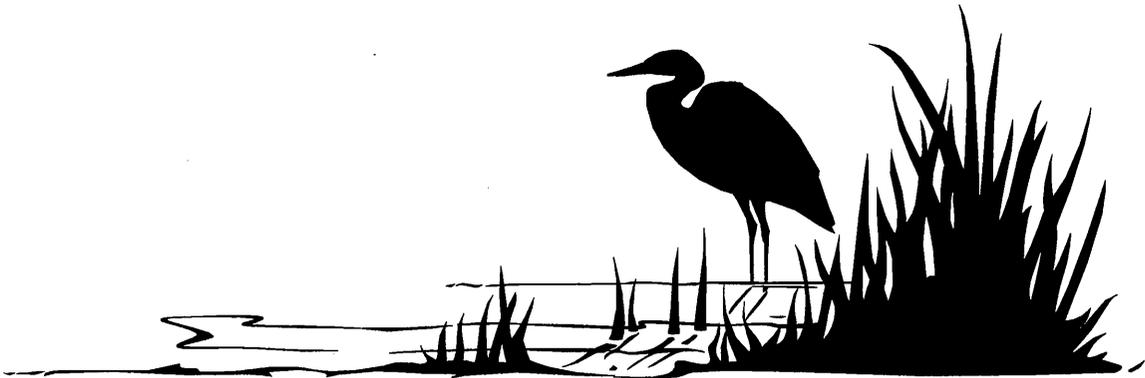




**Southwest Florida
Water Management
District**

**Sarasota Bay
Surface Water Improvement
and Management (SWIM) Plan
December 2002**



**SWIM SECTION
RESOURCE MANAGEMENT DEPARTMENT
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
7601 U.S. HIGHWAY 301 NORTH
TAMPA, FLORIDA 33637
(813) 985-7481**

Sarasota Bay

Surface Water Improvement and Management (SWIM) Plan Update

December 2002

Southwest Florida Water Management District
SWIM Section
Resource Management Department
7601 U.S. Highway 301 North
Tampa, Florida 33637
(813) 985-7481

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EXECUTIVE SUMMARY

Sarasota Bay has a surface water area of approximately 52 square miles, and a contributing watershed of approximately 150 square miles. The watershed is split between Manatee County and Sarasota County, and encompasses the City of Sarasota, as well as the island communities of Anna Maria, Holmes Beach, Bradenton Beach, and Longboat Key.

Numerous inlets allow for the exchange of water between the bay and the Gulf of Mexico, including Anna Maria Sound, Longboat Pass, New Pass, Big Pass, and Venice Inlet. Until its closure in 1983, Midnight Pass also was an area of tidal mixing.

Due in part to its remarkable natural beauty, Sarasota Bay is an often-cited reason for visitors drawn to the area. Visitors are a vital part of the local economy, as tourism is the number one source of employment in Sarasota County, and the number two source in Manatee County.

While the Sarasota Bay region has been inhabited for thousands of years, human degradation of the bay accelerated during the post-World War II years. Between 1950 and 1990, approximately 39 percent of the tidal wetlands were lost to development. Also during this time period, approximately 30 percent of Sarasota Bay's seagrass meadows were lost due to the combined impacts of direct losses due to shoreline development, and indirect losses due to degraded water quality.

However, much progress has been made to restore Sarasota Bay in the years since its designation as an "estuary of national significance" by the U.S. Environmental Protection Agency in 1987. With the formation of the Sarasota Bay National Estuary Program (Sarasota Bay NEP) in that year, much attention was focused on developing and implementing a series of projects aimed at restoring and protecting the natural resources of Sarasota Bay.

Associated with upgrades to private and public wastewater treatment plants, point-source nitrogen loads to Sarasota Bay have been reduced from 569 tons per year in 1988 to 110 tons per year in 1999, an 81 percent decline. In response, water clarity improved in 7 of 13 bay segments between 1983 and 1998, and only degraded in 1 of 13 bay segments. As water clarity improved, seagrass coverage increased as well, with 596 additional acres found in 1999, as opposed to 1988.

In addition to treatment plant upgrades, the Sarasota Bay region now reclaims approximately 46 percent of its wastewater treatment plant effluent for various reuse projects, and numerous stormwater treatment systems have been put in place to further reduce nutrient and toxin loads to the bay.

In combination with various local, regional, state and federal agencies, habitat restoration projects in the Sarasota Bay region have enhanced or created approximately 200 acres of fisheries habitat through wetland restoration and removal of exotic vegetation. Additional habitat has been created through the deployment of various types and sizes of artificial

reefs, ranging from large, complex systems such as that in place offshore of Leffis Key, to small concrete structures designed to fit at the base of various channel markers.

An accurate depiction of Sarasota Bay is that of a system that is recovering from its most degraded condition, experienced in the late 1980's, to one that is approaching a much healthier condition. A potential problem, however, is that of continued population growth and development of the bay's watershed. If future growth is not adequately planned for, recent improvements in the health of Sarasota Bay could be offset by the impacts of increased stormwater and wastewater loads, as well as direct human impacts, as more people move to the region. While much progress has been made to improve water quality in both Sarasota Bay and Tampa Bay, most of these improvements have been brought about through the successful management of point sources of pollution. It remains to be seen how effective urban communities can be when attempting to reduce non-point source pollution on a watershed level. The continued implementation of stormwater retrofits of priority tributaries, as well as continued efforts to educate homeowners on the need for creating "bay friendly" landscapes will be required. Additional measures, such as the adoption, by local governments, of more stringent stormwater regulations for new development might be worth considering.

The goal, therefore, of this update to the Sarasota Bay SWIM Plan, is to outline a series of research and/or restoration projects that will allow for the preservation and continued restoration of the health of Sarasota Bay, in spite of an increased population in the contributing watershed.

Strategies to accomplish this task focus on improving and protecting water quality through continued efforts to treat wastewater and stormwater, as well as continued efforts focusing on the restoration of wetlands and creation of artificial reefs. Additional research efforts are needed, as well, to better understand the relationship between air quality and water quality, as well as to better understand the impacts to the bay's health that may have been caused by various alterations to the patterns of freshwater inflow into the bay.

This revised Sarasota Bay SWIM Plan provides details for projects that implement the above-described strategies for protecting and improving the bay's health. This Plan will serve as the guidance document that coordinates the efforts of the District with those of the various local, regional, state and federal agencies, as well as private interests, to restore and protect Sarasota Bay.

INTRODUCTION

The SWIM Act

In recognition of the need to place additional emphasis on the restoration, protection and management of the surface water resources of the State, the Florida Legislature, through the Surface Water Improvement and Management (SWIM) Act of 1987, directed the State's water management districts to "design and implement plans and programs for the improvement and management of surface water" (Section 373.451, Florida Statutes). The SWIM legislation requires the water management districts to protect the ecological, aesthetic, recreational, and economic value of the State's surface water bodies, keeping in mind that water quality degradation is frequently caused by point and non-point source pollution, and that degraded water quality can cause both direct and indirect losses of habitats.

Under the SWIM Act, water management districts prioritize water bodies based on their need for protection and/or restoration. This prioritization process is carried out in cooperation with the Florida Department of Environmental Protection (FDEP), the Fish and Wildlife Conservation Commission (FWCC, formerly known as the Florida Game and Freshwater Fish Commission), the Department of Agriculture and Consumer Services (DACS), the Department of Community Affairs (DCA) and local governments. Sarasota Bay was added to the list of priority water bodies by the Southwest Florida Water Management District (District) in 1995.

Following the selection of the priority water bodies and in accordance with the SWIM Act, a SWIM Plan must be drafted, reviewed and approved before State SWIM funds can be spent on restoration, protection or management activities. The purpose of this revision of the Sarasota Bay SWIM Plan is to set forth a realistic course of action, identifying the projects and the effort needed to accomplish them, consistent with the levels and trends of SWIM funding. The evolution of the SWIM Plan for Sarasota Bay is discussed in the following section.

Sarasota Bay SWIM Plan Evolution

The original Sarasota Bay SWIM Plan, approved in 1997, was focused on projects designed to meet the District's obligations, as outlined in the Sarasota Bay NEP's "Comprehensive Conservation and Management Plan" (SBNEP, 1995). The projects outlined within the 1997 SWIM Plan have either been completed or they are ongoing, as shown in Appendix A, "Status of the 1997 Sarasota Bay SWIM Plan." A detailed examination of the status and trends in pollutant loads, water quality and fish and wildlife habitat is included in Appendix B, "Status and Trends of Sarasota Bay."

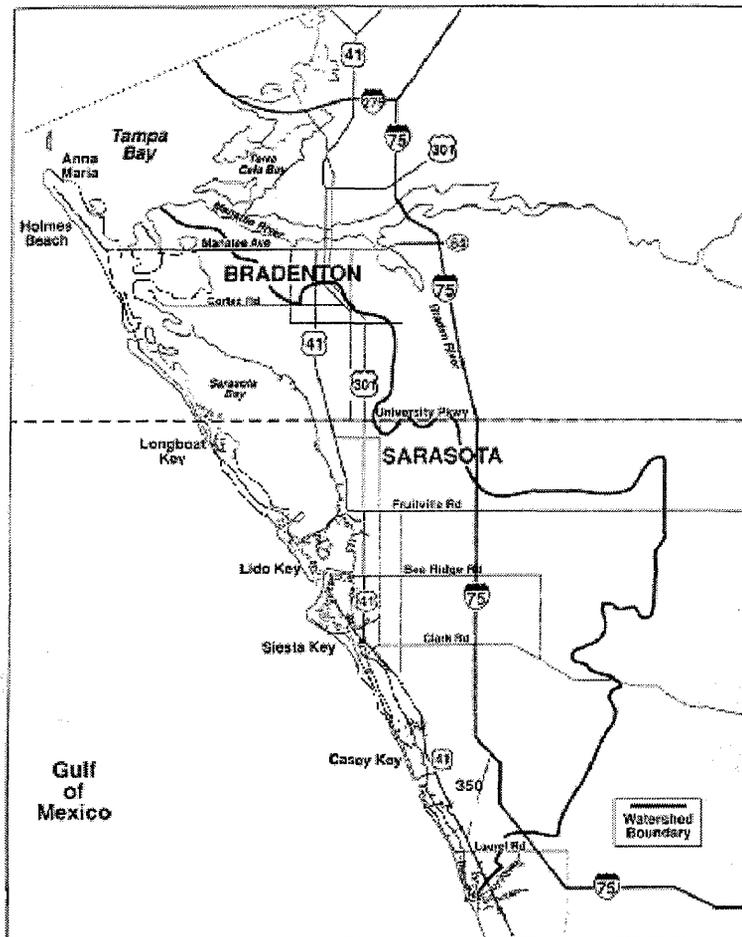
Background

In 1995, The Southwest Florida Water Management District (District) named Sarasota Bay as a SWIM priority water body. Sarasota Bay thus joined the eight other priority water bodies previously listed. These water bodies are: 1) Tampa Bay, 2) Rainbow River, 3)

Banana Lake, 4) Crystal River, 5) Lake Panasoffkee, 6) Charlotte Harbor, 7) Lake Tarpon, 8) Lake Thonotosassa, and 9) Winter Haven Chain of Lakes.

The boundaries of the Sarasota Bay SWIM water body and its corresponding watershed (Figure 1) correspond to those used by the Sarasota Bay National Estuary Program (SBNEP). The water body here after referred to as "Sarasota Bay" extends from Anna Maria Sound and Palma Sola Bay, in the north, to Venice Inlet, in the south, a total of 52 square miles of open water. The contributing watershed is approximately 150 square miles in size (Heyl, 1992).

Figure 1 – Sarasota Bay Watershed



The watershed is split between Manatee County and Sarasota County, and encompasses the City of Sarasota, as well as the island communities of Anna Maria, Holmes Beach, Bradenton Beach, and Longboat Key.

The largest tributary to Sarasota Bay is Phillippi Creek, which drains a watershed of 57 square miles, or 38 percent of the entire watershed. Other major tributaries include South Creek, with a watershed of 20 square miles (14 percent of the total watershed), the Bowlees Creek system, which drains 13 square miles (8 percent of the total), and Whitaker Bayou, which drains 8 square miles (5 percent of the total).

The Sarasota Bay watershed is within the boundaries of the Southern Water Use Caution Area (SWUCA). Increased

demand for groundwater resources has increased the concentration of chlorides in the western boundary of the SWUCA, an indication of saltwater contamination. In response, the SWFWMD proposed setting minimum groundwater levels in the SWUCA. These levels, and other actions taken by SWFWMD, are designed to protect both the resource and water users, and result in greater water-use efficiency.

