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The Tampa Bay Estuary Program

Developing and Implementing an Interlocal Agreement

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List of Acronyms Used in this Report

ABM	Agency on Bay Management
APDP	Action Plan Demonstration Project
ASP	Agency Strategic Plan
BASIS	Bay Area Scientific Information Symposium
BMP	Best Management Practice
CAC	Citizen Advisory Committee
CARL	Conservation and Recreational Lands
CCMP	Comprehensive Conservation and Management Plan
CES	Cooperative Extension System
CFI	CF Industries
CIP	Capital Improvement Program
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DCA	Department of Community Affairs
DER	Department of Environmental Regulation
DNR	Department of Environmental Resources
EMA	Ecosystem Management Area
EMIS	Ecosystem Management Implementation Strategy
EPA	Environmental Protection Agency
EPC	Environmental Protection Commission of Hillsborough County
ERP	Environmental Resource Permit
ERPP	Environmental Resource Permit Program
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FMRI	Florida Marine Research Institute
FWCC	Florida Fish and Wildlife Conservation Commission
FWPCA	Federal Water Pollution Control Administration
GIS	Geographic Information System
IA	Interlocal Agreement
IAD	Institutional Analysis and Development
HRGTF	Hillsborough River Greenways Task Force
MS4	Municipal Separate Storm Sewer Systems
NEB	Net Ecosystem Benefit
NEP	National Estuary Program
NEPPS	National Environmental Performance Partnership System
NGO	Nongovernmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service, USDA
OPB	Office of Planning and Budget
OWOW	Office of Wetlands, Oceans, and Watersheds, EPA
P2000	Preservation 2000
PLRG	Pollutant Load Reduction Goals
SBNEP	Sarasota Bay National Estuary Program
SCP	State Comprehensive Plan
SOR	Save Our Rivers
SWFWMD	Southwest Florida Water Management District
SWIM	Surface Water Improvement Management
TAC	Technical Advisory Committee
TBEP	Tampa Bay Estuary Program

TBRPC	Tampa Bay Regional Planning Council
TBSC	Tampa Bay Study Commission
TMDL	Total Maximum Daily Loading
TPA	Tampa Port Authority
USCG	U.S. Coast Guard
USGS	U.S. Geological Service
USF	University of South Florida
USFWS	U.S. Fish and Wildlife Service
WMD	Water Management District
WWW	World Wide Web
XLC	XL for Communities

The Tampa Bay Estuary Program: Developing and Implementing an Interlocal Agreement

Abstract This case study examines the Tampa Bay Estuary Program's (TBEP's) efforts to develop and implement a Comprehensive Conservation and Management Plan (CCMP) pursuant to the U.S. Environmental Protection Agency's (EPA's) National Estuary Program (NEP). The watershed management efforts were assessed using evaluative criteria provided by the National Academy of Public Administration. The case study concluded that the TBEP had developed an effective watershed management program that secured binding commitments for nutrient reductions and habitat restoration. Of particular interest was the development of the Interlocal Agreement used to secure these commitments and the interorganizational structure used to implement the agreement. The TBEP also monitors both implementation actions and environmental conditions and has provisions to revisit its goals every five years. The case study also discusses several other initiatives in Florida that may be of interest to the Academy in this or future projects. These include the Florida Department of Environmental Protection's (FDEP's) Ecosystem Management Initiative (including its ecosystem team permitting efforts), the EPA's Project XLC, and the relationship between Florida's efforts in performance-based management and the TBEP. This discussion is contained in Appendix A of this report.

Introduction

This case study examines the Tampa Bay Estuary Program's (TBEP's)[1] efforts to develop and implement a Comprehensive Conservation and Management Plan (CCMP) for the Tampa Bay watershed. The Tampa Bay Estuary Program (TBEP) is one of 28 programs[2] in the National Estuary Program (NEP)[3] administered by the United States Environmental Protection Agency's (EPA's) Office of Wetlands, Oceans, and Watersheds (OWOW).[4] The NEP is a voluntary program that provides federal funds (with a 25 percent nonfederal match) and technical assistance to develop a CCMP. The CCMP is required to address three management areas: water and sediment quality; living resources; and, land use and water resources. Each CCMP also addresses other problems, as appropriate.[5] The goal of the CCMP is to improve the management of water quality and living resources in an estuary.[6] While the NEP relies on a relatively well-funded and structured approach to developing a CCMP, individual programs are given a great deal of flexibility in determining how their plans will be implemented and financed. The program is not intended to develop a new program but rather is designed to work within the existing framework of federal, state, regional, and local environmental protection and natural resource management programs.[7]

Each estuary program is required to create a Management Conference that will supervise the development of the CCMP and establish and support a program office or its equivalent. The Management Conference is a collection of advisory and decision making committees, which contain appropriate federal, state, and local government officials, representatives of the scientific and academic community, industry representatives, and concerned members of the general public.[8] While the management conference structure varies among the programs, most estuary programs use a policy committee,[9] management committee,[10] science and technical advisory

committee (STAC), and citizens advisory committee (CAC).[11] The objective of the Management Conference is to :

- Stimulate the transfer of scientific, technical, and management experience and knowledge among management conference participants
- Enhance the general public's and the decision maker's awareness of the environmental problems
- Provide opportunities to discuss solutions to environmental problems
- Provide a way to synthesize input in decision making processes
- Provide a forum to build partnerships and obtain commitments necessary to implement the CCMP[12]

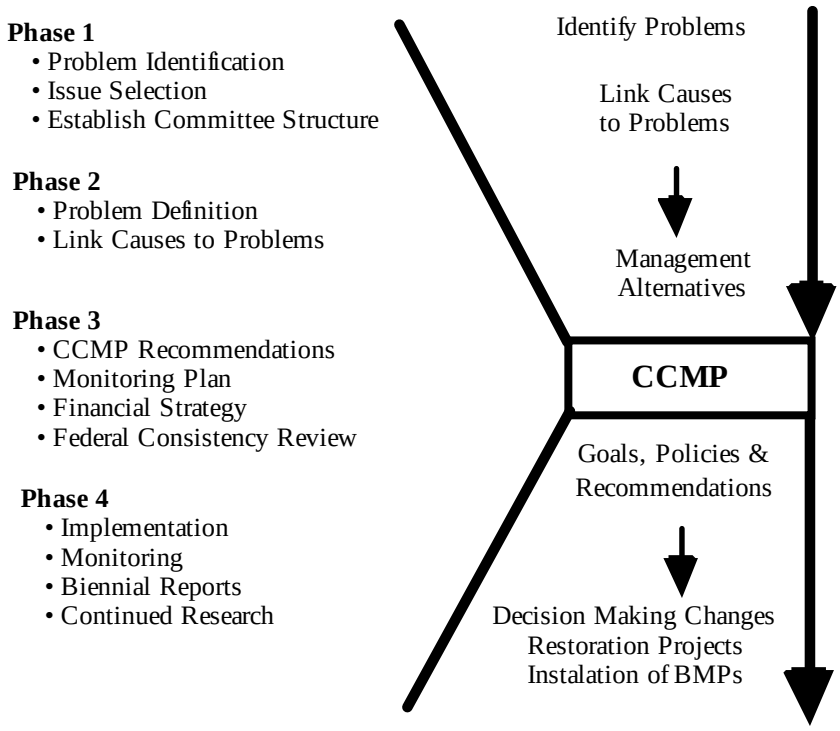
Management Conference participants use a structured planning process[13] designed to satisfy the seven statutory purposes contained in Section 320 of the Clean Water Act:

- Assess trends in the estuary's water quality, natural resources, and uses
- Identify causes of environmental problems by collecting and analyzing data
- Assess pollutant loadings in the estuary and relate them to observed changes in water quality and natural resources
- Recommend and schedule priority actions to restore and maintain the estuary and identify the means to carry out these actions (the Comprehensive Conservation and Management Plan or CCMP serves this purpose)
- Ensure coordination on priority actions among federal, state, and local participants in the management conference
- Monitor the effectiveness of actions taken under the CCMP
- Ensure that federal assistance and development programs are consistent with the goals of the plan[14]

The planning process consists of series of interrelated federally mandated steps that emphasize problem definition, provide flexibility in issue selection, and promote rational, watershed-based planning [Figure 1].[15] The programs are also expected to employ whatever forms of information gathering, public education, and public involvement are needed to develop consensus on management actions and ensure the CCMP's implementation.[16] Each estuary program is also encouraged to take early action where problems and solutions have been identified and implement action plan demonstration projects (APDPs), which test, on a small scale, the effectiveness of strategies and technologies that may become part of the CCMP.[17] It should be noted that the planning process is intended to be iterative in nature with problems continually redefined and the development of a CCMP often begins prior to the completion of the characterization phase.[18]

This planning process culminates in the development of a Comprehensive Conservation and Management Plan (CCMP) for the EPA's approval. The CCMP contains action plans that address the priority problems identified by the management conference. It also identifies lead agencies for implementation activities, the sources of implementation funding, and a schedule for Implementation activities. The CCMP must also include a federal consistency report and plans for its coordinated implementation. A monitoring plan that can be used to evaluate the

Figure 1: The NEP's Planning Process



Modified from: Mark T. Imperial and Timothy M. Hennessey, "An Ecosystem-Based Approach to Managing Estuaries: An Assessment of the National Estuary Program," *Coastal Management* 24 (no. 1, 1996): 121.

effectiveness of implementation activities is also required.[19]

The EPA provides limited implementation funding, approximately $300,000 per year, which goes primarily to maintaining a small core staff and program office. Accordingly, the challenge for each estuary program is to develop an effective implementation structure that can monitor and coordinate implementation efforts and leverage or develop the resources necessary to support these activities.[20] The EPA provides each estuary program with a great deal of flexibility in these efforts.[21] The EPA monitors the implementation efforts through annual work plans and a Biennial Review of each program's implementation activities.

Objectives of this Case Study

This case study examines the development of the Tampa Bay Estuary Program's (TBEP's) CCMP and its recommendations for addressing nutrient loadings and protecting, restoring, and managing habitat. The analysis then describes the Interlocal Agreement that established the interorganizational arrangement used to implement the CCMP as well as other relevant implementation activities. These activities are then be assessed using evaluative criteria provided by the National Academy of Public Administration which are described in more detail in final report entitled *Environmental Governance in Watersheds: The Importance of*

Collaboration to Institutional Performance. The case study also discusses several other initiatives in Florida that may be of interest to the Academy in this or future projects. These include the Florida Department of Environmental Protection's (FDEP's) Ecosystem Management Initiative (including its ecosystem team permitting efforts), the EPA's Project XLC, and the relationship between Florida's efforts in performance-based management and the TBEP. This discussion is contained in Appendix A of this report.

The case study begins with a brief discussion of the methods used to collect and analyze the data that provide the basis for our analysis. It also notes the literature used to frame and guide our inquiry. The following section examines the planning environment where the TBEP is located. This includes a discussion of the Tampa Bay ecosystem, the nature and extent of the environmental problems affecting the watershed, the changes in these problems over time, and the institutional arrangement responsible for managing Tampa Bay and its natural resources. After a short discussion of the history of planning efforts for Tampa Bay, the development of TBEP's CCMP is examined. This will be followed by a discussion of the development of the Interlocal Agreement and the extent of the TBEP's current implementation activities. The final section assesses the development and implementation of this watershed governance effort using the evaluative criteria provided by the Academy.

Methods

This case study was developed using systematic and generally accepted methods of qualitative research. Qualitative approaches[22] are often recommended when trying to understand how a process occurs or to examine complex relationships between decision-making processes, physical settings, community characteristics, stakeholders' interests, existing institutional arrangements, availability of resources, and the capacities of state, regional, and local actors.[23] As a result, qualitative approaches tend to be descriptive and focus on explaining why a process is, or is not, effective and how different contextual factors influence the success of that process.

Three distinct streams of research provide the general theoretical foundation for guiding our inquiry, identifying potential cause and effect relationships, and making recommendations to the Academy. The first line of research is the environmental policy research focused on place-based or community-based management, which includes the growing research on ecosystem-based management and watershed management as well as the literature on integrated environmental management, integrated coastal zone management, and adaptive management. Moreover, there is a great deal of environmental policy research in diverse areas such as collaborative decision making, stakeholder involvement and public participation, and the role of science in the policy process that will also inform this assessment. Unfortunately, this literature often ignores or downplays the administrative and institutional challenges associated with developing and implementing watershed management plans.[24] Accordingly, the second stream of research is the growing public administration literature on intergovernmental management and networks, which is broadly defined here to include the literature on policy formation and implementation, interorganizational theory, policy networks, social networks, and federalism. The final line of research is the institutional analysis literature. In particular, the study draws on the Institutional Analysis and Development (IAD) framework developed by Elinor Ostrom and her colleagues.[25] Of related interest is research on assessing implementation "success" and

measuring institutional or network performance. A more detailed review of this literature can be found in Appendix A of our final report entitled *Environmental Governance in Watersheds: The Importance of Collaboration to Institutional Performance*.

