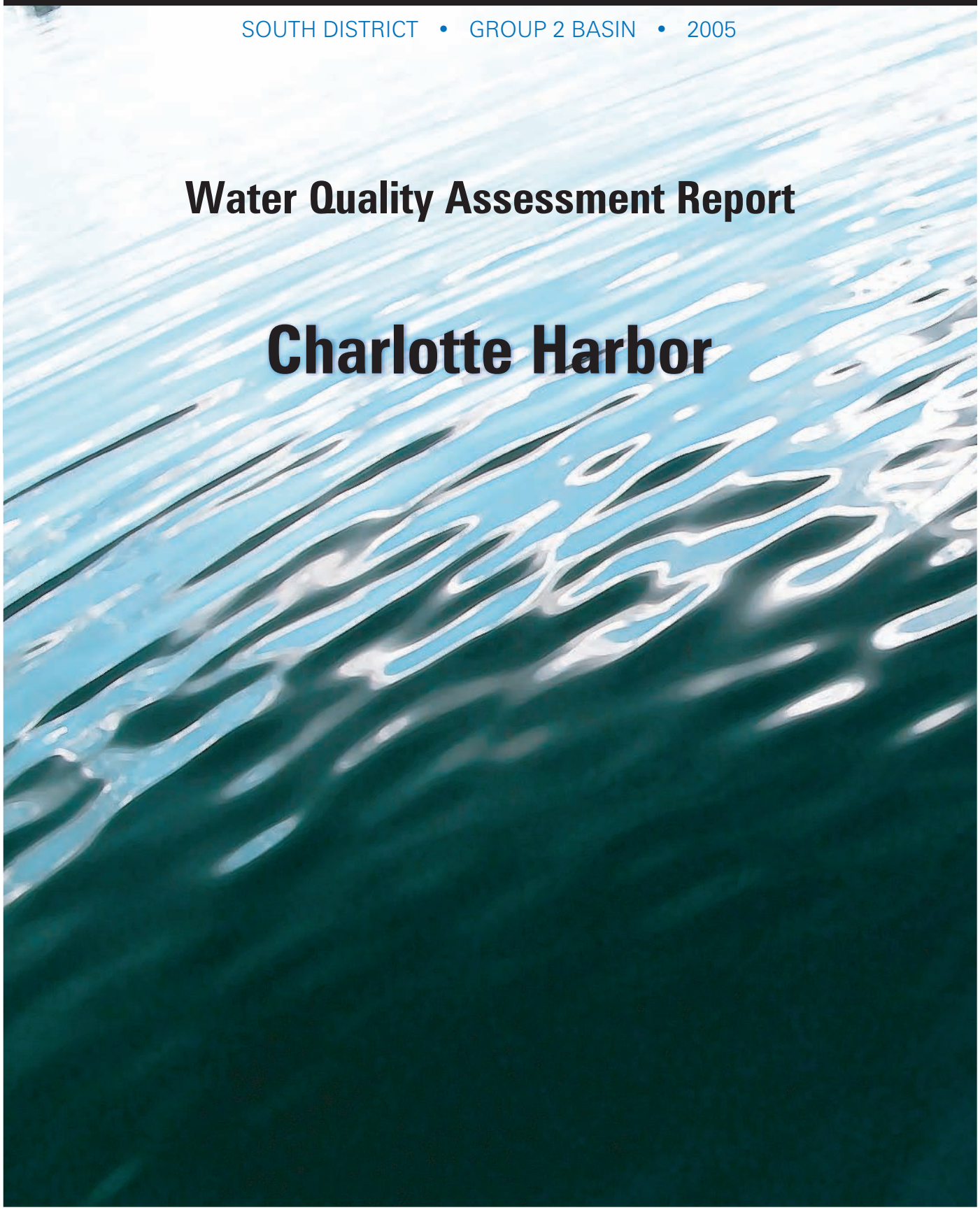
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management

SOUTH DISTRICT • GROUP 2 BASIN • 2005

Water Quality Assessment Report

Charlotte Harbor



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Acknowledgments

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Web Sites

Florida Department of Environmental Protection, Bureau of Watershed Management

TMDL Program
http://www.dep.state.fl.us/water/tmdl/index.htm

Identification of Impaired Surface Waters Rule
http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf

STORET Program
http://www.dep.state.fl.us/water/storet/index.htm

2002 305(b) Report
http://www.dep.state.fl.us/water/docs/2002_305b.pdf

Criteria for Surface Water Quality Classifications
http://www.dep.state.fl.us/water/wqssp/classes.htm

Status Reports
http://www.dep.state.fl.us/water/tmdl/stat_rep.htm

Allocation Technical Advisory Committee (ATAC) Report
http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf

U.S. Environmental Protection Agency's National STORET Program
http://www.epa.gov/storet/
http://www.epa.gov/region4/water/tmdl/florida/

Preface

Content Features

- **Executive Summary:** Appears at the beginning of every report and provides an overview of the watershed management, its implementation, and how this approach will be used to identify impaired waters.
- **Sidebar:** Appears throughout the report and provides additional information pertinent to the text on that page.
- **Noteworthy:** Appears on pages near text that needs additional information but is too lengthy to fit in a sidebar.
- **Definitions:** Appear where scientific terms occur that may not be familiar to all readers. The word being defined is bold-faced in the text.
- **References:** Appear at the end of Chapter 5 and provide a complete listing of all sources used in the text.
- **Appendices:** Appear at the end of the report and provide additional information on a range of subjects such as bioassessment methodology, rainfall and stream flow, types of natural communities, STORET stations, water quality statistics, land use, and permitted facilities.

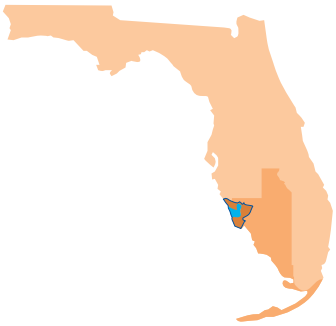
Executive Summary

Charlotte Harbor

The Water Quality Assessment Report for the Charlotte Harbor Basin is part of the implementation of the Florida Department of Environmental Protection's (Department) watershed management approach for restoring and protecting water resource problems and addressing Total Maximum Daily Load (TMDL) Program requirements. A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet the waterbody's designated uses. A waterbody that does not meet its designated uses is defined as impaired. The watershed approach, which is implemented using a cyclical management process, provides a framework for implementing the requirements of the federal Clean Water Act and the 1999 Florida Watershed Restoration Act (FWRA) (Chapter 99-223, Laws of Florida).

A Status Report, published during Phase 1 of the watershed management cycle, provided a *Planning List,* or preliminary identification, of potentially impaired waterbodies in the Charlotte Harbor Basin. This Assessment Report presents the results of additional data gathered during Phase 2 of the cycle. The report contains a *Verified List* of impaired waters (**Table 4.3** in Chapter 4) that must be adopted by Secretarial Order and approved by the U.S. Environmental Protection Agency (EPA). TMDLs must be developed and implemented for these waters, unless the impairment is documented to be a naturally occurring condition that cannot be abated by a TMDL or unless a management plan already in place is expected to correct the problem. The Verified List also constitutes the Group 2 basin-specific 303(d) list of impaired waters, so called because it is required under Section 303(d) of the Clean Water Act. See **Noteworthy** in Chapter 1 for a description of the contents of this report, by chapter.

In the Charlotte Harbor Basin, state, federal, regional, and local agencies and organizations are making progress towards identifying problems and improving water quality. Through its watershed management activities, the Department works with these entities to support programs that are improving water quality and restoring and protecting ecological resources. The Department's TMDL Program objectives will be carried out in the basin through close coordination with key stakeholders and initiatives such as the Charlotte Harbor National Estuary Program (CHNEP); the Southwest Florida Water Management District (SWFWMD); the South Florida Water Management District (SFWMD); the Florida Marine Research Institute; Charlotte, Sarasota, and Lee Counties; and the cities of Punta Gorda and Cape Coral.



Not only do stakeholders in the basin share responsibilities in achieving water quality improvement objectives, but they also play a crucial role in providing the Department with important monitoring data and information on management activities. Significant data providers in the basin include the Department's South District, Florida Department of Health (DOH), Lee County Environmental Lab, Florida LakeWatch, Sarasota County Environmental Services, SFWMD, SWFWMD, and the U.S. Geological Survey (USGS).

During the next few years, considerable data analysis will be done to establish TMDLs for impaired waters in the Charlotte Harbor Basin, establish the initial allocations of pollutant load reductions needed to meet those TMDLs, and produce a Basin Management Action Plan (B-MAP) to reduce the amount of pollutants that cause impairments. These activities depend heavily on the active participation of the water management district, local governments, businesses, and other stakeholders. The Department will work with these organizations and individuals to undertake or continue reductions in the discharge of pollutants and achieve the established TMDLs for impaired waterbodies.

Summary of Findings

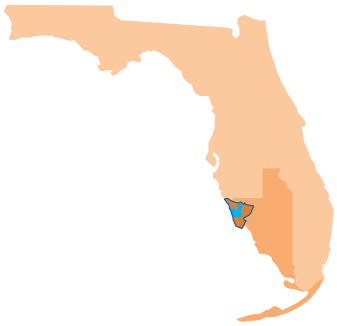
Charlotte Harbor is Florida's second-largest open-water estuary, with an open-water surface area of about 270 square miles. The principal issues in the open waters of the harbor are altered freshwater inflows, excessive nutrient inputs, hypoxia, red tides, the protection of mangroves and seagrasses, and the effects of boat traffic on water quality and submerged aquatic vegetation. The main issues in the drainage basin are the conversion of natural lands to agricultural, industrial (mining), and urban uses; and altered hydrology and water chemistry related to phosphate mining, agriculture, urban storm water, overpumping of ground water, ditching and draining of wetlands, and reduced rainfall.

The Department's assessment shows that 13 waterbodies or waterbody segments in the Charlotte Harbor Basin are impaired and require the development of TMDLs. The following summarizes, by planning unit, impairments by waterbody type and primary pollutants. Planning units are smaller areas in the basin that provide a more detailed geographic basis for identifying and assessing water quality improvement activities.

Lemon Bay Planning Unit

Of the 28 waterbody segments in the Lemon Bay planning unit, 19 segments have sufficient data for assessment. Of these, 6 are verified impaired for at least one parameter assessed, 6 remain on the Planning List requiring further study, and 7 meet standards for one or more parameters assessed.

The 6 verified impaired segments in the planning unit, and the parameters of impairment, are as follows:



WBID	Name	Impairment(s)
1983A	Lemon Bay	Bacteria (Shellfish) Nutrients (Chlorophyll *a*)
1983B	Lemon Bay	Bacteria (in Shellfish)
2030	Alligator Creek	Fecal Coliforms
2067	Oyster Creek	Dissolved Oxygen (DO)
2068	Buck Creek	DO
2078B	Coral Creek E. Branch	Nutrients (Chlorophyll *a*)

Other potential impairments in the planning unit include nutrients (waterbody identification numbers [WBID] 2042, 2049, and 2075D), DO (WBIDs 2030, 2039, 2049, 2052, 2078A, and 2078B), fecal coliforms (WBID 2039), total coliforms (WBID 2039), zinc (WBID 2078B), copper (WBID 2078B), cadmium (WBID 2078B), mercury in fish tissue (WBID 8054), and lead (WBID 2078B). All of these WBIDs have been placed on the Planning List. WBIDs 2030, 2039, 2075D, and 2078A have a sufficient number of exceedences to place them on the Verified List; however, a causitive pollutant has not been identified and further investigation is required. WBID 2039 has insufficent data for both fecal and total coliforms and further investigation is required. WBIDs 2042, 2049, and 2078B have insufficient or no data and have been added to the Planning List because of their inclusion on the original 1998 303(d) list. Most of the problems causing water quality impairments within the basin are either directly or indirectly related to anthropogenic impacts.

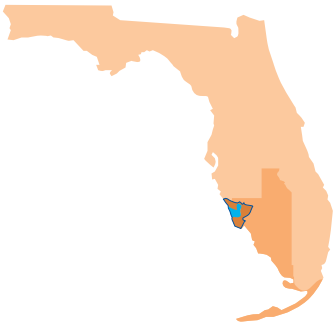
Charlotte Harbor Proper Planning Unit

Of the 35 waterbody segments in the Charlotte Harbor Proper planning unit, 15 segments have sufficient data for assessment. Of these, 4 are verified impaired for at least one parameter assessed, 3 remain on the Planning List, and 8 meet standards.

The 4 verified impaired segments in the planning unit and the parameters of impairment are as follows:

WBID	Name	Impairment(s)
2063	N. Fork Alligator Creek	DO
2065A	Charlotte Harbor Proper	Iron
2065C	Charlotte Harbor Proper	Bacteria (Shellfish)
2073	Mangrove Point Canal	DO

Other potential impairments in the planning unit include nutrients (WBIDs 2065A and 2065B), DO (WBIDs 2071 and 2087), mercury in fish tissue (WBID 8055), and turbidity (WBID 2071). WBID 2071 has insufficent data for both DO and turbidity and has been added to the Planning List because of its inclusion on the original 1998 303(d) list. Most of the problems causing water quality impairments within the basin are either directly or indirectly related to anthropogenic impacts.



Pine Island Planning Unit

Of the 19 waterbody segments in the Pine Island planning unit, 16 segments have sufficient data for assessment. Of these, 3 are verified impaired for at least one parameter assessed, 4 remain on the Planning List, and 9 meet standards.

The 3 verified impaired segments in the planning unit, and the parameters of impairment, are as follows:

WBID	Name	Impairment(s)
2065E	Pine Island Sound Upper	Bacteria (Shellfish)
2092E	Pine Island	Bacteria (Shellfish)
2092F	Sanibel Island	Nutrients (Trophic State Index [TSI])

Other potential impairments in the planning unit include nutrients (WBIDs 2082C, 3240s, and 8058A), DO (WBID 2082C), and mercury in fish tissue (WBID 2065F, 8056, 8057, 8058, and 8059). All of these WBIDs have been placed on the Planning List. WBIDs 2082C, 3240S, and 8058A have a sufficient number of exceedences to place them on the Verified List; however, a causitive pollutant has not been identified and further investigation is required. WBID 2065F has no data and has been added to the Planning List because of its inclusion on the original 1998 303(d) list. Most of the problems causing water quality impairments within the basin are either directly or indirectly related to anthropogenic impacts.

Total Maximum Daily Load Priority Areas

There are no high priority areas for TMDL development within the Charlotte Harbor Basin. Section 62-303.500, Florida Administrative Code (F.A.C.) defines high priority waters as follows: waterbody segments where the impairment poses a threat to potable water supplies or human health; waterbody segments where the impairment is due to a pollutant regulated by the Clean Water Act and the pollutant has contributed to the decline or extirpation of a federally listed threatened or endangered species, as indicated in the Federal Register listing the species; or waterbody segments verified as impaired that are included on the EPA's 1998 303(d) list as high priority. All of the impaired parameters for the WBIDs placed on the Verified List have been assigned medium priority for TMDL development, except for nutrients in WBIDs 1983A and 2978B which have been assigned a low priority. Lemon Bay is the most highly impacted planning unit within the Charlotte Harbor Basin, with six WBIDs each on the Verified and Planning Lists. Two of the verified impairments are fecal coliforms and total coliform bacteria, which indicate human impact. Further evidence of this impact can be seen in the downgrade of shellfish harvesting areas and the listing of WBIDs 1983A and 1983B as impaired for bacteria (in shellfish). DO, another verified impaired parameter, can be attributed to the increase in nutrient loading due to human activity. This condition is further complicated by the close proximity of barrier islands to the shore, resulting in poor flushing of the system.

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Chapter 1: Introduction

Purposes and Content of the Assessment Report

The Florida Department of Environmental Protection (Department) is implementing a statewide watershed management approach for restoring and protecting water quality and addressing **Total Maximum Daily Load** (TMDL) Program requirements. Under Section 303(d) of the federal Clean Water Act and the 1999 Florida Watershed Restoration Act (FWRA) (Chapter 99-223, Laws of Florida), TMDLs must be developed for all waters that do not meet their designated uses (such as drinking water, recreation, and shellfish harvesting) and are thus defined as impaired.

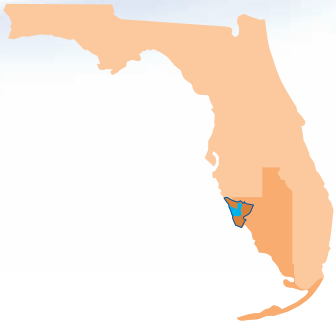
TMDLs will be developed, and the corresponding reductions in pollutant loads allocated, as part of the watershed management approach, which rotates through the state's 52 river basins over a 5-year cycle. Extensive public participation from diverse stakeholders in each of these basins is crucial in all phases of the cycle.

A Status Report published during Phase 1 of the watershed management cycle provided a *Planning List,* or preliminary identification, of potentially impaired waterbodies in the Charlotte Harbor Basin. A copy of the report can be found at http://www.dep.state.fl.us/water/tmdl/stat_rep.htm.

This Assessment Report, which updates the information in the Status Report, incorporates data collected from the Department's strategic monitoring and gathered from other agencies and groups during Phase 2 of the watershed cycle. The report contains a *Verified List* of impaired waters required by the FWRA and Section 303(d) of the federal Clean Water Act, for which TMDLs must be developed and implemented (see **Noteworthy** for a description of the Assessment Report's contents, by chapter). Based on the assessment results, in the Charlotte Harbor Basin, 13 waterbodies or waterbody segments are verified impaired for one or more parameters. TMDLs must be developed for these waters, unless the impairment is documented to be a naturally occurring condition that a TMDL cannot abate, a TMDL has already been developed, or unless a management plan is already in place to correct the problem.

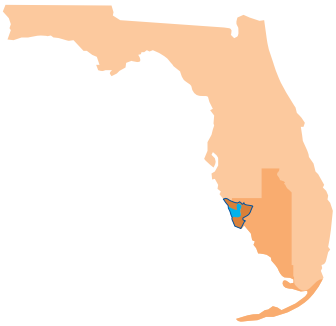
This report is intended for distribution to a broad range of potential stakeholders, including decision makers in federal, state, regional, tribal, and local governments; public and private interests; and individual citizens.

The Verified List is required by Subsection 403.067, Florida Statutes (F.S.), and Section 303(d) of the federal Clean Water Act. The Department has adopted the Verified List of impaired waters in accordance with the FWRA and the Identification of Impaired Surface Waters Rule (IWR) (Rule 62-303, Florida Administrative Code [F.A.C.]). The U.S. Environmental Protection Agency (EPA) also approved this list as the current 2002



Total Maximum Daily Load

The maximum amount of a given pollutant that a waterbody can assimilate and remain healthy, such that all of its designated uses are met.



303(d) list of impaired waters for the basin, so called because it is required under Section 303(d) of the Clean Water Act.

The first 303(d) list, which was required by the EPA in 1998, is to be amended annually to include basin updates. Florida's 1998 303(d) list included a number of waterbodies in the Charlotte Harbor Basin. **Tables 3.5 through 3.7** in Chapter 3 list these waters, by planning unit.

This Assessment Report follows the EPA's guidance for meshing Clean Water Act requirements for Section 305(b) water quality reports and Section 303(d) lists of impaired waters. This integrated water quality assessment is used to identify the status of data sufficiency, the potential for impairment, and the need for TMDL development for each waterbody or waterbody segment in the basin.

A description of the legislative and regulatory background for TMDL development and implementation through the watershed management approach, and a brief explanation of the TMDL Program, are available in **Appendix A**. Background information on the Department's TMDL Program, the process of TMDL development and implementation, lists of impaired and potentially impaired waters, and assessments for other parts of the state are available at http://www.dep.state.fl.us/water/tmdl/index.htm.

Stakeholder Involvement

The FWRA requires the Department to work closely with stakeholders to develop and implement TMDLs. In addition, the Department's Allocation Technical Advisory Committee (ATAC) report, submitted to the legislature, recommends relying on stakeholder involvement. Stakeholder involvement in the TMDL process will vary with each phase of implementation to achieve different purposes **(Table 1.1)**. The ATAC report is available at http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf.

The Department will work cooperatively with a number of key stakeholders to develop, allocate, and implement TMDLs in the Charlotte Harbor Basin. These groups include the Charlotte Harbor National Estuary Program (CHNEP); the Southwest Florida Water Management District (SWFWMD); the South Florida Water Management District (SFWMD); the Florida Marine Research Institute; Charlotte, Sarasota, and Lee Counties; and the cities of Punta Gorda and Cape Coral.

Table 1.1: Stakeholder Involvement in the TMDL Program

Watershed Management Cycle	Nature of Stakeholder Involvement
Phase 1: Preliminary Evaluation	Close coordination with local stakeholders to conduct a preliminary basin water quality assessment; inventory existing and proposed management activities; identify management objectives and issues of concern; develop a Strategic Monitoring Plan; and produce a preliminary Status Report that includes a Planning List of potentially impaired waters
Phase 2: Strategic Monitoring and Assessment	Cooperative efforts between the Department and local stakeholders to collect additional data; get data into STORET (the EPA's national water quality **STO**rage and **RET**rieval database); complete water quality assessment; produce a final Assessment Report that includes a Verified List of impaired waters for Secretarial adoption; and provide an opportunity for stakeholders to document reasonable assurance (for Department review) that existing or proposed management plans and projects are adequate to restore water quality without the establishment of a TMDL
Phase 3: Development and Adoption of TMDLs	Coordination with stakeholders to discuss TMDL model framework, including model requirements, parameters to be modeled, model endpoints, design run scenarios and preliminary allocations; communication of science used in the process; public workshops for rule adoption of TMDLs
Phase 4: Development of Basin Management Action Plan	Broad stakeholder participation in developing a Basin Management Action Plan (B-MAP) (including detailed allocations and implementation strategies), incorporating it into existing management plans where feasible; public meetings during the planning process
Phase 5: Implementation of Basin Management Action Plan	Emphasis on implementing the B-MAP, other voluntary stakeholder actions, and local watershed management structures; Department will continue to provide technical assistance, fulfill oversight responsibilities, and administer National Pollutant Discharge Elimination System (NPDES) point and nonpoint source permits

The Watershed Management Cycle in the Florida Department of Environmental Protection's South District

Figure 1.1 shows the order in which the Department's South District basins will be evaluated under the watershed management cycle. These groups are identified according to a U.S. Geological Survey classification system using hydrologic unit codes.

Everglades West Coast, a Group 1 basin, was the first basin in the district to undergo a preliminary assessment in 2000; an Assessment Report was published in 2002. A preliminary assessment for the Group 2 basin, Charlotte Harbor, was completed in 2001, and the basin is the subject of this Assessment Report. The basin lies in the Charlotte Harbor and a small portion of the Sarasota Bay hydrologic units. The Group 3 basin, Caloosahatchee, was assessed on a preliminary basis in 2002. Similarly, preliminary assessments for the Group 4 and Group 5 basins, Fisheating Creek and Florida Keys, have been initiated in 2003 and 2004, respectively. In 2005, the cycle will resume with the Group 1 basin, Everglades West Coast.

Figure 1.1: Schedule for Implementing the Watershed Management Cycle in the Department's South District, Basin Groups 1 through 5

Noteworthy

Contents of This Report

- **Chapter 1: Introduction** briefly characterizes the purpose and content of the Assessment Report, discusses stakeholder involvement, and describes how the watershed management cycle will be implemented in the Department's South District.
- **Chapter 2: Basin Overview** characterizes the basin's general setting, water resources, major water quality trends, and watershed management issues and activities.
- **Chapter 3: Surface Water Quality Assessment** discusses basinwide water quality trends and provides, by basin planning unit, an evaluation of water quality, a discussion of permitted discharges and land uses, a summary of ecological priorities and problems, and an overview of water quality improvement plans and projects.
- **Chapter 4: Verified List of Impaired Waters** contains the Verified List of impaired waters, discusses public participation, describes documentation of reasonable assurance, lists the pollutants causing impairments, provides listings based on other information indicating a nutrient imbalance, and describes the adoption process for the Verified List.
- **Chapter 5: TMDL Development, Allocation, Implementation, and Monitoring Priorities** discusses the prioritization of listed waters, ambient monitoring priorities, TMDL development, TMDL allocation and implementation, and the development of a Basin Management Action Plan (B-MAP).

Chapter 2: Basin Overview

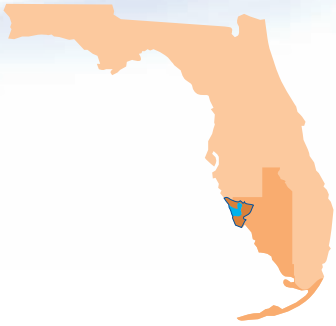
Basin Setting

Charlotte Harbor, in southwest Florida, is a semienclosed body of water open to the Gulf of Mexico through several tidal inlets. The harbor is America's 17th largest estuary and Florida's 2nd largest open-water estuary. Its open-water surface area is about 270 square miles (Charlotte Harbor National Estuary Program [CHNEP], 1998) and averages 7 feet in depth (Stoker, 1992). The drainage basin stretches from the headwaters of the Peace River in Polk County, southward through San Carlos Bay, and eastward to Lake Okeechobee, encompassing 8 counties and 4,670 square miles (Stoker, 1992). Charlotte Harbor receives its fresh water from 3 major rivers and several smaller streams that mix with the marine waters of the Gulf of Mexico. Depending on the season, location and depth in the harbor, salinity can range from zero to full-strength seawater.

The Charlotte Harbor region is home to 5 national wildlife refuges, 5 state aquatic preserves, and 1 state buffer preserve. The region supports a great diversity of semitropical plant and animal life. In 1990, 86 federal and state protected plant and animal species were found. **Figure 2.1** shows the principal geopolitical features in the Charlotte Harbor Basin. **Appendix B** briefly describes the basin's ecoregions and provides a list of major natural communities and imperiled animal species.

In 1995, Charlotte Harbor was recognized as an "estuary of national significance" and was accepted into the National Estuary Program. The CHNEP study area, at 4,400 square miles, differs slightly from the 4,670-square-mile drainage basin depicted by the U.S. Geological Survey (USGS) (Stoker, 1992). The study area adds the Estero, Lemon, Dona, and Roberts Bay watersheds, but does not include the nontidal portions of the Caloosahatchee River watershed between Franklin Lock and Lake Okeechobee.

For this watershed management cycle, the area under review *only* includes Charlotte Harbor Proper, Pine Island Sound, Matlacha Pass, San Carlos Bay, Lemon Bay, Placida Harbor, and Gasparilla Sound, all of which lie within Charlotte and Lee Counties and a portion of Sarasota County. This assessment does not include Estero Bay and the Peace, Myakka, and Caloosahatchee Rivers, although their inputs into the Charlotte Harbor Basin are occasionally mentioned.



Much of the information about the Charlotte Harbor Basin in this chapter was obtained from The Comprehensive Conservation Management Plan for the Greater Charlotte Harbor Watershed*, Volumes 1 and 2 (Charlotte Harbor National Estuary Program, 2000a), and* The Story of the Greater Charlotte Harbor Watershed *(Estevez et al., 1998). References also include the Charlotte Harbor National Estuary Program Web site at http://www.charlotteharbornep.com/. The chapter cites other references individually. The reference section contains a complete listing of all the resources used in creating this report.*

Population

The Charlotte Harbor Basin is one of the nation's fastest growing areas. Charlotte and Lee Counties are projected to be among the nation's leading coastal counties in percentage of population change between 1988

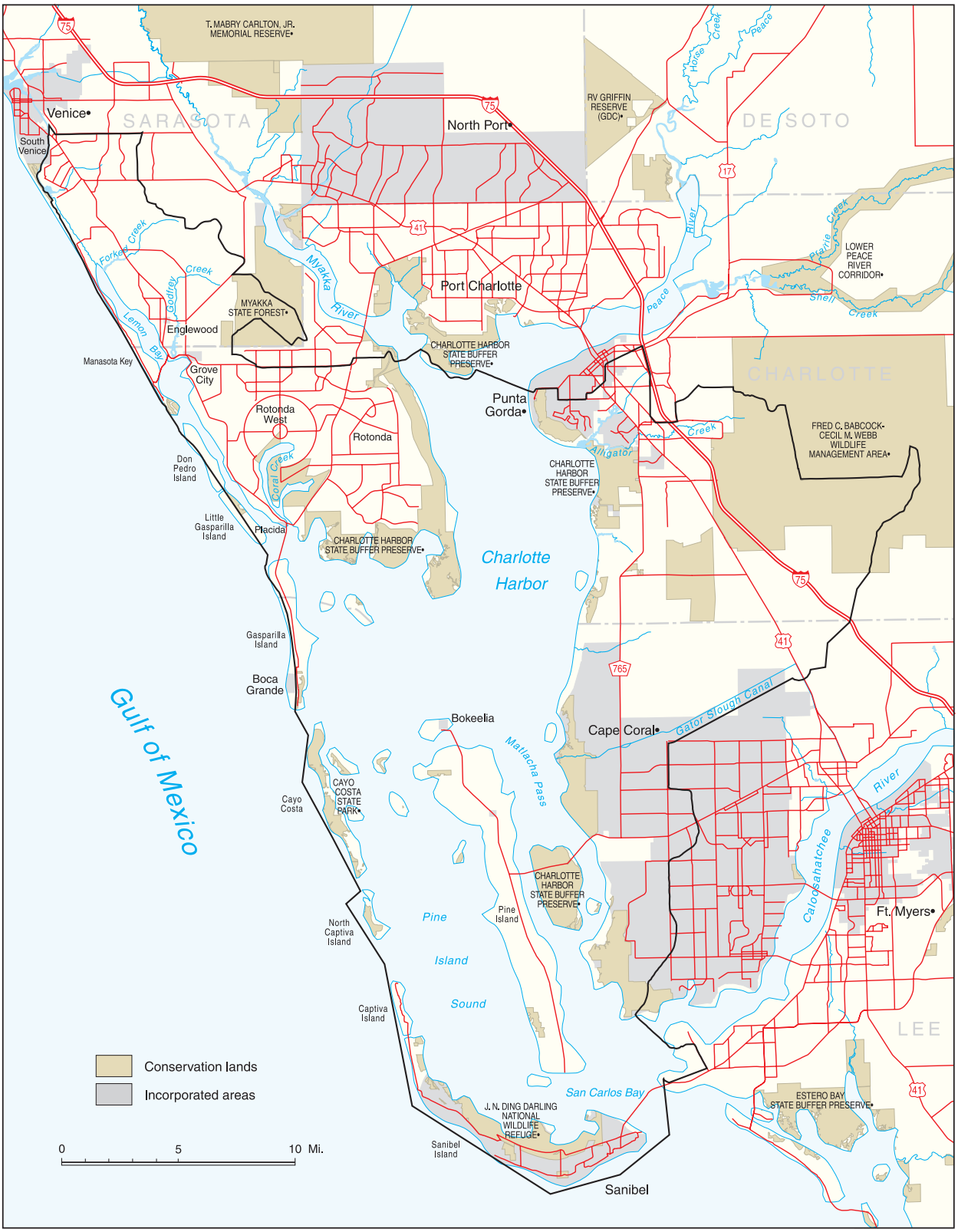
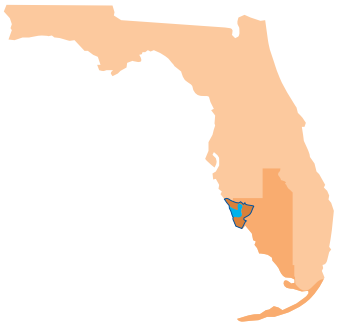


Figure 2.1: Geopolitical Map of the Charlotte Harbor Basin



and 2010. **Table 2.1** lists the region's population growth by county. Some of the larger population centers in the basin are Punta Gorda, Cape Coral, Sanibel, Englewood, South Venice, and Venice Gardens.

Table 2.1: Population Growth by County in the Charlotte Harbor Region

County	1980	2000	2020
Charlotte	58,500	142,400	210,700
Lee	205,300	421,800	594,300
Sarasota	202,300	325,900	419,100
TOTAL	**466,100**	**890,100**	**1,224,100**

Source: Charlotte Harbor National Estuary Program, 2000.

Land Use

Table 2.2 shows the land use percentages in a broad (Level I) geographic information system (GIS) analysis, carried out in the Charlotte Harbor Basin by the South Florida Water Management District (SFWMD) and Southwest Florida Water Management District (SWFWMD) in 1998.

Table 2.2: Level I 1998 Land Use in the Charlotte Harbor Basin

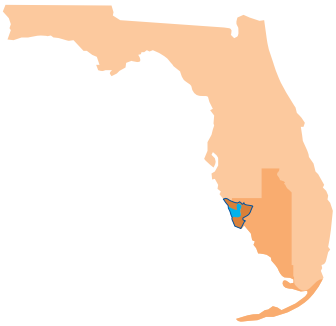
Level I	Type	Percent of Basin
1000	Urban and Built-up	16.3
2000	Agriculture	3.1
3000	Rangeland	3.9
4000	Upland Forest	10.8
5000	Water (including open bay)	47.9
6000	Wetlands	16.5
7000	Barren Land	0.4
8000	Transportation, Communications, and Utilities	1.1

Economic Activity

Recreation/Tourism

In 1993, approximately 1.7 million tourists vacationed in the 3 coastal counties (Sarasota, Charlotte, and Lee) of the Charlotte Harbor Basin. Total tourism expenditures were more than $1.1 billion, with vacationing tourism dollars contributing 53 percent of total tourism spending (CHNEP, 1998). Popular recreational activities include boating, swimming, sunbathing, and fishing.

About one-third of all Florida tourists visit the region to go fishing. A recent economic study (CHNEP, 1998) indicated that the recreational fishery is valued at $107.2 million annually. Charlotte Harbor provides some of the best saltwater sportfishing in the world, with snook, tarpon, redfish, and spotted seatrout comprising some of the most favored gamefish. Of particular note is the nation's largest tarpon tournament, held annually in Boca Grande.



Commercial Fishing

Charlotte Harbor's commercial fishery is valued at $22.6 million annually (CHNEP, 1998). Commercial fisheries in the Charlotte Harbor estuary system include black mullet, spotted seatrout, king whiting, flounder, bluefish, grouper, king mackerel, and several species of sharks. The harbor also supports blue crab, pink shrimp, stone crab, hard clam, and scallop populations.

Agriculture

Although agriculture is not a prominent land use in the 3-county Charlotte Harbor Basin, accounting for less than 6 percent of the actual land area, it is the prominent land use in the greater drainage basin (consisting of 8 counties) and the region's economic anchor, second only to tourism. Citrus is the main agricultural product. More than a dozen citrus varieties are grown, although most acreage goes into juice oranges. In 1995, a total of 283,000 acres in the CHNEP study area was dedicated to citrus (one-third of all Florida citrus acreage) (Estevez et al., 1998).

Beef cattle follow citrus in economic importance. Ranching occurs in vast areas of the greater Charlotte Harbor drainage basin and is the main agricultural activity in the Myakka River watershed. In 1999, 4 counties in the CHNEP study area (Polk, DeSoto, Hardee, and Manatee) counted among Florida's top 10 beef producers (Estevez et al., 1998). Those counties—plus Charlotte, Sarasota, and Lee Counties—brought the total beef cattle production in the region to 371,900 head (Florida Department of Agriculture and Consumer Services [DACS], 1999).

Surface Water Resources

The Charlotte Harbor Basin contains numerous surface waterbodies. This section delineates the basin's hydrology, describes the movement and management of water in the basin, briefly describes the major characteristics of surface waters that influence water quality in the basin, and describes surface water classifications and special designations. **Figure 2.2** shows the locations of the largest waterbodies. A more detailed discussion in Chapter 3 provides information on each planning unit.

Freshwater inflow to Charlotte Harbor originates from three large rivers, navigational and drainage canals, and a number of smaller creeks. The **Myakka**, **Peace**, and **Caloosahatchee Rivers** provide the majority of the surface freshwater supply. Although this Assessment Report does not assess these three watersheds, the discussion that follows provides an overview of the hydrology of the larger region.

Myakka River

The Myakka River watershed contains the largest contiguous wetlands of the three watersheds supplying most of Charlotte Harbor's fresh water. The river begins its southerly flow from its headwaters, where seven tributaries converge to form the Flatford Swamp in Manatee County. After leaving Flatford Swamp, and following a narrow floodplain forest corridor, the

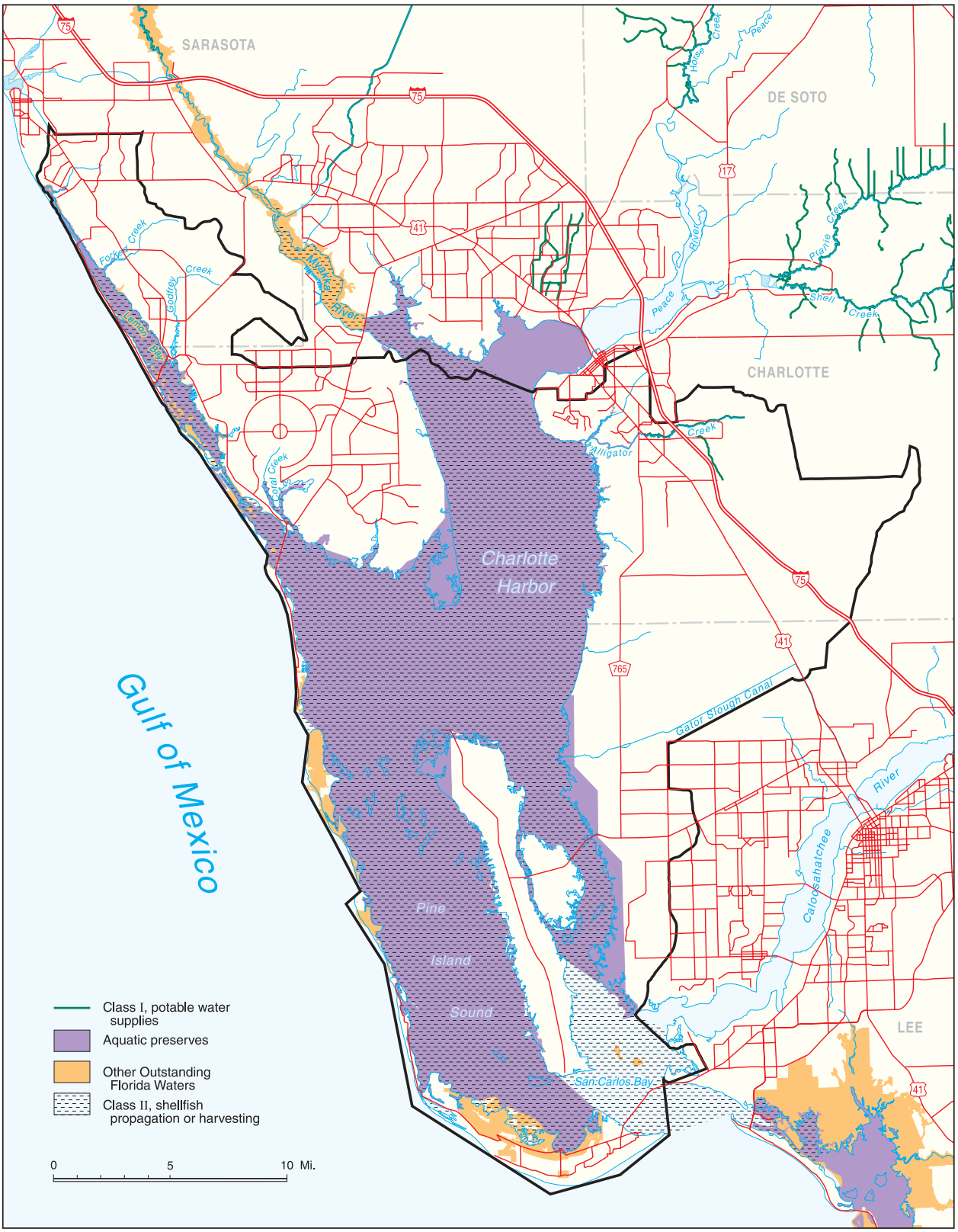
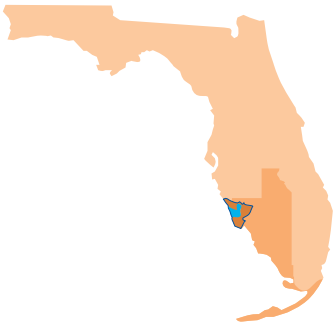


Figure 2.2: Surface Water Resources of the Charlotte Harbor Basin



Myakka River slows and enters a series of lakes in Myakka River State Park, the largest state park in Florida. Deer Prairie Creek and Big Slough feed the river as it widens and enters Charlotte Harbor. The Sarasota County portion of the Myakka River is designated as an Outstanding Florida Water (OFW) and a Florida Wild and Scenic River.

Cattle ranching dominates the watershed, especially upstream of Myakka River State Park. To satisfy the need for rangeland and pastureland, much of the watershed was drained and flows diverted. These alterations enabled some of the drained area to be used for row crops and citrus groves. Other parts of the upper and central portions of the Myakka River watershed have been acquired by the state for management and protection.

In the headwaters of the Myakka River, a large area of dead and dying trees has been identified in the **Flatford Swamp**, a region characterized by wetland tree species such as swamp tupelo, American elm, sweet gum, and Carolina ash. The cause is linked to elevated water tables and/or extended hydroperiods associated with the movement of irrigation water from row crop operations into the Flatford Swamp (Tomasko, 2002).

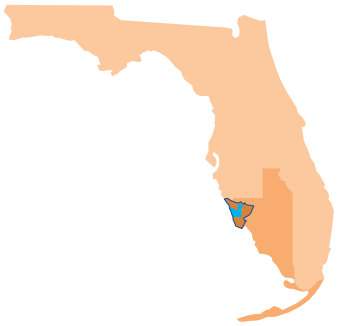
In the lower portion of the Myakka River watershed, urban development is gradually displacing agriculture. Former grazing lands along the banks of the lower Myakka River are now being converted to urban uses, mostly homes. Some construction is finally occurring on the vast inventory of lands that were platted in the 1960s (see the section on **"Roads to Nowhere"** later in this chapter). At that time, the plats displaced agriculture in western Port Charlotte and the city of North Port. Today the city of North Port receives its drinking water from Big Slough, a tributary to the Myakka River.

Peace River

At 2,400 square miles, the Peace River watershed is the largest and most diverse in the greater Charlotte Harbor region. The river originates at the Green Swamp in central Polk County as Saddle Creek, draining a series of wetlands and lakes in the Lakeland and Winter Haven area. The rate of flow is directly proportional to ground water levels. Underground and overland flows follow natural and altered paths through canals, flood control structures, former phosphate mines, wetlands, and finally Lake Hancock.

South of Lake Hancock, Saddle Creek merges with canals and Peace Creek to form the main channel of the Peace River. Other large tributaries that join and augment the river flow downstream include Payne, Charlie, Joshua, Horse, and Prairie/Shell Creeks. The Peace River flows over 100 miles in a southwesterly direction from Lake Hancock to Charlotte Harbor.

For almost a century, **phosphate mines** have been a major land use in the Polk County headwaters of the Peace River, greatly altering the watershed's hydrology and natural flora and fauna. Before legislative action and subsequent regulations, some natural tributaries to the Peace River were mined and not reclaimed. Under state law, all lands mined after July 1, 1975, must be reclaimed. Citrus, cattle ranching, row crop farming and other more intensive development have also altered the watershed's



hydrology and natural flora and fauna in Polk County and downstream in Hardee and DeSoto Counties.

All of these land uses contribute to the pollutant loading (particularly nutrients) of the Peace River and adversely affect water quality in some of its segments. The Peace River is the major freshwater contributor to Charlotte Harbor. The Peace River and its tributary, Shell Creek, are also a major source of drinking water for about 90,000 people in Charlotte, DeSoto, and Sarasota Counties. River flows have declined because of the effects of mining, agriculture, municipal water withdrawals, and reduced rainfall. The reduced flows are most apparent upstream, although no trends are yet apparent at Arcadia. This decrease threatens the ecology of the river system and could potentially threaten the ecology of Charlotte Harbor.

The flow of algae-laden water from Lake Hancock to the Peace River is a continuing problem. Not only do the algae increase the river's nutrient and biological oxygen demand (BOD) load, but they also cause taste and odor problems in the downstream drinking water supply. Recently there has also been concern that the blue-green algae common to this system may release some toxic compounds to the water during decomposition. Much more research is needed to identify these toxicants and develop methods for their detection and removal (Stone, 2002).

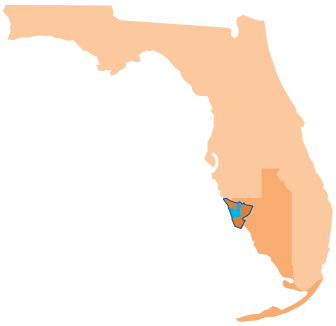
Another concern is the increasing salinity of Joshua, Prairie, and Shell Creeks (three large Peace River tributaries) that are affected by irrigation runoff of chloride, total dissolved solids and sulfate-enriched ground water pumped for agriculture (Corbett, 2002). The SWFWMD currently has a program in place to identify and back-plug salty wells affecting water quality in Joshua, Shell, and Prairie Creeks (Minnis, 2002).

Caloosahatchee River

Historically, the Caloosahatchee River originated as overland flow from Lake Okeechobee through marshlands and swamp forest (CHNEP, 2000a). In 1882, Hamilton Disston dug a canal linking Lake Okeechobee to the Caloosahatchee River. Several drainage districts channeled the river further between 1905 and 1927 (Fernald and Purdum, 1998).

The modern Caloosahatchee River is a channelized flood control and navigational water, maintained by the U.S. Army Corps of Engineers (USACOE) as part of the Okeechobee Waterway, which links the Atlantic Ocean to the Gulf of Mexico via the St. Lucie River, Lake Okeechobee, and the Caloosahatchee River. Franklin Lock, in Lee County, artificially separates the fresh water of the Caloosahatchee River from the salt water of the estuary, truncating the estuary. It also marks the beginning of the 30-mile tidal basin of the Caloosahatchee River, which starts at the lock and continues to the Gulf of Mexico.

Twentieth-century transportation, drainage, irrigation, and waste disposal have had lasting effects on the Caloosahatchee River and its watershed. The river's channel has been straightened, shorelines hardened, and oyster reefs dredged. Both water quality and quantity have been altered by raw sewage, stormwater runoff, extreme counterseasonal freshwater releases from Lake Okeechobee, pesticide spills, thermal effluent, and exotic nuisance species.



Agribusiness has converted much upland and wetlands east (upstream) of Franklin Lock to intensive agricultural uses. The conversion includes numerous drainage and irrigation canals where crop demands regulate river flows into or out of the adjacent canals. The citrus industry has expanded significantly into the upper watershed during the past decade (due to severe citrus freezes in central Florida) and depends on the control of soil water levels.

In addition to the upstream channel, small creeks and tributaries contribute significant freshwater flows to the river and estuary. Considerable freshwater urban runoff also enters the river and estuary from the extensive Lee County network of navigation and drainage channels.

Dominated by the human uses in the surrounding cities of Cape Coral and Fort Myers, the estuary still provides critical habitat that requires careful management. Despite the accumulated damage to the estuary, seagrasses still flourish when river conditions are suitable.

The SWFWMD recently established a minimum flow and level (MFL) for the Caloosahatchee River. From December 20, 2001, through the end of January 2002, the district released small pulses of fresh water from Lake Okeechobee into the Caloosahatchee River in an attempt to reduce the estuary's salinity.

Surface Water Quality Classifications

Surface water quality classifications in the Charlotte Harbor Basin are as follows:

Class I:

- Alligator Creek (Charlotte Harbor planning unit), north and south prongs, to the water control structure downstream of State Road 765-A.

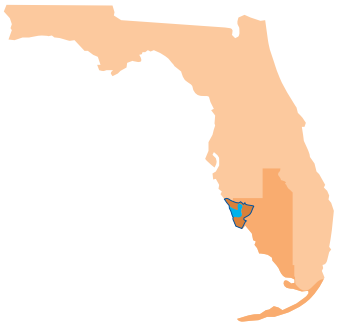
Class II:

- Lemon Bay, Placida Harbor, and tributaries
- Charlotte Harbor, Myakka River, and Gasparilla Sound
- Matlacha Pass, San Carlos Bay, and Pine Island Sound

The remainder of the state waters in the basin (portions of Sarasota, Charlotte, and Lee Counties) are Class III unless specifically designated as Class IV waters. Class IV waters consist of all secondary and tertiary canals or ditches wholly within agricultural areas behind a water control structure permitted by the water management district under Sections 373.103, 373.413, or 373.416, Florida Statutes (F.S.). The basin contains no Class V waters.

Florida's water quality standards, the foundation of the state's program of water quality management, designate the "present and future most beneficial uses" of the waters of the state (Subsection 403.061[10], F.S.). Water quality criteria for surface water and ground water, expressed as numeric or narrative limits for specific parameters, describe the water quality necessary to maintain these uses. Florida's surface water is classified using the following five designated use categories:

Class I	Potable water supplies
Class II	Shellfish propagation or harvesting
Class III	Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV	Agricultural water supplies
Class V	Navigation, utility, and industrial use (there are no state waters currently in this class)



Special Designations

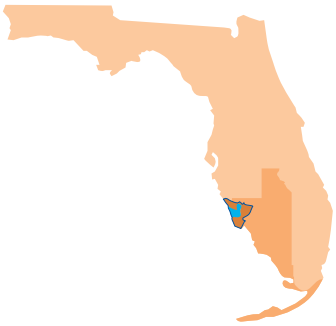
Outstanding Florida Waters

Table 2.3 and **Figure 2.2** list and depict OFWs in the Charlotte Harbor Basin.

OFWs are designated for "special protection due to their natural attributes" (Section 403.061, F.S.). These waters are listed in Section 62-302.700, Florida Administrative Code (F.A.C.). The intent of an OFW designation is to maintain ambient water quality, even if these designations are more protective than those required under the waterbody's surface water classification. Most OFWs are associated with managed areas in the state or federal park system, such as aquatic preserves, national seashores, or wildlife refuges. Other OFWs may also be designated as "Special Waters" based on a finding that the waters are of exceptional recreational or ecological significance, and are identified as such in Rule 62-302, F.A.C.

Table 2.3: Outstanding Florida Waters in the Charlotte Harbor Basin

County	Location
Sarasota	Lemon Bay Estuarine System (special water OFW)
	Lemon Bay State Aquatic Preserve
Charlotte	Cape Haze State Aquatic Preserve
	Charlotte Harbor State Buffer Preserve
	Don Pedro Island State Park
	Gasparilla Sound–Charlotte Harbor State Aquatic Preserve
	Island Bay National Wildlife Refuge
	Lemon Bay Estuarine System (special water OFW)
	Lemon Bay State Aquatic Preserve
	Port Charlotte Beach State Recreation Area
Lee	Cape Haze State Aquatic Preserve
	Cayo Costa State Park
	Charlotte Harbor State Buffer Preserve
	Gasparilla Island State Park
	Gasparilla Sound–Charlotte Harbor State Aquatic Preserve
	J.N. "Ding" Darling National Wildlife Refuge
	Josslyn Island (Conservation and Recreation Lands acquisition)
	Matlacha Pass National Wildlife Refuge
	Matlacha Pass State Aquatic Preserve
	Pine Island National Wildlife Refuge
	Pine Island Sound State Aquatic Preserve



Minimum Flows and Levels

The SWFWMD recently established an MFL for the Caloosahatchee River. From December 20, 2001, through the end of January 2002, the district released small pulses of fresh water from Lake Okeechobee into the Caloosahatchee River in an attempt to reduce the estuary's salinity.

Consumptive use and alterations to this watershed has reduced, or has the potential to reduce, the amount and timing of surface water being delivered. Projected increases in withdrawals also could reduce future flows and levels.

To help determine the amount of water that is available for human use from a particular source, the district must determine each waterbody's MFL. Under the Florida Water Resources Act (FWRA) (Chapter 373, F.S.), an MFL is the limit at which further water withdrawals will cause significant harm to the water resources of the area and related natural systems. Lakes and aquifers have minimum levels. Minimum flows are set for rivers and streams.

Ground Water Resources

Physiography

The Charlotte Harbor Basin, which is in the Gulf Coastal Lowlands physiographic province, ranges in elevation from sea level to 50 feet above sea level. The Gulf Coastal Lowlands are flat areas with wetlands interspersed with pine-palmetto flatwoods. The poorly drained soils in this region are typically high in tannic acid due to the local vegetation. The rivers are characterized as "blackwater" (tea-colored) because of the presence of these tannins in surface water runoff (Fernald and Purdum, 1998).

Aquifers

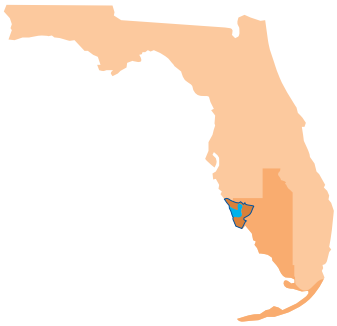
The hydrogeologic framework in the Charlotte Harbor Basin consists of the surficial aquifer system, intermediate aquifer system, and the upper Floridan aquifer system. The surficial aquifer, an unconfined system, ranges in depth from a few feet to over 60 feet. It consists of unconsolidated sand, marl, phosphate, shell, and limestone; its hydraulic properties vary considerably across the basin.

Underlying the surficial aquifer system is the confined intermediate aquifer system, where permeable strata from the Hawthorn Group have unnamed clay layers present above and below. This intermediate system is the primary ground water source of drinking water in most of the basin (Sarasota, Charlotte, and Lee Counties). Consisting of clastic sediment interbedded with carbonate rocks, it has three major permeable zones that exhibit a wide range of hydraulic properties. The upper Floridan aquifer, which consists of a thick sequence of limestone and dolomite, underlies the lower clay layer of the intermediate system.

The intermediate system flows horizontally from northeast to southwest; however, there is a considerable amount of vertical flow in portions of

the basin. The variable hydraulic connection between the aquifer systems results in an upward flow potential in Charlotte, Sarasota, and western DeSoto Counties. The flow provides recharge to the intermediate and surficial aquifer systems. Local rainfall provides the principal source of recharge to the surficial system, while the intermediate aquifer receives most of its recharge from downward leakage through the upper confining unit or upward flow from the Floridan aquifer system (Miller, 1990).

Water quality ranges from fresh in the surficial aquifer system and upper permeable zones of the intermediate aquifer system to moderately saline in the lower permeable zone of the intermediate system and the upper Floridan aquifer. Although the upper Floridan is the most productive zone, its use is limited because of poor water quality from high sulfate, chlorides, and total dissolved solids. The basin contains many artesian wells. Improperly constructed and flowing artesian wells facilitate the movement of poorer quality water from the upper Floridan aquifer upward into the intermediate and surficial aquifer systems and surface waters. Large ground water withdrawals from major ground water supply wells near the coastline have resulted in the vertical (upward) movement of the near-horizontal saltwater/freshwater interface and localized up-coning of saline water from the upper Floridan aquifer into the surficial and intermediate aquifer systems.



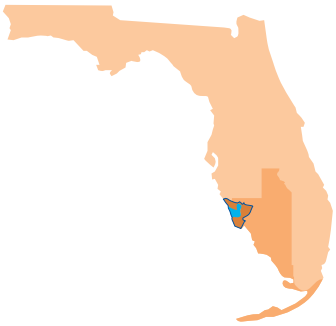
Ground Water–Surface Water Interactions

A large portion of the basin is in a discharge zone for the intermediate and Floridan aquifer system. Ground water discharging from artesian wells is the primary ground water to surface water interaction within this basin's defined boundaries. Just outside the northern basin boundaries are several hot springs and a large submarine spring to the south of Sanibel. Historically, the public has misidentified some flowing artesian wells as springs, including Hot Springs, just south of Punta Gorda in Charlotte County. Plugging abandoned artesian wells and establishing wellhead protection programs have been emphasized in the basin to protect and preserve ground water and surface water resources.

Ground water contributions to the Peace River have declined over the years. The potentiometric surface of the Floridan aquifer system in the area has also declined due to the cumulative effects of historical and current ground water pumping practices in the upper Peace River Basin. It is thought that declines in the flow of the upper Peace River are related to the lower **potentiometric surface** in the Floridan aquifer system. Once the potentiometric surface declines, the potential increases for downward leakage, which can reduce the amount of water available for streamflow (see the section on **"Hydrologic Alterations—'Famine or Feast'"** later in this chapter). Recent information provided by the SWFWMD indicates that the potentiometric surface in the upper Peace River Basin is slowly recovering (McCommons Beck, 2002).

Potentiometric Surface
The altitude to which water will rise in a tightly cased well open to a confined aquifer

The construction of canals and ditches in areas surrounding Charlotte Harbor has affected the surficial aquifer. The construction has resulted in a pronounced lowering of the water table and saltwater intrusion in the surficial aquifer system, especially in coastal Charlotte County and eastern Sanibel Island. Saltwater intrusion in the other aquifer systems is also a



problem due to the tremendous increase in ground water withdrawals over the years.

On-Site Sewage Treatment and Disposal Systems

On-Site Sewage Treatment and Disposal Systems (OSTDS), or septic tanks, are commonly used where central sewer is not cost-effective or practical. When located correctly and functioning properly, these systems dispose of domestic waste safely. The effluent discharged is comparable to secondarily treated wastewater from a sewage treatment plant. Wastewater is discharged from the drainfield to the surficial aquifer. When not functioning properly, however, OSTDSs can provide additional loadings of nitrogen and phosphorus to ground water. The following discussions for Sarasota, Charlotte, and Lee Counties summarize the status of OSTDS use in the Charlotte Harbor Basin.

Sarasota County

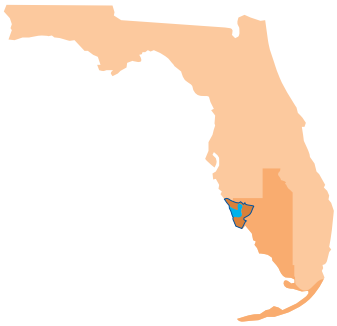
Sarasota County has two major waterways that discharge into Charlotte Harbor. The largest, the Myakka River, is sparsely populated south of Interstate 75 and contains less than 100 septic systems. The Myakka is designated as a Wild and Scenic River, and development and land use are controlled by county ordinance through the Myakka River Protection Plan, which encourages the use of central sewers except in very low-density developments. Such developments would require on-site systems that meet the more restrictive county septic ordinance, including a 3-foot separation between the wettest season water table and the bottom of the septic drainfield.

Big Slough, in the city of North Port, empties into the Myakka River close to the Sarasota–Charlotte County line. This creek's development is primarily seaward at the lower end. Septic systems on the upper end are generally post-1983, and conform to current state regulations for water table/drainfield separations. In addition, North Port enforces more stringent standards for the development of property on the creek, requiring aerobic treatment units where on-site systems are necessary (Perkins, 2001).

Charlotte County

Countywide, there are presently about 41,000 septic systems (OSTDS) serving county residences (85 percent), commercial buildings (8 percent), and institutions (7 percent). During the last 10 years, the rate of installation of new systems dropped from over 800 in 1991 to 400 by 1996, and then increased to 480 in 2000. During the expansive building years of 1977 to 1990, between 1,200 and 2,000 systems were installed per year.

About 4,000 buildings formerly on OSTDS have connected to expanded sewers during the last 5 years. In 1992, a county ordinance required all newly platted subdivisions to locate OSTDS at least 150 feet from tidal surface waters. In 1998, an innovative county ordinance was implemented, requiring advanced wastewater treatment systems for all platted, high-density building lots ($\leq$10,000 square feet) and structures adjacent to surface water, where the drainfield is within 100 feet of a waterbody. Over 150,000 vacant high-density lots and 15,000 waterfront lots platted



in the late 1960s have come under the jurisdiction of this ordinance. To date, over 100 advance systems have been permitted, and another 150 high-density lots have been combined to reduce density (Vincent, 2001).

Lee County

The soils of Lee County are primarily poorly drained sands or loamy sands and often overlie limestone substrate. The 1988 Lee County Soil Survey verifies a 10-inch wet season water table (WSWT). The state requires a 24-inch separation between the WSWT and the bottom of the drainfield (Rule 64E-6, F.A.C.). Since October 1988, mound system construction has been required for all new septic systems in Lee County to achieve that separation and avoid the saturation of subsurface soils during the wet season.

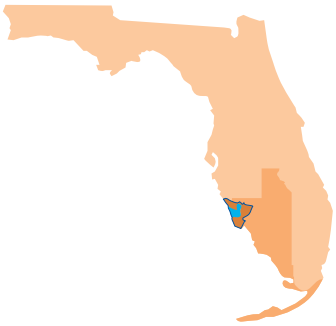
Lee County ranks in the top three counties statewide in terms of the number of OSTDS permits issued. For at least the last 10 years, it has consistently permitted an annual average of 2,000 on-site systems serving both residences and businesses. Since 1993, the county's 15 service utilities have provided public sewage to 13,270 residences and businesses previously served by OSTDS. This continuing expansion, however, has yet to keep pace with new OSTDS permits as housing growth continues, particularly in Lehigh Acres and Cape Coral.

Lee County presently has about 63,000 OSTDS in use. About 28,870 are mound system construction installed after October 1988. The remaining 38,130 are subsurface systems constructed under previous regulations. Many of these have failed as a result of hydraulic overload, tree roots, and system abuse and have been repaired using more recent repair standards. On average, nearly 500 failing OSTDS are repaired each year, and Lee County has recorded 6,296 permitted repairs since 1988.

The failure rate for new systems in the first two years is extremely low and has decreased since 1988, when mound system construction was initiated. An analysis of repairs on systems constructed since 1988 indicates that domestic wastewater does not travel laterally from the drainfield more than a couple of feet. Nor is there significant contamination of ground water from the horizontal movement of effluent through soils used to construct on-site systems in Lee County (Barker, 2001).

Water Usage

In the southwest Florida region, the intermediate aquifer is often the principal ground water source of water supply. Municipalities also extensively use rivers and creeks as a water supply. The SWFWMD's most recent Water Management Plan (SWFWMD, 2000a) indicates that 82 percent of freshwater withdrawals for the entire district comes from ground water sources, although Sarasota and Charlotte Counties primarily use surface waters (McCommons Beck, 2002). As of 1997, the estimated public water use (public supply and domestic self-supply) was the district's largest withdrawal category, with about 43 percent of total freshwater use. Agriculture was the second highest category, with an estimated 37 percent of total freshwater use.



Overall water supply demands in the SWFWMD are expected to increase over 50 percent by 2020, including a 69 percent increase in agriculture and a 49 percent increase in public supply. Better resource management, desalinization, conservation, investigation of alternative water sources, and reuse of water are all recommended to meet these increased demands.

Water Use Caution Areas/Water Resource Caution Areas

Water Use Caution Areas (WUCA) are established where water resources within a water management district are currently or potentially at critical stages. The SWFWMD portion of the Charlotte Harbor Basin lies in the Southern Water Use Caution Area (SWUCA). SWUCA encompasses all of Manatee, Sarasota, Hardee, and DeSoto Counties and portions of Hillsborough, Charlotte, Polk, and Highlands Counties. The SWFWMD has developed short-term, intermediate, and long-term actions to protect ground water resources in the SWUCA.

A similar designation, referred to as a Water Resource Caution Area (WRCA), occurs in the SFWMD portion of the Charlotte Harbor Basin (Pine Island planning unit). The WRCA also includes all of Lee County as well as Hendry, Collier, and Monroe Counties in the Caloosahatchee and Everglades West Coast Basins.

Watershed Management Activities and Processes

Over the years, management plans and activities in the basin have been implemented to eliminate wastewater discharges; reduce discharges of polluted stormwater from urban and agricultural areas; and protect, preserve, and restore special areas. The following section describes historical, current, and ongoing issues, activities, and processes to address water quality problems. **Table 2.4** provides a historical timeline of planning issues and management activities.

Much of the progress in the Charlotte Harbor Basin in developing water quality restoration plans and implementing watershed and water quality improvements is attributable to coordinated local, state, and regional efforts. Many plans share common goals, and their implementation is based on various groups playing critical roles in planning, funding, managing, and executing projects. The Florida Department of Environmental Protection (Department) continues to coordinate its efforts with these entities to obtain data, strengthen monitoring activities, and exchange information through periodic meetings.

Historical Issues and Activities

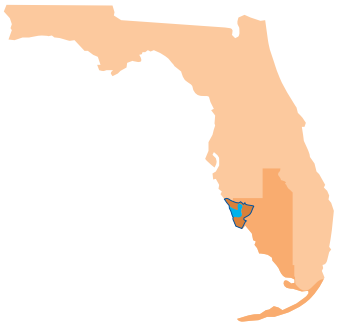
Conditions in and around the Charlotte Harbor Basin have changed dramatically in the last century. Drainage has increased throughout the region because of explosive agricultural and residential development and roadway construction. In response, many conservation areas have also been

Table 2.4: Timeline Summary of Environmental Issues and Activities in the Charlotte Harbor Basin

Year	Issues and Activities
1881–1900	Florida sells 4 million acres of land to Hamilton Disston, who in 1882 constructs a canal between Lake Okeechobee and the Caloosahatchee River, beginning a series of actions affecting lake levels and downstream water quality in Charlotte Harbor. Phosphate mining begins in the Peace River watershed. The U.S. Army Corps of Engineers (USACOE), under the Federal Rivers and Harbor Act, recommends navigational improvements (channelization) for the Kissimmee–Okeechobee–Caloosahatchee system.
1904–1907	In 1904, Napoleon Bonaparte Broward is elected governor of Florida on a promise to drain the Everglades. The Florida legislature creates the Everglades Drainage District in 1907, publicly funding drainage and flood control projects.
1913–1916	The "District," established in 1913, is the first of several to carry out drainage projects in south Florida. The General Drainage Act of 1913 authorizes adjacent landlords to establish drainage districts to drain and "reclaim" their lands. The construction of Tamiami Trail begins in 1916.
1920–1928	Major hurricanes flood South Florida from 1922 to 1928, killing many people. The Caloosahatchee River is channelized by 1927; Tamiami Trail is completed by 1928.
1947–1949	Two more hurricanes and floods hit South Florida in 1947. The existing canal network is unsuccessful in alleviating flood conditions. Congress passes the Flood Control Act of 1948, authorizing the USACOE to create a huge, multistage flood control project in South Florida. The Florida legislature creates the Central and Southern Florida (C&SF) Flood Control District in 1949 to operate and maintain the massive project.
1952–1959	Red tide affects 400 square miles (including offshore waters) from Boca Grande to Sanibel Island from June to December 1952. Red tide occurs from Pinellas County southward to Sanibel Island in 1953–1954. In 1955, the State Board of Health declares that the Peace River "is now suffering severely from excessive organic and chemical pollution." Red tide kills fish from Clearwater to Fort Myers in 1959; Sanibel Island is one of the hardest-hit areas.
1960–1968	Hurricane Donna causes massive damage to southwest Florida in 1960, and the Southwest Florida Water Management District (SWFWMD) is created in 1961 in response to the flooding. Red tide is observed from Tampa Bay to Marco Island in April 1963. Red tide and fish kills in the Fort Myers area are reported from August 1967 to January 1968.
1969–1974	The U.S. Geological Survey (USGS) depicts an area in southwestern Polk County as a "caution area" for additional ground water withdrawals in a 1969 map. Red tide is reported in the Fort Myers area from May to September 1971. The Florida legislature passes the Florida Water Resources Act in 1972, establishing 5 water management districts statewide and expanding their responsibilities to include the control and regulation of ground water and surface water. Florida citizens approve a constitutional amendment in 1972 authorizing $240 million in state bonds to buy environmentally sensitive lands. Under the Environmentally Endangered Lands (EEL) Program, the state acquires 350,000 acres, including the Cayo Costa State Park in the Charlotte Harbor Basin. Red tide is reported in the Fort Myers area from January to June 1974.
1975–1976	The Florida legislature passes the Aquatic Preserves Act in 1975, creating a statewide system of specially protected and managed aquatic areas. The Florida Department of Environmental Regulation is created in 1975. The C&SF Flood Control District is renamed the South Florida Water Management District (SFWMD) in 1976.
1979–1982	The 1979 legislative session creates the Conservation and Recreational Lands (CARL) Program for land acquisition. In January 1979, the governor of Florida forms the Charlotte Harbor Resource Planning and Management Committee, which is charged with ensuring the protection of Charlotte Harbor and adjoining coastal estuaries. General Development Utilities (GDU) starts withdrawing 6 million gallons per day (mgd) of water from the Peace River for potable use in 1980. The Florida legislature passes the Save Our Rivers (SOR) Act in 1981. The SOR Program authorizes the water management districts to purchase lands along rivers. Red tide kills 39 manatees in the Caloosahatchee River area in February and March 1982.