Historic Land Use

Sarasota Bay first took shape approximately 5,000 years ago (Estevez, 1992), as a result of the formation and development of offshore barrier islands during a period of continuing sea level rise. These barrier islands, in turn, appear to be associated with previously subtidal bars originally formed on top of elevated portions of Miocene bedrock (Kuhn, 1983).

The Sarasota Bay watershed contains a number of archeological sites, including shell middens, sand mounds, and cemeteries (Deming et al., 1990). These structures are the sole remaining artifacts of a number of prehistoric cultures, which date back to 10,000 B.C. The demise of the Native American presence in Sarasota Bay roughly coincides with initial contact with Spanish Conquistadors and settlers (Deming et al., 1990).

During the 1870's, a resort hotel in Osprey was one of the first business ventures to take advantage of Sarasota Bay's wealth of natural beauty, although commercial fishing had occurred since the late 1700's (Whelan, 1992). During the period of 1895 to 1903, the first large-scale channel alteration activities took place in Sarasota Bay, as the dredge "Suwanee" enlarged and/or created channels at Palma Sola Pass, at Longbar, and in the area between Little Sarasota Bay and Venice (Whelan, 1992).

During the years 1910 and 1911, the City Commission of Sarasota mandated the seawalling of the City waterfront, while the citizens of the City of Sarasota voted for a combination water and sewage treatment system (Whelan, 1992). Ten years later, Sarasota County was officially formed by the partitioning in two of the old Manatee County.

Population growth in the watershed has been dramatic, especially in the post-World War II years. During this period of rapid growth, much environmental damage occurred, as a result of large-scale dredge and fill projects, such as the conversion of Bird Key into a finger fill canal community, and the dredging (in the 1960's) of the Intracoastal Waterway. The dredging of the Intracoastal Waterway may have increased the hydraulic instability of Midnight Pass, the movement of which precipitated its permitted closure and subsequent failed re-opening in the winter of 1983 (Sheng and Peene, 1992; Sheng, personal communication).

Recent (1990) Land Use

Water quality in Sarasota Bay is influenced by the amount of watershed that drains into different parts of the Bay. In northern and central portions of the bay (i.e. those areas north of Roberts Bay), 59 square miles of watershed drain into 45 square miles of open water. In the area of Roberts Bay south to Venice Inlet, 91 square miles of watershed drain into 7 square miles of open water. Thus, the watershed : open water ratio in the northern and central parts of Sarasota Bay is 1.3, while in the southern part of Sarasota Bay, this ratio climbs to 13.4, a roughly ten-fold increase.

Using results from the most recent pollutant load modeling effort for Sarasota Bay (Heyl, 1992), residential land-use accounted for approximately 42 percent of the total watershed,

while 36 percent is a combination of forested upland, rangeland, and open/recreational uses. Commercial and industrial land-uses account for 10 percent of the watershed, and cropland and citrus account for 9 percent of the land. The remainder of the watershed (4 percent) is comprised of both wetlands and open water bodies (lakes and streams).

In Manatee County's portion of the watershed, approximately 64 percent of the land is urbanized, with 72 percent of the urbanized land (46 percent of the total) being residential (Heyl, 1992). In the City of Sarasota, 87 percent of the watershed is urbanized, with 70 percent of the urbanized land (61 percent of the total) being residential. Sarasota County's portion of the watershed is 42 percent urbanized, with 87 percent of the urbanized land (36 percent of the total) being residential. Consequently, residential land uses account for less than 50 percent of the watershed in the northern and southern regions, and more than 50 percent of the watershed in the central region. As residential land uses comprise 64 to 87 percent of the urban land use category, the water quality characteristics of stormwater runoff from residential land uses (e.g. elevated nitrogen and phosphorus concentrations) have the potential to have a large impact on water quality in the bay itself.

Sarasota Bay SWIM Process

Concern for the overall health of Sarasota Bay resulted in its designation by the U.S. Environmental Protection Agency as an "estuary of national significance" in 1987. In 1989, the SBNEP was formed to oversee the protection and restoration of Sarasota Bay and its natural resources. In 1992, the results of a bay-wide assessment were published in the document "Sarasota Bay Framework for Action." In this report, principal investigators for the various studies proposed various activities that would be needed to better protect and restore Sarasota Bay. After numerous public meetings and much debate, these activities were developed into "Action Plans" that were focused on issues such as stormwater, wastewater, habitat loss, and recreational use conflicts. In turn, responsibility for implementing each of the Action Plans was determined, and the collection of Action Plans, in addition to responsible parties for each item, was summarized in the document "Comprehensive Conservation and Management Plan" (SBNEP, 1995). This Plan, commonly referred to as the CCMP, was the basis for the projects outlined within the previous SWIM Plan for Sarasota Bay, which was adopted by the Governing Board in 1997.

Sarasota Bay Priority Management Issues

Both the 1995 Sarasota Bay NEP's CCMP and the 1997 Sarasota Bay SWIM identified the following as priority management issues:

- Declines in sediment and water quality;
- Loss of wetlands and other coastal habitats;
- Loss of seagrasses;
- Declines in finfish and shellfish populations; and

- Recreational impacts / overuse

Sarasota Bay SWIM Plan Goals

The goals of the Sarasota Bay SWIM Plan are consistent with the goals identified by the Sarasota Bay NEP. These goals are:

- Improve water transparency in Sarasota Bay;
- Decrease the quantity, and increase the quality of stormwater runoff to Sarasota Bay;
- Restore shoreline habitats in Sarasota Bay;
- Restore and sustain fish and other living resources in Sarasota Bay; and
- Continue monitoring programs and applied research projects in Sarasota Bay

Sarasota Bay Management Strategies

The management strategies for protecting and restoring Sarasota Bay are based on the Sarasota Bay NEP's CCMP (1995). Within this document, there are numerous activities listed which require coordination between local governments and the District, or direct action by the District. These activities are intended to protect and restore Sarasota Bay, by devising action plans to achieve the above-mentioned goals. More specifically, each "Action Plan" in the CCMP lists those cooperating organizations whose efforts are needed to carry out the identified activities. In addition, The Sarasota Bay NEP's Technical Advisory Committee (TAC) recently (Fall 2001) held a series of discussion on the value of continued and additional research and/or restoration projects. Of a total of 15 potential projects, the top 7 were widely supported by TAC members. The remaining 8 projects received marginal or no support from the TAC. The top 7 projects are summarized in Table 1, as well as ongoing projects to map seagrass coverage and continue ongoing wetlands habitat restoration. Ongoing SWIM projects, and the above-mentioned priority projects identified by the TAC, are the basis for the course of action outlined in this SWIM Plan update, by continuing the ongoing efforts to implement the Sarasota Bay NEP's CCMP.

Additionally, the SBNEP's TAC recently (August 9, 2002) endorsed the concept of revising the existing nutrient loading model for Sarasota Bay and its watershed. The existing model (Heyl 1992) is based on land use data from 1990, and modifications to wastewater and stormwater treatment practices during the past decade may have significantly altered the sources and quantities of various pollutant loads. This project is also listed in both Table 1 and the section on Priority Projects.

Table 1. Estimated Budget for Priority Projects for Implementation of the Sarasota Bay SWIM Plan
 (“page” refers to location in text where further explanation of the project is contained).

Project	FY 2003	FY 2004	FY 2005	FY 2006	Page
Various Habitat Restoration Projects	\$2,000	\$110,000	\$115,000	\$120,000	14
Continue Seagrass Mapping Efforts	\$20,000	\$5,000	\$22,000	\$6,000	15
Determine Status and Trends (if any) in Water Quality	\$2,000	\$55,000	\$2,000	\$60,000	16
Continued Deployment of Artificial Reefs	\$52,000	\$52,000	\$57,000	\$62,000	17
Construction of Oyster Reefs	\$2,000	\$17,000	\$2,000	\$22,000	18
Determine N-Loading Sources from Urban Land Use	\$2,000	\$50,000	\$22,000	\$2,000	19
Water Quality Monitoring in Phillippi Creek	\$2,000	\$12,000	\$2,000	\$12,000	20
Integrated Water Resource Evaluation	\$2,000	\$2,000	\$2,000	\$2,000	21
Update Pollutant Loading Model	\$2,000	\$102,000	\$2,000	\$2,000	22
Total Budget	\$ 88,000	\$ 462,000	\$ 338,000	\$ 405,000	

Linkage to Other Water Resource Management Activities

In addition to projects that are initiated by SWIM, the SWIM Program is able to accomplish its objectives more effectively and efficiently by coordinating internally with other District programs and externally through partnerships with local governments and other State and federal agencies.

Internal Linkages

The District has many tools available to implement the legislative intent of the SWIM Program, including but not limited to, integrated planning and coordination, regulatory authority, land acquisition programs and the SWIM program itself. Each of these areas provides opportunities to assist in the management of Sarasota Bay.

The SWFWMD's Water Management Plan - As required in Chapter 373, Florida Statutes, the District prepared its Water Management Plan (DWMP). Within this plan, the District organized its mission into four areas of responsibilities; water supply, flood protection, water quality management and natural systems management. The DWMP recognizes that the integration of all these areas is essential to effective planning and management of the resource. The DWMP has policies that relate to the protection, restoration, and management of Sarasota Bay

Comprehensive Watershed Management (CWM) - The District has recognized the need to take a unified approach to surface water management and has created an initiative that prioritizes resource management needs by watershed throughout the District. For Sarasota Bay, the Southern Coastal Watershed Management Initiative is the relevant entity. These management plans combine information on water quantity (i.e., flood) management with water quality and natural systems objectives, as well as water supply when applicable. Information on regulatory, land acquisition, and land-use matters is combined into a comprehensive surface water management strategy, including appropriate policies, on a watershed-specific basis. Local governments, as the parties responsible for land planning and development are key players in this integrated management approach. In the Sarasota Bay region, existing linkages between the District and the Sarasota Bay National Estuary Program make the need for CWM coordination somewhat less pressing than in other areas. Implementation of restoration projects and technical assessments will continue to be coordinated with CWM, but will continue to be implemented mainly through the joint participation and funding of the Sarasota Bay National Estuary Program and the District's SWIM Section.

Regulation

Wetlands Protection Through Regulatory Programs - One way that the District achieves wetlands protection is through regulatory programs. Wetlands protection is addressed under Chapters 40D-2, 40D-3, 40D-4, 40D-40 and 40D-45, F.A.C. The District's surface water permitting rules (40D-4, 40 and 45, F.A.C.) require that any impact to wetlands not specifically exempted must either be avoided or compensated. Compensation for impacts includes as a minimum, type-for-type mitigation at a one-to-one ratio. Other types of compensation may be required,

including preservation of associated upland areas, alternate types of wetland creation, protection of exempt wetlands, and restoration for previously impacted wetlands. The intent is to ensure that the habitat necessary for the survival of fish and wildlife is maintained.

Mitigation Banking - Mitigation banking allows developers to compensate for wetland losses in one place by preserving, restoring or creating wetlands in another to prevent a net loss of wetlands. The rule allows mitigation banking in some instances, although it remains a controversial issue. The SWFWMD coordinates with the Florida Department of Transportation to take advantage of mitigation bank opportunities on District lands and within SWIM priority water bodies.

Land Acquisition - Land acquisition at the District was recently guided and funded by two major statewide initiatives: The Water Management Lands Trust Fund (a.k.a. Save our Rivers Program or SOR), and Preservation 2000 (P-2000). In 2000, the P-2000 Program for land acquisition came to an end. Funds for land acquisition and management was available through Save our Rivers through 2000, however, the SOR funds may not be used for land acquisition after 2001. The Florida Forever Act, passed by the Florida Legislature in 1999, made funds available, beginning in 2001, to the water management districts for both land acquisition and restoration, including funding for SWIM projects.

The District's land acquisition programs target the protection of natural resources at the regional level. Lands of importance to water resources and water management are acquired along with lands of unique environmental values endangered by development activities. The District owns more than 200,000 acres, the majority of which were purchased through the SOR and P2000 programs. Many recent purchases have been a joint acquisition between the District and a local government or with other State agencies. Leveraging District land acquisition funds with those of local governments and other agencies can and has resulted in significant acquisitions that might not have been made otherwise. These programs have been coordinated with SWIM Plans by focusing on critical habitats, such as wetlands and their interconnected upland communities that are part of the Sarasota Bay ecosystem, and that should be acquired for preservation and/or restoration.

Basin Board Activities - The basin boards of the SWFWMD have specific functions and duties that are consistent with Chapter 373, F.S., and the programs of the Governing Board. Their purpose is to identify and evaluate key water resource management issues in order to develop and fund management strategies to address them. The basin boards are facilitators in the resolution of non-regulatory water management issues for a number of other governments. It is at the basin level that intergovernmental water resource programs are implemented, monitored and evaluated for improvement. The basin boards also provide a means of obtaining feedback from local governments and citizens. Basin boards also serve as funding partners for local governments and others in addressing mutually beneficial water resource solutions. The basin boards also provide the District's SWIM funding match for approved SWIM projects within their basins. For Sarasota Bay, the relevant basin board is the Manasota Basin Board.