Data for the study was collected from three primary sources. Examining different data sources was important because it allowed the investigators to use a strategy of triangulation when formulating answers to the research questions.[26] The first data source involved collecting a wide range of documents and archival records about the program and the planning efforts discussed in the case study. A bibliography of these materials can be found in Appendix C of our final report. Field interviews with 34 individuals representing various organizations were the second source of data. A snowball sampling technique was used to identify the individuals. The interviews were confidential and recorded on tape to ensure the accuracy of the data collected. Follow-up telephone interviews were conducted with individuals who could not be reached in the field. They were also used to clarify responses from earlier interviews. Some direct observation of interorganizational events and meetings during the site visit were also used in the analysis.

Systematic qualitative techniques such as coding were then used to examine various documents, field notes, and interview responses. Codes were derived both inductively and deductively from the data and generated based on a start list derived from previous research and the evaluative criteria provided by the Academy. As coding continued, patterns emerged and codes were then used to dimensionalize concepts. When coding data, quotes and short vignettes were identified for inclusion in the case studies and the final evaluation report to provide some context to the observations. As data analysis continued, tables, figures, matrices, and network displays were used to identify trends and make observations. Some of these displays have been modified for inclusion in the case study. A detailed timeline was also prepared to assist in the analysis and to evaluate potential causal linkages [Appendix B of this volume]. The case study report was then pre-structured in order to ensure comparability with the other case in this study. When the draft case study was completed, the interview notes and transcripts were reread to ensure the accuracy of its contents. The case study was then sent to several of the principal informants for additional factual verification. A more detailed discussion of these methods and procedures for data collection and analysis can be found in Appendix B of our final report.

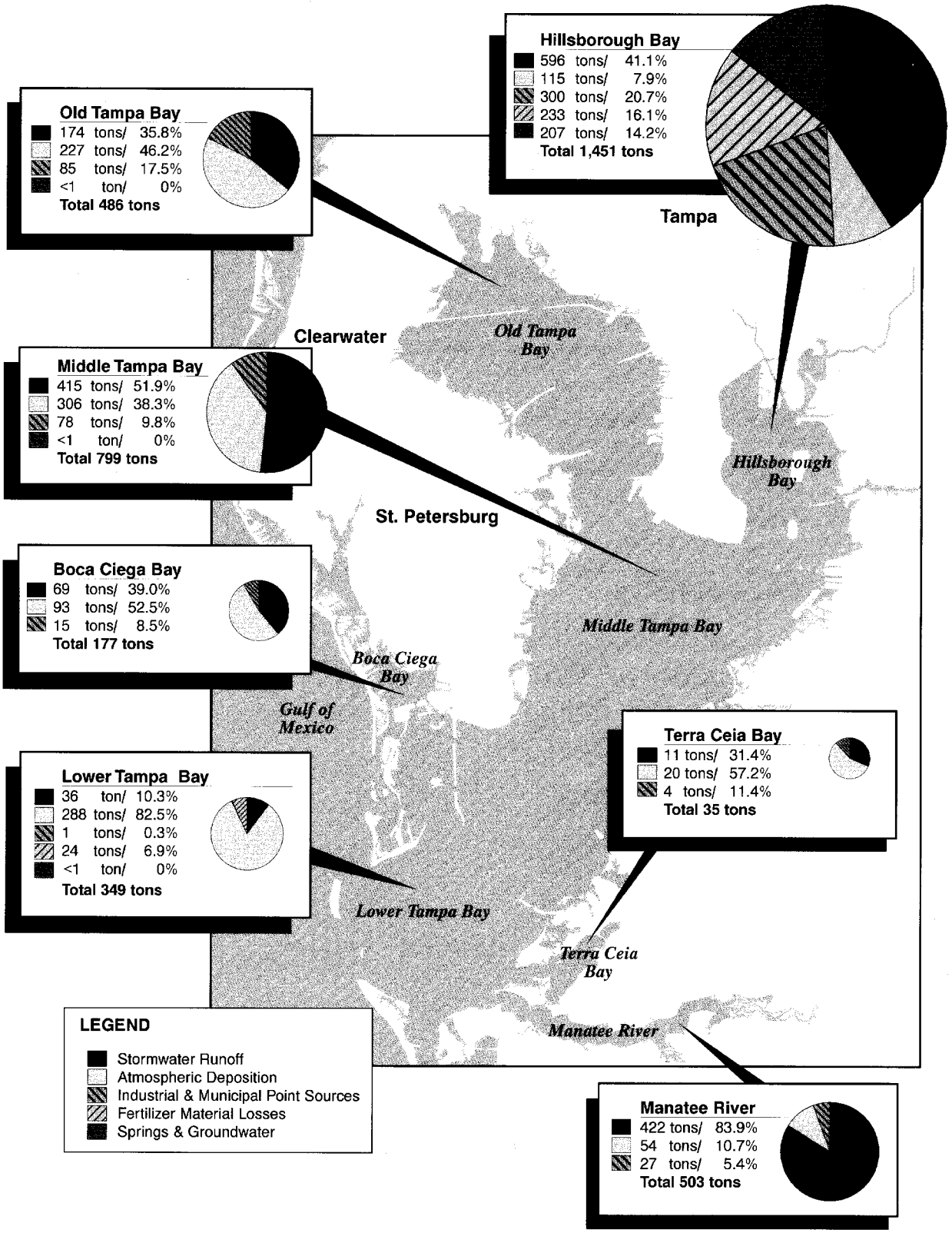
The Planning Environment

In order to understand the development and implementation of a CCMP for the Tampa Bay watershed, it is important to have some familiarity with the planning environment. The flowing sections discuss the Tampa Bay ecosystem, the nature and extent of the environmental problems affecting the ecosystem, and the institutional framework of federal, state, and local government programs that manage these resources.

The Tampa Bay Ecosystem

Tampa Bay is located along the Southwest coast of Florida between 27.5° and 28° N latitude [Figure 2].[27] It is the most prominent geographic feature in the region. It is also the largest open-water estuary in Florida spanning nearly 1,030 km^2 (398 square miles). Tampa Bay extends approximately 56 km (35 miles) inland from the Gulf of Mexico and is 5 to 10 miles

Figure 2: Annual Nitrogen Loadings to Tampa Bay by Bay Segment (1992 – 1994 Average)



Source: TBEP, *Charting the Course: The Comprehensive Conservation and Management Plan for Tampa Bay* (St. Petersburg, FL: TBEP, 1996), 18.

wide along most of its length.[28] For management purposes, the bay has been divided into segments: Old Tampa Bay; Hillsborough Bay; Middle Tampa Bay; Lower Tampa Bay; Terra Ceia Bay; Boca Ciega Bay; and, Manatee River. The average depth of the Bay is 4 m (13 feet) with the maximum natural depth of 27 m (89 feet). It is crossed by four major causeways and has 42 nautical miles of dredged channels with authorized depths between 6 and 13 m (20 to 43 feet).[29]

Four major rivers (Hillsborough, Alfia, Little Manatee, and Manatee) and 40 creeks and coastal streams flow into Tampa Bay. They are the major source of freshwater input to Tampa Bay.[30] The watershed (i.e., drainage basin) is relatively flat and covers approximately 5,950 km^2 (2,300 square miles) and includes all or parts of Hillsborough, Pinellas, Manatee, Pasco, Polk, and Sarasota counties.[31] In 1993, urban lands accounted for approximately 25 percent of the watershed, while agricultural lands, wetlands, and undeveloped lands accounted for approximately 35 percent, 13 percent, and 27 percent respectively.[32]

Due to its location, the region has a subtropical climate with an average annual temperature of around 22° C (72° F) with an average annual precipitation of 55 inches of rain.[33] These conditions support a diverse range of flora and fauna. The mild climate, high quality of developable land, and the waterscapes, wildlife, and recreational opportunities offered in the region have led to explosive population growth. The region is home to more than 2 million people with population projected to increase 17 percent to 2.34 million by 2010.[34] While the growth rate slowed during the 1990s, an average of nearly 500 people per week still move into the region.[35]

The region also has a number of important ecological resources. Three classes of emergent tidal wetlands are generally recognized in the Tampa Bay area: mangrove forests; salt marshes, and salt barrens. The emergent tidal wetlands collectively provide critical habitat for much of the bay's wildlife. The areas provide important attachment sites for algae and invertebrate communities and provide submerged habitat for hundreds of recreationally and commercially important species of fish, crabs, shrimp, and other shellfish[36] such as the pink shrimp, tarpon, snook, menhaden, mullet, blue crabs, and red drum. Sizable populations of bottle-nose dolphins also inhabit the bay while the shallow seagrass flats provide an important feeding ground for the endangered Florida Manatee.[37] Marsh grasses and mangrove trees also provide critical, feeding, nesting, and sheltering habitat for a variety of birds such as pelicans, cormorants, herons, ibises, spoonbills, and egrets.[38] In fact, Tampa Bay's wetlands, mangroves and shoreline areas support the state's largest and most diverse colonies of wading and shorebirds and one of the most productive bird nesting habitats in the United States.[39] The wetland areas also stabilize submerged shoreline sediments and help to minimize erosion.[40] Moreover, they are a key element of the watershed's natural drainage system because they detain and release runoff and serve as natural filters for nutrients and other contaminants.[41]

The bay is also a direct and indirect economic asset to Florida's "Suncoast". Tampa Bay supports three major seaports and a cruise ship industry that contribute more than $10 billion annually to the local economy.[42] The Port of Tampa is the state's largest port and consistently ranks among the top 10 in the nation in trade activity while the smaller ports at Port Manatee and St. Petersburg are also economically important.[43] More than 4 billion gallons of oil and other

hazardous materials pass through Tampa Bay while another 18 million tons of refined fertilizer products and phosphate rock are exported annually.[44] The bay is also vital to the region's sanitary and electrical service industries. The Bay and its resources support an important tourism and recreational industry with more than 100,000 boats registered in the three counties adjacent to the Bay.[45] The region also supports a vibrant commercial fishing industry.

Problems Affecting Tampa Bay

Like many urbanized watersheds, Tampa Bay and its resources experienced a number of environmental problems due increased population and residential, commercial and industrial development. Population growth in the region began to increase dramatically in the 1950s and went largely unchecked for decades.[46] As a result, urban land uses expanded by 214 percent, which caused the loss of upland habitat.[47] For example, pine forest habitats were once the predominant habitat covering nearly 70 percent of the watershed. Now less than 31 percent of the uplands are upland pine habitat and nearly all the coastal pine habitat has been eliminated. Both are important habitats for the regions 37 federal- or state-listed species.[48] Habitat loss has also reduced many of the functions that the upland areas serve such as groundwater recharge and flood retention and natural water quality filtration.[49]

The increased population and development caused a significant deterioration in the bay's water quality, habitat, and natural resources. Water quality declined dramatically as a result of sewage discharges from the wastewater treatment facilities[50] and industrial discharges surrounding the Bay.[51] Stormwater runoff and other nonpoint sources (NPS) of pollution from increased development also caused water quality problems.[52] The most serious water quality problem was eutrophication from excessive nutrient loadings.[53]

Records of water quality and biological indicators such as phytoplankton biomass and seagrass coverage suggest that nutrient enrichment appears to have been most serious between the late 1960s and the early 1980s.[54] The most severe degradation occurred in the upper reaches of the bay while areas close to the Gulf of Mexico were less impacted.[55] Excessive algae growth and fish kills were common and light penetration was reduced to the point that it caused reductions in seagrass. Since 1950, 40 percent[56] of the bay's seagrass beds have disappeared.[57] It was reported that near the sewage treatment plants you could actually see the effluent bubbling up in the bay. This reduced recreational opportunities by closing areas to primary contact recreation. The waters were so murky that in some parts of the bay sport divers could barely see their hands. There is also some evidence of toxic contamination in bay sediments and living resources.[58]

Increased development also destroyed habitat and impacted the region's natural resources. The most significant habitat loss occurred during the 1950s and 1960s when dredge and fill activities associated with urban residential and port development were largely unregulated.[59] Residential and industrial development, canals, and causeways have altered approximately half of the bay's original shoreline.[60] Significant flood control and nutrient absorption capacity associated with the wetland areas was lost. Residential and port development reduced the total area of Tampa Bay by 3.6 percent while dredging for navigation purposes created 42 nautical miles of channels, several thousand acres of submerged spoil area,

and 1,100 acres of diked emergent spoil islands in Hillsborough Bay.[61] The Tampa Harbor Deepening Project, which began in 1972 and ended in 1988, required the removal of more than 100 million cubic yards of bay bottom while another million cubic yards of material (enough to fill 100,000 dump trucks) is removed each year to maintain the navigation channels and ports at an estimated cost of $10 million per year.[62] Moreover, numerous streams and creeks were modified and straitened to speed drainage of wetlands and improve human access to the Bay.[63]