Table 2.4 (continued)

Year	Issues and Activities
1987–1988	In 1987, the Florida legislature passes the Surface Water Improvement and Management (SWIM) Act, a statewide program for protecting and restoring priority surface waterbodies of regional significance. Congress establishes the National Estuary Program through amendments to the Water Quality Act in 1987. GDU expands potable water withdrawals from the Peace River to 12 mgd in 1988.
1990–1993	The Florida legislature adopts Governor Bob Martinez's Preservation 2000 (P-2000) Program in 1990, which provides funds for the CARL and SOR land acquisition programs. The SWFWMD assembles a Charlotte Harbor SWIM advisory committee in 1992 to help prepare a SWIM Plan for Charlotte Harbor. Red tide outbreaks occur from Charlotte to Pinellas Counties in September and November 1992. The district's governing board approves the first SWIM Plan for Charlotte Harbor in early 1993. That same year, the Florida Environmental Reorganization Act merges the Departments of Environmental Regulation and Natural Resources into the Florida Department of Environmental Protection.
1995–1996	Governor Lawton Chiles nominates Charlotte Harbor as an "estuary of national significance" in 1995, and Charlotte Harbor is accepted into the National Estuary Program, 1 of only 27 other watersheds in the United States to receive the designation. The longest red tide bloom recorded in Florida is present in varying concentrations from Tarpon Springs to the Keys from late 1994 through April 1996, contributing to massive manatee mortality in Charlotte, Lee, and Sarasota Counties in 1996, most of which occurs in Lee County. Congress passes the Everglades and South Florida Ecosystem Restoration Act in 1996 to restore the water quality and basic hydrologic patterns in the entire Everglades/South Florida ecosystem.
1997–1998	The Peace River Manasota Regional Water Supply Authority (PRMRWSA), the successor to GDU, completes a conceptual design in 1997 to build a 42-inch, 23-mile pipeline from the Peace River to Sarasota County to transport potable water. Governor Chiles issues an executive order requiring the water management districts to develop a priority list and schedule for the establishment of minimum flows and levels (MFLs) for surface water and ground water by November 15, 1997. A moderate bloom of red tide with shellfish bed closures and fish kills occurs between October 1997 and March 1998 from Charlotte Harbor to Venice. During the El Niño event of 1997–1998, the SFWMD releases extreme amounts of fresh water from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries (from early January to late April 1998). Fish with lesions, ulcers, and bloody spots are collected in Charlotte Harbor from April to June 1998. In 1998, PRMRWSA receives a 20-year permit to expand withdrawals form the Peace River to 18 mgd.
1999–2002	The Florida legislature establishes the Florida Forever Program in 1999, which replaces P-2000. This new program provides $300 million a year for preservation and restoration efforts. The 1999 C&SF restudy recommends to Congress that a hydrologic feasibility study be conducted for southwest Florida. The Management Conference approves the Charlotte Harbor National Estuary Program's (CHNEP) Comprehensive Conservation and Management Plan (CCMP) in February 2000. The SFWMD lowers water levels in Lake Okeechobee by 2 feet in April 2000, again discharging extreme amounts of fresh water into the St. Lucie and Caloosahatchee Estuaries. The CHNEP sends a letter to the water management district, stating that the extreme releases of fresh water from Lake Okeechobee into the Caloosahatchee River are not consistent with the CCMP. A moderate bloom of red tide occurs from Charlotte Harbor to Key West in the spring of 2000. Fish with lesions, ulcers, and red lips/fins are collected in Charlotte Harbor from May to August 2000. A red tide bloom of varying concentrations ranges from southern Pinellas County to Collier County from September through December 2001. To meet the MFL, the SFWMD releases fresh water from Lake Okeechobee to the Caloosahatchee River and estuary from December 2001 through the end of January 2002. Mullet with lesions are spotted and caught in the Caloosahatchee Estuary downstream of Franklin Lock from mid-December, 2001 to January, 2002. Another red tide event occurs along the Gulf Coast in early February 2002, ranging from Tampa Bay to Naples.
2003	On February 13, 2003, the SFWMD Governing Board adopted a resolution naming the lower Charlotte Harbor a SWIM waterbody. This designated SWIM area includes the Caloosahatchee Estuary, San Carlos Bay, Estero Bay, Matlacha Pass, and Pine Island Sound.



created. A number of significant events, including the following, have contributed greatly to ecological and hydrologic modifications in the region.

Agriculture

Freezes in the 1980s in central Florida accelerated the establishment of citrus groves in southwest Florida (notably Lee County). Agricultural land clearing, leveling, and drainage improvements have transformed many natural habitats. The associated overpumping of aquifers for irrigation has caused large decreases in ground water pressure (notably in the Myakka and Peace watersheds). Furthermore, irrigation runoff from fields, when discharged to surface waters, has modified hydroperiods (Tomasko, 2002) and altered the natural water chemistry of receiving tributaries, bringing with it fertilizers and pesticides (Estevez et al., 1998) that could eventually find their way into Charlotte Harbor (see similar discussions on the **Myakka**, **Peace**, and **Caloosahatchee Rivers** earlier in this chapter).

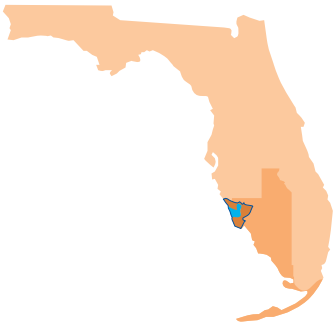
Phosphate Mining

The phosphate industry is a significant factor in resource management in the greater Charlotte Harbor drainage basin. Florida currently provides approximately 75 percent of the nation's phosphate supply and about 25 percent of the world's supply. Most of that phosphate comes from the Bone Valley phosphate deposit of more than 500,000 acres, which principally lies in the Peace River watershed. Approximately 240,000 acres have already been mined, including 197,000 acres in Polk County, largely in the Peace River watershed. Additional mines in the Peace River watershed are under consideration in Hardee, DeSoto, and Manatee Counties, one of which will also cut across the upper end of the Big Slough (Myakka) watershed. The Bone Valley reserves are projected to last at least another 30 years.

The impacts of phosphate mining and chemical processing are of significant public concern, especially to the downstream residents in Charlotte County, whose water supply (the Peace River) is directly affected by poor quality water occasionally discharged from mines and processing plants. Of particular concern are potential dam breaches at either of these types of facilities, which could lead to massive clay slime spills or highly acidic processing or wastewater discharges. Since the Charlotte Harbor Proper planning unit receives most of its flow from the Peace River, the environmental consequences of such events could possibly affect the harbor. The mining and reclamation process also significantly changes the landform of large areas, affecting the hydrology of the Charlotte Harbor Basin (see the section below on **"Hydrologic Alterations—'Famine or Feast'"**).

Residential Development and "Roads to Nowhere"

The land sales development that began in the 1950s dramatically and permanently changed the character and use of the region. Lowlands were dredged and filled, and pastures and cropland were drained and cleared to create almost a million outlying home sites in southwest Florida (Southwest Florida Regional Planning Council [SWFRPC], 1995). The land was subdivided, canals were dug, and streets were paved. Even though some



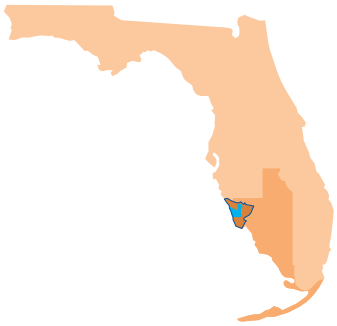
of these extensive tracts of land were platted and sold 20 years ago, very few houses were actually built. Most of the platted lots and streets still lie empty and overgrown. The platting removed thousands of acres from agricultural and other productive uses years in advance of when the land would actually be needed for housing. In the meantime, continued road building near the urban centers of Venice, Englewood, Port Charlotte, Punta Gorda, Cape Coral, Sanibel, and Fort Myers is opening up even more agricultural lands and natural habitat to urban development.

Hydrologic Alterations—"Famine or Feast"

Human activities have significantly altered the amount and timing of freshwater flows into the Charlotte Harbor system, at times denying the harbor its historical supply of fresh water and at other times deluging it, particularly at the southern end (American Oceans Campaign Web site, 1996). Over the years, sections of the Peace River and its underlying aquifer have been overpumped, drained, and diverted to support agriculture, phosphate mining and drinking water withdrawals, which have increased from 6 to 12 to 18 million gallons per day (mgd).

Ground water overpumping by **agriculture**, industry, **phosphate mining**, and municipal potable suppliers, plus reduced rainfall, are thought to be responsible for the cessation of flow from Kissengen Springs and the development of sinkholes in the upper Peace River. A limestone crevice in the streambed south of Bartow occasionally swallows the entire flow of the Peace River (Hammet, 1988). As a consequence, the upper Peace River's flow of fresh water is one-third less than historical levels (SWFRPC, 1995). Recent evidence provided by the SWFWMD indicates that, while dry season flows in the upper Peace River are decreasing, wet season flows are increasing. Furthermore, no trends in flow (either decreasing or increasing) have been noted in the lower river at the Arcadia gage (McCommons Beck, 2002). However, two significant diversions, which occur downstream of the Arcadia gage, are not figured into these trend results. The Peace River Manasota Regional Water Supply Authority siphons 18 mgd of drinking water from the lower Peace River, downstream of its confluence with Horse Creek. Some of this water is removed from the Peace Basin and sent to Sarasota County residents. In addition, the city of Punta Gorda draws about 4 mgd of drinking water from Shell Creek, a tributary to the Peace River, near its mouth at the entrance to Charlotte Harbor.

In the Myakka headwaters, dry season flows have actually increased. The Flatford Swamp is being inundated with excess irrigation water from row crop operations, extending the swamp's hydroperiod and causing significant tree mortality (Tomasko, 2002) (see the discussion of **Flatford Swamp** in the section on the Myakka River earlier in this chapter). Estevez et al. (1998) indicates that the lower Myakka River shows significant declines in wet season flows. Recent contradictory evidence provided by the SWFWMD (McCommons Beck, 2002) indicates that both wet and dry season flows in the Myakka River (at Sarasota gage) are actually increasing. Historically, the Myakka River watershed was drained and diverted to support pastureland. Such ditching and draining would be expected to increase wet season flows and decrease dry season flows. However, the advent of



row crops and citrus groves in the basin and current irrigation practices may actually be responsible for increased flows in the Myakka River year-round (Tomasko, 2002).

It is important to note that two significant diversions occur downstream of gauging stations (Tomasko, 2002) and therefore seem not to be quantified in terms of total flow to Charlotte Harbor. Estevez et al. (1998) indicates that an estimated 10 percent of peak flows are diverted from the Myakka River to the Gulf of Mexico, near Venice via the Blackburn Canal and Curry Creek, for flood control. Also, Big Slough, a tributary of the Myakka River, is being siphoned at 1 mgd for the city of North Port's drinking water supply (Estevez et al., 1998). A proper accounting of total Myakka River flow into Charlotte Harbor should include these diversions.

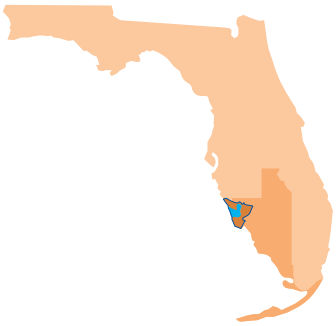
In the Charlotte Harbor Proper and Pine Island planning units, interceptor waterways on the Cape Haze and Cape Coral Peninsulas collect runoff from canal systems and store large volumes of brackish water inland of fringing mangrove systems. This practice alters the timing of flow to the harbor (see the discussion of the Cape Coral Spreader Waterway Restoration in the **"Ongoing Issues and Activities"** section later in this chapter). In addition, Lee County and the city of Fort Myers draw about 10 mgd of drinking water from the Caloosahatchee River upstream of Franklin Lock, denying some freshwater flow to the harbor.

In the meantime, the Caloosahatchee–San Carlos Bay area has also had to contend with occasional deluges of fresh water from Lake Okeechobee via the Caloosahatchee River, as a result of the management of Lake Okeechobee's lock system. The USACOE and the SFWMD currently manage Lake Okeechobee and the Caloosahatchee River for competing objectives such as flood control, water supply (potable and agricultural), navigation (the Lake Okeechobee Waterway), and ecological restoration (the Comprehensive Everglades Restoration Plan). Although management practices have improved, submerged aquatic vegetation, oyster reef coverage, and bay scallop populations have been drastically harmed by the sudden, large freshwater infusions (SWFRPC, 1995). The nutrient-enriched deluges have also been implicated in algal blooms (SFWMD, 2000), including toxic *cyanobacteria* in the estuarine Caloosahatchee–San Carlos Bay area (Barienbrock, 2001). Extremely low salinities from these discharges are also thought to be responsible for the presence of a fungus called *Aphanomyces invadens* and the occurrence of fish with lesions in the Caloosahatchee–San Carlos Bay and St. Lucie Estuaries (Lollar, 2002; Sosa, 2002).

Red Tides

Red tides are quite common in the Gulf of Mexico–Charlotte Harbor region. They were first documented in Florida in 1530, when Nuñez de Vaca, the Spanish explorer, wrote about Indians who told him of fish kills in and around the Tampa Bay area.

A red tide is a higher-than-normal concentration of microscopic algae. During blooms, the organisms may color the water red, greenish, brownish, or purple. *Karenia brevis*, the species that causes most red tides in Florida, produces a toxin that affects fish and shellfish, often killing millions. People who eat infected mollusks (clams, oysters, coquinas, and mussels) can suffer



central nervous system problems. As the red tide blooms approach coastal areas, the breaking waves can cause the toxin to become mixed with sea spray, causing respiratory irritation.

A particularly widespread red tide event was thought to be responsible for massive manatee mortality in 1996 in Charlotte, Lee, and Sarasota Counties, with 142 manatees dying of "natural and undetermined causes." Lee County alone accounted for 45 percent of the total statewide manatee deaths for that category in 1996 (Florida Marine Research Institute Web site, 2002).

Fish Consumption Advisories

Fish consumption advisories, issued by the Florida Department of Health (DOH), were used to assess potential impairment due to mercury contamination of fish tissues. Waterbodies with "limited consumption" or "no consumption" status were considered potentially impaired.

For the most part, Florida's freshwater fish are considered safe to eat. The most common health advisory issued in Florida deals with methyl mercury. During the past several years, DOH, the Florida Fish and Wildlife Conservation Commission (FWC), and the Department have discovered high concentrations of methyl mercury in freshwater fish tissues in many locations around the state.

Currently, no methyl mercury fish consumption advisories have been issued for freshwater fish in the Charlotte Harbor Basin. However, a limited consumption advisory has been issued for largemouth bass, bowfin, and gar **(Table 2.5)** in the adjacent Peace River (Polk, Hardee, and DeSoto Counties). Although the Peace River lies immediately outside the basin, the causes and sources of the mercury contamination are not fully understood, and there is concern that it may eventually become more widespread.

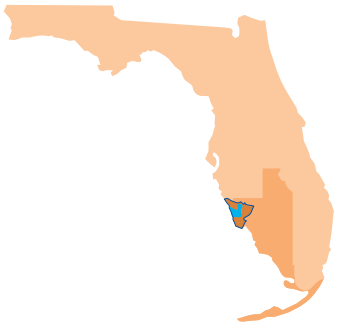
Mercury has been detected in marine fish species in the Charlotte Harbor Basin. There is currently a no-consumption fish advisory in effect along the Florida Gulf Coast (including Charlotte Harbor) for king mackerel over 39 inches (from the nose to where the tail forks) and a limited consumption advisory for king mackerel between 33 and 39 inches. A

Table 2.5: Fish Consumption Advisories for Mercury in the Charlotte Harbor Region

Fish Species	Waterbody	Advisory
Largemouth Bass	Peace River	Limited Consumption
Bowfin	Peace River	Limited Consumption
Gar	Peace River	Limited Consumption
Shark	Charlotte Harbor	Limited Consumption
Crevalle Jack	Charlotte Harbor	Limited Consumption
Spotted Seatrout	Charlotte Harbor	Limited Consumption
Spanish Mackerel	Charlotte Harbor	Limited Consumption
King Mackerel (33″–39″)	Gulf of Mexico	Limited Consumption
King Mackerel (>39″)	Gulf of Mexico	No Consumption

Source: The Department's mercury Web site at http://www.floridadep.org/labs/mercury/index.htm.

limited consumption fish advisory has also been issued for sharks, crevalle jack, spotted seatrout, and Spanish mackerel from Charlotte Harbor.



Ongoing Issues and Activities

A number of major restoration initiatives, if continued, will have significant positive effects on the basin's water quality. The management activities described in this section often have many smaller projects included within them. **Appendix C** contains a more complete listing of management and restoration efforts and projects in the basin.

Cape Coral Spreader Waterway Restoration

In the late 1970s, the developer of Cape Coral entered into a Consent Order with the state that required the construction of two interceptor canals. These canals, known locally as spreader waterways, were designed to capture the waters from the upland canal systems and allow them to sheet flow through wetland areas before discharging into the surface waters of Matlacha Pass. Over time, however, several "breaches" developed that allowed the canal waters to discharge directly to the estuary without being filtered through the wetland system.

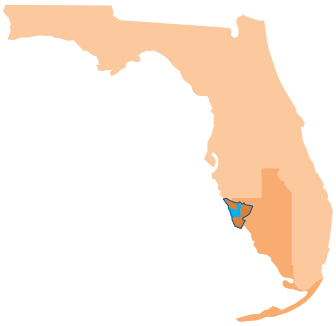
The spreader waterway restoration project will install structures to close off the direct discharges of water and restore the sheet flow that was originally intended. The wetlands will take up any nutrients that may be present in the canal waters prior to discharge, enhancing water quality. The restoration of sheet flow will also allow the fresh canal water to discharge along the length of the shoreline instead of at a few points, creating a more natural salinity distribution pattern. The property in question is managed as part of the Charlotte Harbor Buffer Preserve, and the restoration project is being handled by the Department's South District Office. Phase 1 of the project began in May 2002.

Charlotte Harbor Aquatic Preserves

The Charlotte Harbor Aquatic Preserves consist of 165,000 acres of submerged resources within five individually named preserves in Sarasota, Charlotte, and Lee Counties. All of the waters in these preserves, as follows, are also designated as OFWs:

- Cape Haze Aquatic Preserve
- Gasparilla Sound–Charlotte Harbor Preserve
- Matlacha Pass Aquatic Preserve
- Pine Island Sound Aquatic Preserve
- Lemon Bay Aquatic Preserve

The state legislature created the Aquatic Preserve Program in 1975 under the Florida Aquatic Preserves Act (Chapter 258, F.S.), whose purpose was to preserve and maintain submerged lands with exceptional biological, aesthetic, and scientific values for future generations to enjoy. Guidance for the management of the Charlotte Harbor Aquatic Preserves is contained in Rule 18-20, F.A.C.



The Aquatic Preserve Management Plans developed for each preserve examine the general conditions and management needs for habitats and species, with special emphasis on resource management, research, and education. Management plans for the first four preserves listed above were adopted on May 18, 1983. Lemon Bay's management plan was adopted on April 7, 1992.

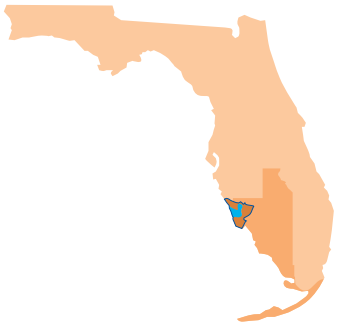
The role of the Aquatic Preserve Program in managing the submerged resources of each preserve is as follows:

- Oversee activities that affect the natural and cultural resources in the system,
- Provide information on its ecological functions and economic importance,
- Educate the public on the inherent and economic values of the resources,
- Conduct field surveys of proposed project sites to collect accurate biological and physical information and ensure its use in consideration of permit-related issues and planning decisions,
- Coordinate resource management and enforcement activities with other agencies, and
- Conduct or assist pertinent research projects.

Charlotte Harbor National Estuary Program

The CHNEP, sponsored by the U.S. Environmental Protection Agency (EPA), is a partnership of citizens, elected officials, resource managers, and commercial and recreational resource users collaborating to address diverse resource management concerns over the 4,400-square-mile drainage basin. A cooperative decision-making process was used to produce a Comprehensive Conservation and Management Plan (CCMP), which outlines priority actions that should be taken to improve the water quality and ecological integrity of the greater Charlotte Harbor drainage basin. The CCMP groups environmental concerns into three classes of quantifiable objectives: hydrologic alterations, water quality degradation, and fish and wildlife habitat loss. Its goals are as follows:

- Improve the environmental integrity of the Charlotte Harbor study area,
- Preserve, restore, and enhance seagrass beds, coastal wetlands, barrier beaches, and functionally related uplands,
- Reduce point and nonpoint sources of pollution to attain the desired uses of the estuary,
- Provide the proper freshwater inflow to the estuary to ensure a balanced and productive ecosystem,
- Develop and implement a strategy for public participation and education, and



- Develop and implement a formal Charlotte Harbor management plan with a specified structure and process for achieving goals for the estuary.

The CHNEP receives most of its funding from the EPA, with additional support from state, regional, and local governments, which are also signatories to the CCMP. The CHNEP, as an umbrella group, has many participating entities currently managing or planning water quality improvements and/or ecosystem restoration and preservation projects in the study area that are not individually listed here. **Appendix C** contains an expanded list of these projects.

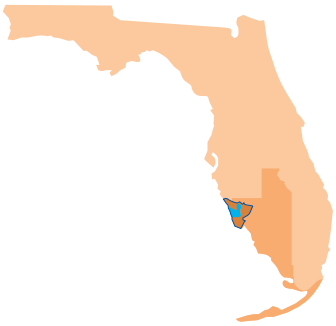
Charlotte Harbor Surface Water Improvement and Management Plan

First written in January 1993 and updated in August 2000, this SWFWMD plan seeks to improve the water quality and ecological integrity of the greater Charlotte Harbor drainage basin. Working hand in hand with the CHNEP, the Charlotte Harbor Surface Water Improvement and Management (SWIM) plan identified hydrologic alterations, water quality degradation, and fish and wildlife habitat loss as the key management issues to address in the Charlotte Harbor region.

In addition, under the Department's requirements, the SWIM Program is working to develop a potential resource-based pollutant load reduction goal (PLRG) for Charlotte Harbor. A recent SWFWMD SWIM study suggests that cleaning the nutrient-laden water from Lake Hancock prior to its discharge to the Peace River would be a suitable PLRG for Charlotte Harbor. This activity alone would offset future nutrient loading from population growth and development for the next ten to twenty years (Tomasko, 2001).

The *SWIM Plan Update—2000* was designed to review the research and management plans in the CHNEP's CCMP and to identify actions requiring support and action by SWIM. The update expanded its boundaries to include Lemon Bay, for which the water management district's SWIM section and its contractors have developed a "Scope of Work" to conduct the following tasks:

- The review and potential modification of a preliminary nitrogen loading model for Lemon Bay,
- The refinement of the model to allow for watershed-level nutrient load estimates,
- The development of watershed nutrient load estimates for future land use scenarios,
- The identification of potential management options to minimize and/or offset existing and potential future nutrient loads,
- The estimation of nutrient load efficiencies of various management options, and



- The development of cost estimates for various management options. Funds to implement the project(s) would be budgeted in future years and would be contingent upon board approval and the participation of Sarasota and Charlotte Counties.

Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

Through the network, water quality is monitored once a month at 35 to 40 sites throughout the CHNEP's Aquatic Preserve Estuaries. On the first Monday of each month at sunrise, approximately 75 volunteers sample these fixed sampling sites for 19 physical, chemical, and biological parameters. The parameters include weather and water surface conditions, water and Secchi depth, water temperature, dissolved oxygen (DO), pH and color, chlorophyll *a*, phosphorus, nitrogen, and fecal coliform bacteria. The monitoring program, which is sponsored and coordinated by the Charlotte Harbor Aquatic Preserve staff, has an approved quality assurance plan and field procedures manual. All the parameters are measured on site by the volunteers, except for the chlorophyll *a*, nutrient, and bacteria samples, which are analyzed by the Department's South District Laboratory in Punta Gorda. These data are available in an Access database.

Charlotte Harbor Fisheries-Independent Monitoring Program

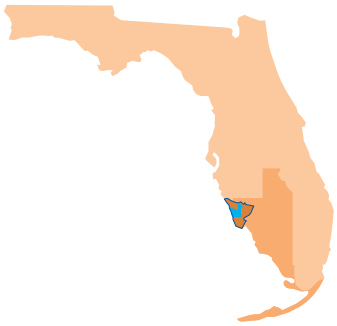
The Fisheries-Independent Monitoring (FIM) Program, conducted by the Florida Marine Research Institute, a division of the FWC, is a survey that uses a stratified-random sampling (SRS) technique to describe and compare fish population trends. Surveys are currently under way in six estuaries statewide, including Charlotte Harbor. Fishes are collected using seines and otter trawls. Data collected include species, size, sex, and numbers of fish caught. Habitat features such as the type and quantity of submerged and shoreline vegetation and the presence of seawalls or oyster beds are recorded for each sample site. Measurements of water quality include temperature, pH, salinity, and DO. Researchers examine the fish collected at each site for any external abnormalities or signs of poor health, and tissue samples for analysis of mercury content are taken from selected fish.

Data from the SRS surveys provide estimates of the relative abundance of many economically and recreationally important species, and are used to predict the availability of a species in the near future. The information is also used to determine what fisheries management measures are needed and to assess the effectiveness of those measures after they are enacted.

Charlotte Harbor State Buffer Preserve

The Charlotte Harbor State Buffer Preserve, which consists of 46,195 acres of uplands in Charlotte and Lee Counties, is being acquired to provide an upland buffer between developable areas and the waters of the Charlotte Harbor Aquatic Preserves. All of the waters in the Charlotte Harbor State Buffer Preserve are designated as OFWs.

The primary goals of the Buffer Preserve Program are to conserve and preserve natural ecological values and systems, protect archaeological and historical resources, and enhance public appreciation of natural resources,



as set forth in Chapter 253, F.S. Guidance for managing the Charlotte Harbor Buffer Preserve is contained in Rules 18-2 and 18-23, F.A.C.

The acquisition of what was originally known as the Charlotte Harbor State Reserve began under the Environmentally Endangered Lands (EEL) Program in the 1970s. Land acquisition continued through funding from the Conservation and Recreation Lands (CARL) Program and Preservation 2000 (P-2000). Land acquisitions will continue through funding from the 1999 Florida Forever Act, which replaced P-2000.

The Charlotte Harbor Buffer Preserve Management Plan examines the general conditions and management needs for certain habitats and species, with special emphasis on exotic species control, fire management, and cultural resource protection and restoration. The buffer preserve also performs an important public education function by providing guided nature walks and kiosks with interpretive panels. The management plan was adopted on August 27, 1997.

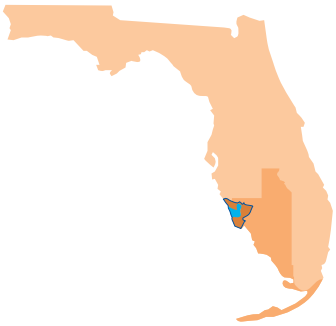
Central and Southern Florida Project Comprehensive Review Study

The Central and Southern Florida (C&SF) Project was first authorized in 1948 to provide flood control, water control, water supply, and other services to the area that stretches from Orlando to Florida Bay. Although the project has performed its intended purposes well, it has also contributed to an unintended decline in the south Florida ecosystem. The purpose of the C&SF Project Comprehensive Review Study (the restudy) was to make structural and operational modifications to the C&SF Project to achieve the following:

- Improve the quality of the environment;
- Improve aquifer protection;
- Improve the integrity, capability, and conservation of agricultural and urban water supplies;
- Improve other water-related purposes; and
- Maintain current levels of flood protection.

The restudy, conducted by the USACOE and the SFWMD, resulted in the Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, now known as the Comprehensive Everglades Restoration Plan (CERP). The plan was transmitted to Congress on July 1, 1999. Although the activities associated with this restudy and restoration plan do not directly involve the Charlotte Harbor Basin, they will affect the Caloosahatchee River, which flows into the Pine Island planning unit of the Charlotte Harbor Basin. Specifically, several projects within CERP will address the distribution of water from Lake Okeechobee to Charlotte Harbor, as follows:

- The C-43 Basin Storage Reservoir Project is investigating methods to store large flows and reduce nutrient loads before they reach the lower Caloosahatchee River, thus decreasing the harm to the San



Carlos Bay/Pine Island Sound Estuaries. The draft Project Management Plan has been completed and the Project Implementation Report is scheduled for completion in 2004. Construction is scheduled for completion by 2011.

- C-43 Basin Aquifer Storage & Recovery Project will capture C-43 Basin runoff and releases from Lake Okeechobee and store the water under ground. Excess runoff from the C-43 Basin and Lake Okeechobee flood control discharges will first be pumped into the C-43 Basin Reservoir. Water from the reservoir will then be injected into the aquifer storage and recovery (ASR) wellfield for long-term (multi-season) storage. The wells will be designed for water supply benefits, some flood attenuation, water quality benefits to reduce salinity and nutrient impacts of runoff to the Caloosahatchee Estuary, and to provide for minimum flows and levels to the river and estuary. This project includes 44 ASR wells, to be placed in the C-43 Basin in Hendry, Glades, or Lee Counties. The project assumes each well will have a capacity of 5 million gallons per day with a total capacity of approximately 220 million gallons per day. The level and extent of treatment and number of the ASR wells may be modified based on findings from a proposed ASR pilot project. The C-43 Basin ASR project is currently in the pre-construction, engineering and design phase. Construction is scheduled to start in August of 2008, and be completed by February of 2018.

Florida Blueways Project

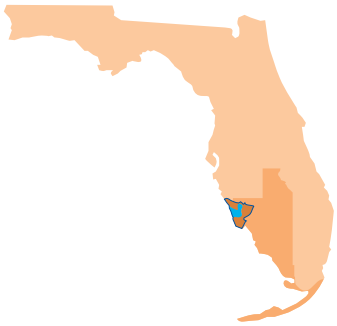
The Florida Department of Community Affairs' Coastal Management Program (the parent agency program for the Blueways Project) is responsible for coordinating local, state, and federal agency activities using existing laws to ensure that Florida's coast is as valuable to future generations as it is today. The Coastal Management Program has selected the Charlotte Harbor region as a case study for the Florida Blueways Project. The project has been designed to create new, innovative, integrated tools for coastal managers. It will collect and integrate ecological, human use, and management information for Charlotte Harbor; identify data needs; and determine how to best organize, present, manipulate, coordinate, and update the data using a GIS-based system.

Preservation 2000/Florida Forever

The Florida legislature established P-2000 as a funding source for the CARL, Save Our Rivers (SOR), Florida Communities Trust, and FWC's land acquisition programs. P-2000 and related programs have been asked to fund some of the sensitive land purchases in the Charlotte Harbor Basin. In spring 1999, as P-2000 was about to expire, the legislature established Florida Forever to take its place. This program provides $300 million per year for preservation and restoration efforts.

Regional and Local Growth Management Activities

Each regional planning council in Florida is required to have a Strategic Regional Policy Plan, updated every five years, that contains an



environmental component guiding local governmental planning. These policy plans are adopted by rule and receive their statutory guidance from Section 186.501, F.S. The counties comprising Charlotte Harbor are contained within the Southwest Florida Regional Planning Council, the host and local sponsor of the CHNEP, and the designated monitor of the Charlotte Harbor Resource Planning and Management Plan.

Each local government in Florida is required through Chapter 163, F.S., to have a Local Government Comprehensive Plan, updated every five to seven years, that is supported and implemented through land development regulations and capital improvement programs. Each local plan must include future land use and conservation elements, as well as stormwater management, water supply, and sewerage subelements. The local governments around Charlotte Harbor must also have coastal management elements. These plans must also be updated every five to seven years and be consistent with regional and state comprehensive planning. Plans by all the local governments surrounding Charlotte Harbor are in compliance with state law.

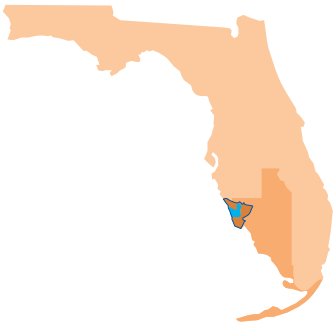
Sanibel-Captiva Conservation Foundation

The Sanibel-Captiva Conservation Foundation (SCCF), established in 1967 by a group of concerned citizens, is dedicated to the preservation of natural resources and wildlife habitat on and around Sanibel and Captiva Islands. This nonprofit foundation has established the following four priority activity areas:

- Land acquisition,
- Habitat management,
- Environmental education, and
- Landscaping for wildlife.

Since its inception, the foundation has acquired and preserved over 1,800 acres of environmentally sensitive land on and around the islands—including critical wildlife habitats, rare and unique subtropical plant communities, and freshwater wetlands along the Sanibel River. The foundation's land holdings are largely in freshwater wetlands along the Sanibel River, in the heart of the island. In 1994, the foundation established the "Habitat Management Fund," an endowment to provide for the restoration and ongoing management of foundation lands.

Environmental education is an important mission of the foundation. Over 500,000 people participate in one or more of the foundation's educational programs yearly, including lectures, workshops, orientation sessions for new island residents, guided tours of nature trails, nature cruises, and beach walks. The foundation also runs a "Landscaping for Wildlife Program" that preserves and creates a diverse, quality-functioning habitat for wildlife within the urbanized areas of Sanibel and Captiva and educates the public about the use of herbicides and pesticides, water conservation techniques, and the elimination of exotic pest plants.



Southwest Florida Feasibility Study

The Southwest Florida Feasibility Study was borne out of the C&SF restudy's recommendations to Congress in July 1999. The restudy, which only assessed water resource issues as they related to the Caloosahatchee Basin on the west coast, recognized that other hydrologic watersheds in southwest Florida have not been comprehensively studied. Thus, it recommended a feasibility study to identify southwest Florida's water resource conditions and develop potential solutions to problems.

The USACOE and the SFWMD are conducting the Southwest Florida Feasibility Study. The study area includes all of Lee County, most of Collier and Hendry Counties, and portions of Charlotte, Glades, and Monroe Counties. It encompasses approximately 4,300 square miles and includes 2 major drainage basins. The northern boundary includes the Caloosahatchee River and corresponds to the jurisdictional boundary between the SFWMD and SWFWMD in Charlotte County. The eastern boundary delineates the divide between the Big Cypress Swamp and the Everglades system.

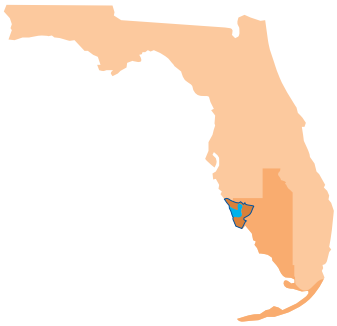
The study will determine the feasibility of making structural, nonstructural, and operational modifications and improvements in the region in the interest of environmental quality, water supply, and other purposes. It will develop a comprehensive regional plan of action to address the following:

- The health of aquatic and upland ecosystems;
- The quantity, quality, timing, and distribution of water flows;
- The agricultural, environmental, and urban water supply;
- The sustainability of economic and natural resources;
- Flood protection; and
- Fish and wildlife, biological diversity, and natural habitat.

The Southwest Florida Feasibility Study will be accomplished in two phases. The first phase (scoping), paid for by the federal government, will quickly identify problems, opportunities, and potential solutions in the region. The second phase (feasibility), conducted with the SFWMD, will develop alternative solutions in more detail so that Congress can authorize and fund a viable plan.

Agricultural Best Management Practices

The FWRA authorizes the Florida Department of Agriculture and Consumer Services (DACS) to develop interim measures and agricultural best management practices (BMP). Additional authority for agricultural BMPs is provided in legislation on nitrates and groundwater (Section 576.045, F.S.), the Lake Okeechobee Protection Program (Section 373.4595, F.S.), Agricultural Water Conservation (Section 570.085, F.S.), and Florida Right to Farm Act Amendments (Section 823.14, F.S.). While BMPs are often adopted by rule, they are voluntary if not covered by regulatory programs. If they are adopted by rule and the Department verifies their effectiveness, then implementation provides a presumption of compliance with water quality standards.



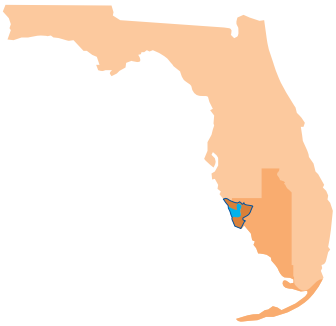
Over the last several years, DACS has worked with agriculturists, soil and water conservation entities, the University of Florida's Institute of Food and Agricultural Sciences, and other major interests to improve product marketability and operational efficiency by implementing agricultural BMPs, while at the same time promoting water quality and water conservation objectives. In addition, programs have been established and are being developed to create a network of state, local, federal, and private sources of funds for developing and implementing BMPs.

Agricultural BMP practices and programs under way in the Charlotte Harbor Basin include the following:

Best Management Practices Manuals

To encourage growers to use BMPs, BMP manuals have been published for a number of agricultural industries, including container-grown plants, blended fertilizer plants, agrichemical handling and farm equipment maintenance, cow/calf operations, aquaculture, and landscaping. Many of these manuals can be downloaded at http://www.dep.state.fl.us/water. Manuals for row crops, equine or horse farms, and ornamental nurseries are currently being developed. The use of a BMP manual alone, however, does not presume compliance with the Department's water quality standards.

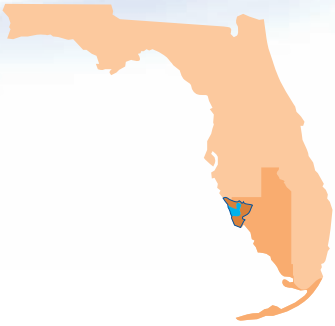
- **Guide for Producing Container Grown Plants:** This manual, published in 1995 by the Southern Nurserymen's Association, includes irrigation and fertilization BMPs for the container cultivation of nursery plants. It was produced through a cooperative effort between the University of Florida, Auburn University, Tennessee Tech University, and Virginia Tech. Since the manual is not Florida-specific, an effort is currently under way to use the document in developing a Florida-specific manual.
- **BMPs for Blended Fertilizer Plants in Florida:** The manual for blended fertilizer industrial operations, published in October 1997, was cooperatively produced by the Florida Fertilizer and Agrichemical Association, DACS, and the Department.
- **BMPs for Agrichemical Handling and Farm Equipment Maintenance:** Recently revised and reprinted, this manual gives producers guidance on hazardous materials, proper pesticide handling, and the proper disposal of waste products. It was cooperatively produced in 1998 by DACS, the Department, and several industry associations.
- **Water Quality BMPs for Cow/Calf Operations:** Many cattle operators statewide have been trained in using this manual and applying BMPs. The Florida Cattlemen's Association and several state, federal, and local agencies developed the manual, which was published in 1999. Copies were printed and distributed in 2000 using EPA Section 319 grant funds.



- **Aquaculture BMPs:** As directed by the 1998 Florida legislature, DACS worked cooperatively with industry, state agencies, and the environmental community to develop a comprehensive BMP manual for aquaculture. Florida law requires that the Department adopt the manual by rule and provides regulatory exemptions under Chapters 373 and 403, F.S., for growers who implement BMPs and are certified by DACS' Division of Aquaculture. The manual, which was printed and distributed in 2000, has been adopted by rule.
- **Florida Green Industries BMPs for Protection of Water Resources in Florida:** This manual provides BMPs for professional turfgrass and landscape managers. Published in 2002, it was developed through a cooperative effort by Florida Green Industries (an industry association); the Department; DACS; the Florida Department of Community Affairs; and the St. Johns, South Florida, and Southwest Florida water management districts.

Chapter 3: Surface Water Quality Assessment

Scope of the Assessment

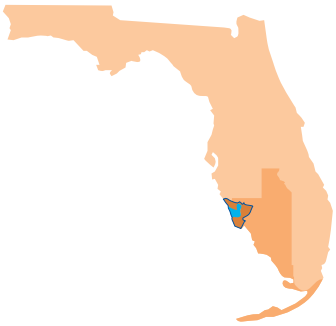


This chapter presents the results of an updated assessment of surface water quality in the Charlotte Harbor Basin. The primary purpose of the assessment is to determine if waterbodies or waterbody segments are to be placed on the Verified List of impaired waterbodies. The listing will be in accordance with evaluation thresholds and data sufficiency and data quality requirements in the Identification of Impaired Surface Waters Rule (IWR) (Rule 62-303, Florida Administrative Code [F.A.C.]). The results of the assessment will be used to identify waters in the basin for which Total Maximum Daily Loads (TMDL) will be developed.

The chapter describes the planning units in the basin used as a basis for the assessment. A section on each planning unit contains a general description and summary of key water quality indicators (such as nutrients, chlorophyll *a*, dissolved oxygen [DO], and microbiological parameters). Permitted discharges, land uses, ecological status, and water quality improvement plans and projects are summarized for each planning unit. The discussion notes where applicable surface water quality criteria have been exceeded and summarizes the report's findings in maps, noting potentially impaired waterbodies in each planning unit. The chapter also contains background information on sources of data and on designated use attainment, and explains the state's integrated water quality assessment process.

While potentially impaired waters and their causative pollutants are identified, it is not within the scope of this report to identify discrete sources of potential impairments. Information on the sources of impairment will be developed in subsequent phases of the watershed management cycle, including TMDL development and implementation.

Appendix A contains a discussion of the legislative and regulatory background for TMDL development and implementation. **Appendix D** provides additional information on reasonable assurance. **Appendix E** provides the methodology used to develop the Planning and Verified Lists. **Appendix F** contains the integrated water quality assessment summary **(Table F.1)**, the water quality monitoring stations used in the assessment **(Table F.2)**, and data on water quality trends **(Figures F.1–F.11)**. **Appendix G** lists permitted wastewater treatment facilities and landfills in the basin, **Appendix H** lists Level I land use by planning unit, and **Appendix I** describes pollutant loading trends. The complete text of the IWR is available at http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf.



Update on Strategic Monitoring and Data-Gathering Activities During Phase 2

During Phase 2 of the watershed management cycle, strategic monitoring and data-gathering activities focused first on waters on the 1998 303(d) list, followed by waters that were placed on the Planning List through the IWR assessment alone. The majority of the strategic monitoring work was conducted by the Department's South District staff and included both chemical and biological monitoring and data upload to **STO**rage and **RET**rieval (STORET) databases. Data-gathering activities included working with environmental monitoring staff in the South Florida Water Management District (SFWMD), the Southwest Florida Water Management District (SWFWMD), and local and county governments to obtain applicable monitoring data from their routine monitoring programs and special water quality projects in the basin.

Twelve waterbody segments on the Planning List and the 1998 303(d) list needed further data to verify impairment. Parameters included silver, cadmium, iron, lead, and selenium. Also included were biology (based on bioassessments), biological oxygen demand (BOD), DO, fecal and total coliforms, unionized ammonia, nutrients and their indicators (nitrogen, phosphorus, and chlorophyll *a*), turbidity, and total suspended solids (TSS).

Thirteen waterbody segments were verified impaired for at least one parameter in the Charlotte Harbor Basin as the result of strategic monitoring and data-gathering activities in Phase 2. **Table F.1** in **Appendix F** provides the updated impairment status of the basin through December 18, 2003.

Sources of Data

The assessment of water quality in the Charlotte Harbor Basin includes an analysis of quantitative data from various sources, some of which are readily available to the public. These sources include the U.S. Environmental Protection Agency's (EPA) Legacy and "new" STORET databases, the U.S. Geological Survey (USGS), and the Florida Department of Health (DOH). The STORET databases contain water quality data from a number of sources, including the Florida Department of Environmental Protection (Department), water management districts, local governments, and volunteer monitoring groups. **Appendix E** contains a detailed description of STORET and the methodology used to develop the Planning and Verified Lists, based on the IWR.

Table 3.1 summarizes the individual data providers who contributed to the IWR 2002 Database for the Charlotte Harbor Basin for the period of record used in this assessment. **Figure 3.1** contains a pie chart showing the amount of data provided by each source.

Individual data providers who contributed to the IWR Database for the Charlotte Harbor Basin during the period of record used in this assessment (January 1, 1996 through June 30, 2003) include the Department's

Table 3.1: Summary of Data Providers in the Charlotte Harbor Basin

Organization	Total Number of Water Quality Observations
Charlotte Harbor Aquatic Preserve	6,534
City of Cape Coral	30,711
Florida Department of Environmental Protection's South District	71,334
Florida Department of Health	2,556
Florida LakeWatch	4,369
Lee County Environmental Lab	15,123
Peace River/Manasota Regional Water Supply Authority	13,384
Sanibel–Captiva Conservation Foundation	3,600
Sarasota County Environmental Services	20,463
South Florida Water Management District	3,588
Southwest Florida Water Management District	17,345
U.S. Geological Survey	7,860
Total	**196,867**

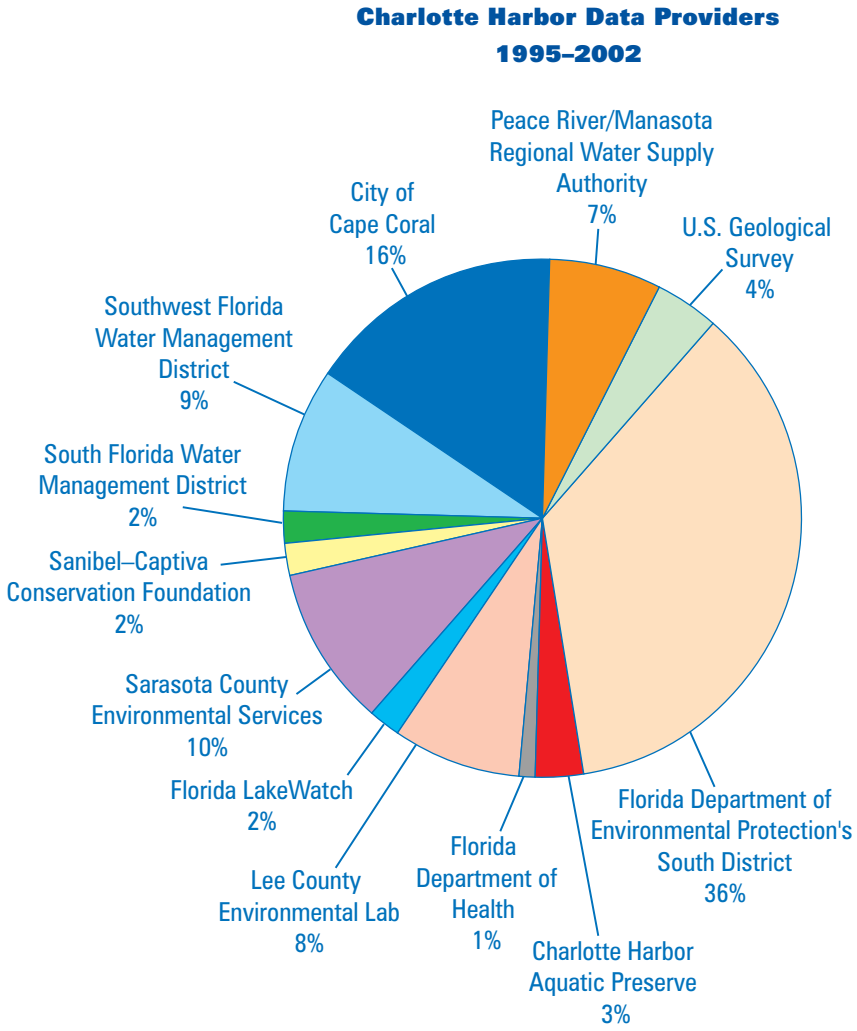
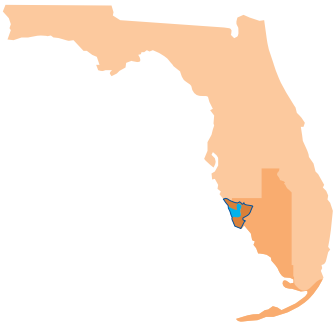


Figure 3.1: Sources of Data for the Charlotte Harbor Basin



South District, DOH, Lee County Environmental Lab, Florida LakeWatch, Sarasota County Environmental Services, SFWMD, SWFWMD, Charlotte Harbor Aquatic Preserve, Sanibel-Captiva Conservation Foundation, city of Cape Coral, Peace River/Manasota Regional Water Supply Authority, and the USGS.

The Department created the IWR 2002 Database to evaluate data in accordance with the methodology prescribed in the Identification of Impaired Surface Waters Rule (Rule 62-303, F.A.C.). For the Verified List assessment, the data evaluation period of record is 7 years, and for the Planning List, 10 years. **Table E.2** in **Appendix E** shows the periods of record for the Verified and Planning Lists in the first basin rotation cycle. Data collected between January 1, 1996, and June 30, 2003, were evaluated to establish the Verified List for the Charlotte Harbor Basin (IWR 2003 Run 14.2).

To support listing decisions, the evaluation of water quality in this basin also includes qualitative information drawn from data in technical reports and documents that are not yet included in the database. Some of these sources include historical water quality or ecological information that was not uploaded to the database because of its qualitative treatment of issues.

Attainment of Designated Use

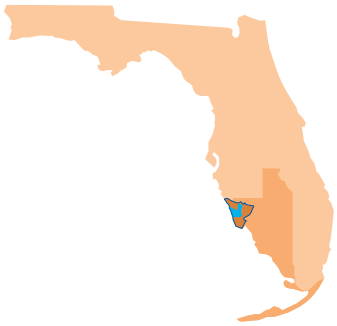
While the designated uses of a given waterbody are established using the surface water quality classification system described in Chapter 2, it is important to note that the EPA uses slightly different terminology in its description of designated uses. Because the Department is required to provide use attainment status for both the state's 305(b) report and the state's 303(d) list of impaired waters, the Department uses EPA terminology when assessing waters for use attainment. The water quality evaluations and decision processes that are defined in Florida's IWR for listing impaired waters are based on the following designated use attainment categories:

Aquatic Life Use Support-Based Attainment
Primary Contact and Recreation Attainment
Fish and Shellfish Consumption Attainment
Drinking Water Use Attainment
Protection of Human Health

Table 3.2 summarizes the designated uses assigned to Florida's various surface water classes.

Table 3.2: Designated Use Attainment Categories for Surface Waters in Florida

Designated Use Attainment Category Used in Impaired Surface Waters Rule Evaluation	Applicable Florida Surface Water Classification
Aquatic Life Use Support-Based Attainment	Class I, II, and III
Primary Contact and Recreation Attainment	Class I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment	Class I
Protection of Human Health	Class I, II, and III



Integrated Report Categories and Assessment Overview

The EPA has requested that the states merge their reporting requirements under the Clean Water Act for Section 305(b) surface water quality reports and Section 303(d) lists of impaired waters into an *Integrated Water Quality Monitoring and Assessment Report* (Wayland, 2001). This Assessment Report integrates the 303(d) list and the 305(b) report for the Charlotte Harbor Basin.

Following the EPA's guidance, the Department delineated waterbodies or waterbody segments in each of the state's river basins, assessed them for impairment based on individual parameters, and then placed them into one of five major assessment categories and subcategories. These categories provide information on a waterbody's status based on water quality, sufficiency of data, and the need for TMDL development **(Table 3.3)**. This Assessment Report contains a comprehensive evaluation of waterbodies that fall into Integrated Report Categories 1 through 5 in the table.

Because not enough recent data on chemistry, biology, and fish consumption advisories have been collected, currently only a few waterbodies or waterbody segments statewide fall into Category 1 (attaining all uses). In particular, fish tissues in many waterbodies statewide have not been tested for mercury. Out of 82 waterbodies or waterbody segments in the Charlotte Harbor Basin, none have sufficient data to assess all designated use categories.

More waterbodies and segments statewide fall into Category 2 (attaining some uses but with insufficient data to assess completely) than Category 1 (attaining all uses) because monitoring programs can sometimes provide sufficient data for partially determining whether a designated use in a particular waterbody is attained. Twenty-four waterbody segments in the basin fall into Category 2.

However, most waterbodies in the state fall into Category 3 (having insufficient data). In the Charlotte Harbor Basin, the breakdown of waterbodies or segments in Category 3 is as follows:

- Category 3a—27 segments for which no data are available to determine their water quality status;

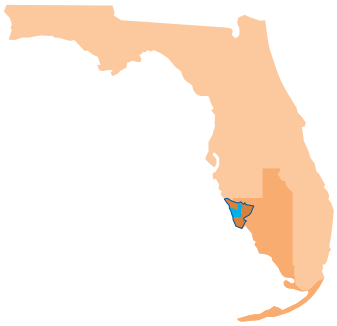
Understanding the Terms "Pollutant" and "Pollution"

For purposes of the TMDL Program, pollutants are chemical and biological constituents, introduced by humans into a waterbody, that may result in pollution (water quality impairment). There are other causes of pollution, such as the physical alteration of a waterbody (for example, canals, dams, and ditches). However, TMDLs are established only for impairments caused by pollutants (a TMDL quantifies how much of a given pollutant a waterbody can receive and still meet its designated uses).

Waterbodies that are verified impaired due to specified pollutants, and therefore require a TMDL, are listed under Category 5 in the Assessment Report; waterbodies with water quality impairments due to other causes, or unknown causes, are listed under Category 4c. Although TMDLs are not established for Category 4c waterbodies, these waterbodies still may be addressed through a watershed management program (for example, the Kissimmee River restoration).

Table 3.3: Categories for Waterbodies or Waterbody Segments in the 2002 Integrated Report

Category	Description	Comments
1	Attaining all designated uses	If use attainment is verified for a waterbody or segment that was previously listed as impaired, the Department will propose that it be delisted.
2	Attaining some designated uses and insufficient or no information or data are present to determine if remaining uses are attained	If attainment is verified for some designated uses of a waterbody or segment, the Department will propose partial delisting for the uses attained. Future monitoring will be recommended to determine if remaining uses are attained.
3a	No data and information are present to determine if any designated use is attained	Future monitoring will be recommended to determine if designated uses are attained.
3b	Some data and information are present but not enough to determine if any designated use is attained	Future monitoring will be recommended to gather sufficient information and data to determine if designated uses are attained.
3c	Enough data and information are present to determine that one or more designated uses may not be attained according to the Planning List methodology	This indicates a waterbody or segment is potentially impaired for one or more designated uses. These waters will be prioritized for future monitoring to verify use attainment or impaired status.
3d	Enough data and information are present to determine that one or more designated uses are not attained according to the Verified List methodology	This indicates that a waterbody or segment exceeds Verified List evaluation criteria and may be listed as impaired at the end of Phase 2 of the watershed management cycle. However, the data have not yet been fully evaluated and the waters have not been formally verified as impaired. Further monitoring and analysis may be necessary. NOTE: This category is applicable only to the Assessment Report. Waters that pass the Verified List criteria at this stage of the process are placed in Category 5.
4a	Impaired for one or more designated uses but does not require TMDL development because a TMDL has already been completed	After a TMDL for the impaired waterbody or segment is approved by EPA, it will be included in a Basin Management Action Plan to reduce pollutant loading toward attainment of designated use(s).
4b	Impaired for one or more criteria or designated uses but does not require TMDL development because impairment is not caused by a pollutant	This category includes waterbodies or segments that are impaired because of naturally occurring conditions or pollution. The impairment is not caused by specific pollutants. (See **sidebar** on previous page for a discussion of the difference between the terms "pollutant" and "pollution.")
4c	Impaired for one or more designated uses but does not require TMDL development because the water will attain water quality standards due to existing or proposed measures	Pollutant control mechanisms designed to attain applicable water quality standards within a reasonable time frame are either proposed or in place.
5	One or more designated uses is not attained and a TMDL is required	Waterbodies or segments in this category are impaired for one or more designated uses by a pollutant or pollutants. Waters in this category are included on the basin-specific Verified List adopted by the Department's Secretary as Florida's impaired waters list and submitted to the EPA as Florida's 303(d) list of impaired waters at the end of Phase 2.



- Category 3b—5 segments with some data but not sufficient data for making any determinations; and
- Category 3c—13 segments that are potentially impaired based on the Planning List criteria.

Several potentially impaired (Category 3c or 3d) waters either fail to meet water quality standards for DO or show signs of biological stress or nutrient impairment. According to the IWR, specific pollutants causing DO exceedances or biological stress, or an underlying nutrient imbalance creating an imbalance in flora or fauna, must be documented for a waterbody or segment to be listed as impaired. Sometimes these conditions cannot be linked to a causative pollutant, and sometimes they may reflect natural background conditions.

Currently, no waterbodies in the basin are designated as being in Category 4. This category includes those waterbodies/segments that are impaired but do not require a TMDL for one of three reasons:

- Category 4a—segments for which a TMDL has already been developed,
- Category 4b—segments for which the impairment is not attributable to a pollutant or pollutants but is due to other alterations to the waterbody, and
- Category 4c—segments for which there is reasonable assurance that the designated use of an impaired waterbody will be attained by an existing or proposed pollutant control measure.

Finally, 13 waterbodies in the basin are in Category 5. These impaired waterbodies are on the Verified List of impaired waters adopted by the Department's Secretary and will require TMDLs. Chapter 5 of this report discusses in detail the waters in this category.

Planning Units

The Charlotte Harbor Basin encompasses approximately 738 square miles and a complex hydrologic system. To provide a more detailed geographic basis for identifying and assessing water quality improvement activities, the basin was subdivided into smaller areas called planning units. A planning unit is either an individual large tributary basin or a group of smaller adjacent tributary basins with similar characteristics. Planning units help organize information and management strategies around prominent watershed characteristics.

Water quality assessments were conducted for waterbody segments within planning units. Each of these smaller, hydrologically based drainage areas within a planning unit is assigned a unique waterbody identification number (WBID). Waterbody segments are assessment units (or geographic information system [GIS] polygons) that the Department used to define

waterbodies when it biennially inventoried and reported on water quality to the EPA under Section 305(b) of the federal Clean Water Act. These WBIDs are the assessment units identified in the Department's lists of impaired waters submitted to the EPA in reports under Section 303(d) of the Clean Water Act.

The Charlotte Harbor Basin contains three planning units: Charlotte Harbor Proper, Lemon Bay, and Pine Island. **Table 3.4** describes these planning units, and **Figure 3.2** shows their locations and boundaries. The remainder of this chapter provides a general description of each planning unit, information on land use and potential point sources of pollution, water quality assessments for individual waterbody segments, and summaries of ecological issues and watershed quality improvement plans and projects.

Table 3.4: Planning Units in the Charlotte Harbor Basin

Planning Unit	Square Miles	Description
Charlotte Harbor Proper	407	Comprises the main portion of the Charlotte Harbor Estuary, a largely open body of water. Other significant named waterbodies in the planning unit are Gasparilla Sound, Catfish Creek, and Whidden Creek.
Lemon Bay	97	Includes a series of interconnected lagoonal embayments and their watersheds, extending from South Venice to the southern end of Little Gasparilla Island. Significant waterbodies include Lemon Bay; Godfrey, Rock, Oyster, and Buck Creeks; Placida Harbor; and Coral Creek. The Intracoastal Waterway runs through Lemon Bay and Placida Harbor.
Pine Island	234	Includes Pine Island Sound, Matlacha Pass, and San Carlos Bay Estuaries. Smaller named waterbodies include Tarpon Bay, Island Creek, Sanibel River, and Gator Slough Canal.

Appendix F of this report provides a water quality summary by planning unit, a list of water quality monitoring stations, the integrated assessment summary, and trend data. **Appendix G** includes summary information, by planning unit, for permitted wastewater treatment facilities and landfills in the basin. **Appendix H** lists Level I land uses by planning unit.

Assessment by Planning Unit

- Lemon Bay Planning Unit

General Description

The Lemon Bay planning unit contains a series of interconnected lagoonal embayments and their watersheds, extending from South Venice to the southern end of Little Gasparilla Island. Significant waterbodies include Alligator, Godfrey, Rock, Oyster, Buck, and Coral Creeks; Lemon Bay; and Placida Harbor. The Intracoastal Waterway runs through Lemon Bay and Placida Harbor. While the USGS actually lists the Lemon Bay planning unit as part of the Sarasota Bay hydrologic unit code (HUC), the Department included it in the Charlotte Harbor Basin because of Lemon Bay's direct connection via Placida Harbor.

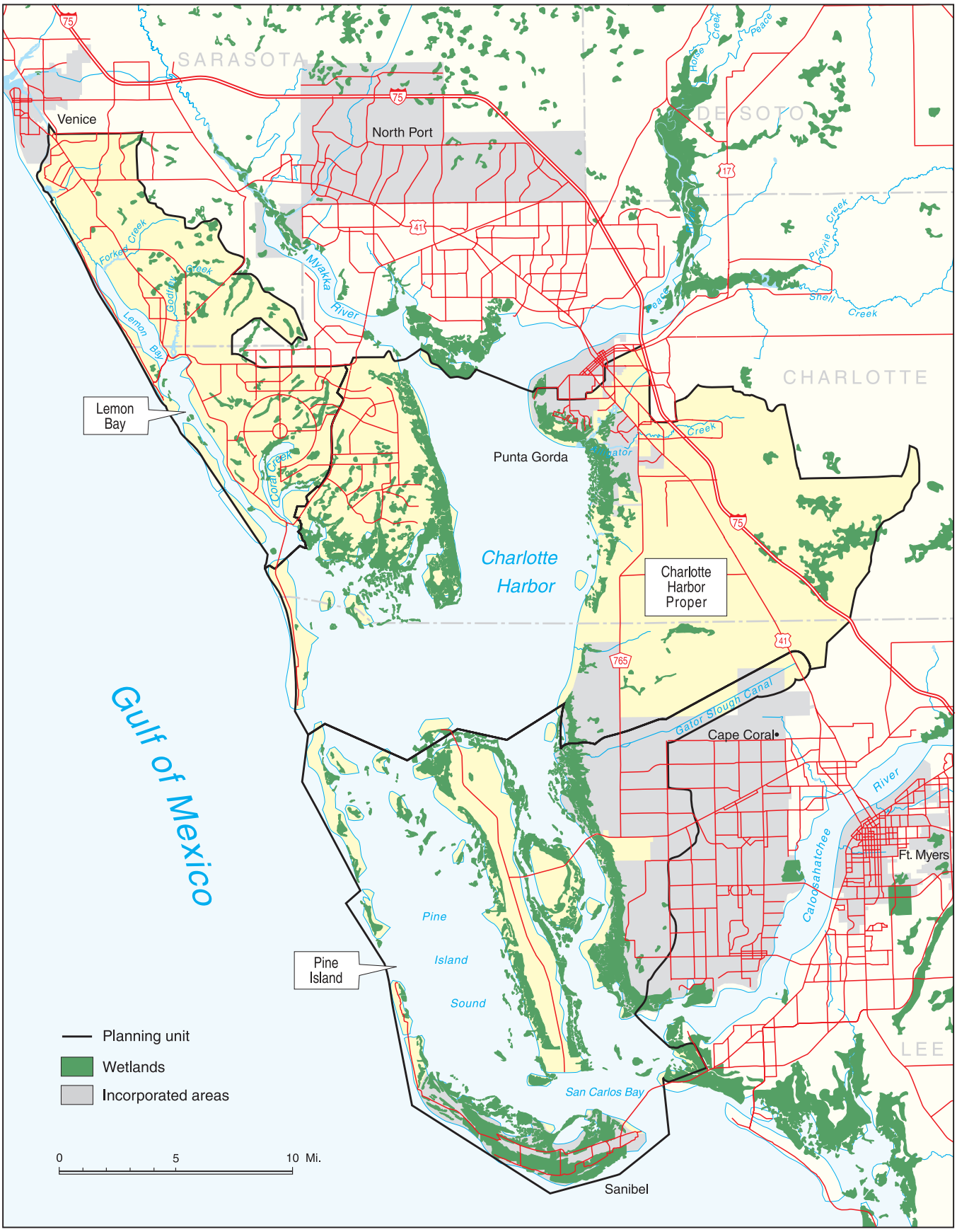
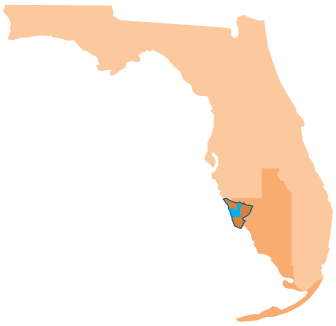


Figure 3.2: Locations and Boundaries of Planning Units in the Charlotte Harbor Basin



Because the Lemon Bay planning unit is the most urbanized in the Charlotte Harbor Basin, its resource managers face numerous challenges associated with boating, sewage disposal, stormwater runoff, and natural area protection. Significant natural areas include the following:

- Lemon Bay Aquatic Preserve (7,667 acres)
- Don Pedro Island State Park (132 acres)
- Stump Pass State Park (245 acres)
- Amberjack Slough Environmental Park (178 acres)
- Oyster Creek Environmental Park (135 acres)
- Cedar Point Preserve (88 acres)

Communities in the planning unit include South Venice, Manasota, Englewood, Englewood Beach, Grove City, Cape Haze, and Rotonda West.

Figure 3.3, a composite map of the planning unit, shows waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources.

Water Quality Summary

Table 3.5 summarizes the water quality assessment status of all waterbody segments in the planning unit. The table and **Figure 3.3** show that six waterbody segments in this planning unit are impaired.

Only estuarine water quality data were available for an assessment of the Lemon Bay planning unit. Based on available data, water quality within the Lemon Bay planning unit appears to be remaining constant. Trend charts (**Figures F.1–F.11** in **Appendix F**) indicate a general decline in total nitrogen (TN), while chlorophyll *a*, DO, and total phosphorus (TP) have remained constant. The data show a decline in TN concentration from an approximate average of 0.8 mg/L in 1982 to an approximate average of 0.58 mg/L in 2001. Data show chlorophyll *a* has remained relatively consistent at an approximate average concentration of 5.0 µg/L from 1991 through 2002. Data show that DO has remained relatively consistent at an approximate average concentration of 6.0 mg/L from 1975 through 2000. Data for TP show a slight decline in the approximate average concentration of TP from 0.15 mg/L in 1982 to 0.125 mg/L in 1993, returning to an approximate average concentration of 0.15 mg/L by 2000.

Overall, the water quality of the estuaries in the planning unit is fair, with most of the estuary segments having sufficient data for assessment being found potentially impaired and placed on either the Verified or Planning List. DO (WBIDs 2067, 2068, 2039, 2049, and 2052), nutrients (WBIDs 2078, 2078A, 2049, and 2075D), and coliform bacteria (WBIDs 2030 and 2039) appear to be the major water quality concerns. WBIDs 1983A and 1983B are potentially impacted for bacteria (in shellfish). No data were available for lakes or springs in the planning unit.

Permitted Discharges and Land Uses

Point Sources. The planning unit has no Superfund or state-funded hazardous waste sites. It contains one closed Class II solid waste landfill, but no other types of landfills. There are no delineated areas under

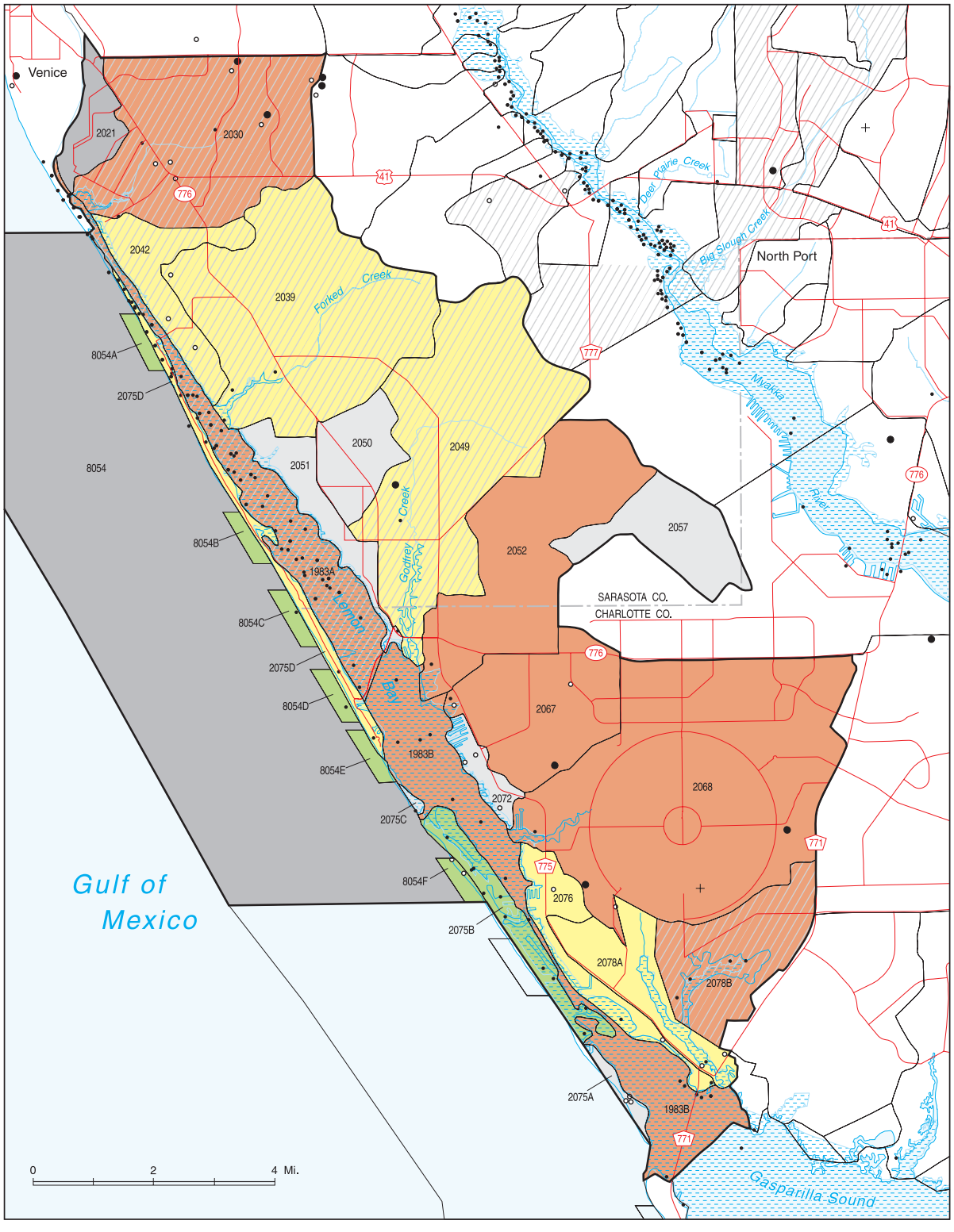


Figure 3.3: Composite Map of the Lemon Bay Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.5: Integrated Water Quality Assessment Summary for the Lemon Bay Planning Unit (IWR Run 14.2, December 18, 2003)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[4]
1983A	Lemon Bay	Estuary	IIIM	Nutrients, DO	—	Bacteria (Shellfish), Nutrients (Chlorophyll *a*)	Fecal Coliforms, DO, Turbidity	5
1983B	Lemon Bay	Estuary	II	—	—	Bacteria (Shellfish)	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	5
2021	Direct Runoff To Bay	Estuary	IIIM	—	—	—	—	3b
2030	Alligator Creek	Estuary	IIIM	Nutrients	Total Coliforms	Fecal Coliforms, DO*	Nutrients, (Chlorophyll *a*), Turbidity	5
2039	Forked Creek	Estuary	IIIM	Nutrients	Nutrients, (Chlorophyll *a*), Total Coliforms, Fecal Coliforms, DO	—	—	3c
2042	Direct Runoff To Bay	Estuary	IIIM	Nutrients	Nutrients, (Chlorophyll *a*)	—	—	3c
2049	Gottfried Creek	Estuary	IIIM	Nutrients, DO	Nutrients, DO	—	—	3c
2050	Unnamed Ditch	Stream	IIIF	—	—	—	—	3a
2051	Direct Runoff To Bay	Estuary	IIIM	—	—	—	—	3a
2052	Rock Creek	Estuary	IIIM	—	—	DO*	Fecal Coliforms, Turbidity	5*
2057	Unnamed Ditch	Stream	IIIF	—	—	—	—	3a
2067	Oyster Creek	Estuary	IIIM	—	—	DO	—	5

Table 3.5 (continued)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[4]
2068	Buck Creek	Estuary	IIIM	—	—	DO	Nutrients, (Chlorophyll *a*), Fecal Coliforms	5
2072	Direct Runoff To Bay	Estuary	IIIM	—	—	—	—	3a
2075A	Barrier Island	Estuary	IIIM	—	—	—	—	3a
2075B	Barrier Island	Estuary	IIIM	—	—	—	Fecal Coliforms, DO, Turbidity	2
2075C	Barrier Island	Estuary	IIIM	—	—	—	—	3a
2075D	Barrier Island	Estuary	IIIM	—	Nutrients, (Chlorophyll *a*)	—	Fecal Coliforms, DO, Turbidity	3c
2076	Direct Runoff To Bay	Estuary	IIIM	—	Nutrients, (Chlorophyll *a*)	—	Fecal Coliforms, DO, Turbidity	3c
2078A	Coral Creek	Estuary	IIIM	—	DO	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms, Turbidity	3c
2078B	Coral Creek E. Branch	Estuary	IIIM	Nutrients, DO, Zinc, Copper, Cadmium, Lead	DO, Zinc, Copper, Cadmium, Lead	Nutrients, (Chlorophyll *a*)	Fluoride, Turbidity	5
8054	Lemon Bay Gulf	Coastal	IIIM	—	—	—	—	3b
8054A	Manasota Key Beach	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8054B	Blind Pass Beach	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8054C	Englewood North	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8054D	Englewood Mid Beach	Coastal	IIIM	—	—	—	Fecal Coliforms	2

Table 3.5 (continued)

WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Data Evaluation under the Impaired Surface Waters Rule Criteria[3]: Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[4]
8054E	Englewood South	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8054F	Palm Island N.	Coastal	IIIM	—	—	—	Fecal Coliforms	2

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:

Class I: **Potable water supplies**
Class II: **Shellfish propagation or harvesting**
Class III: **Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV: **Agricultural water supplies**
Class V: **Navigation, utility, and industrial use (there are no state waters currently in this class)**

[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:

1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollution control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.