The District, through the eight basin boards, has an established Cooperative Funding Program that provides financial assistance on a cost-share basis primarily to local governments for regional water resource projects. Projects can also be funded through “basin initiatives” where a basin decides to provide the impetus for a water management solution, with or without a local partner. Many of the basin boards have in place a five-year plan which outlines the types of activities it expects to undertake in the next five years and provides an estimate of the funding required to support these projects. The basin plans were prepared in close coordination with local governments, demonstrating another opportunity for integration with local governments and ensuring the most efficient and cost-effective approach to addressing mutual water resource management goals and objectives.

External Linkages

FDEP - Total Maximum Daily Load (TMDL) Program - Section 303(d) of the Federal Clean Water Act requires states to submit lists of waters that fail to meet applicable water quality standards (i.e., “impaired waters”) and to establish and implement TMDL’s for these waters on a prioritized schedule. The TMDL program is part of FDEP’s Watershed Approach Initiative, which provides the framework for implementing Section 303(d) of the Federal Clean Water Act, as well as the 1999 Florida Watershed Restoration Act. Listing requirements include the identification of pollutants causing impairment (e.g., nutrients, sediments, bacteria, etc.). Impaired waters are primarily those listed as having either “poor” or “fair” water quality in the FDEP 1996 305(b) report. In response to various legal proceedings, Chapter 99-223 created 403.067 (Florida Statutes), wherein it was established that the initial list of water bodies in the 303(d) list was to be used for planning purposes only, and that FDEP would be required to adopt by rule a methodology for determining impaired waters. Also, FDEP is now required to validate the impairment of listed water bodies, and to evaluate whether proposed pollution control programs are sufficient to help impaired water bodies to meet their appropriate water quality standards. Once impairment has been verified and TMDL’s have been adopted, 403.067 (F.S.) requires FDEP to allocate TMDL’s, by rule, to the level of major categories of nonpoint sources. FDEP is then required to develop specific Basin Plans to implement TMDL’s. In all these activities, the SWIM Plan’s efforts at implementing the PLRG for Sarasota Bay will be carefully integrated with FDEP’s efforts at developing and implementing TMDL’s.

Local / Federal Government Coordination and Partnering - The District has prepared county-level Integrated Plans for the local governments within its jurisdiction, as part of the District’s Water Management Plan. The purpose of the Integrated Plan is to identify and evaluate key water resource management issues with the local government’s jurisdiction, and to develop and coordinate common District and local government strategies to address these issues. Greater detail is available in Appendix D, “Governance within the Sarasota Bay Basin.”

PRIORITY PROJECTS

The Sarasota Bay SWIM Plan Update is focused on implementing those projects viewed as priorities by the Sarasota Bay NEP's Technical Advisory Committee. The following project summaries identify the current status of active and proposed projects, and provide project timelines and estimated budgets for implementation. Project descriptions are shown on separate pages for each effort.

Approval of the Sarasota Bay SWIM Plan does not constitute approval of any specific habitat restoration project, as the SWIM Plan is meant to serve as a general outline of the need for various types of restoration projects.

Project Title: Various Habitat Restoration Projects

Summary:

The Sarasota Bay NEP's "Framework for Action" (SBNEP, 1992) documented an approximate 39 percent decline in wetlands habitat throughout the bay's watershed. As these areas played significant roles in flood retention, water quality improvement, and as habitats for feeding and shelter for a variety of fish, birds and other wildlife, the CCMP (SBNEP, 1995) lists wetlands habitat enhancement and/or creation projects as a priority for bay restoration. This budget category would allow flexibility for carrying out design, permitting and construction of habitat restoration projects throughout the Sarasota Bay watershed, including projects not yet identified. As has been the practice for past habitat restoration projects, the geographic location, conceptual design and general scope of work for all habitat restoration projects will be reviewed by the SBNEP's Technical Advisory Committee.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$5,000	\$5,500	\$5,000
Contracts	\$0	\$105,000	\$110,000	\$115,000
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$110,000	\$115,000	\$120,000

Agency or Local Government Partnering:

As various habitat restoration projects are identified, designed and permitted, the following entities could become involved with funding these projects: FDEP, FFWCC, Manatee County, Sarasota County, FDOT, and the Sarasota Bay NEP.

Project Title: Continue Seagrass Mapping Efforts

Summary:

The Sarasota Bay NEP's "A Decade of Progress" (SBNEP, 2000) documented an approximate 30 percent decline in seagrass coverage throughout the bay between 1950 and 1988. Seagrass meadows are not only useful "bio-indicators" of water quality in Sarasota Bay, they serve vital roles as habitats for a variety of recreationally and commercially important species of finfish and shellfish (SBNEP, 1992). The District has coordinated and carried out a bay-wide seagrass mapping effort to determine the status and trends (if any) in seagrass acreage throughout Sarasota Bay. Seagrass distribution has been quantified for the years 1988, 1994, 1996 and 1999. Efforts are underway to map seagrass distribution in 2001, as well. This project should be continued on a roughly biannual basis, to detect changes, if any, in the extent of these important fisheries habitats.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$5,000	\$5,000	\$5,500	\$6,000
Contracts	\$15,000	\$0	\$16,500	\$0
Expenses	\$0	\$0	\$0	\$0
Total	\$20,000	\$5,000	\$22,000	\$6,000

Agency or Local Government Partnering:

This project is carried out in coordination with the FDEP, the FFWCC, and the Sarasota Bay NEP.

Project Title: Determine Status and Trends in Water Quality

Summary:

In order to determine the rate of progress toward meeting the goal of improving water quality in Sarasota Bay, water quality must be assessed on a regular basis. This effort would continue to assess the status and trends (if any) in water quality in Sarasota Bay, and would update recent effort that examined water quality data up to the year 1998.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$5,000	\$2,000	\$5,000
Contracts	\$0	\$50,000	\$0	\$55,000
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$55,000	\$2,000	\$60,000

Agency or Local Government Partnering:

This project will be carried out in coordination with the Manatee County, Sarasota County, the City of Sarasota, FDEP, and the Sarasota Bay NEP.

Project Title: Continued Deployment of Artificial Reefs

Summary:

The Sarasota Bay NEP's "Framework for Action" and CCMP documented the decline in recreational and commercial fisheries landings in Sarasota Bay, and attributed most of this decline to reductions in habitat for juveniles. In response, the Sarasota Bay NEP has been involved with numerous efforts to increase habitat for juvenile and adult stages of fish and other marine life through the deployment of various forms of artificial reefs. As of 2000, 20 artificial reef projects have been permitted, with 7 already constructed. This project would involve partnering with local, state and federal agencies to continue artificial reef monitoring and deployment efforts both within the Bay and for shoreline enhancement.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$50,000	\$50,000	\$55,000	\$60,000
Expenses	\$0	\$0	\$0	\$0
Total	\$52,000	\$52,000	\$57,000	\$62,000

Agency or Local Government Partnering:

This project will be carried out in coordination with the Manatee County, Sarasota County, FDEP, the University of Florida Sea Grant Program, and the Sarasota Bay NEP.

Project Title: Construction of Oyster Reefs

Summary:

The Sarasota Bay NEP's "Framework for Action" and CCMP documented the decline in recreational and commercial fisheries landings in Sarasota Bay, and attributed most of this decline to reductions in habitat for juveniles. In particular, oyster reef habitat was thought to have declined significantly, both in terms of acreage and also the health of remaining reefs. At their November 2001, meeting, TAC members ranked the construction of oyster reefs as a priority restoration project for upcoming years. In addition to acting as a physical structure for shelter and/or feeding for various species of fish and other marine life, oyster reefs have the potential to actively improve water clarity in Sarasota Bay, through the filtering action of the oysters themselves. This project would involve partnering with local state and federal agencies to develop an initial assessment of the effectiveness of larger scale oyster reef construction efforts and addressing permitting questions. Reefs would have to be constructed keeping in mind the importance of their placement in the appropriate salinity regime. Further involvement will be dependent upon review of these preliminary efforts.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$0	\$15,000	\$0	\$20,000
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$17,000	\$2,000	\$22,000

Agency or Local Government Partnering:

This project will be carried out in coordination with the Manatee County, Sarasota County, FDEP, the Florida Marine Research Institute, and the Sarasota Bay NEP.

Project Title: **Determination of Nitrogen Loading Sources from Urban Land Use Categories**

Summary:

As documented in the Sarasota Bay NEP's "Framework for Action," urban stormwater runoff is the single major source of nitrogen loading to Sarasota Bay. While much effort has, and will be, expended on stormwater retrofits to reduce these impacts, there is, at present, an incomplete knowledge about the sources of nitrogen that are found in urban and residential stormwater runoff. It is not known, for example, if the relatively high concentration of nitrogen in this runoff is due to atmospheric deposition onto the watershed, landscaping practices, fecal pollution from pets, or any other sources. Without knowing the ultimate sources of nitrogen in urban runoff, it remains difficult to devise strategies to reduce nutrient loads at their source. This project would involve an assessment of the relative roles of atmospheric deposition, landscaping practices, pet waste, etc. on producing elevated concentrations of nitrogen in urban runoff.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$5,000	\$2,000	\$2,000
Contracts	\$0	\$45,000	\$20,000	\$0
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$50,000	\$22,000	\$2,000

Agency or Local Government Partnering:

This project will be carried out in coordination with the Manatee County, Sarasota County, the City of Sarasota, FDEP, and the Sarasota Bay NEP.

Project Title: Water Quality Monitoring in Phillippi Creek

Summary:

In many of the coastal regions of Sarasota County, septic tank systems cannot adequately treat wastewater, mostly due to issues of higher than appropriate densities, as well as high water tables. Previously, the Sarasota Bay NEP played a critical role documenting the widespread pollution associated with this problem. In response, Sarasota County is presently undertaking a multi-year effort to replace failed septic tank systems, with the initial priority placed on Phillippi Creek. Documentation of changes, if any, in the status of Phillippi Creek's water quality is an important part of monitoring the effectiveness of these efforts, with particular emphasis placed on detecting trends (if any) in nitrogen concentrations and pathogen levels. This project, which was ranked as a priority effort by the Sarasota Bay NEP's Technical Advisory Committee (TAC), is currently being conducted by Sarasota County. The proposed budget would allow for the District to remain involved in assessing results from the monitoring effort, and could allow the District to aid in more sophisticated monitoring efforts, if deemed appropriate by the TAC.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$0	\$10,000	\$0	\$10,000
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$12,000	\$2,000	\$12,000

Agency or Local Government Partnering:

This project will be carried out in coordination with Sarasota County, the City of Sarasota, FDEP, and the Sarasota Bay NEP.

Project Title: Integrated Water Resource Evaluation

Summary:

In much of Southwest Florida, population growth and urbanization of the landscape has been associated with modifications to the timing and quantity of freshwater inflow into adjacent streams and estuaries. Although alterations in the timing and quantity of freshwater inflow have not been identified as a problem in Sarasota Bay (SBNEP, 1992 & 1995) the potential exists that this has been a previously unrecognized issue. The proposed budget would allow the District to stay involved in various efforts to determine the impacts (if any) to Sarasota Bay associated with altered freshwater inflow, it does not involve the support of any particular investigations. Staff time to develop inflow estimates and participate in various advisory meetings is included. Other expenses are not yet anticipated.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$0	\$0	\$0	\$0
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$2,000	\$2,000	\$2,000

Agency or Local Government Partnering:

This project will be carried out in coordination with Sarasota County, Manatee County, the City of Sarasota, and the Sarasota Bay NEP.

Project Title: Evaluation and Implementation of Urban Stormwater Retrofit Projects

Summary:

Stormwater runoff is the largest source of both nitrogen loads, as well as toxin loads, into Sarasota Bay (SBNEP, 1992). Consequently, the identification of stormwater pollution "hot spots" was undertaken to allow the Sarasota Bay NEP to focus its efforts on the primary sources of toxin and nutrient loading to the bay. Priority watersheds are Cedar Hammock Creek, Bowlees Creek, Whitaker Bayou, Hudson Bayou, and Phillippi Creek. This project would involve the District partnering with various local, state and federal agencies to design, permit and construct the most cost-effective techniques to treat stormwater runoff in priority watersheds. This project will be coordinated with the District's ongoing Cooperative Funding Program, ensuring that the costs of pursuing these efforts will be borne by local governments as well as the District and other funding sources.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$0	\$55,000	\$110,000	\$115,000
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$57,000	\$112,000	\$117,000

Agency or Local Government Partnering:

This project will be carried out in coordination with Sarasota County, Manatee County, the City of Sarasota, and the Sarasota Bay NEP.

