the magnitude of water quality impacts from the point source dischargers, the swamp systems in the area, particularly from the Northeast Cape Fear River and the Black River, and the impact from higher salinity waters. A group of dischargers in the area along with the University of North Carolina at Wilmington (UNC-W) have met with state representatives to discuss setting up a monitoring plan in lieu of individual monitoring requirements in NPDES permits. The Division is currently working cooperatively with UNC-W and dischargers in order to develop a Cape Fear River Program. Under this program, which would be conducted under the guidance of the Center for Marine Research at the University of North Carolina at Wilmington, additional sampling stations would be established up and down the river in order to help scientists better understand and provide improved protection to the river's water quality. More

sophisticated modeling than the current QUAL2E may be performed if the data collected through this program indicate it is warranted.

Jordan Lake NSW Strategy Jordan Lake is support-threatened overall, and the lake has been classified as eutrophic. In addition, many tributaries to the lake are impaired (e.g. rated as not supporting or partially supporting their uses). Algal blooms frequently occur in many of the lake arms. Greater emphasis will be placed in the future on nonpoint source programs to control nutrients.

Deep River Nutrients The Deep River has severe nutrient problems, and the Deep River and many of its tributaries have been listed as impaired. The Basin Plan recommends total phosphorus limits for major dischargers in the Deep River watershed. In addition, communication with the agricultural agencies has begun in order to encourage farmers in this watershed to develop and implement nutrient management plans. DWQ will also coordinate with the Division of Water Resources to work towards having dams operated in a run of river mode rather than a peaking mode and that minimum releases from the many reservoirs in the basin are met. This management strategy should be followed up with further monitoring in the basin to determine if improvements are occurring. Finally, the Division should consider developing an NSW strategy for the Deep River watershed that will more explicitly address the point and nonpoint sources of nutrients. DWQ will also suggest to the nonpoint source team set up in this basin that the Deep River be prioritized in their studies (see Section 7.2.3).

Cape Fear River A QUAL2E model has been developed for the Cape Fear mainstem from Buckhorn Reservoir to Lock and Dam 1. There is some uncertainty associated with the model. For example, water quality data collected on the river indicate that instream BOD concentrations remain fairly constant which indicates that little decay is occurring or there are other sources of BOD. In addition, data concerning photosynthesis and retention time behind the dams would be useful in fine-tuning the model.

Haw River Water quality data have been collected on the Haw River to Saxapahaw in light of the number of major dischargers in this watershed (total permitted flow of 74.75 MGD). Further information on oxygen-consuming wastes may be collected on the river to Jordan Lake. These data will then be compiled into a QUAL2E model to evaluate the interaction of the Greensboro WWTPs located in the Buffalo Creek Basin, South Burlington, East Burlington and Graham. The model can then be used to fine tune management strategies for new and expanding dischargers in the area.

Toxicity Limits in Lower Cape Fear Currently a number of discharges to the Cape Fear have received chronic toxicity tests based on an instream waste concentration derived from estimates of advective flow which assumes complete mixing while facilities upstream have received acute tests based on tidal flushing and mixing. Major discrepancies between facilities will be addressed when NPDES permits are renewed. However, DWQ should determine a boundary at which the flow in the river becomes dominated by tidal influences in order to ensure that future recommendations for toxicity limits are objectively based.

Haw Creek Low DO values have been observed on Haw Creek. An investigation of sources including nonpoint sources should be made.

Utley Creek Holly Springs discharges to Utley Creek, a low flow tributary to Harris Lake. Holly Springs' self monitoring data show DO levels as low as 4.8 mg/l below

the discharge. DWQ's empirical desktop model may not adequately predict dissolved oxygen concentrations in this stream, and DWQ should consider developing a QUAL2E model if Holly Springs pursues an expansion in this tributary.

7.2.2 Other NPDES Program Initiatives

In the next five years, efforts will be continued to:

- improve compliance with permitted limits;
- improve pretreatment of industrial wastes to municipal wastewater treatment plants so as to reduce the toxicity in effluent wastes;
- encourage pollution prevention at industrial facilities in order to reduce the need for pollution control;
- require dechlorination of chlorinated effluents or use of alternative disinfectants;
- require multiple treatment trains at wastewater facilities; and
- require plants to begin plans for enlargement well before they reach capacity.