[4]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

F = Fresh water
M = Marine

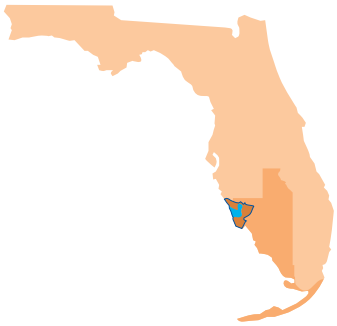
*The rationale behind the veracity of this verified impairment is currently being reevaluated.

Rule 62-524, F.A.C., Potable Water Well Permitting in Delineated Areas. **Figure 3.3** depicts and **Appendix G** lists permitted wastewater treatment facilities and landfills in the planning unit.

Nonpoint Sources. Sarasota County, Charlotte County and Florida Department of Transportation (DOT) District 1 currently have regulated municipal separate storm sewer systems (MS4s) operating in this planning unit. **Appendix I** presents the estimated pollutant loading for the Lemon Bay planning unit, and **Appendix H** summarizes land use totals and percentages.

Ecological Summary

This planning unit is the most urbanized in the Charlotte Harbor Basin. The development of residential communities has destroyed many wetlands and marshes by conversion into open-water canals and filled



uplands. Ecological concerns include the effects of boat traffic and dredging on the Intracoastal Waterway, the existence of dynamically unstable tidal inlets, the presence of large areas of undeveloped platted lots (see the section on **"Roads to Nowhere"** in Chapter 2), the retention of mangrove stands, the protection of seagrass beds, and the growth of nuisance exotic vegetation. Also of concern are the effects of septic systems and stormwater runoff on water quality. In deeper areas of the bay, nutrients from these sources can cause algal blooms that reduce water clarity and cause seagrasses to die back.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix D** contain more detailed documentation of the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the 2003 list of impaired waters.

• Charlotte Harbor Proper Planning Unit

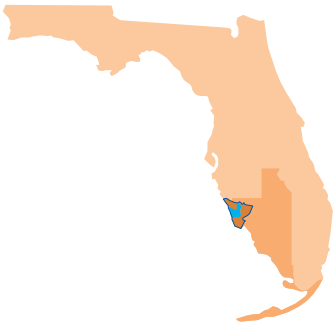
General Description

The Charlotte Harbor Proper planning unit comprises the main portion of the estuary, the largely open body of water primarily in Charlotte County. Unlike other estuaries in southwest Florida that are mostly influenced by the Gulf of Mexico, Charlotte Harbor Proper is dominated by the rivers (**Peace** and **Myakka**) that feed into it. Other significant named waterbodies in the planning unit are Gasparilla Sound, Catfish Creek, and Whidden Creek.

Charlotte Harbor connects to the Gulf of Mexico through the pass (Boca Grande Pass) between Gasparilla and Cayo Costa Islands. Although the harbor covers about 270 square miles, much of it is very shallow. Areas of deep water extend up into the lower Myakka and Peace Rivers. Sandy shelves make up the harbor "walls," including Cape Haze on the west and Punta Gorda/Cape Coral on the east. These east and west walls are covered by seagrass beds—essential habitat for young fish and other wildlife.

Although tides from the Gulf of Mexico affect water levels far up the Myakka and Peace Rivers, and salt water migrates up the rivers during periods of low river flow, typical high flows in summer freshen the rivers and lower the harbor's salinity. Thus, the harbor changes dramatically with the seasons. Outwelling river water, fresh and warm, overflows deeper water from the Gulf that tends to be salty (dense) and cool. This layering effect causes oxygen depletion (hypoxia) in the deeper harbor waters.

A remarkable feature of this planning unit is that nearly all the wetlands surrounding the harbor are designated as state buffer preserves and are publicly owned. Significant natural areas include the following:



- Gasparilla Sound/Charlotte Harbor Aquatic Preserve (79,168 acres),
- Cape Haze Aquatic Preserve (11,284 acres),
- Charlotte Harbor State Buffer Preserve/Cape Haze Units (20,343 acres),
- Charlotte Harbor State Buffer Preserve/Punta Gorda Unit (5,572 acres),
- Charlotte Flatwoods Environmental Park (486 acres),
- Gasparilla Island State Park (144 acres), and
- Island Bay National Wildlife Refuge (20 acres).

Communities in the planning unit include Punta Gorda, South Punta Gorda Heights, Tropical Gulf Acres, Pirate Harbor, Charlotte Beach, Rotonda, Placida, and Boca Grande.

Figure 3.4, a composite map of the planning unit, shows waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources.

Water Quality Summary

Table 3.6 summarizes the water quality assessment status of all waterbody segments in the Charlotte Harbor Proper planning unit. The table and **Figure 3.4** show that six waterbody segments in the planning unit are impaired.

Based on available data, water quality within the Charlotte Harbor Proper planning unit appears to be improving. Trend charts (**Figures F.1–F.11** in **Appendix F**) indicate a general decline in chlorophyll *a*, TN, and TP while DO has remained constant. The data show a decline in chlorophyll *a* concentration from an approximate average of 7.5 µg/L in 1982 through 1988, to an approximate average of 3.0 µg/L in 1996 through 2000. TN data was limited but appeared to show a steady decline from an approximate average concentration of 0.8 mg/L in 1983 to an average approximate average concentration of 0.2 mg/L in 1999. Data were sufficient to show a steady decline in the approximate average concentration of TP from 0.225 mg/L in 1982 to 0.075 mg/L in 1999. Data show DO has remained relatively consistent at an approximate average concentration of 6.75 mg/L from 1971 through 2000. One stream waterbody segment was potentially impaired for DO according to the IWR (WBID 2063, the North Fork of Alligator Creek), and one stream segment was placed on the planning list (WBID 2071, the North Prong of Alligator Creek). The overall water quality of the streams in this planning unit could not be assessed due to little or no data.

Overall, the water quality of the estuaries in the planning unit is fair, with all but two estuary segments having sufficient data to find them potentially impaired. The primary contaminant of concern is mercury (in fish tissue), which is present in half of all the potentially impaired WBIDs (2065A, 2065B, and 2065D). Other contaminants of concern include DO (WBIDs 2073 and 2087), iron (WBID 2065A), and bacteria (in shellfish)

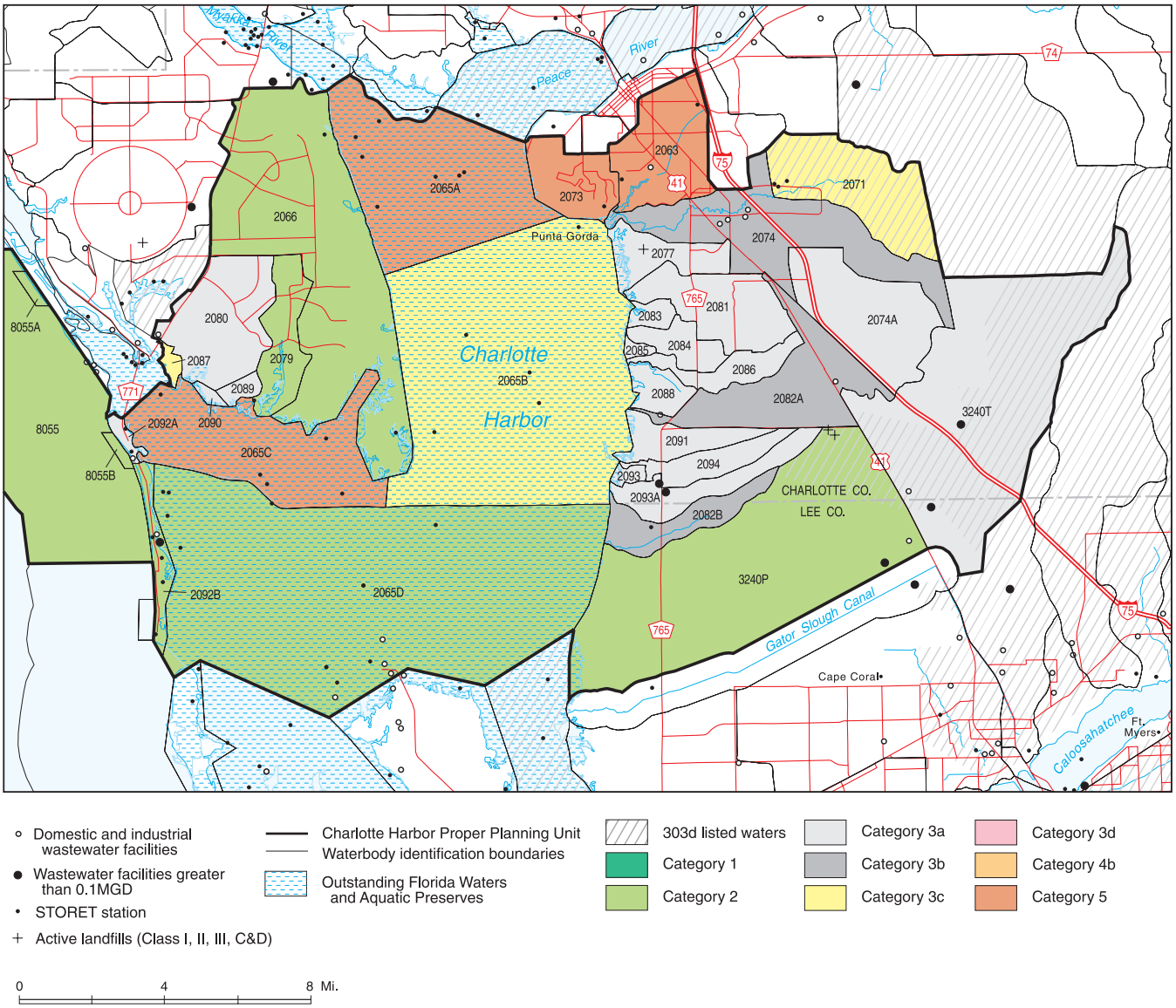


Figure 3.4: Composite Map of the Charlotte Harbor Proper Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.6: Integrated Water Quality Assessment Summary for the Charlotte Harbor Proper Planning Unit (IWR Run 14.2)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[4]
2063	N. Fork Alligator Creek	Stream	IIIF	—	—	Mercury in Fish, DO	Nutrients, (Chlorophyll *a*), Fecal Coliforms	5
2065A	Charlotte Harbor Upper	Estuary	II	—	Nutrients, (Chlorophyll *a*)	Iron	Fecal Coliforms, DO, Turbidity	5
2065B	Charlotte Harbor Mid	Estuary	II	—	Nutrients, (Chlorophyll *a*)	—	Fecal Coliforms, DO, Turbidity	3c
2065C	Charlotte Harbor Mid	Estuary	II	—	—	Bacteria (Shellfish)	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	5
2056D	Charlotte Harbor Lower	Estuary	II	—	—	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	2
2066	Direct Runoff To Bay	Stream	IIIF	—	—	—	Fecal Coliforms, DO, Turbidity	2
2071	N. Prong Alligator Creek	Stream	IIIF	Fecal Coliforms, DO, Turbidity	DO, Turbidity	—	Biology	3c
2073	Mangrove Point Canal	Estuary	IIIM	—	—	DO	Nutrients, (Chlorophyll *a*), Fecal Coliforms	5
2074	Alligator Creek	Stream	I	—	—	—	—	3b
2074A	Alligator Creek	Stream	IIIF	—	—	—	—	3a
2077	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2079	Whidden Creek	Stream	IIIF	—	—	—	Fecal Coliforms, DO, Turbidity	2

Table 3.6 (continued)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[4]
2080	Catfish Creek Bayou	Stream	IIIF	—	—	—	—	3a
2081	Alligator Creek	Stream	IIIF	—	—	—	—	3a
2082A	Pirate Canal	Stream	IIIF	—	—	—	—	3b
2082B	Yucca Pen Creek	Stream	IIIF	—	—	—	—	3b
2083	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2084	Mound Creek	Stream	IIIF	—	—	—	—	3a
2085	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2086	Winegourd Creek	Stream	IIIF	—	—	—	—	3a
2087	Direct Runoff To Bay	Stream	IIIM	—	DO	—	Nutrients, (Chlorophyll *a*)	3C
2088	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2089	Boggess Hole Outflow	Stream	IIIF	—	—	—	—	3a
2090	Direct Runoff To Bay	Stream	IIIM	—	—	—	—	3a
2091	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2092A	Direct Runoff To Bay	Stream	IIIF	—	—	—	—	3a
2092B	Gasparilla Island	Estuary	IIIM	—	—	—	Fecal Coliforms, DO, Turbidity	2
2093	Direct Runoff To Bay	Stream	IIIM	—	—	—	—	3a
2093A	Hog Branch	Stream	IIIM	—	—	—	—	3a
2094	Bear Branch	Stream	IIIF	—	—	—	—	3a
3240P	North Urban Cape Coral	Estuary	IIIM	—	—	—	Fecal Coliforms, DO, Turbidity	2

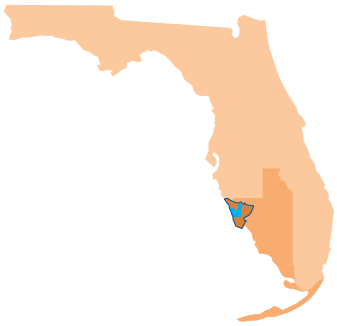
Table 3.6 (continued)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[4]
3240T	Gilchrest Drain	Stream	IIIF	—	—	—	—	3a
8055	Char Harbor Prop Gulf	Coastal	IIIM	—	—	—	Fecal Coliforms, DO, Turbidity	2
8055A	Palm Island South	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8055B	Boca Grande	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8056A	Cape Coral Yacht Club	Coastal	IIIM	—	—	—	Fecal Coliforms	2

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:
Class I: **Potable water supplies**
Class II: **Shellfish propagation or harvesting**
Class III: **Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV: **Agricultural water supplies**
Class V: **Navigation, utility, and industrial use (there are no state waters currently in this class)**
[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollution control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[4]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

F = Fresh water
M = Marine



3240P) were found to be not impaired, although one (WBID 3240P) had insufficient data to adequately assess all potential contaminants.

Permitted Discharges and Land Uses

Point Sources. The planning unit has no Superfund or state-funded hazardous waste sites. It contains one active Class I solid waste landfill and one active and one inactive construction and debris (C&D) landfill (see **Noteworthy** on point sources and on environmental remediation). There are no delineated areas under Rule 62-524, F.A.C., "Potable Water Well Permitting in Delineated Areas" (see **Noteworthy** on delineated ground water contamination areas). **Figure 3.4** depicts and **Appendix G** lists permitted wastewater treatment facilities and landfills in the planning unit.

Nonpoint Sources. Charlotte County, the City of Punta Gorda and DOT District 1 currently have regulated MS4s operating in this planning unit. **Appendix I** presents the estimated pollutant loading for the Charlotte Harbor Proper planning unit, and **Appendix H** summarizes land use totals and percentages (see **Noteworthy** for a definition of nonpoint sources and land uses).

Ecological Summary

The main ecological issues in the Charlotte Harbor Proper planning unit are **altered freshwater inflows** into the harbor and pollutants introduced by urban, industrial, and agricultural sources and degraded upstream waterbodies. Ground water overpumping, irrigation, and surface water diversions for flood control and potable uses must logically be altering the quantity, quality, timing, and distribution of water flows, perhaps in ways that may be difficult to quantify. As forests and pasturelands are **mined**, industrialized, urbanized, or converted to intensive **agriculture** such as citrus and row crops, more pesticides, fertilizers, heavy metals, oils, solvents, and other organic compounds can run off into the harbor's tributaries, especially the Peace River. Estevez et al. (1998) reported that total organic nitrogen in the Peace River is increasing, and while phosphorus is decreasing, the river's phosphorus levels remain among the highest in Florida. Total phosphorus concentrations are increasing with time in the Myakka River, and both rivers show trends of increasing chloride, sulfate, and dissolved solids, indicating ground water influence (Estevez et al., 1998).

Of particular concern is Lake Hancock, a highly polluted lake at the headwaters of the Peace River that discharges nitrogen- and algae-laden water into Charlotte Harbor Proper. Excessive nutrients (particularly nitrogen) can stimulate the growth of algae in the harbor. As the algae grow, or are transported downstream from upriver sources (e.g., Lake Hancock), they require a large amount of DO to decompose. The decomposition process creates low oxygen conditions (anoxia/hypoxia) that can cause fish kills.

While the deeper waters of Charlotte Harbor may already be naturally hypoxic, the addition of nutrients and algae from upstream sources can only exacerbate the situation and extend the size of the anoxic/hypoxic zone. A recent study by the SWFWMD suggests that cleaning the nutrient-laden water from Lake Hancock alone would offset future nutrient loading from population growth and development for the next 10 to 20 years (Tomasko,

Noteworthy

Information on Point Sources in Planning Units

Point sources discharging pollutants to surface water or ground water originate from discrete, well-defined areas such as a facility discharge from the end of a pipe, a disposal well, or a wastewater sprayfield. Point sources generally fall into two major types: domestic wastewater sources (which consist of sewage from homes, businesses, and institutions) and industrial wastewater sources (which include wastewater, runoff, and leachate from industrial or commercial storage, handling, or processing facilities). Landfills, hazardous waste sites, dry cleaning solvent cleanup program (DSCP) sites, and petroleum facility discharges are also considered point sources. These sites have the potential to leach contaminants into ground water and surface water.

Identifying the source of waterbody impairment is an important part of assessing water quality and developing TMDLs. As part of this report, information is presented on point sources, including permitted facilities that discharge wastewater and landfills.

Delineated Ground Water Contamination Areas

The Department's Delineation Program was established in response to the discovery of ground water contaminated by ethylene dibromide (EDB), a soil fumigant that was historically used in 38 Florida counties to control nematodes in citrus groves and row crops. The program currently includes ground water contaminated by other pesticides, industrial solvents, and nutrients. However, the coverage of delineated areas in this program is not intended to include all sources of contaminated ground water in Florida. The Delineation Program is designed to ensure the protection of public health when consuming potable ground water supplies and to minimize the potential for cross-contamination of adjacent ground water resources.

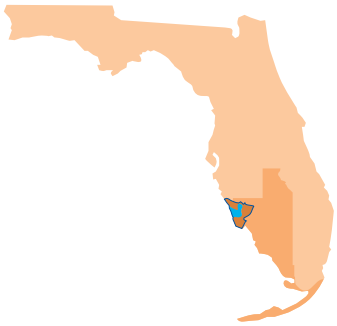
The Delineation Program's primary responsibilities are as follows:

- Delineate areas of ground water contamination,
- Implement a water well construction permitting/application process that requires stringent construction standards, and
- Require water testing after completion of the well to ensure the potable quality of the water source.

Any newly constructed water wells in delineated areas, and existing water wells found to be contaminated, are remediated by installing individual water treatment systems or by connecting the users to public water supply systems.

Nonpoint Sources and Land Uses

Rainfall generates stormwater runoff. As it flows over the land and through the ground, runoff may carry nonpoint source pollutants from many different sources to lakes, rivers, and estuaries in a watershed, and into ground water supplies. Nonpoint sources also include atmospheric deposition and leaching from agricultural lands, urban areas, and unvegetated lands. The pollutants in runoff often include fertilizers, bacteria, metals, sediments, petroleum compounds, and metals.



2001) and would represent a suitable pollution load reduction goal (PLRG) for Charlotte Harbor.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix D** contain additional information on the requirements for reasonable assurance).

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the 2002 list of impaired waters.

• Pine Island Planning Unit

General Description

The Pine Island planning unit contains the Pine Island Sound, Matlacha Pass, and San Carlos Bay Estuaries. Smaller named waterbodies include Tarpon Bay, Island Creek, Sanibel River, and Gator Slough Canal. Pine Island Sound and Matlacha Pass lie immediately south of Charlotte Harbor Proper, on either side of Pine Island, and connect farther south to form San Carlos Bay. The islands of Cayo Costa, Captiva, and Sanibel insulate the Pine Island Sound, Matlacha Pass, and San Carlos Bay Estuaries from the Gulf of Mexico. Numerous small creeks and wetland areas on Pine Island provide some fresh water to the estuaries, but most fresh water comes from direct rainfall and runoff from western Cape Coral. The estuaries contain extensive seagrass beds and large mangrove forests dominate the shorelines; both of these provide essential habitat for young fish and much wildlife. The American crocodile *(Crocodylus acutus)* is found in these waters, the farthest point north that the species has been observed.

The Cape Coral waterways directly influence the quantity and quality of freshwater inflow to Matlacha Pass and San Carlos Bay. Periodically, large releases from the Caloosahatchee River can discharge fresh water through San Carlos Bay into southern Pine Island Sound, harming the estuaries. Seagrasses, oyster beds, and other plants and animals are vulnerable to salinity changes, sediments, and pollutants caused by dramatic changes in freshwater inflows.

Significant natural areas include the following:

- Pine Island Sound Aquatic Preserve (54,176 acres),
- Matlacha Pass Aquatic Preserve (12,511 acres),
- Charlotte Harbor State Buffer Preserve/Cape Coral Unit (7,951 acres),
- Charlotte Harbor State Buffer Preserve/Pine Island Unit (6,474 acres),
- J.N. "Ding" Darling National Wildlife Refuge (5,550 acres),
- Sanibel-Captiva Conservation Foundation Lands (1,800+ acres),

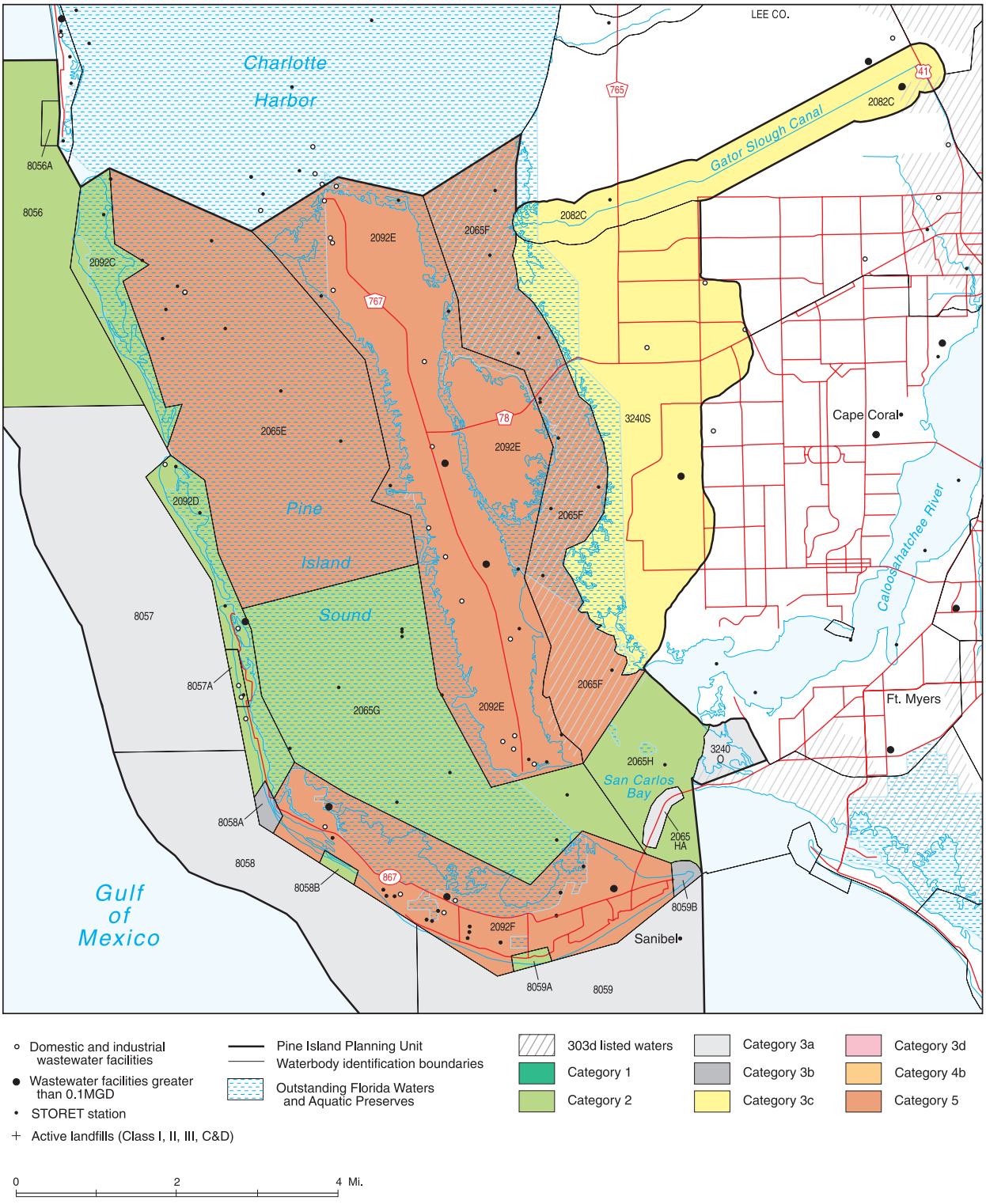
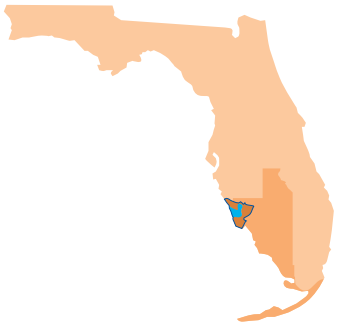


Figure 3.5: Composite Map of the Pine Island Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources



- Cayo Costa State Park (1,655 acres),
- Pine Island National Wildlife Refuge (548 acres), and
- Matlacha Pass National Wildlife Refuge (512 acres).

Communities in the planning unit include Bokeelia, Pineland, Pine Island Center, Flamingo Bay, St. James City, North Captiva, Captiva, Sanibel, and Cape Coral.

Figure 3.5, a composite map of the planning unit, shows waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources.

Water Quality Summary

Table 3.7 summarizes the water quality assessment status of all waterbody segments in the planning unit. The table and figure show that three waterbody segments in this planning unit are impaired.

Based on available data, water quality within the Pine Island planning unit appears to be stable, as trend charts (**Figures F.1–F.11** in **Appendix F**) indicate that chlorophyll *a*, DO, and TP have remained constant. There were insufficient data to assess a general basin trend for TN. The data show a generally consistent chlorophyll *a* concentration of an approximate average of 4.0 µg/L in 1996 through 2002. DO and TP data also show generally consistent concentrations, with DO having an approximate average of 7.0 mg/L for 1973 through 2000 and total phosphorus (TP) having an approximate average concentration of 0.75 mg/L for 1973 through 2001. There is only one stream waterbody segment within the planning unit (WBID 2082C, Gator Slough Canal) which was placed on the planning list for nutrients and DO. DO met the verification threshold according to the IWR criteria; however, a causative pollutant has not been identified. It is suspected that the nutrient data have been miscalculated due to one laboratory reporting its analytical results in the wrong measure of units. This is being investigated by the Department but has not been confirmed at the time of this report.

Overall, the water quality of the estuaries in the planning unit is good. Only two estuary segments, (WBID 2065E) Pine Island Sound Upper and (WBID 2092E) Pine Island Sound, have sufficient data to find them potentially impaired for bacteria (in Shellfish).

One planning unit "Sanibel Island" (WBID 2092F), is designated as a "lake" type. The annual mean trophic state index (TSI) values exceeded the IWR listing threshold value of 60 in 1996, and 1999 through 2002. The planning unit has been placed on the verified list for nutrient impairment.

Permitted Discharges and Land Uses

Point Sources. The planning unit contains no Superfund or state-funded hazardous waste sites, and no solid waste or other types of landfills. There are no delineated areas under Rule 62-524, F.A.C., Potable Water Well Permitting In Delineated Areas. **Figure 3.5** depicts and **Appendix G** lists permitted wastewater treatment facilities and landfills in the planning unit.

Table 3.7: Integrated Water Quality Assessment Summary for the Pine Island Planning Unit (IWR Run 14.2, December 18, 2003)

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[4]
2065E	Pine Island Sound Upper	Estuary	II	—	—	Bacteria (Shellfish)*	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	5*
2065F	Matlacha Pass	Estuary	II	Mercury in Fish	Mercury in Fish	Bacteria (Shellfish)*	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	5*
2065G	Pine Island Sound lower	Estuary	II	—	—	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	2
2065H	San Carlos Bay	Estuary	II	—	—	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	2
2065HA	Sanibel Island Causeway	Estuary	IIIM	—	—	—	—	3a
2082C	Gator Slough Canal	Stream	IIIF	—	Nutrients, (Chlorophyll *a*), DO	—	Fecal Coliforms, Turbidity, Copper, Lead, Zinc, Arsenic	3c
2092C	N. Captiva Island	Estuary	IIIM	—	—	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	2
2092D	Captiva Island	Estuary	IIIM	—	—	—	Fecal Coliforms, DO, Turbidity	2

Table 3.7 (continued)

WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
					Potentially Impaired (Cat. 3c) for Listed Parameters	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[4]
2092E	Pine Island	Estuary	II	—	—	Bacteria (Shellfish)	Nutrients, (Chlorophyll *a*), Fecal Coliforms, DO, Turbidity	5
2092F	Sanibel Island	Lake	IIIF	—	—	Nutrients (TSI)	—	5
3240O	Punta Rasa Cove	Estuary	IIIM	—	—	—	—	3a
3240S	South Uran Cape Coral	Estuary	IIIM	—	Nutrients, (Chlorophyll *a*)	—	—	3c
8056	Pine Island Gulf 1	Coastal	IIIM	—	—	—	DO Turbidity	2
8056A	Cape Coral Yacht Club	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8057A	South Seas Plantation	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8058A	Blind Pass/ Turner Beach	Coastal	IIIM	—	Nutrients (Chlorophyll *a*)	—	Fecal Coliforms	3b
8058B	Bowmans Beach	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8059A	Tarpon Bay Beach	Coastal	IIIM	—	—	—	Fecal Coliforms	2
8059B	Lighthouse Beach	Coastal	IIIM	—	—	—	Nutrients, (Chlorophyll *a*), Fecal Coliforms	3b

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:

Class I: **Potable water supplies**
Class II: **Shellfish propagation or harvesting**
Class III: **Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV: **Agricultural water supplies**
Class V: **Navigation, utility, and industrial use (there are no state waters currently in this class)**

[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:

1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollution control mechanism provides reasonable assurance that the water will attain standards in the future;

Table 3.7 (continued)

4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[4]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

F = Fresh water
M = Marine

*The rationale behind the veracity of this verified impairment is currently being reevaluated.

Nonpoint Sources. Lee County, the City of Cape Coral, the City of Sanibel and DOT District 1 currently have regulated municipal separate storm sewer systems operating in this planning unit. **Appendix I** presents the estimated pollutant loading for the Pine Island planning unit, and **Appendix H** summarizes land use totals and percentages.

Ecological Summary

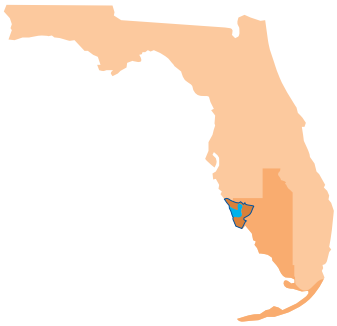
Agribusiness has converted many uplands and wetlands in the Caloosahatchee watershed upstream of San Carlos Bay and east of Franklin Lock to intensive **agricultural uses**, creating numerous drainage and irrigation canals where crop demands regulate river water flows into or out of the adjacent canals. The citrus industry, which has expanded significantly into the upper portion of the planning unit during the past decade, depends on the control of soil water levels. The development of residential communities and the presence of large areas of undeveloped lots have also destroyed a significant portion of the planning unit's wetlands and marshes by conversion into open-water canals and filled uplands (see the section on **"Residential Development and 'Roads to Nowhere'"** in Chapter 2).

Although the lower portion of Charlotte Harbor occasionally suffers from reduced freshwater inflows, it is also periodically deluged with excess levels of nutrient-laden fresh water from several sources (agriculture, urban areas, and Lake Okeechobee), causing algal blooms and reducing DO levels. Of particular concern are flood control discharges from Lake Okeechobee via the Caloosahatchee River (see the section on **Hydrologic Alterations—"Famine or Feast"** in Chapter 2). Submerged aquatic vegetation, oyster reef coverage, and bay scallop populations have been drastically harmed by these sudden, extreme salinity fluctuations (Southwest Florida Regional Planning Council, 1995).

Water Quality Improvement Plans and Projects

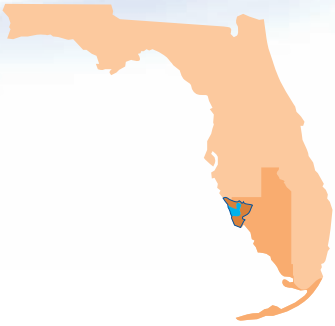
Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix D** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the 2002 list of impaired waters.



Chapter 4: The Verified List of Impaired Waters

Public Participation



The Department has worked with a variety of stakeholders and held public meetings on developing and adopting the Verified Lists of impaired waters for the six Group 2 basins across the state. **Table 4.1** lists the statewide schedule for the development and adoption of the Group 2 Verified Lists, including the public meetings. The schedule for the Charlotte Harbor Basin is highlighted in boldface type. **Appendix J** contains documentation provided during the public comment period.

Basin-specific draft Verified Lists of waters that met the requirements of the Impaired Surface Waters Rule (IWR) were made available to the public on June 2, 2003. The lists were placed on the Florida Department of Environmental Protection's (Department) Total Maximum Daily Loads (TMDL) Web site, at http://www.dep.state.fl.us/water/tmdl, and were also sent up on request to interested parties by mail or via e-mail.

Citizens were given the opportunity to comment on the draft lists in person and/or in writing. A total of 8 public meetings were held across the state to encourage public participation on a basin-by-basin basis. The Department also accepted written comments for 45 days beginning June 2, 2003, and ending July 17, 2003.

Following the public meetings for the Group 2 basins, which took place between June 9 and June 19, 2003, revised draft lists were made available to the public on September 5, 2003. The public had the opportunity to comment on these revised lists either in writing and/or at a final public meeting in Tallahassee. Comments received by on October 2, 2003, were considered in preparing the revised draft lists. Comments on any of the lists were accepted and considered throughout the full comment period.

The final basin-specific Verified Lists developed through the public participation process were adopted by Secretarial Order on May 27, 2004. As of the writing of this report, the Verified Lists for the Group 2 basins have not yet been submitted to the EPA as the state's current 303(d) list of impaired waters.

Table 4.1: Schedule for Development and Adoption of the Group 2 Verified Lists

Date	Scheduled Activity
May 14, 2003	Public meeting at Jacksonville on Lower St. Johns Basin Draft Verified List
June 2, 2003	**Publication of Draft Verified Lists for the Other Group 2 Basins and Beginning of Public Comment Period**
June 13, 2003	Public Meeting at Apalachicola on the Apalachicola and Chipola Basins
June 11, 2003	Public Meeting at Sanford on the Middle St. Johns Basin
June 10, 2003	Public Meeting at St. Petersburg on the Tampa Bay Tributaries Basin
June 9, 2003	**Public Meeting at Punta Gorda on the Charlotte Harbor Basin**
June 19, 2003	Public Meeting at Stuart on the St. Lucie and Loxahatchee Basins
June 19, 2003	Public Meeting at Jupiter on the St. Lucie and Loxahatchee Basins
June 25, 2003	Public Meeting at Jacksonville on the Lower St. Johns Basin Revised Draft List
September 5, 2003	**Publication of Revised Draft Verified List for the Other Group 2 Basins**
September 17, 2003	**Public Meeting in Tallahassee on Revised Draft Verified Lists for All Basins, and Public Comments and Input from Prior Public Meetings**
October 2, 2003	**Final Deadline for Receiving Public Comments**
May 27, 2004	**Adoption of Verified List by Secretarial Order**
To Be Announced	**Submittal to EPA as State's 303(d) List of Impaired Waters**

Identification of Impaired Waters

As discussed in Chapter 2, waters on the Verified and Planning Lists must meet specific thresholds and data sufficiency and data quality requirements in the Impaired Surface Waters Rule (Rule 62-303, Florida Administrative Code [F.A.C.]). **Appendix A** describes the legislative and regulatory background for the development of the Planning and Verified Lists. **Appendix E** contains a methodology that describes the criteria and thresholds required for both lists under the IWR.

Any waters that do not have sufficient data to be analyzed in accordance with the requirements of the IWR will remain on the 1998 303(d) list of impaired waters maintained by the U.S. Environmental Protection Agency (EPA). These waters are not delisted, and they will be sampled during the next phases of the watershed management cycle so that their impairment status can be verified.

The Verified List of Impaired Waters

Table 4.2 contains the Verified List of impaired waters for the Charlotte Harbor Basin, based on the water quality assessment performed for the December 2003 update to the 303(d) list. **Figure 4.1** shows waters on the Verified List for the entire basin as of December 18, 2003, and the projected year for TMDL development. For presentation purposes, the entire watershed for the listed water is highlighted. However, only the main waterbody in the assessment unit has been assessed and other waters in the watershed may not be impaired.

Table 4.2: The Verified List of Impaired Waters (IWR Run 14.2, December 18, 2003)

WBID	Water-body Segment	Water-body Type	1998 303(d) Param-eters of Concern	Parameters Identified Using the 2002 Impaired Surface Waters Rule	Current Status[1]	EPA's Inte-grated Report Category[2]	Priority for TMDL Development[3]	Projected Year for TMDL Development[4]	Comments
1983a	Lemon Bay	Estuary	Nutrients, DO	Nutrients (Chloro-phyll *a*)	VL	5	Low	2008	Planning Period: no data; verified period: Chloro-phyll *a* verified. Annual average Chlorophyll *a* exceeded 11 µg/L in 1996–2001. Colimitation of N and P based on median TN/TP ratios of 2.96 (436 values) during the PP and 2.67 (454 values) during the verified period.
1983a	Lemon Bay	Estuary	Nutrients, DO	Bacteria (Shellfish)	VL	5	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from approved to conditional).
1983b	Lemon Bay	Estuary	—	Bacteria (Shellfish)	VL	5	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from approved to conditional).
2030	Alliga-tor Creek	Estuary	Nutrients	Fecal Coliforms	VL	5	Medium	2008	Planning period: 27/59; verified period: 9/28.
2030	Alliga-tor Creek	Estuary	Nutrients	DO*	VL	5*	Medium	2008	Planning period: 45/60; verified period: 21/28. Linked to nutri-ents, TN may be causative pol-lutant (mean = 1.275 mg/L)

Table 4.2 (continued)

WBID	Water-body Segment	Water-body Type	1998 303(d) Param-eters of Concern	Parameters Identified Using the 2002 Impaired Surface Waters Rule	Current Status[1]	EPA's Inte-grated Report Category[2]	Priority for TMDL Development[3]	Projected Year for TMDL Development[4]	Comments
2052	Rock Creek	Estuary		DO*	VL	5*	Medium	2008	Planning period: 12/27; verified period: 11/20. BOD is identified as a causative pollutant (mean = 3.7 mg/L)
2063	N. Fork Alliga-tor Creek	Stream	—	DO	VL	5	Medium	2008	Planning period: 24/35; verified period: 24/34 BOD is identified as the causative pollutant (mean = 4.6 mg/L).
2065a	Char-lotte Harbor Upper	Estuary	—	Iron	VL	5	Medium	2008	Planning period: 5/11; verified period: 21/36.
2065c	Char-lotte Harbor Mid	Estuary	—	Bacteria (Shellfish)	VL	5	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from approved to conditional).
2065e	Pine Island Sound Upper	Estuary	—	Bacteria (Shellfish)	VL	5*	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from approved to conditional).
2065f	Mat-lacha Pass	Estuary	—	Bacteria (Shellfish)	VL	5*	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from approved to conditional and prohibited).
2092e	Pine Island	Estuary	—	Bacteria (Shellfish)	VL	5	Medium	2008	Listed based on change in shellfish harvest-ing classification (downgraded from conditional to prohibited).

Table 4.2 (continued)

WBID	Water-body Segment	Water-body Type	1998 303(d) Param-eters of Concern	Parameters Identified Using the 2002 Impaired Surface Waters Rule	Current Status[1]	EPA's Inte-grated Report Category[2]	Priority for TMDL Development[3]	Projected Year for TMDL Development[4]	Comments
2067	Oyster Creek	Estuary	—	DO	VL	5	Medium	2008	Planning period: 9/21; verified period: 9/20 BOD is identified as the causative pollutant (mean BOD = 2.6 mg/L).
2068	Buck Creek	Estuary	—	DO	VL	5	Medium	2008	Planning period: 14/21; P–14/20 Both N (median TN = 1.11 mg/L) and BOD (mean BOD = 4.5 mg/L) are identified as causative pollutants.
2073	Man-grove Point Canal	Estuary	—	DO	VL	5	Medium	2008	Planning period: 12/34; verified period: 12/34 Both N (median TN = 1.04 mg/L) and P (median TP = 0.15 mg/L) are identified as causative pollutants.
2078b	Coral Creek E. Branch	Estuary	Nutrients, DO, Zinc, Copper, Cad-mium, Lead	Nutrients (Chloro-phyll *a*)	VL	5	Low	2008	Planning period: no data; verified period: Chloro-phyll *a* verified. Annual average Chlorophyll *a* exceeded 11 µg/L in 1996–2001. Colimitation of N and P based on median TN/TP ratios of 19.55 (30 values) during the PP and 16.87 (54 values) during the verified period.

Table 4.2 (continued)

WBID	Water-body Segment	Water-body Type	1998 303(d) Param-eters of Concern	Parameters Identified Using the 2002 Impaired Surface Waters Rule	Current Status[1]	EPA's Inte-grated Report Category[2]	Priority for TMDL Development[3]	Projected Year for TMDL Development[4]	Comments
2092f	Sanibel Island	Lake	—	Nutrients (TSI)	VL	5	Medium	2008	Planning period: TSI potentially impaired; verified period: TSI verified. Annual average TSI exceeded 60 in 1996 and 1999–2002. Colimitation of N and P based on median TN/TP ratios of 32.81 (1044 values) during the PP and 28.28 (778 values) during the VP.
8999	South-west Florida Gulf Coast	Coastal	—	Mercury in Fish	VL	5	Medium	2011	Data verified to be within the last 7.5 years. Confirmed recent data for coastal fish advisory for shark, king mackerel, spotted seatrout, little tunny, greater amberjack, bluefish, and crevalle jack. Includes WBIDs 8054, 8054 A-F, 8055, 8055A, 8055B, 8056, 8056A, 8057A, 8058A, 8058B, 8059A, and 8059B. Confirmed consumption advisory in Charlotte Harbor for Spanish Mackerel. Includes WBIDs 2065A, 2065B, 2065C, and 2065D.

Table 4.2 (continued)

Notes:

[1]**MS**—meets standards; **PL—**(Planning List) potentially impaired; **VL**—(Verified List) verified impaired; **ID**—insufficient data to assess; **ND**—no data to assess.
[2]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollution control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[3] Where a parameter was 1998 303(d) listed, the priority shown for that parameter in the 1998 303(d) list was retained (high or low). Where a parameter was only identified as impaired under the IWR, priorities of high, medium, or low were used.
[4] Dates and priorities in parentheses indicate a TMDL is scheduled under the terms of the consent decree between EPA and Earthjustice, but there are insufficient data available to assess the water according to the specifications of the IWR.

BOD = Biological oxygen demand
TN = Total nitrogen
TP = Total phosphorus
TSI = Trophic state index

*The rationale behind the veracity of this verified impairment is currently being reevaluated.

Pollutants Causing Impairments

Of the 82 water segments in the Charlotte Harbor Basin, 13 waters are impaired for at least one parameter, and a TMDL is required for these waters. There are a total of 8 parameter listings for impairment following the methodology in **Appendix E**. The Lemon Bay planning unit has the largest number of impaired parameter listings with 6, followed by the Charlotte Harbor planning unit with 4 listings.

The most common parameter exhibiting impairment throughout the Charlotte Harbor Basin is bacteria (in shellfish) with 5 listings, followed by DO impairment with 4 listings, and nutrient impairments (chlorophyll *a* [2] and TSI [1]) with 3 listings. The Southwest Florida Gulf Coast (waterbody identification number [WBID] 8999) is listed due to fish consumption advisories for mercury; this includes WBIDs 8054, 8054A-F, 8055, 8055A, 8055B, 8056, 8056A, 8056B, 8059A, 8059B, 2065A, 2056B, 2065C, and 2065D. The state has also issued limited consumption advisories in Charlotte Harbor for Spanish Mackerel which applies to fish species having mercury levels of 0.5 to 1.5 pounds per minute.

As required by the IWR, the Department must identify the pollutants causing or contributing to DO exceedances in order to place DO on the Verified List. If a water segment is on the Verified List for both DO and nutrients, the nutrients are identified as pollutants contributing to DO exceedances. The Department also applies the following analysis to identify the pollutant(s) contributing to DO exceedances:

1. The water segment median values for biological oxygen demand (BOD), total nitrogen, and total phosphorus are determined for the verified period (i.e., January 1995 to June 2002).

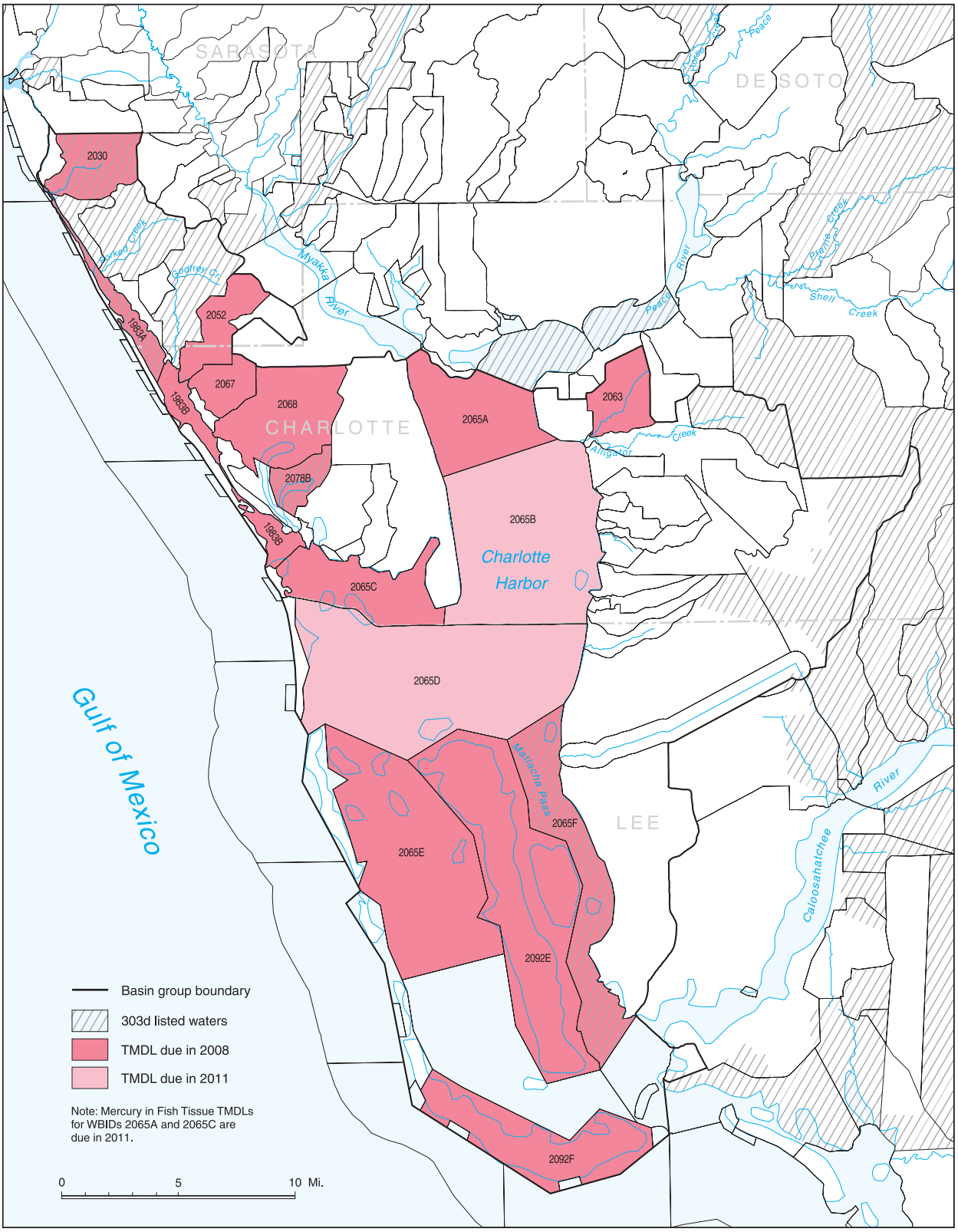
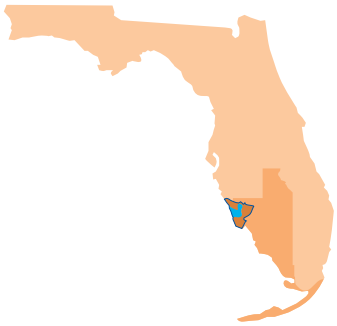


Figure 4.1: Waters on the Verified List, with Projected Year for TMDL Development



2. The median values are then compared with the screening levels for the appropriate waterbody type. The screening levels represent the 70th percentile value of data collected from streams, lakes, or estuaries **(Table 4.3)**.
3. If a water segment median value exceeds the screening level, the parameter is identified as a pollutant contributing to the exceedances.

Table 4.3: Screening Level Values (70th Percentile) Based on STORET Data from 1970 to 1987

	Biological Oxygen Demand (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
Streams	2.0	1.6	0.22
Lakes	2.9	1.7	0.11
Estuaries	2.1	1.0	0.19

Source: Friedemann, F., and J. Hand. July 1989. *Typical Water Quality Values for Florida's Lakes, Streams and Estuaries.*

Table 4.4 provides the median values for water segments where there is a sufficient number of DO exceedances to place the water on the Verified List. If a water has a sufficient number of exceedances for placement on the Verified List but the median values are less than the screening levels, the DO for that segment is included on the Planning List.

Additionally, to place a water segment on the Verified List for nutrients, the Department must identify the limiting nutrient or nutrients on the Verified List, as required by the IWR. The following method is used to identify the limiting nutrient(s) in streams and lakes:

4. The ratios of total nitrogen to total phosphorus are calculated for each paired value of total nitrogen and total phosphorus (per sampling event) collected during the verified period.
5. The individual ratios over the entire verified period are evaluated to determine the limiting nutrient(s). If all the sampling event ratios are less than 10, nitrogen is identified as the limiting nutrient, and if all the ratios are greater than 30, phosphorus is identified as the limiting nutrient. Both nitrogen and phosphorus are identified as limiting nutrients if the ratios are between 10 and 30.

Table 4.4: Charlotte Harbor Basin Median Values for the Verified Period

WBID	Waterbody Segment	Waterbody Type	Biological Oxygen Demand 5 Day (mg/L)	Total Nitrogen(mg/L)	Total Phosphorus (mg/L)
2063	N. Fork Alligator Creek	Stream	4.6	1.03	0.11
2067	Oyster Creek	Estuary	2.65	0.647	0.091
2068	Buck Creek	Estuary	4.5	1.11	0.07
2073	Mangrove Point Canal	Estuary	ND	1.04	0.15

a—Value is higher than the screening level value.
b—Represents ammonia median.

Table 4.5 displays the nitrogen and phosphorus ratios for stream and lake segments potentially impaired by nutrients.

Table 4.5: Charlotte Harbor Basin Nitrogen to Phosphorus Ratios for the Verified Period

WBID	Waterbody Segment	Waterbody Type	Total Nitrogen Median (mg/L)	Total Phosphorus Median (mg/L)	Nitrogen to Phosphorus Ratio Median	Nitrogen to Phosphorus Ratio Minimum	Nitrogen to Phosphorus Ratio Maximum
1083A	Lemon Bay	Estuary	0.62	0.22	2.67	0.36	103.64
2078B	Coral Creek E. Branch	Estuary	0.71	0.043	16.87	11.04	32.12
2092F	Sanibel Island	Lake	1.67	0.07	28.28	0.75	177.27

Adoption Process for the Verified List of Impaired Waters

The Verified List must be submitted in a specific format (Section 62-303.710, F.A.C.) before being approved by order of the Department's Secretary. The list must specify the pollutant and concentration causing the impairment. If a waterbody segment is listed based on water quality criteria exceedances, then the list must provide the applicable criteria. However, if the listing is based on narrative or biological criteria, or impairment of other designated uses, and the water quality criteria are met, the Verified List is required to specify the concentration of the pollutant relative to the water quality criteria and explain why the numeric criterion is not adequate.

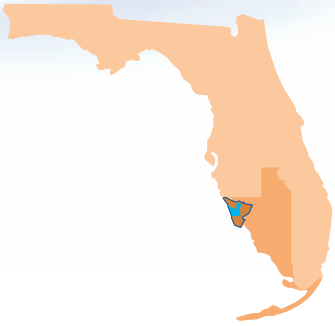
For waters with exceedances of the DO criteria, the Department must identify the pollutants causing or contributing to the exceedances and list both the pollutant and DO in the Verified List.

For waters impaired by nutrients, the Department is required to identify whether nitrogen or phosphorus, or both, are the limiting nutrients, and specify the limiting nutrient(s) in the Verified List.

The Verified List must also include the priority and schedule for TMDL development established for a waterbody segment and note any waters that are being removed from the current Planning List. In future watershed management cycles, the list must also note waters that are being removed from any previous Verified List for the basin.

Chapter 5: TMDL Development, Allocation, Implementation, and Monitoring Priorities

Prioritization of Listed Waters



Following the identification of impaired waters on the Verified List, the Florida Department of Environmental Protection (Department) determines priorities for developing Total Maximum Daily Loads (TMDL) in Phase 3 of the watershed management cycle. When TMDLs are established, general allocations of pollutant load reductions are identified, at least to the level of point and nonpoint source categories.

Because TMDLs cannot be developed for all listed waters during a single watershed management cycle, waterbodies will be prioritized using the criteria in the Impaired Surface Waters Rule (IWR) (Section 62-303.500, Florida Administrative Code [F.A.C.]). The rule states that when establishing the TMDL development schedule for waters on the Verified List, the Department will prioritize impaired waterbody segments according to the severity of the impairment and each waterbody's designated uses, taking into account the most serious water quality problems, most valuable and threatened resources, and risk to human health and aquatic life.

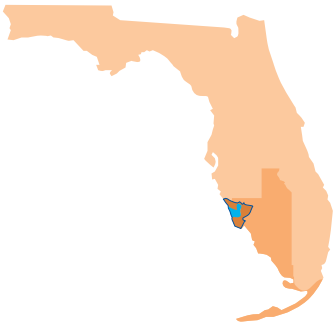
Under the IWR, the determination of high-, low-, and medium-priority waters is based on the following criteria.

High-priority waters:

- Waterbody segments where the impairment poses a threat to potable water supplies or human health;
- Waterbody segments where the impairment is due to a pollutant regulated by the Clean Water Act and the pollutant has contributed to the decline or extirpation of a federally listed threatened or endangered species, as indicated in the Federal Register listing the species; or
- Waterbody segments verified as impaired that are included on the U.S. Environmental Protection Agency's (EPA) 1998 303(d) list as high priority.

Low-priority waters:

- Waterbody segments that are listed before 2010 because of fish consumption advisories for mercury (due to the current insufficient understanding of how mercury cycles in the environment);



- Human-made canals, urban drainage ditches, and other artificial waterbody segments that are listed only due to exceedances of dissolved oxygen (DO) criteria; or
- Waterbody segments that were not on the Planning List but were identified as impaired during Phase 2 of the watershed management cycle and were included on the Verified List, unless the segment meets the second high-priority criterion.
- The EPA has also proposed assigning to this category the list of additional waterbody segments that the agency developed using its own evaluation methodology, until the Department has had the opportunity to investigate these waterbodies further.

All segments not designated high or low priority are medium priority, and are prioritized based on the following factors:

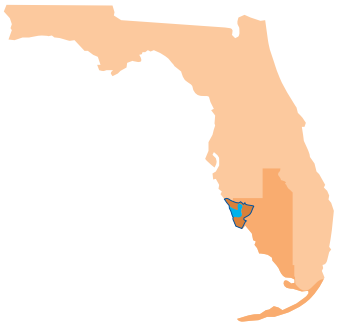
- The presence of Outstanding Florida Waters (OFW);
- The presence of waterbody segments that fail to meet more than one designated use, i.e., aquatic life, primary contact and recreation, fish and shellfish consumption, and drinking water and protection of human health;
- The presence of waterbody segments that exceed an applicable water quality criterion or alternative threshold with a frequency of greater than 25 percent at a minimum confidence level of 90 percent;
- The presence of waterbody segments that exceed more than one applicable water quality criterion; or
- Administrative needs of the TMDL program, including meeting a TMDL development schedule agreed to with the EPA, basin priorities related to the Department's watershed management approach, and the number of administratively continued permits in the basin.

The Department is adhering to the TMDL schedule established in the Consent Decree between the EPA and Earthjustice for waters on the 1998 303(d) list that are also identified as impaired under the IWR.

Total Maximum Daily Load Development

During Phase 3 of the watershed management cycle, TMDLs will be developed for both point and nonpoint sources of pollutants in impaired waterbodies and will be adopted by rule at the end of this phase.

TMDL development involves determining the maximum amount of a given pollutant that a waterbody can assimilate and still meet the applicable numeric or narrative water quality criterion for the pollutant. In most cases, this "assimilative" capacity will be determined using computer modeling (both hydrodynamic and water quality models) that predicts the fate and transport of pollutants in the receiving waters. Modeling for the typical



TMDL will include model setup, calibration, and verification, followed by a variety of model runs that determine the assimilative capacity of the water under worst-case conditions.

State law and federal regulations require that TMDLs include a margin of safety (MOS) that takes into account "any lack of knowledge concerning the relationship between effluent limitations and water quality." The EPA has allowed states to establish either a specific MOS (typically some percentage of the assimilative capacity) or an implicit MOS based on conservative assumptions in the modeling. To date, the Department has elected to establish an implicit MOS based on predictive model runs that incorporate a variety of conservative assumptions (they examine worst-case ambient flow conditions and worst-case temperature, and assume that all permitted point sources discharge at their maximum permitted amount).

It is important to note that TMDLs will be developed only for the actual pollutants causing the impairment in the listed waterbody. These are called the "pollutants of concern." In Florida, the most commonly listed pollutants of concern are nutrients, sediments, and coliforms. TMDLs will not be developed for impairments that are not due to pollutant discharges—for example, natural conditions, physical alterations such as dams and channelization, or changes in the flow of the water. In other cases, a waterbody may be deemed potentially impaired based on bioassessment data or toxicity data. In these cases, the Department must determine the actual pollutant causing the impairment before a TMDL can be developed.

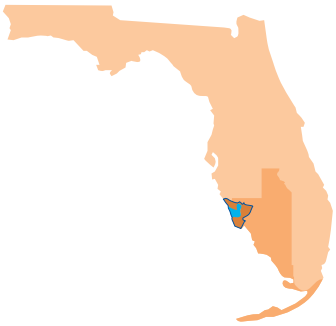
Total Maximum Daily Load Allocation and Implementation

Initial Allocation of Pollutant Loadings

The Florida Watershed Restoration Act (FWRA) requires that a TMDL include the "establishment of reasonable and equitable allocations . . . among point and nonpoint sources . . . ." The Department refers to this as the "initial allocation," which is adopted by rule. For the purposes of allocating the required pollutant loadings, the term "point sources" primarily includes traditional sources such as domestic and industrial wastewater discharges.

Recent EPA guidance requires states to include as point sources those stormwater systems that are covered by a National Pollutant Discharge Elimination System (NPDES) stormwater permit. However, NPDES-permitted stormwater discharges are not subject to the same types of effluent limitations, cannot be centrally collected and treated, and typically have not invested in treatment controls to the same degree as traditional point sources. Nonpoint sources include intermittent, rainfall-driven, diffuse sources of pollutants associated with everyday human activities, including runoff from urban land uses, agriculture, silviculture, and mining; discharges from failing septic systems; and atmospheric deposition.

These point and nonpoint definitions do not directly relate to whether a source is regulated. Some nonpoint sources such as stormwater systems are permitted under the regulatory programs of the Department or water



management districts, while others, such as agricultural stormwater discharges, are not. This distinction is important because the implementation of the allocations to nonpoint sources outside the authority of regulatory programs will require cooperation from dischargers to implement best management practices (BMPs) voluntarily.

While a "detailed allocation" will ultimately be necessary to implement a TMDL fully, a key goal of the initial allocation is to assign responsibility for pollutant load reductions between point and nonpoint sources. For point sources, allocations will be implemented through the Department's NPDES wastewater and stormwater permitting programs. The implementation of nonpoint source load reductions will be done through a combination of regulatory and nonregulatory processes.

Initial allocations of pollutant loadings will also be made to historical sources (e.g., the phosphorus-laden sediments at the bottom of a lake) and upstream sources (those entering into an impaired waterbody). Upstream sources include sources outside Florida, and these sources will receive reduced allocations similar to in-state sources.

The FWRA provided direction for the allocation of TMDLs and directed the Department to provide guidance on the allocation process by establishing an Allocation Technical Advisory Committee (ATAC), consisting of representatives of key stakeholder groups. The committee's report recommended a three-step process for developing initial allocations and addressed detailed allocations for nonpoint sources, stakeholder involvement, the use of BMPs, and other TMDL implementation issues (Department, 2001). A copy of the ATAC report can be found at http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf.

Implementation Programs and Approaches

The FWRA designates the Department as the lead agency in coordinating the implementation of TMDLs. Existing programs and approaches through which TMDLs may be carried out include the following:

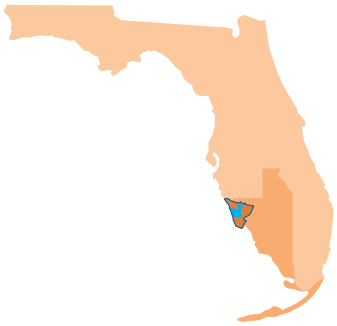
1. Permitting and other existing regulatory programs, such as NPDES permits, domestic and industrial wastewater permits, and stormwater/environmental resource permits;

   The municipal NPDES stormwater permittees in the Charlotte Harbor Basin are Florida Water Services Burnt Store RO; Gasparilla Island Water Association; Aquasource Utility, Inc., formerly Rotonda West Utility; Cape Coral Reverse Osmosis Wastewater Treatment Plant; and Island Water Association, Sanibel Island.

2. Local land development codes;

3. Nonregulatory and incentive-based programs, including BMPs, cost sharing, waste minimization, pollution prevention, new approaches to land use design and development, and public education;

4. Basin Management Action Plans (B-MAP) developed under the FWRA;



5. Other water quality management and restoration activities, for example, Surface Water Improvement and Management plans approved under Section 373.456, Florida Statutes;
6. Pollutant trading or other equitable economically based agreements;
7. Public works, including capital facilities; or
8. Land acquisition.

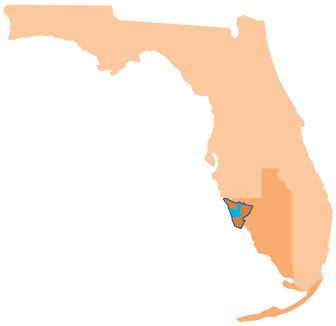
These programs and approaches will be carried out at local, regional, state, and possibly federal levels. TMDL implementation will require extensive stakeholder involvement throughout the state, and, in some cases, between Florida and other states. **Appendix A** provides additional details on the implementation programs and approaches listed here.

Development of Basin Management Action Plans

The FWRA authorizes the Department to develop B-MAPs for implementing TMDLs. These plans will be developed with extensive stakeholder input to build consensus on detailed allocations based on the initial general allocations to categories of discharges.

The B-MAPs would contain final allocations, strategies for meeting the allocations, schedules for implementation, funding mechanisms, applicable local ordinances, and other elements. In cases where stakeholder consensus could not be reached on detailed allocations and/or a B-MAP within a reasonable time, the Department would develop the allocations.

Once a B-MAP is developed, the Department will make it available for public review and comment. Guidance for the content and format of the B-MAPs is being developed; the plans are likely to include a description of both regulatory and nonregulatory approaches to meeting specific TMDLs.



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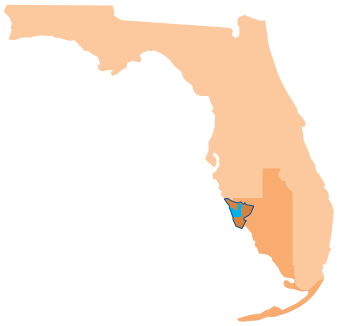

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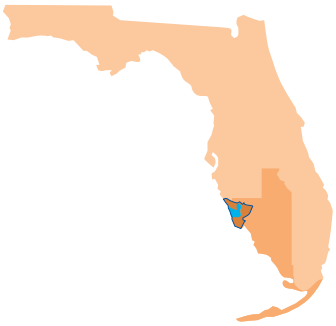

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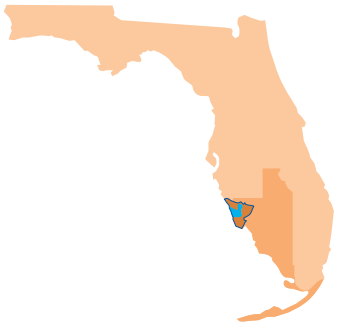

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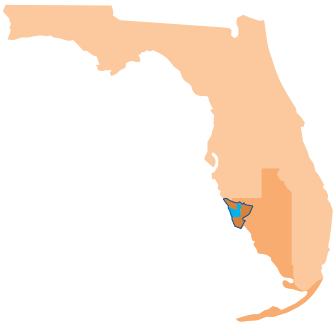

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Charlotte Harbor Appendices

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Appendix A: Legislative and Regulatory Background on the Watershed Management Approach and the Implementation of TMDLs

Federal and State Legislation on Surface Water Quality and TMDLs

Clean Water Act

Congress enacted the Clean Water Act in 1972 with the goal of restoring and maintaining the "chemical, physical, and biological integrity of the nation's waters" (33 U.S.C. § 1251[a]). The ultimate goal of the act is to eliminate the "discharge of [all] pollutants into navigable waters" (33 U.S.C. § 1251[a][1]).

Section 305(b) of the Clean Water Act requires states to report biennially to the U.S. Environmental Protection Agency (EPA) on their water quality. The 305(b) assessment report provides information on the physical, chemical, biological, and cultural features of each river basin in Florida. This initial assessment provides a common factual basis for identifying information sources and major issues, and for determining the future changes, strategies, and actions needed to preserve, protect, and/or restore water quality. Understanding the physical framework of each basin allows the development of a science-based methodology for assessing water quality and an accurate picture of the waters that are most impaired or vulnerable to contamination.

Section 303(d) of the Clean Water Act requires states to submit to the EPA lists of surface waters that do not meet applicable water quality standards and establish total maximum daily loads (TMDLs) for each of these waters on a schedule. A pollution limit is then allocated to each pollutant source in an individual river basin.

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and meet all of its designated uses (see **Noteworthy** on Florida's surface water quality classifications for a listing of these classifications). A waterbody that does not meet its designated use is defined as *impaired*.

NOTEWORTHY: FLORIDA'S SURFACE WATER QUALITY CLASSIFICATIONS

Florida's water quality standards program, the foundation of the state's program of water quality management, designates the "present and future most beneficial uses" of the waters of the state (Subsection 403.061[10], F.S.). Water quality criteria, expressed as numeric or narrative limits for specific parameters, describe the water quality necessary to maintain these uses for surface water and ground water. Florida's surface water is protected for five designated use classifications, as follows:

Class I	***Potable water supplies***
Class II	***Shellfish propagation or harvesting***
Class III	***Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife***
Class IV	***Agricultural water supplies***
Class V	***Navigation, utility, and industrial use (there are no state waters currently in this class)***

Florida Watershed Restoration Act

In 1998, the EPA settled a lawsuit with the environmental group Earthjustice over Florida's TMDL Program. The Consent Decree resulting from the lawsuit requires all TMDLs on the state's 1998 Section 303(d) list of impaired waters to be developed in thirteen years. If the state fails to develop the TMDLs, the EPA is required to do so.