It is estimated that between 1950 and 1990, Tampa Bay witnessed a net loss of 5,128 acres (or 21 percent) of emergent wetlands[64] while 14,992 acres have been lost since 1900.[65] There has been a greater loss, on a percentage basis, of the shallow, lower salinity tidal marshes predominantly found in tidal streams.[66] Between 1950 and 1990, the relative losses of tidal marshes and salt barrens far exceeded that of mangroves. As a result, the ratio of mangroves to tidal marsh to salt barrens (based on a percentage of emergent wetland acreage) moved from being 49:48:3 in 1900 to 67:28:5 and 73:22:5 in 1950 and 1990, respectively.[67] Many restoration efforts have actually exacerbated the imbalance by focusing on restoring mangrove habitat. Accordingly, habitat restoration efforts need to be mindful of not only restoring habitat lost historically but also need to try and "restore the balance" of the habitats that is essential to maintaining these sensitive ecological systems.[68]

The loss of sensitive habitat led to declines in many nesting species of birds. For example, it is estimated that the white ibis population dropped by approximately 75 percent since the early 1950s.[69] Moreover, habitat loss in combination with poor water quality and inadequate fisheries management damaged the populations of some fisheries resources.[70] For example, the bay scallop, once a thriving resource, was virtually eliminated.[71] Many species of commercially valuable fish and shellfish also declined such as oysters, bait shrimp, red drum, and spotted sea trout.[72] Meanwhile, shipping activity at the region's port facilities creates an ever-present risk of accidents and spills. This risk was realized in August 1993 when two barges and a freighter collided near the mouth of the bay in a fiery explosion that resulted in a spill of nearly 330,000 gallons of oil.[73] These public concerns were further heightened when Florida Power and Light proposed to burn Orimulsion at its Manatee County plant.[74]

Improving the Management of Tampa Bay and its Resources

Given the pervasiveness of these problems, it should not be surprising that there is a long history of attempts to improve the management of Tampa Bay.[75] Early efforts were targeted at addressing eutrophication problems. The first major study of Tampa Bay and its water quality problems was done by the Federal Water Pollution Control Administration (FWPCA). In 1969, the FWPCA issued its report *Problems and Management of Water Quality in Hillsborough Bay, Florida*[76] that identified eutrophication problems resulting from nutrient enrichment from discharges of partially treated sewage, fertilizer processing facilities, and the Alafia River.[77] This study combined with grass-roots citizens efforts in the early 1970s helped spark interest in efforts to upgrade sewage treatment plants and reduce nutrient loadings.[78] By the late 1970s and early 1980s these efforts were well underway as represented by the upgrades to the sewage treatment plants in Tampa and Clearwater and the reuse program in St. Petersburg. The legislature's Wilson-Grizzle and Grizzle-Figg initiatives further ensured that all sewage treatment facilities discharging to the bay would meet AWT standards.[79]

By the early 1980s, scientists and resource managers recognized a lack of coordination among federal, state, regional, and local governments with respect to managing Tampa Bay and its resources.[80] As a step towards improved management, a Bay Area Scientific Information Symposium (BASIS) was organized in 1982 to summarize the existing knowledge of the estuary and its tributaries.[81] Some of the key findings of the symposium were that the resources should be managed as an ecological system and that the bay had suffered significant declines in a number of important measures of ecological health. Moreover, the group concluded that the multitude of overlapping and sometimes conflicting interests and jurisdictions of bay managers contributed to these declines. The BASIS organizers subsequently suggested to the Tampa Bay Regional Planning Council (TBRPC) that Tampa Bay's problems should be investigated from a variety of viewpoints.[82]

In 1983, a special act of the Florida Legislature created the Tampa Bay Study Commission (TBSC). The commission examined the opportunities and constraints associated with developing a comprehensive, unified management strategy for Tampa Bay. The product of these efforts was a landmark report entitled *The Future of Tampa Bay*, which contained 42 recommendations to the legislature, state agencies, and local governments dealing with a wide range of issues.[83] The report's three highest priority issues were inadequate funding, loss of seagrass, and nonpoint source pollution. Although only a few recommendations were adopted, the report's ideas and issues remain relevant.[84] One of the report's central recommendations was the establishment of a Bay Management Authority that would have regulatory authority over the management of the bay. This approach was rejected in favor of the creation of a nonregulatory advisory body, the Agency on Bay Management (ABM). The ABM was formed in 1985 as a standing committee to the TBRPC. The ABM serves as a forum for sharing information and advising the TBRPC on issues affecting Tampa Bay. It also prepares and annual *State of the Bay* report detailing local efforts to protect and manage the bay.

The priority problems and recommendations contained in the *Future of Tampa Bay* formed the starting point for identifying the priority projects that would undertaken to implement the SWIM plan developed by the SWFWMD.[85] In 1987, the legislature adopted the Surface Water Improvement and Management (SWIM) act to address the mounting concerns over the loss of natural systems that helped to maintain water quality and provided habitat.[86] In many respects, the program marked a transition from more narrowly focused single issue programs to one based on managing ecological systems.[87] The program was also designed to move away from the year-to-year funding of projects on a piece meal basis and required that restoration funds be spent within a priority-setting and long-range planning framework.

The program is administered by the FDEP through the five regional water management districts. The WMDs were required to prioritize water bodies according to the need for restoration or cleanup and to provide a funding mechanism.[88] The FDEP reviews and approves the identification of priority water bodies and the development of SWIM plans with assistance from the Department of Community Affairs (DCA) and the Florida Freshwater Fish and Game Commission (Reorganized as the Florida Fish and Wildlife Conservation Commission (FWCC) in 1999). Other programs also rely on the priority setting provisions of the SWIM program. The Section 319 Nonpoint Source (NPS) Management Program, the Clean Water State Revolving

Fund (CWSRF), Florida's Conservation and Recreational Lands (CARL) and the Save Our Rivers (SOR) land acquisition programs all give special priority to projects that benefit SWIM water bodies.[89]

The legislature designated Tampa Bay as one of six water bodies that would be part of the SWIM program. The SWFWMD's governing board approved the SWIM plan for Tampa Bay and its tributaries in August 1988. The focus of this program has been to maximize investments in restoration and rehabilitation projects and to minimize data collection and research. Since 1987, 40 habitat restoration projects and 28 stormwater retrofit projects have either been completed or are in various stages of completion.[90] The SWIM program has also been responsible for the development of a long-term seagrass-monitoring program for Tampa Bay, which began in 1988.[91]

Coordination and cooperation between local governments has been good. Moreover, local governments play an essential role in the program by providing matching funds, publicly owned land for restoration projects, in-kind services, and long-term maintenance of projects.[92] However, after the first three years of program activities, appropriations were reduced and in some years there have been no new appropriations. Accordingly, the highly unpredictable funding levels hindered the implementation of the long-range restoration and protection strategies built into the program. It has also weakened the supportive network of local, regional, and federal financial and in-kind commitments made to the program.[93]

Institutional Framework Managing Tampa Bay

A number of programs are involved in managing these problems and trying to improve water quality and protect and restore habitat. A 1994 survey conducted by the TBEP estimated that based on FY 94-95 budgets, more than $250 million was spent annually by federal, state, and local agencies on the restoration and management of Tampa Bay.[94] The largest portion was spent by local governments with 68.3 percent or roughly $170 million spent on wastewater collection, treatment, and reuse. Local governments and SWFWMD spent the majority of the $35 million or 13.8 percent spent on stormwater management. Regulation and enforcement comprised 5.4 percent or $13.5 million of total expenditures. Habitat restoration, preservation, and management totaled about $7 million or 2.8 percent of budgets not including the cost of land acquisition, which comprised another 3.9 percent of the budgets. Dredging and dredged materials management (2.6 percent), environmental monitoring (1.8 percent), public education (.5 percent), and program administration (.9 percent) comprised the remaining expenditures.[95]

Accordingly, the institutional framework of programs managing Tampa Bay is quite complex and provides numerous opportunities for collaboration. To simplify the discussion, only the key actors involved in the development of the Tampa Bay Estuary Program's (TBEP's) CCMP will be discussed. These include: Florida Department of Environmental Protection (FDEP); Southwest Florida Water Management District (SWFWMD); the Environmental Protection Commission (EPC) of Hillsborough County; Tampa Bay Regional Planning Council (TBRPC) and its Agency on Bay Management (ABM); and, Hillsborough County, Pinellas County, and Manatee County and the cities of Tampa, St. Petersburg, and Clearwater. The following sections provide an overview of these actors. A number of other organizations also

played important roles in either the development or the implementation of the CCMP such as the U.S. Environmental Protection Agency (EPA),[96] U.S. Army Corps of Engineers (COE),[97] Tampa Port Authority (TPA),[98] Tampa BayWatch,[99] and the Florida Marine Research Institute (FMRI).[100] The activities of these and other actors will be noted as appropriate.

Florida Department of Environmental Protection (FDEP)

The FDEP was created in 1993 when the state's Departments of Environmental Regulation (DER) and Natural Resources (DNR) merged. This environmental "super" agency performs a variety of functions including research, regulation, planning and management, land management (152 state parks), and oversight of the five WMDs. More than 3,000 FDEP employees implement a full range of EPA programs including the Water Quality Standards and Classification, Point Source Permitting, and NPS Management programs.[101] Many of the programs are delegated to the FDEP's six district offices, the five WMDs, or county-level environmental programs such as the Environmental Protection Commission (EPC) of Hillsborough County. Accordingly, it is a decentralized structure that implements a number of programs that were actively involved in the development and implementation of the TBEP's CCMP.

Of particular importance are the FDEP's efforts to address nonpoint source (NPS) pollution. The FDEP's NPS programs have always been based upon partnerships with other state, regional, and local agencies together with the private sector.[102] Florida was the first state in the country to develop a comprehensive stormwater management program in 1982. Florida also took the rather unique step of adopting a performance standard for older stormwater systems that predated the rule.[103] It is a technology-based program rather than the water quality-based effluent program used to regulate point sources. It relies on specific performance standards that are achieved through the development of design criteria for specific best management practices (BMPs).[104] The regulations have been modified periodically since 1982 to ensure that the BMPs are achieving the desired treatment efficiencies. These regulations are implemented through the Environmental Resource Permit Program (ERPP).[105] The ERPP is implemented jointly with the five WMDs that are delegated many regulatory responsibilities.[106] The arrangement provides the WMDs with the flexibility to make minor adjustments to the design criteria to better reflect regional conditions.[107] Both the WMD's and the FDEP's rules require new development to include a comprehensive erosion and sediment control program and a comprehensive stormwater management system. The FDEP also requires that the WMDs develop stormwater pollutant load reduction goals (PLRGs) and include them in their SWIM plans other watershed plans or rules.[108]

Southwest Florida Water Management District (SWFWMD)

The Southwest Florida Water Management District (SWFWMD) was created in 1961 as a special act of the Florida legislature to be the local sponsor for a major flood control project addressing the massive flood damage caused by Hurricane Donna in 1960.[109] In 1972, the Florida Water Resources Act[110] created the present system consisting of five WMDs. By statute, the five WMDs operate under the general supervisory authority of the FDEP and both agencies are charged with the protection of water resources and share the authorities granted pursuant to

the statute.[111] The SWFWMD is governed by an eleven-member board appointed by the Governor and confirmed by the Senate. The region includes 98 local governments spread over 10,000 square miles with the largest concentration residing in the Tampa Bay region. Board members must live in the district and serve four-year terms. The district's primary funding source is *ad valorem* taxes, although revenues also come from federal and state appropriations, permit fees, interest earnings, and other sources. Taxing authority is established by the legislature within the limits of the state's constitution. The limit for the SWFWMD is one mill.[112] The SWFWMD is further subdivided into nine hydrologic subdistricts, eight of which have separate basin boards, which are also appointed by the Governor and confirmed by the Senate. The basin boards are allocated a portion of the SWFWMD's millage and then identify projects and programs to address the needs of their subregion.