Project Title: Update the Pollutant Loading Model for Sarasota Bay

Summary:

The existing pollutant loading model for Sarasota Bay and its watershed (SBNEP, 1992) is based on land use data from 1990. Stormwater pollution loads priority tributaries are based, in part, on land use data that is now more than a decade old. While this past effort predicted pollutant loads expected to occur in future years, recent patterns of population growth might not be quite what was predicted in the existing effort, and sources and quantities of various pollutant might be different than what was expected. In addition, various efforts to reduce point source loads via upgrading wastewater treatment plant operations and increased reuse of wastewater treatment effluent should be examined to determine their actual, rather than expected, nutrient load reduction impact. Finally, the previous pollutant loading model used wet deposition nitrogen concentration data from Tampa Bay that probably overestimated this loading source, while not including the potentially significant source of "dry deposition" of nitrogen. An updated pollutant loading model would involve the District partnering with the SBNEP, as well as various local, state and federal agencies to design a scope of work for this effort that would update and refine the amounts and sources of various pollutant loads to the bay.

Annual Budget Estimates:

	FY 2003	FY 2004	FY 2005	FY 2006
Salaries	\$2,000	\$2,000	\$2,000	\$2,000
Contracts	\$0	\$100,000	\$0	\$0
Expenses	\$0	\$0	\$0	\$0
Total	\$2,000	\$102,000	\$2,000	\$2,000

Agency or Local Government Partnering:

This project will be carried out in coordination with FDEP, Sarasota County, Manatee County, the City of Sarasota, and the Sarasota Bay NEP.

APPENDIX A – STATUS OF THE 1997 SARASOTA BAY SWIM PLAN

Within the 1997 Sarasota Bay SWIM Plan, a number of priority projects were outlined, and the basis for undertaking these activities was described. Generally, activities involved starting a number of projects aimed at reducing pollutant loads coming from stormwater and wastewater, as well as habitat restoration projects, seagrass mapping efforts, and various other technical studies. This section discusses the results of these completed and ongoing efforts. Although considered in some detail, much more information is contained in the technical reports referenced. These reports are available from the District's SWIM Section, at (813) 985-7481, ext. 2206.

Project: Develop a reuse master plan for Sarasota Bay's watershed.

Status: A final report was for this project was completed in 1998. The report was a summary of efforts by local governments to reuse wastewater and stormwater, and outlined a course of action to be followed to ensure greater coordination of future efforts. At present, the Sarasota Bay region reclaims 46 percent of its wastewater treatment plant effluent, which has resulted in reduced demand for groundwater resource for non-drinking water purposes, and reduced nutrient loading from wastewater discharges.

Project: Promote the Florida Yards and Neighborhoods program.

Status: The District has continued to support the Florida Yards and Neighborhoods program as a resident-oriented education program designed to reduce water demand, as well as a means to potentially reduce urban non-point source nitrogen runoff. Continued support is expected to come directly from the Basin Board, at least until FY 2005.

Project: Incorporating water quality improvements into stormwater master plans.

Status: The SWIM program has worked with Manatee and Sarasota Counties to develop conceptual and/or detailed stormwater master plans for various tributaries to Sarasota Bay. These master plans all are designed to incorporate, to the maximum extent practical, improvement of water quality, as well as flood protection. Tributaries that have existing stormwater master plans, or that are expected to have completed master plans by FY 2005 include the following: Arlington/Euclid Canal, Phillippi Creek, Catfish Creek, and Whitaker Bayou.

Project: Habitat restoration.

Status: As of 2001, approximately 200 acres of wetlands and adjacent uplands have been restored in the Sarasota Bay watershed (SBNEP, 2001). This amount of habitat restoration is higher than the proposed rate of 18 acres per year agreed to in the Sarasota Bay NEP's Comprehensive Conservation and Management Plan (1995). Completed projects include the following: City Island, Leffis Key, Sixth Street Canal, Quick Point Preserve, Caples Shoreline, Selby Gardens, Sister Keys, Durante Park, and Hog Creek. Proposed projects include: Bird Colony Islands, 1912 Cortez Schoolhouse site, Perico Bayou, Crossley Estate, Palmer Point, and the Jim Neville Preserve.

Project: Seagrass mapping.

Status: Seagrass meadows, which have been shown to be sensitive bio-indicators of human alterations to water quality, are an important habitat for a number of recreationally and commercially important species of finfish and shellfish. As part of an effort to determine the status and trends of seagrass meadows in Sarasota Bay, the SWIM Program agreed to map seagrass distribution in Sarasota Bay on a regular basis (SBNEP, 1995). At present, seagrass coverage has been quantified for the years 1988, 1994, 1996, and 1999. Information on seagrass coverage is presented to the Sarasota Bay NEP on a regular basis, and is included in the most recent assessment of the bay (SBNEP, 2000).

Project: Further assessment of atmospheric deposition in Sarasota Bay.

Status: In the Sarasota Bay NEP's CCMP (1995), two technical projects were identified as needing further investigation. The first of these projects was to further investigate the sources and impacts of atmospheric deposition on the health of Sarasota Bay. This effort has been completed, and involved a number of tasks. Construction and maintenance of an atmospheric deposition monitoring site allows for the refinement of previous estimates of nitrogen loads. This more recent estimate suggests that nitrogen loads to the bay are lower than previously thought. The second project involved the development of a source model for atmospheric loads, which suggested that nitrogen loads from Sarasota Bay could come from areas as far away as the Cities of Tampa and Lakeland. The third project involved determining the biological impacts of atmospheric deposition of nitrogen. Results from this project suggest that direct loads of atmospherically-derived nitrogen may not be as biologically important a source of nitrogen loading as are stormwater and wastewater.

Project: Identification of toxic load sources in Sarasota Bay.

Status: In the Sarasota Bay NEP's CCMP (1995), two technical projects were identified as needing further investigation. The first task involved (described above) involved an assessment of the sources and impacts associated with atmospheric deposition of pollutant loads into Sarasota Bay. The second identified project was designed to further identify, on a sub-basin level, the sources of toxin loads in priority watersheds. As identified in the CCMP (1995), these priority watersheds are Cedar Hammock Creek, Bowlees Creek, Whitaker Bayou, Hudson Bayou, and Phillippi Creek. This project has been completed, and results have been communicated to both Sarasota and Manatee Counties, as well as the City of Sarasota. This information is being used to help these local governments better prioritize sub-basins within priority watersheds for stormwater treatment retrofits.

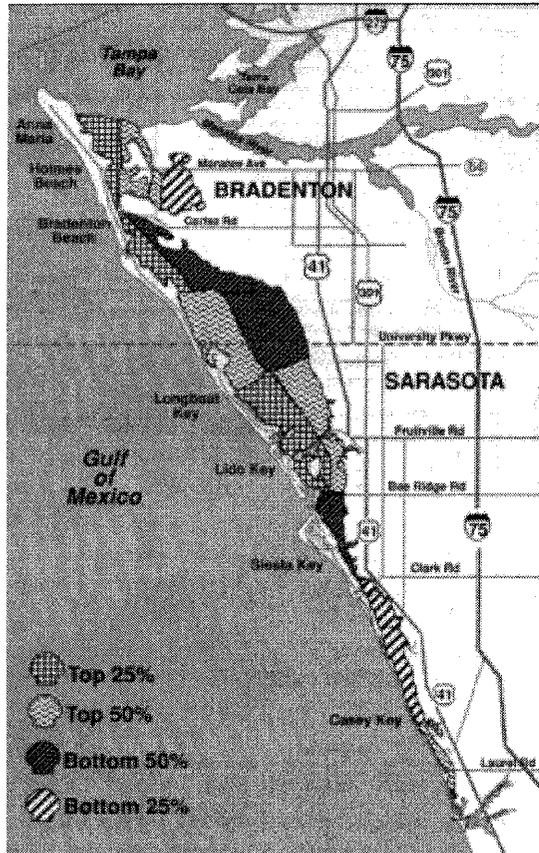
Project: Data management.

Status: This element, identified as a need in the Sarasota Bay NEP's CCMP (1995), involved aiding the Sarasota Bay NEP in several tasks. These tasks involved the following: 1) uploading all relevant water quality data sets into STORET, 2) purchase of hardware and software to allow for various data analysis efforts, and 3) updating the status and trends of water quality previously conducted in 1992 (SBNEP, 1992). All these tasks have been accomplished, with the SBNEP's data collection efforts being fully loaded into STORET. Ongoing water quality monitoring efforts are conducted by both Sarasota and Manatee Counties, which are the responsible parties for uploading data into STORET. Additionally, Mote Marine Laboratory completed an update of water quality status and trends, with data sets that extended up to 1998.

APPENDIX B - STATUS AND TRENDS IN THE HEALTH OF SARASOTA BAY

Status and Trends in Water Quality

Status



When comparing bay segments against each other in terms of water clarity, a general pattern emerges (Figure B-1). Areas closest to flushing passes tend to have the greatest water clarity, and areas such as eastern Palma Sola Bay (just west of Bradenton, between Manatee Avenue and Cortez Road) and Little Sarasota Bay (east of Casey Key), which are "null zones" for circulation (Sheng and Peene, 1992) tend to have the lowest water clarity. However, Roberts Bay (just east of Siesta Key) also has relatively low water clarity, despite its proximity to Big Pass (between Lido Key and Siesta Key), and the waters just east of central Longboat Key have good water clarity, despite being located in a null zone for circulation (Sheng and Peene, 1992).

Using FDEP's methodology for determining "trophic state indices - TSI" (i.e. Hand et al., 1996), and excluding stations located in tributaries, Lowrey (1992) found that all bay segments had TSI values in the "good" range, except for Midnight Pass, which had a TSI value in the "fair" range (Lowrey, 1992). A past comparison of TSI values suggested that water quality in Sarasota Bay was better than upper and middle portions of Tampa Bay, and about the same as lower Tampa Bay (Lowrey, 1992).

Figure B-1. Relative Water Clarity Index.

Trends

A more recent assessment of water quality in Sarasota Bay was completed by Dixon and Heyl (1999). This effort examined trends in nutrients, salinity, water clarity, etc. for 12 bay segments, 4 pass segments (including the area of the former Midnight Pass) and an offshore segment. Table 2 summarizes the number of bay segments (not including passes) that showed trends of improvement, degradation, or no trend for three different time periods (1968 to 1998, 1983 to 1998, and 1989 to 1998).

These time periods refer to the period of record for water quality data (1968 to 1998), the time period after the closure of Midnight Pass (1983 to 1998), and the time period after implementation of numerous wastewater treatment plant upgrades (1989 to 1998).

Table 2 – Trends in Water Quality. Number of bay segments (out of 12 total) with significant ($p < 0.05$) trends over time for total nitrogen, total phosphorus, chlorophyll A, secchi disk depth, and salinity (data summarized from Dixon and Heyl, 1999).

	1968-1998	1983-1998	1989-1998
Total Nitrogen	Improve –10 Degrade – 0 No trend – 2	Improve – 10 Degrade – 0 No trend – 2	Improve – 9 Degrade – 0 No trend – 3
Total Phosphorus	Improve –10 Degrade – 0 No trend – 2	Improve – 10 Degrade – 0 No trend – 2	Improve – 9 Degrade – 0 No trend – 3
Chlorophyll A	Improve – 4 Degrade – 1 No trend – 7	Improve – 5 Degrade – 0 No trend – 7	Improve – 0 Degrade – 1 No trend – 11
Secchi Disk Depth	Improve –7 Degrade – 2 No trend – 3	Improve – 7 Degrade – 1 No trend – 4	Improve – 2 Degrade – 2 No trend – 8
Salinity	Increase –2 Decrease – 5 No trend – 5	Increase – 2 Decrease – 2 No trend – 8	Increase – 2 Decrease – 3 No trend – 7

Since 1968, 10 of 12 bay segments show a pattern of decreasing concentrations of total nitrogen and total phosphorus. During this same time period, chlorophyll A concentrations improved in 4 of 12 segments, but actually degraded in 1 bay segment (western Anna Maria Sound just east of Holmes Beach). Water clarity, as measured in secchi disk depths, improved in 7 segments, but degraded in 2 bay segments (along the barrier islands just east of Bradenton Beach and northern Longboat Key, and in Little Sarasota Bay). Salinity increased at 2 segments (eastern and western portions of Palma Sola Bay), but decreased in 5 other bay segments, including Little Sarasota Bay. In general, areas with improved water clarity were also areas with improving trends for both nutrients and chlorophyll A. Improvements in water clarity do not seem to be driven by reduced volumes of stormwater runoff due to changes in rainfall, as most bay segments that showed evidence of increased secchi disk depths did not also have trends of increasing salinity.