In response to concerns about the TMDL lawsuit and in recognition of the important role that TMDLs play in restoring state waters, the 1999 Florida legislature enacted the Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida). The act clarified the Department's statutory authority to establish TMDLs, required the Department to develop a methodology for identifying impaired waters, specified that the Department could develop TMDLs only for waters on a future state list of impaired waters developed using this new methodology, and directed the Department to establish an Allocation Technical Advisory Committee to address the allocation process for TMDLs. The act also declared Lake Okeechobee impaired and, as required under the TMDL Consent Decree, allowed the state to develop a TMDL for the lake (see **Noteworthy** for a description of the legislation's major provisions).

NOTEWORTHY: THE FLORIDA WATERSHED RESTORATION ACT

The Florida Watershed Restoration Act contains the following major provisions:

- *Establishes that the 303(d) list submitted to the EPA in 1998 is for planning purposes only.*
- *Requires the Department to adopt 303(d) listing criteria (that is, the methodology used to define impaired waters) by rule.*
- *Requires the Department to verify impairment and then establish a Verified List for each basin. The Department must also evaluate whether proposed pollution control programs are sufficient to meet water quality standards, list the specific pollutant(s) and concentration(s) causing impairment, and adopt the basin-specific 303(d) list by Secretarial Order.*
- *Requires the Department's Secretary to adopt TMDL allocations by rule. The legislation requires the Department to establish "reasonable and equitable" allocations of TMDLs, but does not mandate how allocations will be made among individual sources.*
- *Requires that TMDL allocations consider existing treatment levels and management practices; the differing impacts that pollutant sources may have; the availability of treatment technologies, best management practices (BMPs), or other pollutant reduction measures; the feasibility, costs, and benefits of achieving the allocation; reasonable time frames for implementation; the potential applicability of moderating provisions; and the extent that nonattainment is caused by pollutants from outside Florida, discharges that have ceased, or alteration to a waterbody.*
- *Required a report to the legislature by February 2001 addressing the allocation process.*
- *Authorizes the Department to develop basin plans to implement TMDLs, coordinating with the water management districts, the Florida Department of Agriculture and Consumer Services (FDACS), the Soil and Water Conservation Districts, regulated parties, and environmental*

groups in assessing waterbodies for impairment, collecting data for TMDLs, developing TMDLs, and conducting at least one public meeting in the watershed. Implementation is voluntary if not covered by regulatory programs.

- *Authorizes the Department and FDACS to develop interim measures and BMPs to address nonpoint sources. While BMPs would be adopted by rule, they will be voluntary if not covered by regulatory programs. If they are adopted by rule and the Department verifies their effectiveness, then implementation will provide a presumption of compliance with water quality standards.*
- *Directs the Department to document the effectiveness of the combined regulatory/voluntary approach and report to the legislature by January 1, 2005. The report will include participation rates and recommendations for statutory changes.*

Determining Impairment Based on the State's Impaired Surface Waters Rule

Section 303(d) of the federal Clean Water Act and the Florida Watershed Restoration Act describe impaired waters as those waterbodies or waterbody segments that do not meet applicable water quality standards. "Impairment" is a broad term that includes designated uses, water quality criteria, the Florida antidegradation policy, and moderating provisions (see **Noteworthy** for explanations of these terms).

The state's Identification of Impaired Surface Waters Rule (Rule 62-303, F.A.C.) was developed in cooperation with a Technical Advisory Committee and adopted by the Florida Environmental Regulation Commission on April 26, 2001. It provides a science-based methodology for evaluating water quality data in order to identify impaired waters, and it establishes specific criteria for impairment based on chemical parameters, the interpretation of narrative nutrient criteria, biological impairment, fish consumption advisories, and ecological impairment. The rule is available at http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf.

The Impaired Surface Waters Rule also establishes thresholds for data sufficiency and data quality, including the minimum sample size required and the number of exceedances of the applicable water quality standard for a given sample size that identify a waterbody as impaired. The number of exceedances is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. **Waters that are identified as impaired through the Impaired Surface Waters Rule are prioritized for TMDL development and implementation**.

NOTEWORTHY: EXPLANATION OF TERMS

- ***Designated uses,*** *discussed in an earlier sidebar, comprise the five classifications applied to each of the state's surface waterbodies.*
- ***Water quality criteria*** *comprise numeric or narrative limits of pollutants.*
- ***The Florida Antidegradation Policy*** *(Sections 62-302.300 and 62-4.242, F.A.C.) recognizes that pollution that causes or contributes to new violations of water quality standards or to the continuation of existing violations is harmful to the waters of the state. Under this policy, the permitting of new or previously unpermitted existing discharges is prohibited where the*

*discharge is expected to reduce the quality of a receiving water below the **classification** established for it. Any lowering of water quality caused by a new or expanded discharge to surface waters must be in the public interest (that is, the benefits of the discharge to public health, safety, and welfare must outweigh any adverse impacts on fish and wildlife or recreation). Further, the permittee must demonstrate that other disposal alternatives (for example, reuse) or pollution prevention are not economically and technologically reasonable alternatives to the surface water discharge.*

- ***Moderating provisions** (provided in Subsections 62-302.300[10], Rules 62-4 and 62-6, F.A.C., and described in Sections 62-302.300, 62-4.244, 62-302.800, 62-4.243, F.A.C., and Sections 403.201 and 373.414, F.S.) include mixing zones, zones of discharge, site-specific alternative criteria, exemptions, and variances. These provisions are intended to moderate the **applicability** of water quality standards where it has been determined that, under certain special circumstances, the social, economic, and environmental costs of such **applicability** outweigh the benefits.*

Determining impairment in individual waterbodies takes place in two phases. First, in each river basin the Department evaluates the existing water quality data, using the methodology prescribed in the Impaired Surface Waters Rule, to determine whether waters are potentially impaired. Waters found to be potentially impaired are included on a *Planning List* for further assessment under Subsections 403.067(2) and (3), F.S. As required by Subsection 403.067(2), F.S., the Planning List is not used to administer or implement any regulatory program. It is submitted to the EPA for informational purposes only.

The second step is to assess waters on the Planning List under Subsection 403.067(3), F.S., as part of the Department's watershed management approach (described in the following section). The Department carries out additional data gathering and strategic monitoring, focusing on these potentially impaired waters, and determines—using the methodology in Part III, Section 62-303.400, F.A.C.—if a waterbody is, in fact, impaired and if the impairment is caused by pollutant discharges.

An Assessment Report is produced containing the results of this updated evaluation and a *Verified List* of impaired waters. The criteria for the Verified List are more stringent than those for the Planning List. The Department is required to develop TMDLs for waters on the Verified List under Subsection 403.067(4), F.S. A watershed management plan (called a Basin Management Action Plan) to reduce the amount of pollutants that cause impairments must also be produced and implemented.

The Verified List is adopted by Secretarial Order in accordance with the Florida Watershed Restoration Act. Once adopted, the list is submitted to the EPA for approval as the state's Section 303(d) list of impaired waters for the basin.

Implementing TMDLs

The Watershed Management Approach

The Department's statewide approach to water resource management, called the watershed management approach, is the framework for implementing TMDLs as required by the federal and state governments. The approach does not focus on individual causes

of pollution. Instead, each basin is assessed as an entire functioning system, and aquatic resources are evaluated from a basinwide perspective that considers the cumulative effects of human activities. Water resources are managed on the basis of natural boundaries, such as river basins, rather than political or regulatory boundaries. Federal, state, regional, tribal, and local governments identify watersheds not meeting clean water or other natural resource goals and work cooperatively to focus resources and implement effective strategies to restore water quality. Extensive public participation in the decision-making process is crucial.

The watershed management approach is not new, nor does it compete with or replace existing programs. Rather than relying on single solutions to water resource issues, it is intended to improve the health of surface water and ground water resources by strengthening coordination among such activities as monitoring, stormwater management, wastewater treatment, wetland restoration, land acquisition, and public involvement.

By promoting the management of entire natural systems and addressing the cumulative effects of human activities on a watershed basis, this approach is intended to protect and enhance the ecological structure, function, and integrity of Florida's watersheds. It provides a framework for setting priorities and focusing the Department's resources on protecting and restoring water quality, and aims to increase cooperation among state, regional, local, and federal interests. By emphasizing public involvement, the approach encourages stewardship by all Floridians to preserve water resources for future generations.

The watershed approach is intended to speed up projects by focusing funding and other resources on priority water quality problems, strengthening public support, establishing agreements, and funding multiagency projects. It avoids duplication by building on existing assessments and restoration activities and promotes cooperative monitoring programs. It encourages accountability for achieving water quality improvements through improved monitoring and the establishment of TMDLs.

The Watershed Management Cycle

As part of the Department's watershed management approach, TMDLs will be developed, and the corresponding pollutant loadings allocated, as part of a watershed management cycle that rotates through the state's fifty-two river basins over a nine-year period. The cycle's five phases are as follows:

- ***Phase 1: Preliminary Watershed Evaluation.*** For each river basin, a **Basin Status Report** is developed, containing a *Planning List* of potentially impaired waters that may require the establishment of TMDLs. The report characterizes each basin's hydrologic, ecological, and socioeconomic setting as well as historical, current, and proposed watershed management issues and activities. It also contains a preliminary evaluation of major water quality parameters, water quality issues by planning unit, an evaluation of ecological resources, and basinwide pollutant loading trends related to land uses. At the end of Phase 1, a **Strategic Monitoring Plan** is developed.

- ***Phase 2: Strategic Monitoring and Assessment.*** Additional data are collected through strategic monitoring and uploaded to STORET. The data are used to verify whether potentially impaired waters in each basin are impaired and to calibrate and verify models for TMDL development. At the end of Phase 2, an **Assessment Report** is produced for each basin that contains a Verified List of impaired waters. The report also provides an updated and more thorough evaluation of water quality, associated biological resources, and current management plans. The Department will adopt the *Verified List* through a Secretarial Order and submit it to the EPA as the state's Section 303(d) list of impaired waters.

- ***Phase 3: Development and Adoption of TMDLs.*** TMDLs for priority impaired waters in the basin will be developed and adopted by rule. Because TMDLs cannot be developed for all listed waters during a single watershed management cycle due to fiscal and technical limitations, waterbodies will be prioritized using the criteria in the Identification of Impaired Surface Waters Rule (Rule 62-303, F.A.C.).

- ***Phase 4: Development of a Basin Management Action Plan (B-MAP).*** A B-MAP will be developed for each basin to specify how pollutant loadings from point and nonpoint sources will be allocated and reduced in order to meet TMDL requirements. The plans will include regulatory and nonregulatory (i.e., voluntary) and structural and nonstructural strategies, and existing management plans will be used where feasible. The involvement and support of affected stakeholders in this phase will be especially critical.

- ***Phase 5: Implementation of a Basin Management Action Plan.*** Implementation of the activities specified in the B-MAP will begin. This includes carrying out rule development as needed, securing funding, informing stakeholders and the public, and monitoring and evaluating the implementation of the plan.

To implement the watershed cycle, the state's river basins have been divided into five groups within each of the Department's six districts statewide, and each district will assess one basin each year. **Table A.1** shows the basin groups for implementing the cycle in the Department's districts, and **Figure A.1** shows these groups and the rotating cycle in the districts. **Table A.2,** which lists the basin rotation schedule for TMDL development and implementation, shows that it will take nine years to complete one full cycle of the state.

The watershed management cycle is an iterative, or repeated, process. One of its key components is that the effectiveness of management activities (TMDL implementation) will be monitored in successive cycles. Monitoring conducted in Phase 2 of subsequent

cycles will be targeted at evaluating whether water quality objectives are being met and whether individual waters are no longer impaired. The Department also will track the implementation of scheduled restoration activities, whether required or voluntary, to ensure continued progress towards meeting the TMDLs.

Table A.1: Basin Groups for Implementing the Watershed Management Cycle, by Department District Office

District	Group 1 Basins	Group 2 Basins	Group 3 Basins	Group 4 Basins	Group 5 Basins
Northwest	Ochlockonee–St. Marks Rivers	Apalachicola–Chipola Rivers	Choctawhatchee River and Bay and St. Andrews Bay	Pensacola Bay	Perdido River and Bay
Northeast	Suwannee River	Lower St. Johns River		St. Marys–Nassau Rivers	Upper East Coast
Central	Ocklawaha River	Middle St. Johns River	Upper St. Johns River	Kissimmee River	Indian River Lagoon
Southwest	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay and Peace–Myakka Rivers	Withlacoochee River	Springs Coast
South	Everglades West Coast	Charlotte Harbor	Caloosahatchee River	Fisheating Creek	Florida Keys
Southeast	Lake Okeechobee	St.Lucie–Loxahatchee Rivers	Lake Worth Lagoon/Palm Beach Coast	Southeast Coast Biscayne Bay	Everglades

Table A.2: Basin Rotation Schedule for TMDL Development and Implementation

Phased Approach: *9 years to complete one full cycle of state*

Year/ Group	2000	2001	2002	2003	2004	2005	2006	2007	2008
Group 1	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2	Phase 3	Phase 4
Group 2		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2	Phase 3
Group 3			Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2
Group 4				Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1
Group 5					Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
	1	2	3	4	5	6	7	8	9

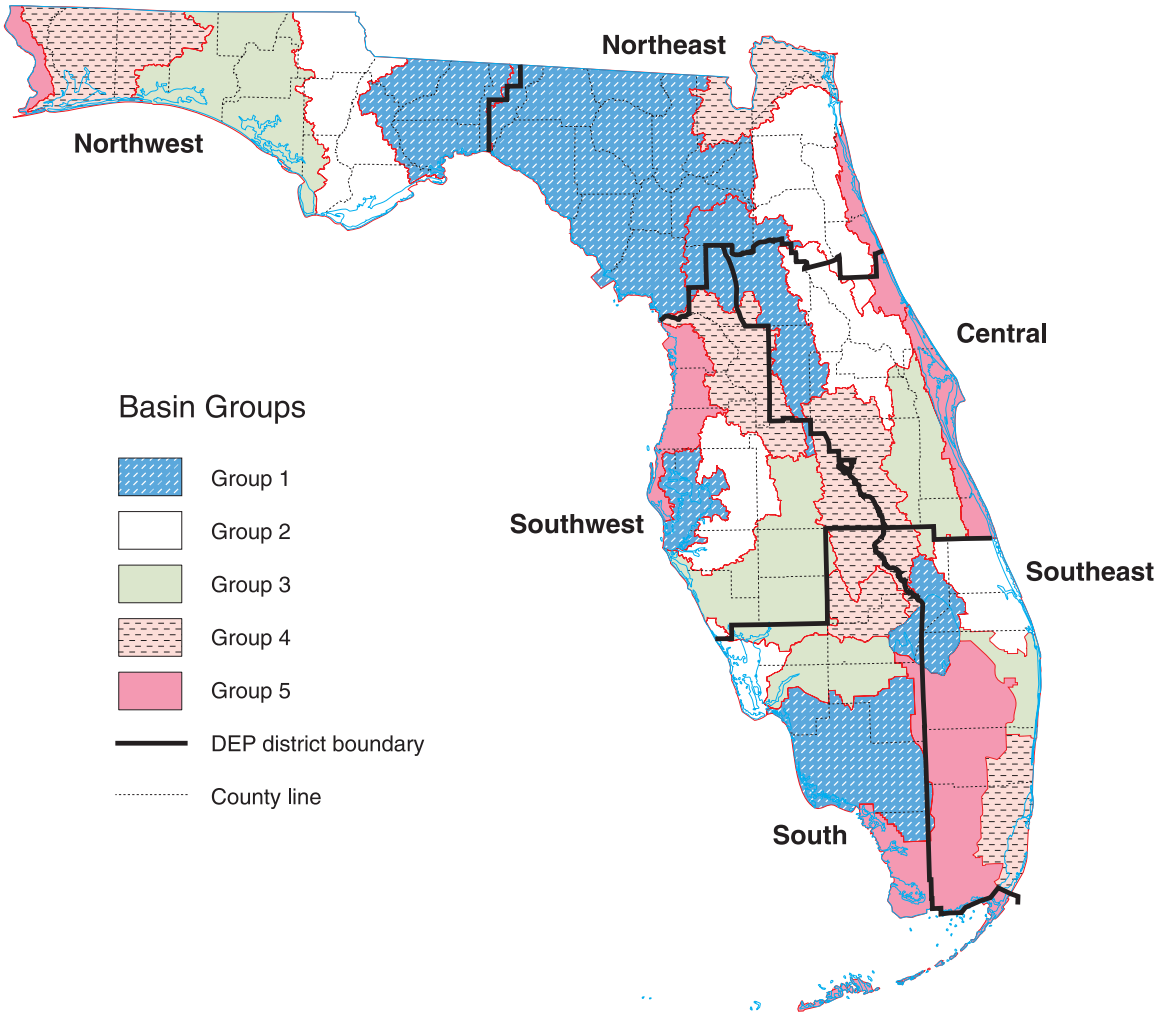

Figure A.1: Five-Year Rotating Basin Cycle in the Department's Six Districts

Pollutants can enter a waterbody through point source discharges (generally from a specific facility) or nonpoint discharges (e.g., stormwater runoff, septic tanks). Government agencies, businesses, organizations, and individuals who contribute to these discharges will be asked to share the responsibility of attaining TMDLs through load allocations (the amount of a specified pollutant allotted for discharge) that are based on an established TMDL. **Table A.3** summarizes these potentially affected stakeholders, and the actions they may be asked to take to help achieve a TMDL.

Table A.3: Potentially Affected Stakeholders and Actions To Achieve TMDLs

Potentially Affected Stakeholders	Actions To Achieve TMDL
Municipal stormwater/wastewater programs	Reduce and treat urban stormwater runoff through stormwater retrofits, replacement of septic tanks
Commercial developers, homebuilders, individual homeowners	Improve development design and construction, enhance best management practices, replace septic tanks
Municipal and industrial wastewater treatment facilities, National Pollutant Discharge Elimination System (NPDES) permitted facilities	Reduce pollutant loadings from permitted discharges
Farming and silviculture operations	Reduce and treat runoff through best management practices
Federal, regional, state agencies; regional and local water quality coalitions	Carry out waterbody restoration projects

Permitting and Other Approaches

NPDES Permits

All point sources that discharge to surface water bodies require a NPDES permit. These permits can be classified into two types: domestic or industrial wastewater discharge permits, and stormwater permits. NPDES-permitted point sources may be affected by the development and implementation of a TMDL. All NPDES permits include "reopener clauses" that allow the Department to incorporate new discharge limits when a TMDL is established. These new limitations may be incorporated into a permit when a TMDL is implemented or at the next permit renewal, depending on the timing of permit renewal and workload. For NPDES municipal stormwater permits, the department intends to insert the following statement once a B-MAP is completed:

"The permittee shall undertake those activities specified in the (Name of Waterbody) Basin Management Action Plan in accordance with the approved schedule set forth in the B-MAP."

Domestic and Industrial Wastewater Permits

In addition to NPDES-permitted facilities, all of which discharge to surface waters, Florida also regulates domestic and industrial wastewater discharges to ground water via land application. Since ground and surface water are so intimately linked in much of the state, reductions in loadings from these facilities may be needed to meet TMDL limitations for pollutants in surface waters. If such reductions are identified in the B-MAP, they would be implemented through modifications of the existing state permits.

Florida Stormwater/Environmental Resource Permits

Florida was the first state to require the treatment of stormwater from all new development with the implementation of the state's stormwater treatment rule in 1982. Today, except in the area served by the Northwest Florida Water Management District, new development projects receive an environmental resource permit that combines stormwater flood protection, stormwater treatment, and wetland protection/mitigation into a single permit. These permits are designed to obtain 80 percent average annual load reduction of total suspended solids. This level of treatment may need to be increased, depending on the allocation of load reductions, especially for nutrients. For example, the St. Johns River Water Management District recently adopted basin-specific criteria for the Lake Apopka Basin that require the phosphorus loading from new development not to exceed predevelopment phosphorus loading.

Local Land Development Codes

Since structural stormwater treatment practices can only achieve certain levels of load reductions, and because the hydrologic changes accompanying urban development often cause ecological impacts to aquatic systems, local land development codes that promote "low-impact development" are an important component of restoring impaired waters. Local codes may need to be reviewed to determine how to promote developments that minimize impervious surfaces (such as reduced street widths or the use of pervious pavements), promote the protection of vegetation, promote the protection and restoration of riparian buffers along streams and lakes, and adopt the principles of the Florida Yards and Neighborhoods Program in local landscaping codes.

Best Management Practices (BMPs)

Typically, BMPs refer to a practice or combination of practices that, based on sound science and best professional judgment, are determined to be the most effective and practicable means of reducing nonpoint source pollutant discharges and improving water quality. Both economic and technological considerations are included in the evaluation of what is practicable. BMPs may include structural controls (such as retention areas or detention ponds) or nonstructural controls (such as street sweeping or public education). Many BMPs have been developed for urban stormwater to reduce pollutant loadings and peak flows. These BMPs accommodate site-specific conditions, including soil type, slope, depth to groundwater, and the designation of receiving waters.

The passage of the Florida Watershed Restoration Act increased the emphasis on implementing BMPs to reduce nonpoint source pollutant discharges from agricultural operations. Recognizing that the development and adoption of BMPs might take several years, the legislature authorized the use of Interim Measures (IMs) during the BMP development process for agricultural operations. In essence, IMs are a set of logical conservation practices designed to reduce agricultural nonpoint pollutant discharges based on current knowledge and best professional judgment. These practices will evolve into more formal BMPs as better scientific data on their effectiveness is obtained.

Once the Florida Department of Agriculture and Consumer Services adopts BMPs, the Department is charged with verifying their effectiveness in reducing agricultural nonpoint sources. Once verified, agricultural operations that have implemented BMPs will receive a waiver of liability and presumption of compliance similar to that granted a developer who obtains an environmental resource permit.

Other Strategies

The success of implementing nonpoint source TMDL load allocations will require variety, creativity, and stakeholder commitment to watershed management and personal stewardship. In addition to BMPs, other possible strategies for meeting TMDLs, restoring water quality, and preventing the further degradation of Florida's watersheds include cost sharing, waste minimization, pollution prevention, new approaches to land use design and development, and pollutant trading. The Department will assemble a Technical Advisory Committee to help develop a pollutant-trading rule, which must be reviewed by the legislature prior to its adoption. The Department will also continue to work with local stakeholders on TMDL allocation issues and implementation plans.

Sources of Information

For additional information on the Department's Watershed Management Program and TMDLs, please contact the following basin coordinators:

- Southwest Florida and the Greater Everglades, Pat Fricano (850) 245-8559
- Southeast Florida, Daniel Apt (305) 795-3486
- Northwest and Central Florida, Mary Paulic (850) 245-8560
- Northeast Florida and Suwannee Basin, John Abendroth (850) 245-8557
- West Central Florida and Tampa Bay Region, Tom Singleton (850) 245-8561

For information on establishing and implementing TMDLs, contact Jan Mandrup-Poulsen at (850) 245-8448. Additional information is available on the Department's Web site at www.dep.state.fl.us/water/watersheds/index.htm.

Appendix B: Supplementary Ecological Information in the Charlotte Harbor Basin

The Charlotte Harbor Basin lies completely within the Southwestern Florida Flatwoods subregion of the Southern Coastal Plain Ecoregion. Ecoregions are regions of relative ecological homogeneity for factors such as climate, physiography, geology, soils, and vegetation. The Southwestern Florida Flatwoods subregion is characterized by pine flatwoods, extensive areas of pasture and rangeland, cabbage palm hammocks, and marshes. These natural communities support diverse animal and plant life. **Table B.1** describes the acreage and types of natural communities in the basin, and **Table B.2** lists imperiled animal species in the Charlotte Harbor National Estuary Program study area.

Table B.1: Types of Natural Communities in the Charlotte Harbor Basin

Category	Community Type	Area in Acres	Percent of Total Area	Characteristics
Upland				
1	Coastal strand	493.6	0.11	Occurs on well drained sandy coastlines and includes typically zoned vegetation of upper beach, nearby dunes, or coastal rock formations.
2	Dry prairie	26,864.7	6.30	Large treeless grasslands and shrublands on very flat terrain interspersed with scattered cypress domes, cypress strands, isolated freshwater marshes, and hammocks.
3	Pinelands	47,797.4	11.20	Includes north and south Florida pine flatwoods, south Florida pine rocklands, scrubby flatwoods, and commercial pine plantations. Cypress domes, bayheads, titi swamps, and freshwater marshes are commonly interspersed in isolated depressions.
6	Oak scrub	224.4	0.05	Hardwood community consisting of clumps of low-growing oaks interspersed with white sand. Occurs in areas of deep, well-washed sterile sand.
7	Mixed hardwood pine	1,441.6	0.34	Southern extension of the Piedmont southern mixed hardwoods, occurring mainly on clay soils of the northern Panhandle. Also includes upland forests in which a mixture of conifers and hardwoods dominate overstory.
8	Hardwood hammock	7,933.4	1.86	Includes major upland hardwood associations that occur statewide on fairly rich sandy soils.
9	Tropical hammock	3,085.7	0.72	Cold-intolerant hardwood community with very high plant diversity that occurs on coastal uplands in extreme south Florida. Characterized by tropical trees and shrubs at the northern edge of their range, which extends into the Caribbean.
Wetland				
10	Coastal salt marsh	9,135.4	2.14	Herbaceous and shrubby wetland communities that include cordgrass, needlerush, and transitional or high salt marshes, occurring statewide in brackish waters along protected low energy estuarine shorelines.
11	Freshwater marsh	10,353.1	2.43	Wetland communities dominated by wide assortment of herbaceous plant species growing on sand, clay, marl, and organic soils in areas

Category	Community Type	Area in Acres	Percent of Total Area	Characteristics
				where water depths and inundation regimes vary.
12	Cypress swamp	4,251.3	1.00	Regularly inundated communities that form forested buffer along large rivers, creeks, and lakes, or occur in depressions as circular domes or linear strands. Strongly dominated by bald cypress or pond cypress.
13	Hardwood swamp	1,170.6	0.27	Association of wetland adapted trees, composed either of pure stands of hardwoods or hardwood-cypress mixture. Occurs on organic soils and forms forested floodplain of nonalluvial rivers, creeks, and broad lake basins.
15	Shrub swamp	93.2	0.02	Dominated by low-growing, woody shrubs or small trees, usually found in wetlands changed by natural or human perturbations such as altered hydroperiod, fire, clear-cutting or land clearing, and siltation.
16	Mangrove swamp	36,908.5	8.65	Dense, brackish water swamps, usually dominated by red, black, and white mangroves, that occur along low-energy shorelines and in protected, tidally influenced bays of southern Florida. Comprises freeze-intolerant tree species that are distributed south of a line from Cedar Key on the Gulf coast to St. Augustine on the Atlantic coast.
Open water				
18	Water	177,053.9	41.51	Open water areas of inland lakes, ponds, rivers, and streams and brackish and saline waters of estuaries, bays, and tidal creeks.
Disturbed				
19	Grass and agricultural land	23,645.9	5.54	Upland communities with very low-growing grasses and forbs. Intensively managed sites such as improved pastures, lawns, golf courses, road shoulders, cemeteries, or weedy fallow agricultural fields.
20	Shrub and brush	8,749.4	2.05	Includes different situations where natural upland communities have recently been disturbed and are recovering through natural successional processes.
21	Exotic plant communities	2,837.8	0.66	Upland and wetland areas dominated by invasive non-native trees that have invaded native plant communities.
22	Barren and Urban land	64,443.9	15.11	Unvegetated areas such as roads, beaches, active strip mines, borrow areas, cleared land on sandy soils, and urban areas (rooftops, parking lots, etc.).
TOTAL		**426,483.1**		

Table B.2: Imperiled Animal Species in the Charlotte Harbor National Estuary Program Study Area

Common Name	Scientific Name	Status
Fish		
Mangrove rivulus	*Rivulus marmoratus*	Special Concern
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Threatened
Amphibians and Reptiles		
American crocodile	*Crocodylus acutus*	Endangered
Atlantic green turtle	*Chelonia mydas mydas*	Endangered
Atlantic hawksibill turtle	*Eretmochelys imbricata*	Endangered
Kemp's ridley turtle	*Lepidochelys kempii*	Endangered
Atlantic leatherback turtle	*Dermochelys coriacea*	Endangered
Atlantic loggerhead turtle	*Caretta caretta caretta*	Threatened
Eastern indigo snake	*Drymarchon corais couperi*	Threatened
Florida gopher frog	*Rana areolata aesopus*	Special Concern
Gopher tortoise	*Gopherus polyphemus*	Special Concern
American alligator	*Alligator mississippiensis*	Special Concern
Birds		
Wood stork	*Myctria americana*	Endangered
Florida Everglades kite	*Rostrhamus sociabilis plumbeus*	Endangered
Peregrine falcon	*Falco peregrinus*	Endangered
Cuban snowy plover	*Charadrius alexandrinus tenuirostris*	Endangered
Kirtland's warbler	*Dendroica kirtlandii*	Endangered
Florida grasshopper sparrow	*Ammodtramussavannarum floridanus*	Endangered
Southern bald eagle	*Haliaeetus leucocephalus leucocephalus*	Threatened
Southeastern American kestrel	*Falco sparverius paulus*	Threatened
Audobon's caracara	*Caracara cheriway auduboni*	Threatened
Florida sandhill crane	*Grus canadensis pratensis*	Threatened
Roseate tern	*Sterna dougallii dougallii*	Threatened
Least tern	*Sterna albifrons*	Threatened
Florida scrub jay	*Aphelocoma coerulescens coerulescens*	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Threatened
Eastern brown pelican	*Pelecanus occidentalis carolinensis*	Special Concern
Little blue heron	*Florida caerulea*	Special Concern
Snowy egret	*Egretta thula*	Special Concern
Tricolored heron	*Hydranassa tricolor*	Special Concern
Reddish egret	*Dichromanassa rufescens*	Special Concern
Roseate spoonbill	*Ajaia ajaja*	Special Concern
Limpkin	*Aramus guarauna pictus*	Special Concern
American oystercatcher	*Haematopus palliatus*	Special Concern
Florida burrowing owl	*Athena cunicularia floridana*	Special Concern
Marian's marsh wren	*Cistothorus palustris marianae*	Special Concern
Cuban yellow warbler	*Dendroica petechia gundlachi*	Special Concern
White ibis	Eudocimus albas	Special Concern
Mammals		
Florida manatee	*Trichechus manatus latirostris*	Endangered
Florida panther	*Felis concolor coryi*	Endangered
Mangrove fox squirrel	*Sciurus niger avicennia*	Threatened
Florida mouse	*Peromyscus floridanus*	Threatened
Florida black bear	*Ursus americanus floridanus*	Threatened
Everglades mink	*Mustela vision-evergladensis*	Threatened
Sherman's fox squirrel	*Sciurus niger shermani*	Special Concern

Source: Charlotte Harbor National Estuary Program, 1998.

Appendix C: Summary of Water Quality Management Activities in the Charlotte Harbor Basin

Plan/Project and Entity	Description	Geographic Area	Status
Alligator Creek Hydrological Restoration Project Florida Department of Environmental Protection/Charlotte Harbor Aquatic and State Buffer Preserves	The project will implement a habitat restoration master plan for a 1,600-acre parcel on state buffer preserve lands that includes designing and permitting about two dozen projects. It is funded by the SWFWMD SWIM Program. Phase I involved the restoration of 20 acres and is now complete. Phase II will involve five projects and 600 acres of land. SWFWMD has earmarked $250,000 to begin this process. It has already selected a consultant to help design, permit, and oversee bid solicitation and construction management.	Charlotte Harbor Aquatic and State Buffer Preserve	Phase I complete; Phase II in progress
Aquatic Preserve Management Maps Florida Department of Environmental Protection/Charlotte Harbor Aquatic and State Buffer Preserves	Resource management base maps are being developed for five of the Aquatic Preserve estuaries in the Charlotte Harbor National Estuary Program (CHNEP) using true color aerial photography provided by the SWFWMD. Using aerial photographs taken for seagrass mapping by SWFWMD in 1995, "wall sized" photo-mosaic maps of Charlotte Harbor/Gasparilla Sound/Cape Haze and Lemon Bay have been developed. Photo-mosaic maps of Pine Island Sound and Matlacha Pass will be developed pending the availability of aerial photography for the Lee County areas of the CHNEP.	Charlotte Harbor, Gasparilla Sound, Cape Haze, Pine Island Sound, and Matlacha Pass	In progress
Cape Coral Stormwater Utility Program/Utility Expansion Plan City of Cape Coral	In 1990, the city of Cape Coral implemented a stormwater utility program. Monies from this program are to be used to improve canal dredging, stormwater pipe repair and replacement, swale and catch basin repair and replacement, water quality monitoring, and public education.	City of Cape Coral	In progress
Charlotte County Environmental Lands Acquisition Advisory Committee (ELAAC) Charlotte County Natural Resources Planning Section	A committee appointed by the county commission was created to identify and evaluate environmentally important lands and recommend which lands the county should attempt to protect through acquisition, leases, easements, and other methods. Members are selected by the organization they represent.	Countywide in Charlotte County	In progress
Charlotte County South Gulf Cove Water Quality Enhancement Charlotte County Public Works	The project will concentrate on improving dissolved oxygen levels in dead-end canals.	South Gulf Cove, Charlotte Harbor	Under review

Plan/Project and Entity	Description	Geographic Area	Status
Charlotte County Advanced On-site Sewage Treatment Program Florida Dept of Health/Charlotte County Health Department	A county ordinance implemented March 1, 1999, requires advanced on-site sewage systems for septic systems within 100 feet of surface water or delineated wetlands, and for high-density lots without surface water nearby. The new ordinance specifies the use of an aerobic treatment unit (ATU) and drainfield. ATUs with drainfields achieve advanced secondary treatment standards. Other combinations of treatment systems that may be used include sand filters and low-pressure irrigation systems.	Unincorporated Charlotte County	Currently in effect
Charlotte County Central Sewer Expansion Charlotte County Utilities	Charlotte County Utilities is currently expanding sanitary sewer service to 3,700 existing properties, 2,300 of which are occupied. The county will continue to identify areas and expand sanitary sewer service when economically feasible.	Charlotte County	In progress
Charlotte County Master Stormwater Plan Charlotte County Public Works	The county will present an organized plan for surface water improvements in Charlotte County.	Charlotte County	Implementa-tion in progress
Charlotte Harbor Buffer Preserve Land Acquisition Florida Department of Environmental Protection/Charlotte Harbor Aquatic and State Buffer Preserves	This land acquisition project will provide a buffer between upland development and open waters of the Charlotte Harbor State Buffer Preserve.	Land around Charlotte Harbor in Lee and Charlotte counties and in Matlacha Pass	In progress
Charlotte Harbor Estuarine Water Quality Monitoring Program Charlotte County, Florida Marine Research Institute (FMRI), and SWFWMD	A joint monitoring project between Charlotte County, FMRI, and SWFMD to collect water from the lower Peace and Myakka Rivers, upper Charlotte Harbor, Gasparilla Sound, and Lemon Bay. FMRI is under contract to do the monitoring for the county and the water management district.	The Charlotte County portions of Lemon Bay, Charlotte Harbor, and Gasparilla Sound	Ongoing
Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN)	Trained volunteers monitor water quality once a month, broadly, at thirty-five to forty sites throughout the CHNEP's Aquatic Preserve Estuaries. On the first Monday of each month at sunrise, approximately seventy-five volunteers sample these fixed sampling sites for nineteen physical, chemical, and biological parameters. The parameters include weather and water surface conditions, water and Secchi depth, water temperature, dissolved oxygen, pH and color, chlorophyll, phosphorus, nitrogen, and fecal coliform bacteria. The monitoring program has an approved quality assurance plan and field procedures manual. Chlorophyll, nutrient, and bacteria samples are analyzed by the Department's South District Laboratory in Punta Gorda.	Lemon Bay, Cape Haze, Gasparilla Sound, Charlotte Harbor, Pine Island Sound, Matlacha Pass, San Carlos Bay, and Estero Bay	Ongoing

Plan/Project and Entity	Description	Geographic Area	Status
Charlotte Harbor Flatwoods Hydrologic Restoration–Zemel Road Southwest Parcel Charlotte County Natural Resources Planning Section	The acquisition of a 330-acre parcel will expand the Flatwoods Conservation Area. The parcel is strategically located to allow for the restoration of historical sheet flow from the Webb Wildlife Management Area (WMA) to Charlotte Harbor. The project area is west of Webb Preserve, south of Alligator Creek, and north of Gator Slough Canal to Charlotte Harbor.	West of Webb WMA, south of Alligator Creek, and north of Gator Slough Canal	Design study grants being reviewed by Southwest Florida and South Florida water management districts
Charlotte Harbor National Estuary Program - Comprehensive Conservation and Management Plan (CCMP) Charlotte Harbor National Estuary Program	The CHNEP is led by a director and a management conference of four committees (Policy, Management, Technical Advisory, and Citizen Advisory) and several technical subcommittees (Water Quality, Habitat Conservation, etc.). The program's goals as laid out in the CCMP are as follows: 1. Improve the environmental integrity of the Charlotte Harbor study area. 2. Preserve, restore, and enhance seagrass beds, coastal wetlands, barrier beaches, and functionally related uplands. 3. Reduce point and nonpoint sources of pollution to attain desired uses of the estuary. 4. Provide the proper freshwater inflow to the estuary to ensure a balanced and productive ecosystem. 5. Develop and implement a strategy for public participation and education. 6. Develop and implement a formal Charlotte Harbor management plan with a specified structure and process for achieving goals for the estuary. The CCMP groups environmental concerns into three classes of quantifiable objectives: 1. Hydrologic alterations 2. Water quality degradation 3. Fish and wildlife habitat loss	Charlotte Harbor; coastal Venice; the Peace, Myakka, and Caloosahatchee rivers; Pine Island Sound; Matlacha Pass and Estero Bay basins	CCMP complete; implementation in progress

Plan/Project and Entity	Description	Geographic Area	Status
Charlotte Harbor Surface Water Improvement and Management (SWIM) Plan Update 2000 Southwest Florida Water Management District	The plan seeks to improve the water quality and ecological integrity of the greater Charlotte Harbor watershed by identifying and addressing hydrologic alterations, water quality degradation, and fish and wildlife habitat loss, and developing a potential resource-based pollutant load reduction goal (PLRG). The Update 2000 expanded its boundaries to include Lemon Bay, for which the SWIM Section and its contractors have developed a "Scope of Work" to conduct the following tasks: 1. The review and potential modification of a preliminary nitrogen loading model for Lemon Bay. 2. The refinement of the model to allow for sub-basin level nutrient load estimates. 3. The development of sub-basin nutrient load estimates for future land use scenarios. 4. The identification of potential management options to minimize and/or offset existing and potential future nutrient loads. 5. The estimation of nutrient load efficiencies of various management options. 6. The development of cost estimates for various management options. Funds to implement the project(s) would be budgeted in future years and would be contingent upon board approval and the participation of Sarasota and Charlotte Counties.	Charlotte Harbor; Peace and Myakka rivers; Lemon Bay and Coastal Venice basins	Update finalized; implementation in progress
Caloosahatchee Water Management Plan South Florida Water Management District	The plan, initiated in fiscal year 1998, will provide watershed and estuary data to both the Lower West Coast Water Supply Plan and the C&SF Project Comprehensive Review Study (the restudy).	Lee County	Completed in 2000
Delineation of Saltwater Intrusion in Lee and Collier Counties U.S. Geological Survey/Water Resources Division	The project will delineate the farthest inland extent of the saltwater interface in the surficial and intermediate aquifer systems. The population of Lee and Collier Counties is growing rapidly, increasing demand on the water resources of the region. Additional pumping of fresh ground water from coastal wellfields may cause salt water to move inland into the aquifers. A scientific understanding of the location of the saltwater interface will enable water resource managers to better limit the extent of saltwater intrusion.	Coastal areas of Lee and Collier counties	New project
East Spring Lake Charlotte County Public Works	The project will create a saltwater wetland/stormwater treatment system on four small islands. These islands were created when General Development Corporation dredged the canals many years ago. Three of the islands will be scraped down, with one left as a control. The islands will be scraped to different elevations to determine optimal habitat. The project area comprises East Spring Lake, Alligator Bay, Charlotte Harbor–at East Spring Lake and Edgewater Drive in Port Charlotte.	Port Charlotte	Under review
Encourage Efficient Use and Reuse of Water Charlotte County Utilities	Charlotte County Utilities has upgraded its East Port Water Reclamation Facility for advanced treatment and now supplies three golf courses and two mobile home parks.	Charlotte County	In progress

Plan/Project and Entity	Description	Geographic Area	Status
Fisheries-Independent Monitoring (FIM) Program Florida Marine Research Institute/Florida Fish and Wildlife Conservation Commission	The FIM Program is a survey project using stratified-random sampling (SRS) techniques to describe and compare fish population trends. Surveys are currently under way in six estuaries statewide, including Charlotte Harbor. Fishes are collected using seines and otter trawls. Data collected include species, size, sex, and numbers of fish caught. Habitat features such as the type and quantity of submerged and shoreline vegetation and the presence of seawalls or oyster beds are recorded for each sample site. Measurements of water quality include temperature, pH, salinity, and dissolved oxygen. The fish collected at each site are examined for any external abnormalities or signs of poor health. Tissue samples for analysis of mercury content are taken from selected fish. Data from the SRS surveys provide estimates of the relative abundance of many economically and recreationally important species, and are used to predict the availability of a species in the near future. The information is also used to determine what fisheries management measures are needed and to assess the effectiveness of those measures after they are enacted.	Charlotte Harbor	In progress
Florida Blueways Project Coastal Management Program/Florida Department of Community Affairs	The program is designed to create new innovative integrated tools for coastal managers, as follows: 1. Focusing on a smaller area of Florida (Charlotte Harbor) as a case study project to identify data needs and determine how best to organize the data for presentation and manipulation. 2. Creating an information base and management support for initiating a policy framework to integrate management across the coastal, nearshore, and marine environments. 3. Collecting and integrating ecological, human use, and management information for Florida's coastal ocean and estuarine environments. 4. Meeting with state decision makers to review the project and to discuss the management framework needed to use Blueways effectively to coordinate management across coastal and ocean areas. 5. Implementing a geographic information system (GIS)–based program to integrate and update data with environmental conditions, resource uses, and existing management efforts, in order to coordinate protection measures.	Charlotte Harbor	In progress
Flow and Salinity Patterns at Selected Points in Estuaries of the CHNEP Study Area U.S. Geological Survey/Water Resources Division	This project is designed to fill data gaps along the coastline of estuaries inside the CHNEP study area and at selected points in these estuaries, to support the development and calibration of hydrodynamic models. The study will use the latest in acoustic technology, which provides for the accurate measurement of water velocity through tide cycles. Salinity and temperature will also be measured at selected sites in order to describe the effects of freshwater and tidal flows on salinity.	Charlotte Harbor to Estero Bay (Charlotte and Lee Counties)	Planning stage
Habitat Improvement: Modification of Previously Hardened Natural Shorelines Sarasota Co. Natural Resources	To improve habitat, the project will modify previously existing natural shorelines that have been hardened with vertical seawalls in aquatic preserves and adjacent riverine systems.	Lemon Bay, Gottfried Creek, Alligator Creek, Forked Creek	In progress

Plan/Project and Entity	Description	Geographic Area	Status
Huckaby Creek Partial Restoration Phase I & II Charlotte Harbor Environmental Center, Inc.	Huckaby Creek was dredged and channelized in the 1960s for stormwater conveyance. The construction of the canal resulted in an earthen plug in Huckaby Creek and a spoil berm along the entire length of the canal. The berm inhibits proper sheet flow from the uplands of Tippecanoe Scrub to Huckaby Creek and Tippecanoe Bay. Phase I improves sheet flow, and Phase II removes exotic vegetation on the berm.	Huckaby Creek, Tippecanoe Bay, and Charlotte Harbor	Phase I completed; Phase II in progress
J.N. "Ding" Darling National Wildlife Refuge Complex Expansion J.N. "Ding" Darling National Wildlife Refuge/U.S. Department of the Interior	The U.S. Fish and Wildlife Service, Southeast Region, proposes to expand the acquisition boundaries of the J. N. "Ding" Darling National Wildlife Refuge Complex. The proposed expansion area covers 13,813 acres in Charlotte and Lee Counties: Pine Island National Wildlife Refuge (NWR) (3,882 acres), Matlacha Pass NWR (6,953 acres), and Caloosahatchee NWR (2,978 acres). The acquisitions will contribute to meeting high-priority habitat protection goals of the CHNEP study area.	Pine Island Sound, Matlacha Pass, and the Caloosahatchee River	In review
J.N. "Ding" Darling Water Control Structures Water Management Plan J.N. "Ding" Darling National Wildlife Refuge/U.S. Department of the Interior	The project will increase tidal flushing and nutrient and biota exchange between the tidally influenced estuary and the refuge's West Impoundment.	J.N. "Ding" Darling National Wildlife Refuge, Sanibel Island	Planned
J.N. "Ding" Darling Wildlife Drive Water Control Structure Rehabilitation Project J.N. "Ding" Darling National Wildlife Refuge/U.S. Department of the Interior	The project will replace five water control structures and add a structure in the far western reaches of the West Impoundment of the J.N. "Ding" Darling National Refuge to improve tidal flushing, water conveyance, and flow volumes in the East and West impoundments.	J.N. "Ding" Darling National Wildlife Refuge, Sanibel Island	In progress
Lee County Ambient Surface Water Monitoring Program Lee County	The program was established to provide information on stormwater runoff, in conjunction with Lee County's Stormwater Master Plan. Information can be used for loading calculations by basin for TMDLs and pollutant load reduction goals (PLRGs).	Subbasin watersheds throughout Lee County	In progress
Lee County Conservation Land Acquisition and Stewardship Committee Lee County Natural Resources Division/County Lands Division	In 1996, voters approved a referendum to raise real property taxes to fund the purchase of environmentally sensitive lands to be placed in public trust for preservation. Over $11 million per year is generated for the acquisition of properties of willing sellers. Each proposal goes through a ranking process based on environmental significance, water resource value, management potential, contiguity to other preserve areas, development potential, and selling price.	Lee County	Since February 1997, 44 parcels chosen for acquisition, 6 acquired as of July 1999

Plan/Project and Entity	Description	Geographic Area	Status
Lee County Estuarine Monitoring Program Lee County Natural Resources Division/Environmental Lab	Quarterly monitoring of fourteen fixed sites in Estero Bay and fourteen fixed sites around Pine Island. The analysis includes nutrients, chlorophyll, fecal coliform, pH, dissolved oxygen, turbidity, biochemical oxygen demand, temperature, and salinity. The information will be useful for TMDL calculations.	Lee County marine waters	In progress
Lee County Hydrologic Data Network Lee County Natural Resources Division	The network collects county rainfall, stage, and ground water level data. It provides valuable calibration information for hydrologic models such as "HECRAS" and "HEC1," and also provides early warning data for possible flood emergencies. Ground water data are used to establish wet season water table levels so that engineering and environmental consultants can establish control elevations for stormwater management facilities. The network reduces the potential for lowering natural ground water levels, thereby conserving water resources.	Lee County watersheds	Two additional stage recorders installed in fiscal year 1999
Lee County Surface Water Master Plan Lee County Division of Natural Resources	A comprehensive study of the surface water management of Lee County was completed in a number of phases, which include individual reports for watersheds in the county.	Lee County	Completed in 1992; under implemen-tation
Lemon Lake Restoration Feasibility Study Charlotte Harbor Environmental Center, Inc.	The historical brackish water flow from Lemon Bay to Lemon Lake through Lemon Creek has been altered by channelization and filling. Although culverts do exist, it is believed that the flow is restricted and reduces the flow into Lemon Lake.	Amberjack Slough	Proposed
Lower West Coast Water Supply Plan South Florida Water Management District	The Lower West Coast (LWC) Water Supply Plan is a state-required regional water supply plan that serves as a guide for addressing future water demands in southwest Florida. The plan sets a framework around which future water use decisions for the LWC Planning Area can take place. The LWC Planning Area includes all of Lee and a portion of Charlotte County.	Includes all of Lee County and the SWFWMD portion of Charlotte County	In progress
Melaleuca Eradication on Cape Haze Peninsula Charlotte County Mosquito Control Program	A joint project between Charlotte County, the Charlotte Harbor State Buffer Preserve and the SWFWMD SWIM Program to eradicate melaleuca on the Cape Haze peninsula.	Cape Haze Peninsula in Charlotte County	Phase III in process
Oyster Resources Restoration in the Coastal Venice, Myakka River, and Lemon Bay Basins Sarasota County Natural Resources	The project will delineate current oyster areas with a global positioning system; determine which areas are suitable for planting using salinity, temperature, dissolved oxygen, and substrate measurements; use culch or oyster seed on the selected areas; and provide long-term monitoring of results by density analyses.	Sarasota County: coastal Venice, Myakka River, and Lemon Bay watersheds	Proposed

Plan/Project and Entity	Description	Geographic Area	Status
Partners For Fish and Wildlife Program/Challenge Grant Cost-Share Florida Panther National Wildlife Refuge/U.S. Fish and Wildlife Service	The U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program was established to develop partnerships with private landowners, local governments, and nongovernmental organizations to restore, enhance, and protect wildlife habitat beyond the agency's borders. Federal dollars are matched (a 50 percent minimum, including "in-kind" contributions) by nonfederal public and private institutions, organizations, and individuals. The projects are ranked based on established criteria, including the following: 1. Reestablish original wetland vegetation and hydrology on at least 70 percent of the project site, or on nonwetland sites that provide benefits to threatened and endangered species, contain unique habitat types, or are important for ecosystem restoration purposes under the Multi-Species Recovery Plan of Florida (such as endangered species' habitat corridor links or exotic species control). 2. Establish wetland vegetation and hydrology that are different from historical occurrences, but that at least partially restore original functions and values.	South Florida Ecosystem, CHNEP study area	Ongoing
Peace River Hydrobiological Monitoring Program (HBMP) Peace River/Manasota Regional Water Supply Authority	The program will monitor withdrawals from the Peace River, evaluate ecological relationships to freshwater inflows, and monitor water quality and biological variables to determine if ecological changes are occurring and are related to changes in freshwater inflows.	Lower Peace River and upper Charlotte Harbor	In progress
Peace River Water Quality Monitoring Project Peace River/Manasota Regional Water Supply Authority	The project will sample the Peace River and its major tributaries monthly, analyze the data annually to develop trends, and determine pollutant loads being delivered to the Charlotte Harbor Estuary.	Peace River watershed	In progress
Pine Island Watershed Natural Resource Assessment Geographic Information System (GIS) Calusa Land Trust and Nature Preserve of Pine Island	Survey and observation data, as well as other information, will be entered into the existing Pine Island GIS database to identify restoration needs.	Pine Island Sound, Matlacha Pass, and San Carlos Bay	In progress
Port Charlotte (Greater) Canal Water Quality Enhancement Charlotte County Public Works	Enhance water quality in the canal system by the addition of flocculents to precipitate out nutrients, total dissolved solids, and total suspended solids. The contaminants attach themselves to an electronically charged molecule and form a floc, which then settles to the bottom. The project area includes the Canal system in Greater Port Charlotte (Little Alligator Basin and Fordam-Niagra Basin) and Alligator Bay, with Charlotte Harbor as the receiving waterbody.	Greater Port Charlotte	Planned

Plan/Project and Entity	Description	Geographic Area	Status
Punta Gorda–Burnt Store Isles Stormwater Treatment Retrofit City of Punta Gorda	To protect water quality, the city of Punta Gorda proposes to complete a stormwater treatment retrofit project in the Burnt Store Isles residential community to replace an antiquated and ineffective boat lock. The current drainage system uses grass swales with no designed treatment capacity.	Burnt Store Isles	Under review by the Department
Punta Gorda Aquifer Storage and Recovery Project	The project will install multiple aquifer storage and recovery (ASR) wells at the city of Punta Gorda wastewater treatment plant site for storage/recovery of treated potable water from the city's water supply reservoir. Storage is proposed during periods where water is readily available, and the water would be recovered during drought conditions or emergency situations.	City of Punta Gorda	Feasibility well ongoing; future wells planned
Punta Gorda Central Sewer Expansion City of Punta Gorda	The project will provide central sewer service to areas in Charlotte County surrounding the city of Punta Gorda near tidal waterbodies. The city has an existing wastewater transmission system near these areas, south of the Peace River. Its existing wastewater treatment plant will accommodate the additional volume of wastewater. Priority areas include the Charlotte Park and Solona areas near Charlotte Harbor.	City of Punta Gorda	Master Plan work began in February 1999
Punta Gorda Geographic Information System (GIS) City of Punta Gorda	The city is developing a GIS system consisting of high quality and informative graphics along with the capacity for limitless geographic analysis. Specifically, existing land use and the natural environment will be inventoried. The information will be used to track changes, especially in natural sites, and assess how they relate to human needs (such as single-family homes and marinas).	City of Punta Gorda	In progress
Sanibel Environmentally Sensitive Lands Acquisition Program	This purchase program for city conservation lands focuses on privately owned undevelopable and wetland lots, especially in the Sanibel Gardens and Tarpon Bay wetland subdivisions.	Sanibel Island	In progress
Sanibel Island Surface Water Management Plan City of Sanibel	The project, a partnership with the Sanibel-Captiva Conservation Foundation, the J.N. "Ding" Darling National Wildlife Refuge, and private property owners, will restore the historical hydroperiod in the freshwater interior wetlands of Sanibel Island through the construction of a weir at Tarpon Bay.	Sanibel Island	In progress
Sanibel River Corridor Environmental Restoration City of Sanibel	The project consists of partnerships with the Sanibel-Captiva Conservation Foundation, the J.N. "Ding" Darling National Wildlife Refuge, and several state and federal environmental restoration grant programs. Carried out on conservation lands consisting primarily of freshwater wetlands with long narrow upland ridges parallel to the Sanibel River on Sanibel Island, the project will remove old fill road ditches and near monocultures of the noxious exotic tree Brazilian pepper (*Schinus terebinthifolius*). It will reestablish a freshwater marsh system dominated by saltmarsh cordgrass (*Spartina bakeri*), giant leather fern *(Acrostichum danaeifolium*), sawgrass (*Cladium jamaicense*), and cabbage palm (*Sabal palmetto*). Old oxbows and meanders along the river will be restored and straight-dredged channels recontoured.	Sanibel River corridor on Sanibel Island	Two-thirds complete

Plan/Project and Entity	Description	Geographic Area	Status
Sanibel-Captiva Habitat Management and Ecology Program Sanibel-Captiva Conservation Foundation, Inc.	The Sanibel-Captiva Conservation Foundation currently owns more than 1,800 acres of wetland and upland habitats in the CHNEP study area. It is actively managing these lands by removing invasive plants, carrying out prescribed burns, enhancing wetlands by restoring hydroperiods, creating deep water refuges, enhancing uplands through shrub management, and planting native species of subtropical trees and shrubs. Monitoring and carrying out research on plant, fish, and wildlife communities is an integral part of the program.	Sanibel-Captiva Area of Pine Island Sound Basin	Ongoing
Sarasota Co. Resource Management GIS Program Sarasota County Natural Resources	The program will collect rectified infrared aerial data for approximately 100 square miles in eastern Sarasota County to document changes in wetlands and other habitats. ArcView geographic information system (GIS) software will be used to document large-scale habitat changes over time.	Sarasota County	To be determined
Sarasota County Ambient Water Quality Monitoring Program Sarasota County Natural Resources	The county's Pollution Control Division will continue to ensure that discharges are in compliance with state rule. A total of forty stations—Sarasota Bay (twenty-five stations), Lemon Bay (five stations), Upper Myakka River (five stations), and Lower Myakka River (five stations)—are monitored monthly for the following water quality parameters: temperature, pH, salinity, specific conductance, biological oxygen demand, color, turbidity, total suspended solids, dissolved nitrate (NO2), dissolved nitrite (NO3), inorganic nitrogen (NO2+, NO3, N), dissolved and total ammonia, dissolved inorganic nitrogen, total Kjedahl nitrogen (TKN), total nitrogen (TN), orthophosphate, total phosphorus (TP), chlorophyll *a*, and Secchi depth.	Sarasota County; Sarasota Bay, Lemon Bay, and Upper and Lower Myakka River	In progress
Surface Water Ambient Monitoring Program (SWAMP) Florida Department of Environmental Protection	A number of stations in the CHNEP study area were sampled as part of SWAMP.	Charlotte Harbor watershed	Completed
Three Dimensional (3-D) Circulation Model South Florida Water Management District	This project will develop a coupled circulation/water quality model of the Charlotte Harbor estuarine system in three phases.	Charlotte Harbor	In progress
Three Lakes Charlotte County Public Works	To reduce flooding and enhance water quality and wetland habitat, the project will excavate three lakes that were designed and permitted but never built. Drainage is currently very poor in the project area in greater Port Charlotte, consisting of Alligator Bay bordered by Edgewater Drive, Collingswood Boulevard, Pellam Boulevard, and Placid Avenue.	Greater Port Charlotte	Under construction

Appendix D: Information on Reasonable Assurance

TO: **Interested Parties**

FROM: **Mimi Drew, Director**
Division of Water Facilities

DATE: **September 2002**

SUBJECT: **Guidance for Development of Documentation To Provide Reasonable Assurance that Proposed Pollution Control Mechanisms Will Result in the Restoration of Designated Uses in Impaired Waters**

The purpose of this memo is to describe the types of information that should be considered, and subsequently documented, when evaluating whether there is sufficient reasonable assurance that:

1. Proposed pollution control mechanisms (typically described in watershed management or restoration plans) addressing impaired waters will result in the attainment of applicable water quality standards (designated uses) at a clearly defined point in the future, and

2. Reasonable progress towards restoration of designated uses will be made by the time the next 303(d) list of impaired waters is due to be submitted to the EPA.

There are many site-specific issues related to determining whether reasonable assurance has been provided. Accordingly, this document describes the elements or issues that should be considered when evaluating a submittal or when documenting the basis for the Department's decision, rather than attempting to establish specific criteria on what constitutes reasonable assurance.

It should be noted that the term "reasonable assurance" is used throughout many Department programs and rules, and this guidance specifically addresses the issues related to the "reasonable assurance" provided by proposed pollution control mechanisms. This guidance should not be used to evaluate the meaning of reasonable assurance in other contexts, particularly in permitting decisions.

Background

The Impaired Surface Waters Rule (IWR), Rule 62-303, F.A.C. (Identification of Impaired Surface Waters), establishes a formal mechanism for identifying surface waters in Florida that are impaired (do not meet applicable water quality standards) by

pollutants. Most waters that are verified as being impaired by a pollutant will be listed on the state's 303(d) list pursuant to the Florida Watershed Restoration Act (FWRA) and Section 303(d) of the Clean Water Act. Once listed, Total Maximum Daily Loads (TMDLs) will be developed for the pollutants causing the impairment of the listed waters. However, as required by the FWRA, the Department will evaluate whether existing or proposed pollution control mechanisms will effectively address the impairment before placing a water on the state's Verified List. If the Department can document there is reasonable assurance that the impairment will be effectively addressed by the control measure, then the water will not be listed on the final Verified List (other impaired waters that will not be listed include waters with TMDLs and waters impaired by pollution).

Current Rule Text Relating to Evaluation of Pollution Control Mechanisms

The rule text addressing the evaluation of proposed pollution control mechanisms is as follows:

Section 62-303.600, Evaluation of Pollution Control Mechanisms

Upon determining that a waterbody is impaired, the Department shall evaluate whether existing or proposed technology-based effluent limitations and other pollution control programs under local, state, or federal authority are sufficient to result in the attainment of applicable water quality standards.

2. If, as a result of the factors set forth in (1), the waterbody segment is expected to attain water quality standards in the future and is expected to make reasonable progress towards attainment of water quality standards by the time the next 303(d) list is scheduled to be submitted to EPA, the segment shall not be listed on the Verified List. The Department shall document the basis for its decision, noting any proposed pollution control mechanisms and expected improvements in water quality that provide reasonable assurance that the waterbody segment will attain applicable water quality standards.

Responsible Parties for Reasonable Assurance Demonstration

It is ultimately the Department's responsibility to assure adequate documentation in the administrative record whenever the Department decides to not list an impaired waterbody segment for a given pollutant. This documentation will be very important because the Verified Lists will be adopted by Order of the Secretary and third parties will be provided an opportunity to challenge, via an administrative hearing, all listing decisions (both those listing a water and those to not list a water for a given pollutant). However, the Department expects that local stakeholders will often offer to prepare the necessary documentation to demonstrate reasonable assurance that proposed control

mechanisms will restore a given waterbody. The Department will provide guidance to stakeholders on what information is needed and how it should be submitted.

Time Frame for Development of Documentation

The Department plans to prepare basin-specific Verified Lists as part of its watershed management cycle, which rotates through all of the state's basins over a five-year, five-phased cycle[1]. During the first phase of the cycle, the Department will assess water quality in the basin and prepare a draft Planning List of potentially impaired waters. The Department and interested parties will then have approximately one year (Phase 2) to monitor waters on the planning list and prepare documentation, as appropriate, to provide reasonable assurance that impaired waters will be restored. The Department will review submittals from interested parties during Phase 2, before adopting the Verified List for the basin containing the waterbody segment in question.

What It Means To Be Under Local, State, or Federal Authority

Both the FWRA and the IWR require that the pollution control programs under consideration be "under local, state, or federal authority." A pollution control program will be considered "under local, state, or federal authority" if the program is subject to or required by a local ordinance, state statute or rule, or federal statute or regulation.

Programs will also be considered under local, state, or federal authority if they are subject to a written agreement, signed by both local stakeholders and at least one governmental entity, that includes measurable goals, performance criteria, benchmarks, and back-up corrective actions to assure the further progress of the program. It is important to note that these written agreements do not need to be enforceable for nonregulated nonpoint sources.

Many nonpoint sources are currently outside of the regulatory programs of EPA, the Department, and the water management districts, and reductions at these nonpoint sources will be voluntary. In fact, pollution control mechanisms for these nonpoint sources would be voluntary even if a TMDL were developed. As such, these agreements may provide the same level of reasonable assurance that can be provided for a TMDL implementation plan as long as they maintain the Department's enforcement capability over all point sources involved.

Time Frame for Attaining Water Quality Standards

The FWRA and the IWR do not establish a specific time limit by which waters must attain applicable water quality standards or designated uses. However, the pollution control mechanisms or watershed restoration plan must provide reasonable assurance that designated uses will be met at some time **in the future**. As such, the documentation

[1] Federal regulations currently call for state 303(d) lists every two years, but Florida plans to submit annual updates based on the basin-specific Verified Lists.

submitted to the Department must provide a specific date by which time designated uses are expected to be restored. In cases where designated uses will not be met for many years, the documentation should also provide justification as to why the specified time is needed to restore designated uses.

Parameter-Specific Nature of Demonstration

For the Department not to place an impaired waterbody segment on the Verified List, reasonable assurance must be provided for each pollutant that has been documented to be causing impairment of the waterbody segment. However, some entities, including the Department, may want to provide reasonable assurance addressing only selected pollutants, which could result in the Department not listing the waterbody segment for those pollutants, but still listing it for others. In this event, TMDLs will only be developed for the remaining listed pollutants.

Information To Consider and Document when Assessing Reasonable Assurance in the IWR

To provide reasonable assurance that existing or proposed pollution control mechanisms will restore designated uses, the following information should be evaluated and documented for the Administrative Record:

1. **A Description of the Impaired Water**—name of the water listed on the Verified List, the location of the waterbody and watershed, the watershed/8-digit cataloging unit code, the NHD identifier (when they become available), the type (lake, stream, or estuary) of water, the water use classification, the designated use not being attained, the length (miles) or area (acres) of impaired area, the pollutant(s) of concern (those identified as causing or contributing to the impairment), and the suspected or documented source(s) of the pollutant(s) of concern.

3. **A Description of the Water Quality or Aquatic Ecological Goals—**a description of the water quality–based targets or aquatic ecological goals (both interim and final) that have been established for the pollutant(s) of concern, the averaging period for any numeric water quality goals, a discussion of how these goals will result in the restoration of the waterbody's impaired designated uses, a schedule indicating when interim and final targets are expected to be met, and a description of procedures (with thresholds) to determine whether additional (backup) corrective actions are needed.

4. **A Description of the Proposed Management Actions To Be Undertaken**—names of the responsible participating entities (government, private, others), a summary and list of existing or proposed management activities designed to restore water quality, the geographic scope of any proposed management activities, documentation of the estimated pollutant load reduction and other benefits anticipated from implementation

of individual management actions, copies of written agreements committing participants to the management actions, a discussion on how future growth and new sources will be addressed, confirmed sources of funding, an implementation schedule (including interim milestones and the date by which designated uses will be restored), and any enforcement programs or local ordinances, if the management strategy is not voluntary.

5. **A Description of Procedures for Monitoring and Reporting Results**—a description of the water quality monitoring program to be implemented (including station locations, parameters sampled, and sampling frequencies) to demonstrate reasonable progress; quality assurance/quality control elements that demonstrate the monitoring will comply with Rule 62-160, F.A.C.; procedures for entering all appropriate data into STORET; the responsible monitoring and reporting entity; the frequency and format for reporting results; the frequency and format for reporting on the implementation of all proposed management activities; and methods for evaluating progress towards goals.

6. **A Description of Proposed Corrective Actions**—a description of proposed corrective actions (and any supporting document[s]) that will be undertaken if water quality does not improve after implementation of the management actions or if management actions are not completed on schedule, and a process for notifying the Department that these corrective actions are being implemented.

Water Quality–Based Targets and Aquatic Ecological Goals

Some of the most important elements listed above are the requirements to provide water quality–based targets or aquatic ecological goals and a discussion on how resultant pollutant(s) reduction targets/goals will result in restoration of designated uses. Some people have expressed concern about these targets because they equate a water quality–based restoration target with a TMDL (thus assuming a "Catch 22" that a TMDL is needed to make a demonstration that a TMDL is not needed). However, as is also the case for TMDLs, water quality–based targets can take many forms, and need not be a result of a complex hydrodynamic/water quality model.

In some cases, there may be sufficient historical data (paleolimnological data, loadings from periods predating the impairment, or baseline data for Outstanding Florida Waters[2], for example) that could be used to determine an appropriate water quality target. In other cases, simplified modeling (including regression analysis) may allow for conservative estimates of the assimilative capacity that could then be used as the basis for restoration goals. And, finally, a water quality target may have been developed that would be scientifically equivalent to (or act as the basis for) a TMDL, but the target has not been administratively adopted as a TMDL. In each of these cases, a sound water

[2] Baseline data would be data for the year prior to designation of the OFW.

quality target could be used to evaluate whether the proposed pollution control mechanisms will sufficiently reduce loadings to meet the assimilative capacity of the water in question and result in attainment of designated uses.

Interim Targets

Because it will usually take many years to restore fully the designated uses of an impaired water, interim water quality targets will often be needed to measure whether reasonable progress is being made towards the restoration of designated uses. Examples of such interim targets are provided in the last section of this document, but site-specific measures are also encouraged.

Averaging Periods for Water Quality Targets

While the averaging period for water quality–based targets should be consistent with how the underlying standard is expressed, they can often be expressed in a variety of ways and need not be expressed as "daily loads." Annual averages or medians are often appropriate for some parameters, but shorter-term (seasonal, for example) averages may be necessary if the impairment is limited to specific seasons or parts of the year. Multi-year averages may be appropriate in limited circumstances where there is naturally high variation of the water quality target.

Estimates of Pollutant Reductions from Restoration Actions

It will often be difficult to estimate precisely the pollutant reductions that will result from specific restoration activities. This is particularly true for the implementation of best management practices (BMPs). However, to provide reasonable assurance that a BMP or other restoration action will reduce loadings of the pollutant of concern to a level that will restore the water's designated uses, documentation should address how the reductions were calculated, including providing documented values from the scientific literature for reductions attributed to similar management actions. If the expected reductions are expressed as a range, the midpoint of the range should be used as the basis for estimating reductions, unless documentation is provided supporting the use of different removal efficiencies in this specific application.

New Sources/Growth

Another key element is the discussion on how future growth and new sources will be addressed. Restoration goals must address possible increased loadings of the pollutant of concern that are anticipated due to population growth or land use changes in contributing watersheds, both from point and nonpoint sources. This will be particularly important for waters impaired by nutrients, given that so many Florida watersheds are faced with continuing urban, residential, and agricultural development that results in increased nutrient loading from stormwater, septic tanks, and wastewater discharges.

Examples of Reasonable Progress

The determination of whether there will be reasonable progress towards attainment of water quality standards will be very site- and pollutant-specific. Documentation should be provided supporting specific progress towards restoration of the designated uses of the impaired water. Possible examples of reasonable progress include, but are not limited to the following:

- A written commitment to implement controls reducing loadings within a specified time frame from watershed stakeholders representing at least 50 percent of the anthropogenic load of the pollutant(s) of concern;

- Evidence of at least a 10 percent reduction (or alternatively, a percent reduction consistent with meeting the water quality target by the specified date) in annual anthropogenic loading of the pollutant(s) of concern;

- Evidence of at least a 10 percent decrease (or alternatively, a percent decrease consistent with meeting the water quality target by the specified date) in the annual average concentration of the pollutant(s) of concern in the water;

- Bioassessment results showing there has been an improvement in the health of the biological community of the water, as measured by bioassessment procedures similar to those used to determine impairment and conducted in similar conditions; or

- Adoption of a local ordinance that specifically provides water quality goals, restricts growth or loads tied to the pollutant(s) of concern, and provides an enforcement option if the proposed management measure(s) are not implemented as required.

Reasonable progress must be made by the time the next 303(d) list is due to be submitted to EPA, which is currently every two years. EPA has contemplated changing the listing cycle to every four or five years, and the IWR was specifically worded to allow a longer time frame for requiring reasonable progress in the event that the listing cycle changes.

Long-Term Requirements

If at any time the Department determines that reasonable assurance and reasonable progress are not being met, the order adopting the Verified List will be amended to include the waterbody on the Verified List for the pollutant(s) in question. Additional reasonable progress must be made each time a waterbody is considered for listing under Rule 62-303, F.A.C. (every five years).

If you have any questions about this guidance memo, contact Daryll Joyner of the Department's Bureau of Watershed Management in Tallahassee at 850-245-8431.

Appendix E: Methodology for Determining Impairment Based on the Impaired Surface Waters Rule

The Impaired Surface Waters Rule

To identify impaired waters in each of the state's river basins, the Department evaluates water quality data using the science-based methodology in the Identification of Impaired Surface Waters Rule (Rule 62-303, F.A.C.). The rule establishes specific criteria and thresholds for impairment, in addition to data sufficiency and data quality requirements. The methodology described in the rule is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. The complete text of the Impaired Surface Waters Rule is available at http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf.