Longer-term objectives will include refining overall management strategies after obtaining feedback on current management efforts during the next round of water quality monitoring. Long-term point source control efforts will stress reduction of wastes entering wastewater treatment plants, seeking more efficient and creative ways of recycling byproducts of the treatment process (including nonpotable reuse of treated wastewater), and keeping abreast of and recommending the most advanced wastewater treatment technologies.

7.2.3 Nonpoint Source Control Strategies and Priorities/Nutrient Reduction Efforts

Improving our knowledge of and controlling nonpoint source pollution will be a high priority over the next five years. Nonpoint source pollution, as noted in Section 4.5 in Chapter 4, accounts for the majority of impaired waters in the Cape Fear River Basin. Sediment and nutrients are the most widespread cause of nonpoint source impairment in freshwater streams and lakes.

To address nonpoint sources of pollution, DWQ has begun setting up nonpoint source teams in each of the state's 17 major river basins. These teams will have representatives from agriculture, urban stormwater, construction, mining, on-site wastewater disposal, forestry, solid waste, wetlands, groundwater, the League of Municipalities and wildlife organizations. These teams will provide descriptions of NPS activities within a basin, conduct assessments of NPS controls in targeted watersheds, identify future monitoring sites, develop five-year action plans for NPS pollutants, and develop Section 319 project proposals for targeted watersheds.

Agricultural, urban stormwater, and construction BMPs are particularly needed in the Deep River and its tributaries to address the water quality issues in that particular watershed. This Deep River watershed has been prioritized for further work during the next basin planning cycle, and the NPS team for the Cape Fear River Basin may be asked to consider this watershed for high priority status in developing its strategies.

Reducing nonpoint source nutrient loading to the Jordan Lake Basin will also be a high priority over the next five years. Progress has been seen in reducing point source loadings of total phosphorus to the basin; however, little is known at present on the location and effectiveness of agricultural BMPs that have been implemented in the Jordan Lake watershed in recent years.

Depending on resource availability, NCDWQ would like to evaluate the present NSW nutrient reduction strategy prior to updating the Cape Fear River Basin Plan in 2000 with the objective of developing revised point and nonpoint source nutrient reduction goals. This objective will include

identification of nutrient reduction technologies and associated costs of implementation for both point and nonpoint source pollution. This effort will require continuing close coordination with researchers, baseline water quality monitoring data and obtaining solid information on the location, type, number and effectiveness of agriculture BMPs. NCDWQ is currently working with the USDA Natural Resources Conservation Service to develop hydrologic maps for maintaining agriculture BMP data that will be compatible with the subbasin map units used by NCDWQ. This should prove extremely helpful in gathering the data needed on agricultural BMPs.

7.2.4 Future Monitoring Priorities

Monitoring of the chemical and biological status of receiving waters will provide critical feedback on the success of the basin management strategy. As discussed in Chapter 4, monitoring data will be collected from (1) ambient water chemistry, (2) sediment chemistry, (3) biological communities, (4) contaminant concentrations in fish and other biota, (5) ambient toxicity, and (6) facility self-monitoring data. The specific parameters measured will relate directly to the long-term water quality goals and objectives defined within the basinwide management strategy.

7.3 FUTURE PROGRAMMATIC INITIATIVES

7.3.1 Further Evaluation of Swamp Systems

Many of the waterbodies in the eastern third of the State are classified as swamp waters. It is difficult to evaluate monitoring data in these systems to determine if a waterbody is impaired. For example, a swamp may have low dissolved oxygen concentrations, but these may be due to natural background concentrations rather than from impacts from point and nonpoint sources. DWQ will continue its efforts to evaluate these systems using chemical and biological data.

DWQ's desktop dissolved oxygen model is also not an adequate tool to use in a swamp system. It appears that the decay rates assumed in the model are not indicative of swamp systems, and that the predicted reaeration rates under critical flows are low. DWQ would like to develop a model that can be used in channelized swamps that have some degree of slope to allow for one dimensional flow. Work has begun on reviewing swamp models. In addition, DWQ will begin determining which swamp systems may be modelable. Most likely, early analyses will be limited to black water river systems. The Northeast Cape Fear River may be a good river to study in the Cape Fear River basin.