The five WMDs implement a number of programs tailored to the particular water resource needs of each geographic region. The focus of the programs is on: 1) protecting and managing groundwater and surface water quality and quantity; 2) stormwater management and flood control; 3) wetlands protection and restoration; and, 4) protection and management of natural systems. Accordingly, the WMDs perform a diverse range of activities including planning, permitting, data collection, modeling, property acquisition and management, quantity allocation, and flow regulation. The SWFWMD also provides technical, planning, and financial assistance to the region's county and municipal governments. Of particular importance to the case study are the SWFWMD's regulatory activities (e.g., ERP program), implementation of the SWIM plan for Tampa Bay, water quality and seagrass monitoring activities, and their stormwater management and habitat restoration efforts that are often are done in conjunction with other state and local agencies.

Environmental Protection Commission (EPC) of Hillsborough County

The Environmental Protection Commission (EPC) of Hillsborough County was created in 1967 by a special act of the state legislature to fill a need for government regulation of pollution.[113] The EPC is a separate agency managed by a board comprised of the Hillsborough County Commissioners. It has environmental jurisdiction throughout the County, including the cities of Tampa, Temple Terrace and Plant City. The mission of the EPC is regulate and manage contaminants of air, soils, and waters as well as to prevent excessive and unnecessary noise in order to protect plant and animal life and to ensure the health, safety, and welfare of citizens and visitors in Hillsborough County. In order to fulfil its mission, the EPC administers a variety of regulatory and nonregulatory programs administered through four divisions: Air, Water, Waste, and Wetlands.[114] Each division conducts investigations of complaints regarding pollution and addresses permitting and other issues in air quality, domestic wastewater, industrial wastewater, surface water quality, solid and hazardous wastes, underground storage tanks, wetland delineation, and artificial reefs.

In addition to its own regulations, the EPC has been delegated some of the FDEP's regulatory responsibilities and maintains close working relationships with the FDEP and the EPA. In 1993, the EPC became the first local program in Florida to receive full air permitting delegation from the state, although the state retained permitting jurisdiction over some major facilities. Therefore, an EPC air pollution source permit represents federal state, and county

approval.[115] This regulatory streamlining helps the EPC provide the county residents with more efficient service.[116] However, progress in receiving delegations from the FDEP has been slower than the EPC had hoped for even though the agency has demonstrated it is capable of performing the delegated functions.[117] Where the EPC has not been delegated FDEP permitting authority, the agency reviews FDEP permit applications to ensure compliance with local standards and concerns. In instances where the FDEP does not require appropriate permit stipulations, the EPC will often seek these stipulations by filing petitions for administrative hearings on proposed FDEP permits.[118] The EPC is currently working with the FDEP and the SWFWMD to identify opportunities for further delegation and regulatory streamlining.[119]

The EPC is also engaged in a variety of nonregulatory activities. The EPC is involved in a variety of public information and education activities. It provides technical assistance to local place-based environmental management efforts such as the TBEP. The agency also maintains a comprehensive water quality monitoring program in the region with 92 stations, fifty-two bay stations and forty tributary stations.[120] The EPC has been actively involved in working with the EPA's Local Government Advisory Committee to identify and promote programs that could assist and support local government efforts to protect the environment.[121] To help improve accountability and agency performance, the EPC is required by the legislature to undergo periodic performance audits. The audit reports, which are now part of a cross-organizational study, found the EPC to be a model local program across the Country that was effectively implementing its mandates. The next performance audit is scheduled for 2000.[122]

Tampa Bay Regional Planning Council (TBRPC)

The Tampa Bay Regional Planning Council (TBRPC) was the first regional planning council in Florida.[123] The TBRPC was created in 1962 when representatives from Tampa, St. Petersburg, and Clearwater recognized the need for coordination to address issues that spanned community boundaries. The TBRPC is an association of local governments and gubernatorial representatives that brings together representatives of 43 local jurisdictions in the Tampa Bay region to coordinate planning and provide an opportunity for sharing solutions to the region's problems.[124] Two thirds of the TBRPC's membership is comprised of representatives of municipal and county level elected officials who are appointed by their respective boards. The remaining one third of the membership is comprised of members appointed by the Governor. Three ex-officio members representing SWFWMD, FDEP, and the Florida Department of Transportation (FDOT) were added to the Council in 1993.

The TBRPC administers a wide range of programs from those addressing the area's aging population to providing technical assistance in terms of economic modeling or geographical information systems (GIS). It also serves as a convener, having undertaken a mission of organizing and hosting workshops of special interest to the Tampa Bay region. Of particular importance to the case study is the TBRPC's Agency on Bay Management (ABM). The ABM was organized as the TBRPC's natural resources committee in 1985 in response the recommendations of the TBSC in 1984. The ABM is an advisory committee comprised of no more than 65 voting members recommended by the Executive Steering Committee and appointed by the Chair of the Council. The representatives include, but not be limited to representatives of various federal (COE, USGS, NMFS, USFWS, USCG, MacDill Air Force

Base), state (e.g., FDEP, FMRI, FDOP), regional (e.g., SWFWMD, TBRPC, TBEP, Hillsborough County City-County Planning Commission), and local agencies (e.g., EPC, counties, cities, municipalities bordering the bay) as well as representatives of the Florida Senate and House of Representatives [Table 1].[125] It also includes members of various interest groups such as the environmental, commercial, industrial, recreational, scientific, and academic interests in the Tampa Bay Region. Its primary functions are to improve the comprehensive management of Tampa Bay, encourage the coordination of regulatory programs and studies of all federal, state, and local agencies involved in the management of Tampa Bay. The ABM also serves as a liaison between the TBRPC and environmental organizations and interest groups.

Collectively, the TBRPC and the ABM have had an important role in improving the management of Tampa Bay and its natural resources. The ABM serves as an important forum for communication and collaboration on a wide range of Bay issues.[126] The ABM routinely provides recommendations on development projects in the Tampa Bay watershed. The ABM is active in public outreach efforts. The ABM also monitors agency actions with respect to the management of Tampa Bay and publishes these results in an annual *State of the Bay*.[127] The TBRPC and the ABM have also served as an important mechanism for lobbying state and local legislative bodies and served as a catalyst for new initiatives to improve the management and protection of Tampa Bay. Both organizations helped to get the SWIM program established statewide and were instrumental in getting the TBEP established. More recently, the TBRPC led the effort to get a specialty license plate established to support Tampa Bay. The funds generated by the specialty plate will now be used to support the implementation of the TBEP's CCMP or the ABM's *Agency Action Plan*. The ABM is also engaged in a number of activities at the request of the TBEP. These include: the Manatee Protection Strategies Task Force; the Mitigation Criteria Working Group; and, the Off-Road Vehicle Access Working Group. These three groups will generate recommendations to the TBEP that respond to issues raised in the CCMP.

Local Governments

Perhaps the most important actors in this case are six local governments.[128] Hillsborough County has the fourth largest population in the state and covers the largest land area (1,051 square miles) of the counties within the watershed. The county is home to the City of Tampa, which is the largest urban center in the region and the third largest city. The 1994 estimate of the county's population was approximately 879,069.[129] Manatee County has a land area of 741 square miles of land area and six incorporated municipalities and had an estimated population in 1994 of 228,283.[130] Pinellas County is a peninsula and has the smallest land area (280 square miles) of any county in the region. It is also the most densely populated county in Florida with more than 3,000 people per square mile. St Petersburg is the largest city in the county and the fourth largest city in the state. It is one of 24 municipalities and the county had a population estimated to be 870,722 in 1994.[131]

All of the cities and counties have well-developed administrative structures and a capacity for addressing environmental problems with well staffed environmental and engineering departments.[132] The local governments are also involved in watershed management in many ways including land use planning, water quality regulation (e.g., stormwater management

Table 1: Selected Members of Various Collaborative Organizations

Organization	ABM	TBNEP Policy Com.	TBNEP Mgt. Com.	TBNEP Nit. Mgt. Consortium	TBNEP Interlocal Agreement (TBEP)
TBEP	X				
EPA		X	X	X	X [a]
COE	X			X	X [a]
NMFS	X				
US FWS	X				
USGS	X				
FL House of Representatives	X				
FL Senate	X				
FDEP [b]	X	X	X	X	X
SWFWMD	X	X	X	X	X
EPC	X		X	X	X
Hillsborough County	X	X	X	X	X
Pinellas County	X	X	X	X	X
Manatee County	X	X	X	X	X
City of Tampa	X	X	X	X	X
City of St. Petersburg	X	X	X	X	X
City of Clearwater	X	X	X	X	X
Other Incorporated Local Govts.	X				
TBRPC			X	X	X
FMRI	X		X	X	X
FL Fish and Wildlife Con. Com.	X				X
FDOT	X				
Tampa Port Authority	X		X	X	X
Manatee Port Authority	X				
Manatee County Ext. Service	X			X	
Eckerd College	X				
University of South Florida	X				
Tampa BayWatch	X		X [d]		
Audubon Society	X				
Sierra Club	X				
Center for Marine Conservation	X				
Chevron Products Corporation	X				
Florida Phosphate Council				X	
Easter Assoc. Term. Company				X	
Florida Power and Light	X			X	
Florida Power Corporation	X			X [c]	
Tampa Electric Company	X			X [c]	
FL Strawberry Growers Assoc.				X	
IMC-Agrico	X			X	
CSX Transportation				X	
Cargill Fertilizer, Inc.	X			X	
CF Industries, Inc.				X	
Pakhoed Dry Bulk Terminals				X	
Citizen members	X		X [d]		

[a] Signed an MOU rather than the Interlocal Agreement; [b] Southwest District Office represents the FDEP; [c] Not a formal signatory but it has participated in discussions; [d] As Co chair of the CAC

requirements), restoration, protection (e.g., parks and natural areas), land acquisition and water quality monitoring. Local governments are required to develop and implement comprehensive land use plans and accompanying regulations to ensure that future growth minimizes adverse social, financial, and environmental impacts.[133] Local government is also an important partner in the state's efforts to manage stormwater runoff. As part of their growth management responsibilities, local governments are developing and implementing stormwater master plans that address existing deficiencies in infrastructure and well as planning for future development.[134] Local governments with populations above 100,000 are also required to get a National Pollutant Discharge Elimination System (NPDES) permit from the EPA for their municipal separate storm sewer systems (MS4). Because the drainage systems of local governments are often interconnected, the EPA has implemented the MS4 permitting program on a countywide basis in Florida.[135] Accordingly, many local stormwater management efforts are designed to satisfy the EPA's NPDES permit requirements.

In order to address these concerns, local governments are involved in a number of watershed management activities. For example, the Stormwater Management Section in Hillsborough County's Public Works Department is developing watershed management plans for all 17 basins in the County. In 1998, six plans were completed and the remainder of the plans will be completed over the next five years. Existing policies such as those contained in the County's NPDES permit, their Comprehensive Plan, and the TBEP's CCMP guide the development of these plans. Each watershed will also be assessed in terms of water quality, flood control, natural systems, and water supply. During the development of each plan, water quality will be assessed and a pollutant-loading model at the catchment level will be used to identify "hotspots". Each plan will include recommendations for specific projects to address flooding and water quality problems as well as other issues that are identified. Both citizens and community organizations such as the Hillsborough River Greenways Task Force, the Blue Sink Coalition, and the Alfia River Basin Stewardship Council are an important part of this watershed planning process. Pinellas and Manatee counties have been engaged in developing similar watershed management plans for basins in their communities.[136] All three counties have also been actively involved in undertaking various projects to improve the management of their watershed resources.[137] For example, between 1995 and 1998, Manatee County received more than $52 million in grants and grant commitments to undertake watershed protection, conservation, land acquisition, habitat restoration, and flood control projects.