As part of the watershed management approach, for each river basin in the state the Department will follow the methodology in Section 62-303.300, F.A.C., to develop a Planning List of potentially impaired waters to be assessed under Subsections 403.067(2) and (3), F.S. The methodology for developing the Planning List includes an evaluation of aquatic life use support, primary contact and recreational use support, fish shellfish consumption use support, drinking water use support, and protection of human health. Data older than ten years cannot be used to evaluate water quality criteria exceedances for the Planning List. As required by Subsection 403.067(2), F.S., the Planning List will not be used to administer or implement any regulatory program, and is submitted to the EPA for informational purposes only.

After further assessment, using the methodology in Part III, Section 62-303.400, F.A.C., the Department will determine if waters on the Planning List are, in fact, impaired and if the impairment is caused by pollutant discharges. These waters are placed on a Verified List. The criteria for the Verified List are more stringent than those for the Planning List. Data older than five years should not be used to verify impairment. The Verified List will be adopted by Secretarial Order and forwarded to the EPA for approval as Florida's Section 303(d) list of impaired waters. The Department will develop TMDLs for these waters under Subsection 403.067(4), F.S.

Attainment of Designated Use(s)

While the designated uses of a given waterbody are established using the surface water quality classification system described previously, it is important to note that the EPA uses slightly different terminology in its description of designated uses. Because the Department is required to provide use attainment status for both the state's 305(b) report and the state's 303(d) list of impaired waters, the Department uses EPA terminology when assessing waters for use attainment. The water quality evaluations and decision processes for listing impaired waters that are defined in Florida's Impaired Surface Waters Rule are based on the following designated use attainment categories:

Aquatic Life Use Support-Based Attainment
Primary Contact and Recreation Attainment

Fish and Shellfish Consumption Attainment
Drinking Water Use Attainment and Protection of Human Health

Table E.1 summarizes the designated uses assigned to Florida's various surface water classifications.

Table E.1: Designated Use Attainment Categories for Surface Waters in Florida

Designated Use Attainment Category Used in Impaired Surface Waters Rule Evaluation	Applicable Florida Surface Water Classification
Aquatic Life Use Support-Based Attainment	Class I, II, and III
Primary Contact and Recreation Attainment	Class I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment	Class I
Protection of Human Health	Class I, II, and III

Sources of Data

The Department's assessment of water quality for each basin statewide includes an analysis of quantitative data from a variety of sources, many of which are readily available to the public. These sources include the EPA's Legacy and modernized STOrage and RETrieval (STORET) databases, the U.S. Geological Survey (USGS), the Department, the Florida Department of Health (DOH), the water management districts, local governments, and volunteer monitoring groups.

Historically, the Department carried out statewide water quality assessments using data available in the EPA's Legacy STORET Database; STORET makes up approximately 60 percent of the statewide data used in the 2002 Impaired Surface Waters Rule assessment. The Legacy STORET dataset is a repository of data collected and uploaded by numerous organizations through 1999. The Legacy STORET Database can be accessed at http://www.dep.state.fl.us/water/storet/index.htm.

In 2000, the EPA created a modernized version of STORET that included new features designed to address data quality assurance/quality control concerns (see the new STORET Web site at www.epa.gov/storet/). However, because of software difficulties associated with batch uploading of data to the modernized STORET, the data being uploaded to the national repository decreased dramatically, and lingering problems have temporarily reduced STORET's importance as a statewide data source. It houses only about 5 percent of the statewide Impaired Surface Waters Rule 2002 Database.

Approximately 35 percent of the data used in the 2002 Impaired Surface Waters Rule assessment was provided by individual organizations that for various reasons, such as time constraints or resource limitations, were not able to enter their data into the national database. The organizations providing the largest datasets include the South Florida, Southwest Florida, and St. Johns River water management districts; the USGS; and the University of Florida LakeWatch volunteer monitoring group. Several of these databases are readily available to the public via the Internet: the South Florida Water Management District at http://www.envirobase.usgs.gov/, the USGS at http://water.usgs.gov/, and LakeWatch at http://lakewatch.ifas.ufl.edu/.

The Impaired Surface Waters Rule 2002 Database was created to evaluate data simultaneously in accordance with the Impaired Surface Waters Rule methodology for every basin in the state, based on the appropriate data "window." For the Verified List assessment, the window is 7.5 years (for the Impaired Surface Waters Rule 2002 Database), and the Planning List assessment window is 10 years. **Table E.2** shows the periods of record for the Verified and Planning Lists for the five basin groups.

The evaluation of water quality in the state's basins also includes some qualitative information. These sources are described in the Basin Status Reports and Assessment Reports for each basin.

Table E.2: Data Used in Developing the Planning and Verified Lists, First Basin Rotation Cycle

Basin Group	Reporting	Period of Data Record Used in Impaired Surface Waters Rule Evaluation
Group 1	Planning List	January 1, 1989 – December 31, 1998
	Verified List	January 1, 1995 – June 30, 2002
Group 2	Planning List	January 1, 1991 – December 31, 2000
	Verified List	January 1, 1996 – June 30, 2003
Group 3	Planning List	January 1, 1992 – December 31, 2001
	Verified List	January 1, 1997 – June 30, 2004
Group 4	Planning List	January 1, 1993 – December 31, 2002
	Verified List	January 1, 1998 – June 30, 2005
Group 5	Planning List	January 1, 1994 – December 31, 2003
	Verified List	January 1, 1999 – June 30, 2006

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Notes: Typically, a 10-year data record is used for the development of the Planning Lists, and a 7.5 -year record is used for the Verified Lists.

Methodology

To determine the status of surface water quality in individual river basins in Florida, three categories of data—chemistry data, biological data, and fish consumption advisories—were evaluated to determine potential impairments for the four attainment of designated use categories discussed earlier: aquatic life, primary contact and recreation, fish and shellfish consumption, and drinking water use and protection of human health.

Aquatic Life Based Attainment

The Impaired Surface Waters Rule follows the principle of independent applicability. A waterbody is listed for potential impairment of aquatic life use support based on exceedances of any one of four types of water quality indicators (numeric water quality criteria, nutrient thresholds, biological thresholds, and toxicity data).

Exceedances of Numeric Water Quality Criteria

The chemistry data from STORET used in evaluating impairment were also used for preparing the state's 2000 305(b) report. Only ambient surface water quality stations were included in the assessment of impairment. Water quality information from point sources or wells was excluded. Monitoring stations were classified as one of five

waterbody types—spring, stream, lake, estuary, or blackwater—based on criteria described in the latest 305(b) report. The assessments included the following parameters:

Metals[–]	Arsenic, aluminum, cadmium, chromium VI, chromium III, copper, iron, lead, mercury, nickel, selenium, silver, thallium, and zinc
Nutrients	Chlorophyll *a* for streams and estuaries, and Trophic State Index (TSI) (chlorophyll *a*, total nitrogen, and total phosphorus) for lakes
Conventionals	Dissolved oxygen (DO), fecal coliforms, total coliforms, pH, unionized ammonia

The requirements for placing waters on the Planning List included a minimum of 10 temporally independent samples from the ten-year period of record shown in **Table E.2,** unless there were three exceedances of water quality or one exceedance of an acute toxicity criterion in a three-year period. The screening methodology for the Verified List requires at least twenty samples from the last five years preceding the Planning List assessment. An exceedance, meaning that water quality criteria or standards are not met, is recorded any time the criterion is exceeded by any amount. An exceedance for DO, however, means that a waterbody does not meet the dissolved oxygen criterion, rather than an actual exceedance of the criterion.

To determine if a water should be placed on the Planning List for each parameter, the chemical data were analyzed using a computer program written to assess the data, based on criteria established in the Impaired Surface Waters Rule, with two exceptions. First, unionized ammonia data were not analyzed by the program, but rather with an Excel spreadsheet. Second, because the full complexity of the pH criterion could not be programmed, the incomplete listings for pH are not included. They will be further examined while additional data are collected during Phase 2 of the watershed management cycle. Data analysis and statistical summaries of WBIDs, waterbody types, and parameters obtained from the STORET Database were conducted using Access, SAS statistical software, and ArcView GIS applications

The data for metals and conventional parameters were compared with the state surface water quality criteria in Section 62-302.530, F.A.C. (Identification of Impaired Surface Waters Rule). The rule contains a table of sample numbers versus exceedances. A waterbody was placed on the Planning List if there was at least 80 percent confidence that the actual criteria exceedance rate was greater than or equal to 10 percent. To be placed on the Verified List, at least a 90 percent confidence rate was required.

[–] Although arsenic and selenium are not true metals according to the periodic table of elements, they are considered to be metalloids by the EPA and are treated as metals for water quality purposes.

Exceedances of Nutrient Thresholds

The state currently has a narrative nutrient criterion instead of a numeric value for nutrient thresholds. The narrative criterion states, "In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Impaired Surface Waters Rule provides an interpretation of the narrative nutrient criterion. In general, the Trophic State Index (TSI) and the annual mean chlorophyll *a* values are the primary means for assessing whether a waterbody should be assessed further for nutrient impairment.

The rule also considers other information that might indicate an imbalance in flora or fauna due to nutrient enrichment, such as algal blooms, excessive macrophyte growth, a decrease in the distribution (either in density or aerial coverage) of seagrasses or other submerged aquatic vegetation, changes in algal species richness, and excessive diel oxygen swings.

Potential nutrient impairment was evaluated by calculating annual mean chlorophyll *a* values for estuaries and streams and the TSI for lakes. For lakes, the TSI was calculated using chlorophyll *a*, total phosphorus, and total nitrogen measurements. Direct evidence of imbalances of flora and fauna in waterbodies was also considered in the evaluation of nutrient impairments.

In estuarine areas, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 11 micrograms per liter (µg/L) or if annual mean chlorophyll *a* values increased by more than 50 percent over historical values for at least two consecutive years. For streams, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 20 µg/L or if the annual mean increased by more than 50 percent over historical values for at least two consecutive years.

A lake with a mean color greater than 40 platinum cobalt units (PCUs) was considered nutrient enriched if the annual mean TSI exceeded 60. A lake with a mean color less than or equal to 40 PCUs was considered nutrient enriched if the annual mean TSI exceeded 40. In addition, a lake was considered nutrient enriched if there was an increase in TSI over the 1989 to 2000 period or if TSI measurements were 10 units higher than historical values.

Exceedance sof Biological Thresholds

Bioassessments were carried out for streams, lakes, canals, and rivers using the Impaired Surface Waters Rule as guidance and following the Department's standard operating procedures, which provide definitions and specific methods for the generation and analysis of bioassessment data. These are referenced in the individual bioassessment data tables contained in the Basin Status Reports. The purpose behind using a bioassessment methodology in surface water characterizations is that biological components of the environment manifest long-term water quality conditions and thus provide a better indication of a waterbody's true health than discrete chemical or physical measurements alone. Similar to water quality criteria, bioassessment methods involve the identification of a biological reference condition, based on data from unimpaired or least impacted waters in a given region.

For the Planning and Verified List assessments, the reference condition data were used to establish expected scores, ranging from best to worst, for various measures of community structure and function, such as numbers or percentages of particular species or feeding groups. Data on community structure and function from waters of unknown quality in the same region as reference waters were compared with the expected scores of metrics to evaluate their biological integrity.

Metrics (e.g., number of taxa, percent Diptera, percent filter feeders) were used independently and as an aggregated group called an index. Indices have advantages over individual metrics in that they can integrate several related metrics into one score that reflects a wider range of biological variables. A number of bioassessment metrics and indices exist for assessing populations of plant and animal life, including fish, diatoms (e.g., microscopic algae and unicellular plankton), and macroinvertebrates (e.g., insects, crayfish, snails, and mussels).

Only macroinvertebrate data from ambient sites in state surface waters were used in the bioassessments analyzed for the Planning and Verified Lists. The data included sites designated as test and background sites for National Pollutant Discharge Elimination System (NPDES) fifth-year inspections, but excluded data from effluent outfalls from discharging facilities or data from monitoring sites not clearly established to collect ambient water quality data. Because site-specific habitat and physicochemical assessment information (e.g., percent suitable macroinvertebrate habitat, water velocities, extent of sand or silt smothering, and riparian (see the definition below) buffer zone widths) was not available at the time of reporting, it was not included. However, this information is instrumental in pinpointing the causes for failed bioassessment metrics and will be included in future reporting.

DEFINITION: RIPARIAN

Of, on, or relating to the banks of a natural course of water.

The data used to develop the Planning and Verified Lists were obtained from the Department's Biological Database (SBIO) and the EPA's STORET Water Quality Database, where it could be substantiated that the data were generated in compliance with the bioassessment standard operating procedures referenced in the Impaired Surface Waters Rule (Section 62-303.330, F.A.C.).

The data from these databases are used without regard to the randomness of sample site selection. The general period of record for data used in the analysis of lotic (moving) waters was January 1, 1991, through December 31, 1998. The period of record for data used in the analysis of lentic (still) waters was June 21, 1995, through December 31, 1998. The June 21st date corresponds to the inception of the Department's current standard operating procedures for sampling lakes (FS-7640). For the purposes of the Basin Status Reports, the seasons are defined as follows: winter (1/1–3/31), spring (4/1–6/30), summer (7/1–9/30), and fall (10/1–12/31). Wet seasons are generally spring and summer, and dry seasons are fall and winter, although conditions can vary in the state as a whole.

Lake Condition Index

The scoring of the individual metrics of the Lake Condition Index (LCI), except percent Diptera, was performed according to the following formula:

100(B/A) where A = the 95 percentile of the reference population and B = observed value

For percent Diptera, the following formula was used:

100 (100-B)/(100-A) where A = the 95 percentile of the reference population and B = observed value

An average LCI score was calculated by averaging the scores of the six metrics in the method: total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Odonata, and Trichoptera (EOT taxa); percent EOT taxa; Shannon-Wiener Diversity Index score; Hulbert Index score; and percent Dipteran individuals. LCI calculations were only provided for clear lakes ($\leq$ 20 platinum cobalt units [PCUs]). As macroinvertebrate-based indices have not been shown to assess colored lakes in Florida accurately (> 20 PCUs), they have been excluded from bioassessments. A poor or very poor rating based on the average score constituted a failed bioassessment, based on the Impaired Surface Waters Rule.

Stream Condition Index

A total Stream Condition Index (SCI) score was calculated by adding the scores of the seven metrics in the method, i.e., total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT taxa); percent Chironomid taxa; percent dominant taxa; percent Diptera; percent filter feeders; and Florida Index. A poor or very poor rating based on the total score constituted a failed bioassessment, based on the Impaired Surface Waters Rule. The Basin Status Reports contain definitions and specific methods for the generation and analysis of bioassessment data.

BioRecon

To establish an impairment rating based on BioRecon data, three metrics were used: the Florida Index score, total number of taxa, and total number of EPT taxa. If all three metrics failed to meet thresholds, the water was deemed “impaired” based on the Impaired Surface Waters Rule.

Biological Integrity Standard

Quantitative data, generated through the use of Hester-Dendy artificial substrate samplers, were used to calculate Shannon-Wiener Diversity Index scores for paired background and test sites, as specified in the Biological Integrity Standard of Subsection

62-302.530(11), F.A.C. One failure of the standard meant that a waterbody segment was listed as potentially impaired.

Evaluation of Toxicity Data

Although the Impaired Surface Waters Rule describes the use of toxicity data for the assessment of aquatic life-based attainment, no ambient toxicity data are available for assessment and this metric was not used.

Primary Contact and Recreation Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if the following criteria were met:

- The waterbody segment did not meet the applicable water quality criteria for bacteriological quality,
- The waterbody segment included a bathing area that was closed by a local health department or county government for more than one week or more than once during a calendar year based on bacteriological data,
- The waterbody segment included a bathing area for which a local health department or county government issued closures, advisories, or warnings totaling twenty-one days or more during a calendar year based on bacteriological data,
- The waterbody segment included a bathing area that was closed or had advisories or warnings for more than twelve weeks during a calendar year based on previous bacteriological data or on derived relationships between bacteria levels and rainfall or flow.

Fish and Shellfish Consumption Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if it did not meet the applicable Class II water quality criteria for bacteriological quality, or if a fish consumption advisory had been issued. Fish consumption advisories were based on the Florida Department of Health's "limited consumption" or "no consumption" advisories for surface waters because of high levels of mercury in fish tissue. In addition, for Class II waters, waterbody segments that had been approved for shellfish harvesting but were downgraded to a more restrictive classification were listed as potentially impaired.

Drinking Water Attainment and Protection of Human Health

For Class I waters, a waterbody was potentially impaired if it did not meet the applicable Class I water quality criteria.

Appendix F: Integrated Assessment (Master List) for the Charlotte Harbor Basin

Data collected since the January 1, 1991 update of the 303(d) list were used to update the listing status of waters. **Table F.1** contains the listing status of all assessed waters in the basin as of January 2003. It should be noted that subsequent to the January 1, 1996 update of the 303(d) list, some waterbody segments were further subdivided to produce separate segments for lakes versus their surrounding watersheds. Therefore, **Table F.1** shows the WBIDs under which these segments were designated in the 1998 303(d) list, as well as the new or currently recognized WBIDs for them.

Information in this appendix was obtained from an inventory of the Legacy and modernized STORET databases, as well as data contributed directly to the Department by individual data providers. **Table F.2** includes only stations with data from the Planning and Verified assessment periods.

Table F.1: Integrated Water Quality Report (Master List) for the Charlotte Harbor Basin, by Planning Unit. IWR Run 14.2

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
8999	FLORIDA GULF COAST	COASTAL	Mercury (in fish tissue)	NA	IM	5	Low	2011	Data verified to be within the last 7.5 years. Confirmed recent data for coastal fish advisory for Shark, King Mackerel, Spotted Seatrout, Little Tunny, Greater Amberjack, Bluefish, and Crevalle Jack. Includes WBIDs 8054, 8054 A-F, 8055, 8055A, 8055B, 8056, 8056A, 8057, 8057A, 8058, 8058A, 8058B, 8059, 8059A, and 8059B. Confirmed consumption advisory in Charlotte Harbor for Spanish Mackerel. Includes WBIDs 2065A, 2065B, 2065C, 2065D, 2065Fand 2065HA.
2063	N FORK ALLIGATOR CREEK	STREAM	Dissolved Oxygen	NA	IM	5	Medium	2008	PP - 24/35; VP - 24/34 BOD is identified as the causative pollutant (mean = 4.6 mg/l).
2063	N FORK ALLIGATOR CREEK	STREAM	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 3.99 ug/L, Range = 1-12.6 ug/L, N=27
2063	N FORK ALLIGATOR CREEK	STREAM	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/29 ; VP - 0/30
2063	N FORK ALLIGATOR CREEK	STREAM	Turbidity	NA	ID	3b	NA	NA	PP - 0/2 ; VP - 0/1

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
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2065A	CHARLOTTE HARBOR UPPER	ESTUARY	Iron	NA	IM	5	Medium	2008	PP - 7/11 ; VP - 35/60 Verified by IWR criteria.
2065A	CHARLOTTE HARBOR UPPER	ESTUARY	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll: Mean = 6.82 ug/L, Range = 0.01-52 ug/L, N=197. Further investigation regarding additional data is being conducted.
2065A	CHARLOTTE HARBOR UPPER	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 23/776 ; VP - 27/589
2065A	CHARLOTTE HARBOR UPPER	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 13/252 ; VP - 22/512
2065A	CHARLOTTE HARBOR UPPER	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 4/802 ; VP - 5/589
2065B	CHARLOTTE HARBOR MID	ESTUARY	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll: Mean = 4.4 ug/L, Range = 0.01-61.4 ug/L, N=225. Further investigation regarding additional data is being conducted.
2065B	CHARLOTTE HARBOR MID	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 38/1216 ; VP - 20/841
2065B	CHARLOTTE HARBOR MID	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/17 ; VP - 0/16
2065B	CHARLOTTE HARBOR MID	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/176 ; VP - 0/169
2065C	CHARLOTTE HARBOR MID	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 5.16 ug/L, Range = 1-15.2 ug/L, N=76
2065C	CHARLOTTE HARBOR MID	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 19/911 ; VP - 6/602

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2065C	CHARLOTTE HARBOR MID	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 25/1054 ; VP - 11/682
2065C	CHARLOTTE HARBOR MID	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/984 ; VP - 0/612
2065C	CHARLOTTE HARBOR MID	ESTUARY	Bacteria (in Shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from approved to conditional).
2065D	CHARLOTTE HARBOR LOWER	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 3.93 ug/L, Range = 0.01-22.2 ug/L, N=251
2065D	CHARLOTTE HARBOR LOWER	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 39/1216 ; VP - 20/841
2065D	CHARLOTTE HARBOR LOWER	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 35/1261 ; VP - 19/775
2065D	CHARLOTTE HARBOR LOWER	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/1342 ; VP - 0/900
2066	DIRECT RUNOFF TO BAY	STREAM	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 32/362 ; VP - 12/196
2066	DIRECT RUNOFF TO BAY	STREAM	Fecal Coliform	NA	NI	2	NA	NA	PP - 1/396 ; VP - 1/206
2066	DIRECT RUNOFF TO BAY	STREAM	Turbidity	NA	NI	2	NA	NA	PP - 4/390 ; VP - 4/206
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Dissolved Oxygen	Dissolved Oxygen	IM	3c	Low	2009	PP - 3/7 ; VP - 1/2 Placed on Planning List pursuant to Rule 62.303.300(2).

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2071	NO. PRONG ALLIGATOR CREEK	STREAM	Fecal Coliform	NA	ID	3b	NA	NA	PP - 1/4 ; VP - No Data
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Coliform	Coliform	ND	3c	Low	2009	PP - No Data; VP - No Data. Placed on Planning List pursuant to Rule 62.303.300(2).
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Biology	NA	NI	2	NA	NA	PP - No Data ; VP - 0/1
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Fluoride	NA	ID	3b	NA	NA	PP - 0/1 ; VP - No Data
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Iron	NA	ID	3b	NA	NA	PP - 0/1 ; VP - 0/1
2071	NO. PRONG ALLIGATOR CREEK	STREAM	Turbidity	Turbidity	IM	3c	Low	2009	PP - 0/7 ; VP - 0/2. Placed on Planning List pursuant to Rule 62.303.300(2).
2073	MANGROVE POINT CANAL	ESTUARY	Dissolved Oxygen	NA	IM	5	Medium	2008	PP - 12/34 VP - 12/34 Both nitrogen (median TN =1.04 mg/l) and phosphorus (median TP = 0.15 mg/l) are identified as causative pollutants.
2073	MANGROVE POINT CANAL	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 7.72 ug/L, Range = 1.5-17.7 ug/L, N=29
2073	MANGROVE POINT CANAL	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/30 ; VP - 0/30
2074	ALLIGATOR CREEK	STREAM	Dissolved Oxygen	NA	ID	3b	NA	NA	PP - 1/1; VP - No Data

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2074	ALLIGATOR CREEK	STREAM	Fecal Coliform	NA	ID	3b	NA	NA	PP - 0/1; VP - No Data
2074	ALLIGATOR CREEK	STREAM	Turbidity	NA	ID	3b	NA	NA	PP - 0/1; VP - No Data
2074	ALLIGATOR CREEK	STREAM	Un-Ionized Ammonia	NA	ID	3b	NA	NA	PP - 0/1; VP - No Data
2074A	ALLIGATOR CREEK	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2077	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2079	WHIDDEN CREEK	STREAM	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 10/112 ; VP - 0/58
2079	WHIDDEN CREEK	STREAM	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/137 ; VP - 0/73
2079	WHIDDEN CREEK	STREAM	Turbidity	NA	NI	2	NA	NA	PP - 0/137 ; VP - 0/73
2080	CATFISH CREEK BAYOU	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2081	ALLIGATOR CREEK	STREAM	N/A	NA	ND	3a	NA	NA	PP - No Data VP - No Data
2082A	PIRATE CANAL	STREAM	Dissolved Oxygen	NA	ID	3b	NA	NA	PP - No Data; VP - 0/1
2082A	PIRATE CANAL	STREAM	Copper	NA	ID	3b	NA	NA	PP - No Data; VP - 0/1
2082A	PIRATE CANAL	STREAM	Conductanc e	NA	ID	3b	NA	NA	PP - No Data; VP - 0/1
2082A	PIRATE CANAL	STREAM	Fluoride	NA	ID	3b	NA	NA	PP - No Data; VP - 0/1
2082A	PIRATE CANAL	STREAM	Turbidity	NA	ID	3b	NA	NA	PP - No Data; VP - 0/1

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2082B	YUCCA PEN CREEK	STREAM	Dissolved Oxygen	NA	ID	3b	NA	NA	PP - 0/2 ; VP - No Data
2082B	YUCCA PEN CREEK	STREAM	Fecal Coliform	NA	ID	3b	NA	NA	PP - 0/1 ; VP - No Data
2082B	YUCCA PEN CREEK	STREAM	Turbidity	NA	ID	3b	NA	NA	PP - 0/2 ; VP - No Data
2083	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2084	MOUND CREEK	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2085	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2086	WINEGOURD CREEK	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2087	DIRECT RUNOFF TO BAY	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 3.65 ug/L, Range = 1-14.7 ug/L, N=21
2087	DIRECT RUNOFF TO BAY	ESTUARY	Dissolved Oxygen	NA	IM	3c	NA	NA	PP - 16/30 ; VP - 16/30 DO met the verification threshold per the IWR, but the causative pollutant has not yet been identified.
2087	DIRECT RUNOFF TO BAY	ESTUARY	Fecal Coliform	NA	ID	3b	NA	NA	PP - 0/19; VP - 0/19
2088	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2089	BOGGESS HOLE OUTFLOW	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data

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2090	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2091	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2092A	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2092B	GASPARILLA ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 34/594 ; VP - 10/339
2092B	GASPARILLA ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 6/682 ; VP - 3/382
2092B	GASPARILLA ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 1/682 ; VP - 1/382
2093	DIRECT RUNOFF TO BAY	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2093A	HOG BRANCH	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2094	BEAR BRANCH	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
3240P	NORTH URBAN CAPE CORAL	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 1/108 ; VP - 0/80
3240P	NORTH URBAN CAPE CORAL	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/24 ; VP - No Data
3240P	NORTH URBAN CAPE CORAL	ESTUARY	Oil/Grease	NA	NI	2	NA	NA	PP - 0/23 ; VP - No Data
3240P	NORTH URBAN CAPE CORAL	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/108 ; VP - 0/80

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3240P	NORTH URBAN CAPE CORAL	ESTUARY	Nutrients (Chlorophyll)	NA	ID	3b	NA	NA	PP - Only single sample collected (2/2/95), which was reported as 1,000ug/L, and was excluded from the analysis; VP - No Data
3240P	NORTH URBAN CAPE CORAL	ESTUARY	Total Coliform	NA	ID	3b	NA	NA	PP - 0/1 ; VP - 0/1
3240T	GILCHREST DRAIN	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
8055	CHAR HARBOR PROP GULF	COASTAL	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 3/252 ; VP - 0/126
8055	CHAR HARBOR PROP GULF	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/293 ; VP - 0/147
8055	CHAR HARBOR PROP GULF	COASTAL	Turbidity	NA	NI	2	NA	NA	PP - 0/291 ; VP - 0/145
8055A	PALM ISLAND SOUTH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/4 ; VP - 0/66
8055B	BOCA GRANDE	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/5 ; VP 0/59
8056A	CAPE CORAL YACHT CLUB	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/9; VP - 0/84
1983A	LEMON BAY	ESTUARY	Bacteria (in Shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from approved to conditional).

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1983A	LEMON BAY	ESTUARY	Nutrients (Chlorophyll)	Nutrients	IM	5	Low	2008	Verified based on 2001 mean chlorophyll value of 11.75. Total phosphorous (mean = 0.22mg/L) is identified as the causative pollutant. The system is nitrogen limited.
1983A	LEMON BAY	ESTUARY	Dissolved Oxygen	Dissolved Oxygen	NI	2	NA	NA	PP - 72/1039 ; VP - 52/736
1983A	LEMON BAY	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 5/742 ; VP - 0/367
1983A	LEMON BAY	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/1093 ; VP - 0/736
1983A	LEMON BAY	ESTUARY	Copper	NA	ID	3b	NA	NA	PP - 2/2 ; VP - No Data
1983A	LEMON BAY	ESTUARY	Iron	NA	ID	3b	NA	NA	PP - 0/1 ; VP - No Data
1983A	LEMON BAY	ESTUARY	Total Coliform	NA	ID	3b	NA	NA	PP - 1/16 ; VP - No Data
1983B	LEMON BAY	ESTUARY	Bacteria (in Shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from approved to conditional).
1983B	LEMON BAY	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 7.73 ug/L, Range = 1 - 23.2 ug/L, N=57.
1983B	LEMON BAY	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 37/1199 ; VP - 16/729
1983B	LEMON BAY	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 46/1357 ; VP - 21/828
1983B	LEMON BAY	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/1380 ; VP - 0/826
1983B	LEMON BAY	ESTUARY	Copper	NA	ID	3b	NA	NA	PP - 2/2 ; VP - No Data
2021	DIRECT RUNOFF TO BAY	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data

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2030	ALLIGATOR CREEK	ESTUARY	Dissolved Oxygen	NA	IM	5	NA	NA	PP - 45/60 ; VP - 21/28 DO met the verification threshold per the IWR, but the causative pollutant was incorrectly linked to nutrients. The rationale behind the veracity of this impairment is currently being reevaluated.
2030	ALLIGATOR CREEK	ESTUARY	Fecal Coliform	NA	IM	5	Medium	2008	PP - 27/59 ; VP - 9/28
2030	ALLIGATOR CREEK	ESTUARY	Nutrients (Chlorophyll)	Nutrients	NI	2	NA	NA	Chlorophyll: Mean = 10.35 ug/L, Range = 1-48.7 ug/L, N=25.
2030	ALLIGATOR CREEK	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/32 ; VP - No Data
2030	ALLIGATOR CREEK	ESTUARY	Total Coliform	NA	IM	3c	NA	NA	PP - 20/30 ; VP - No Data
2039	FORKED CREEK	ESTUARY	Nutrients (Chlorophyll)	Nutrients	ND	3c	High	2004	PP - No Data; VP - No Data Placed on Planning List pursuant to Rule 62.303.300(2).
2039	FORKED CREEK	ESTUARY	Dissolved Oxygen	NA	IM	3c	NA	NA	PP - 13/27 ; VP - 3/9 DO met the verification threshold per the IWR, but the causative pollutant has not yet been identified.
2039	FORKED CREEK	ESTUARY	Fecal Coliform	NA	IM	3c	NA	NA	PP - 5/17 ; VP - No Data
2039	FORKED CREEK	ESTUARY	Turbidity	NA	ID	3b	NA	NA	PP - 0/18 ; VP - No Data
2039	FORKED CREEK	ESTUARY	Total Coliform	NA	IM	3c	NA	NA	PP - 7/13 ; VP - No Data

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2042	DIRECT RUNOFF TO BAY	ESTUARY	Nutrients	Nutrients	ND	3c	High	2004	PP - No Data VP - No Data Placed on Planning List pursuant to Rule 62.303.300(2).
2049	GOTTFRIED CREEK	ESTUARY	Dissolved Oxygen	Dissolved Oxygen	PL	3c	High	2004	PP - 26/40 ; VP - 17/25 DO met the verification threshold per the IWR, but the causative pollutant has not yet been identified..
2049	GOTTFRIED CREEK	ESTUARY	Nutrients (Chlorophyll)	Nutrients	PL	3c	High	2004	PP - No Data ; VP - No Data. Placed on Planning List pursuant to Rule 62-303.300(2).
2049	GOTTFRIED CREEK	ESTUARY	Fecal Coliform	NA	ID	3b	NA	NA	PP - 5/16 ; VP - 1/2
2049	GOTTFRIED CREEK	ESTUARY	Total Coliform	NA	ID	3b	NA	NA	PP - 3/7 ; VP - No Data
2049	GOTTFRIED CREEK	ESTUARY	Turbidity	NA	ID	3b	NA	NA	PP - 0/17 ; VP - 0/2
2050	UNNAMED DITCH	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2051	DIRECT RUNOFF TO BAY	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data : VP - No Data
2052	ROCK CREEK	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/10 ; VP - 0/4
2052	ROCK CREEK	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/11 ; VP - 0/4

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2052	ROCK CREEK	ESTUARY	Dissolved Oxygen	NA	IM	5	NA	NA	PP - 12/27 ; VP - 11/20 DO met the verification threshold per the IWR. BOD was inaccurately identified as the causative pollutant. The rationale behind the veracity of this impairment is currently being reevaluated.
2057	UNNAMED DITCH	STREAM	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2067	OYSTER CREEK	ESTUARY	Dissolved Oxygen	NA	IM	5	Medium	2008	PP - 9/21 ; VP - 9/20 BOD (2.6 mg/l) is identified as the causative pollutant.
2067	OYSTER CREEK	ESTUARY	Fecal Coliform	NA	ID	3b	NA	NA	PP - 0/3 ; VP - 0/2
2067	OYSTER CREEK	ESTUARY	Turbidity	NA	ID	3b	NA	NA	PP - 0/3 ; VP - 0/2
2068	BUCK CREEK	ESTUARY	Dissolved Oxygen	NA	IM	5	Medium	2008	PP - 14/21 ; VP - 14/20 Both nitrogen (median TN = 1.11 mg/l) and BOD (4.5 mg/l) are identified as causative pollutants.
2068	BUCK CREEK	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 7.75 ug/L, Range = 1-20 ug/L, N=17
2068	BUCK CREEK	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 2/18 ; VP - 2/17
2068	BUCK CREEK	ESTUARY	Turbidity	NA	ID	3b	NA	NA	PP - 0/2 ; VP - 0/1
2072	DIRECT RUNOFF TO BAY	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2075A	BARRIER ISLAND	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data

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2075B	BARRIER ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 60/788 ; VP - 12/322
2075B	BARRIER ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 13/906 ; VP - 2/365
2075B	BARRIER ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/904 ; VP - 0/363
2075C	BARRIER ISLAND	ESTUARY	N/A	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2075D	BARRIER ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 15/472 ; VP - 3/213
2075D	BARRIER ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 4/554 ; VP - 0/249
2075D	BARRIER ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 1/535 ; VP - 1/230
2075D	BARRIER ISLAND	ESTUARY	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll (Mean = 15.58 ug/L, Range = 1.6 - 79.5 ug/L, N=16) met the verification threshold per the IWR, but the causative pollutant has not yet been identified. Total nitrogen is elevated at 0.97mg/L but does not yet exceed the threshold limit of 1.00mg/L.
2076	DIRECT RUNOFF TO BAY	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 5/186 ; VP - 1/72
2076	DIRECT RUNOFF TO BAY	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 4/211 ; VP - 0/82
2076	DIRECT RUNOFF TO BAY	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/211 VP - 0/82

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2078A	CORAL CREEK	ESTUARY	Dissolved Oxygen	NA	IM	3c	NA	NA	PP - 27/73 ; VP - 12/22 DO met the verification threshold per the IWR, but the causative pollutant has not yet been identified.
2078A	CORAL CREEK	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/60 ; VP - 0/1
2078A	CORAL CREEK	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/60 ; VP - 0/1
2078A	CORAL CREEK	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 10.89 ug/L, Range = 1.0 - 59.0 ug/L, N=53.
2078B	CORAL CREEK E. BRANCH	ESTUARY	Nutrients (Chlorophyll)	Nutrients	IM	5	Low	2008	2001 mean chlorophyll value of 12.81. TN and TP are co-limited.
2078B	CORAL CREEK E. BRANCH	ESTUARY	Dissolved Oxygen	Dissolved Oxygen	ID	3c	Low	2008	PP - 1/16 ; VP - No Data Placed on Planning List per Rule 62-303.300(2)
2078B	CORAL CREEK E. BRANCH	ESTUARY	Fluoride	NA	NI	2	NA	NA	PP - 0/10 ; VP - No Data
2078B	CORAL CREEK E. BRANCH	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/10 ; VP - No Data
2078B	CORAL CREEK E. BRANCH	ESTUARY	Zinc	Zinc	ID	3c	Low	2008	PP - 0/2 ; VP - No Data. Placed on the Planning List pursuant to Rule 62-303.300(2).
2078B	CORAL CREEK E. BRANCH	ESTUARY	Copper	Copper	ID	3c	Low	2008	PP - 1/1 ; VP - No Data Placed on the Planning List pursuant to Rule 62-303.300(2).

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
2078B	CORAL CREEK E. BRANCH	ESTUARY	Fecal Coliform	NA	ID	3b	NA	NA	PP - 0/9 ; VP - No Data
2078B	CORAL CREEK E. BRANCH	ESTUARY	Cadmium	Cadmium	ND	3c	Low	2008	PP - No Data; VP - No Data Placed on the Planning List pursuant to Rule 62-303.300(2).
2078B	CORAL CREEK E. BRANCH	ESTUARY	Lead	Lead	ND	3c	Low	2008	PP - No Data; VP - No Data Placed on the Planning List pursuant to Rule 62-303.300(2).
2078B	CORAL CREEK E. BRANCH	ESTUARY	Iron	NA	ID	3b	NA	NA	PP - 1/8 ; VP - No Data
8054	LEMON BAY GULF	COASTAL	Dissolved Oxygen	NA	ND	3a	NA	NA	PP - No Data ; VP - No Data
8054	LEMON BAY GULF	COASTAL	Nutrients (Chlorophyll)	NA	ND	3a	NA	NA	PP - No Data ; VP - No Data
8054	LEMON BAY GULF	COASTAL	Turbidity	NA	ND	3a	NA	NA	PP - No Data ; VP - No Data
8054A	MANASOTA KEY BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP- 0/11 ; VP - 0/96
8054B	BLIND PASS BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/11 ; VP - 0/96
8054C	ENGLEWOOD NORTH	COASTAL	Dissolved Oxygen	NA	ND	3a	NA	NA	PP - No Data ; VP - No Data
8054C	ENGLEWOOD NORTH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/9 ; VP - 0/66
8054C	ENGLEWOOD NORTH	COASTAL	Turbidity	NA	ND	3a	NA	NA	PP - No Data ; VP - No Data
8054D	ENGLEWOOD MID BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/6 ; VP - 0/70

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
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8054E	ENGLEWOOD SOUTH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/7 ; VP - 0/64
8054F	PALM ISLAND NORTH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/6 ; VP - 0/66
2065E	PINE ISLAND SOUND UPPER	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 4.58 ug/L, Range = 0.5 - 24.2 ug/L, N=82.
2065E	PINE ISLAND SOUND UPPER	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 13/840 ; VP - 1/557
2065E	PINE ISLAND SOUND UPPER	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 26/960 ; VP - 8/590
2065E	PINE ISLAND SOUND UPPER	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 4/077 ; VP - 4/653
2065E	PINE ISLAND SOUND	ESTUARY	Bacteria (in Shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from approved to conditional). The rationale behind the veracity of this impairment is currently being reevaluated.
2065F	MATLACHA PASS	ESTUARY	Nutrients (Chlorophyll)	Nutrients	NI	2	NA	NA	Chlorophyll: Mean = 5.4 ug/L, Range = 0.5-63.1 ug/L, N=201.
2065F	MATLACHA PASS	ESTUARY	Mercury (in fish tissue)	Mercury	ND	3c	Medium	2011	FDEP researching the time frame requirement of 7.5 years for the mercury data. Placed on the Planning List pursuant to Rule 62-303.300(2)

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
2065F	MATLACHA PASS	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 100/1171 ; VP - No Data
2065F	MATLACHA PASS	ESTUARY	Bacteria (in shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from approved to conditional and prohibited). The rationale behind the veracity of this impairment is currently being reevaluated.
2065F	MATLACHA PASS	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 45/1336 ; VP - No Data
2065F	MATLACHA PASS	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 1/1325 ; VP - No Data
2065G	PINE ISLAND SOUND LOWER	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 5.89 ug/L, Range = 0.5-25.0 ug/L, N=96.
2065G	PINE ISLAND SOUND LOWER	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 28/742 ; VP - 13/536
2065G	PINE ISLAND SOUND LOWER	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 23/767 ; VP - 9/458
2065G	PINE ISLAND SOUND LOWER	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 4/733 ; VP - 4/469
2065H	SAN CARLOS BAY	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 4.55 ug/L, Range = 0.5-27.45 ug/L, N=127.
2065H	SAN CARLOS BAY	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 1/846 ; VP - 1/272
2065H	SAN CARLOS BAY	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/20 ; VP - 1/104

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
2065H	SAN CARLOS BAY	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/125 ; VP - 0/134
2065HA	SANIBEL ISLAND CAUSEWAY	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
2082C	GATOR SLOUGH CANAL	STREAM	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll: Mean = 2,745 ug/L, Range = 0.5-25,600 ug/L, N=96. The causative pollutant has not yet been identified.
2082C	GATOR SLOUGH CANAL	STREAM	Dissolved Oxygen	NA	IM	3c	NA	NA	PP - 267/562 ; VP - 194/398 DO met the verification threshold per the IWR, but the causative pollutant has not been identified.
2082C	GATOR SLOUGH CANAL	STREAM	Copper	NA	NI	2	NA	NA	PP - 0/240 ; VP - 0/164
2082C	GATOR SLOUGH CANAL	STREAM	Fecal Coliform	NA	NI	2	NA	NA	PP- 9/298 ; VP - 11/227
2082C	GATOR SLOUGH CANAL	STREAM	Lead	NA	NI	2	NA	NA	PP - 0/240 ; VP - 15/241
2082C	GATOR SLOUGH CANAL	STREAM	Oil/Grease	NA	NI	2	NA	NA	PP - 0/77 ; VP - 1/164
2082C	GATOR SLOUGH CANAL	STREAM	Turbidity	NA	NI	2	NA	NA	PP - 3/568 ; VP - 1/380
2082C	GATOR SLOUGH CANAL	STREAM	Zinc	NA	NI	2	NA	NA	PP - 0/240 ; VP - 0/401

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
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2082C	GATOR SLOUGH CANAL	STREAM	Arsenic	NA	NI	2	NA	NA	PP - 0/1 ; VP - 0/164
2092C	NORTH CAPTIVA ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 3/138 ; VP - 1/54
2092C	NORTH CAPTIVA ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 2/154 ; VP - 1/58
2092C	NORTH CAPTIVA ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/139 ; VP - 0/43
2092C	NORTH CAPTIVA ISLAND	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 4.79 ug/L, Range = 1.0 - 10.5 ug/L, N=14.
2092D	CAPTIVA ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 12/364 ; VP - 3/199
2092D	CAPTIVA ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/426 ; VP- 0/242
2092D	CAPTIVA ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 3/421 ; VP - 3/241
2092E	PINE ISLAND	ESTUARY	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 6.81 ug/L, Range = 0.6 - 72 ug/L, N=106.
2092E	PINE ISLAND	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 46/680 ; VP - 15/429
2092E	PINE ISLAND	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 61/733 ; VP - 33/475
2092E	PINE ISLAND	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 1/655 ; VP - 1/363

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
2092E	PINE ISLAND	ESTUARY	Bacteria (in Shellfish)	NA	IM	5	Medium	2008	Listed based on change in shellfish harvesting classification (downgraded from conditional to prohibited).
2092F	SANIBEL ISLAND	LAKE	Nutrients (TSI)	NA	IM	5	Medium	2008	The annual mean TSI values exceeded the IWR listing threshold value of 60 in 1996 and 1999 through 2002. The system is phosphorous limited.
3240O	PUNTA RASA COVE	ESTUARY	NA	NA	ND	3a	NA	NA	PP - No Data; VP - No Data
3240S	SOUTH URBAN CAPE CORAL	ESTUARY	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll: Mean = 4,178 ug/L, Range = 10-28,000 ug/L, N=141. The causative pollutant has not yet been identified.
3240S	SOUTH URBAN CAPE CORAL	ESTUARY	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 4/568 ; VP - 2/519
3240S	SOUTH URBAN CAPE CORAL	ESTUARY	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/252 ; VP - 0/140
3240S	SOUTH URBAN CAPE CORAL	ESTUARY	Oil/Grease	NA	NI	2	NA	NA	PP - 0/106 ; VP - No Data
3240S	SOUTH URBAN CAPE CORAL	ESTUARY	Turbidity	NA	NI	2	NA	NA	PP - 0/578 ; VP - 0/515
8056	PINE ISLAND GULF 1	COASTAL	Dissolved Oxygen	NA	NI	2	NA	NA	PP - 0/60 ; VP - 0/60

WBID	Waterbody Segment	Waterbody Type	Parameters Assessed	1998 303(d) List	Proposed Status	EPA's Integrated Report Category	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments
				NI = Not Impaired; IM = Impaired; ID = Insufficient Data; ND = No Data; NA = Not Applicable					
8056	PINE ISLAND GULF 1	COASTAL	Turbidity	NA	NI	2	NA	NA	PP - 0/63 ; VP - 0/64
8056A	CAPE CORAL YACHT CLUB	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/9 ; VP - 0/84
8057A	SOUTH SEAS PLANTATION	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/7 ; VP - 0/68
8058A	BLIND PASS/TURNER BEACH	COASTAL	Nutrients (Chlorophyll)	NA	IM	3c	NA	NA	Chlorophyll, Mean = 11.91 ug/L, Range = 2.0 - 25.0 ug/L, N=14. The causative pollutant has not yet been identified
8058A	BLIND PASS/TURNER BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/5 ; VP - 0/67
8058A	BLIND PASS/TURNER BEACH	COASTAL	Dissolved Oxygen	NA	ID	3b	NA	NA	PP - No Data ; VP - 6/17
8058B	BOWMANS BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/8 ; VP - 0/66
8059A	TARPON BAY BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/7 ; VP - 0/71
8059B	LIGHTHOUSE BEACH	COASTAL	Nutrients (Chlorophyll)	NA	NI	2	NA	NA	Chlorophyll: Mean = 6.25 ug/L, Range = 3.0 - 24 ug/L, N=15.
8059B	LIGHTHOUSE BEACH	COASTAL	Fecal Coliform	NA	NI	2	NA	NA	PP - 0/9 ; VP - 0/76
8059B	LIGHTHOUSE BEACH	COASTAL	Dissolved Oxygen	NA	ID	3b	NA	NA	PP - No Data ; VP - 0/17

Table F.2: Water Quality Monitoring Stations Used in the Verified Period for the Assessment of the Charlotte Harbor Basin, by Planning Unit

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Charlotte Harbor Proper								
2063	STREAM	N FORK ALLIGATOR CREEK	2	21FLCHARCHV008	Alligator Cr at Riveria Oyster Bar	1998	2000	257
				21FLA 25010018	N BR ALLIGATOR CR CFL VENICE WTW	1996	1996	16
2065A	ESTUARY	CHARLOTTE HARBOR UPPER	13	21FLA 60050SEAS	Locust Point at Myakka Cutoff	1996	2000	516
				21FLSWFDFLO 168 314 0	CHARLOTTE HARBOR SOUTHERN TOWER #1	1998	2000	1000
				21FLA 25010010	CHARLOTTE HRBR AT RED MRKR 10	1996	1997	38
				21FLSWFDFLO 168 319 0	CHARLOTTE HARBOR MID HARBOR OFF TIDAL GAGE ST	1998	2000	615
				21FLSWFDCH-006	CHARLOTTE HARBOR SOUTHERN TOWER #1	1996	1998	1652
				21FLSWFDCH-09B	CHARLOTTE HARBOR MID HARBOR OFF TIDAL GAGE ST	1996	1998	855
				21FLA 60070SEAS	Shoal Point at SW tip of Hog Island	1996	2000	516
				21FLA 60130SEAS	200 yds NE of Marker 8	1996	2000	516
				112WRD 265355082075500	UPPER CHAR. HARB., TRANSECT NO.2 NR MANGROVE PT.	1996	2000	4918
				FLPRMRWSPR9	Charlotte Harbor west of Marker 1	1996	2002	5945
				21FLA 25010012	CHARLOTTE HRBR AT BLACK MRKR 1	1996	1997	38
				21FLA 60170SEAS	Mid river between Sta. 90 and Sta. 60	1996	2000	508
				FLPRMRWSPR10	Charlotte Harbor SSE of Key Point	1996	2002	4962
2065B	ESTUARY	CHARLOTTE HARBOR MID	7	21FLSWFDCH-009	CHARLOTTE HARBOR MID HARBOR OFF BURNT ST	1996	1998	1490
				21FLSWFDCH-012	CHARLOTTE HARBOR 1000 YDS E BOCA GRANDE NR PASS	1997	1998	796
				21FLSWFDFLO 168 313 0	CHARLOTTE HARBOR SE OF ALLIGATOR POINT	1998	2000	602
				21FLSWFDFLO 168 317 0	CHARLOTTE HARBOR MID HARBOR OFF BURNT ST	1998	2000	995
				21FLSWFDCH-007	CHARLOTTE HARBOR SE OF ALLIGATOR POINT	1996	1998	814
				21FLA 25010053	4.3 MI S MRKR 1, 3.6 MI W BLACKS ISLAND	1996	1997	39
				21FLA 58117SEAS	Cove N of Cape Haze	1996	1997	150

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
2065C	ESTUARY	CHARLOTTE HARBOR MID	18	21FLA 58180SEAS	Bull Bay at fishing cabin	1996	2000	467
				21FLA 58029SEAS	NE corner of Pekins Ranch Cove	1996	2000	570
				21FLCHARCHV012	Char Harbor/Bull Bay/Piling NE of 1st Fis	1998	2000	228
				21FLCHARGSV002	Gasparilla Sound at Boca Grande Pier	1998	2000	259
				21FLCHARGSV003	Gasparilla Sound at ICW Marker 19	1998	2000	202
				21FLA 58201SEAS	Between spoil islands at Catfish Creek	1996	2000	558
				21FLA 58200SEAS	Catfish Point at pilings	1996	2000	447
				21FLA 58160SEAS	Cape Haze Point	1996	2000	563
				21FLA 58182SEAS	SW corner of Leonard's lease	1996	2000	537
				21FLKWATCHA-CHA11-879	Charlotte-CHA11-879	2001	2001	4
				21FLA 58170SEAS	Turtle Bay at pilings	1996	2000	563
				21FLKWATCHA-CHA11-846	Charlotte-CHA11-846	2001	2001	4
				21FLKWATCHA-CHA11-860	Charlotte-CHA11-860	2000	2000	4
				21FLA 58010SEAS	Uncle Henry's Marina	1996	2000	450
				21FLA 58020SEAS	East Grouper Hole	1996	2000	570
				21FLKWATCHA-CHA12-341	Charlotte-CHA12-341	2001	2001	4
				21FLKWATCHA-CHA12-344	Charlotte-CHA12-344	2001	2001	4
				21FLKWATCHA-CHA12-355	Charlotte-CHA12-355	2000	2000	4
2065D	ESTUARY	CHARLOTTE HARBOR LOWER	31	21FLKWATLEE-LEE3-923	Lee-LEE3-923	2001	2001	4
				21FLCHARCHV009	Burnt Store Marina entrance	1998	2000	228
				21FLCHARCHV011	Char Harbor/N Bokeelia/Marker 4	1998	2000	254
				21FLKWATLEE-LEE3-944	Lee-LEE3-944	2001	2001	4
				21FLEECOPI-08		1996	2002	746
				21FLEECOPI-07		1996	2002	746
				21FLKWATLEE-LEE2-968	Lee-LEE2-968	2000	2000	4
				21FLKWATLEE-LEE2-978	Lee-LEE2-978	2001	2001	4
				21FLKWATLEE-LEE1-160	Lee-LEE1-160	2001	2001	4
				21FLKWATLEE-LEE1-163	Lee-LEE1-163	2000	2000	4
				21FLKWATLEE-LEE1-179	Lee-LEE1-179	2001	2001	4

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLKWATLEE-LEE2-977	Lee-LEE2-977	2001	2001	4
				21FLSWFDCH-011	CHARLOTTE HARBOR MAIN CHANNEL RED BUOY #4	1996	1998	1585
				21FLA 58051SEAS	ICWW 3	1996	2000	566
				21FLA 58119SEAS	Marker 5 S of Cape Haze	1996	2000	381
				21FLA 58110SEAS	Shoreline west of ICWW 1	1996	2000	576
				21FLA 58100SEAS	Rear of Boca Grande Bayou Yatch Basin	1996	1996	8
				21FLA 58091SEAS	Mkr 8 W of Bokeelia	1996	2000	545
				21FLA 58050SEAS	Mouth of Sunset Cut	1996	1996	8
				21FLA 58121SEAS	Bokeelia at fishing pier	1996	2000	532
				21FLA 58140SEAS	Eastern most Range Targets	1996	1996	24
				21FLSWFDFLO 168 590 0	CHARLOTTE HARBOR 1000 YDS E BOCA GRANDE NR PASS	1998	2000	928
				21FLKWATLEE-LEE3-909	Lee-LEE3-909	2000	2000	4
				21FLA 58150SEAS	Seawall East of Golf Course	1996	1996	8
				21FLA 58181SEAS	Shoreline of Bull Key at markers	1996	2000	532
				21FLA 62100SEAS	Mouth of Jug Creek	1996	2000	320
				21FLA 62091SEAS	Marker 8 W of Bokeelia	1996	2000	402
				21FLA 58040SEAS	S tip of Three Sisters Island	1996	2000	452
				21FLA 58031SEAS	Shoreline W of ICWW 7	1996	2000	570
				21FLA 58030SEAS	N tip of Hoagen Key	1996	2000	573
				21FLSWFDFLO 168 345 0	CHARLOTTE HARBOR MAIN CHANNEL RED BUOY #4	1998	2000	963
2066	STREAM	DIRECT RUNOFF TO BAY	4	21FLA 60080SEAS	Mouth of Trout Creek	1996	2000	532
				21FLA 58118SEAS	1000 yds E of Sta.117	1996	1997	150
				21FLA 60140SEAS	Mouth of GDC cove	1996	2000	516
				21FLA 60090SEAS	Cattle Dock Point	1996	2000	516
2071	STREAM	NO. PRONG ALLIGATOR CR	2	21FLA 25010011	N PRONG ALLIGATOR CRK AT SR 768	1998	1998	21
				21FLA 25010077	ALLIGATOR CK AT EDWARDS PROP.	1996	1996	15
2073	ESTUARY	MANGROVE POINT CANAL	1	21FLCHARCHV007	Ponce de Leon Park Inlet	1998	2000	287
2079	STREAM	WHIDDEN CREEK	1	21FLA 58190SEAS	Mouth of Whidden Creek	1996	2000	59

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
2082A	STREAM	PIRATE CANAL	1	21FLFTM 25010081FTM	Pirate Harbor Ditch Above Charlotte CR756	2003	2003	1
2087	ESTUARY	DIRECT RUNOFF TO BAY	1	21FLCHARGSV001	Coral Cr at SR771 Bridge	1998	2000	213
2092B	ESTUARY	GASPARILLA ISLAND	6	21FLA 58120SEAS	Boca Grande Pass Marina	1996	2000	561
				21FLA 58090SEAS	Mouth of Yacht basin	1996	2000	468
				21FLA 58060SEAS	Gasparilla Inn golf course ditch	1996	2000	459
				21FLA 58024SEAS	Mouth of Gasparilla Marina	1996	2000	460
				21FLA 58028SEAS	Boca Grande Causeway Channel Mkr 20	1996	2000	570
				21FLA 58026SEAS	Gasparilla Marina Channel Mkr 7	1996	2000	476
3240P	ESTUARY	NORTH URBAN CAPE CORAL	2	CAPECRD 120	Junction of Laguna Lake with North Spreader Waterway	1996	2002	1500
				21FLA 28020242	CRYSTAL LAKE, N CAPE CORAL	1998	1998	17
8055	COASTAL	CHAR HARB PROP GULF	11	21FLKWATCHA-CHA7-259	Charlotte-CHA7-259	2001	2001	4
				21FLA 56271SEAS	Placida Harbor dock Little Gasparilla Island	1996	2000	598
				21FLKWATCHA-CHA7-257	Charlotte-CHA7-257	2001	2001	3
				21FLA 56272SEAS	South tip of Little Gasparilla Island	1996	2000	594
				21FLKWATCHA-CHA7-264	Charlotte-CHA7-264	2000	2000	4
				21FLKWATCHA-CHA8-355	Charlotte-CHA8-355	2001	2001	3
				21FLKWATCHA-CHA8-651	Charlotte-CHA8-651	2000	2000	3
				21FLKWATCHA-CHA8-679	Charlotte-CHA8-679	2001	2001	3
				21FLKWATCHA-CHA9-072	Charlotte-CHA9-072	2001	2001	4
				21FLKWATCHA-CHA9-083	Charlotte-CHA9-083	2000	2000	4
				21FLKWATCHA-CHA9-117	Charlotte-CHA9-117	2001	2001	3
8055A	COASTAL	PALM ISLAND SOUTH	1	21FLDOH CHARLOTTE43	PALM ISLAND SOUTH	2000	2003	100
8055B	COASTAL	BOCA GRANDE	1	21FLDOH CHARLOTTE44	BOCA GRANDE	2000	2003	100
Lemon Bay								
1983A	ESTUARY	LEMON BAY	226	21FLSARA961211-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960821-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960821-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961211-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961120-LB-5	DATE-GRIDLOCATION	1996	1996	32

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA961120-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961120-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961120-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961120-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961023-LB-5	DATE-GRIDLOCATION	1996	1996	26
				21FLSARA961023-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961023-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960924-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961023-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960821-LB-5	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960924-LB-5	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960924-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960924-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960924-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961023-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA970211-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970521-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970521-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970312-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970312-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA960319-LB-1	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA970312-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA960821-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA970312-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970312-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970211-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA961211-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA970211-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970211-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970108-LB-5	DATE-GRID_LOCATION	1997	1997	32

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA970108-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970108-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970108-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970108-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA961211-LB-5	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA961211-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA970211-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLA 56111SEAS	Mouth of Blind Pass	1996	2000	559
				21FLSARA960319-LB-3	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960213-LB-4	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960213-LB-3	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960213-LB-2	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960213-LB-1	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960124-LB-5	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960124-LB-4	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960124-LB-3	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960319-LB-2	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960124-LB-1	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960319-LB-4	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLA 56113SEAS	ICWW 35	1996	2000	570
				21FLA 56115SEAS	ICWW 36	1996	2000	568
				21FLA 56116SEAS	ICWW 28A	1996	2000	574
				21FLA 56230SEAS	Sandpiper Key Yacht Club docks	1996	1998	205
				21FLSARA970521-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA960410-LB-3	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLCHARLBV003	Lemon Bay/N Englewood/Suncrest Ln	1998	2000	232
				21FLCHARLBV002	Lemon Bay at 7765 Manasota Key Dr	1998	2000	246
				21FLSARA960124-LB-2	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960507-LB-5	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960717-LB-5	DATE-GRIDLOCATION	1996	1996	32

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA960717-LB-4	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960717-LB-3	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960717-LB-2	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960717-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960617-LB-5	LEMON BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960617-LB-4	LEMON BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960617-LB-3	LEMON BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960213-LB-5	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960617-LB-1	LEMON BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960821-LB-1	DATE-GRIDLOCATION	1996	1996	32
				21FLSARA960507-LB-4	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960507-LB-3-D	SARASOTA BAY MONITORING BY CCI	1996	1996	636
				21FLSARA960507-LB-3	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960507-LB-2	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960507-LB-1	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960410-LB-5	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960410-LB-4	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960410-LB-1	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARA960617-LB-2	LEMON BAY MONITORING BY CCI	1996	1996	32
				21FLSARALB-2-10	Lemon Bay, north end, near Manasota Beach Road, October	1998	2002	163
				21FLSARALB-3-06	Lemon Bay, north end, near Forked Creek, June	1998	2002	175
				21FLSARALB-2-03	Lemon Bay, north end, near Manasota Beach Road, March	1998	2002	137
				21FLSARALB-2-04	Lemon Bay, north end, near Manasota Beach Road, April	1997	2002	198
				21FLSARALB-2-05	Lemon Bay, north end, near Manasota Beach Road, May	1998	2002	149
				21FLSARALB-2-06	Lemon Bay, north end, near Manasota Beach Road, June	1998	2002	193
				21FLSARALB-2-07	Lemon Bay, north end, near Manasota Beach Road, July	1998	2002	151
				21FLSARALB-2-01	Lemon Bay, north end, near Manasota Beach Road, January	1999	2002	163

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARALB-2-09	Lemon Bay, north end, near Manasota Beach Road, September	1998	2002	168
				21FLSARALB-1-12	Lemon Bay, north end, near Alligator Creek, December	1998	2001	151
				21FLSARALB-2-11	Lemon Bay, north end, near Manasota Beach Road, November	1998	2001	145
				21FLSARALB-2-12	Lemon Bay, north end, near Manasota Beach Road, December	1998	2001	145
				21FLSARALB-3-01	Lemon Bay, north end, near Forked Creek, January	1999	2002	163
				21FLSARALB-3-02	Lemon Bay, north end, near Forked Creek, February	1998	2002	171
				21FLSARALB-3-03	Lemon Bay, north end, near Forked Creek, March	1998	2002	179
				21FLSARALB-3-04	Lemon Bay, north end, near Forked Creek, April	1997	2002	204
				21FLSARA980915-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARALB-2-08	Lemon Bay, north end, near Manasota Beach Road, August	1998	2002	162
				21FLSARALB-1-04	Lemon Bay, north end, near Alligator Creek, April	1997	2002	166
				21FLSARA981013-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA981013-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA981013-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA981013-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA981013-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARALB-1-01	Lemon Bay, north end, near Alligator Creek, January	1999	2002	151
				21FLSARALB-2-02	Lemon Bay, north end, near Manasota Beach Road, February	1998	2002	159
				21FLSARALB-1-03	Lemon Bay, north end, near Alligator Creek, March	1998	2002	171
				21FLSARALB-3-07	Lemon Bay, north end, near Forked Creek, July	1998	2002	175
				21FLSARALB-1-05	Lemon Bay, north end, near Alligator Creek, April	1998	2002	155
				21FLSARALB-1-06	Lemon Bay, north end, near Alligator Creek, June	1998	2002	167
				21FLSARALB-1-07	Lemon Bay, north end, near Alligator Creek, July	1998	2002	172
				21FLSARALB-1-08	Lemon Bay, north end, near Alligator Creek, August	1998	2002	164
				21FLSARALB-1-09	Lemon Bay, north end, near Alligator Creek, September	1998	2002	158

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARALB-1-10	Lemon Bay, north end, near Alligator Creek, October	1998	2002	153
				21FLSARALB-1-11	Lemon Bay, north end, near Alligator Creek, November	1998	2001	145
				21FLSARALB-1-02	Lemon Bay, north end, near Alligator Creek, February	1998	2002	153
				21FLSARALB-5-09	Lemon Bay, north end, near Englewood, September	1998	2002	156
				21FLSARALB-3-05	Lemon Bay, north end, near Forked Creek, May	1998	2002	187
				21FLSARALB-5-02	Lemon Bay, north end, near Englewood, February	1998	2002	183
				21FLSARALB-5-03	Lemon Bay, north end, near Englewood, March	1998	2002	189
				21FLSARALB-5-04	Lemon Bay, north end, near Englewood, April	1997	2002	156
				21FLSARALB-5-05	Lemon Bay, north end, near Englewood, May	1998	2002	193
				21FLSARALB-5-06	Lemon Bay, north end, near Englewood, June	1998	2002	181
				21FLSARALB-4-12	Lemon Bay, north end, near Osceola Blvd., December	1998	2001	151
				21FLSARALB-5-08	Lemon Bay, north end, near Englewood, August	1998	2002	162
				21FLSARALB-4-11	Lemon Bay, north end, near Osceola Blvd., November	1997	2001	168
				21FLSARALB-5-10	Lemon Bay, north end, near Englewood, October	1998	2002	163
				21FLSARALB-5-11	Lemon Bay, north end, near Englewood, November	1997	2001	174
				21FLSARALB-5-12	Lemon Bay, north end, near Englewood, December	1998	2001	151
				21FLSWFDFLO0655	LEMON BAY INDIAN MOUND BARRIER ISLAND	1998	1998	36
				21FLSWFDFLO0656	LEMON BAY INDIAN MOUND MAIN LAND	1998	1998	36
				21FLA 24010663	LEMON BAY-MARKER ?36?	1996	1998	132
				21FLA 24010662	LEMON BAY 50FT DUE EAST MARKER 2	1996	1998	132
				21FLSARALB-5-07	Lemon Bay, north end, near Englewood, July	1997	2002	210
				21FLSARALB-4-03	Lemon Bay, north end, near Osceola Blvd., March	1998	2002	161
				21FLSARALB-3-08	Lemon Bay, north end, near Forked Creek, August	1998	2002	156
				21FLSARA970521-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARALB-3-10	Lemon Bay, north end, near Forked Creek, November	1998	2002	163

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA960319-LB-5	SARASOTA BAY MONITORING BY CCI	1996	1996	32
				21FLSARALB-3-11	Lemon Bay, north end, near Forked Creek, November	1997	2001	168
				21FLSARALB-3-12	Lemon Bay, north end, near Forked Creek, December	1998	2001	145
				21FLSARALB-5-01	Lemon Bay, north end, near Englewood, January	1999	2002	163
				21FLSARALB-4-02	Lemon Bay, north end, near Osceola Blvd., February	1998	2002	177
				21FLSARALB-3-09	Lemon Bay, north end, near Forked Creek, September	1998	2002	168
				21FLSARALB-4-04	Lemon Bay, north end, near Osceola Blvd., April	1997	2002	204
				21FLSARALB-4-05	Lemon Bay, north end, near Osceola Blvd., May	1998	2002	181
				21FLSARALB-4-06	Lemon Bay, north end, near Osceola Blvd., June	1998	2002	187
				21FLSARALB-4-07	Lemon Bay, north end, near Osceola Blvd., July	1997	2002	198
				21FLSARALB-4-08	Lemon Bay, north end, near Osceola Blvd., August	1998	2002	162
				21FLSARALB-4-09	Lemon Bay, north end, near Osceola Blvd., September	1998	2002	168
				21FLSARALB-4-10	Lemon Bay, north end, near Osceola Blvd., October	1998	2002	157
				21FLSARALB-4-01	Lemon Bay, north end, near Osceola Blvd., January	1999	2002	163
				21FLSARA980226-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980415-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA971212-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971212-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971212-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971212-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971212-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA980112-LB-1	DATE-GRID LOCATION	1998	1998	32
				21FLSARA980112-LB-2	DATE-GRID LOCATION	1998	1998	32
				21FLSARA980112-LB-3	DATE-GRID LOCATION	1998	1998	32
				21FLSARA980112-LB-4	DATE-GRID LOCATION	1998	1998	32
				21FLSARA971113-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA980226-LB-1	DATE-GRID_LOCATION	1998	1998	13

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA971007-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA980226-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980226-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980226-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980316-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980316-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980316-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980316-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980316-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980415-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980415-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980112-LB-5	DATE-GRID LOCATION	1998	1998	32
				21FLSARA970819-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970521-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970616-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970616-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970616-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970616-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970616-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970716-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970716-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970716-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970819-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971113-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970819-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971007-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970819-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970918-LB-1	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970918-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970918-LB-3	DATE-GRID_LOCATION	1997	1997	32

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLSARA970918-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970918-LB-5	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA980915-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA971007-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971007-LB-3	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA971007-LB-4	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA970819-LB-2	DATE-GRID_LOCATION	1997	1997	32
				21FLSARA980825-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980825-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980825-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980825-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980415-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980609-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980609-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980609-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980825-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980609-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980506-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980915-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980506-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980506-LB-4	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980915-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980915-LB-3	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980506-LB-2	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980506-LB-1	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980415-LB-5	DATE-GRID_LOCATION	1998	1998	13
				21FLSARA980609-LB-2	DATE-GRID_LOCATION	1998	1998	13
1983B	ESTUARY	LEMON BAY	27	21FLKWATCHA-CHA3-005	Charlotte-CHA3-005	2001	2001	3
				21FLKWATCHA-CHA2-876	Charlotte-CHA2-876	2001	2001	4
				21FLKWATCHA-CHA2-872	Charlotte-CHA2-872	2000	2000	4

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLA 58027SEAS	Between Swing Bridge and RR Bridge	1996	2000	568
				21FLKWATCHA-CHA2-867	Charlotte-CHA2-867	2001	2001	3
				21FLCHARLBV004	Lemon Bay/Englewood/SR776 Pier	1998	2000	263
				21FLKWATCHA-CHA3-010	Charlotte-CHA3-010	2000	2000	4
				21FLA 58025SEAS	Mouth of MERCABO canal	1996	2000	459
				21FLA 58023SEAS	ICWW 20	1996	2000	562
				21FLCHARLBV007	Lemon Bay at State Park Dock	1999	2000	71
				21FLA 56215SEAS	Sandpiper Key Condos	1996	2000	379
				21FLA 24010665	LEMON BAY-MARKER 9	1996	1998	75
				21FLSWFDFLO0659	LEMON BAY DON PEDRO BARRIER ISLAND	1998	1998	36
				21FLSWFDFLO0658	LEMON BAY DON PEDRO MAIN LAND	1998	1998	36
				21FLA 56260SEAS	Mouth of Eldred's Marina	1996	2000	421
				21FLA 56270SEAS	North end of Little Gasparilla Island	1996	2000	597
				21FLSWFDFLO0653	LEMON BAY STUMP PASS MAIN LAND	1998	1998	35
				21FLSWFDFLO0652	LEMON BAY STUMP PASS BARRIER ISLAND	1998	1998	36
				21FLA 56190SEAS	NE tip of Whidden Key	1996	2000	581
				21FLA 24010673	LEMON BAY 50FT WEST OF MARKER 13	1996	1997	30
				21FLA 56110SEAS	Shoreline west of ICWW 25	1996	2000	463
				21FLA 56001SEAS	Lemon Bay - no station name given	1997	2000	411
				21FLA 56129SEAS	ICWW 19A	1996	2000	570
				21FLA 56180SEAS	Stump Pass	1996	2000	594
				21FLA 56002SEAS	Lemon Bay - no station name given	1997	2000	403
				21FLA 56003SEAS	Lemon Bay - no station name given	1997	2000	403
				21FLA 24010667	LEMON BAY-MARKER 20	1996	1998	115
2030	ESTUARY	ALLIGATOR CREEK	1	21FLCHARLBV001	Alligator Cr at Yacht Club Dr, Venice	1998	2000	248
2039	ESTUARY	FORKED CREEK	1	21FLCHARLBFOR1	Forked Cr at 775 bridge	2000	2000	44
2049	ESTUARY	GOTTFRIED CREEK	2	21FLCHARLBGOT2	Gottfried Cr at SR777	1998	2000	95
				21FLA 24010591	GOTTFRIED CRK AT 775-776-45A BRD	1998	1998	30
2052	ESTUARY	ROCK CREEK	2	21FLA 24010600	AINGER CRK AT SR 775 BRDG	1996	1998	62
				21FLCHARLBANG1	Ainger Cr off 776 at Marina Isles condo	1999	2000	68