The greatest relevance for testing for trends in water quality from 1983 to 1998 is for Little Sarasota Bay. This time period represents conditions after the closure of Midnight Pass, which occurred in 1983. According to Sheng and Peene (1992) the closure of Midnight Pass caused circulation and flushing to decrease in Little Sarasota Bay, although flushing rates increased in Roberts Bay (just east of Siesta Key) and Blackburn Bay (just east of Casey Key). All three bay segments (Roberts Bay, Little Sarasota Bay, and Blackburn Bay) show evidence of decreased concentrations of total nitrogen and total phosphorus during this time period. In contrast, none of these three

bay segments shows a trend in chlorophyll A. Roberts Bay exhibits a trend of improved water clarity between 1983 and 1998, but no trend is evident for either Little Sarasota Bay or Blackburn Bay.

Since 1989, 9 of 12 bay segments show patterns of decreasing concentrations of both total nitrogen and total phosphorus. In contrast, no bay segments show a pattern of decreasing chlorophyll A concentrations, although one bay segment (eastern Palma Sola Bay) exhibits a pattern of increasing algal abundance. Water clarity has apparently increased during this time period in 2 bay segments (along the mainland east of Lido Key, and in Roberts Bay) but has decreased in 2 other bay segments (eastern Palma Sola Bay, and along the barrier islands just north and south of Longboat Pass). It seems unlikely that increased runoff from the 1997 to 1998 El Niño event was the basis for the increased chlorophyll A concentrations and decreased water clarity in eastern Palma Sola Bay during this time period, as there was no concurrent trend in salinity. However, the trend of decreased water clarity between 1989 and 1998 along the barrier islands just north and south of Longboat Pass is concurrent with a trend of declining salinities.

In summary, recent (1989 to 1998) trends of declining concentrations of total nitrogen and total phosphorus (9 of 12 bay segments) do not seem to be accompanied by continued decreases in phytoplankton abundance, as no bay segments showed trends of decreasing chlorophyll A concentrations during that same time period. Also, while 2 bay segments show evidence of improved water clarity between 1989 and 1998, 2 bay segments also seem to have experienced declines in water clarity during that same time period. The basis for this potential disconnect between declining nutrient concentrations and further decreases in phytoplankton abundance and improvements in water clarity (between 1989 and 1998) merits further investigation.

Finally, additional efforts are required to determine the basis for the apparent trends of decreasing water clarity in eastern Palma Sola Bay and that portion of Sarasota Bay adjacent to the barrier islands just north and south of Longboat Pass in recent years.

Contaminant Levels in Bay Sediments

Using aluminum content as a means to "normalize" data sets, sediment enrichment ratios for copper, lead, and zinc were determined for 35 transects located throughout Sarasota Bay (Figure B-2). In this figure, enrichment ratios greater than 1 are indicative of ratios higher than the upper limit to the 95 percent confidence interval created from a statewide data base. This relationship was calculated using

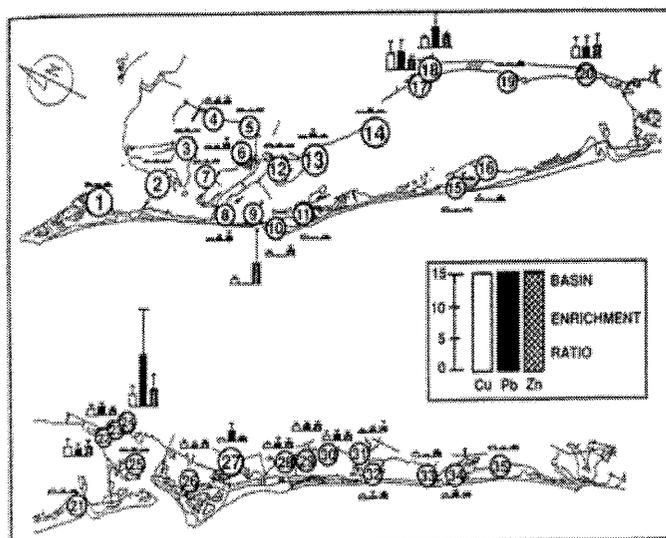


Figure B-2. Enrichment ratios for Cu, Pb, and Zn in various tributaries.

data from locations throughout Florida where toxin loads are absent or minimal (Lowery, 1992). In Sarasota Bay, several "hot spots" for toxin contamination are apparent, specifically, Hudson Bayou, Bowlees Creek, Phillippi Creek, Whitaker Bayou, and Cedar Hammock Creek.

Areas with elevated enrichment ratios are indicative of anthropogenic impacts. Such areas typically show multiple contamination from metals, pesticides, and hydrocarbon residues (Lowrey, 1992). Additionally, areas with elevated levels of toxins in the sediment are typically areas with elevated levels of toxins in shellfish (Dixon, 1992).

These watersheds have been the focus of more detailed assessments in recent years, to try and determine which sub-basins, if any, contribute disproportionately high toxin loads (Dixon et al. 1999 a & b). With this information, stormwater retrofit projects can be placed for optimal benefit.

Status and Trends in Wetlands

Accompanying the post-World War II population boom, tidal wetlands throughout the watershed decreased from approximately 4,104 acres in 1950 to 2,495 acres in 1990 (Estevez, 1992). Forested freshwater wetlands in the Sarasota Bay watershed decreased by 35 percent during the period 1975-1991 (Beaman, 1992).

In Manatee County, much of the original tidal wetland coverage remains intact, although much of the freshwater wetlands have been lost. In Sarasota County, vast stretches of freshwater wetlands remain intact, but the mangrove shoreline has nearly disappeared in most areas (Estevez, 1992). The pattern of wetland loss appears to be related to how development occurred in different parts of the watershed, with Manatee County mostly expanding into the interior regions south of Bradenton, and with Sarasota County mostly expanding parallel to its shoreline with the Bay.

The rate of loss of tidal wetlands during the period of 1975-1990 was about 20 acres per year, which is less than one half the rate experienced during the period of 1950-1975 (52 acres per year; Estevez, 1992). Wetlands loss in Sarasota Bay has typically involved two phenomena: the loss of areal coverage itself, and the fragmentation of remaining wetlands into smaller pieces. As fragmentation alone can have a significant negative impact on wetland processes, regardless of declines in acreage, wetland productivity, habitat value and stability are therefore dually impacted (Reid and Trexler, 1991).

For freshwater wetlands, the rate of loss from 1975-1990 equals 119 acres per year, nearly six times the rate of loss for tidal wetlands. Forested wetlands account for 23 percent of the remaining 1,388 freshwater wetlands in the watershed (by number, not acreage), with marshland accounting for 39 percent and wet prairies accounting for 27 percent of all freshwater wetlands (Beaman, 1992). More than 75 percent of all freshwater wetlands have either been dredged or filled to some degree, with only 21 percent exhibiting no signs of human impact (Beaman, 1992). Additionally, up to 95 percent of freshwater wetlands, depending on location in the watershed, have some

degree of invasive species problems, with the severity of such problems being greatest in the northern and central portions of the watershed, and least in the southern portions (Beaman, 1992). Recent habitat restoration projects are estimated to have created approximately 200 acres of tidal wetlands and adjacent upland communities (SBNEP, 2001).

Status and Trends in Fisheries

Sarasota Bay includes a variety of habitats that are important in sustaining larval, juvenile, and adult stages of many recreationally and commercially important species of fish. Open water habitats, hard bottom communities, and artificial reefs support large numbers of baitfish such as menhaden (Brevoortia sp.) and thread-herring (Opisthonema oglinum), as well as occasional schools of pompano (Trachinotus carolinus), and large numbers of black sea bass (Centropristis striata) and sheepshead (Archosargus probatocephalus). Seagrass meadows provide vital habitat for two of the most sought-after species, spotted seatrout (Cynoscion nebulosus) and redfish (Sciaenops ocellatus), as well as the commercially valuable striped mullet (Mugil cephalus). Mangrove fringes support large numbers of juvenile fish, and also provide critical habitat for various species of grunts (Haemulon spp.) and snappers (Lutjanus spp.).

As is the case in many parts of Florida, the available fisheries data suggest declines in abundance of recreationally and commercially important species have occurred throughout Sarasota Bay. Edwards (1992) used two different figures to graphically illustrate the relative impacts of harvesting versus habitat loss on fisheries productivity.

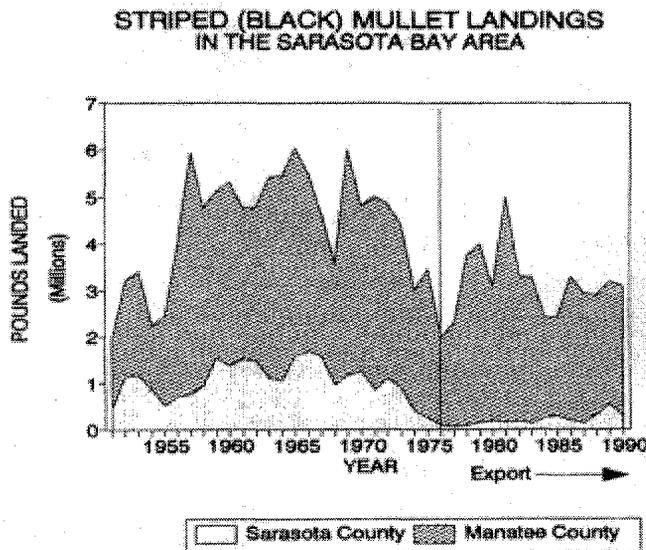


Figure B-3. Stiped Mullet Landings in Sarasota Bay.

Figure B-3, from Edwards (1992), illustrates the decline in striped mullet (Mugil cephalus) landings from both Manatee and Sarasota Counties from 1950 to 1990. Because the vast majority of mullet are caught by commercial fishermen, declines in landings are thought to be related to the combined impacts of commercial fishing pressure and habitat loss. As mullet harvests were maintained at a consistently higher level during a prolonged period of time (the years 1955-1970), as compared to landings during 1975-1990, the decline in mullet landings is not thought to be related to overfishing alone (Edwards, 1992).

Since 1993, commercial harvests of striped mullet have declined substantially, as the use of gill nets for entanglement has been outlawed after Florida voters passed a

Constitutional Amendment to prevent such gear from being used. Commercial harvesting of striped mullet now requires the use of cast nets, rather than gill nets.

In contrast, spotted seatrout (*Cynoscion nebulosus*) show a more significant decline in recent years (Figure B-4), which may reflect increased harvest pressure from recreational anglers, in addition to impacts associated with habitat loss.

When comparing fisheries data with data on status and trends in wetlands and seagrass coverage, Edwards (1992) concluded that "...alteration and degradation of the Sarasota Bay system is the most likely cause of the spotted seatrout fishery decline, with the fishery declines paralleling, in timing and magnitude, the declines of important fishery habitats such as seagrasses, mangroves and natural shorelines."

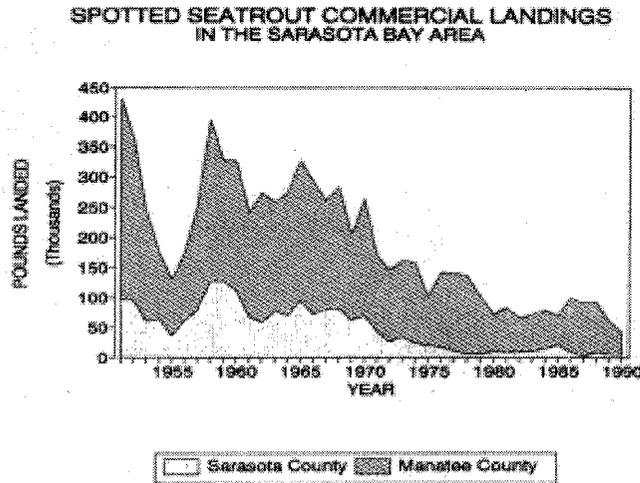


Figure B-4. Spotted Seatrout Landings in Sarasota Bay

Status and Trends in Nitrogen Loads and Seagrass Coverage

Seagrass coverage has been used as a "bio-indicator" of water quality in Tampa Bay (Johansson, 1991) and Lemon Bay (Tomasko et al., 2001). In these two estuaries, the link between human activities and seagrass coverage is mostly mediated through changes in the abundance of phytoplankton. That is, changes in nutrient loads cause changes in phytoplankton populations, which in turn bring about modifications to water clarity. Increases or decreases in water clarity can cause, in turn, changes in seagrass coverage, by controlling the depth to which seagrasses can grow.

In Sarasota Bay, water quality parameters (e.g., nutrient concentrations, chlorophyll A levels, etc.) have been shown to be poor indicators of modeled nitrogen loads (Tomasko et al., 1996). However, and as shown in Figure B-5, seagrass biomass varies inversely with modeled nitrogen loads in Sarasota Bay.