The three city governments are involved in a similar range of activities. For example, Clearwater's *1997 Watershed Action Plan*, which describes how the city will implement its MS4 permit under the EPA's NPDES program, describes how 24 city divisions and departments will be involved in implementing various stormwater management activities. It also includes watershed management plans for 8 subbasins and the $23 million in projects that are in the city's current capital improvement program (CIP) with estimated needs for future projects of between $93 and $117 million.[138]

Tampa Bay Begins a Comeback

This collection of regulatory and nonregulatory programs has been quite effective in addressing a number of the problems affecting Tampa Bay and its resources.[139] Just 30 years ago, Tampa Bay was so polluted that many considered it beyond salvage with the period of poorest water quality on record occurring during the late 1970s and early 1980s.[140] Fortunately, the doomsayers have been proven wrong and this collection of regulatory and nonregulatory programs as well as the previously discussed planning efforts have largely reversed the declines in water quality and have begun to restore the bay's habitat and natural resources.[141]

The turning point in the bay cleanup efforts was arguably in 1979 when the City of Tampa upgraded its sewage treatment plant at Hooker's Point (now called the Howard F. Curren Wastewater Treatment Plan) using federal grant money pursuant to the Clean Water Act construction grant program.[142] This $100 million project was responsible for large reductions in the amount of nitrogen entering the bay.[143] Across the bay, St. Petersburg was pioneering new technology to re-use nutrient rich wastewater that it pumped into the bay until 1978. This wastewater reuse program eliminated almost all of the city's wastewater discharges to the bay. Building on St Petersburg's initiative, many local communities are now discovering the dual benefits of re-using treated wastewater to reduce pressure on groundwater supplies while reducing nutrient inputs to the bay.[144] Clearwater contributed to the bay's recovery by investing more than $50 million in the mid-1980s to upgrade its wastewater treatment plants to advanced wastewater treatment standards.[145] State legislation through the Wilson-Grizzle and Grizzle-Figg initiatives was also passed that required all sewage treatment plants discharging to the bay to meet advanced wastewater treatment (AWT) requirements.[146] Significant pollution abatement actions and a reduction in activities at the region's phosphate mining and fertilizer production plants led to additional nutrient reductions.[147]

In addition to these local efforts, Florida has taken some aggressive steps to address the water quality problems and habitat losses resulting statewide from population growth and increased urbanization. Florida has been a pioneer in addressing nonpoint pollution problems resulting from stormwater runoff and currently has some of the most stringent regulatory requirements in the country. These requirements help minimize stormwater impacts from new development and stimulate retrofitting existing problems. In 1985, Florida's legislature adopted progressive land use planning requirements. Moreover, since the early 1970s Florida has had one of the most, aggressive land acquisition programs in the country.[148] Between 1972 and 1991 the state has invested more than $1.5 billion to purchase 1.2 million acres of land. As a result of the state acquisition programs, 14 counties developed local programs that committed up to $600 million for land conservation funded primarily through local option sales taxes, impact fees, property taxes, and local bonds.[149] Currently, there are a number of land acquisition programs. Preservation 2000 (P2000) is the major acquisition program that is funded through the sale of State bonds that will provide $3 billion in funds. The successor to the program, Florida Forever, was passed by the Florida legislature this past session with similar funding levels [Table 2]. The Conservation and Recreation Lands (CARL) program is funded with a documentary stamp tax and from phosphate mining taxes and is further augmented with P2000 funding. The Land and Water Conservation Fund and the Florida Recreation Development Assistance programs provide matching grants programs to assist local governments with additional funds for land purchases.

Table 2: Summary of Annual Allocations under the P2000 Program

$ (millions)	Program	Administrative Agency
$150	Conservation and Recreation Lands	FDEP, Division of Recreation and Parks
$90	Save Our Rivers	Water Management Districts
$30	Florida Communities Trust	Department of Community Affairs
$8.7	State Park Additions	FDEP, Division of Recreation and Parks
$8.7	Forest Lands	FDEP, Division of Forestry
$8.7	Wildlife Management Areas	Florida Game and Fish Commission
$3.9	Rails to Trails/Florida Scenic Trails	FDEP, Division of Recreation and Parks
$300	Anticipated annual expenditure for land acquisition	

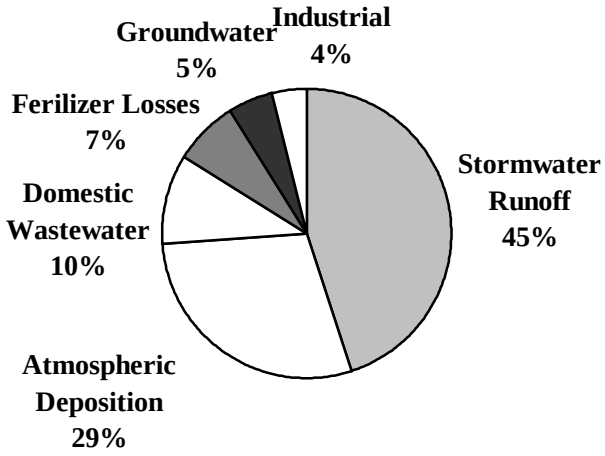
Source: National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. *Evaluation Findings for the Florida Coastal Resources Management Program December 1991 to September 1995* (Silver Spring, MD: NOAA, Office of Ocean and Coastal Resource Management, January 16, 1996).

These programs have been quite effective. For example, P2000 preserved 18,709 acres in the Tampa Bay region while county programs have preserved an additional 42,000 acres.[150]

These efforts generated some remarkable water quality improvements despite ongoing population growth and economic development. Nitrogen and phosphorus loadings decreased by 33 percent and 68 percent, respectively, since the EPC first began measuring water quality in 1972.[151] Scientists estimate that the bay's total nitrogen loading in 1976 (approximately 9,904 tons) was more than 2.5 times higher than the load for the years 1992 – 1994 (approximately 3,800 tons).[152] By the mid-1980s, reductions in nutrient loadings began to produce dramatic improvements in water clarity and reductions in algae biomass.[153] Water the color of pea soup became surprisingly clear within a few years in some areas of the Bay. In the early 1980s, Tampa Bay began to experience consistent measurable gains in seagrass coverage.[154] Between 1982 and 1992, more than 4,000 acres of new or expanded seagrass beds[155] have been documented (an increase of 18.5 percent)[156] with an average annual increase of 2 percent per year between 1988 and 1996.[157] At this rate, the established goal of recovering 12,350 acres of seagrass bringing the total seagrass coverage to about 38,000 acres in 20 to 24 years, roughly the acreage that existed in 1950.[158]

Progress has also been made in the area of wetland habitat protection and restoration. The first effort to develop a baywide habitat restoration plan was prepared by the TBRPC in 1986. Their restoration plan included 39 specific emergent wetland (mangrove forest and tidal marsh) and seagrass restoration projects. However, only 4 sites were restored.[159] The implementation of the SWFWMD's SWIM program for Tampa Bay has been much more effective. By 1996, 24 habitat restoration projects were completed by various organizations which often worked collaboratively on these project. These agencies cooperate in many ways from funding and construction to maintaining and managing the sites once the restoration has been completed. As a result of these efforts, 85.6 acres of wetlands have been restored.[160] Moreover, the SWFWMD has targeted 40 additional sites for restoration between 1995 and 1999 and numerous projects are currently underway.[161] Moreover, aggressive fisheries management

Figure 3: Nitrogen Loadings to Tampa Bay (1992 – 1994 average)



Source: TBEP, *Charting the Course: The Comprehensive Conservation and Management Plan for Tampa Bay* (St. Petersburg, FL: TBEP, December 1996), 70.

coupled with improvements in water quality and habitat helped reverse the decline of red drum and snook with data now indicating that these stocks are on the upswing.[162]

While these improvements are notable and constitute a genuine water quality "success" story, there are still plenty of problems meriting concern. Today, efforts to manage Tampa Bay's water quality problems have shifted from reducing point source discharges of nutrients from sewage treatment plants to a more complex problem of managing nonpoint pollution from various sources and restoring and protecting habitat.[163] Current estimates are that stormwater runoff contributes approximately 45 percent of the bays total nitrogen loadings and significant amounts of metals and pesticides [Figure 3].[164] This 45 percent is comprised of runoff from pasture and rangelands (13 percent), residential runoff (10 percent), undeveloped land (7 percent), intensive agriculture (6 percent), commercial and industrial runoff (5 percent), and mining (4 percent).[165] Other important sources of nitrogen loading are atmospheric deposition (29 percent),[166] municipal wastewater (10 percent)[167], and fertilizer losses during transportation and ship loading (7 percent). Groundwater and springs contribute about 5 percent of the bay's total nitrogen loadings and the numbers appear to be on the increase possibly due to land use changes in the springs recharge areas.[168]

There are still numerous opportunities for stormwater management and the removal of point source discharges. Moreover, continued population growth and the corresponding increase in nutrient loadings remains an important problem. Total nitrogen loadings are expected to move

from 3,800 tons (based on the 1992 – 1994 average) to 4,066 tons in 2010, a seven percent increase.[169] This equates to roughly 17 tons per year.[170] There is also evidence that Tampa Bay's tributaries are considerably more degraded than the Bay.[171] Moreover, point sources remain a concern. Recent attention has focused on the problem of sanitary sewer overflows caused by heavy rainstorms that force some municipal treatment plants to divert raw or partially treated sewage to Tampa Bay. This is a particular concern in St. Petersburg where low land elevations and rapid growth strained existing stormwater and sewer systems. In August 1995, St. Petersburg was forced to divert 15 million gallons into canals leading to the bay when heavy rains caused sewer backups.[172] Later in 1999, the city's Public Utilities Department reported an accidental release of approximately 69 million gallons of treated domestic wastewater over a 41-day stretch beginning March 3, 1999.[173] Corrective actions will be costly and take time.

Even though land acquisition programs have been effective, population growth still threatens valuable habitats and decades of unchecked development created a significant need for restoration. While restoration efforts were notable, they were not targeted in a manner that would restore the historic balance among emergent wetland types. The threat of other water quality problems such as the atmospheric deposition of nutrients and contaminated sediments are poorly understood but have now worked their way onto the policy agendas of state and local decisionmakers. For example, studies now suggest that approximately 29 percent of the bay's total nitrogen loadings are coming from atmospheric pollutants falling directly on the bay.[174] Nitrogen loadings are likely to be much higher once the dry deposition component of the stormwater runoff is determined.[175]

A number of governance problems were also identified. A 1994 survey by the TBEP indicated that bay managers felt that there were significant duplications of responsibility and authority in some areas while there were gaps in others. In general, bay managers felt that this duplication of effort was most evident in the regulatory arena[176] while the greatest gaps were in monitoring and enforcement.[177] Bay managers also cited turf guarding as a problem and recognized the need for a comprehensive, readily available database with information about the bay's health. Many bay managers also complained that publicly financed restoration projects often have to get numerous permits and undergo the same rigorous review as private projects, even when the reviewing agency participated in the design of the project.[178] This increased project cost and in many cases delayed construction up to a year or more.[179] Bay managers also noted that even though a great deal of money is spent on bay management each year, shrinking public funds combined with increased scrutiny of public expenditures is providing new challenges to resource managers. Increasingly, bay managers are being asked to do more with fewer resources and to produce quantifiable results. By the early 1990s, attitudes of bay managers had shifted towards a holistic view of assessing cumulative impacts and trying to manage the whole system (i.e., an ecosystem approach).[180] Many viewed the fragmented regulatory system as leading to environmentally unsound results.[181] Moreover, bay managers strongly believed that the continued trends of population growth, development, and natural resource use could not be sustained without improved coordination, integration, and expansion of the previous efforts to manage Tampa Bay and its environmental problems.[182] This is the context that framed the development of the Tampa Bay Estuary Program.

Table 3: Timeline of Selected Activities Related to the TBEP

TBEP Activities	Other Related Activities
▪ 1990 – Tampa Bay added to NEP ▪ 1991 – State-EPA Management Conference agreement is signed ▪ 1991 – Second BASIS symposium ▪ 1993 – TBEP releases Status and Trends report ▪ 1993 – 1996 – TBEP works to establish specific goals for Tampa Bay ▪ 1994 – 1996 – Committees review management actions ▪ 1996 – CCMP is approved ▪ 1996 – Third BASIS symposium ▪ 1998 – Interlocal Agreement Signed ▪ 1999 – Five-year action plans approved	▪ 1961 – SWFWMD is formed ▪ 1962 – TBRPC is created ▪ 1972 – EPC of Hillsborough County begins monitoring program ▪ 1979 – Tampa upgrades sewage treatment plant ▪ 1982 – Revised stormwater rules adopted ▪ 1982 – First BASIS symposium ▪ 1984 – *The Future of Tampa Bay* report is issued ▪ 1988 – SWIM plan for Tampa Bay approved ▪ 1993 – FDEP created by merging agencies ▪ 1993 – Tampa Bay Watch is incorporated ▪ 1994 – FDEP starts new ecosystem management initiative

The Tampa Bay Estuary Program

The Tampa Bay National Estuary Program followed on the heels of the SWFWMD's SWIM program in 1991 (it has subsequently been renamed the Tampa Bay Estuary Program (TBEP) and to simplify the discussion it will be referred to by its new name).[183] Table 3 contains a timeline of key events in the development of the TBEP, while a more detailed timeline can be found in Appendix B of this report. The TBRPC and the ABM were the driving force early on to get into the EPA's National Estuary Program (NEP). The FDEP and SWFWMD were also instrumental. While there was some concern about getting involved in a federal program, these concerns were outweighed by the belief that it would bring federal funds to research Bay problems. There was also a strong belief that federal involvement would bring national attention to the Bay and its problems and that it might help attract additional federal and state funds. After a fair bit of politicking and lobbying on behalf of their application by various organizations and politicians, the TBEP entered the NEP through the EPA's governor's nomination process in 1990.[184]

Since its inception, the TBEP has been a partnership consisting of six local governments (Hillsborough County, Pinellas County, Manatee County, Tampa, St. Petersburg, and Clearwater) and three regulatory agencies (EPA, FDEP, SWFWMD). Several other agencies were actively involved in the collaborative effort. These included the: TBRPC and the ABM; U.S. Army Corps of Engineers (COE); EPC; Tampa Port Authority; FMRI; and the Florida Game and Freshwater Fish Commission (reorganized as the Florida Fish and Wildlife Conservation Commission (FWCC) in 1999).[185]

In the early days of the program there was some tension between the six local governments and the regulatory agencies. One source of conflict and distrust was water supply

issues. These historic conflicts often pitted communities against one another as well as against regulators. Other conflicts stemmed from problems local governments experienced with regulators. These conflicts had recently increased due to the EPA's new NPDES stormwater requirements that required local governments to get new permits.[186] Several informants suggested that while local officials were generally supportive of environmental efforts because they help the local economy and are good "politics", many of them initially became involved to protect their interests. Several local officials viewed the TBEP as a potential threat to they way they were doing business and there was some fear about how the TBEP might affect their NPDES permits. However, once the program started, it became clear to many local officials that this was not the case. As one local official explained:

> "The city first knew that the estuary program was another potential regulatory branch with a possibility of an extra layer of bureaucracy that may not be cost effective to environmental benefits. After getting into it, it became clear that they were taking a very different approach, which was very attractive to the city, that being a more holistic view and systematic view as to how to improve the bay waters. That it was not end of pipe technology but more holistic and the adoption of habitat as a barometer measuring bay success was attractive?"