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
2067	ESTUARY	OYSTER CREEK	2	21FLA 24010599	OYSTER CREEK AT SR775	1996	1996	31
				21FLCHARLBOYS1	Oyster Cr at 2424 Placida Rd., Englewood	1999	2000	78
2068	ESTUARY	BUCK CREEK	2	21FLCHARLBV006	Buck Cr at SR775	1999	2000	155
				21FLA 24010594	BUCK CRK AT SR 775 BRIDGE	1996	1996	15
2075B	ESTUARY	BARRIER ISLAND	8	21FLA 56170SEAS	Canal SW of ICWW 9	1996	2000	515
				21FLA 56172SEAS	End of canal due west of sta. 170	1996	1997	165
				21FLA 56173SEAS	Lagoon at SW end of Knight Pass	1996	1998	243
				21FLA 56174SEAS	Palm Island dock at N end of Knight Pass	1996	1998	220
				21FLA 56171SEAS	Mouth of Knight Pass	1996	2000	563
				21FLA 56290SEAS	ICWW 5	1996	1998	347
				21FLA 56240SEAS	Bocilla Lagoon Cove	1996	1998	339
				21FLA 56280SEAS	North end of Cape Haze canals	1996	2000	553
2075D	ESTUARY	BARRIER ISLAND	6	21FLCHARLBV005	Ski Alley at Weston's Resort	1998	2000	162
				21FLA 56220SEAS	Gulf to Bay MHP	1996	1998	176
				21FLA 56114SEAS	Shoreline west of ICWW 38	1996	2000	384
				21FLA 56212SEAS	Chadwick Cove	1996	1998	205
				21FLA 56127SEAS	North end of "Ski Alley"	1996	2000	514
				21FLA 56112SEAS	Canal west of ICWW 31	1996	2000	570
2076	ESTUARY	DIRECT RUNOFF TO BAY	2	21FLA 56250SEAS	South end of Cape Haze canals	1996	1998	244
				21FLA 56241SEAS	Island Harbor Marina	1996	2000	412
2078A	ESTUARY	CORAL CREEK	5	21FLCHARGSV005	Coral Cr at 20 Arlington Dr., Cape Haze	1998	2000	103
				21FLKWATCHA-CO-CREEK-1	Charlotte-Coral Creek-1-1	2000	2002	81
				21FLKWATCHA-CO-CREEK-4	Charlotte-Coral Creek-4-4	2000	2002	78
				21FLKWATCHA-CO-CREEK-5	Charlotte-Coral Creek-5-5	2002	2002	5
				21FLA 58210SEAS	Mouth of Coral Creek	1996	1996	8
2078B	ESTUARY	CORAL CREEK E.BRANCH	2	21FLKWATCHA-CO-CREEK-2	Charlotte-Coral Creek-2-2	2000	2002	81
				21FLKWATCHA-CO-CREEK-3	Charlotte-Coral Creek-3-3	2000	2002	81
8054A	COASTAL	MANASOTA KEY BEACH	1	21FLDOH SARASOTA336	MANASOTA KEY BEACH	2000	2003	98

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
8054B	COASTAL	BLIND PASS BEACH	1	21FLDOH SARASOTA275	BLIND PASS BEACH	2000	2003	98
8054C	COASTAL	ENGLEWOOD NORTH	1	21FLDOH CHARLOTTE39	ENGLEWOOD NORTH	2000	2003	99
8054D	COASTAL	ENGLEWOOD MID BEACH	1	21FLDOH CHARLOTTE40	ENGLEWOOD MID BEACH	2000	2003	100
8054E	COASTAL	ENGLEWOOD SOUTH	1	21FLDOH CHARLOTTE41	ENGLEWOOD SOUTH	2000	2003	99
8054F	COASTAL	PALM ISLAND NORTH	1	21FLDOH CHARLOTTE42	PALM ISLAND NORTH	2000	2003	100
Pine Island								
2065E	ESTUARY	PINE ISLAND SOUND UPPR	15	21FLA 62302SEAS	Pine Island Sound - no station name given	1998	2000	192
				21FLA 62301SEAS	Pine Island Sound - no station name given	1996	2000	324
				21FLCHARPIV004	Pine Is Sound at Red Fish Pass/South Seas	2000	2000	86
				21FLEECOPI-09		1996	2002	747
				21FLA 62040SEAS	Rocky Channel S of Wood Key	1996	2000	390
				21FLA 58122SEAS	ICWW 75	1996	2000	545
				21FLEECOPI-11		1996	2002	745
				21FLA 62070SEAS	Eastside of Bird Key	1996	2000	312
				21FLA 62030SEAS	Northwest tip of Panther Key	1996	2000	386
				21FLA 62120SEAS	ICWW 75	1996	2000	388
				21FLA 62050SEAS	Southside of Part Island	1996	2000	381
				21FLA 62060SEAS	Cabbage Key at dock	1996	2000	312
				21FLA 62061SEAS	ICWW 57	1996	2000	382
				21FLA 62080SEAS	Useppa Island at docks	1996	2000	303
				21FLA 62090SEAS	Marker 7 at Patricio Island	1996	2000	398
2065F	ESTUARY	MATLACHA PASS	20	21FLA 62390SEAS	North of bridge at north seawall	1996	2000	384
				21FLA 62460SEAS	Mouth of creek E of Matlacha Pass Mkr 47	1996	2000	448
				21FLA 62370SEAS	SW tip of McCardle Island at stakes	1996	2000	456
				21FLA 62360SEAS	SW shoreline at Power lines	1996	2000	412
				21FLA 62020SEAS	S tip of island E of Matlacha Pass Mkr 53	1996	2000	392
				21FLA 62401SEAS	Matlacha Pass Mkr 48	1996	2000	456
				21FLA 62402SEAS	Matlacha Pass Mkr 29	1996	2000	456
				21FLA 62420SEAS	Northeast perimeter	1996	2000	459

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLA 62430SEAS	Big Dead Creek NE of Matlacha Pass Mkr 78	1996	2000	456
				21FLA 62440SEAS	Buzzard Bay E of Matlacha Pass Mkr 66	1996	2000	448
				21FLA 62380SEAS	S tip of island SW of Matlacha Pass Mkr 51	1996	2000	436
				21FLCHARMPV001	Matlacha Pass/N Matlacha Marker 63	1998	2000	265
				21FLA 62500SEAS	Sword Point	1996	2000	443
				21FLA 62501SEAS	Mouth of St. James Creek	1996	2000	428
				21FLCHARMPV002	Matlacha Pass/Pine Is Rd West Bridge	1998	2000	303
				21FLEECOPI-06		1996	2002	747
				21FLEECOPI-05		1996	2002	747
				21FLEECOPI-04		1996	2002	747
				21FLEECOPI-02		1996	2002	745
				21FLEECOPI-03		1996	2002	745
2065G	ESTUARY	PINE ISLAND SOUND LOWR	25	21FLEECOPI-13		1996	2002	744
				21FLSCCFMARKER 20	Marker 20	2001	2002	259
				21FLCHARSCV002	San Carlos Bay/E of Woodrings Pt/Marker 4	1998	2000	245
				21FLCHARPIV007	Pine Is Sound/Flamingo Bay PVC 1	1999	2000	187
				21FLSFWMCAL 15	PINE ISLAND SOUND REGLA ISLAND	1996	1996	82
				21FLA 62054SEAS	East tip of Long Point	1996	2000	374
				21FLA 62053SEAS	Mouth of Tarpon Bay	1996	2000	364
				21FLSFWMHB07	NE. SIDE REGLA ISLAND IN PINE ISLE. SOUND CALOOS	1996	1997	660
				21FLSFWMROOK477	Pine Island Sound	1999	2000	354
				21FLCHARPIV006	Pine Is Sound/Dinkins Bayou Marker 2	1998	2000	259
				21FLKWATLEE-LEE6-722	Lee-LEE6-722	2001	2001	4
				21FLA 62051SEAS	ICWW 5	1996	2000	364
				21FLKWATLEE-LEE10-485	Lee-LEE10-485	2001	2001	4
				21FLKWATLEE-LEE10-494	Lee-LEE10-494	2000	2000	4
				21FLKWATLEE-LEE10-526	Lee-LEE10-526	2001	2001	4
				21FLKWATLEE-LEE6-691	Lee-LEE6-691	2001	2001	4
				21FLKWATLEE-LEE6-652	Lee-LEE6-652	2000	2000	4

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLEECOPI-12		1996	2002	745
				21FLA 62320SEAS	NW tip of York Island	1996	2000	390
				21FLA 62310SEAS	SE side of Regla Island	1996	2000	389
				21FLA 62311SEAS	ICWW 30	1996	2000	394
				21FLA 62300SEAS	Westside of Demere Key	1996	2000	346
				21FLCHARSCV001	San Carlos Bay/S of St James Marker 12	1998	2000	282
				21FLKWATLEE-PI-SOUND-2	Lee-Pine Island Sound-2	2001	2002	55
				21FLKWATLEE-PI-SOUND-1	Lee-Pine Island Sound-1	2001	2002	67
2065H	ESTUARY	SAN CARLOS BAY	17	21FLKWATLEE-SA-OSBAY-3	Lee-San Carlos Bay-3	2001	2002	66
				21FLEECOPI-01		1996	2002	954
				21FLDOH LEE144	SANIBEL CAUSEWAY	2000	2003	98
				21FLSFWMCAL 17	NEAR NORTHEAST SHORE OF MERWIN KEY - SAN CARLOS	1996	1999	51
				21FLKWATLEE-SA-OSBAY-2	Lee-San Carlos Bay-2	2001	2002	57
				21FLSCCFPICNICISLAND	PICNIC iSLAND	2000	2002	1189
				21FLKWATLEE-SA-OSBAY-1	Lee-San Carlos Bay-1	2001	2002	65
				21FLSFWMHB06	S. SIDE KITCHEL KEY KEY IN SAN CARLOS BAY CALOO	1996	1997	660
				21FLSFWMCAL 12	CALOOSAHATCHEE RIVER	1996	1997	60
				21FLSFWMCAL 11	CALOOSAHATCHEE RIVER	1996	1999	162
				21FLSFWMROOK472	San Carlos Bay, R4	1999	2000	360
				21FLSCCFMARKER 13	Marker 13	2000	2002	685
				21FLSCCFMARKER	Marker	2000	2002	669
				21FLEECOPI-14		1996	2002	745
				21FLKWATLEE-SA-OSBAY-5	Lee-San Carlos Bay-5	2001	2002	77
				21FLKWATLEE-SA-OSBAY-4	Lee-San Carlos Bay-4	2001	2002	58
				21FLKWATLEE-SA-OSBAY-6	Lee-San Carlos Bay-6	2001	2002	46

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
2082C	STREAM	GATOR SLOUGH CANAL	6	CAPECRD 150	Junction of Gator Slough and North Spreader Waterway	1996	2002	1521
				21FLFTM 25020557FTM	Gator slough canal west of US41	2003	2003	20
				21FLEECOGATRGR60	GATOR SLOUGH- US 41	1996	2002	1923
				21FLEECOGATRGR30	GATOR SLOUGH- Burnt Store	1996	2002	2087
				CAPECRD 130	Gator Slough at Burnt Store Road	1996	2002	3557
				CAPECRD 110	Gator Slough at Andalusia Boulevard	1996	2002	3609
2092C	ESTUARY	NORTH CAPTIVA ISLAND	3	21FLA 58130SEAS	Pelican Bay	1996	1996	16
				21FLCHARPIV001	Pine Is Sound at Cayo Costa Dock	1999	2000	133
				21FLA 62130SEAS	Pelican Bay at Cayo Costa State Park dock	1996	2000	318
2092D	ESTUARY	CAPTIVA ISLAND	5	21FLA 62059SEAS	Foster Point	1996	2000	393
				21FLA 62600SEAS	Mouth of Safety Harbor behind shack	1996	2000	394
				21FLA 62319SEAS	Wulfert channel marker #4	1996	2000	364
				21FLA 62058SEAS	South Seas Plantation at dock	1996	2000	380
				21FLA 62057SEAS	Jensen's Marina at sign	1996	2000	294
2092E	ESTUARY	PINE ISLAND	11	21FLA 62350SEAS	Shoreline west of Matlacha Pass Mkr 25	1996	2000	410
				21FLCHARMPV003	Matlacha Pass/E of Tropical Homesites	1998	2000	263
				21FLA 62321SEAS	W tip of Galt Island	1996	2000	381
				21FLA 62470SEAS	Shoreline E of McCardle Island	1996	2000	448
				21FLCHARPIV002	Pine Is Sound at Pineland NE of Markers 1	1998	2000	277
				21FLA 62062SEAS	Pineland docks	1996	2000	299
				21FLA 62400SEAS	Indian Field at dock	1996	2000	420
				21FLCHARCHV010	Char Harbor at Bokeelia Pier	1998	2000	256
				21FLA 62410SEAS	Northwest perimeter at Jug Creek Point	1996	2000	452
				21FLCHARMPV004	Matlacha Pass/E St James/8th Ave Marker 3	1998	2000	285
				21FLA 62330SEAS	Marker 6 at mouth of canal in St. James Cit y	1996	2000	364
2092F	LAKE	SANIBEL ISLAND	40	21FLKWATLEE-SA-RIVER-8	Lee-Sanibel River-8-8	2001	2002	43
				21FLKWATLEE-SEAOATS-3	Lee-Sea Oats-3	1996	1999	68
				21FLKWATLEE-ROSEATE-1	Lee-Roseate-1	1996	1998	28
				21FLKWATLEE-ROSEATE-2	Lee-Roseate-2	1996	1998	28

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLKWATLEE-ROSEATE-3	Lee-Roseate-3	1996	1998	28
				21FLKWATLEE-SA-RIVER-1	Lee-Sanibel River-1-1	1996	2002	183
				21FLKWATLEE-SA-RIVER-3	Lee-Sanibel River-3-3	1996	2002	164
				21FLKWATLEE-SA-RIVER-6	Lee-Sanibel River-6-6	2001	2002	43
				21FLKWATLEE-SA-RIVER-5	Lee-Sanibel River-5-5	1996	2002	164
				21FLKWATLEE-SA-RIVER-7	Lee-Sanibel River-7-7	2001	2002	48
				21FLKWATLEE-MUREX-3	Lee-Murex-3	1996	2002	76
				21FLKWATLEE-SEAOATS-2	Lee-Sea Oats-2	1996	1999	64
				21FLKWATLEE-SA-RIVER-2	Lee-Sanibel River-2-2	1996	2002	169
				21FLKWATLEE-ST.KILDA-1	Lee-St. Kilda-1	1996	1997	24
				21FLKWATLEE-ST.KILDA-2	Lee-St. Kilda-2	1996	1997	24
				21FLKWATLEE-ST.KILDA-3	Lee-St. Kilda-3	1996	1997	24
				21FLKWATLEE-VENUS-1	Lee-Venus-1	1997	1999	29
				21FLKWATLEE-VENUS-2	Lee-Venus-2	1997	1999	29
				21FLKWATLEE-VENUS-3	Lee-Venus-3	1997	1999	30
				21FLKWATLEE-WESTROCK-1	Lee-West Rocks-1	1996	1997	21
				21FLKWATLEE-WESTROCK-2	Lee-West Rocks-2	1996	1997	21
				21FLKWATLEE-WESTROCK-3	Lee-West Rocks-3	1996	1997	20
				21FLKWATLEE-SEAOATS-1	Lee-Sea Oats-1	1996	1999	72
				21FLKWATLEE-GULFPINE-3	Lee-Gulf Pines-3	1996	1997	18
				21FLKWATLEE-SA-RIVER-4	Lee-Sanibel River-4-4	1996	2002	181
				21FLKWATLEE-MUREX-2	Lee-Murex-2	1996	2002	76
				21FLKWATLEE-DUNES-2	Lee-Dunes-2	1996	2001	112
				21FLKWATLEE-GULFPINE-2	Lee-Gulf Pines-2	1996	1997	23
				21FLKWATLEE-DUNES-1	Lee-Dunes-1	1996	2002	169
				21FLKWATLEE-GULFSHOR-1	Lee-Gulf Shores-1	1996	1997	22
				21FLKWATLEE-GULFSHOR-2	Lee-Gulf Shores-2	1996	1997	21

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
				21FLKWATLEE-GULFSHOR-3	Lee-Gulf Shores-3	1996	1997	21
				21FLKWATLEE-MUREX-1	Lee-Murex-1	1996	2002	76
				21FLKWATLEE-GUMBOLIM-2	Lee-Gumbo Limbo-2	1996	1998	27
				21FLKWATLEE-GUMBOLIM-3	Lee-Gumbo Limbo-3	1996	1998	27
				21FLKWATLEE-LITTLEMU-1	Lee-Little Murex-1	1996	2002	227
				21FLKWATLEE-LITTLEMU-2	Lee-Little Murex-2	1996	2002	227
				21FLKWATLEE-LITTLEMU-3	Lee-Little Murex-3	1996	2002	227
				21FLKWATLEE-GUMBOLIM-1	Lee-Gumbo Limbo-1	1996	1998	27
				21FLKWATLEE-GULFPINE-1	Lee-Gulf Pines-1	1996	1997	19
3240S	ESTUARY	SOUTH URBAN CAPE CORAL	7	CAPECRD 190	Junction of Hermosa Canal and Atkinson Canal	1996	2002	3578
				CAPECRD 445	Maxine Canal at Surfside Boulevard	1997	2002	1174
				CAPECRD 450	Junction of South Spreader Waterway and Hernando Canal	1996	2002	1397
				CAPECRD 455	Rose Canal at Oasis Boulevard Bridge	1997	2002	1175
				CAPECRD 570	South Spreader Waterway bend at Sagamore Place	1996	2002	1517
				CAPECRD 580	South Spreader Waterway bend, west of Peelinore Court.	1996	2002	1506
				CAPECRD 550	South Spreader Waterway at west end of El Dorado Parkway	1996	2002	3740
8056	COASTAL	PINE ISLAND GULF 1	3	21FLSWFDFLO 168 344 0	CHARLOTTE HARBOR MAIN CHANNEL GREEN BUOY #7	1999	2002	565
				21FLSWFDCH-013	CHARLOTTE HARBOR MAIN CHANNEL GREEN BUOY #7	1996	1998	1340
				21FLSWFDCH-014	CHARLOTTE HARBOR MAIN CHANNEL RED BUOY #2	1996	1997	604
8056A	COASTAL	CAPE CORAL YACHT CLUB		21FLDOH LEE145	CAPE CORAL YACHT CLUB	2000	2003	100
8057A	COASTAL	SOUTH SEAS PLANTATION	1	21FLDOH LEE139	SOUTH SEAS PLANTATION	2000	2003	98
8058A	COASTAL	BLIND PASS/TURNER BEACH	2	21FLSCCFBLIND PASS	Blind Pass	2001	2002	264
				21FLDOH LEE140	BLIND PASS/TURNER BEACH	2000	2003	98

Planning Unit & WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
8058B	COASTAL	BOWMANS BEACH	1	21FLDOH LEE141	BOWMANS BEACH	2000	2003	98
8059A	COASTAL	TARPON BAY BEACH	1	21FLDOH LEE142	TARPON BAY BEACH	2000	2003	98
8059B	COASTAL	LIGHTHOUSE BEACH	2	21FLSCCFSANIBEL PIER	Sanibel Fishing Pier	2001	2002	270
				21FLDOH LEE143	LIGHTHOUSE BEACH	2000	2003	100

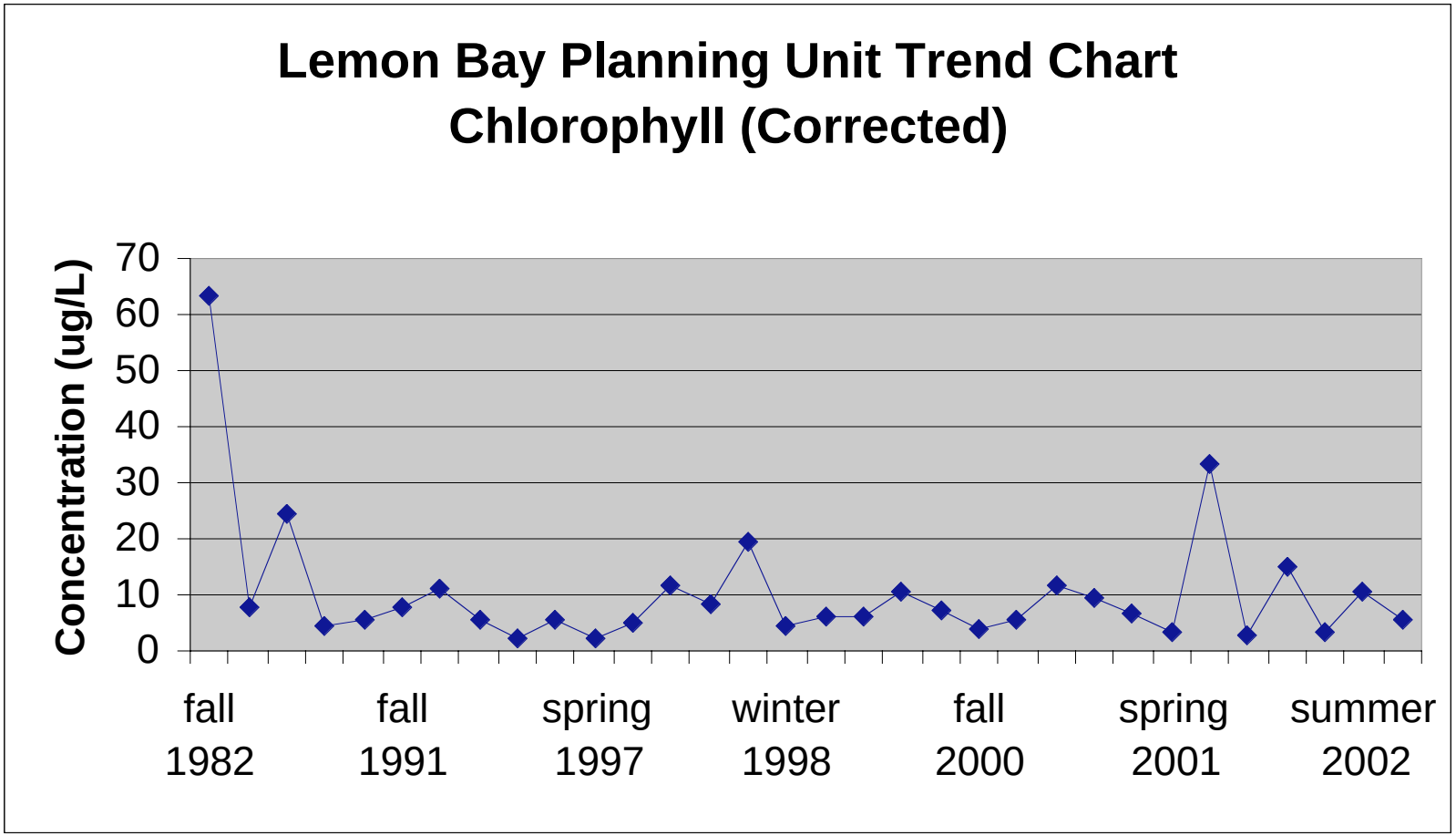


Figure F.1: Lemon Bay Planning Unit Chlorophyll Trend Chart

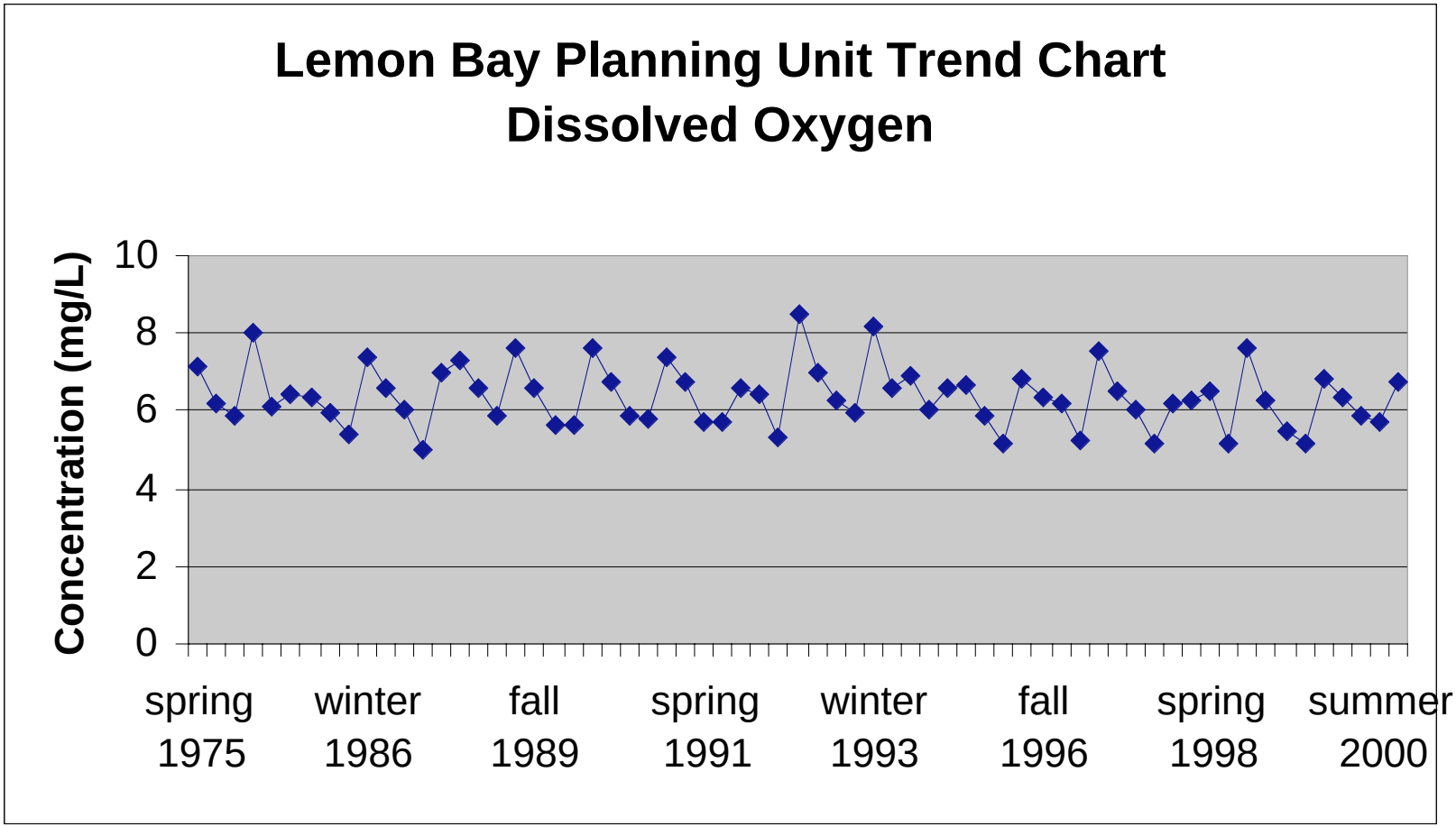


Figure F.2 Lemon Bay Planning Unit Dissolved Oxygen Trend Chart

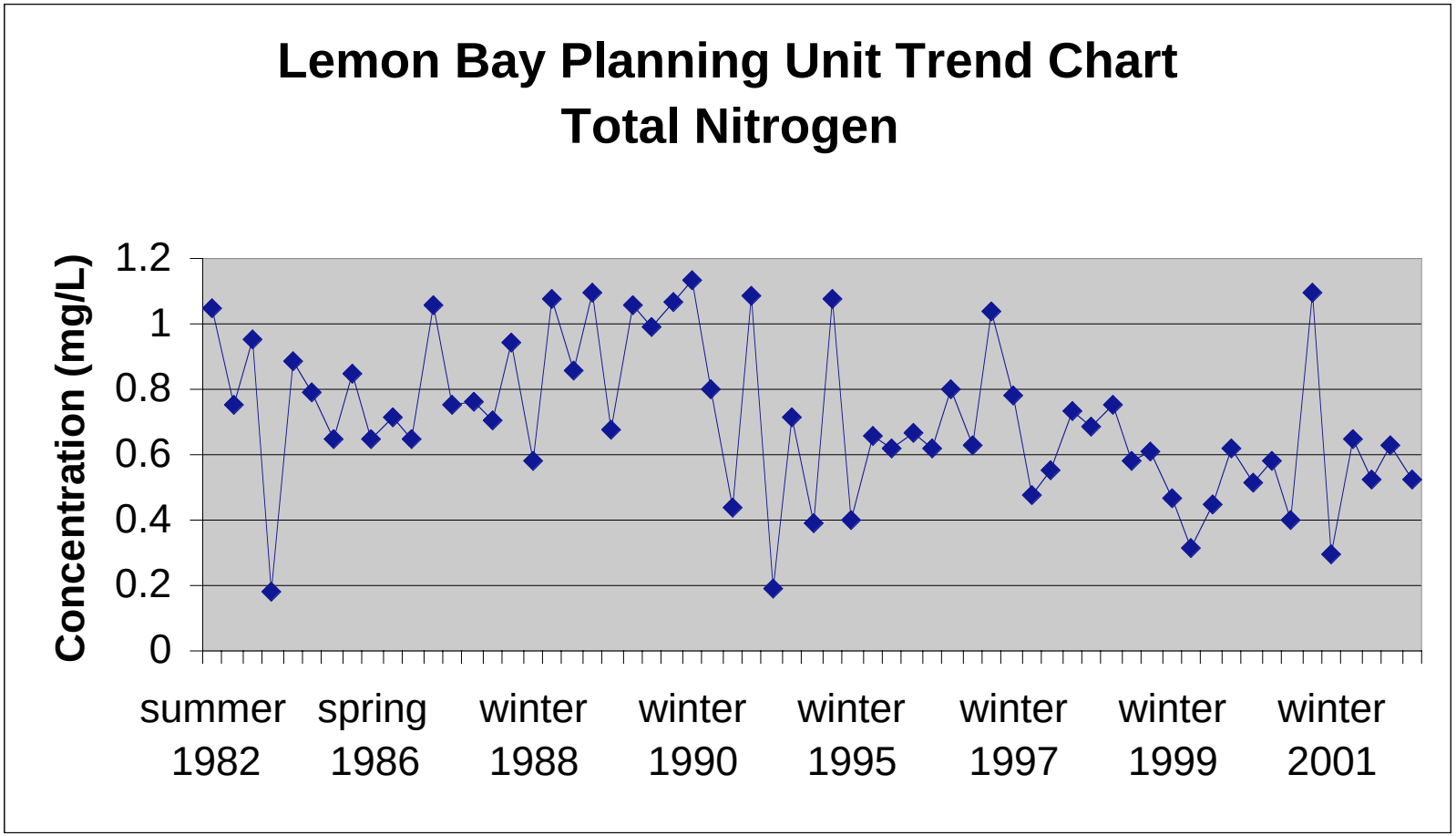


Figure F.3: Lemon Bay Planning Unit Total Nitrogen Trend Chart

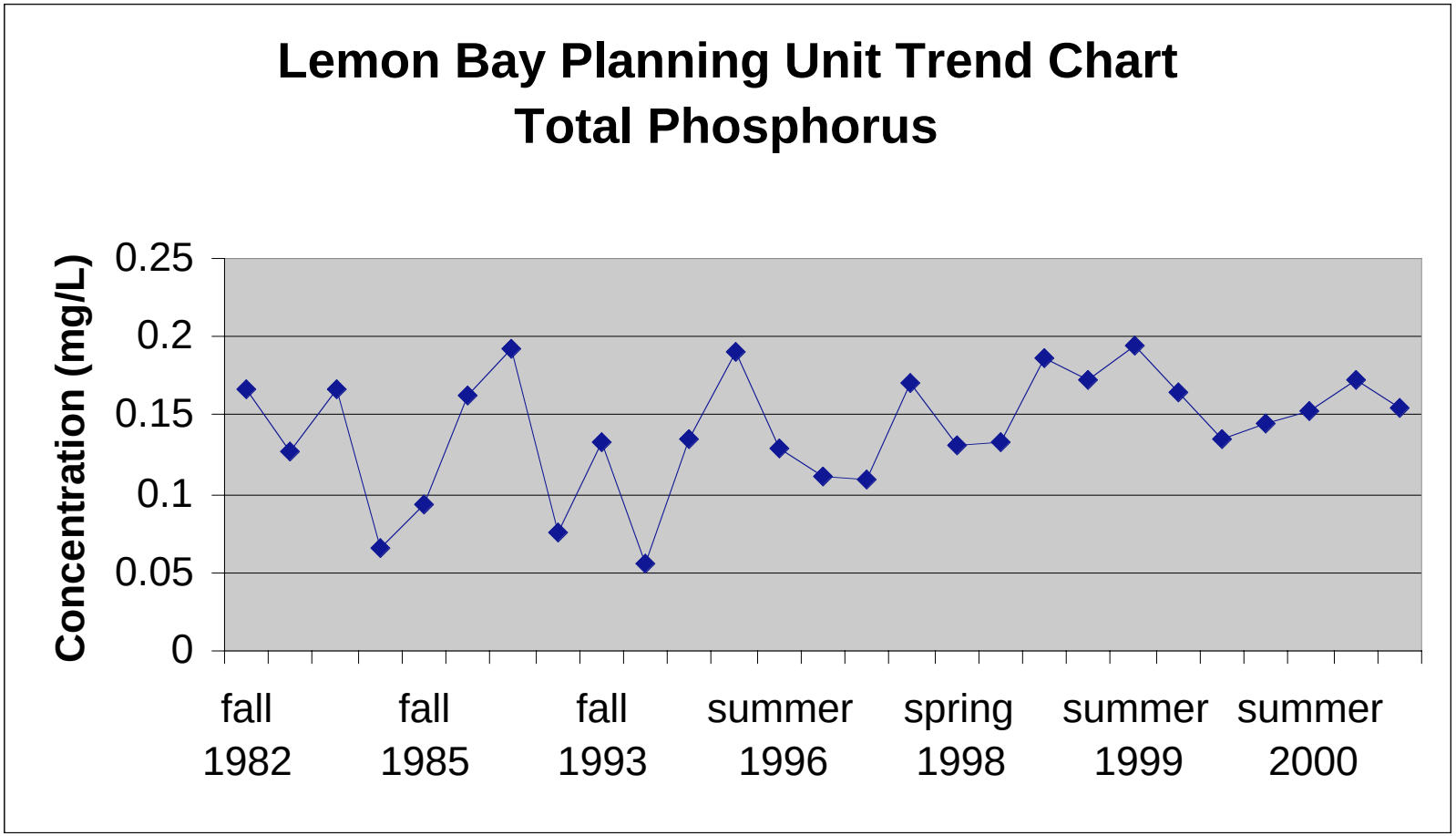


Figure F.4: Lemon Planning Unit Total Phosphorus Trend Chart

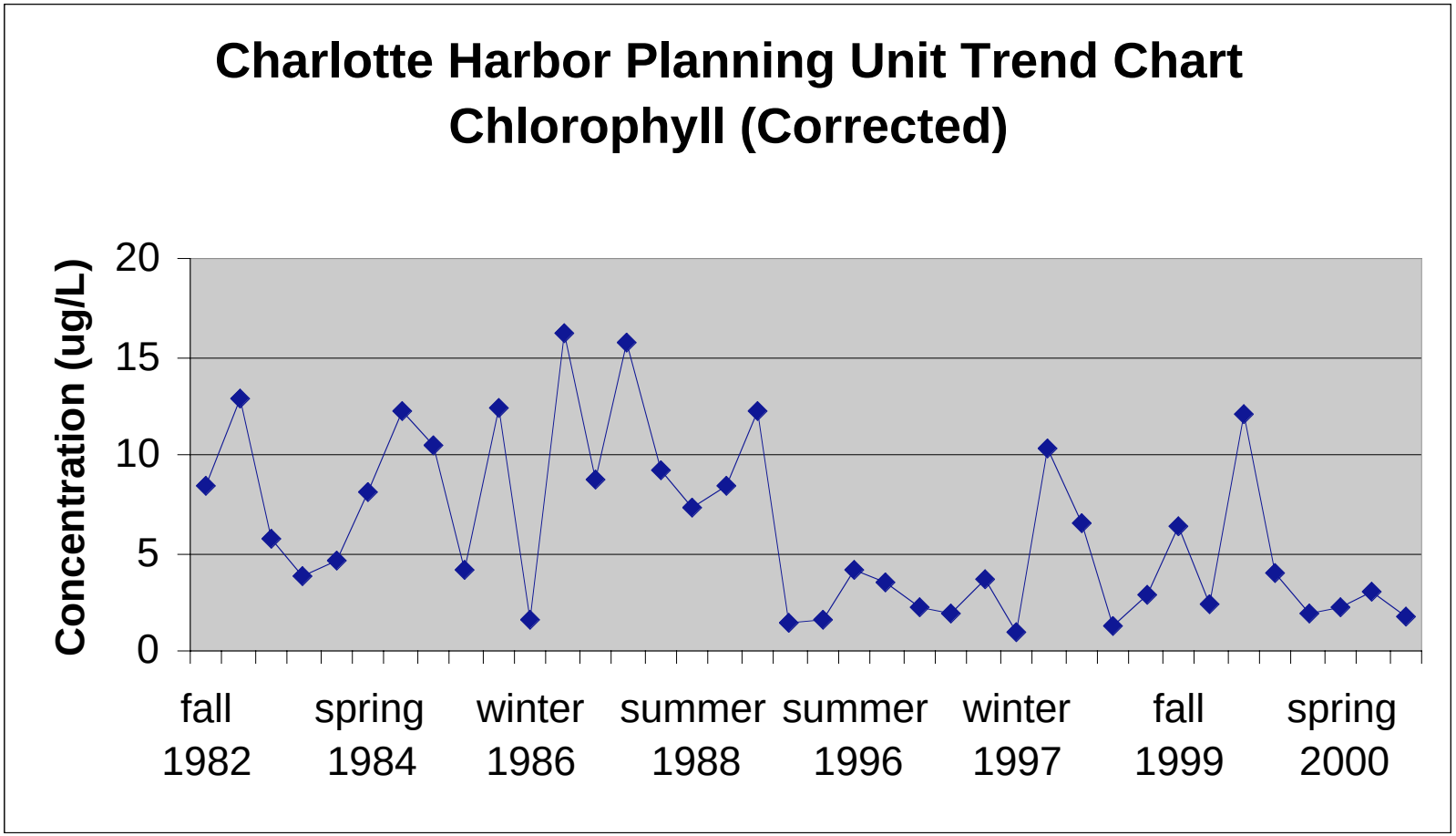


Figure F.5: Charlotte Harbor Planning Unit Chlorophyll Trend Chart

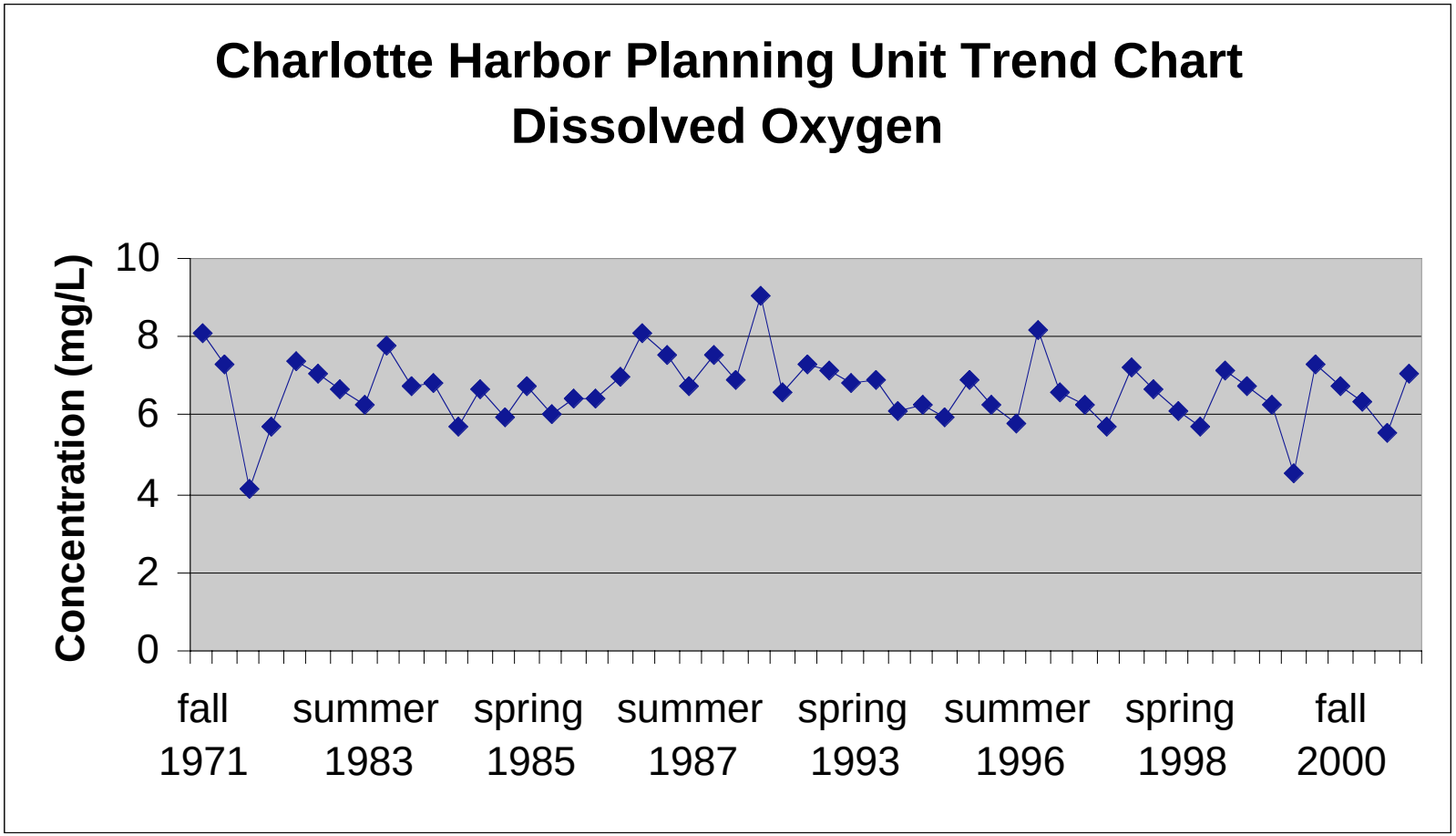


Figure F.6: Charlotte Harbor Planning Unit Dissolved Oxygen Trend Chart

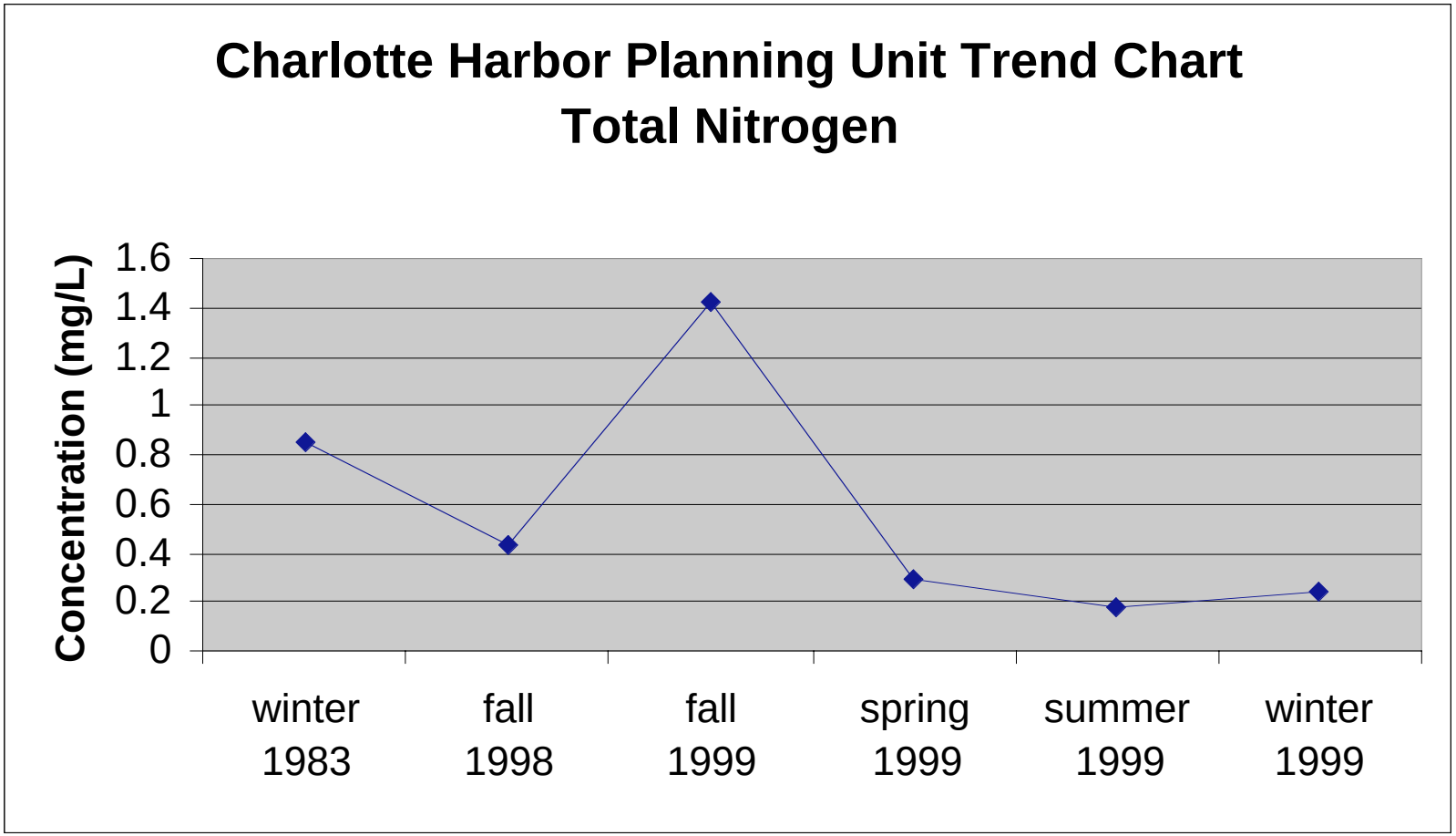


Figure F.7: Charlotte Harbor Planning Unit Total Nitrogen Trend Chart

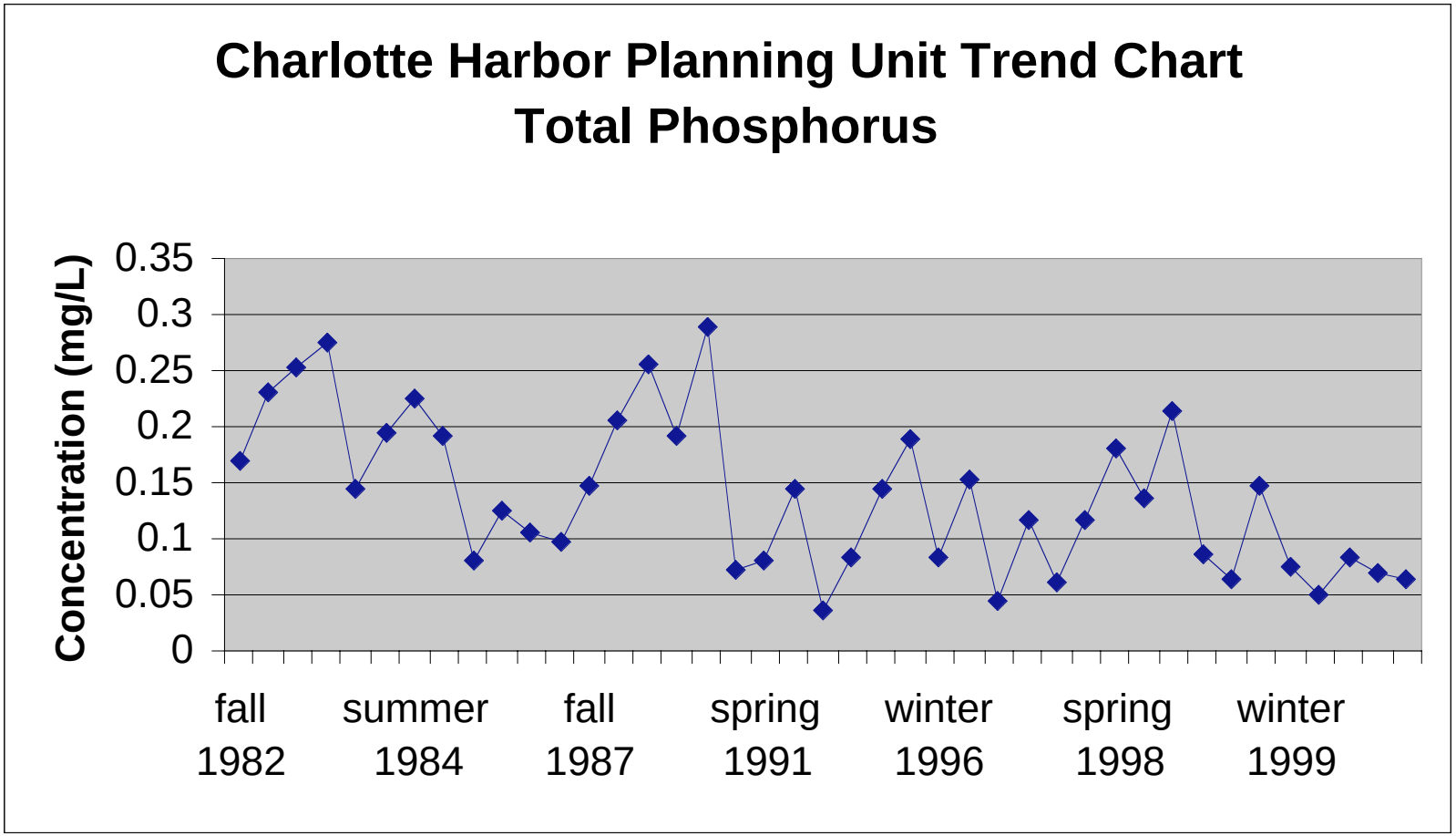


Figure F.8: Charlotte Harbor Planning Unit Total Phosphorus Trend Chart

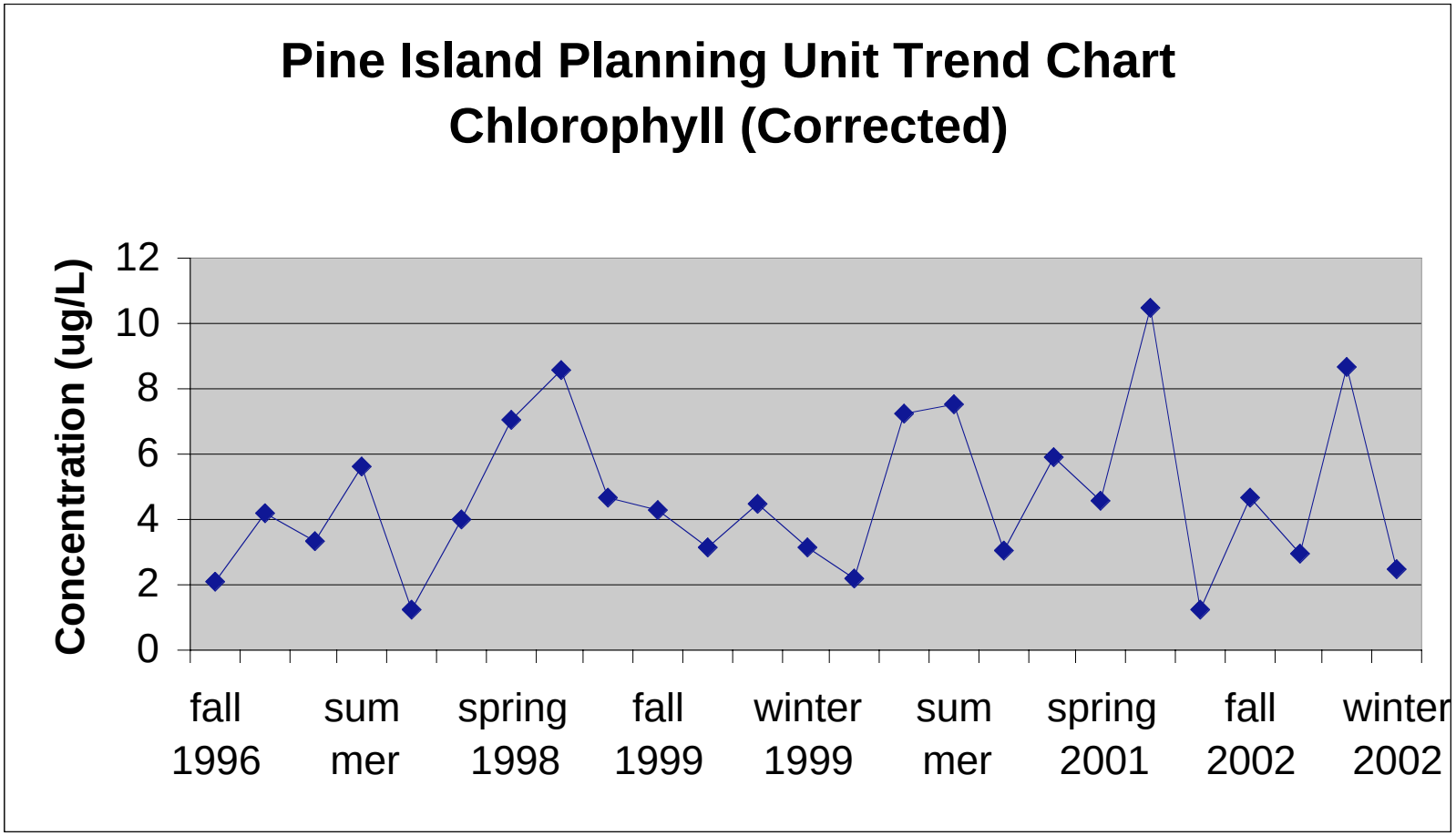


Figure F.9: Pine Island Planning Unit Chlorophyll Trend Chart

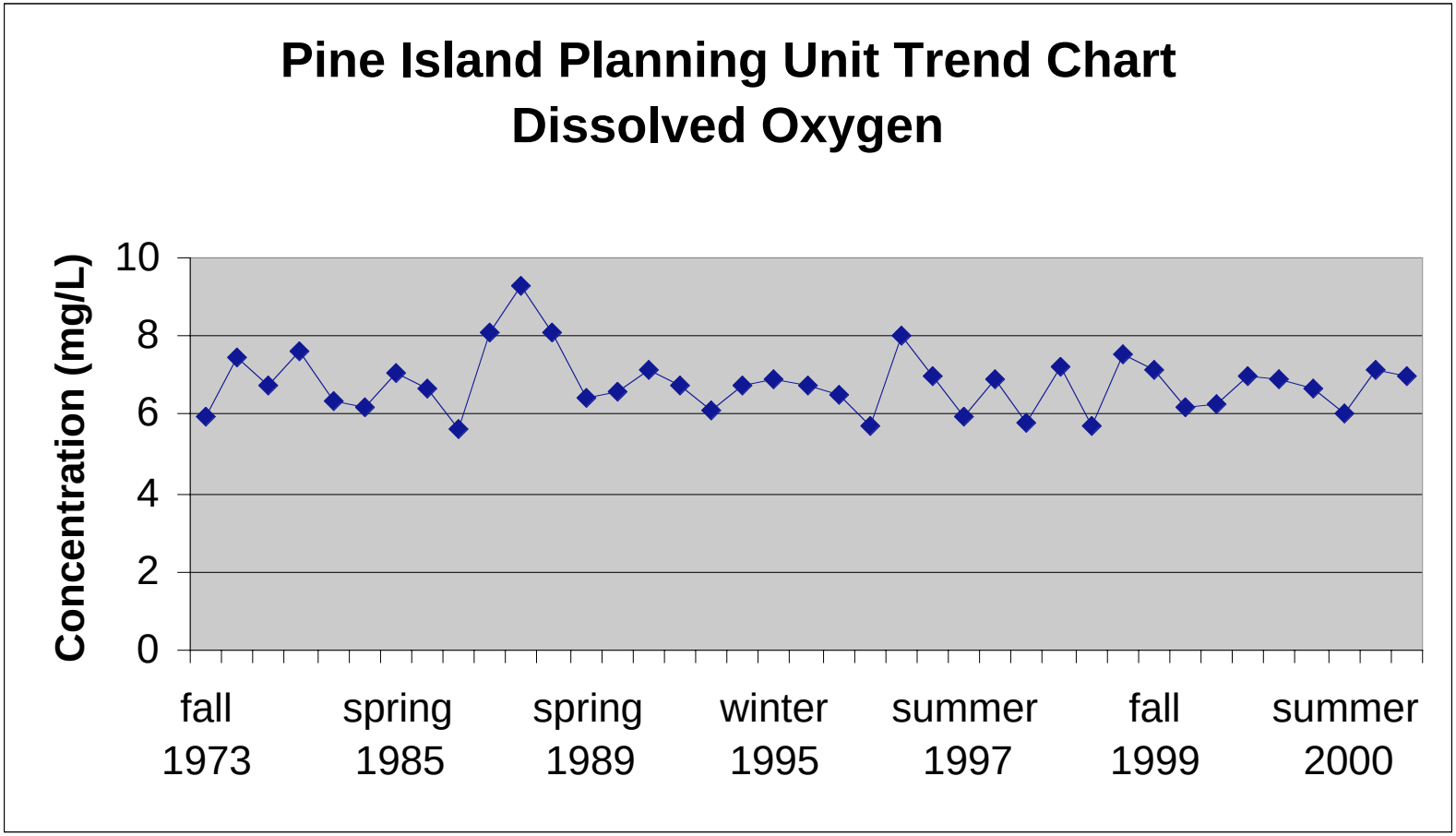


Figure F.10: Pine Island Planning Unit Dissolved Oxygen Trend Chart

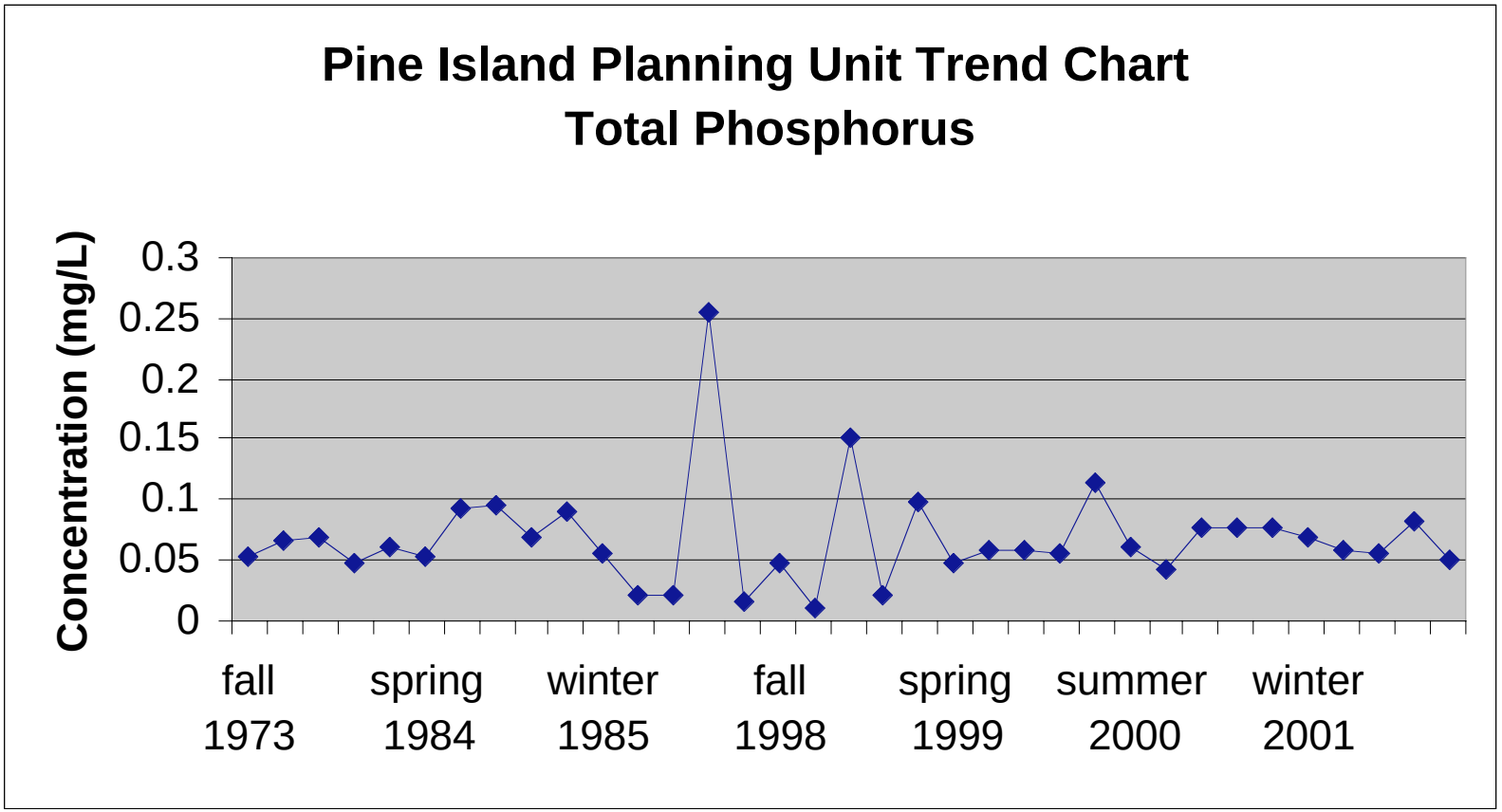


Figure F.11: Pine Island Planning Unit Total Phosphorus Trend Chart

Appendix G: Permitted Facilities and Landfills in the Charlotte Harbor Basin, by Planning Unit

Table G.1: Permitted Wastewater Treatment Facilities in the Charlotte Harbor Basin, by Planning Unit

Name	City	Facility Type	Status	NPDES	Design Capacity (mgd)
Charlotte Harbor Proper Planning Unit					
BAY PALMS MOBILE HOME PARK	PUNTA GORDA	DW	A	N	0.0100
ALLIGATOR MOBILE HOME PARK	PUNTA GORDA	IW	A	N	0.0400
BURGESS ISLAND ASSOCIATES INC	BOKEELIA	IW	A	N	0.0038
SUNSET REALTY AQUACULTURE	BOCA GRANDE	IW	A	N	0.1000
HARBOR BRANCH OCEANOGRAPHIC INSTITUTE INC	BOKEELIA	IW	A	N	
CHARLOTTE COUNTY UTILITY WESTPORT WWTF	PORT CHARLOTTE	DW	A	N	0.3850
TROPICAL PALMS OF FT MYERS LTD MHP	SOUTH PUNTA GORDA	DW	A	N	0.0000
BLUE HERON PINES MHP	PUNTA GORDA	DW	A	N	0.0950
BURNT STORE WWTF	PUNTA GORDA	DW	A	N	0.2500
CASA DEL MAR MHP	PUNTA GORDA	IW	A	N	
FLORIDA WATER SERVICES BURNT STORE RO	PUNTA GORDA	IW	A	Y	0.1600
ALLIGATOR MOBILE HOME PARK	PUNTA GORDA	DW	A	N	
CHARLOTTE CORRECTIONAL INSTITUTION	PUNTA GORDA	DW	A	N	0.1800
SUNSEEKERS RV PARK	N. FT. MYERS	DW	A	N	0.0500
GASPARILLA IS WATER DOMESTIC DIW	BOCA GRANDE	DW	A	N	0.7050
HERON'S GLEN AKA: DEL VERA WWTP	NORTH FORT MYERS	DW	A	N	0.1250
BURNT STORE COLONY MOBILE HOME PARK	PUNTA GORDA	DW	A	N	0.0600
BOCILLA ISLAND CLUB	BOKEELIA	DW	A	N	0.0300
DEL TURA COUNTRY CLUB	N. FORT MYERS	DW	A	N	0.2000
SUN-N-SHADE FAMILY CAMPGROUND STP	PUNTA GORDA	DW	A	N	0.0200
GASPARILLA MOBILE ESTATES	PLACIDA	DW	A	N	0.0250
Lemon Bay Planning Unit					
KNIGHT ISLAND UTILITIES INC	CAPE HAZE	IW	A	N	0.0300
SEASIDE SERVICE SYSTEM INC	PLACIDA	UIC	A	N	0.0360
KNIGHT ISLAND UTILITIES WWTP	CAPE HAZE	DW	A	N	0.0550
COLE, DOROTHY - MARINE BIVALVE	PLACIDA	IW	A	N	
LITTLE GASPARILLA UTILITY INC	GROVE CITY	IW	A	N	

Name	City	Facility Type	Status	NPDES	Design Capacity (mgd)
GULF OLDS PONTIAC AUTOBODY SHOP	SARASOTA	IW	A	N	
PARK POINTE VILLAS WWTP	ENGLEWOOD	DW	A	N	
VENICE GARDENS WWTP	VENICE	DW	A	N	2.0000
FLORIDA PINES MHC	VENICE	DW	A	N	0.0105
POLYNESIAN VILLAGE MHP WWTP	ENGLEWOOD	DW	A	N	0.0400
ENGLEWOOD UTILITIES WWTP	ENGLEWOOD	DW	A	N	0.1550
SANDALHAVEN UTILITIES STP	ENGLEWOOD	DW	A	N	
HIDEAWAY BAY BEACH CLUB CONDO ASSOCIATION INC	PLACIDA	DW	A	N	0.0210
BIZZY BUZZY'S COIN LAUNDRY	GROVE CITY	IW	A	N	
GASPARILLA ISLAND WATER ASSOC	BOCA GRANDE	IW	A	Y	0.6700
MERCURY MARINE	PLACIDA	DW	A	N	
ENGLEWOOD WATER DISTRICT SOUTH	GROVE CITY	DW	A	N	1.2000
VENICE GARDENS WATER UTIL DIW	SARASOTA	UIC	A	N	1.8000
JAPANESE GARDENS MHP WWTP	VENICE	DW	A	N	0.0480
2224 SOUTH TRAIL WWTP	VENICE	DW	A	N	0.0030
AQUASOURCE UTILITY INC FORMERLY ROTONDA WEST UTILIITY	ROTONDA WEST	IW	A	Y	0.5000
AQUASOURCE UTILITY INC AKA: ROTUNDA WEST	PLACIDA	DW	A	N	
INDIGO ISLES MHP OWNERS ASSOC INC	ENGLEWOOD	DW	C	N	
MANASOTA BEACH GARDENS WWTP	ENGLEWOOD	DW	A	N	0.0090
Pine Island Planning Unit					
T&M COMPANY	BOKEELIA	IW	A	N	
FISHERMAN'S BOUNTY INC	ST. JAMES CITY	IW	A	N	
ROY L. KIBBE	ST. JAMES CITY	IW	A	N	
MARINER HIGH SCHOOL	CAPE CORAL	DW	A	N	0.0500
DONAX WATER RECLAMATION FACILITY	SANIBEL	DW	A	N	1.6000
CAPE CORAL REV OSMOSIS WTP	CAPE CORAL	IW	A	Y	1.2000
LAKE FAIRWAYS FFEC SIX	N. FT. MYERS	DW	A	N	0.3000
SUNSET CAPTIVA WWTP	CAPTIVA ISLAND	DW	A	N	0.0250
FISHERMAN'S WHARF CONDOMINIUM	ST. JAMES CITY	DW	A	N	0.0100
PINE ISLAND ROAD WWTF AKA: TWISTEE TREAT	CAPE CORAL	DW	A	N	0.0250
BLUE CRAB KEY CONDO	BOKEELIA	DW	A	N	0.0460

Name	City	Facility Type	Status	NPDES	Design Capacity (mgd)
ISLES OF PINES SUB-DIVISION	BOKEELIA	DW	A	N	0.0083
SEA OATS S/D	SANIBEL ISLAND	DW	A	N	0.0150
PINE ISLAND COVE	ST. JAMES CITY	DW	A	N	0.0500
SANIBEL BAYOUS UTILITIES INC	SANIBEL	DW	A	N	0.0800
TROPIC ISLES RV RESORT	BOKEELIA	DW	A	N	0.0150
GULF PINES SUBDIVISION	SANIBEL ISLAND	DW	A	N	0.0300
TWEEN WATERS INN WWTP	CAPTIVA ISLAND	DW	A	N	0.0400
USEPPA INN & DOCK	USEPPA ISLAND	IW	A	N	0.0270
WULFERT POINT WWTP (CITY OF SANIBEL)	SANIBEL ISLAND	DW	A	N	0.1250
ENVIRONMENTAL SYSTEMS OF PINE ISLAND (CHERRY ESTATES)	ST JAMES CITY	DW	A	N	0.0950
ISLAND WATER ASSOC-SANIBEL ISL	SANIBEL	IW	A	Y	1.3300
PINE ISLAND KOA	SAINT JAMES CITY	DW	A	N	0.0350
SOUTH SEAS PLANTATION	CAPTIVA	DW	A	N	0.4500
PINK CITRUS TRAILER PARK	PINE ISLAND	DW	A	N	0.0250
EDWIN CONNERY	PINE ISLAND	IW	A	N	
PINE ISLAND WWTP	ST. JAMES CITY	DW	A	N	0.5000
GREATER PINE ISLAND RO TREATMENT PLANT	ST JAMES CITY	IW	A	N	0.2670
SAFETY HARBOR CLUB VILLAGE	PINELAND	DW	A	N	0.0150
PINE ISLAND SHOPPING CENTER	FORT MYERS	DW	A	N	0.0200
CAPTAIN'S COVE	BOKEELIA	DW	A	N	0.0400
FOUR WINDS MARINA	BOKEELIA	DW	A	N	0.0115
PAMELA & JOHN SCHULZ	ST. JAMES	IW	A	N	
CAPTIVA SHORES CONDOMINIUM WWTP	CAPTIVA	DW	A	N	0.0100
RABBIT ROAD CENTER AKA:LOCO'S CENTER/TIMBER'S REST/PLAZA CL	SANIBEL	DW	A	N	0.0100
USEPPA INN & DOCK CO.	BOKEELIA	DW	A	N	0.0450

UIC = Underground Injection Control
DW = Domestic Wastewater
IW = Industrial Wastewater

A = Active Facility
C = Closed Facility, but monitored

Table G.2: Landfills in the Charlotte Harbor Basin, by Planning Unit

Planning Unit	City	Address
Lemon Bay	PLACIDA	6MI NE PLACIDA OFF SR771
Charlotte Harbor	TROPICAL GULF ACRES	ZEMEL RD, W US41
Charlotte Harbor	PUNTA GORDA	30001 ZEMEL RD
Charlotte Harbor	PUNTA GORDA	9100 BURNT STORE RD

Appendix H: Level 1 Land Use in the Charlotte Harbor Basin, by Planning Unit

Planning Unit	Charlotte Harbor Proper		Lemon Bay		Pine Island	
Land Use Category	**Area (square miles)**	**Percentage of Land Area**	**Area (square miles)**	**Percentage of Land Area**	**Area (square miles)**	**Percentage of Land Area**
Urban and Built-up	43.98	10.81	42.33	43.47	34.16	14.59
Agriculture	13.08	3.22	4.82	4.95	4.67	1.99
Rangeland	17.35	4.27	8.28	8.51	2.79	1.19
Upland Forests	54.52	13.41	14.86	15.26	10.49	4.48
Water	205.47	50.53	16.20	16.64	131.86	56.34
Wetlands	67.56	16.61	10.01	10.28	44.51	19.02
Barren Land	1.03	0.25	0.06	0.07	1.68	0.72
Transportation, Communications, and Utilities	3.67	0.90	0.81	0.83	3.90	1.67
Totals	**406.67**	**100.00**	**97.37**	**100.00**	**234.06**	**100.00**

Appendix I: Pollutant Loading Trends in the Charlotte Harbor Basin

This nonpoint source loading summary was prepared by T. S. Wu and D. K. Gilbert of the Department's Watershed Assessment Section. It provides loading estimates from two studies by the Southwest Florida Water Management District (SWFWMD) and Charlotte Harbor National Estuary Program (CHNEP), respectively. The following sections discuss these studies and compare their results.