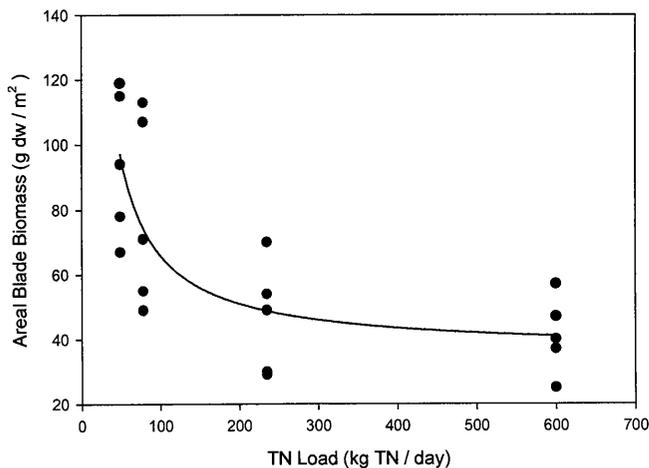


Figure B-5. Nitrogen Loads vs. Seagrass Biomass

modeled nitrogen loads that they are exposed to, it was anticipated that reductions in nitrogen loads into Sarasota Bay would bring about increased seagrass coverage (Tomasko et al., 1992). Fortunately, that appears to be correct.

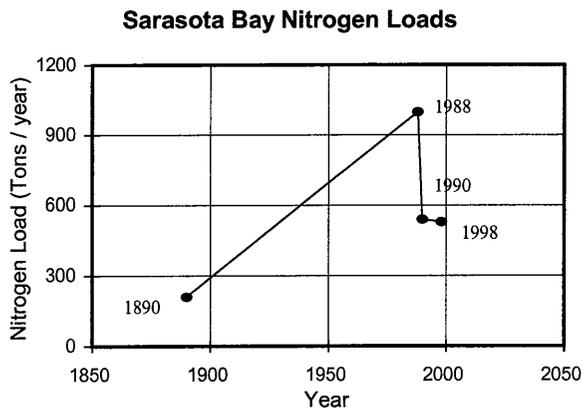


Figure B-6. Bay-wide Nitrogen Loads.

As shown in Figure B-6, nitrogen loads into Sarasota Bay were estimated to have increased substantially between pre-development times (i.e., 1890) and 1988.

In response to significant reductions in nitrogen loads from both public and private wastewater treatment plants, point source nitrogen loads to Sarasota Bay are thought to have declined by perhaps as much as 90 percent. For all nitrogen sources combined, loads are believed to have declined by nearly 50 percent between 1988 and 1998 (SBNEP, 2001).

Additionally, it appears that the role of atmospheric deposition of nitrogen to the open waters of Sarasota Bay is apparently less than was previously estimated. The previous nitrogen loading model for Sarasota Bay used rainfall nitrogen concentrations from the Tampa Bay region to determine this portion of the nitrogen budget. However, recently collected data on rainfall chemistry suggest that the nitrogen concentration in rainfall in Sarasota Bay is substantially lower than that found in Tampa Bay (Dixon et al. 1999c; Heyl, 1992). With rainfall contributing a smaller percentage of nitrogen loads than was previously thought, the reduction in bay-wide nitrogen loads associated with wastewater treatment plant upgrades is higher than was previously estimated (e.g., SBNEP, 1995).

As nitrogen loads to Sarasota Bay have decreased in recent years, the amount of seagrass coverage appears to have increased somewhat concurrently (Figure B-7).

Overall, seagrass coverage in Sarasota Bay expanded by 1,614 acres between 1988 and 1996, a 19 percent increase. However, seagrass coverage apparently declined by 685 acres between 1996 and 1999, probably due to the elevated rainfall and non-point source pollutant loads associated with the 1997 to 1998 El Niño event. The increased rainfall associated with this climatic phenomenon is also thought to be responsible for declines in seagrass coverage in Tampa Bay, Lemon Bay and Charlotte Harbor, as well (Tomasko, 2002).

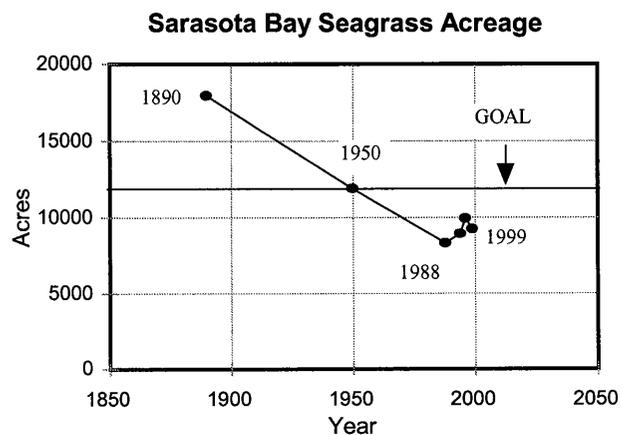


Figure B-7. Seagrass Acreage in Sarasota Bay.

Overall, there is reason to believe that future nitrogen load reductions would be able to bring about further increases in seagrass acreage in Sarasota Bay. However, climatic phenomena such as El Niño events could bring about occasional short-term reductions.

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APPENDIX D - GOVERNANCE WITHIN THE SARASOTA BAY BASIN

A. Overview

Five levels of government are involved in resource management and regulatory activities within the Sarasota Bay Basin. These include single purpose local governments (i.e. independent taxing districts), general purpose local governments (i.e. cities and counties), regional agencies (i.e. SWFWMD and the Southwest Florida Regional Planning Council), as well as state and federal agencies.

B. Agencies

1. Local Governments

a. Sarasota County

Sarasota County, established in 1921, has an estimated (1988) population of 257,667 and a land area of 573 square miles. It contains five general purpose local governments [the Board of County Commissioners, the City of Sarasota (population 51,442), the City of Venice (population 15,252), the City of North Port (population 9,145), and the Town of Longboat Key (population 6,595), which is shared with Manatee County]. With the exception of the City of North Port, the above-mentioned entities have jurisdiction within the Sarasota Bay SWIM Plan area. Ninety-four special districts have been formed, of which 52 are operative arms of County government.

b. Manatee County

Manatee County has an estimated (1990) population of 211,700 and a surface area of 747 square miles. It is served by a Board of County Commissioners and contains the city of Bradenton (population 43,779) and several smaller towns and municipalities. At this time, the city of Bradenton-proper does not appear to be located within the immediate watershed of Sarasota Bay, although out-parcels located along the Palma Sola Causeway are within the watershed of Palma Sola Bay.

2. Sub-state Agencies

Three sub-state agencies exist that would be involved in the implementation of the SWIM plan. These are the West Coast Inland Navigation District, the Southwest Florida Regional Planning Council (for Sarasota County), the Tampa Bay Regional Planning Council (for Manatee County), and the Southwest Florida Water Management District.

The West Coast Inland Navigation District includes the intracoastal waterway of Sarasota and Manatee County. It is the local sponsor for the maintenance activities of the waterways, and has been the local sponsor for inlet and pass maintenance programs for navigation purposes.

The Southwest Florida Regional Planning Council is the Regional Planning Agency designated in Section 186.505 of the Florida Statutes. It performs the responsibilities described in that section and the Regional Planning Agency roles assigned in Section 380.05, F.S. (Resource Planning Committees, DRI reviews and Ch. 163, Local Plan Reviews), for Sarasota County and its municipalities.

The Tampa Bay Regional Planning Council performs these duties for Manatee County.

The Southwest Florida Water Management District is responsible for performing duties assigned under Ch. 373, F.S., as well as duties delegated through DEP for Chs. 253 and 403, F.S., and for local plan review (Ch. 163, F.S.). It performs those duties for an area that includes Sarasota County and Manatee County, as well as those cities contained within these two counties.

3. State Agencies

Many state agencies are involved in environmental regulation and resource management in the Sarasota Bay watershed and estuary. The Florida Department of Environmental Protection (FDEP) is the leading agency in the protection and management of Sarasota Bay. Other relevant entities include the Florida Department of Community Affairs, the Florida Fish and Wildlife Conservation Commission, the Marine Fisheries Commission, Florida Department of Agriculture and Consumer Services, Florida Department of Health, Florida Sea Grant Program, and the Florida Department of Transportation.

a. Department of Agriculture and Consumer Services

This department regulates the purchase and use of restricted pesticides and assists in resource management through the activities of the Soil and Water Conservation Districts and the Division of Forestry. The Division of Aquaculture's Shellfish Environmental Assessment Section (SEAS) program classifies and determines the opening and closure of shellfish harvesting areas.

b. Department of Community Affairs

This department is responsible for reviewing local comprehensive plans and has review authority over developments of regional impact (DRI's). DRI investigations are concerned with proposed developments, which have the potential to affect the health, safety, or welfare of citizens of more than one county.

The Comprehensive Plans of both Sarasota and Manatee counties have been reviewed by the DCA. All have come into compliance with the Local Comprehensive Planning Act, either through a final review action, a stipulation agreement, or a settlement agreement.

c. Department of Environmental Protection

The Department of Environmental Protection, itself a result of the merger of the old Department of Environmental Regulation and the Department of Natural Resources, is the lead state agency involved in water quality, pollution control, and resource recovery programs. The department sets state water quality standards and has permit jurisdiction over point and nonpoint source discharges, certain dredge and fill activities, drinking water systems, power plant siting, and many construction activities conducted within waters of the state. The Office of Water Policy, Bureau of Watershed Management, and Everglades Technical Support Section are key program areas involved in waterbody restoration, in conjunction with the U.S. EPA. These offices also interact closely with other federal and state agencies on water-related matters.

The department is the primary reviewer of SWIM plans and is responsible for the disbursement of monies from the SWIM Trust Fund to the water management districts.

The Department is also highly involved in the management of estuarine resources, primarily through the Office of Coastal and Aquatic Managed Areas.

The Division of State Lands, Division of Recreation and Parks, and Office of Coastal and Aquatic Managed Areas oversee the management of state lands, including sovereign submerged lands, state parks such as Oscar Scherer, and aquatic preserves such as Lemon Ba and Terra Ceia.

The Department's Florida Geological Survey office reviews oil and gas leasing requests involving nearshore and state waters. The Bureau of Beaches and Wetland Resources oversees the Environmental Resource Permitting Program and beach renourishment activities.

d. Florida Fish and Wildlife Conservation Commission

The purpose of the Commission is to manage, protect, and conserve wild animal life and freshwater and marine aquatic life. Its efforts within the SWIM plan area primarily involve freshwater and salt water sport and commercial fishing, fisheries and habitat management, fish stocking, fisheries research, wildlife monitoring, enforcement of fisheries/wildlife regulations, listed species protection, wildlife research, development review, and regional planning.

The Commission is directed to review SWIM plans to determine if the plan has adverse effects on wild animal life and fresh water aquatic life and their habitats.

The Florida Marine Research Institute (FMRI) conducts studies throughout Sarasota Bay with respect to habitat quality (e.g. marsh and seagrass habitats), habitat utilization and value with respect to important fisheries, and fish population dynamics and stock assessment. However, at present, the Juvenile Fish Monitoring Program does not include sample sites in Sarasota Bay.

e. Marine Fisheries Commission

The Marine Fisheries Commission manages marine fish species (excluding endangered or threatened species) by regulating their harvesting. The Commission's jurisdiction covers the following areas: a) gear specifications, b) prohibited gear, c) bag limits, d) size limits, e) species that may not be sold, f) protected species, g) closed areas, h) quality control codes, i) harvesting seasons, j) special considerations related to egg-bearing females, and k) oyster and clam relaying. The MFC is required to make annual recommendations to the Governor and Cabinet regarding marine fisheries research priorities.

f. Department of Health

The Department of Health is responsible for the permitting of septic systems and other on-site disposal systems (OSDS's) through its county health departments. It also coordinates mosquito control programs.

g. Department of Transportation

The Department of Transportation's Project Development and Environmental Offices in Bartow assist in the design, review, and permitting of road and right-of-way projects in the Sarasota Bay region, and would play an important role in the enhancement of circulation in northeaster Palma Sola Bay during the reconstruction of the Palma Sola Causeway.

h. Florida Sea Grant Program

The Florida Sea Grant Program is supported by awards from the Office of Sea Grant (National Oceanic and Atmospheric Administration) under provisions of the National Sea Grant College and Programs Act of 1966. The Florida Sea Grant Program has three major components: applied marine research, education, and advisory services (through local marine extension agents).

Florida Sea Grant provides scientific research and habitat-related information that is useful in the management of Sarasota Bay's natural resources.