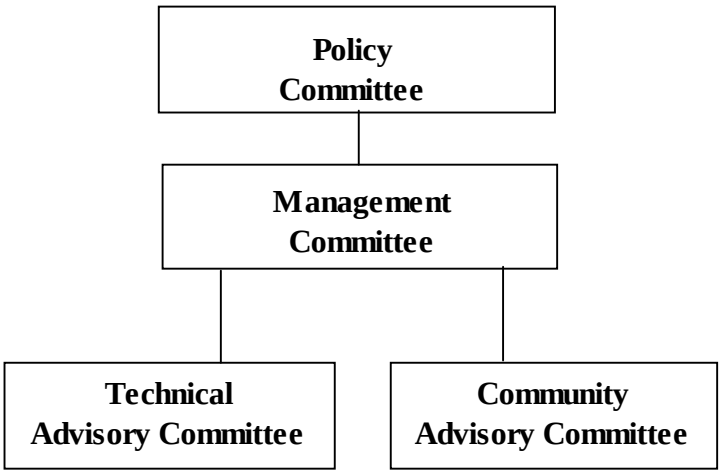
Accordingly, after some initial skepticism and concern, many local officials quickly began to see the merits of the TBEP.

Conflict Emerges Early in the Process

The planning process was relatively devoid of major conflicts. However, one conflict involved the decision of where to house the TBEP. One respondent described this conflict as resembling a "tug of war" between the TBRPC and the SWFWMD. The SWFWMD made the initial application for EPA Section 320 funding in August 1990.[187] However, in October of 1990, the Policy Committee voted to have the TBRPC serve as the administrative agency for the program and the SWFWMD passed the federal and matching funds to the TBRPC in accordance with a letter of agreement between the agencies.[188] The six local government leaders felt uncomfortable giving the SWFWMD control over the program. Moreover, even though the program was housed administratively in the TBRPC, the Policy Committee was adamant that they were in charge of the program.[189]

The TBEP also created a potential conflict with other management programs that were already in place. Accordingly, some effort was spent early in the planning process to sort out roles and responsibilities. This provided some mutual benefits while protecting the "turf" of various agencies. For example, the SWFWMD's SWIM program was feeling pressure to do more implementation work so their handing planning responsibility to the TBEP allowed them to refocus their efforts on other activities. Moreover, the TBEP's technical work added a "sharpness and focus" to many of the issues that was lacking before.

Figure 4: TBEP's Management Conference Structure



The Planning Process

The TBEP generally followed the planning process depicted in Figure 1. Previous efforts such as the development of *The Future of Tampa Bay* report and SWIM plan had identified stakeholders and prioritized the major problems affecting Tampa Bay. The participants also had some history working together through the ABM. Accordingly, the early years of the program went relatively smooth.

Establishing the Management Conference

One of the first steps in the planning process was for the TBEP to establish its Management Conference (i.e., committee structure). One of the first questions that emerged was whether to use the existing ABM structure or to develop a new committee structure. The participants decided to create a new structure because participants were reluctant to change the ABM structure that worked effectively and it was clear that the TBEP would not be engaged in some of ABM's activities (e.g., commenting on specific development projects). Moreover, the TBEP would be much more research oriented than the ABM. Over time, the two entities have developed into complementary institutions.

The TBEP utilized a Management Conference structure similar to that of other estuary programs with a lot of cross-pollination with the ABM's membership [Figure 4 and Table 1]. The TBEP's staff was supervised by a Policy Committee comprised of EPA, FDEP, SWFWMD, Tampa, St. Petersburg, Clearwater, Hillsborough County, Pinellas County, and Manatee County. High-ranking officials and elected politicians represented these entities. The decision to place the Policy Committee largely in the hands of local governments stemmed from the recognition that the implementation of the CCMP would primarily be a local government responsibility. The Policy Committee was active, approving the work done by other committees, setting the overall policy direction for the TBEP, and making administrative and budgetary decisions.

The Management Committee consisted of the top administrators of the organizations represented on the Policy Committee. In addition, other regulatory agencies such as the EPC, Tampa Port Authority, and COE as well as the FMRI and TBRPC were members of the Management Committee. The co-chairs Community Advisory Committee (CAC) and the Technical Advisory Committee (TAC) were also members of the Management Committee. The Management Committee oversaw the work of the CAC and the TAC.[190] It also played a critical role in developing the action plans in the CCMP.

The CAC included representatives of business, agriculture, commercial and recreational fishing, environmental groups and civic organizations. The CAC's members were appointed by Policy Committee members who could each appoint up to three members with the committee consisting of approximately 30 members. In recent years, these rules have been relaxed so that the CAC can elect some of its own members and it does not have to rely exclusively on the Policy Committee for its membership. During the planning process the CAC provided advice to the Policy and Management Committees. Essentially, the CAC served as a "sounding board" for Policy Committee members to help them determine how the public would respond to proposals in the CCMP. The CAC was also charged with the task of educating area residents about the Bay's priority problems, including stormwater runoff and sea grass protection. In addition, the CAC was instrumental in assisting in the planning of focus groups and town meetings on the Draft CCMP and communicating information back to the organizations that they represent.[191]

Unlike the CAC, the Technical Advisory Committee (TAC) was much larger in size and had an open membership with more than 200 members with a core group of 50 – 60 environmental professionals from federal, state, regional, and local agencies, and academia. The TAC provided objective assessments of scientific and technical information for the Policy and Management Board members and helped establish the scientific underpinnings of the CCMP. For example, deciding on assumptions used in models and setting nutrient loading thresholds that could achieve the seagrass restoration objectives.[192]

Priority Problems

Once the Management Conference structure was established the participants had to develop a list of priority problems. The list of problems and recommendations contained in the *Future of Tampa Bay* report and the SWIM plan were used to develop a combined list of problems that was then presented to the TBEP's TAC for its review and input. The revised-list was reviewed by the TBEP's Management Committee and adopted by the Policy Committee in January of 1991.[193] These included:

- Water quality deterioration and eutrophication resulting from excess nitrogen in stormwater runoff, direct discharges to the bay, and from atmospheric deposition
- Declines and impacts to living resources and habitats
- Increased user conflicts and impacts associated with recreational activities, industrial and navigation needs, and urban development
- Lack of agency coordination and response
- Lack of community awareness

- Circulation and flushing of Tampa Bay
- Hazardous waste and toxic contamination of the bay and its sediments[194]

While the goal was to be comprehensive, the management conference participants recognized that not all of the problems on this preliminary list would be addressed.[195] Moreover, other issues were bound to emerge during their deliberations.

Characterization Phase

One of the reasons that the planning process was so lengthy, around 6 years, was that the TBEP invested considerable financial resources in research that attempted to link specific causes to environmental problems. The product of this effort was a status and trends (characterization) report which identifies probable causes of identified problems and documents the relationships between pollution loads and potential uses of an estuary.[196] In fact, many respondents identified this emphasis on science as a major strength of the program.

Early technical efforts were largely focused on identifying gaps in research and synthesizing existing technical information. There was also a general recognition that a more technical basis for many management actions was needed. One of the first things that the TAC did was to sponsor a two-day seminar where they tried to identify the gaps in our knowledge. Some of the major gaps were:

- How seagrass grows and what limits are placed on its growth in the Bay
- Benthic information
- Different types of habitat and how much has been lost

Early research then tried to answer these questions. The TBEP also realized that their water quality data was not all in one place so they commissioned a status and trends report, which was completed in 1993. Gradually the technical work shifted emphasis to developing empirically valid goals for nutrient reduction, seagrass restoration, and habitat restoration. This work involved additional research and modeling efforts. The TAC played a critical role in developing these models and reaching collective agreement on the appropriate assumptions for the TBEP's modeling efforts. Additional work also focused on developing nutrient loading estimates using Geographic Information Systems (GIS) and other analytical techniques.[197]

By all accounts, the characterization phase along with the path-breaking research on seagrass and atmospheric deposition were crucial to developing the TBEP's reputation as an objective and reliable source of information on the state of the estuary and the causes and effects of various problems.[198] As one respondent noted:

> "It was a science-based program. It was not an advocacy-based program where you have someone establishing one point of view when there is always another point of view . . . I felt that they, in this program, presented factual information that was pretty reliable. I viewed the staff as reliable sources of information. I was very interested in the research that they were doing here because a lot of it was cutting edge research that had never been done."

The scientific foundation added to the TBEP's credibility with other federal, state, regional, and local officials.

Other Notable TBEP Activities

While the technical work was going on, the TBEP was busy in other areas: 1) implementing demonstration projects; 2) conducting a broad public participation program; and, 3) developing a collaborative monitoring program. The EPA encourages estuary programs to implement action plan demonstration projects (APDPs) that test management strategies and promote collective action. During the planning process the TBEP secured almost $1 million in matching grants and federal funds for early APDPs designed to jump-start restoration efforts and build community support for the bay's recovery.[199] This does not include other collaborative projects that the TBEP partners were engaged in using existing funding. The demonstration projects proved to be a useful way to demonstrate that the program was "doing something" particularly during the years dominated by research and technical work.

The TBEP was also involved in a number of notable public outreach efforts, many of which were collaborative efforts. The TBEP, the Sarasota Bay NEP, and Florida Cooperative Extension Service (CES) worked together to establish a public education program geared towards homeowners, the *Florida Yards and Neighborhoods Program*. The program teaches local residents ways to reduce nonpoint runoff from their homes and how to improve the environment by changing landscaping. The pilot project has been expanded by CES to 18 other counties throughout the state.[200]

The *Boaters Guide to Tampa Bay* is the product of a collaborative effort between the TBEP and the FDEP. It includes a chart of Tampa Bay that depicts the channels, seagrass beds, artificial reefs, and boat ramps. It also contains information on habitats, sport fish, and boating safety. It relies on information contained in the FMRI's GIS system. More than 100,000 copies of the guide have been distributed though a partnership with county tax collector offices, which distribute the materials to boat owners renewing their tags.[201] A similar guide has now been produced for the Charlotte Harbor NEP.[202]

The TBEP worked hard with other organizations to involve volunteers in bay improvement activities. Through funding provided to Tampa BayWatch, the TBEP established the Bay Conservation Corps that recruits volunteers for bay protection and restoration activities.[203] More than 3,000 citizens have participated in the corps in projects such as salt marsh plantings and bird island cleanups.[204] The TBEP provided over $50,000 in mini grants of up to $5,000 to more than a dozen organizations, schools, and community groups to help build community partnerships for bay restoration. Projects have included educational programs at the Florida Aquarium, developing pollution prevention plans to reduce stormwater runoff, improved landscaping, mangrove restoration and seagrass protection projects, and a restoration video produced by high school students.[205] The TBEP and its constituent organizations are also involved in a number of efforts to improve environmental education in the region's school systems. Through partnerships with local school districts and the Florida Aquarium, the TBEP has sponsored numerous filed trips and workshops for thousands of area students. In cooperation

Table 4: Environmental Monitoring Programs

Agency	Environmental Monitoring Activities
EPC	▪ Water quality, benthos, baywide monitoring report
Tampa	▪ Water quality, seagrass, baywide monitoring report
Manatee County	▪ Water quality, benthos, seagrass, baywide monitoring report
Pinellas County	▪ Water quality, benthos, seagrass, baywide monitoring report
Hillsborough County	▪ Atmospheric deposition
SWFWMD – SWIM	▪ Seagrass mapping
SWFWMD	▪ Land use mapping, sets PLRGs, water quality and loading models, coordinate and produce baywide environmental monitoring report after 1999
FMRI	▪ Critical fisheries monitoring program
TBEP	▪ Atmospheric deposition, coordinate and produce progress reports and action plans, track progress towards CCMP goals
EPA	▪ Atmospheric deposition

Source: TBEP, *Partnership for Progress* (St. Petersburg, FL: TBEP, Undated), TP 2.

with the Tampa Tribune's Newspaper-In-Education Program, the TBEP developed a 6-unit teaching curriculum titled "Exploring Tampa Bay".[206] The FMRI also holds an annual Bay Day where students are exposed to a wide range of information on Tampa Bay and its resources.