Southwest Florida Water Management District Loading Study

This study calculated the annual loading for total nitrogen (TN) and total phosphorus (TP) to Charlotte Harbor (Southwest Florida Water Management District, 1995). The study area, shown in **Figure I.1**, is subdivided into sixteen watersheds **(Table I.1)** organized into seven groups **(Figure I.2)**, for which loading estimates to Charlotte Harbor were calculated. The Department's Charlotte Harbor Group 2 Basin lies roughly within the southern portion of the SWFWMD study area.

Figure I.1: SWFWMD Charlotte Harbor Loading Study Area

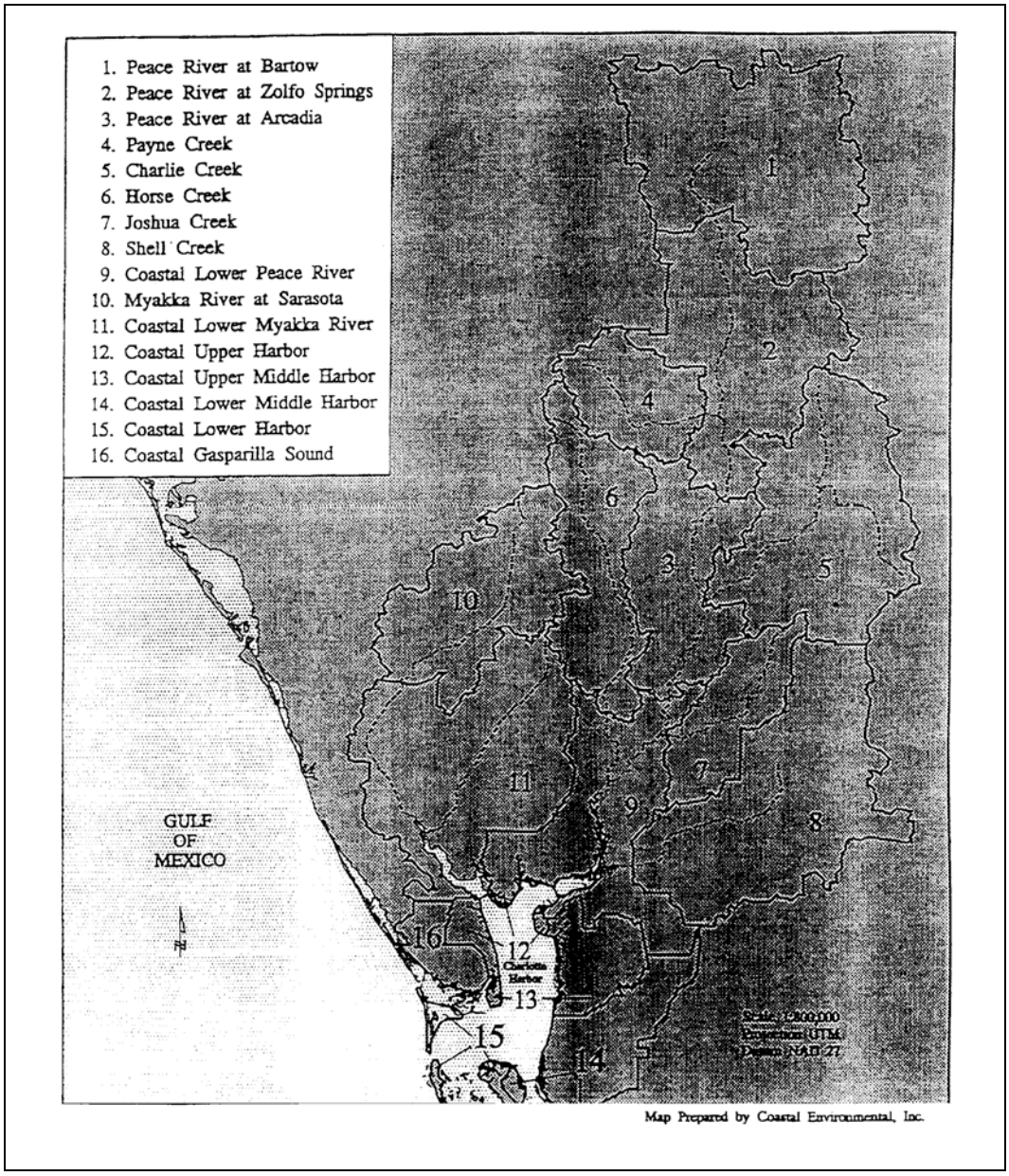
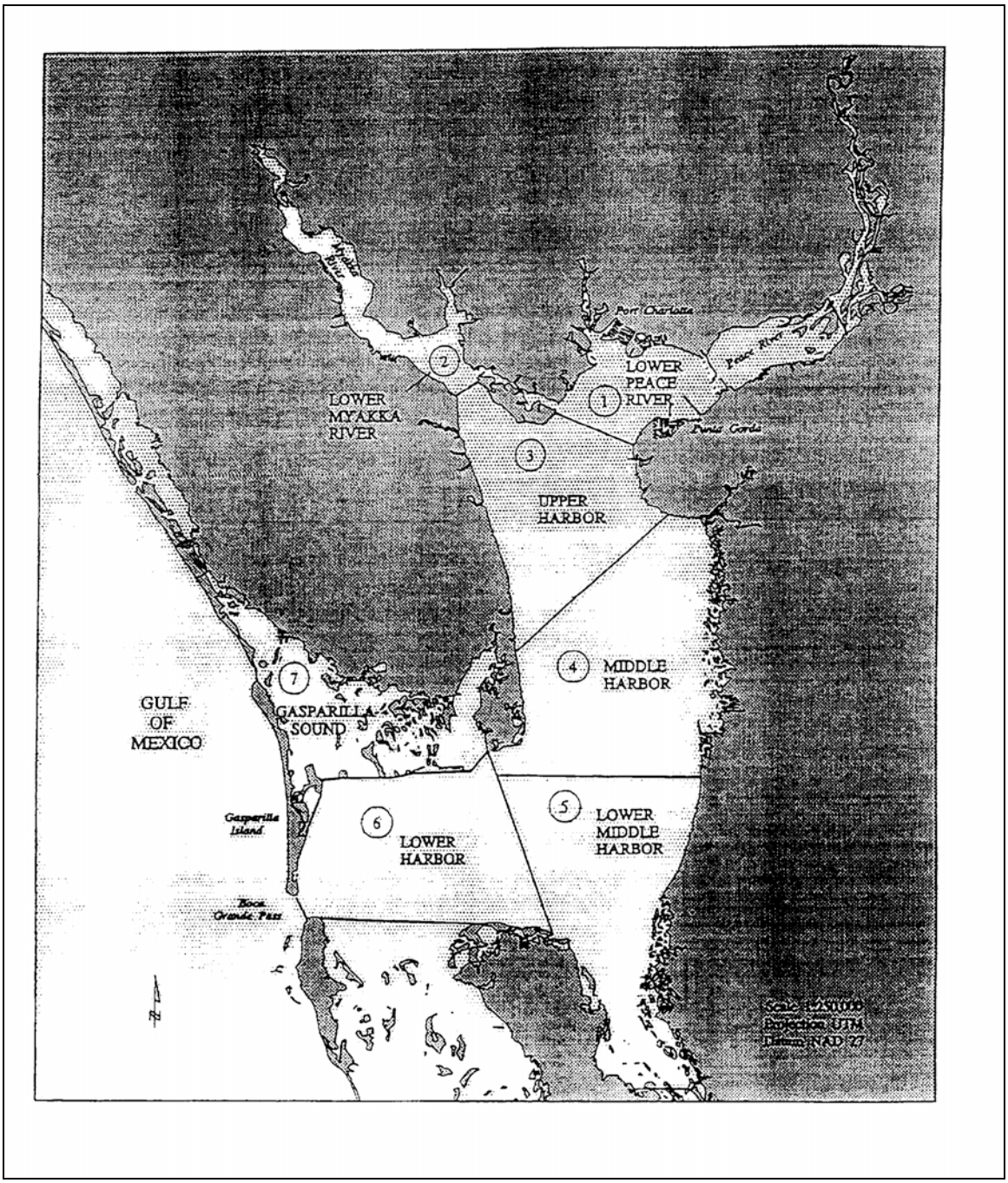


Table I.1: SWFWMD Charlotte Harbor Loading Study Area, Harbor Groups and Watersheds

Harbor Groups	Watersheds
1. Lower Peace River	Peace River at Bartow Peace River at Zolfo Springs Peace River at Arcadia Payne Creek Charlie Creek Horse Creek Joshua Creek Shell Creek Lower Peace River
2. Lower Myakka River	Myakka River near Sarasota Lower Myakka River
3. Upper Harbor	Coastal Upper Harbor
4. Upper Middle Harbor	Coastal Upper Middle Harbor
5. Lower Middle Harbor	Coastal Lower Middle Harbor
6. Lower Harbor	Coastal Lower Harbor
7. Gasparilla Sound	Coastal Gasparilla Sound

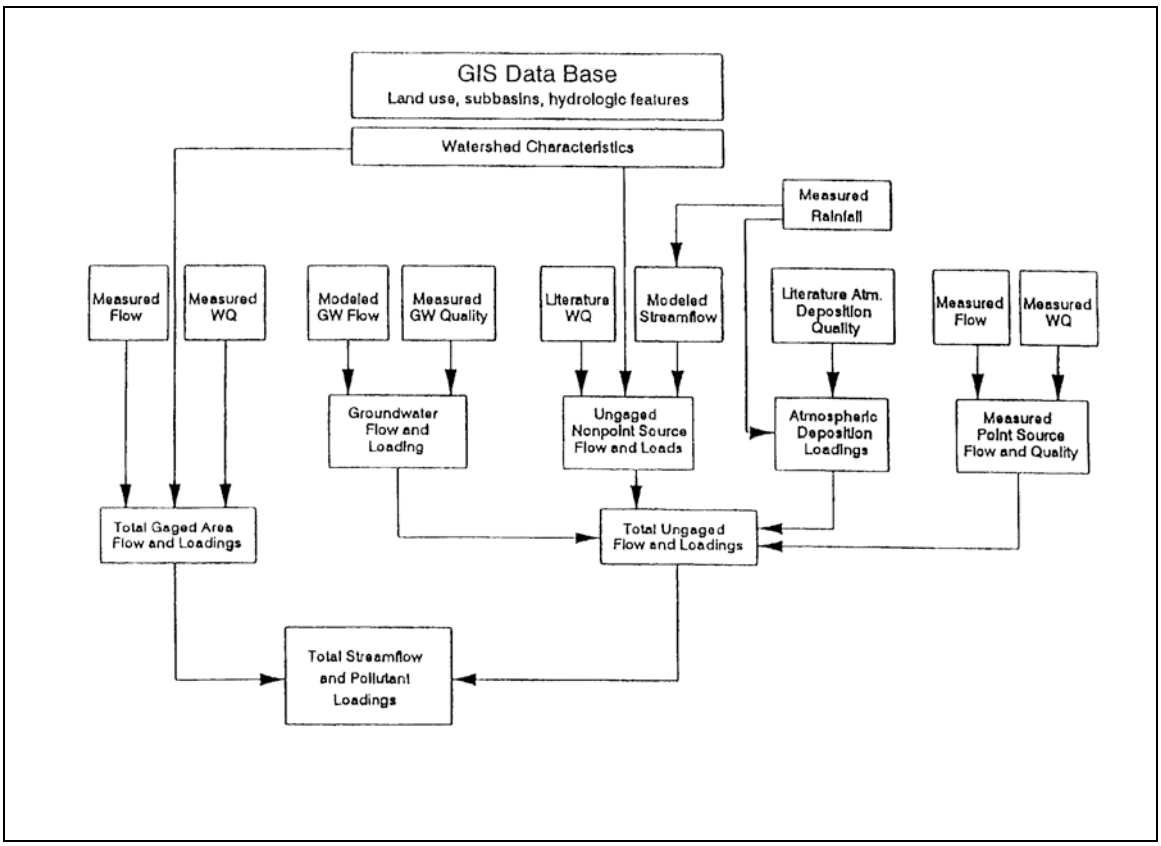
Figure I.2: Groups Analyzed in the SWFWMD Charlotte Harbor Loading Study



A geographic information system (GIS) database loading model was constructed to calculate total stream flow and pollutant loadings to the harbor. These loadings were

calculated from nonpoint source, point source, atmospheric deposition, and ground water information. **Figure I.3** shows the model structure.

Figure I.3: SWFWMD Charlotte Harbor Loading Model Construction



In addition to the four major sources of nutrient and solids loadings estimated from the GIS model, the potential for loadings from septic tanks (on-site wastewater treatment systems, or OWTSs) in the coastal area was also evaluated. Pollutant loadings were estimated for current (1985–91) and projected future (circa 2010) conditions.

Freshwater inflows were estimated for historical (circa 1948–55), current, and projected future conditions. Measured environmental data, including rainfall, streamflow, and ground water quantity and quality, as well as the quantity and quality of reported point source discharges, were used to the greatest extent feasible. In situations where measured data did not exist, or their use was not recommended, modeling techniques were used to estimate pollutant loadings and freshwater inflows.

The results of the existing (current) (1985–91) loading analysis suggest that nonpoint source inputs are the most significant source of pollutant loadings to Charlotte Harbor. Approximately 67 percent of the total nitrogen (TN) loads, 41 percent of the total

phosphorus (TP) loads, and 90 percent of the total suspended solids (TSS) loads are estimated to be delivered to the harbor via streamflow and direct runoff. Of the nonpoint source loadings, an estimated 1,800 tons/year of TN, 600 tons/year of TP, and 15,000 tons/year of TSS are delivered to the harbor from the Peace River.

Atmospheric deposition is the second most significant source of nutrients, contributing approximately 20 percent and 39 percent of the total TN and TP loads, respectively. Point sources contribute almost 10 percent of the TN load, 19 percent of the TP load, and 10 percent of the TSS load. Current loadings for ground water and OWTSs are small, making up only a small percentage of the total load.

In the future, nonpoint source loadings are projected to be the largest source of all three constituents to the harbor. The most substantial change is projected for OWTSs, which are expected to increase in relative contribution. **Table I.2** summarizes estimated loadings from OWTSs for current and future conditions, for each harbor group and for the harbor as a whole. The loadings are based on projected increases in the total number of septic tanks in use near the harbor, from approximately 37,765 in 1992 to 98,603 in 2010. This scenario assumes no large-scale increases to central sewer service by 2010. If central sewer service was significantly expanded, then the OWTS load would drop.

Current OWTS TN loadings range from substantially less than 1 ton per year for several harbor groups with few OWTSs in their drainage areas (Upper Harbor, Lower Middle Harbor, and Lower Harbor) to almost 50 tons per year for the Lower Peace River group. The Lower Myakka River group receives approximately 22 tons per year of TN from OWTSs. Future loadings are higher by a factor of approximately 2.6 and are linearly related to the projected increase in the number of OWTSs. The Lower Peace River group receives the highest OWTS loading, approximately 115 tons per year of TN. The Gasparilla Sound group is also projected to experience a substantial increase in OWTS TN loadings, from approximately 12 tons per year to over 32 tons per year.

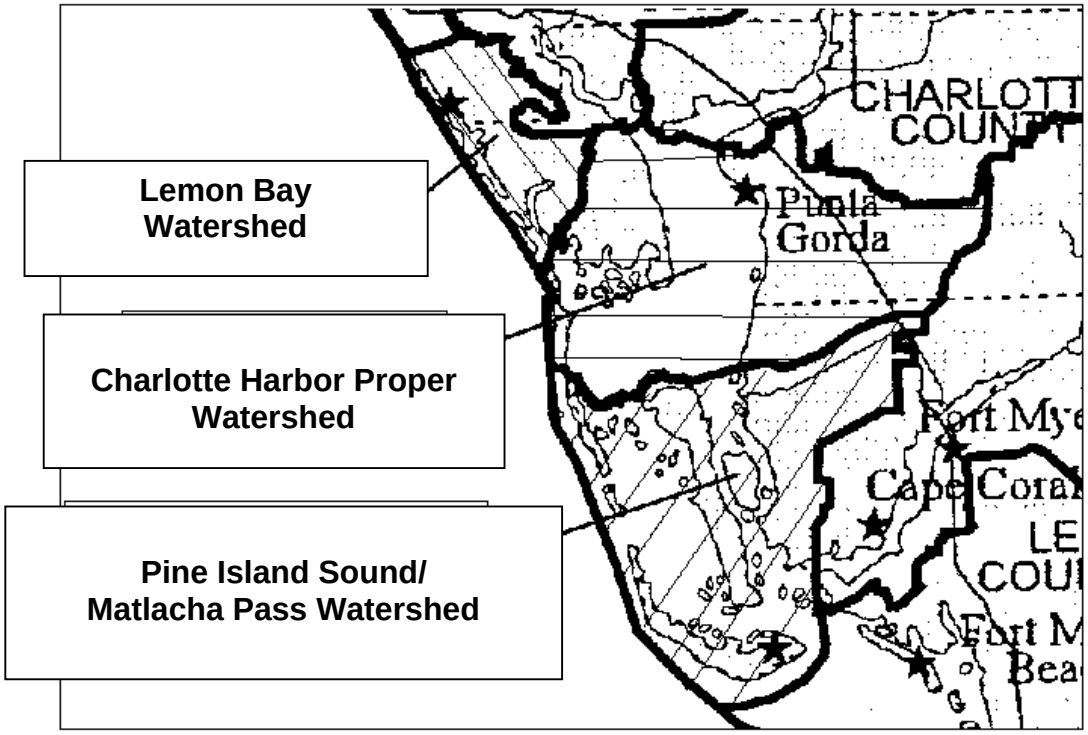
Table I.2: Summary of Estimated Current (1992) and Future Conditions from OWTS Loadings to Charlotte Harbor

Harbor Group	TN Load (tons/year)		TP Load (tons/year)	
	Current	Future	Current	Future
Lower Peace River	48.4	115	3.36	8.16
Lower Myakka River	21.6	72.6	1.56	5.16
Upper Harbor	0.12	1.68	<0.01	0.12
Upper Middle Harbor	5.52	9	0.36	0.6
Lower Middle Harbor	0.12	0.48	<0.01	<0.01
Lower Harbor	0.24	0.43	<0.01	<0.01
Gasparilla Sound	12	32.4	0.84	2.28
TOTAL	**88**	**231**	**6.12**	**16.3**

Charlotte Harbor National Estuary Program Loading Study

The study area, shown in **Figure I.4,** corresponds to the Department's Charlotte Harbor Group 2 Basin.

Figure I.4: Charlotte Harbor Proper, Lemon Bay, and Pine Island Sound/Matlacha Pass Watersheds



The CHNEP study computed the potential pollution load for Charlotte Harbor using the following equation (Charlotte Harbor National Estuary Program, 1999):

$$L_{jtl} = q_{jtl} E_l$$

Where L_{jtl} = the estimated monthly pollutant load in the t-th month for the j-th subbasin for the land use l,

qjtl = the estimated monthly runoff discharge in the t-th month for the j-th sub-basin for the land use l, soil group, and wet/dry runoff coefficients.

E_l = the pollutant concentration for land use 1 **(Table I.3).**

Table I.3: Pollutant Concentrations for TN, TP, and TSS used in the CHNEP Loading Study

Land Use	TN Concentration (mg/L)	TP Concentration (mg/L)	TSS Concentration (mg/L)
Low Density Residential	1.88438	0.29625	18.16
Medium Density Residential	2.2475	0.33075	34
High Density Residential	2.08857	0.37593	64.56
Commercial	1.83833	0.26167	73.8833
Industrial	1.668	0.276	93.925
Mining	1.63	0.245	50.3
Institutional,Transportation,Utilities	1.204	0.074	11.0667
Range Lands	2.6	1.3	13.1
Barren Lands	1.18	0.05	10
Pasture	2.66	0.81	8.6
Groves	2.02	0.28783	9.85
Feedlots	19.7	3.8	50
Nursery	2	0.3	55
Row and Field Crops	3.1675	1.295	34.65
Upland Forests	3.79	0.54	55.3

The equation above was used to calculate nonpoint source loading of TN, TP and TSS for each watershed, using estimated rainfall, land use, and soil cover. The pollution load potential was estimated in order to assign priorities to major basins and smaller watersheds. Thus, the methodology focused on consistently estimating relative loads among major basins and watersheds to avoid bias.

Data on rainfall, land cover (1988 data from the South Florida Water Management District), land cover (1990 data from the Southwest Florida Water Management District), and soils (from the U.S. Department of Agriculture) were used to estimate relative runoff discharge rates for the smaller watersheds. Using a surface-fitting approach, rainfall values for each month were computed for 1970 to 1996. Runoff was calculated by multiplying the rainfall estimate by a literature-based runoff coefficient value for each parcel in the land cover and soil database.

The runoff coefficients used for these analyses were specific for south Florida, varied by land use/cover and hydrologic soil group, and were adjusted for wet or dry season conditions. Hydrologic loadings were estimated on an "off the land" basis, and it was assumed that all runoff entered the harbor, regardless of whether pumps or gravity flow was used to discharge it from the watershed.

Month-specific pollutant loading estimates for TN, TP, and TSS were computed for each individual parcel of unique land use and soil in a basin or smaller watershed. Loadings were computed using land use pollutant concentration estimates specific to south Florida. Pollutant concentrations reported in the literature have widely varying values, and this increased the level of uncertainty in the absolute values of the load

estimates. However, more intensively developed land uses such as medium- and high-density residential and intensive agriculture clearly have a high potential for TN, TP, and TSS loading to the estuary, and the pollutant load prioritization of watersheds for this study reflects these load source patterns. Existing domestic and industrial point sources in the basin are also listed and their potential impacts discussed.

Unless otherwise indicated, the following estimates are rounded to the nearest 1,000 acres, 1 million cubic meters of discharge, and ton of pollutant loads. For this discussion, urban land uses were defined as residential, commercial, industrial, mining, institutional, transportation, and utilities. Agricultural land uses were defined as pasture, groves, feedlots, row and field crops, and nursery. Undeveloped land uses were defined as rangelands, barren lands, and upland forests.

Loading Estimates for the Lemon Bay Watershed

The total estimated annual runoff discharge for the Lemon Bay watershed is 48 million cubic meters from a contributing area of 33,000 acres. The estimated annual pollutant loads are 134 tons of TN, 32 tons of TP, and 1,926 tons of TSS.

The largest sources of pollutant loads from runoff are urban land uses, whose 12,000 acres contribute approximately 57 tons of TN, 9 tons of TP, and 1,150 tons of TSS. **Table I.4** presents the loads from runoff by land use. Residential lands, which are the primary urban land use, are dominated by medium-density residential parcels.

The watershed contains few agricultural areas (1,000 acres), which contribute a total of approximately 1 million cubic meters of runoff, 3 tons of TN, 1 ton of TP, and 11 tons of TSS per year. These agricultural lands primarily comprise pasture and grovelands.

Table I.4: TN, TP, TSS, and Hydrologic Load by Land Use Type in the Lemon Bay Watershed

	TN		TP		TSS		Hydrologic Load	
Land Use Type	tons/yr	% of subbasin	tons/yr	% of subbasin	tons/yr	% of subbasin	m^3	% of subbasin
Low-Density Residential	9	7%	1	4%	86	5%	4,322,976	9.0%
Medium-Density Residential	29	22%	4	14%	440	23%	11,774,733	24.5%
High-Density Residential	8	6%	1	5%	254	13%	3,576,918	7.4%
Commercial	6	5%	1	3%	247	13%	3,035,576	6.3%
Industrial	1	1%	0	1%	64	3%	618,042	1.3%
Mining	1	1%	0	1%	43	2%	785,015	1.6%
Institutional, Transportation, Utilities	2	1%	0	0%	15	1%	1,212,987	2.5%
Rangelands	33	25%	17	52%	169	9%	11,695,442	24.4%
Barren Lands	0	0%	0	0%	3	0%	256,962	0.5%
Pasture	2	2%	1	2%	7	0%	766,825	1.6%
Groves	0	0%	0	0%	2	0%	169,147	0.3%
Row and Field Crops	0	0%	0	0%	2	0%	28,512	0.1%

Upland Forests	41	31%	6	18%	595	31%	9,773,707	20.4%
TOTAL	**134**	**100%**	**32**	**100%**	**1,926**	**100%**	**48,016,841**	**100%**

Loading Estimates for the Charlotte Harbor Proper Watershed

The total estimated annual runoff discharge for the Charlotte Harbor Proper watershed is 80 million cubic meters. The estimated annual pollutant loads are 244 tons of TN, 63 tons of TP, and 2,719 tons of TSS. The total contributing area, comprising 67,081 acres, extends on both sides of Charlotte Harbor Proper.

The nonpoint source loads are primarily from undeveloped land uses. In total, the 42,000 acres of undeveloped land contribute approximately 45 million cubic meters of runoff, 158 tons of TN, 43 tons of TP, and 1,739 tons of TSS. **Table I.5** presents the loads from runoff by land use. The undeveloped contributing uplands are primarily forest and rangeland.

Developed urban and agricultural lands are a lesser component of the nonpoint sources for runoff. The 16,000 acres of agricultural lands contribute approximately 17 million cubic feet of runoff, 48 tons of TN, 14 tons of TP, and 165 tons of TSS per year. Most of the agricultural lands are pasture. The 8,000 acres of urban lands contribute about 19 million cubic meters of runoff, 38 tons of TN, 6 tons of TP, and 814 tons of TSS per year. Most of the urban lands are residential.

Table I.5: TN, TP, TSS, and Hydrologic Load by Land Use Type in the Charlotte Harbor Proper Watershed

	TN		TP		TSS		Hydrologic Load	
Land Use Type	**tons/yr**	**% of subbasin**	**tons/yr**	**% of subbasin**	**tons/yr**	**% of subbasin**	**m^3**	**% of subbasin**
Low-Density Residential	9	4%	1	2%	88	3%	4,411,046	5.5%
Medium-Density Residential	8	3%	1	2%	125	5%	3,354,459	4.2%
High-Density Residential	9	4%	2	3%	272	10%	3,825,866	4.8%
Commercial	3	1%	0	1%	106	4%	1,308,885	1.6%
Industrial	2	1%	0	1%	125	5%	1,210,539	1.5%
Mining	2	1%	0	0%	53	2%	958,046	1.2%
Institutional, Transportation, Utilities	5	2%	0	1%	45	2%	3,677,554	4.6%
Rangelands	58	24%	29	46%	291	11%	20,184,161	25.1%
Barren Lands	2	1%	0	0%	15	1%	1,380,073	1.7%
Pasture	45	19%	14	22%	147	5%	15,541,163	19.3%
Groves	2	1%	0	1%	10	0%	956,383	1.2%
Row and Field Crops	1	0%	0	1%	8	0%	208,986	0.3%
Upland Forests	98	40%	14	22%	14,331	53%	23,556,872	29.2%
TOTAL	**244**	**100%**	**63**	**100%**	**27,191**	**100%**	**80,574,034**	**100%**

Loading Estimates for the Pine Island Sound/Matlacha Pass Watershed

This watershed has one of the smallest contributing areas among the major watersheds in the CHNEP study area. The 88,000 acres contribute a total estimated annual runoff discharge of 96 million cubic meters. The estimated annual pollutant loads are 260 tons of TN, 76 tons of TP, and 4,528 tons of TSS.

Most (75 percent) of the hydrologic load from the watershed is estimated to be discharged from undeveloped lands. In particular, these loads are from upland forests. **Table I.6** presents the loads from runoff by land use.

Developed urban and agricultural lands contribute the remaining 25 percent of the total hydrologic load. The 12,000 acres of urban land contribute 39 million cubic meters of runoff, 77 tons of TN, 12 tons of TP, and 2,935 tons of TSS. The 3.000 acres of agricultural land contribute 3 million cubic meters of runoff, 10 tons of TN, 3 tons of TP, and 53 tons of TSS. These lands primarily comprise medium- and low-density residential land uses.

Table I.6: TN, TP, TSS, and Hydrologic Load by Land Use Type in the Pine Island Sound Watershed

	TN		TP		TSS		Hydrologic Load	
Land Use Type	tons/yr	% of subbasin	tons/yr	% of subbasin	tons/yr	% of subbasin	m^3	% of subbasin
Low-Density Residential	10	4%	2	2%	99	2%	4,965,225	5.2%
Medium-Density Residential	16	6%	2	3%	234	5%	6,269,347	6.6%
High-Density Residential	6	2%	1	1%	188	4%	2,649,170	2.8%
Commercial	3	1%	0	1%	138	3%	1,696,843	1.8%
Industrial	40	15%	7	9%	2,239	50%	21,673,867	22.6%
Mining	1	0%	0	0%	27	1%	486,604	0.5%
Institutional, Transportation, Utilities	1	0%	0	0%	9	0%	766,570	0.8%
Rangelands	102	39%	51	67%	513	11%	35,603,243	37.2%
Barren Lands	2	1%	0	0%	21	1%	1,900,059	2.0%
Pasture	6	2%	2	3%	20	1%	2,165,346	2.3%
Groves	1	0%	0	0%	5	0%	449,747	0.5%
Feedlots	1	1%	0	0%	3	0%	56,442	0.1%
Nursery	1	0%	0	0%	14	0%	229,480	0.2%
Row and Field Crops	1	0%	0	1%	10	0%	272,084	0.3%
Upland Forests	69	27%	10	13%	1,006	22%	16,542,563	17.3%
TOTAL	**260**	**100%**	**76**	**100%**	**4,528**	**100%**	**95,726,592**	**100%**

Comparison of Loading Results

The CHNEP study results for Charlotte Harbor Proper were compared with results from the SWFWMD study for the Lower Myakka River, Upper Harbor, Upper Middle

Harbor, Lower Middle Harbor, Lower Harbor, and Gasparilla Sound groups. The areas are roughly the same, as are the temporal periods of record. The CHNEP study uses 1988 and 1990 land use data, and the SWFWMD study uses 1985–1991 data as the existing condition.

The TN and TP loads from **Table I.2** (representing the common area for the CHNEP and SWFWMD studies) total 18 tons of TN per year and 1.2 tons of TP per year **(Table I.7).**

Table I.7: Summary of SWFWMD's Estimated Current (1992) Conditions from OWTS Loadings (tons/year) to Charlotte Harbor (for the Area Common to the CHNEP and SWFWMD Studies)

Harbor Group	TN Load	TP Load
Upper Harbor	0.12	<0.01
Upper Middle Harbor	5.52	0.36
Lower Middle Harbor	0.12	<0.01
Lower Harbor	0.24	<0.01
Gasparilla Sound	12	0.84
TOTAL	**18**	**1.2**

These two nonpoint/point source estimations are much smaller than only the nonpoint source estimations of 244 tons per year for TN and 63 tons per year for TP from the CHNEP study. Both studies illustrate the results achieved by simple screening models (U.S. Environmental Protection Agency, May 1997), which are not designed to provide "absolute" estimates of loadings, only estimates of relative loading.

These two applications are also based on different assumptions and models, which result in different values (loads) with the ratio of 1: 40 ~ 50. It is hard to conclude which study could provide a better "absolute" estimation of loads without detailed data to support those assumptions and the use of a calibrated and validated model.

Updated Information *(provided by the CHNEP)*

The CHNEP contracted with Janicki Environmental, Inc. to analyze water quality data for a status and trends report for the Charlotte Harbor NEP study area. The analysis included monitoring data from Lee and Sarasota Counties, the Southwest and South Florida water management districts, the Department, the city of Cape Coral, and the Peace River/Manasota Region Water Supply Authority for the Charlotte Harbor Basin.

The results of the surface water quality trends and status analyses (released in August, 2003) indicated that although there have been many areas of stable or improving water quality, there have been many ongoing declines in water quality in many of the basins in the Charlotte Harbor study area, and these areas offer an opportunity for regionally focused water quality improvements. Many relatively large changes (i.e., >5% of the median value per year) were observed in the water quality conditions for the southern basins of the study area (e.g., the Cape Coral peninsula south of Interstate 75, the north shore of the Caloosahatchee River north of Interstate 75, the coastal bays near Pine Island, and the Estero Bay watershed). Dissolved oxygen declines, and generally worsening surface water quality were observed in these areas. Coincident with these

dissolved oxygen declines, biological oxygen demand declines were observed on the northern side of the lower Caloosahatchee River and in the Estero Bay watershed. Overall, total suspended solids were observed to have steep increases in the entire southern portion of the study area, including the full extent of Charlotte Harbor Proper. The only exception was that these trends were relatively less steep in the Estero Bay watershed stations. (Wade et al., 2003)

Continuing work in the Lemon Bay Planning Unit is not yet finalized. Preliminary results indicate that EMC data are much lower in Lemon Bay watersheds (compared to NURP data). This is believed to be mostly because of the widespread use of vegetated swales as stormwater conveyance systems. The EMC data used in previous load estimates came from data sets where urban stormwater runoff was mostly directed offsite by use of curbs, gutters, stormwater pipes and direct outfalls. For further information contact David A. Tomasko, Ph.D. of the Southwest Florida Water Management District (SFWMD), Surface Water Improvement and Management Section (SWIM).

Acknowledgments

The information for this section was obtained by reviewing the CHNEP and SWFWMD reports, cited in the References section that follows. The information was provided by Dr. David A. Tomasko and Chuck Tornabene from SWFWMD and Catherine Corbett from CHNEP, respectively.

References

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Wade, D., A. Janicki, S. Janicki, M. Winowitch. 2003. *Charlotte Harbor National Estuary Program, Water Quality Data Analysis and Report.* Available at: http://www.charlotteharbornep.com/Resources/wq/water_quality_data_analysis.htm

Appendix J: Documentation Provided during Public Comment Period

SUMMARY OF PUBLIC COMMENTS AND THE DEPARTMENT'S RESPONSES ON

FLORIDA'S 2003 VERIFIED LIST OF IMPAIRED SURFACE WATERS

Bureau of Watershed Management

Division of Water Resource Management

Florida Department of Environmental Protection

GENERAL COMMENTS ON 303(d) PROPOSAL: CHARLOTTE HARBOR

EPA, Region 4, has reviewed the water segments of Charlotte Harbor for consistency with the CWA, and for verified impairment, delisting proposals, and inconsistencies that lie within the data submitted by FDEP. The objective of these comments id to bring attention to inconsistencies regarding the CWA that were observed on FDEP's proposed verified, delist, and master list. The comments below are a summary of the individual comments that are included on the attached spreadsheet.

1. Nutrient impairment is identified primarily by trophic state indices (TSIs) and annual mean chlorophyll a values. (62-303.350(1)). Chlorophyll a is not a parameter of concern, but an indicator for identifying nutrient impairment. Therefore, listing chlorophyll a as a parameter of concern rather than nutrients is inconsistent with the IWR. Please correct this listing. (WBIDs: All where monitored).

   RESPONSE: FDEP has reviewed the delist, verified, and master lists and replaced the listing of Chlorophyll a to nutrients where applicable.

2. Impaired water segments listed on the 1998 303(d) list must remain on the 303(d) list if they are not delisted with good cause justification. (WBID: 2071)

   RESPONSE: The North Prong of Alligator Creek (WBID 2071) is listed on the 1998 303(d) list for Dissolved Oxygen, Coliforms, and Turbidity, with a low priority and 2009 year for TMDL development. These parameters, priority, and year for TMDL development remain on the FDEP's master list. None of the parameters have been de-listed.

3. According to 62-302.530, Criteria for Surface Water Quality Classifications states that "The discharge of nutrients, shall continue to be limited as needed to prevent violations of other standards…" Thus, nutrients should not be delisted or recognized as "meeting standards" when dissolved oxygen is impaired due to nutrient impairment. This relationship between DO and nutrients is inconsistent with 62-302,530. (WBID: 2073, 2082B, 2030, 2068)

   RESPONSE: FDEP agrees with EPA's interpretation of 62-302.530. The requirements in 62-302.530, Florida Administrative Code are water quality criteria. (Note: the criteria for dissolved oxygen are numeric, but the criterion for nutrients is narrative.) Chapter 62-303, F.A.C., "Identification of Impaired Surface Waters" provides a methodology for using independently applicable thresholds (not criteria) for assessing data and information gathered from ambient waters.

Thus, under Chapter 62-303 (used for making listing decisions), FDEP may very well determine that the DO criterion is verified as being exceeded more than 10% of the time and that the nutrient thresholds that were applied in attempting to identify the suspected cause of the low DO. These nutrient thresholds are "rules of thumb," based on statewide values for each waterbody type. However, the low DO values may also be caused by oxygen-demanding substances for which we frequently have no data or they may be (at least in part) due to natural conditions. When we find there is an impairment due to "nutrients," that impairment is not based on concentrations of nitrogen or phosphorus (potential "causative factors"), but rather we apply measures of response variables (e.g., chlorophyll concentrations in streams or marine waters or the Trophic State Index in lakes).

Given the above discussion, FDEP agrees that the short-hand term "Meets Standards" may not be the best phrase to describe our findings and will likely change that column header before posting the final Group 2 lists.

4. FDEP is not properly following the Integrated Report. Incorrect categories are being placed on various parameters throughout the basin. Please refer to 62-302.530. (WBIDs: 2071, 2030, 2068, 2039, 2052, 8059B)

   RESPONSE: According to EPA's *Guidance for 2004 Assessment Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act; TMDL* ".in order to refine their classifications, States may choose to establish new or additional categories". FDEP has sub-catagorized Categories 3 and 4 following EPA guidelines in a manor consistent with previous assessments. FDEP has reviewed the following WBIDs with reference to 62-302.530 and believes that the following parameters and Integrated categories are correct for the following parameters; WBID 2071 Dissolved Oxygen 3c, Biology 2, Coliform 3c. Fecal Coliform 3b, Fluoride 3b, Iron 3b, Turbidity 3c; WBID 2030 Dissolved Oxygen 5, Fecal Coliform 5, Nutrients 2, Turbidity 2, Total Coliform 3b; WBID 2068 Dissolved Oxygen 5, Nutrients 2, Fecal Coliform 2, Turbidity 3a; WBID 2039 Nutrients 3c, Dissolved Oxygen 2, Fecal Coliform 2, Total Coliform 3b; WBID 2052 Fecal Coliform 2, Turbidity 2, Dissolved Oxygen 3b; WBID 8059B Nutrients 2, Feal Coliform 2, Dissolved Oxygen 3b. FDEP encourages EPA to specifically itemize the WBIDs and parameters disagreed with and their rationale.

5. As previously agreed, water segments from the 1998 list require additional monitoring in order to determine attainment status. (WBID: 2071)

   RESPONSE: Water quality monitoring will continue for WBID 2071.

Daryl,

In addition to the comments mailed on July 31st regarding Charlotte Harbor's Draft 2003 303(d) list, here are some administrative comments that you should update before you finalize the List. The attached spreadsheet exemplifies these changes listed below. If you have any questions, feel free to contact me at 404.562.9268. Thanks for your support.

Jennifer Eason
Florida TMDL Coordinator

1. The 1998 cadmium, copper, and, lead listing for Coral Creek East Branch (WBID 2078B) was not included on the 2003 master list for Charlotte Harbor. Please add these listings.

   RESPONSE: The listings for cadmium and lead were added to the Draft Master List.

2. Copper was listed as a 2003 parameter of concern with no reported data for Coral Creek East Branch (WBID 2078B) in category 3b, although copper was listed on 1998 list and therefore should be placed in category 3c.

   RESPONSE: The listing for copper has been changed to category 3c.

3. Dissolved oxygen listing for Coral Creek East Branch (WBID 2078B) does not have a priority listing or a year projected for TMDL development. According the 1998 303(d) list, dissolved oxygen has a low priority and the projected year for development is 2008. Please add this information to the verified list.

   RESPONSE: Coral Creek East Branch (WBID 2078B) is already listed on the Draft Master list as having a low priority and projected year of 2008 for TMDL development for Dissolved Oxygen. It has been placed on the planning list per IWR Rule 62-303.300(2). The Assessment Status is Insufficient Data (PP – 1/16, VP – No Data) and the Integrated Assessment Category is 3C. As a causative pollutant has not been identified, and there is insufficient data, FDEP cannot add this WBID to the Verified List.

4. On EPA's spreadsheet, the HUC listing for Lemon Bay is incorrect. The correct HUC listing is Sarasota Bay and not Charlotte Harbor. Please make note of this change in your records.

RESPONSE: FDEP has noted that on EPA's spreadsheet the HUC listing for Lemon Bay is Sarasota Bay.

5. Dissolved Oxygen and nutrients should be listed as a 1998 parameter of concern for WBID 1983A, Lemon Bay, on EPA's spreadsheet. I apologize for this inconsistency. Please make note of this change.

   RESPONSE: Dissolved oxygen and nutrients are listed as 1998 parameters of concern on EPA's spreadsheet.

6. The 1998 nutrient listing for Forked Creek (WBID: 2039) was not included on the master list. Please add this listing, along with the priority listing and year for TMDL development.

   RESPONSE: The nutrient listing for Forked Creek (WBID 2039) was included on the Draft Master list as was the Assessment Status, integrated Assessment Category, Priority for TMDL development, and Comments. The word "nutrients" not written in the designated area under the Parameters Identified section. FDEP apologizes for this omission and has added "nutrients" to the listing.

7. As previously agreed, water segment from the 1998 list require additional monitoring in order to determine attainment status. (WBID: 2078B, 2049, 2039, and 2071)

RESPONSE: Water quality monitoring will continue for WBIDs 2078B, 2049, 2039, and 2071.

Charlotte Harbor Basin Group 2 Comments

Formal Public Meeting Comments (Punta Gorda, FL., 6/09/03): Catherine Corbett, representing the Charlotte Harbor National Estuary Program (CHNEP), Rick Cantrell, representing the Florida Department of Environmental protection (FDEP), Tom Fraser representing W. Dexter Bender & Associates, Liz Donelly representing The Conservancy of SW Florida, Anura Kurunamuni representing Lee County Environmental Resources, Pauline Blocker representing Save Our Seas (SOS), Judy Ott representing the Charlotte Harbor Aquatic Preserve, Nancy Ross representing Earthbalance, Tony Janicki representing Janicki Environmental, Bill Byle representing Charlotte County Natural Resources, John Ryan representing Sarasota County Water Resources, and Debbie Highsmith, Joe Goulding, and Dick Keene private citizens all made comments at the Charlotte Harbor Basin Public Meeting in Punta Gorda. The comments and responses made at the meeting are provided as written comments.

Public Questions and Comments
Charlotte Harbor Draft Verified List
Public Meeting - June 9, 2003
Punta Gorda, FL

Question Period

Catherine Corbett

CHNEP: How does DEP deal with depth profiles in analyzing water quality sample data for DO?

Answer: We take an average of all values in a depth profile and report it as a single value. However, if a single value is found to be at a toxic level (<1.5 mg/l), then that one sample takes precedence.

Rick Cantrell

FDEP - South District: Why not just take the sample at the benthos, rather than averaging it all out? The mean value for DO is not the "truth" in a stratified waterbody like Charlotte Harbor.

Answer: No response.

Tom Fraser

W. Dexter Bender & Associates: Since the purpose of TMDLs is to protect living resources, and since living resources are on or near the benthos, DEP should not consider the surface or middle depth DO concentrations for a stratified waterbody like Charlotte Harbor from Cape Haze, North. The benthic communities in upper Charlotte Harbor are imbalanced for several months a year. Today I have provided DEP with scientific literature on the subject matter.

Answer: No response.

Tom Fraser
W. Dexter Bender & Associates: Regarding mercury impairments on the maps provided, why have only the coastal WBIDs been colored red? Mercury is found in migrating fish, hence the whole estuary should be red, not just the coast.
Answer: Mercury was depicted this way to prevent sensory overload. If all the WBIDs in the bay were colored red for fish consumption advisories, then the meeting participants would not be able to see the other impairments.

Tom Fraser
W. Dexter Bender & Associates: Waters should be listed as water quality impaired and then separately as biologically impaired. And those waters which are biolgically impaired should get priority for resolution before water quality impaired water bodies.
Answer: No response.

Tom Fraser
W. Dexter Bender & Associates: Why are we waiting until 2011 to address the mercury / fish consumption issue?
Answer: Because it is not a Florida problem, but rather a nationwide and really a global problem.

Tom Fraser
W. Dexter Bender & Associates: Then why do we depict mercury in fish tissue on our verified list, if its not a State of Florida problem?
Answer: Because state and federal laws require it be reported.

Debbie Highsmith
Private Citizen: What does the Department want ordinary citizens to do?
Answer: Send us any evidence of any impairments you have come across.

Debbie Highsmith
Private Citizen: Where has this TMDL program been successful? Where is this program working?
Answer: We've just started this program in Florida. We need a rational process to determine where the sources of pollution are and how to address it. Jan then gave examples of water quality restoration success with riparian buffers.

Liz Donelly
The Conservancy of SW Fla.: What was the data cut-off for the Group II water quality analysis?
Answer: The cutoff was June 30 2002. We use 7.5 years of data from Jan. 1 1996 until June 30, 2002.

Anura Kurunamuni
Lee County Environmental Resources: Lee County is currently doing a stormwater study along with flow measurements. Suggests looking at flow data because sometimes ground water flowing into surface water can affect water chemistry.
Answer: Flow data is very important.

Joe Goulding

Private Citizen: I am an old timer from Florida whose family came at the turn of the century. I've noticed that the oysters beds at the Lee / Charlotte County line are not so plentiful in recent times. Sea grasses are gone in many areas, now only mud flats. You used to be able to fill up a washtub with blue crabs. They've become scarce in recent times. And why are the Peace / Myakka river systems not depicted on your maps?

Answer: Peace/Myakka Rivers are being assessed this year. We will prepare the Verified List for them next year.

Catherine Corbett

CHNEP: The Southwest Florida Water Management District has done hypoxia studies in upper Charlotte Harbor. Hypoxia has increased since the 1950's. SWFWMD has proposed a pollutant load reduction goal (PLRG) for Charlotte Harbor, which entails cleansing the water coming out of Lake Hancock of nutrients.

Answer: No response.

Tom Fraser

W. Dexter Bender and Associates: Are we looking at other elements (i.e. micronutrients) that affect productivity?

Answer: That is not a focus of the TMDL program. We are keyed into looking at community shifts first. Then look with more detail later.

Pauline Blocker

Save our Seas: How many more studies is it going to take for DEP to fix the water quality problems in Florida? You cannot take a body of water like Charlotte Harbor and consider it separate from the Gulf of Mexico!

Answer: We have a process ….. (Jan was cut off by an emotional outburst from Ms. Blocker).

Pauline Blocker (continued)

Save our Seas: I'm sick of DEP!!! When are you going to address the phosphate mining in Florida? I'm leaving! (Ms. Blocker stormed out of the meeting only to return 5 seconds later to continue her diatribe against the Department).

Pauline Blocker (continued)

Save our Seas: If it weren't for environmental groups, DEP would not be doing what they are now attempting to do (i.e TMDLs) at all! However, when it comes to the phosphate industry, DEP lets them dump their wastewater wherever they want! We (environmental groups) provide you with the data, but you do not do anything about the data we give you!

Answer: No response.

Judy Ott

Charlotte Harbor Aquatic Preserve: Once DEP sets TMDLs, how do you intend to restore waterbodies? Will non-regulatory fixes be utilized to address the problem?

Answer: NPDES "Point and Non-Point Source" permits, and "Concentrated Animal Feeding Operation" (CAFO) permits will be used where applicable. However many non-regulated activities like agriculture must also be modified. Although the Water Management District have a few controls over some non-regulated activities, we will have to rely on the media, peer pressure and just people wanting to do the right thing.

An example of the latter would be voluntary compliance through the use of Agricultural Best Management Practices.

Nancy Ross
Earthbalance: Is the Department moving towards a pollutant trading process?
Answer: We are not there yet. It is not easy. We need more thought on this subject.

Tony Janicki
Janicki Environmental: Tampa Bay tried to get out ahead of DEP so DEP would tell them what to do. Local governments bear the brunt of the restoration or precluding future water pollution. If the public wants to do something to improve water quality, they need to encourage local governments to do their part.

Official Public Comment Period

Bill Byle
Charlotte County Natural Resources: I'm puzzled. In 1996, 156 manatees died in the Charlotte Harbor region. This should be a red flag to DEP. Something is obviously wrong. I'm concerned that the TMDL program doesn't really identify problems. It doesn't see salt water as a pollutant, when it migrates upriver and kills fresh water organisms in what should the fresh water part of the river. It seems to me that pesticides, heavy metals, endocrine disrupters and radioactive substances are not being monitored.

Answer: Most people or programs don't monitor those things.

Bill Byle
Charlotte County Natural Resources: The state has an obligation to monitor these other things.
Answer: We do not disagree, but right now we are reporting what we do know.

John Ryan
Sarasota County Water Resources: Does the Department have "models" for two creeks in Sarasota County, which are scheduled for TMDLs in 2004?
Answer: Contact Kevin Petrus in Tallahassee or Charles Kovach in the Tampa District Office.

Dick Keene
Resident, Burnt Store Isles: In their analysis of water quality for the Punta Gorda area, did the Department utilize the water quality data that was collected to for the dredge and fill permit to remove the lock gates to the Burnt Store Isles canal system?
Answer: We will look into this issue.

Joe Goulding
Private Citizen: If the new phosphate mines go through (i.e get permitted) (I imagine he means Ona and Pine Level), and their dams break, the Charlotte Harbor is going to be finished. It happened in the 70's and it never recovered. Someone up in the DEP needs to do something about it. Lee County needs to do something about it too, since half of Charlotte Harbor is in Lee County.
Answer: No response.

Written Public Comments:

- Why was WBID 2065A on the draft Master List as meeting standards when the SWFWMD has already developed a PLRG for nutrients in this system? There are significant DO sags in the benthos of this part of the bay, and the only samples that matter in this stratified system are the ones taken at the bottom. [Rick Cantrell, FDEP South District; Catherine Corbett, Charlotte Harbor National Estuary Program.].

  RESPONSE: WBID 2065A was listed on the draft Master List as meeting standards because the calculated mean for chlorophyll, when using the IWR raw data and the departments method for calculating chlorophyll mean value, is 8.82 which meets standards. The WBID has been moved to the planning list pending further investigation.

- It is my understanding that there may data associated with the Sanibel River that your organization has not reviewed. Apparently there is a consent order between DEP and either City of Sanibel or the operator of its WWTP regarding the discharges form the plant. Part of the CO requires water quality monitoring of the river. The Sanibel Lakewatch group has collected monitoring data and the 2002 report is available on line at http://lakewatch.ifas.ufl.edu/2002CountyPDFReports/DataSumPart1.pdf on page 358 of the report. The 2001 report is also online :http://lakewatch.ifas.ufl.edu/2001CountyPDFReports/Lee.pdf. [Elizabeth Donley, The Conservancy of Southwest Florida.].

  RESPONSE: FDEP has obtained the latest Lakewatch data for 2002 and is has formated it for inclusion in Run 11 of the IWR. It was not available for Runs 9.3 or 10.

- Why is WBID 3240S classified as estuarine when there are several weirs along Burnt Store, north of Pine Island Road? The DEP has worked diligently to close all the breaks that were allowing saltwater inputs throughout the spreader systems, and now they are currently reading as fresh. Conditions have changed within those systems. In 3240S, our station 190 is located above a weir, and all the conductances show it as fresh in the data. so the threshold should be 20 mg/l, correct? And just skimming through the data, I didn't see that many outside the limits for fresh or salt (<11 mg/l). [Connie Jarvis, City of Cape Coral.].

  RESPONSE: Waterbody type dictates which water quality criteria are applied to water quality data, and can presumably influence the outcome of the departments assessments, so it is important that the type assigned to a segment is accurate as it relates to the data being assessed. FDEP reanalyzed South Urban Cape Coral (WBID 3240S) with data the department had in it's IWR database as of July 11, 2003. The method used was a calculation of the median specific conductance value using all available data, and application of a 5,000 µmhos/cm threshold for an estuarine classification. This method is consistent with how the departments data analysis staff assigned the original waterbody type to this segment. The new data from various sources being added to the IWR database over the past several months, showed a Mean specific conductance value of 9,272 µmhos/cm, a Median value of 7,810µmhos/cm and a range of 440 to 24,250 µmhos/cm out of 49 samples collected. As a result of specific conductance values above 5000 µmhos/cm, no change in listing status is warranted at this time.

- Well, after digging through the bench sheets, and redoing calculations, it turns out that we were an order of magnitude off. Results were expressed in mg/l, when in fact they already were ug/l. So, basically, the results reported need to be divided by 1000. Kraig will be changing these in STORET to reflect the correct units. What is the time frame before the next run to have this accomplished, and what/who else do we need to do/contact in order to rectify this? Thanks for your patience..... [Connie Jarvis, City of Cape Coral.].

  RESPONSE: This letter refers to data for WBID 3240S. The data for IWR Run 11 has already been pulled, so any corrections in FLSTORET will not be seen until Run 12.

- A large amount of water quality data was collected as part of a dredge and fill permit application for the removal of some locks to the canals of the Burnt Store Isles community in Punta Gorda. It is my understanding that the FDEP approved the removal of the locks from the canal system because the residents were able to provide data documenting that the canal system was in fact meeting water quality standards for DO. According to the Draft Master List the area (Mangrove Point Canal, WBID 2073) is verified impaired for DO. Did this data make it into STORET, and was it used in the assessment of WBID 2073 for DO?

  RESPONSE: The lock was removed on the basis that it was no longer holding water in the system and that there were many other routes for water to get into Alligator Creek. The data was added to FLSTORET and will be available for IWR Run 12.0.

- Sample site (21FLCHARCHV009) is at the mouth of Burnt Store Marina's harbor entrance to Charlotte Harbor and is an estuarine sample site. The marina is not in the Yucca Pen Creek watershed and the data associated with the sample point should not be used in the evaluation of Yucca Pen Creek. The only remaining sample sites (two) for dissolved oxygen were collected in 1993 and 1994. They were both above the dissolved oxygen threshold, one was 5.5 and the other 6.0. We would formally request Yucca Pen Creek be reevaluated due to the lack of applicable data. The classification of the stream should be as estuarine for the majority of the segment. However, I do not know where we should draw the line because we have not monitored the creek and thus have no data for such a determination, only observation and experience. The main reason we have not monitored the creek is because it is not easily accessable by vehicle and the upper reach is dry during most of the year.
  [Tony Pellicer, Lee County Natural Resources Division].

  RESPONSE: FDEP reviewed the location of sampling site 21FLCHARCHV009 by conversations with district staff, utilizing GIS coordinates and aerial photographs. The site is located at the entrance of the Burnt Harbor Marina, and the harbor does not appear to be connected to WBID 2082B, Yucca Pen Creek. Although connected to WBID 2065D the entrance to the harbor is channelized, and is therefore indicative of conditions within the harbor rather than those associate with either WBID. FDEP is of the opinion that the data collected at this site are not representative of natural conditions and should not be associated with any WBID. The data of sample site 21FLCHARCHV009 will remain as part of WBID 2082B until the FDEP has adequately reviewed the permits which were issued to the marina. A decision will

then be made determining if the marina is bettor regulated through permitting or the TMDL program.

- Two of the stations attributed to WBID 1983A "Lemon Bay" may cause problems for calculations of DO because they are so different than the rest of the data. Stations 21FLSARA950920-LB-1-D and 21FLSARA960507-LB-3-D are diel meter measurements from dataloggers, not discrete samples.

> Station 21FLSARA24010559 is located in the Intracoastal Waterway at the Venice Avenue bridge. The correct WBID for station 21FLSARA24010559 is WBID 2015 "Hatchett Creek" not WBID 1983A "Lemon Bay".
>
> WBID 2042 "Direct Runoff to Bay" or Coastal Drainage from Alligator Creek to Forked Creek Station 21FLSARA24010621 is currently assigned to WBID 2042 (Direct Runoff to Bay) but is actually located in WBID 2030 (Alligator Creek). The site description is "Alligator Creek at Shamrock Blvd.".

WBID 2039 "Forked Creek" DEP station 21FLA56112SEAS is in WBID 2039 "Forked Creek", which is incorrect, based on the station description "Canal west of ICWW 31" and the salinity of 30 ppt. It should be included in WBID 1983A "Lemon Bay" or 2051 "Direct Runoff to Bay". Maybe whoever at DEP did the SEAS project can explain the true location.

> WBID 2051 "Direct Runoff to Bay" or Coastal Drainage south of Forked Creek to the mouth of Gottfried Creek Data for 21FLCHARLBV003 should be moved from WBID 2051 (Direct Runoff to Bay) to WBID 1983A (Lemon Bay). The LB in the station name refers to Lemon Bay
>
> WBID 8054 "Lemon Bay Gulf" or Gulf of Mexico from Alligator to Coral Creek Station 21FLCHARLBANG1 is attributed to WBID 8054 "Lemon Bay Gulf" but should be in WBID 2052 "Rock Creek". The ANG in the station name refers to Ainger Creek, otherwise known as Rock Creek.

Station 21FLCHARLBOYS1 should be transferred from WBID 8054 "Lemon Bay Gulf" to WBID 2067 "Oyster Creek". The OYS in the station name refers to Oyster Creek. Maps of these sample sites are available at http://www.dep.state.fl.us/coastal/activities/research/map.htm.

> The station 21FLSARALB-1-03 is a Sarasota County Sample Site that is part of a stratified-random project for Lemon Bay. Station 21FLSARALB-1-03 belongs in WBID1983A "Lemon Bay" rather than the WBID 8054 "Lemon Bay Gulf" where it is currently assigned.
>
> Station 21FLGFWFTBM000588 should be checked too, there are no similar sample names or samples from Fish and Game in this area.
>
> WBID 2075D "Barrier Island" or Manasota Key 21FLSARA950315-LB-2, 21FLSARA950517-LB-2, 21FLSARA950621-LB-2, 21FLSARA960319-LB-2, 21FLSARA960410-LB-2, 21FLSARA960507-LB-2, and 21FLSARA960617-

LB-2 are attributed to WBID 2075D ("Barrier Island") but are part of a randomized sampling project of Lemon Bay and should be correctly assigned to WBID 1983A ("Lemon Bay").

WBID 8054C "Englewood North" or Gulf of Mexico beach area The sample site named 21FLA56110SEAS is not in WBID 8054C "Englewood North". The station description is "Shoreline west of ICWW 25". This station should be in WBID 1983A "Lemon Bay" or WBID 2075D "Barrier Island" (Manasota Key).

General Comments about local water quality:
Because phosphate ores occur in this part of the state, TP concentrations are naturally higher than statewide medians. TP is probably never a limiting nutrient locally. Rather than using statewide median TP concentrations to identify causative pollutants for low DO, it makes more sense to use ambient concentrations from a pristine reference stream such as the Myakka River. We have an ample amount of Myakka data and have supplied it to the Bureau of Watershed Mgt. before, but would be glad to do so again.

Some local basins receive natural drainage from wetlands, especially in the summer. The Myakka basin is a good reference for naturally occuring low DO values, rather than the state standard, which is a poor match. Gottfried Creek is a wetland influenced system.

We have some basins that are draft verified impaired for low DO with the causative pollutants identified as nutrients. Once the WBID corrections are made, there will be no instances where high chlorophyll is associated with these basins. What is the mechanism for low DO caused by nutrients when no nutrient (chorophyll) impairment is found? [John Ryan, Sarasota County].

RESPONSE: Stations 21FLSARA950920-LB-1-D and 21FLSARA960507-LB-3-D were correctly assessed as dataloggers according to the departments criteria and their data was included in the IWR Run. The remaining sampling locations were reviewed by FDEP and moved to their correct locations. The data from each of the locations was correctly moved to the corresponding WBID and these changes were incorporated into IWR Run 12.0.

- Reviewing the data for Gator Slough, we compaired the data from the Lee County Environmental Laboratory and that collected from the Cape Coral Laboratory for chlorophyll-a. The values submitted by the Cape Coral Laboratory appear to be three orders of magnitude above those obtained by Lee County. This also falls in line with the information provided by Connie Jarvis relating to how the data was reported (ppm versus ppb). That would account for the three orders of magnitude difference.
  We would formally request the department review the chlorophyll-a data for Gator Slough, WBID-2082-C and for Cape Coral, wbid-3240-S. We understand this data was uploaded recently to reflect the correction and the corrected data should be included in future runs in making the final determination.
  [Tony Pellicer, Lee County Natural Resources Division].
  RESPONSE: The data for IWR Run 11 has already been pulled, so any corrections in FLSTORET will not be seen until Run 12. FDEP will review the chlorophyll data

for WBIDs 2082C and 3240S when IWR Run 12 becomes available and include it in future runs.

- It is my understanding that officials from the City of Punta Gorda have contacted DEP staff regarding the possible inclusion of the Burnt Store Isles canal system in the "draft verified list" as a "Integrated Assessment Category" 5.
  The BSI canal system has been monitored for at least 10 years as part of a permit process that lead to the removal of lock gates at the entrance to the canal system earlier this year. In addition, on-going monitoring continues. These extensive water testing studies have shown that the water in the canal system is in better condition then the water within Alligator Creek and that the canal system water meets all standards.
  As part of the extensive efforts to ensure that the canal system water quality meets all standards, the Burnt Store Country Club undertook a multi-million dollar upgrade and major modification to it's irrigation and fertilization system... changes that have ensured that runoff into the canal system is absolutely minimized and that chemical applications are done such that they do not enter the canal system. This is not wishful thinking, but rather enhancements that are documented through water testing analysis.
  We join you in efforts to ensure that Charlotte Harbor has water that meets all applicable standards. This is in our own best interests. However, we ask you to ensure that the documented water quality studies that have already been accomplished for the BSI canal system are factored in your analysis.
  Best regards, [Richard O. Keen, President, Burnt Store Isles Association, Inc.].

  RESPONSE: The FDEP contacted Mr. Keen and verified that this was the same data gathered by Canal Watch and previously supplied by Mr. Ron McGregor. The FDEP has entered this data in the FLSTORET database and will evaluate it beginning with IWR run 12.0.

- A number of requests were received for copies of the data used in the Group 2 assessment of Charlotte Harbor and its tributaries. [Tony Pellicer, Lee County Government; John Ryan, Sarasota County; Elizabeth Donley, The Conservancy of Southwest Florida.].

  RESPONSE: The data were provided as requested. Any additional data requests for the Group 2 Waters in the Charlotte Harbor basin can be directed to Robert Perlowski, at (850) 245-8458 or robert_perlowski@dep.state.fl.us.

- In having a discussion with Mr. Ron McGregor from your Punta Gorda office today, regarding the “low D.O.” readings in some of the water bodies here in Punta Gorda. The canals in Punta Gorda are all man-made canals, which by its own nature would result in “low D.O.” readings. The Water Body I.D.’s are #2063 for Burnt Store Isles, by Alligator Creek, #2069 & # 2070 Punta Gorda Isles which flow to the Peace River/Charlotte Harbor. These canals are dead end canals, have a low flushing effect and are tidal influenced. My understanding with Ron, is that due to the depth of these

canals a low D.O. reading will always appear, with little if any remedy to improve the reading. I hope that this information helps you in your reconfiguring the "impaired water body map", and keeps us off the 303d list. If you should need further information, please do not hesitate to call. Sincerely, [Randall Brodersen, Engineer Technician/Inspector, City of Punta Gorda]

RESPONSE: WBIDs 2069 and 2070 are part of the Peace River Basin and will be assessed with the Group 3 waters at the appropriate time. The water quality of WBID 2063 will continue to be monitored. Although the WBID may not be impaired for dissolved oxygen, due to its being a man made system, it may contribute to impairments such as nutrients.

- As a preliminary matter, the Conservancy reiterates its previous comment that a 45-day commenting period is inadequate. We were pleased that the Department of Environmental Protection ("DEP") extended the comment period, and we believe that DEP should implement a 60-day or greater comment period as standard. As we have stated in the past, 45 days is simply too short a period to adequately review the DEP draft report and the associated data. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

  RESPONSE: The FDEP would like to extend the period for public comments. However to do so would not allow FDEP an adequate amount of time to fully investigate, and respond to, the comments received and integrate them into the assessment process.

- The Federal Clean Water Act (CWA) Section 303, 33 U.S.C. § 1313, requires each state to "identify those waters within its boundaries for which the [technology-based or other existing] effluent limitations are not stringent enough to implement any water quality standard [WQS] applicable to such waters." 33 U.S.C. § 1313(d)(1)(A). United States Environmental Protection Agency ("EPA") regulations and policy clarify that states must identify all segments of water bodies which do not or may not within the next two years meet numeric water quality criteria, narrative criteria, waterbody designated or existing uses or anti-degradation requirements. 40 C.F.R. § 130.7(b)(3), (5); National Clarifying Guidance for 2000 State and Territorial Section 303(d) Listing Decisions (Aug. 17, 1997) set forth with memorandum from Robert Wayland, III, to Water Division Directors ("Clarifying Guidance"), page 2. Thus, it is unacceptable for the state not to list, for example, threatened waters or waters that have been identified as impaired by data other than chemical water quality samples indicating exceedences of numerical standards. Similarly, the state must list those water bodies which can reasonably be expected to fail to meet WQS in the future due to, for example, a planned housing or industrial development.

  While EPA's recent guidance would permit DEP to eliminate from the list water bodies that are impaired due to deposition of air pollution and water bodies that are impaired due to streamflow impacts attributable to dams or weirs, these are two major

sources of impaired waters in the region that need to be recognized and addressed. If the waters are impaired as a result of these "non-discharge" factors, then the developed TMDLs need to address these sources of impacts so that discharges of pollutants in the watershed do not worsen the impairment.

DEP should also consider EPA's recent review of the Group 1 Basin List. See Decision Document Regarding Department Of Environmental Protection's §303(D) List Amendment Submitted On October 1, 2002 And Subsequently Amended On May 12, 2003 (EPA Region IV, Water Management Division, June 11, 2003). [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

RESPONSE: Subsection 303(d) of the Clean Water Act (CWA) and section 403.067, F.S., describe impaired waters as those not meeting applicable water quality standards, which is a broad term that includes designated uses, water quality criteria, the Florida antidegradation policy, and moderating provisions. However, as recognized when the water quality standards were adopted. Many water bodies naturally do not meet their designated use. Data on exceedances of water quality criteria will provide critical information about the status of assessed waters, but it is the intent of the verified list to only include those waters that are impaired due to point source or nonpoint source pollutant discharges. It is not the intent of the verified list to include those waters that do not meet water quality criteria exclusively due to natural conditions or physical alterations of the water body not related to pollutants.

As to listing waters that are expected to fail to meet standards in the future, Section 62-303.100(2) of the IWR states that subsection 303(d) of the Clean Water Act and Section 403.067, FS describe impaired waters as those not [currently] meeting applicable water quality standards. To list waters as impaired based solely upon speculative future construction and/or land use is an erroneous predisposition.

- The State has determined that data collected after June 30, 2002, will not be considered in the analysis process for determining whether a water body segment should be placed on the impaired waters list (Mr. Jan Mandrup-Poulsen, DEP, June 9, 2003, Public Meeting). The Conservancy contends that DEP should consider all data, up to and including data being collected and analyzed on May 31, 2003. As mentioned above, federal regulations and guidance require DEP to identify "all segments of water bodies which do not or may not **within the next two years** meet numeric water quality criteria, narrative criteria, waterbody designated or existing uses or anti-degradation requirements." 40 C.F.R. § 130.7(b)(3)[emphasis added]. The Conservancy believes that DEP is violating the intent of the regulation by establishing a date almost one year prior to the publication date of the draft verified IWR list as the cutoff for analyzing data. The data sets released by DEP to the public reveal data gaps that may be able to be resolved if DEP considered data that had been collected more recently than 12 months ago.

In developing its list of all threatened or impaired waters, the state must use "all existing and readily available water quality-related data and information." 40 C.F.R. §§130.7(b)(5). This data includes, at a minimum, waters identified in the most recent state section 305(b) report as "partially meeting" or "not meeting" designated uses or as "threatened;" waters calculated by models not to meet water quality standards; or waters "for which water quality problems [including fishing, shellfishing, or recreational restrictions] have been reported" by local, federal or state agencies, members of the public or academic institutions. 40 C.F.R. § 130.10(d)(6). This inclusive list of sources of information means that the state may not exclude information because of arbitrary limitations on what it considers acceptable data. The EPA recently reviewed the DEP Group 1 Basin submission and concluded that "FDEP should work towards amending its process to include a method for identifying water quality limited segments when provided with clear evidence of impairment within small data sets." Decision Document Regarding Department Of Environmental Protection's §303(D) List Amendment Submitted On October 1, 2002 And Subsequently Amended On May 12, 2003 (EPA Region IV, Water Management Division, June 11, 2003). Nor may the state refuse to list any impaired or threatened waterbody segment because it does not know the source of the pollutants causing the impairment. Clarifying Guidance, page 4-6. The recent EPA review of the Group 1 Basin submission also questioned the restriction for listing unless the causative pollutant is identified.