7.3.2 Discharger Association Monitoring

The Division has been encouraging the formation of discharger associations in the lower, mid and upper Cape Fear River Basin for the purpose of obtaining higher quality monitoring data at a lower cost to dischargers. Discharger assocation members would be relieved of having to perform upstream and downstream monitoring on their own. Instead, they would pool the money otherwise spent on this monitoring, and would contract with a professional firm to conduct intensive data collections at times and locations agreed upon by DWQ and the association. One important benefit of the data would be to improve the predictive water quality models used by DWQ to determine waste limits for many dischargers in the basin. A discharger monitoring program has been established in the lower Cape Fear River Basin (below Lock and Dam #1) as part of the Cape Fear Program at UNC-Wilmington. The Cape Fear Program is a comprehensive research program that is examing both the water quality and ecological aspects of the lower Cape Fear River. Effort are underway to establish dischargers assocations in the mid and upper reaches of the basin.

7.3.3 Promotion of Non-Discharge Alternatives/Regionalization

NCDWQ requires all new and expanding dischargers to submit an alternatives analysis as part of its NPDES permit application. Non-discharge alternatives, including tying on to an existing WWTP or land-applying wastes are preferred from an environmental standpoint. If the Division determines that there is an economically reasonable alternative to a discharge, DWQ may recommend issuance of the NPDES permit.

7.3.4 Improved Data Management and Expanded Use of Geographic Information System (GIS) Computer Capabilities

NCDWQ is in the process of centralizing and improving its computer data management systems. Most of its Water Quality Program data including permitted dischargers, waste limits, compliance information, water quality data, stream classifications, and so on, will be put in a central data center which will then be made accessible to most staff at desktop computer stations. Much of this information is also being entered into the state's GIS computer system (Center for Geographic Information and Analysis or CGIA). As this and other information is made available to the GIS system, including land use data from satellite or air photo interpretation, and as the system becomes more user friendly, the potential to graphically display the results of water quality data analysis will be tremendous.

Research Triangle Institute is performing a pilot study in the Tar-Pamlico River Basin in which high priority waterbodies for nonpoint source control programs are mapped. These maps will be used by the various nonpoint source agencies for planning purposes. As resources become available, this tool will be developed for other basins.

7.3.5 Water Supply Planning/Interbasin Transfers

A water supply plan for the Jordan Reservoir and the Cape Fear River needs to developed. Water quantity in the basin needs to be managed in order to ensure an adequate and clean supply of water and healthy ecosystem while providing adequate waste assimilative capacity for dischargers. As noted in Chapter 2, public water supply users are predicting a doubling of their water supply needs by the year 2020. This is a critical and ongoing issue that needs to be addressed in future updates of the plan. It is anticipated that the Division of Water Resources will take the lead in developing a plan and that it will include input from water authorities, local governments and other basin stakeholders.

7.3.6 Integrate Wetlands, Groundwater and Atmospheric Deposition into Basinwide Planning in the Cape Fear Basin

Research is being conducted in other basins to assess the impacts of groundwater and atmospheric deposition on water quality. The prime pollutant of concern is nitrogen loading to lakes and estuaries. Livestock operations are a potential source for both atmospheric and groundwater nutrient loading.

On wetland, the general assembly passed a bill in 1996 calling for developing of basinwide wetland restoration plans beginning in 1997. As the program develops, its findings will be applied to future updates of the basin plan.

7.3.7 Increasing Public Participation and Stakeholder Involvement in the Basinwide Planning Process

Protection and enhancement of water quality is a shared need and a responsibility of all those who work, reside or recreate in the basin. Communication of ideas, conducting

research, sharing information, solving problems cost-effectively with minimal regulation, and balancing the needs of various stakeholder groups are all necessary for long-term success. Basinwide planning can assist in meeting these needs but the planning process and products will need to be improved. Below are several recommended improvements to be undertaken during the next basinwide planning cycle for the Cape Fear basin.

- More clearly define the role for citizen participation in basinwide planning
- Ensure active interaction between DWQ staff and other basin programs and organizations
- Increase state staff involved in public outreach so as to provide better opportunities for communication between stakeholders and the state.
- Produce more user-friendly basin plans and associated reports in order to enhance public interest and understanding in water quality protection.