Another notable accomplishment was the development of a collaborative environmental monitoring program. One of the interesting features of this case is that there was already a good environmental monitoring program in place prior to the establishment of the TBEP. However, there were 36 separate environmental monitoring programs for habitat, water quality, and fisheries collecting data. Many of the programs were run by municipal or county governments to comply with NPDES permit requirements. The most noteworthy of these programs is conducted by the EPC of Hillsborough County, which had been conducting ambient water quality monitoring since 1972 at 54 stations in 4 of the 5 Bay segments.[207] While these efforts produced a tremendous amount of valuable data, there was little coordination between the programs. Some sites lacked coverage while in others there was duplication and redundancy. Data was also stored in various forms that prevented easy synthesis. Different quality assurance procedures raised questions about the comparability of data.

To improve coordination and make the changes necessary to monitor CCMP implementation, the TBEP and the monitoring partners formed a collaborative partnership [Table 4].[208] A series of workshops with local government and agency partners helped define the water quality, benthic, fisheries, and habitat components of the program. An effort was also made to standardize data collection and storage so that the data could be synthesized in a single document every two years by the TBEP. The partners also coordinated sampling sites with nearly 70 percent of the 126 existing monitoring stations incorporated into a statistically valid sampling design based on the EPA's Environmental Monitoring and Assessment Program (EMAP) protocols. The partners also agreed to quality control and quality assurance procedures advocated by the EPA and FDEP. Moreover, the partners conduct regularly scheduled quality

assurance checks where samples are swapped and the results of different lab tests compared. The results have proven so successful that the TBEP has joined forces with the Sarasota Bay and Charlotte Harbor NEPs to form the Florida West Coast Regional Ambient Monitoring Program (RAMP).[209] The hope is that this collaborative monitoring program will eventually be expanded statewide.

Developing the CCMP

These activities culminated in the development of the TBEP's Comprehensive Conservation and Management Plan (CCMP). The technical foundation of the plan was built through sound scientific information coupled with what many respondents characterized as a "painstaking consensus-building process".[210] Early efforts focused on developing what were called "preliminary action plans" that contained what would become the guts of the CCMP. An iterative process was then used to review various drafts having them reviewed by CAC and TAC members and then forwarded to the Management and Policy Committees for their approval. These documents were then combined into a draft CCMP that was then reviewed by the committees. Once approved it was subject to a series of public meetings and public comment. More than 250 residents attended a series of town meetings on Tampa Bay in the spring of 1996 to discuss the draft CCMP with a panel of experts drawn from local communities. The TBEP and its citizen advisors also conducted a series of smaller focus groups with interest groups to solicit their feedback.[211] In general, the plan was well received and little controversy surrounded the approval of the draft or final CCMP.

While the process took a long time, most respondents felt that the time spent was crucial to both the CCMP's widespread acceptance and the development of the Interlocal Agreement used to secure the commitments for implementing the CCMP. One Management Committee member when asked to characterize the decision making process described it as follows:

> "It was based on consensus building. Contentious issues came and went. There was productive controversy at best . . . virtually every major decision, at least on the board I sat on, was made with nothing short of unanimous approval. The chemistry of the board members lent a lot to the process. There seemed to be a good mixture of visionaries with pragmatists . . . there were good roundtable discussions with an adequate amount of political sensitivity and it has a pseudo-environmental membership dealing with hands-on brick and mortar membership with those that have to deal with permits. So you had almost diametric entities sitting across a table working out solutions in a professional manner. Looking back on it, I am quite amazed at how it did work."

While one Policy Committee member characterized the process this way: "The best part of this process is that you sat down with these guys. And it was sort of like a bunch of jagged rocks being thrown into one of those rock tumblers. And we just rubbed each other raw for five years because you thought the other guy is not as big of a jerk as you might have thought . . . He's got his problem and I have got my problems."

Most of the respondents, particularly the Policy and Management Committee members we interviewed, felt strongly that the consensus-building process was instrumental in helping the

various participants learn about each other and their respective concerns. Many of the participants also felt that the consensus-building process built interpersonal trust and personal relationships. Although it may have been somewhat less effective in building trust at the institutional level because many of the parties are still engaged in other areas of conflict (e.g., water supply questions). Many of the respondents also claimed that they would have been unable to develop the Interlocal Agreement used to implement the CCMP if they had not built these relationships during the planning process.

The CCMP

The TBEP and its partners in December 1996 approved the CCMP, *Charting the Course*. The CCMP contains 41 specific action plans [Appendix C of this report] for bay improvement in five priority areas of concern:

- Water and Sediment Quality
- Bay Habitats
- Fish and Wildlife
- Dredging and Dredged Material Management
- Spill Prevention and Response

Each of the 41 actions describes the specific steps to be taken, the parties best suited to address the issue, and a proposed implementation schedule. This format and procedure closely follows that of the other CCMPs produced by members of the NEP. The action plans are designed to help achieve 11 goals, several of which are quantifiable and measurable [Tables 5, 6, and 7]. It is also important to note that the partners in the TBEP were more concerned with accomplishing the goals then they were with accomplishing the action plans as they are described in the CCMP. Accordingly, the action plans are best viewed as a starting point for the partners to determine how they will work towards achieving the CCMP's goals.

Of particular interest to this study are the goals and actions related to nutrient loading and habitat restoration and protection [Table 5]. The CCMP contains quantifiable goals for nutrient reduction designed to "hold the line" on nutrient loadings from future growth and economic development. The TBEP's modeling and research suggest that this should be adequate to achieve the CCMP's goal of returning seagrass coverage in the Bay to 1950 levels, which equates to an additional 12,350 acres of seagrass over 1992 levels [Table 6]. The CCMP adopted a five-year nutrient management goal that effectively caps nitrogen loadings at existing levels (i.e., the 1992 – 1994 average).[212] This equates to a reduction of future nitrogen loadings of roughly 17 tons per year or 84 tons per year by 2000.[213] Moreover, five-year goals have been developed for all Bay segments.[214] Annual costs to offset those loads are estimated at approximately $100,000 per ton of nitrogen or about $1.7 million per year.[215]

The Tampa Bay Nitrogen Management Consortium (hereafter referred to as the Consortium) was established in October 1996 to develop a plan with specific actions to reduce nitrogen loading, which comes from atmospheric deposition, industrial point sources, fertilizer shipping and handling, and intensive agriculture.[216] The Consortium includes members of the

Table 5: TBEP Goals for Water and Sediment Quality

Goal	Status: Environmental Indicators	Status: Action Indicators
Prevent increases to the bay's nitrogen loadings by 'holding the line' at 1992 – 1994 levels to provide water clarity suitable for the recovery of 12,350 acres of seagrass. To compensate for expected growth, reduce or preclude additional nitrogen loadings by 17 tons per year	Nitrogen loadings to the bay are scheduled to be updated with 1995 – 1999 data in the year 2000	1995 – 1999 reduction goals for all bay segments are expected to be met by the end of 1999 through implementation of projects specified by public and private partners in the Tampa Bay Nitrogen Management Consortium Action Plan Partners for Progress
Interim target: Maintain segment specific chlorophyll a concentrations equal to the lowest of either the annual average of 1992 – 1994 or the concentration that supports the seagrass restoration goal	Average annual chlorophyll a levels for each bay segment have fluctuated above and below specific targets since 1994. No obvious trends over time are evident.	
Reduce the amount of toxic chemicals in contaminated bay sediments and protect relatively clean areas of the bay from contamination	"Hot spots" of contaminated sediments occur in relatively concentrated areas around large marinas, ports, and urban stormwater outfalls. To date, no trends in sediment quality since monitoring was initiated in 1993 have been observed.	Baywide annual sediment quality monitoring was initiated in 1993. Work towards developing numeric targets are under development as are action plans to address "hot spots"
Gain a better understanding of the role that atmospheric deposition plays in the bay's water quality, and identify and address the sources of air pollution		Ten research and monitoring projects addressing atmospheric deposition in the Tampa Bay area are ongoing
Reduce bacterial contamination now present in the bay to levels safe for swimming and shellfish harvesting	Number of beach closures and percent shellfish beds open (not yet compiled for Tampa Bay)	Identification of appropriate indicators for human health concerns in Tampa Bay will be initiated in fall 1998. Coordination between local health units to standardize "beach closure" conditions is underway

Modified from: TBEP, *Tampa Bay Estuary Program Biennial Review: October 1998* (St. Petersburg, FL: TBEP, October 1998), 2 – 3.

Table 6: TBEP Goals for Bay Habitats

Goal	Status: Environmental Indicators	Status: Action Indicators
Recover an additional 12,350 acres of seagrass over 1992 levels, while also preserving the bay's existing 25,600 acres and reducing propeller scaring of seagrass.	Since 1992, seagrass acreage is increasing at about 500 acres per year. At this rate, the goal will be reached in 25 years.	Nitrogen management goals are being met. Channels through seagrass have been marked in heavily scarred areas. Aerial photos and mapping occurs every 2 years and biannual seagrass conditions monitoring was initiated in fall 1998.
"Restore the historic balance" of coastal wetland habitats in Tampa Bay by restoring at least 100 acres of low-salinity (oligohaline) tidal marsh every five years, for a total increase over time of 1,800 acres.	Approximately 250 acres of oligohaline habitat will be restored by 2000, exceeding the 1995 – 1999 goal by 150 acres. Oligohaline restoration will occur in all bay segments.	Twenty habitat restoration projects, which include the creation or restoration of oligohaline habitat, are ongoing or scheduled to be completed by 2000. When completed, a total of 250 acres of oligohaline habitat will be restored in all bay segments, exceeding the goal by 150 acres.
Preserve and enhance the bay's 18,800 acres of existing mangrove/salt marsh habitats, including the 28 coastal habitat sites designated as priorities for protection, either through public purchase or methods such as conservation easements.	A total of 1,833 acres of the 13,434 acres identified as the "Tampa Bay Estuarine Ecosystem" have been acquired for preservation and restoration between 1995 - 1997	All 28 priority sites have been given the highest priority for the state's Save Our Rivers or P2000 land acquisition programs by SWFWMD.
Establish and maintain adequate freshwater flows to Tampa Bay and its tributaries to increase crucial low salinity habitat		Developed consensus-based salinity regime and dissolved oxygen criteria for the Hillsborough River below the dam, based on needs of estuarine-dependent species. Th criteria are being considered in the determination of minimum flows by SWFWMD (not yet finalized)

Modified from: TBEP, *Tampa Bay Estuary Program Biennial Review: October 1998* (St. Petersburg, FL: TBEP, October 1998), 4 – 5.