4. Federal Agencies

Federal jurisdiction in Sarasota Bay involves the regulatory responsibilities of the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, and the U.S. Department of Interior. Their main regulatory functions include overseeing dredge and fill activities, maintaining navigability of the waters of the United States, overseeing cleanups following pollution spills, protecting endangered species, protecting overall environmental quality, and managing offshore activities. These agencies, in conjunction with the U.S. Geological

Survey and the National Oceanic and Atmospheric Administration, also contribute to the collection of technical data concerning Sarasota Bay and its watershed.

a. U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency is the primary federal agency responsible for water quality protection. The agency oversees hazardous waste cleanups, protection of public drinking water systems, all point source pollutant discharges into waters of the United States (National Pollutant Discharge Elimination System permits), and the protection and restoration of surface and groundwater. The agency also reviews Corps of Engineers permit activities, sets minimum quality standards, and sets guidelines for state environmental programs. EPA also funds sewerage facilities studies through the SWFRPC and the TBRPC, and system improvements through the Florida Department of Environmental Protection.

The EPA's greatest presence in Sarasota Bay is through its National Estuary Program, established under Section 320 of the Clean Water Act. Sarasota Bay was selected for inclusion in the National Estuary Program in July 1988. The Sarasota Bay National Estuary Program (SBNEP) officially began with the signing of a five-year agreement among local, regional, state and federal agencies on June 26, 1989.

The SBNEP has produced three documents needed for the preservation and restoration of Sarasota Bay. These documents include: State of the Bay Report (SOB - 1990), Framework for Action (FFA - 1992), and the Comprehensive Conservation and Management Plan (CCMP - 1995). The SOB was designed to be a primer on general bay problems, as well as a blueprint for establishing the research and restoration goals for the SBNEP. Upon completion of the necessary technical projects, the principle investigators and SBNEP staff produced the FFA. The FFA included preliminary management options, identified by principal investigators, that were designed to improve the quality of Sarasota Bay. After reviewing the proposed management options through a series of more than 30 public workshops and committee hearings, a course of action was finalized for the restoration and preservation of Sarasota Bay. This document, the CCMP, is the final work product specified by the original five-year agreement. At present, the SBNEP is actively involved in the process of implementing the actions called for in the CCMP, as well as fostering relationships between various governmental bodies for facilitating restoration and protection projects.

b. U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers is concerned with all activities which affect navigable waters of the United States, particularly those involving construction of structures and dredging and filling in navigable waters. The Corps is also involved in permitting the placement of dredge and fill material into navigable waters and adjacent wetlands, and in funding aquatic plant control in navigable and public waters.

c. U.S. Coast Guard

The U.S. Coast Guard is the primary federal agency entrusted with marine law enforcement. The Guard's mission also includes hazardous materials cleanups, search and rescue, buoy replacement, vessel safety inspection, and right-of-way clearance on navigable waterways.

d. U.S. Department of Commerce

Within the department, the National Oceanic and Atmospheric Administration, which includes the National Weather Service and the National Hurricane Center, is a scientific and data collection agency which assimilates oceanographic and meteorological information in the form of maps, charts, interpretive reports, and other documents. The National Marine Fisheries Service administers NOAA's program to manage living marine resources for commercial and recreational use. It supports fisheries management operations, international fisheries affairs, fishery development, trade, and industry assistance activities, habitat conservation activities, and scientific and technical aspects of NOAA's marine fisheries resources programs.

f. U.S. Department of Interior

The primary water-related functions performed by this agency involve the review of proposed activities which may impact threatened or endangered species, review of U.S. Army Corps of Engineers permits for potential effects on fish and wildlife, and management of all federally-owned public lands. Within the department, the U.S. Geological Survey conducts investigations concerning hydrology, hydrogeology, water use, and ground and surface water quality. The U.S. Fish and Wildlife Service manages and restores fish and wildlife populations and conducts research on the effects of pollution on those resources. The National Park Service maintains federal parks and sanctuaries, regulating multiple uses on these lands to achieve a balance of benefits for both man and wildlife. The department also oversees those requests and offshore activities associated with exploration and development on the outer continental shelf.

APPENDIX E - POINT AND NON-POINT (NPDES) DISCHARGES WITHIN THE SARASOTA BAY BASIN

The attached spreadsheet is a list of FDEP-permitted point and non-point (NPDES) discharges within the watershed of Sarasota Bay. This list was compiled by staff of FDEP's Southwest District Office in Tampa, and special thanks are given to Mr. Charles Kovach, for coordinating this assessment.

13409	FLA013409	PETERSON MANUFACTURING	155 CATTLEMAN ROAD	SARASOTA		58	SWSA	DW	A	N	0.0033	Front Gate
13414	FLA013414	TRI-STATE MOBILE HOME PARK	24 EAST BAY ST	OSPREY	34229	58	SWSA	DW	A	N	0.0100	Front Gate
13416	FLA013416	FIELD CLUB	1400 FIELD RD	SARASOTA		58	SWSA	DW	A	N	0.0080	Front Gate
13419	FLA013419	OAKWOOD GARDEN WWTP	4035 SOUTH SCHOOL AVENUE	SARASOTA	34231	58	SWSA	DW	A	N	0.0090	Front Gate
13420	FLA013420	FAIR WINDS CONDOMINIUM	ALBEE ROAD	NOKOMIS		58	SWSA	DW	A	N	0.0170	Front Gate
13421	FLA013421	YODER'S TOO RESTAURANT	3434 BAHIA VISTA	SARASOTA		58	SWSA	DW	A	N	0.0050	Front Gate
13422	FLA013422	SPANISH LAKES MHP	1340 N TAMIAAMI TRAIL	NOKOMIS	34275	58	SWSA	DW	A	N	0.0600	Front Gate
13426	FLA013426	HOUGHTON WAGMAN PARTNERSHIP, LTD.	7839 FRUITVILLE ROAD	SARASOTA	34240	58	SWSA	DW	A	N	0.0033	Front Gate
13427	FLA013427	DOLOMITE UTILITIES TRI-PAR WWTP	1450 BLIND BROOK DRIVE	SARASOTA	34234	58	SWD	DW	A	N	0.3000	Front Gate
13428	FLA013428	MANASOTA BEACH GARDENS WWTP	1730 MANASOTA BEACH ROAD	ENGLEWOOD	34223	58	SWSA	DW	A	N	0.0090	Front Gate
13429	FLA013429	POLYNESIAN VILLAGE MHP WWTP	1495 ALAMANDER AVENUE	ENGLEWOOD	34223	58	SWSA	DW	A	N	0.0400	Front Gate
13436	FLA013436	KING'S GATE RVP WWTP	1500 KING'S WAY	NOKOMIS		58	SWSA	DW	A	N	0.0400	Front Gate
13441	FLA013441	TERVIS TUMBLER WWTP	HWY 41 AT HAPPY HAVEN DR.	OSPREY		58	SWSA	DW	A	N	0.0078	Front Gate
13443	FLA013443	ENGLEWOOD UTILITIES WWTP	555 FOXWOOD BLVD.	ENGLEWOOD	34223	58	SWSA	DW	A	N	0.1550	Front Gate
13447	FLA013447	PROCTOR ROAD WWTP	WORCESTER ROAD SOUTH OF WILKINSON	SARASOTA	34231	58	SWD	DW	A	N	0.0250	Front Gate
13449	FLA013449	HEALTH SOUTH OF SARASOTA	3251 PROCTOR ROAD	SARASOTA	34231	58	SWSA	DW	A	N	0.0100	Front Gate
13450	FLA013450	MEDICAL CENTER OF SARASOTA WWTP	3920 BEE RIDGE ROAD	SARASOTA	34277	58	SWSA	DW	A	N	0.0150	Front Gate
13451	FLA013451	BEEKMAN PLACE UTILITY WWTP	290 COCOANUT AVENUE	SARASOTA	34230	58	SWSA	DW	A	N	0.0900	Front Gate
13453	FLA013453	LAKE FOREST CONDOMINIUM	4062 LAKE FOREST DRIVE	SARASOTA		58	SWSA	DW	A	N	0.0306	Front Gate
13454	FLA013454	LONGWOOD RUN UTILITIES WWTP	6250 LONGWOOD RUN BOULEVARD	SARASOTA	34243	58	SWD	DW	A	N	0.2150	Front Gate
13456	FLA013456	KENSINGTON PARK UTILITIES 27TH STREET	2461 DR. MARTIN LUTHER KING JR. WAY	SARASOTA	34234	58	SWD	DW	A	N	0.1750	Front Gate
13457	FLA013457	OAK HAMMOCK PROF.CTR.(BENEVA CREEK)	3845 BEE RIDGE ROAD	SARASOTA		58	SWSA	DW	A	N	0.0100	Front Gate
13458	FL0134589	FRUITVILLE WWTP	1616 WENDEL KENT ROAD	SARASOTA	34240	58	SWD	DW	A	Y	1.5000	Front Gate
13459	FLA013459	WOODBRIIDGE ESTATES	N OF WILKINSON W SWIFT ROAD	SARASOTA		58	SWSA	DW	A	N	0.0150	Front Gate
13463	FLA013463	CARDIO RESEARCH, INC.	803 SOUTH TAMIAAMI TRAIL	OSPREY	34229	58	SWSA	DW	A	N	0.0075	Front Gate
13464	FLA013464	VENETIAN MHP	8885 TAMIAAMI TR	SARASOTA		58	SWSA	DW	A	N	0.0300	Front Gate
13477	FLA013477	SARASOTA BAY MHP - R/O PLANT	42 WEST OAK	OSPREY	34229	58	SWD	IW	A	N		Front Gate
13479	FLA013479	FLORIDA MINING & MATERIALS/LITRELL	200 N. SEABOARD AVENUE	VENICE	34284	58	SWD	IW	A	N		Front Gate
13481	FLA013481	DARBY BUICK, INC.	5170 S. TAMIAAMI TRAIL	SARASOTA	34231	58	SWD	IW	A	N		Front Gate
13483	FLA013483	SINGELTARY CONCRETE	435 SEABOARD AVENUE	VENICE	34292	58	SWD	IW	A	N		Front Gate
13484	FLG110080	FLORIDA ROCK INDUSTRIES, INC. (VENICE READY MIX BATCH PLANT)	252 SEABOARD AVENUE	VENICE	34292	58	SWD	CBP	A	Y		Center of Plant
13485	FLA013485	ALBRITTON FRUIT COMPANY, INC.	5947 CLARK CENTER AVE.	SARASOTA	34238	58	SWD	IW	A	N		Front Gate
13486	FLG110291	CEMEX, INC. - SARASOTA CBP	1100 CENTRAL AVENUE	SARASOTA	34236	58	SWD	CBP	A	Y		Front Gate
13487	FL0134872	LAKE VILLAGE MOBILE HOME COMMUNITY	400 LAKE DR	NOKOMIS	34275	58	SWD	IW	A	Y		Front Gate
13491	FLA013491	OSCAR SCHERER STATE PARK	1843 S TAMIAAMI TRAIL	OSPREY	34229	58	SWSA	DW	A	N	0.0150	Front Gate
14053	FLA014053	SANDALHAVEN UTILITIES STP	6800 PLACIDA RD @FIDDLERS GREEN	ENGLEWOOD	33533	8	SD	DW	A	N		Front Gate
14064	FLA014064	LANDINGS ON LEMON BAY	2424 PLACIDA ROAD	ENGLEWOOD	34224	8	SD	DW	C	N	0.0099	Center of Plant