Moreover, the state must actively solicit such information from other agencies, the public, and all possible sources. 40 C.F.R. § 130.7(b)(5)(iii); Clarifying Guidance, page 2. As suggested in this guidance, fish consumption advisories should also be used. Although the Impaired Waters Rule contemplates the use of fish consumption advisories, the only advisories mentioned in the list of waters are mercury advisories. There are several other fish consumption advisories in the region that have been issued due to localized contamination, such as bacterial contamination of shellfish. Advisories for shellfish have been issued for Pine Island Sound – east and west, Gasparilla Sound, and Lemon Bay, in excess of a cumulative 2,300 days since 1995. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

RESPONSE: The FDEP does use all existing and readily available water quality data and information that is made known to the department, qualified, and submitted in a timely fashion. The cutoff for analyzing data is necessary in order to verify that proper quality assurance and quality controls were applied to the collecting and analyzing of the data, provide adequate time to enter the analytical results into the FLSTORET database, and correct any errors resulting from the process.

Both fish consumption advisories and shellfish advisories were used as part of the assessment process. These are listed on the Master list as Charlotte Harbor Basin Coastal WBIDs and are inclusive of all WBIDs in the Charlotte Harbor Basin.

Separate TMDLs will be developed to address these two issues and they are therefore not included with the individual listing for each WBID.

- The Conservancy has requested access to data used by DEP to establish its current draft verified list. Had this information been posted on-line, review of the data, and DEP's analysis thereof would have been accelerated and enabled the Conservancy to better participate in the public meeting held shortly after the release of the report. We believe that we are not the only reviewers that would have benefited from more accessibility to the data.

  With the increase in use of the internet and the State of Florida's initiative to make information readily available to citizens, the Conservancy urges DEP to establish a website or FTP site to house the data used in developing the draft verified lists for the impaired waters rule. The URL can then be published so that interested parties have early and unlimited access to the data. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

  RESPONSE: Full unlimited access to all of the data used by FDEP is available on-line through the FDEP web site at: http://www.dep.state.fl.us/water/storet/index.htm. The program used to process the data for the IWR runs is not currently available on-line due to the tremendous amount of programming involved. The FDEP is happy to send copies of this program for each IWR run to individuals and organizations as requested.

- The boundaries chosen by DEP to represent the Charlotte Harbor Basin do not follow the natural watershed boundaries. Moreover, the major sources of inflow to Charlotte Harbor, the Myakka, Peace and Caloosahatchee Rivers, were not included within the Basin. The Conservancy appreciates that the Charlotte Harbor Watershed encompasses a large geographic area, however, DEP should have at the very least included the tidally influenced portions of the Myakka and Peace Rivers within the Charlotte Harbor Basin. Because TMDLs for this basin may ultimately involve upstream portions of the Myakka and Peace Rivers, the whole watershed should have been included.

  In the alternative, the DEP should have utilized the boundaries that the CHNEP has itself developed for Charlotte Harbor Proper Basin (See Comprehensive Conservation and Management Plan "CCMP," page 31). The boundaries depicted in the CCMP better comply with the natural flow of water in the basin. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

  RESPONSE: The FDEP basin groups (hydrogeologic units) do not align exactly with the USGS hydrologic units, therefore there can be portions of several hydrologic units in any one basin group. Charlotte Harbor, the Peace River, the Myakka River, and Caloosahatchee River are divided into separate basin groups based on their geomorphologic characteristics. Thus the data for the basins is no longer aggregated

and assessed together, but rather the analysis is done by each individual basin. This method allows the department to further focus on specific areas within each basin in which impairments might lie. The new basin boundaries proposed would not be consistent with the departments methodology of determining basin boundaries based on geomorphologic characteristics. However, the department is in the process of reconsidering our current waterbody segmentation scheme and welcomes input on alternatives that are amenable to the objectives of water quality assessment.

- Section 62-302.700 FAC provides special protections for Outstanding Florida Waters and Outstanding National Resource Waters. The Section states that: "No degradation of water quality, other than that allowed in Rule 62-4.242(2) and (3), F.A.C., is to be permitted in Outstanding Florida Waters and Outstanding National Resource Waters, respectively, notwithstanding any other Department rules that allow water quality lowering."

  The Charlotte Harbor Basin is comprised almost entirely of Outstanding Florida Waters - including ALL waters within Charlotte Harbor National Estuary Program boundaries, which co-exist with U.S. Wildlife Refuge boundaries, Florida DEP State Aquatic Preserve boundaries, State Parks and Recreation Areas, and Florida Forever Projects.

  The Conservancy believes that the designation of waters as Outstanding Florida Waters, together with the "no degradation" criteria, provides a water quality standard that should be included in the evaluation of waters for the DEP 303(d) list. It would consistent with the data framework of Chapter 62-303, F.A.C., to assess Outstanding Florida Waters using this "no degradation" criteria. Such an assessment would require data on the water quality at the time the waters were designated as Outstanding Florida Waters, and monitoring results would be compared to these "baseline" data to determine whether there has been degradation. Even if the assessment of Outstanding Florida Waters for degradation does not fit within the framework of Chapter 62-303, as discussed above, DEP would be required to include these waters on the 303(d) list if they exhibit degradation, pursuant to 40 C.F.R. § 130.7(b)(3). [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

RESPONSE: 62-302.300 FAC States that "1. The Department's rules that were adopted on March 1, 1979, regarding water quality standards are based upon the best scientific knowledge related to the protection of the various designated uses of waters of the State; and
2. The mixing zone, zone of discharge, site specific alternative criteria, exemption, and equitable allocation provisions are designed to provide an opportunity for the future consideration of factors relating to localized situations which could not adequately be addressed in this proceeding, including economic and social consequences, attainability, irretrievable conditions, natural background, and detectability.

(c) This is an even-handed and balanced approach to attainment of water quality objectives. The Commission has specifically recognized that the social, economic and environmental costs may, under certain special circumstances, outweigh the social, economic and environmental benefits if the numerical criteria are enforced statewide. It is for that reason that the Commission has provided for mixing zones, zones of discharge, site specific alternative criteria, exemptions and other provisions in Chapters 62-302, 62-4, and 62-6, F.A.C. Furthermore, the continued availability of the moderating provisions is a vital factor providing a basis for the Commission's determination that water quality standards applicable to water classes in the rule are attainable taking into consideration environmental, technological, social, economic and institutional factors. The companion provisions of Chapters 62-4 and 62-6, F.A.C., approved simultaneously with these Water Quality Standards are incorporated herein by reference as a substantive part of the State's comprehensive program for the control, abatement and prevention of water pollution.
(d) Without the moderating provisions described in (b)2. above, the Commission would not have adopted the revisions described in (b) 1. above nor determined that they are attainable as generally applicable water quality standards."

Interpretation of the "no degradation" criteria cited is objective, at best, and must be taken in context with consideration given to the whole intent and meaning of 62-302 FAC. In the most extreme case "no degradation" could be taken, literally, to mean absolutely no amount of any contaminant under any circumstance. The Department believes that numerical standards, based on the most recent technological advancements and research, such as those listed in 62-302.530, Criteria for Surface Water Quality Classifications, and any subsequent revisions, should be used to determine waterbody impairment. The Department does agree that special consideration should be given to OFWs in order to retain their unique characteristics and beneficial use.

- There are several problems with the Impaired Waters Rule for the identification and listing of waters pursuant to Section 303(d) of the Clean Water Act. Most importantly, the manner in which the rule is implemented by DEP rewards lack of data at a time when it is unlikely that additional data will be gathered in order to meet the stringent data requirements of the Rule.

  Specifically, there are waters that were previously identified in the 1998 303(d) report as having "parameters of concern" but for which in the interim 4 years, data were not collected in the manner and frequency required to make a definitive decision concerning impairment. By not including these waters on the verified list, DEP is rewarding the failure to establish an adequate water quality monitoring system. These waters were known to be of concern in 1998; if monitoring had been put in place at that time, a sufficient number of quarters of data would have been collected so that a fully informed decision about whether these waters are impaired or not could be formulated. These include:

2071, North Prong of Alligator Creek, turbidity, coliform, dissolved oxygen
2049, Gottfried Creek, 2049, nutrients
2078B, Coral Creek E. Branch, dissolved oxygen, zinc

For the Group 1 Basins, EPA has required that waters be retained on the Verified List unless EPA approves their removal. The same approach should be taken for Charlotte Harbor. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

RESPONSE: The Basin Rotation Schedule that the Department has implemented is designed so that any inadequacies in the data can be identified and corrected in time for the next rotation and assessment of the basin. The IWR has strict data requirements because it is based on sound scientific principals and statistical data analysis. It is FDEPs intention to adequately assess all waters within the State. However given the Departments limited amount of resources and the large number of waters in Florida this task has not yet been completed.

FDEP is not "rewarding the failure to establish an adequate water quality monitoring system" by not placing waters with insufficient data on the Verified List. All of the water bodies in question (WBIDs 2071, 2049, and 2078B) are on the 303(d) list and will have TMDLs created for them as required by legislative mandate. According to the IWR the FDEP cannot place a waterbody on the Verified list without a minimum number of exceedences in water quality and a verified causative pollutant. Based on further investigation the FDEP may find sufficient cause to place these WBIDs on the Verified List in the future. Upon review the EPA may require that these WBIDs be placed on the Verified List.

- Given that Charlotte Harbor, an Outstanding Florida Water, is the receiving body for the Peace River, it is a significant data gap that DEP is not considering radionuclides as a potential parameter for impairment. The Peace River flows through the heart of the phosphate mining belt, and phosphate mining is associated with surface and aquifer water contamination by fluorides, acids, heavy metals, and radionuclides. See http://fipr.state.fl.us/envserv.htm. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

  RESPONSE: These contaminants will be evaluated as part of the Peace River basin assessment. Any TMDL developed will take into consideration the OFWs and the requirements of Charlotte Harbor.

- The draft verified list for the Charlotte Harbor Basin indicates that there are insufficient data available to make a determination as to the status of WBID 2092F. The Conservancy wishes to reinforce its previous transmittal of information to DEP concerning the possibility of eligible data from the Sanibel Lakewatch group. The group has collected water quality monitoring data, and the 2002 report is posted on line at:

http://lakewatch.ifas.ufl.edu/2002CountyPDFReports/DataSumPart1.pdf, on page 358 of the report. The 2001 report is also online at: http://lakewatch.ifas.ufl.edu/2001CountyPDFReports/Lee.pdf.

Additionally, a consent order was reached between the City of Sanibel and DEP concerning discharges from the WWTP. There should be water quality data that were collected to comply with the consent order. This data may also be appropriate for use in determining whether this water body is attaining its designated use. [Gary A. Davis Director, Environmental Policy, The Conservancy of Southwest Florida].

RESPONSE: Additional data were retrieved by FDEP personnel and entered into the FLSTORET database. As a result WBID 3092F, Sanibel Island Lake, has sufficient data to be placed on the Verified List.

- July 31, 2003

Mr. Daryll Joyner, Program Administrator
Watershed Management Program
Department of Environmental Protection
MS 3510
2600 Blair Stone Rd
Tallahassee, FL 32399-2400

Dear Mr. Joyner:

We want to take this opportunity to recognize DEP for their hard work in assembling the first draft of the Lemon Bay Total Maximum Daily Load (TMDL). In particular, we would like to thank Diana Williams for speaking at the Lemon Bay Stakeholders Meeting held by the County last February, where we had the opportunity to educate residents about the many facets that affect Lemon Bay. We recognize that the TMDL is a large, innovative and complex initiative for DEP, and it is of utmost importance to our community.

Please accept this letter as our comments on the draft document. Most comments will focus on the accuracy of the science used to establish the impaired waterways of Lemon Bay and the lack of a watershed approach or stakeholder involvement in analyzing and reviewing the data.

SCIENCE:

- *Making public policy around the goal of preserving a precious natural resource, such as our waterways, demands that the science be the best available and utilize a high degree of accuracy. Our review of the data indicates a gross lack of quality control or quality assurance in the methodology of determining the impaired waters. In an effort as important as establishing the pollutant assimilative capacity of such an important resource such, we expect rigorous scientific techniques be applied. We feel it is reasonable to request a DEP official*

sign and seal the TMDL work just as DEP would require a similar type of seal from the County in our programs. **Attachment A** *is a compilation of our technical review of the data and corrections needed. This reflects only data pertinent to Sarasota County. You will see the corrections are extensive. We request these corrections be incorporated into the methodologies used to determine impaired waters and that we be given a chance to review the analysis before establishment of a verified list.*

Implementing the TMDL process and actions needed to assure that our water bodies meet designated uses will be an important and demanding process for DEP and Sarasota County. We must ensure that the spending of public resources to meet this worthy goal is based on best available data, sound science, and involvement of all stakeholders.

Water Quality Standards:

We do have paramount concern with the set of standards used to assess the health of Lemon Bay. As was demonstrated with the Myakka TMDL, the use of Site Specific Alternative Criteria (SSAC) for blackwater creeks located in the southwest and southern portions of Florida is critical. There is a vast amount of data demonstrating these tidally-influenced, blackwater creeks do not naturally attain a dissolved oxygen level of 4 or 5 mg/L. In addition, our geology is such that a large amount of phosphorous occurs naturally and therefore phosphorous is not a limiting nutrient in our waterbodies.

Gottfried Creek has been identified as impaired due to low dissolved oxygen levels. Further analysis of the data shows a statistical correlation between the dissolved oxygen concentration and the amount of color in the creek. This is a very natural condition for creeks that are influenced by wetland drainage that has been established through SSAC studies on the Myakka River. These low DO levels may not represent impairment, but a natural condition to be expected. Trying to increase the DO levels within the creek to meet an artificial attainment level would adversely impact this sensitive ecosystem. We ask DEP to establish protocol for establishing Site Specific Alternative Criteria (SSAC) for pollutants of concern such as dissolved oxygen, nitrogen, phosphorous, and *chlorophyll a* in the tidal creek systems.

LACK OF A "WATERSHED APPROACH":

- *We are concerned over the lack of a "holistic watershed approach" to assessing the health of the watersheds. This means the inclusion of hydrology, habitat, and biological data in addition to the water chemistry data used to assess impairment. One of the most impacted characteristics of our watersheds is the hydrology. The ditching and draining activities of the past has substantially altered the timing and volume of water to the receiving water bodies, yet this is not accounted for in DEP's assessment of the watersheds.*

SARASOTA COUNTY'S APPROACH TO WATERSHED MANAGEMENT IN LEMON BAY:

The Board of Sarasota County Commissioners identified Water Resource Management and Sustainability as one of seven strategic initiatives to be developed

for this community's future. This initiative takes a Comprehensive Watershed Management Approach and includes coordinating the following areas of responsibility (1) water supply (2) flood protection (3) water quality and (4) natural systems. To coordinate these areas of responsibility, Sarasota County is working to bring together all Natural Resources, Stormwater Management, and Utility water programs within the County's organization. This common sense approach to water management is intended to integrate the functions within each discipline including planning, design, permitting, and operations.

Sarasota County is in the process of evolving these disciplines and functions around regional watersheds contributing water to our five major bay segments such as Lemon Bay. We have developed a Comprehensive Watershed Management Plan addressing not only the four areas of responsibility, but also the four areas of science affecting our watersheds: (1) hydrology (2) water quality (3) habitat and (4) biology. We recognize that there is a cascading and interconnected relationship between these four areas.

In general, the Comprehensive Watershed Management Plan initiatives or key activities are global to the County. We will now work with the stakeholders in each of the five watersheds to prioritize our work within each one.

Lemon Bay's unique features include its relatively undeveloped watershed, the impact of the intracoastal waterway on the bay system, the lack of circulation within the bay itself, the relatively low event mean concentrations in stormwater runoff determined by SWFWMD, and the lack of wastewater treatment plant discharges in the watershed.

- *One example of a key activity within the Comprehensive Watershed Management Plan is a study the County has undertaken to determine the current hydrologic regime within those drainage basins in the Lemon Bay watershed. This is the most basic element of any water quality modeling and has a large impact on determining pollutant loads. We will compare the current hydrologic regimes of our altered watersheds to more natural watersheds, such as Deer Prairie Slough and the Myakka River Basin, to determine how the volume and timing of flow to the estuary has changed. We know that the total flow volume has been increased to Lemon Bay over the years through ditching and drainage work for agriculture and mosquito control purposes. Once we understand the change in the hydrologic regime, the County will work to restore the natural hydrology through stormwater conservation, habitat restoration and other projects within the watershed. We will look to DEP for support and guidance during this process.*

DESIRED OUTCOMES:

- Currently, SWFWMD is completing a pollutant loading study of the Lemon Bay Watershed. This study will develop "Event Mean Concentrations" (EMCs) specific to the watershed. SWFWMD has also indicated that the health of Lemon Bay and the tidal creeks have impacts that are more substantial than stormwater runoff such as circulation issues and recreational use. Inclusion of these affects

on the analysis of Lemon Bay watersheds should be incorporated into DEP's analysis.

- The establishment of Site Specific Alternative Criteria for Lemon Bay that could include the use of data from the work being conducted in the Myakka River Basin. Meeting current state and federal guidelines for water quality criteria may be unattainable or even worse, harmful to our natural creek systems.
- Involvement of stakeholders in the analysis of data and determination of the verified list for impaired water bodies. We are fortunate to have a community that is extremely knowledgeable about the Lemon Bay watershed. They need to have input on the data and it's review.
- The establishment of clear guidelines for review and correction of the data and proper time allowance within the comment period for corrected data runs to be executed. During this cycle of assessment, we found it impossible to ensure that DEP's impairment decisions were accurate because the time lag between corrected data runs exceeded the deadline for the comment period.
- Managing the productivity of Lemon Bay will require more than evaluating surface water quality. As the TMDL process proceeds, we ask that DEP assure sound science of water quality data produced, take into account the effects of the changes in hydrology on the Lemon Bay system, be a partner in the study by SWFWMD on Lemon Bay Water Quality, and support local governments in the implementation of Comprehensive Watershed Management Action Plans.

Sarasota County has been a leader in protection and preservation of the Lemon Bay watershed. As a NPDES permit holder, the County will be expected to implement the TMDL. Therefore a legitimate TMDL needs to be established. The proposed draft of impaired waters for the Lemon Bay Watershed contains far too many scientific errors and lacks a holistic approach which could mislead the efforts of watershed management planning in the basin. More work is needed.

We believe that DEP's initiative can bring stakeholder involvement and coordination in the Lemon Bay watershed to a new level. We look forward to working with DEP and the other stakeholders in developing a holistic and coordinated Watershed Management Plan for the sustainability of the Lemon Bay Watershed. If you have any questions, please contact John Ryan at 941.861.0663.

Sincerely,

Theresa A. Connor, P.E. (Sarasota County)
General Manager, Water Resources

RESPONSE: The FDEP thanks Sarasota County for its extensive review, and comments, of the draft Master, Verified, and De-listed lists. Sarasota Counties technical review of the data and corrections noted will be incorporated into the process used to determine future Group 2 waters lists. The assistance from other governmental agencies and citizens groups is essential to the success of the TMDL program.

The Department follows the clearly defined, scientifically based, methodologies in Chapters 62-302 and 62-303 of the F.A.C. to assess waterbodies and create TMDLs. This process is driven by legislative mandate, and thus many new studies and methods cannot be immediately incorporated at the present time. When new studies are completed, and scientific methods are developed, and proven to be scientifically accurate, FDEP will be glad to review and incorporate them into the TMDL process in the future.

- **WBID Corrections**

  Many of these corrections from Data Run 10 have already been sent by electronic mail to DEP staff in Tallahassee.

  Station 21FLA 56112SEAS was located in WBID 2039 (Forked Creek), but should be in WBID 2075D (Barrier Island). The station description is "Canal west of ICWW 31". The nautical charts show a canal west of Marker 31 on the Intracoastal Waterway in Lemon Bay.

  Station 21FLCHARLBV003 was located in WBID 2051 (Direct Runoff to Bay) but should be in WBID 1983A (Lemon Bay). The station description is "Lemon Bay/N Englewood/Suncrest Ln". LB in the station name refers to Lemon Bay.

  Station 21FLCHARLBANG1 was located in WBID 8054 (Lemon Bay Gulf) but should be in WBID 2052 (Rock Creek). The station description is "Ainger Cr off 776 at Marina Isles condo". Ainger Creek is Rock Creek. The ANG in the station name refers to Ainger Creek.

  Station 21FLCHARLBOYS1 was located in WBID 8054 (Lemon Bay Gulf), but should be in WBID 2067 (Oyster Creek). The station description is "Oyster Cr at 2424 Placida Rd., Englewood". OYS in the station name refers to Oyster Creek. Maps of these sample sites are available on DEP's web site http://www.dep.state.fl.us/coastal/activities/research/map.htm.

  Station 21FLA 56110SEAS was located in WBID 8054C (Englewood North), but should be in WBID 1983B (Lemon Bay). The station description is "Shoreline west of ICWW 25". The nautical charts show this channel marker in Lemon Bay south of the bridge.

  Station 21FLGFWFTBM000588 was located in WBID 8054 (Lemon Bay Gulf), but should be in WBID 14443E. All the stations with similar names are in 1443E as shown in the "station list" table in Run 10. It looks like the latitude of 27.0022 should be 27.9922 and this is the reason for the incorrect WBID assignment.

  Station 21FLA 24010574 with the station description of LEMON B E END S SD ENGLEWOOD B B was assigned to WBID ZZZ but should be in WBID 1983B.

The former Sarasota County Environmental Services Laboratory operated an ambient monitoring program until 1992. The following ES Lab stations should be relocated:

> Station 21FLSARA24010559 was located in WBID 1983A (Lemon Bay), but should be in WBID 2015 (Hatchett Creek). The station description is "Intracoastal Waterway at the Venice Avenue bridge". This was a Sarasota County Environmental Services Lab sample location. WBID 2015 is in Group 3, not 2.
>
> Station 21FLSARA24010621 was located in WBID 2042 (Direct Runoff to Bay) but should be in WBID 2030 (Alligator Creek). The station description is "Alligator Creek at Shamrock Blvd.". This was a Sarasota County Environmental Services Lab sample location.

Station 21FLSARA24010572 was in WBID 1983, but should be in 1983A.

> Sarasota County has the STORET Organization ID of 21FLSARA. Since 1995 the County has conducted stratified-random sampling in Lemon Bay (WBID 1983A) and although station naming is confusing, all the stations include LB in the station name. The following stations from this County sampling program should all be in WBID 1983A:
>
> Station 21FLSARALB-1-03 was located in WBID 8054 (Lemon Bay Gulf), but should be in WBID 1983A (Lemon Bay). The station description is "Lemon Bay, north end, near Alligator Creek, March".
>
> Stations 21FLSARA950315-LB-2, Station 21FLSARA950517-LB-2, 21FLSARA960617-LB-3, 21FLSARA950621-LB-2, 21FLSARA950621-LB-3, 21FLSARA960319-LB-2, 21FLSARA960410-LB-2, 21FLSARA960507-LB-2, and 21FLSARA960617-LB-2 were located in WBID 2075D (Barrier Island), but should be in WBID 1983A (Lemon Bay).

The table titled "station list" in Run 10 was checked. The following stations were assigned to WBID 2018, but should be in WBID 1983A: 21FLSARA960213-LB-1, 21FLSARA960410-LB-1, 21FLSARA960507-LB-1, 21FLSARA960617-LB-1, 21FLSARA950215-LB-1, 21FLSARA950517-LB-1, 21FLSARA950621-LB-1, 21FLSARA951212-LB-1, and 21FLSARA951212-LB-1-D.

The following stations were assigned the WBID "NODATA" and should be in WBID 1983A: 21FLSARALB-2-03, 21FLSARALB-2-04, 21FLSARALB-2-05, 21FLSARALB-2-06, and 21FLSARALB-3-06.

The following stations were assigned to WBID XXX, but should be in WBID 1983A: 21FLSARA950315-LB-1, 21FLSARA960319-LB-1, 21FLSARA960717-LB-1, 21FLSARA960717-LB-2, 21FLSARA960717-LB-3, 21FLSARA960717-LB-4, 21FLSARA960717-LB-5, 21FLSARA960821-LB-1, 21FLSARA960821-LB-2, 21FLSARA960821-LB-3, 21FLSARA960821-LB-4, 21FLSARA960821-LB-5, 21FLSARA960924-LB-1, 21FLSARA960924-LB-2, 21FLSARA960924-LB-3,

21FLSARA960924-LB-4, 21FLSARA960924-LB-5, 21FLSARA961023-LB-1, 21FLSARA961023-LB-2, 21FLSARA961023-LB-3, 21FLSARA961023-LB-4, 21FLSARA961023-LB-5, 21FLSARA961120-LB-1, 21FLSARA961120-LB-2, 21FLSARA961120-LB-3, 21FLSARA961120-LB-4, 21FLSARA961120-LB-5, 21FLSARA961211-LB-1, 21FLSARA961211-LB-2, 21FLSARA961211-LB-3, 21FLSARA961211-LB-4, 21FLSARA961211-LB-5, 21FLSARA970108-LB-1, 21FLSARA970108-LB-2, 21FLSARA970108-LB-3, 21FLSARA970108-LB-4, 21FLSARA970108-LB-5, 21FLSARA970211-LB-1, 21FLSARA970211-LB-2, 21FLSARA970211-LB-3, 21FLSARA970211-LB-4, 21FLSARA970211-LB-5, 21FLSARA970312-LB-1, 21FLSARA970312-LB-2, 21FLSARA970312-LB-3, 21FLSARA970312-LB-4, 21FLSARA970312-LB-5, 21FLSARA970521-LB-1, 21FLSARA970521-LB-2, 21FLSARA970521-LB-3, 21FLSARA970521-LB-4, 21FLSARA970521-LB-5, 21FLSARA970616-LB-1, 21FLSARA970616-LB-2, 21FLSARA970616-LB-3, 21FLSARA970616-LB-4, 21FLSARA970616-LB-5, 21FLSARA970716-LB-1, 21FLSARA970716-LB-2, 21FLSARA970716-LB-3, 21FLSARA970819-LB-1, 21FLSARA970819-LB-2, 21FLSARA970819-LB-3, 21FLSARA970819-LB-4, 21FLSARA970819-LB-5, 21FLSARA970918-LB-1, 21FLSARA970918-LB-2, 21FLSARA970918-LB-3, 21FLSARA970918-LB-4, 21FLSARA970918-LB-5, 21FLSARA971007-LB-1, 21FLSARA971007-LB-2, 21FLSARA971007-LB-3, 21FLSARA971007-LB-4, 21FLSARA971007-LB-5, 21FLSARA971113-LB-1, 21FLSARA971113-LB-2, 21FLSARA971212-LB-1, 21FLSARA971212-LB-2, 21FLSARA971212-LB-3, 21FLSARA971212-LB-4, 21FLSARA971212-LB-5, 21FLSARA980112-LB-1, 21FLSARA980112-LB-2, 21FLSARA980112-LB-3, 21FLSARA980112-LB-4, 21FLSARA980112-LB-5, 21FLSARA980226-LB-1, 21FLSARA980226-LB-2, 21FLSARA980226-LB-3, 21FLSARA980226-LB-4, 21FLSARA980226-LB-5, 21FLSARA980316-LB-1, 21FLSARA980316-LB-2, 21FLSARA980316-LB-3, 21FLSARA980316-LB-4, 21FLSARA980316-LB-5, 21FLSARA980415-LB-1, 21FLSARA980415-LB-2, 21FLSARA980415-LB-3, 21FLSARA980415-LB-4, 21FLSARA980415-LB-5, 21FLSARA980506-LB-1, 21FLSARA980506-LB-2, 21FLSARA980506-LB-3, 21FLSARA980506-LB-4, 21FLSARA980506-LB-5, 21FLSARA980609-LB-1, 21FLSARA980609-LB-2, 21FLSARA980609-LB-3, 21FLSARA980609-LB-4, 21FLSARA980609-LB-5, 21FLSARA980825-LB-1, 21FLSARA980825-LB-2, 21FLSARA980825-LB-3, 21FLSARA980825-LB-4, 21FLSARA980825-LB-5, 21FLSARA980915-LB-1, 21FLSARA980915-LB-2, 21FLSARA980915-LB-3, 21FLSARA980915-LB-4, 21FLSARA980915-LB-5, 21FLSARA981013-LB-1, 21FLSARA981013-LB-2, 21FLSARA981013-LB-3, 21FLSARA981013-LB-4, and 21FLSARA981013-LB-5.
[Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: Many of these comments regarding the proper placement of sampling locations were previously submitted by John Ryan of Sarasota County to the FDEP. FDEP reviewed all of these comments and will make the necessary changes to the FLSTORET database. These changes will be incorporated into IWR Run 12.0.

- **The Draft Verified List**

WBID 2030 Alligator Creek

This WBID is listed as verified impaired for low dissolved oxygen (DO) concentrations, caused by elevated phosphorous and nitrogen concentrations. There are three stations in Run 10 for this WBID, but only one (21FLCHARLBV001) contains data from the time period to be used for verification.

The salinity of the water in this area is more like a bay than a creek (Range 4.4 - 29.6 ppt; Mean = 16.9; n = 28), so is correctly identified as an estuary. The dissolved oxygen concentrations were low (Range: 1.2 - 6 mg/l; Mean = 3.4; n = 28) when compared to the Florida estuary standard of 4.0 mg/l (62-302, FAC).

Total Phosphorus (TP) is naturally higher than statewide medians in this part of Florida. Without a specific study, it is reasonable to assume that nitrogen, not phosphorus, is the limiting nutrient in estuaries. It is commonly believed that excessive nutrients can cause algae blooms that depress DO. In this case, there is no excessive algae, as measured by chlorophyll impairment.

DEP correctly says the total nitrogen (TN) concentrations are elevated. (Range 0.24 - 2.22; Median = 1.275 ;n = 34). Similar values are found in the County Lab data from the early 1990s. The year 2000 305(b) report provides a statewide stream median of 0.1 mg/l and an estuary median of 0.8; both much lower than Alligator Creek. Alligator Creek has TN values much higher than Lemon Bay, and slightly higher than the Myakka River.

There are natural low DO conditions found in wetland-influenced waterways in the region. During the 2001 TMDL process for the Myakka River, it became obvious that Florida's water quality standards for DO were inadequate to determine impairment of wetland-influenced streams. Sarasota County is currently participating in a DEP study of the Myakka River watershed to find Site Specific Alternative Criteria for DO. The Alligator Creek basin has experienced significant development but much of the floodplain is intact. The assumption that low DO is unnatural and is caused by nutrients is not demonstrated by the data.

There is no convincing evidence that there is nutrient impairment of the mostly freshwater WBID 2030 based exclusively on predominantly estuarine samples taken near the mouth of the creek. The argument that the low DO conditions were caused by high TN concentrations without ever causing elevated chlorophyll levels is a weak argument. Alligator Creek may have impaired water quality that was caused by humans, but the Verified List has not provided reasonable assurance that this is the case. It is certainly reasonable for stakeholders to develop a watershed management plan that will protect and improve water quality in this basin. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The Draft Verified List was based on analytical data in the IWR Run 9.3. Without a specific study it is not reasonable to assume that Total Phosphorus (TP) is naturally higher than statewide medians in this part of Florida, nor that nitrogen, not phosphorus, is the limiting nutrient in estuaries. Although meeting standards, the mean value of 9.48ug/L for chlorophyll is indicative of elevated nutrient levels. Additionally, although only listed as 3c (planning list) fecal coliform had sufficient impairments to be listed on the Verified list according to IWR Run 11.0. Either of the planning or verified listings are indicative that impaired water quality was caused by humans. There might be naturally low DO conditions found in wetland-influenced waterways throughout the region, however FDEP has no evidence to support this and must rely on the analytical data. FDEP encourages local governments and private citizens groups to work with the department in developing satisfactory sampling plans and research projects that will adequately assess Florida's waterbodies.

- **WBID 2049 "Gottfried Creek" (excluding west branch)**

  This WBID is listed as verified impaired for low DO concentrations, caused by elevated phosphorous and nitrogen concentrations. The salinity ranges from 1.5 - 35 (Median = 13.8, n = 31) so this WBID is correctly identified as an estuary. There are 23 DO data records ranging from 1 to 7.1 mg/l with a median value of 3.15 mg/l, so DO is lower than the state standard of 4.0 mg/l.

  Attachment C is an aerial photo that shows the headwater wetlands of Gottfried Creek, and the relatively undeveloped nature of the basin. It makes more sense to attribute the low DO conditions in Gottfried Creek to the high oxygen demand of wetland drainage than to man-made impacts. The relatively pristine Myakka River Basin is a good reference natural system. Attachments D and E show the close relationship between color and DO in the Myakka River. Attachment F charts a similar strong correlation in Gottfried Creek between DO and color. Color is an indicator of wetland drainage and high natural oxygen demand.

  As discussed previously, TP is not a limiting nutrient in estuaries and is naturally elevated by local phosphate ore deposits. The Myakka River has TP levels much higher than the state median (Attachment G). The median TN concentration cited by DEP was 1.178, but there is no TN data for the post-1995 period. Using data from the early 1990s, the mean value for TN is 0.99 and is close to the mean for the Myakka River, as shown in the attached chart (Attachment H).

  Sarasota County believes that Gottfried Creek is not impaired at all. This WBID is very much a wetland-influenced system, with naturally low DO concentrations and high TN values. The un-impacted Myakka River provides a better baseline than do comparisons to statewide averages. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: WBID 2049 is listed as verified impaired for low DO concentrations caused by elevated phosphorous (mean=0.295mg/L) concentrations. FDEP has re-evaluated the data used to calculate TN, found the data to be in error, and removed TN as a causative pollutant. The Myakka River may be a good reference natural system, however it is significantly different from Gottfried Creek hydrogeologically. There have been no published reports, that FDEP is aware of, correlating the relationship between water color and dissolved oxygen. The information that Sarasota County provided regarding the correlation between water color and dissolved oxygen was good research and deserves to be investigated further. However until these results have undergone proper scientific review FDEP cannot accept them as fact. Further research is required to conclusively determine if elevated Phosphorus levels are the result of naturally occurring conditions in this part of the State.

- **WBID 1983A "Lemon Bay"**

  This WBID is not listed as verified impaired. Unfortunately, there are numerous omissions and errors in Run 10 of the database, which makes assessment of the data impossible. Many sample stations from this WBID were assigned elsewhere, as described above. In addition, it appears that many of Sarasota County's data were not used to calculate the lists.

  Since 1995, Sarasota County has conducted stratified-random monthly sampling of Lemon Bay ambient water quality. The program was designed to characterize water quality throughout the bay, and to avoid variations associated with a few fixed locations. Lemon Bay is divided into five strata (areas LB-1, 2, 3, 4, and 5). Each area gets sampled once each month. Once each month, each area is sampled in a different location, resulting in 12 samples per year in each area, totaling 60 sample locations per year in Lemon Bay. The 60 sample stations are repeated every year in the same months as in previous years. Samples events have been completed for every month; there are no missing months.

  Until the database WBID corrections have been made, it is impossible to check that all of Sarasota County's data has been used in the calculation of Lemon Bay impairment. To check that the County data was available, data downloads were done from Florida STORET and EPA's Legacy STORET. It was found that all of the County data was present in the two databases. In particular, there is chlorophyll data for every month between January 1995 through October 2002. Attachment I is a spreadsheet depicting all of the County stations for Lemon Bay. DEP analysts can use this spreadsheet to ensure that all of our data is being used for determination of impairment. All of these stations should be assigned to WBID 1983A.

  All the chlorophyll data in WBID 1983A from Run 10 was combined with the data downloaded from both STORETs. Using IWR methods, the following annual averages were calculated:

  1996 4.02

1997	6.48
1998	13.54
1999	9.05
2000	8.31
2001	11.77
2002	10.57

According to the Impaired Waters Rule (62-303, FAC) both 1998 and 2001 exceeded the nutrient guideline of 11 ug/l for estuaries. Interpreting the meaning of the conditions in Lemon Bay is undoubtedly more complicated than the methods in the impaired waters rule, but it is vital that the listing of waters as verified impaired is done using accurate and complete data and methods. Attachment J is a spreadsheet of the data and calculations of chlorophyll annual averages in Lemon Bay.

The SWFWMD has nearly completed a study of Lemon Bay. Preliminary results suggest that nitrogen loading to Lemon Bay has not increased over the last few decades. It has been hypothesized that drainage swales have captured and denitrified stormwater before it enters the bay. Chlorophyll abundance in northern Lemon Bay (WBID 1983A) may be more a function of naturally poor flushing to the Gulf, rather than pollutant loading from the watershed. Stakeholder development of a watershed management plan for northern Lemon Bay (WBID 1983A) is a sensible, responsible public policy. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The FDEP is currently in the process of reviewing and inputting the sampling station corrections which Sarasota County has submitted. It is anticipated that these changes will be available for IWR Run 12.0. All of the Group 2 waters for Charlotte Harbor will be re-assessed once this task is complete. To avoid future confusion the FDEP suggests that Sarasota County meet with its designated STORET coordinator to assure proper input of their data. FDEP has very well defined methodology for utilizing chlorophyll concentration as a measure of nutrient impairment. Although there were two exceedences in chlorophyll concentration during the verified period these were followed by compliant concentrations the following years. Additionally the mean chlorophyll concentration for the verified period was 7.85ug/L which meets water quality standards.

- **WBID 2042 "Direct Runoff to Bay"**

  This WBID is a coastal drainage basin located between Alligator Creek and Forked Creek and has been listed as verified impaired for chlorophyll. Drainage is through minor ditches, and there are no pollution sources in the area. The only data source is from station 21FLSARA24010621, a former County station that was discontinued in 1992, so predates the time period needed to assess for verified impairment. This

station has no chlorophyll data in Run 10. In addition, it is assigned to the wrong WBID and should be moved to 2030, as described above.

> The station list table in Run 10 also shows another station in WBID 2042. Station 21FLA 24010621 has a station description of "Alligator Creek at Shamrock Blvd." and is could be a DEP station that should be reassigned to WBID 2030.
>
> Listing of this coastal drainage WBID as impaired appears to be a miscalculation and should be removed from the list. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The listing of WBID 2042 is based upon its inclusion on the 1998 303(d) list for nutrient impairment. As this is a legislative mandated listing the WBID will have a TMDL developed for it in 2004. FDEP has noted Sarasota Counties comments and is currently in the process of reviewing and inputting the sampling station corrections which Sarasota County has submitted. It is anticipated that these changes will be available for IWR Run 12.0.

- **WBID 2039 "Forked Creek"**

Run 10 contains 1498 records from four stations. Three of the stations (21FLSARA24010567, 21FLSARA24010623, and 21FLA24010678) had no chlorophyll data and no data post-1995, so were not used for IWR assessment. These three stations were correctly located in Forked Creek WBID 2039, and were correctly identified as estuarine (based on salinity).

> The fourth station, DEP station 21FLA56112SEAS had 1141 data records and is the sole station for the entire impairment decision. The station description is "Canal west of ICWW 31", which suggests that the station is on the west side of Lemon Bay, not near Forked Creek. The lat-longs locate it in a bay inlet near Highland Avenue and Bayshore Road. Intracoastal Waterway channel marker 31 is south of Forked Creek and Manasota Key does have some canals west of the marker. The other similarly named stations shown in the "station list" table of Run 10 seem to be samples of Lemon Bay, not streams. Salinities for this station are predominantly estuarine (@30ppt), but are occasionally fresh (min = 7.8 ppt) so the station is near a freshwater source.

It is most likely that station 21FLA56112SEAS is near the shoreline either east or west of Marker 31 and not located near Forked Creek at all. DEP should check with their own data providers to accurately locate this station in the proper WBID. In the unlikely event that DEP locates this station in the mouth of Forked Creek, it is unscientific to characterize this tidal basin as impaired or not, based on a single estuarine sample location. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The exact location of sampling station 21FLA56112SEAS, utilizing the lat-longs, appears to be in a small stream located in the south west portion of WBID 2039, labeled water line 76958. This is consistent with the salinity data, as the

stream should be tidally influenced. The Department agrees that more sampling is required to properly characterize this WBID.

- **WBID 2051 "Direct Runoff to Bay"**
  This WBID is a coastal drainage basin between Forked Creek and Gottfried Creek. It has been verified as having impaired water quality for both DO and chlorophyll, with nitrogen and phosphorus as causative pollutants.

  One station provides all the data. Station 21FLCHARLBV003 is part of Lemon Bay Aquatic Preserve Volunteer Monitoring Network, and is located on the shore of Lemon Bay near Suncrest Lane. This station is assigned to the wrong WBID and should be reassigned to WBID 1983A Lemon Bay. There is no remaining data to assess impairment of WBID 2051. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: Based on Sarasota Counties verification this sampling station will be removed from WBID 2051 and moved to WBID 1983A (Lemon Bay). Both WBIDs will be re-assessed in IWR Run 12.0 with the corrected additions and deletions of analytical data.

- **WBID 8054 "Lemon Bay Gulf"**
  This WBID covers a large area of the Gulf of Mexico roughly from near Alligator Creek to Coral Creek. It has been verified to be impaired for DO, with phosphorus identified as the cause.

  As detailed above, all four stations are incorrectly assigned to this WBID: 21FLCHARLBANG1, 21FLCHARLBOYS1, 21FLGFWFTBM000588, and 21FLSARALB-1-03. Once the WBIDs are reassigned there is no data left to assess this WBID. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: Based on Sarasota Counties verification, this sampling station will be removed from WBID 2051 and moved to WBID 1983A (Lemon Bay). Both WBIDs will be re-assessed in IWR Run 12.0 with the corrected analytical data.

- **WBID 2052 "Rock Creek"**
  This WBID is most commonly called Ainger Creek in Sarasota County. One station (21FLA 24010600) provides all of the 153 records in Run 10. The station was sampled by DEP and is located near the mouth of Ainger Creek at Placida Road. It is correctly located within WBID 2052. It is correctly identified as an estuary. Although this WBID is partly within Sarasota County, the sample location is not. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The Department thanks Sarasota County for its comments. However it is not possible to change all of the departments records necessary to rename this WBID. WBID 2052 will remain Rock Creek.

- **WBID 2075D "Barrier Island"**
  This WBID is called Manasota Key locally. There are 3433 records in Run 10 from 11 stations. Seven of the stations are Sarasota County Stations in Lemon Bay, so have an incorrect WBID assignment, as described above.

  The four DEP stations (21FLA56114SEAS, 21FLA56127SEAS, 21FLA56212SEAS, and 21FLA56220SEAS) are in Lemon Bay and may be close enough to Manasota Key to be in this WBID. Only station 21FLA 56114SEAS could affect decisions relating to Sarasota County. It may belong in WBID 1983A. The salinities range from 3.9 to 35.2 with a median of 25.4 ppt, which suggest a coastal influence, and probable correct WBID assignment of 2075D. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: Based on the lat-longs of record, the FDEP believes that sampling stations 21FLA56114SEAS, 21FLA56127SEAS, 21FLA56212SEAS, 21FLA56220SEAS, and 21FLA 56114SEAS are being assessed in the correct WBIDs. Should Sarasota County be able to produce other, verifiable lat-longs for these sampling stations, FDEP will be happy to review the data and make the necessary changes.

- **WBID 8054C "Englewood North"**
  This WBID is a Gulf of Mexico beach area north of the Beach Road bridge in Englewood. Two stations provide all data (21FLA56110SEAS and 1FLDOH CHARLOTTE39). DEP station 21FLA56110SEAS is described as "Shoreline west of ICWW 25" and is in Lemon Bay, not the Gulf of Mexico; it should be reassigned to WBID 2075D or 1983A. Station 1FLDOH CHARLOTTE39 is correctly located in this beach WBID. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: There is not sufficient evidence at this time to justify moving station 21FLA56110SEAS to another WBID. The lat-longs correctly place the sample on the west (Gulf) side of the barrier island, on the beach in WBID 8054C. The Department will investigate Sarasota Counties comments in further detail and make changes to the appropriate WBIDs should a change in the sampling location be verified.

- **WBID 8054A "Manasota Beach"**
  One DOH Healthy Beaches sample station is the entire data set of 87 records. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: One sample station for WBID 8054A (Manasota Beach) is adequate.

- **WBID 8054B "Blind Pass Beach"**
  One DOH Healthy Beaches sample station is the entire data set of 87 records. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: One sample station for WBID 8054B (Blind Pass Beach) is adequate.

- **WBID 8999 "Florida Gulf Coast"**
  This WBID is mapped and is described in the Verified report, there is no data in Run 10. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: WBID 8999 is inclusive of all WBIDs along the Florida Gulf Coast and does not show up in the IWR Run. It appears on the Master List and Verified List for mercury impairment, and a TMDL for the coastal waters of Florida will be developed in 2011.

- **WBID 2021 "Direct Runoff to Bay"**
  This WBID is a coastal drainage basin northwest of Alligator Creek near the ICW. No data at all in Run 10 and not listed in the draft Verified List, but the WBID appears on the map. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: Due to a programming error, none of the WBIDs with no data appear on the IWR Master List. The FDEP is not required to list these WBIDs, but makes every attempt to include them. Due to different databases all WBIDs will appear on the Basin Map, regardless of the data.

- **WBID 2050 "Unnamed Ditch"**
  This WBID is the west branch of Gottfried Creek. No data at all in Run 10 and not listed in the draft Verified List, but the WBID appears on the map. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

  RESPONSE: Due to a programming error, none of the WBIDs with no data appear on the IWR Master List. The FDEP is not required to list these WBIDs, but makes every attempt to include them. Due to different databases all WBIDs will appear on the Basin Map, regardless of the data.

- **WBID 2057 "Unnamed Ditch"**
  This WBID is the east fork of Ainger Creek (Rock Creek). No data at all in Run 10 and not listed in the draft Verified List, but the WBID appears on the map. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: Due to a programming error, none of the WBIDs with no data appear on the IWR Master List. The FDEP is not required to list these WBIDs, but makes every attempt to include them. Due to different databases all WBIDs will appear on the Basin Map, regardless of the data.

- **General Comments about Local Water Quality:**

> Because phosphate ores occur in this part of the state, TP concentrations are naturally higher than statewide medians. TP is probably never a limiting nutrient locally, especially in estuaries. Rather than using statewide median TP concentrations to identify causative pollutants for low DO, it makes more sense to use ambient concentrations from a pristine reference stream such as the Myakka River. We have an ample amount of Myakka data and have supplied it to the Bureau of Watershed Mgt. before, but would be glad to do so again.

Some local basins receive natural drainage from wetlands, especially in the summer. The Myakka basin is a good reference for naturally occurring low DO values, rather than the state standard, which is a poor match. Gottfried Creek is one such wetland-influenced system.

> We have some basins that are draft verified impaired for low DO with the causative pollutants identified as nutrients, but with no chlorophyll impairment. What is the mechanism for low DO caused by nutrients when no nutrient (chlorophyll) impairment is found?

It is understandable that the data management demands on the department are immensely challenging. The County is eager to ensure that the water quality data we have is included in the impaired waters assessments. We have supplied our database to DEP on several occasions in the past and would always be willing to send it again, upon request.

> The County did not anticipate the magnitude of the commitment that would be needed to perform quality assurance to the impaired waters assessment process. It would be advantageous to all stakeholders if the DEP would make it more clear how to perform the QA and when the deadlines happen. During this cycle of assessment, the County found it impossible to ensure that impairment decisions were accurate because the time lag between corrected data runs exceeded the deadline for the comment period. [Theresa A. Connor, P.E., General Manager, Water Resources, Sarasota County].

RESPONSE: The FDEP acknowledges that because phosphate ores occur in this part of the state, TP concentrations could be naturally higher than statewide medians. However the FDEP cannot assume that this is the case without proper scientific testing and documentation. Without this documentation the FDEP cannot assume that TP is a result of naturally occurring background levels. The Myakka River is not a good reference for ambient concentrations because it is substantially hydrologically different from the WBIDs in the Charlotte Harbor Basin.

The requirements in 62-302.530, Florida Administrative Code are water quality criteria. (Note: the criteria for dissolved oxygen are numeric, but the criterion for nutrients is

narrative.) Chapter 62-303, F.A.C., "Identification of Impaired Surface Waters" provides a methodology for using independently applicable thresholds (not criteria) for assessing data and information gathered from ambient waters. Thus, under Chapter 62-303 (used for making listing decisions), FDEP may very well determine that the DO criterion is verified as being exceeded more than 10% of the time and that the nutrient thresholds that were applied in attempting to identify the suspected cause of the low DO. These nutrient thresholds are "rules of thumb," based on statewide values for each waterbody type. However, the low DO values may also be caused by oxygen-demanding substances for which we frequently have no data or they may be (at least in part) due to natural conditions. When we find there is an impairment due to "nutrients," that impairment is not based on concentrations of nitrogen or phosphorus (potential "causative factors"), but rather we apply measures of response variables (e.g., chlorophyll concentrations in streams or marine waters or the Trophic State Index in lakes).

- **From:** pauline&Jim [mailto:warrenj81@ewol.com]
  Sent: Tuesday, June 10, 2003 12:58 PM
  To: Jeb Bush; Mandrup-Poulsen, Jan; Coram, Phil
  Subject: UPDATE: STOP TOXIC DUMPING IN THE GULF!

  Dear Directors and Area Reps:
  To continue the past practice of Save Our Seas, a copy of this e-mail has been sent to Governor Jeb Bush, Phil Corman, and Jan Mandrup-Poulsen, FDEP reps. for rebuttal prior to Save Our Seas membership for dispersal. Begin to send this evening if you do not hear from me!
  Save Our Seas, supporters in your area have asked that I contact you to act on their behalf to stop the scheduled dispersion of partially treated water into the Gulf of Mexico scheduled this month with toxic dispersion to come. This e-mail includes the PEW Oceans Commission report a 3-year, $5.5 million study that warns oceans on the verge of collapse unless certain actions are taken. (Click onto Gulf of Mexico and click again for specifics.) And a public meeting I attended on Monday, June 9, 2003 in which FDEP staff would not to address the impact toxic dumping would have on Gulf of Mexico despite their own maps of gulf indicate "EPA Category 5: Water quality standard not attained water impaired and requires TMDL."(Total Maximum Daily Load). For your perusal and action:
  FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION RECOGNIZES POTENTIAL RISKS & ADVERSE IMPACTS ON ENVIRONMENT BY PHOSPHATE MINING BUT DECIDES LONG TERM SOLUTION IS TO DEPOSIT TOXINS INTO THE GULF OF MEXICO DESPITE PEW REPORT

  January 30, 2001, "The difficulties facing the Mulberry Corporation must not be allowed to create difficulties for the residents of the affected areas," said Department of Environmental Protection Secretary David B. Struhs. "We are not acting to study the problem, but will instead work with all concerned to take

action and keep this as a story for the business and financial section rather than becoming environmental news."

1. Discharges of partially treated “industrial waste” wastewater (double-lime with aeration) have been pumped into the surface waters in Bishop Harbor under an Emergency Order and are in affect until May 31, 2003. “Impacts (to Bishop Harbor) are already occurring and are expected to become more pronounced. The primary **risks and adverse impacts are associated with its nitrogen load and include stimulation of harmful (toxic) algae blooms (Procentrum) can be an increased risk to human health due to high potential for human exposure to contaminated water**.” (Citations taken from Marine Protection, Research and Sanctuaries Act of 1972 documents.)

2. Since Bishop Harbor cannot take more toxins, the Florida Department of Environmental Protection, FDEP needs another site to discharge toxins from Piney Point--Gulf of Mexico is chosen.

3. Memorandum
Subject Marine Protection, Research and Sanctuaries Act April 2003
From: James D. Giattian, Director, Water Management Division
To: J. I. Palmer Jr., Regional Administrator, U.S. EPA Region 4
“Attached for your signature is the emergency ocean dumping permit for <u>partially</u> treated wastewater from the abandoned Piney Point facility pursuant to Section 102a of the Marine Protection, Research and Sanctuaries Act (MRPSA) of 1972. The wastewater is ‘industrial waste‘ as defined in Section 102a (b) of MRSPS."
4. Emergency as defined by the MPRSA, 33 USC1412a, “EPA may only issue emergency permit for the dumping of industrial waste into ocean waters if EPA determines that an emergency has been demonstrated to exist, poses an unacceptable risk to human health and admits <u>no other feasible solution</u>.”
April 9, 2003, Environmental Protection Agency EPA issues “one-time permit disposal of 534.7 millions gallons of <u>partially treated</u> waste water from April 9, 2003 through November 30, 2003" (**Reclaimed water will add 125 tons of ammonia-nitrogen, plus arsenic, cadmium, lead, manganese and other toxins with possible radiochemical compounds into the Gulf of Mexico abutting fisheries preserve, without an Environmental Impact Report.**)
5. "…ocean dispersion should only be used as a stop gap measure over the **short-term** until other options could be implemented to relieve the emergency situation.” However, Phil Coram, P. E. Program Administrator, Bureau of Mine Reclamation, FDEP states: "**Offshore dispersal may provide a long-term solution**."
6. Emergency permit is issued based upon FDEP speculation of rainfall, hurricane concern and admitting no other feasible solution exists. Historical documents from the National Oceanic and Atmospheric Administration state: “Annual yearly rainfall of 52 inches...in the area." "Only 10-11 storms of hurricane intensity in 87 years have passed inland on the west coast in the area from Cedar Key to Fort Myers.” May 4, 2003 Deena Wells, spokeswoman for the FDEP states: We're moving forward with pipeline construction very soon. **<u>We are going to build a storage facility to store the water</u>.** We expect to be barging it out in the Gulf within six weeks."

7. Further, EPA approves FDEP permit--without Environmental Impact Report on Gulf of Mexico. Scientific research is the foundation of resource management. An Environmental Impact Report provides information about the natural processes in the Gulf of Mexico prior to dumping. This sets the benchmark we will have to determine the effects of the FDEP's dumping activities. Without this knowledge the FDEP cannot make effective resource management decisions.
When FDEP representatives were asked why no Environmental Impact Report was obtained and no scientific data to support FDEP's decision, David Herbster, FDEP sites; "relatively safe solution to the problem" and "budget cutbacks." Orlando Rivera, PWS, Environmental Adm., Mandatory Phosphate Section, Bureau of Mine Reclamation states, "**The Florida legislature, while recognizing that the extraction and processing of phosphate has the potential for causing adverse impacts to the environment, also recognizes that the extraction and processing of phosphate contributes to the economic well-being of the state. The DEP sees no reason to duplicate or question the federal government's effort on this issue".**
8. The dispersion area will be 19,500 square miles. Distribution will be 40 miles off shore, which abuts spawning habitat of grouper and other fish species, not to mention affects on coral and sponges. Nor does FDEP's proposed action address tidal flows, which could cause more death of fish, dolphins, and endangered West Indies manatees.

CONSIDER DEP & FDEP'S FIDUCIARY RESPONSIBILITIES

The U .S. Environmental Protection Agency (EPA) emphasis is on human health and safety; any benefits to fish and wildlife are indirect. The EPA often does not address off-site contamination of natural resources. The Florida Department of Environmental Protection MISSION STATEMENT: "To Protect Florida's Coastal and Aquatic Resources. Focus efforts within and beyond our boundaries to address priority threats to the ecosystem. Make decisions based on the best available science and information such as, changes in water quality, abundance and diversity of fish populations, and natural replenishment of corals and sponges." Taken directly from FDEP's Website.
We are a group of business people disbursed throughout the State of Florida. We are both Democratic and Republican, some highly active in environmental causes and many, well apathetic who have joined together under S.O.S.--Save Our Seas to protect the Gulf of Mexico from becoming the future dumping ground for the phosphate mining industry. We are fighting a multi-billion dollar business here in Florida and we need your help! Log onto www.flsenate.gov and www.myfloridahouse.com. Call toll-free or e-mail your state representatives and tell them that the Florida Attorney General states: "The Legislature has the ultimate oversight of state agencies." The State Senators and House Representatives are where the buck ultimately stops! Demand that they tell the FEPA to **immediately cease and desist the proposed toxic dumping in the Gulf of Mexico since:**
1.The EPA's Emergency Permit is based upon flawed criteria for "emergency" permit establishes a dangerous precedence
2. Discharge is located within a Fisheries Reserve

3. Reliance on self-monitoring is insufficient
4. Monitoring of environmental impacts are virtually nonexistent
ULTIMATELY, THE LIFE OF THE GULF OF MEXICO NOW AND IN THE FUTURE DEPENDS UPON YOUR IMMEDIATE ACTION!
Sincerely,
Pauline Blocker, President
S.O.S. Save Our Seas
P.O. Box 3432
Placida, FL 33946
(941) 697-8507
NOTE: Marine Protection, Research and Sanctuaries Act documents state: "The FDEP is currently discharging double-lime with aeration treated wastewater into Bishop Harbor under an Emergency Order. This order allows such discharges until May 31, 2003. With the onset of warmer weather temperatures in March, adverse impacts to Bishop Harbor, an aquatic preserve, and Tampa Bay are likely to grow more severe. Signs of impact are already occurring and will become more pronounced. The primary risks and adverse impacts are associated with its nitrogen load and include increased phytoplankton concentrations that attenuate available light to recovering sea grass communities, stimulation of harmful (toxic) algae blooms. As a result of the current discharges an algal bloom (Prorocentrum) has been reported in Bishop Harbor. Blooms of toxic algae in microgram production can be an increased risk to human health due to the high potential for human exposure to contaminated water. The consumption of wastewater from Piney Point, through discharges of partially treated wastewater into Bishop Harbor will need to be halted due to impacts caused by increased algal growth stimulated by the nitrogen." Decision is made to dump toxins into the Gulf of Mexico.

THE REAL ISSUE IS BETTER CONTROL OF PHOSPHATE MINING IN THE STATE OF FLORIDA.

The DEP, without proper analysis of documents of financial capacity prior to permitting and licensing, did permit and license Mulberry Phosphates to conduct a business without consideration of environmental concerns in the State of Florida. In February 2001 when Mulberry Phosphates went bankrupt, they simply walked away leaving the costs for cleanup of two gyp stacks at Piney Point to the taxpayers in the State of Florida. The taxpayers in the State of Florida will expend $500 million to clean up one phosphogypsum stack at this site.
The DEP has had ample time since February 2001 to resolve this problem and they have not. (**There are currently about 1 billion tons of phosphogypsum stacked in twenty-four stacks in the state. About 30 million new tons are generated each year. This does not bode well for the future of Florida's environment.**)
The problem of cleaning up the phosphate sites in the State of Florida is so large, the state is basically ignoring it. It is time to put a moratorium on all phosphate mining and permits and evaluate the current problems in the state. Otherwise, the

taxpayers are going to continue to continue to pay for one environmental problem after another!

Tallahassee: The Florida Legislature this month considered bills that call for waiving liability for "Good Samaritan" companies that help during environmental emergencies. Both failed. If the FDEP truly believed that the water they intend to dump into the Gulf of Mexico was environmentally safe, why would they need such bills? Liability of course!

Additionally, an amendment to one of these bills called for a state law to mandate phosphate chemical companies to draft emergency manuals to "tell the state how to operate the plants in the event the companies go bankrupt." The FDEP does not require Emergency Manual Procedures of the four phosphate companies currently conducting business in Florida: IMC Phosphates Company; Cagill Fertilizer, Inc.; PCS Phosphate-White Springs; and CF industries Inc.)

Under the emergency permit for disposal, the DEP is considering a plan that would call for commercial fishermen to assist with the monitoring by collecting and documenting samples when they travel in the gulf. Southern Fisheries Association includes roughly 500 companies in five states, spokesman Bob Jones stated: We do not know what the bottom and the quality of the water looks like now. If you are going to have any recourse if something goes wrong, we need to have an idea of what things looked like before. Some commercial fishermen and marine environmental experts object to the monitoring proposal. They say despite their extensive knowledge of gulf waters the DEP needs input from fishermen but they (fisherman) are not qualified to provide the kind of scientific monitoring needed.

Those who have studied the Gulf should conduct the monitoring. For example, Florida State University biologist Felicia Coleman and Chris Koenig who have studied grouper and redfish spawning habitats in the gulf for twelve years. Felicia Coleman said some of the protected fishing habitats could be in jeopardy because they abut areas where wastewater dumping is planned. She states: it is the state's job to protect those resources for those people who use them.

IN THE NEWS

April 28, 2003, State Rep. Gus Bilikrakis, R-Palm Harbor, said we'll do everything we can to prevent it (the disposal plan). St. Petersburg Times

April 28, 2003, **Ready for a fight,** Several groups from Tampa Bay's sponge, shrimp and commercial fishing industries want county, state and local officials to pressure the Florida Department of Environmental Protection to reconsider its disposal plan and listen to them. I was outraged knowing that they had done this without an environmental impact study of any facts or input from the fishing industry stated one multistate industry representative. We're astounded that the state fast-tracked this without any public debate and without give out all the facts, stated another. The government has a responsibility to get them the facts.... They (DEP) have to show us what helped them make the decision stated one county commissioner. St. Petersburg Times

MAY 25, 2003, excerpt from article printed in Tampa Bay paper. A controversial plan to dispose of the wastewater in the Gulf of Mexico has been

getting the industry some much-deserved bad press. We can only hope the broader picture is not ignored. This episode will hopefully get the “potential consequences” message across to the public in general. At stake are thousands of acres of land, expansion of mining in the future and the disposal of the toxic byproducts they will produce. These issues must be addressed. The public needs to make an informed decision. Do the possible long term ecological consequences justify temporary jobs and revenue? By Rusty Chinnis

May 27, 2003, Meeting between Sarasota and Charlotte County Commissioners on phosphate issue. Update to come.

June 5, 2003, Washington, The PEW Oceans Commission report a product of a 3 year $5.5 million dollar study states: "The oceans bordering the United states are over fished, polluted, dotted with ‘dead zones’ and in a state of crisis.requires dramatic, controversial and expensive efforts to limit runoff..." Visit http://www.msnbc.com/news/918877.asp?vts=060420031250 or www.pewoceans.org for complete details.

June 9, 2003, "A Visit to the Twilight Zone", Charlotte County, FL. Public Meeting on Total Maximum Daily Load Program, List of Impaired Waters conducted by Jan Mandrup-Paulsen, administrator, FDEP. A map supplied by DEP integrating all the EPA criteria for impaired waters stretching from south of Venice to Sanibel Islands were Category 5: Water quality standard not attained; water impaired and requires TMDL (Total Maximum Daily Load). When asked to respond to PEW report or affects FDEP dumping of toxins into the Gulf of Mexico would have on Charlotte Harbor Basin, Mr. Jan Mandrup-Poulsen administrator DEP stated: **We are not here today to discuss the Gulf of Mexico. How could you not include the Gulf of Mexico in discussions of waters which are impacted by the Gulf?** It appeared that their presentation was merely about collecting data which indicated the various levels of pollutants in Florida waters without any proposed action that would stop and reverse the cause of the pollution. It gave the appearance of bureaucaratic statistic gathering with no plan of action that would be a benefit to those who try to enjoy Florida waters. The statistics provided no new information; scientiists have know for years the various causes of the pollution in Florida waters. Action is needed, not another beauracratic collecting of data of already know information. Several SOS members left in disgust with comments like "non-responsive and another white wash". Pauline Blocker, President SOS, who had hoped to learn from this traveling show, (next appearance in Tallahassee), remained.

Pat Fricano, Biology MS, (without a Certified Environmental Professional 'CE' designation to qualified individuals after a comprehensive review of their background, their abilities, and their knowledge as a registered environmental professionals) hired by FDEP had not yet spoken to address any issue. Prior to the closure, President Blocker left with comment: "You (FDEP) know the data has been available for years, you know the problems in the waters throughout the State of Florida, yet you refuse to do anything about them! The real issue is stringent regulation of the Phosphate Mining Industry. You will not address this issue until groups like SOS force you to do something!"

Perhaps this issue was too esoteric for this group of FDEP reps? Even today upon reflection, I still hear something? Oh yes, I recognize it now--the theme song from the Twilight Zone playing in the background! [Pauline Blocker, Save Our Seas].

RESPONSE: It was the intent of the Department to present the draft Master, Verified, and Delisted lists for the Charlotte Harbor group 2 waters at this meeting.

- **From:** Rich Rollo [mailto:rrollo@englewoodwater.com]
  Sent: Tuesday, July 08, 2003 5:05 PM
  To: Joyner, Daryll
  Cc: Theresa Connor; thomasg.moore@gte.net; Jay Linden
  Subject: Charlotte Harbor Basin Impaired Water

  Daryll Joyner:

  The Englewood Water District (EWD) is a special District of the state pursuant Chapter 96-499. EWD is responsible for providing water, sewer and reuse service to portions of Sarasota and Charlotte Counties adjacent to Lemon Bay including Manasota Key. Buck Creek (EWD's southern boundary), Oyster Creek, Ainger Creek/Rock Creek, Gottfried Creek and Forked Creek are also within EWD's political boundaries. As such, EWD is a water quality stakeholder within the Lemon Bay Basin.
  EWD has been working closely with the Counties, the City of North Port and large developers in an effort to develop cost-effective, regional approaches to best manage local water resources. The long term health of Lemon Bay and its estuaries is of major concern.
  To that end, EWD began an aggressive septic tank replacement program in the mid-1990's at a cost to date in excess of $30M. Approximately 65% of the District now has central sewer. EWD wastewater effluent "disposal" is 100% beneficial reuse. Funding has primarily been through creation of special assessment areas. However, we believe the benefit to Lemon Bay and the local creeks justifies a broader sharing of costs to eliminate septic tanks as a source of ground and surface water pollution.
  We ask that should grants become available for TMDL reduction projects, that septic tank elimination projects be included in eligible projects considered for grants. In addition we ask that credit for recently completed projects be recognized.
  Finally, we would ask that TMDL levels for individual creeks, Lemon Bay or the Gulf be based on "good science" for that specific body of water. Too often a one-size-fit-all (national or state wide) approach may waste limited resources with marginal return on the investment.

  Richard L. Rollo, P.E.

  Administrator

RESPONSE: The FDEP agrees that the Englewood Water District septic tank replacement program is an excellent example of how communities can assist in watershed restoration.

- November 10, 2003

Daiyll Joyner, Program Administrator
Watershed Management Program
Department of Environmental Protection
2600 Blair Stone Road, MS 3510
Tallahassee, FL 32399-2400

Subject: Group 2 Charlotte Harbor Draft Verified List

Dear Mr. Joyner:

Sarasota County is participating in the process of identifying impaired surface water bodies within our jurisdiction through the application of good science and common sense. To that end, the County has submitted several comments to the Department regarding the draft lists of potentially impaired waters including written comments on July 23, 2003 and October 1, 2003. During the Public Meeting in Tallahassee on September 17, 2003, Department representatives stated that responses to commenters had been drafted and were under review. No response from the Department has been received to date.

It is the intention of the County to insist on scientific and sensible lists of impaired waters. Although we expect a long and complicated discussion with the Department about several critical issues, today there is one imminent concern — Gottfried Creek. Posted on the Department's website today are Draft Verified Lists of Impaired Waters for the Group 2 Basins in Charlotte Harbor, revised September 17, 2003. Gottflied Creek is listed as verified impaired for dissolved oxygen with both nitrogen and phosphorus as causative pollutants and with projected TMDL development in 2004. The County conducted an analysis of the data used to develop the verified list and has concluded that insufficient data is available to verify impairment. The documentation of this research, titled "TMDL Verification Analysis for Alligator and Gottfried Creek in Sarasota County, Florida", was submitted to the Department on October 1, 2003, within the comment period deadline.

The County is confident that the data used by the Department to assign Gottfried Creek to the verified list cannot verify impairment for the following primary reasons:

- The only nutrient data for Gottfried Creek predated the time period for verification (1996 to present). It is not scientifically or legally defensible to use historic nutrient data to determine current nutrient impairment.

- The solubility of oxygen decreases with increasing temperature and salinity of water. In our analysis, temperature had the strongest correlation to low DO, followed by salinity. Gottfried Creek is a slow-moving, warm, tidal creek and is likely to have dissolved oxygen concentrations below State standards without being impaired by pollutants.

- All of the DO samples were taken in the morning, at the lowest point of the natural, diurnal sag, which skewed the average low. For this reason the sampling was not representative of averageconditions in the creek. The skewed and limited data does not allow representative conditions to be calculated.

- It is widely known that low dissolved oxygen concentrations are naturally present in wetlands and wetland-influenced systems. Although conclusive evidence cannot be provided today that demonstrates the effect of wetlands in the Gottfried Creek headwaters as the cause of naturally-low DO concentrations, this explanation is at least equally plausible as the rationale professed by the Department stating that nutrients are the cause.

  Sarasota County is confident that the Department has not verified impairment of Gottfried Creek. Not only does the data used by the Department not prove impairment beyond a reasonable doubt, but the preponderance of evidence does not indicate it. Because impairment has not been verified, Gottfried Creek must be removed from the Verified List and added to the Planning List. If a TMDL was created for Gottfried Creek in 2004, as intended by the Department, the document would be terribly flawed and would initiate a fruitless disagreement. Placement of Gottfried Creek on the Planning List, and scheduling a potential TMDL in 2008 or 2009, would allow sufficient time for the Department and the County to ascertain whether impairment truly exists.

  Sarasota County wants to know which water bodies are impaired. We have no intention to avoid an appropriate level of responsibility for managing and improving impaired water bodies. As a significant partner in the TMDL initiative, we must insist that only impaired waters be listed as verified. Sarasota County is willing to engage in any cooperative discussions to resolve this issue of critical concern. In addition, we are eager to participate in any studies to develop accurate indicators of impairment of tidal streams and other water bodies that were not considered during development of the water quality standards.

  It is our understanding that the Draft Verified List will be submitted to Secretary Strahs for adoption later this month. It undermines the dialogue between the Department and local governments to go directly to adoption without communicating the Department's ultimate position on our comments. We request a written response from the Department in a timely manner. If the Department needs additional information to consider our proposal please contact us at your earliest convenience. Without sufficient communication the County will need to consider other appropriate actions in this matter. If you have any questions, please contact me at (941) 861-0663 or jryan@scgov.net.

  Sincerely,

John Ryan (Sarasota County)
Environmental Specialist III, Water Resources

RESPONSE: The FDEP has placed Gottfried Creek on the Planning List pursuant to Rule 62-303.300(2), and because there is insufficient data to determine a causative pollutant. However FDEP cannot change the scheduling of a potential TMDL to 2008 or 2009, because 2004 has been mandated by the consent decree.

Florida Department of Environmental Protection
Division of Water Resource Management
Bureau of Watershed Management
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