PR_FA	FACILITY_I	NAME	ADDRESS	CITY	ZIP_5	COUNTY	OFFICE	FACILITY_T	STATUS	NPDES	DESIGN_CAP	FEATURE
13472	FLA013472	POLY COATINGS OF THE SOUTH	5944 SANDPHIL RD	SARASOTA			58 SWD	IW	N	N	0.0050	
14066	FLA014066	SEASIDE SERVICE SYSTEM INC	LITTLE GASPARILLA ISLAND	PLACIDA			8 SD	UIC	A	N	0.0360	
14081	FLA014081	WATERS EDGE CONDO	SAN CASA DRIVE	ENGLEWOOD			8 SD	DW	C	N		
16274	FLG040008	MOBIL S/S # 02-F3F	1700 LOCKWOOD RIDGE RD	SARASOTA			58 SWD	PET	A	Y		
16774	FLA016774	COLE, DOROTHY - MARINE BIVALVE	12390 PLACIDA ROAD	PLACIDA	33946		8 SD	IW	A	N		
16901	FLA016901	WASTE MANAGEMENT OF SARASOTA	5750 PINKNEY AVENUE	SARASOTA	34233		58 SWD	IW	A	N		
14091	FLA014091	PARK POINTE VILLAS WWTP	WYOMING STREET	ENGLEWOOD	34224		8 SD	DW	A	N		
14052	FLA014052	LITTLE GASPARILLA UTILITY INC	LITTLE GASPARILLA ISLAND	GROVE CITY			8 SD	IW	A	N		
12728	FLA127281	CENTRAL PASCO REUSE SYSTEM	CENTRAL SECTOR OF PASCO COUNTY	N/A			51 SWD	REU	A	N		
18885	FL0188859	KINGS GATE CLUB, INC., RO WTP	CASTLE DR. BETWEEN CAMELOT DR. AND	NOKOMIS	34275		58 SWD	IW	A	Y		Front Gate
18886	FLA188867	SPANISH LAKES MHP R/O WTP	1340 NORTH TAMiami TRAIL	NOKOMIS	34275		58 SWD	IW	A	N		Front Gate
18891	FL0188913	ARBORS MOBILE HOME PARK RO WTP	515 S. TAMiami TRAIL	OSPREY	34275		58 SWD	IW	A	Y		Front Gate
18894	FL0188948	KINGS GATE R.V. PARK RO WTP	1500 KINGS WAY	NOKOMIS	34275		58 SWD	IW	A	Y		Front Gate
18897	FLA188972	PETERSON MANUFACTURING CO., INC. RO WTP	155 CATTLEMEN ROAD	SARASOTA	34232		58 SWD	IW	A	N		Front Gate
18898	FL0188981	LAKE TIPPECANOE RO WTP	4636 TIPPECANOE TRAIL	SARASOTA	34233		58 SWD	IW	A	Y		Front Gate
18899	FL0188999	CAMELOT LAKES (ELL CAP 66)	5580 AXMINSTER DR.	SARASOTA	34241		58 SWD	IW	A	Y		Front Gate
18906	FLA189065	VENICE RANCH MHE RO PLANT	2496 SYLVIA LANE	VENICE	34292		58 SWD	IW	A	N		Center of Plant
12619	FLA012619	MANATEE COUNTY SOUTHWEST REGIONAL WWTP	5101 65TH STREET WEST	BRADENTON	34210		41 SWD	DW	A	N	18.0000	Front Gate
13433	FLA134333	ATLANTIC BRENTWOOD WRF	4411 BAHIA VISTA STREET	SARASOTA	34232		58 SWD	DW	A	N	1.7500	Front Gate
13370	FLA133701	SARASOTA COUNTY EDR DIW	CENTER RD. @ FIRE STATION	VENICE			58 SWD	OTH	A	N		Front Gate
13372	FLA013372	BEE RIDGE WRF	4001 IONA ROAD	SARASOTA	34240		58 SWD	DW	A	N	1.5000	Front Gate
13375	FLA013375	SARASOTA COUNTY SEPTAGE TREATMENT RESIDUALS MANAGEMENT FACIY	8350 BEE RIDGE ROAD	SARASOTA	34241		58 SWD	RES	A	N	5.0000	Front Gate
13376	FLA013376	VENICE, CITY OF - ISLAND BEACH WWTP	1800 SOUTH HARBOR DRIVE	VENICE	34285		58 SWD	DW	A	N	0.5500	Front Gate
13379	FL0041441	VENICE EASTSIDE WWTP	3510 LAUREL ROAD EAST	NOKOMIS	34275		58 SWD	DW	A	Y	3.0000	Front Gate
13382	FLA013382	KENSINGTON PARK UTILITIES MONICA PARKWAY WWTP	3700 MONICA PARKWAY	SARASOTA	34235		58 SWD	DW	A	N	0.4560	Front Gate
13383	FLA013383	SYLVAN LEA S/D	1730 SUGARBERRY LANE	SARASOTA	34240		58 SWSA	DW	A	N	0.0300	Front Gate
13384	FLA013384	BAHIA VISTA ESTATES	3901 BAHIA VISTA ST	SARASOTA	34232		58 SWSA	DW	A	N	0.0400	Front Gate
13385	FLA013385	MEADOWOOD WWTP	4860 17TH STREET	SARASOTA	34235		58 SWD	DW	A	N	0.9840	Front Gate
13389	FLA013389	KING'S GATE CLUB WWTP	N OF LAUREL RD, E OF US 41	SARASOTA			58 SWSA	DW	A	N	0.0500	Front Gate
13392	FLA013392	HERON BAY CLUB WWTP	800 SARABAY ROAD	OSPREY	34229		58 SWSA	DW	A	N	0.0075	Front Gate
13395	FLA013395	LAKE VILLAGE MHP	400 LAKE DRIVE N	NOKOMIS	34275		58 SWSA	DW	A	N	0.0450	Front Gate
13396	FLA013396	HAPPY HAVEN MHP	124 HAPPY HAVEN DRIVE	OSPREY	34229		58 SWSA	DW	A	N	0.0075	Front Gate
13397	FLA043494	VENICE GARDENS WWTP	375 VENICE EAST BOULEVARD	VENICE	34293		58 SWD	DW	A	N	2.0000	Front Gate
13398	FLA013398	FLORIDA PINES MHC	150 SATULAH CR	VENICE	34293		58 SWSA	DW	A	N	0.0105	Front Gate
13404	FL0025755	SIESTA KEY UTILITIES AUTHORITY	5200 OAKMONT PLACE	SARASOTA	34242		58 SWD	DW	A	Y	2.7000	Front Gate
13405	FLA013405	VENICE RANCH MHP WWTP	2496 SYLVIA LANE	VENICE	34292		58 SWSA	DW	A	N	0.0350	Front Gate

14078	FLA014078	HIDEAWAY BAY BEACH CLUB CONDO-ASSOCIATION INC	12000 PLACIDA ROAD	PLACIDA	33946	8 SD	DW	A	N	0.0210	Center of Plant
14089	FLA014089	GASPARILLA MOBILE ESTATES	2001 GASPARILLA ROAD (C.R. 771)	PLACIDA	33946	8 SD	DW	A	N	0.0250	Center of Plant
14097	FLA014097	BIZZY BUZZY'S COIN LAUNDRY	3000 PLACIDA ROAD (SR 775)	GROVE CITY	34224	8 SD	IW	A	N		Center of Plant
14102	FLA141020	GASPARILLA ISLAND WATER ASSOC	1700 E RAILROAD AVE	BOCA GRANDE	33921	8 SD	IW	A	N	0.6700	Center of Plant
14123	FLA014123	MERCURY MARINE	S.R. 775 AT BOCA GRANDE CSWAY	PLACIDA	33946	8 SD	DW	A	N		Center of Plant
14126	FLA014126	ENGLEWOOD WATER DISTRICT SOUTH	EVERINGTON ROAD	GROVE CITY	34224	8 SD	DW	A	N	1.2000	Center of Plant
16096	FLA160962	VENICE GARDENS WATER UTIL DIW	100 CATTLEMEN ROAD	SARASOTA	34232	58 SWD	UIC	A	N	1.8000	Front Gate
16569	FL0165697	FAIR WINDS CONDOMINIUM R/O WATER TREATMENT PLANT	350 FAIRWINDS DRIVE	NOKOMIS	34275	58 SWD	IW	A	Y	0.0110	Center of Plant
13467	FL0041785	SNOWBIRDLAND VISTAS, INC.	1200 EAST COLONIA LANE	NOKOMIS	34275	58 SWD	IW	A	Y		Front Gate
17031	FLA017031	SARASOTA COUNTY AREA TRANSIT FACILITY	5303 PINKNEY AVENUE	SARASOTA	34233	58 SWD	IW	A	N		Front Gate
17062	FLA017062	F.P.L. WEST AUTOMOTIVE CENTER	2344 12TH STREET	SARASOTA	34237	58 SWD	IW	A	N		Front Gate
13394	FLA013394	CORAL COVE TRUST WWTP	7500 SOUTH TAMiami TRAIL	SARASOTA	34231	58 SWSA	DW	A	N	0.0050	Front Gate
13418	FLA013418	JAPANESE GARDENS MHP WWTP	6181 TEAHOUSE ROAD	VENICE	34293	58 SWSA	DW	A	N	0.0480	Front Gate
17376	FLA017376	LAUREL OAK COUNTRY CLUB/ GOLF COURSE OPERATIONS	2875 DICK WILSON DRIVE	SARASOTA	34240	58 SWD	IW	A	N		Front Gate
13407	FLA013407	LAKE TIPPECANOE CONDOMINIUMS WWTP	4636 TIPPECANOE TRAIL	SARASOTA	34233	58 SWSA	DW	A	N	0.0400	Front Gate
13411	FL0032808	SOUTH GATE AWWTP	3209 PINE VALLEY DRIVE	SARASOTA	34239	58 SWD	DW	A	Y	1.3600	Front Gate
13410	FL0032816	GULF GATE AWWTP	7302 BOUNTY DRIVE	SARASOTA	34231	58 SWD	DW	A	Y	1.8000	Front Gate
17934	FL0179345	FORMER HYNAUTIC, INC.	1035 OLD VENICE ROAD	OSPREY	34229	58 SWD	IW	A	Y		Front Gate
13380	FL0043621	SARASOTA, CITY OF - R/O PLANT	1642 12TH STREET	SARASOTA	34236	58 SWD	IW	A	Y		Office
13390	FLA013390	CAMELOT LAKE'S WWTP	5580 AXMINSTER DRIVE	SARASOTA	34241	58 SWD	DW	A	N	0.1680	Front Gate
13432	FLA013432	2224 SOUTH TRAIL WWTP	2224 S TAMiami TR	VENICE	34293	58 SWSA	DW	A	N	0.0030	Front Gate
14127	FL0025780	AQUASOURCE UTILITY INC FORMERLY ROTONDA WEST UTILITY	3560 HAITIAN ROAD	ROTONDA WEST	33947	8 SD	IW	A	Y	0.5000	Center of Plant
14098	FLA014098	AQUASOURCE UTILITY INC AKA: ROTONDA WEST	9494 PLACIDA ROAD	PLACIDA	33946	8 SD	DW	A	N		Center of Plant
14118	FLA014118	INDIGO ISLES MHP OWNERS ASSOC INC	2801 GRIGGS ROAD	ENGLEWOOD	34223	8 SD	DW	C	N		Center of Plant
13473	FL0035335	VENICE, CITY OF - R/O PLANT	200 NORTH WARFIELD AVENUE	VENICE	00000	58 SWD	IW	A	Y	0.3920	Front Gate
13403	FLA013403	PARK PLACE VILLAS (FKA BARCLAY HOUSE)	3900 S LOCKWOOD RIDGE DRIVE	SARASOTA		58 SWSA	DW	A	N	0.0080	Front Gate
13430	FLA013430	LYONS COVE CONDO	101 LOUELLA LN	NOKOMIS		58 SWSA	DW	A	N	0.0050	Front Gate
17596	FLA175960	GULF OLDS PONTIAC AUTOBODY SHOP	2367 TAMiami TRAIL	SARASOTA	34293	58 SWD	IW	A	N		front gate
26807	FLG911063	QUICK STOP NO. 8	1634 N. WASHINGTON BOULEVARD	SARASOTA		58 SWD	PET	A	Y		
28434	FLRNEE028	EMCEE ELECTRONICS, INC	520 CYPRESS AVENUE	VENICE	34292	58 TLST	NEX	A	Y		UNKNOWN
28568	FLRNEE033	SUN HYDRAULICS INC	701 TALLEVAST RD	SARASOTA	34243	41 TLST	NEX	A	Y		unknown
13423	FLA013423	ARBORS MOBILE HOME PARK WWTP	515 SOUTH TAMiami TRAIL	OSPREY	33229	58 SWSA	DW	A	N	0.0300	Front Gate
16936	FLA016936	MANATEE COUNTY PUBLIC WORKS/VEHICULAR WASH WATER RECOVERY	4508-B 66TH STREET WEST	BRADENTON	34210	41 SWD	IW	A	N		Front Gate
18890	FLA188905	WINDWARD ISLE RO WTP	1 CATAMARAN DR.	SARASOTA		58 SWD	IW	A	N		Front Gate
13368	FLA013368	NOKOMIS COMMUNITY PARK WWTP	234 NIPPINO TRAIL EAST	NOKOMIS	34275	58 SWD	DW	A	N	0.0068	Front Gate
13475	FLA013475	SINGELTARY CONCRETE	822 CATTLEMEN ROAD	SARASOTA	34232	58 SWD	IW	A	N		Front Gate
13377	FL0040771	SARASOTA, CITY OF, WWTP	1850 12TH STREET	SARASOTA	34236	58 SWD	DW	A	Y	10.2000	Front Gate
13455	FLA013455	CENTRAL COUNTY WATER RECLAMATION FACILITY	7905 MCINTOSH ROAD	SARASOTA	34238	58 SWD	DW	A	N	4.0000	Front Gate