TBEP's management board, electric utility industry,[217] fertilizer industry, and agriculture [Table 1]. Consortium members met for over a year and developed an action plan to achieve the non-local government portion of the cumulative 1995 – 1999 nitrogen reduction goals.[218] Consortium members then signed a formal resolution to "hold the line" on nitrogen and implement their respective action plans.[219] As a result, three bay segments, Old Tampa Bay, Hillsborough Bay, and Middle Tampa Bay, are expected to meet the 1999 nitrogen management

Table 7: TBEP Goals for Fish and Wildlife, Dredging, and Spill Prevention

Goal	Status: Environmental Indicators	Status: Action Indicators
Improve the on-water enforcement of fishing and environmental regulations	The MAC is currently developing specific indicators to test the effectiveness of the voluntary "go slow" areas. Possible indicators may include: 1) manatee scaring rates and mortality; 2) monitoring how many boaters are aware of the manatee protection strategy including the "go slow" areas; 3) on-water surveys of how many boats slow down upon entering a voluntary "go slow" area; and, 4) presence or absence of manatee education materials at area marinas, boat dealerships, and boat ramps.	In 1997 – 1998, a Manatee Protection Task Force developed recommendations for a manatee protection strategy in Tampa Bay, which included: 1) seasonal "no entry" restrictions in manatee congregation and calving areas; 2) voluntary "go slow" areas throughout the shallow seagrass areas of the bay; and, 3) "safe speed" marked access channels through grass flats. The Manatee Awareness Coalition (MAC) has been formed to train volunteer on-water bay stewards to distribute "MAC pacs", a manatee awareness package to promote the voluntary "go slow" areas to boaters.
Develop a long-range dredged material management plan for the bay that will minimize environmental impacts and maximize beneficial uses of the dredged material	Specific environmental indicators have not been developed for this goal.	The COE and TBEP have entered into an agreement to develop a long-term dredged material management plan for Tampa Bay, which will include the three major ports on the bay. The yearlong plan development process was scheduled to begin in fall 1998.
Install a state-of-the-art vessel traffic and information system (VTIS) to improve coordination of ship movements along the bay's shipping channels	A specific environmental indicator for this goal has not been identified. One possible indicator is the number of ship groundings and spills in Tampa Bay	A real-time tide and weather information (PORTS) system is operational and funded through 2000. Elements of the VTIS are being implemented in Fall 1998. Remaining elements are ongoing

Modified from: TBEP, *Tampa Bay Estuary Program Biennial Review: October 1998* (St. Petersburg, FL: TBEP, October 1998), 6 – 8.

goal with completed and ongoing projects alone. The Lower Tampa Bay and Boca Ciega Bay segments are expected to meet the goal with ongoing and pending projects.[220]

The CCMP's goals for habitat restoration and protection [Table 6] are described in more detail in a technical report prepared by the TBEP entitled *Setting Priorities for Tampa Bay Habitat Protection and Restoration: Restoring the Balance, Final Report*. As previously noted, a net loss of 5,128 acres occurred between 1950 and 1990.[221] The cost estimates for restoring

mangrove/marsh habitat range from $25,000 to $50,000 per acre.[222] Thus, if a 5,128-acre reduction target would cost between $128 million and $256 million while restoring the 14,992 acres lost since 1900 would cost $750 million (not including land costs).[223] Given the fact that in the last 5 years only 85.6 acres have been restored at a cost of $2,150,000, the TBEP participants selected a restoration option with both the lowest estimated cost and the lowest targeted acreage figure (1,786 acres).

The CCMP's target for the minimum level of effort is 100 acres every five years, which is equivalent to the current rate of restoration [Table 6].[224] The preliminary cost estimates are that approximately $350,000 of existing annual expenditures (excluding land acquisition costs) would be necessary to restore about 20 acres of low-salinity tidal stream habitat per year.[225] The CCMP also recommends working towards restoring the relative proportions of the three wetland types present in the benchmark period (1900) within a total coverage area greater than is present in the current period.[226] Under this approach, priority is given to tidal marshes and salt barrens. However, this does not imply that mangrove or marsh restoration activities should not be pursued. Rather, they should be pursued on a "site-opportunity basis" where appropriate sites are available and public funding exists.[227] The TBEP has also identified and ranked 138 possible restoration sites and has developed information that agencies can incorporate into their respective decision making processes for ranking and prioritizing restoration projects.

The TBEP also recommends the acquisition in fee or less than fee of all mangrove forests, tidal marshes, and salt barrens existing along the shores or in the watershed of Tampa Bay that are not protected. Approximately 34 percent of the emergent tidal wetlands are publicly owned and another 17 percent are proposed for public purchase.[228] The TBEP has identified 28 major sites for acquisition. The TBEP further recommends that management plans be established for all public lands with conservation aims with budgeted operation and maintenance plans to ensure that restoration sites, including public mitigation areas, do no revert back to degraded wetlands through neglect and to guard against invasive species.

Implementing the CCMP

Once agreement on the goals and substance of the CCMP was reached, the partners turned their efforts towards making the CCMP more than just a "plan". Many of the actors had seen plans come and go and most wanted to avoid having the CCMP become another plan that would gather dust on a shelf. Accordingly, there was strong support among Policy and Management Committee members for making the CCMP more than a voluntary plan. However, most committee members did not want to create a new regulatory authority either.[229] "From among the leaders on the Policy Board emerged a champion of the ideal to conclude the planning phase of the program with a binding commitment to CCMP implementation. Throughout his five-year term on the Policy Board this individual, an attorney by profession, steadfastly held to that ideal and ultimately was asked by the Policy Board to draft the Interlocal Agreement."[230] The related question became where would the TBEP's institutional home be. This was some of the liveliest discussion that took place among Policy and Management Committee members. Options included:

- Moving it to SWFWMD

- Keep it at the TBRPC
- Move it to the FDEP as part of its new ecosystem management initiative
- Create a stand alone program, possibly a nonprofit organization

In the end, the partners chose to use an independent alliance of government entities pursuant to Chapter 163 of the Florida Statutes, which required developing an Interlocal Agreement.[231]

Developing the Interlocal Agreement

To develop the Interlocal Agreement (IA), the TBEP relied on the services of a facilitation team from the University of South Florida (USF), which also worked with the Sarasota Bay National Estuary Program (SBNEP).[232] The process used by the facilitation team, while ultimately successful, lasted months involving numerous individual and joint meetings and negotiations. The facilitation team began its efforts by holding meetings with each Management Committee member to determine what each wanted with respect to an agreement. The facilitation team discovered that the local government actors wanted some form of legally binding agreement that would assign responsibility for meeting designated amounts of the CCMP goals such as nutrient reductions and habitat restoration.[233] Many of the local officials also blamed regulators for not being flexible enough to allow them to be creative in achieving a net environmental benefit when designing projects. The regulators, while unsure of the agreement concept, did see the local governments as the primary entity responsible for achieving the CCMP's goals. Accordingly, after the initial round of meetings a clear differentiation between the interests of the local governments and the regulators developed.[234] While many expressed doubts about reaching an agreement, all indicated that they would sign an agreement if their interests were protected.[235]

The next step for the facilitation team was to become engaged in an iterative process that involved answering a series of questions such as:

- What should be in the agreement?
- What is the objective of the agreement?
- Who will the agreement apply to?
- Who should sign the agreement? and,
- What will the agreement bind the parties to?[236]

The questions were sent to the Policy and Management Committee members for review. It was discovered that a wide range of perspectives existed.[237] What followed were joint meetings in which the "framework" of the agreement was negotiated. After each meeting, the draft framework was revised and sent to the committee members for their review. Starting with the first meeting, many members began bringing their own attorneys to help negotiate the draft framework. After the first three meetings, the process developed its own momentum and the parties began to resolve issues as new issues were raised.[238]

Two overarching issues framed much of the debate. Regulators were concerned with the question of accountability and wanted local governments to specify projects as well as provide information on funding, outcomes, and schedules for project completion. Local governments

were concerned with this level of detail because of the constantly changing nature of the programs, requirements, and fiscal landscape. However, local governments were willing to develop five-year work plans and to use annual supplements to specify details and changes to the work plans.

In return, local governments wanted regulatory flexibility and some improvements to a fragmented regulatory system that they claimed was often environmentally unsound. Many also claimed that this system was going to serve as an obstacle to the CCMP's implementation. One local official provided an illustrative example of the type of problems local officials confronted:

> "A significant project this city has put in its plan for the NEP, the local NEP, is a lake restoration effort and the city and regional water management district, SWFWMD, each contributed $5 million to restore this body of freshwater that discharges directly into Tampa Bay and the restoration plan called for significant reduction in nitrogen loading to the Bay if we were going to clean up this lake. We spent 3 years getting permits from FDEP and COE to allow this project to go forward. We exceeded our pledges 2 or 3 fold as far as engineering and staff time to get these permits. We essentially delayed the project. More importantly it cost the project additional capital expense. . . . with no net environmental benefit that can be correlated to it. . . . This project was treated no different than an individual wanting to build a marina, it was treated no different than a private sector development . . . yet this project was totally dedicated to the clean up of a lake and its direct impact on the clean up of the bay. Yet, it was never considered in that way. There was given no credit, there was no consideration given to the objective of the project in the permitting process."

Accordingly, local officials were looking for flexibility and some willingness on the part of regulators to consider the objectives of the projects, the cost considerations to taxpayers, and to help fast track projects so that they could minimize costs and expedite restoration efforts.

The regulators were willing to offer some flexibility and help streamline the permit process but the flexibility had to come within the existing set of regulatory requirements.[239] The parties also agreed not to include any "sticks" in the agreement for two reasons. First, without measurable goals it would be impossible to hold any government accountable for failure. Second, if the streamlined permit processing and regulatory flexibility were to serve as a "carrot" then withholding the process for failure to abide by or leaving the agreement would effectively serve as a "stick".[240]

Once the conceptual framework had been agreed upon, the parties turned their efforts towards drafting a legal document that would ensure future collaboration.[241] This also took longer than expected because new issues emerged:

- Should the TBEP be incorporated as a nonprofit agency?
- Should it stay at the TBRPC?
- Should the regulatory agencies or some subset of agencies sign the agreement or should they sign a memorandum of understanding?
- Who should sit on the new policy and management boards?

After more than eight drafts and endless meetings among the actors and their attorneys, an Interlocal Agreement was finally signed on February 12, 1998.[242] The final agreement was signed by thirteen organizations [Table 1]. However, rather than sign the agreement, the Environmental Protection Agency (EPA) and the Army Corps of Engineers (COE) decided to sign Memorandums of Understanding (MOUs) as adjoinders to the IA where they agreed in principal to adhere to the IA's provisions. While the COE was willing to sign the IA, the EPA and the legal counsel in the regional office expressed great resistance and many of the respondents we interviewed expressed genuine bewilderment with the EPA's logic. Rather than push the issue or embarrass the EPA by having the COE sign the IA, it was decided that the two federal "partners" would sign MOUs as adjoinders to the agreement.

The Interlocal Agreement

The Interlocal Agreement (IA) established the TBEP as an independent alliance of government entities pursuant to Chapter 163 of the Florida Statutes.[243] The "Chapter 163" organizational form allowed the TBEP its independence without the complicated financial reporting requirements associated with incorporating a Section 501 (c)(3) nonprofit organization.[244] The statute allows the signatories a great deal of latitude in constructing an organization and defining its responsibilities and duties. Accordingly, the IA details all of the TBEP's functions and responsibilities as well as things that it would not do (e.g., issue rules or regulations).[245] It also provides the signatories with the liability protections currently afforded pursuant to state and local statutes.[246]

A small staff headed by an executive director oversees the IA and the activities it prescribes. Administrative responsibilities such as personnel administration and grants management shifted from the TBRPC to the TBEP once it was established. The IA also directed the TBEP staff to enter into an administrative support agreement with a third party (i.e., the TBRPC) to provide administrative support and within six months to develop their own Operating Procedures Manual to guide its operations.[247]

The TBEP staff are directed by a Policy Board (i.e., Board of Directors), which is a modified version of the Policy Committee. It is comprised of 8 voting members (Tampa, St. Petersburg, Clearwater, Hillsborough County, Pinellas County, Manatee County, FDEP, and SWFWMD) and one nonvoting member (EPA). Each entity chooses its representative. The Policy Board has broad policy making authority and some specific responsibilities.[248] The IA established a Management Board similar to the previous Management Committee. Its responsibilities are delegated to it by the Policy Board and prescribed in the IA. The Management Board consists of representatives of the parties to the IA [Table 1] with the COE and EPA serving as nonvoting members. The IA also continued the Technical Advisory Committee (TAC) and the Community Advisory Committee (CAC) with the co-chairs of the TAC and the CAC designated as voting members of the Management Board. The Management Board was also left to determine whether the chair of the Nutrient Management Consortium would be added as a nonvoting member. The IA also established a procedure that allowed other governmental entities, regulatory agencies, or private entities to become party to the agreement and to join the policy board if unanimously approved by the Policy Board. The IA also required

the Policy Board to take action on the TBRPC's request to become a member of the Policy Board within six months of the effective date of the agreement.[249]

The heart of the IA is its provisions that commit the partners to achieve the CCMP's goals. Each signatory agreed to submit an action plan designed to achieve the CCMP's goals. All goals are to be achieved collectively with the exception of the nitrogen reduction targets that are specifically allocated among the local government partners. The regulatory partners also agreed to extend, as appropriate, the following forms of regulatory flexibility to projects that are part of an approved Action Plan:

- Permitting process flexibility
- Expedited permit processing
- Alternative monitoring and reporting requirements
- Coordinated permitting and inspections
- Cooperative inspections that provide an opportunity for informal resolution of compliance issues before enforcement action is initiated

Moreover, the executive directors of the regulatory agencies agreed to appoint a highly placed staff member as an action plan coordinator to track progress of any project part of an approved action plan and to serve as a liaison for local governments.[250]

The IA includes other provisions designed to facilitate its implementation. The TBEP staff monitor and track implementation progress. The IA includes provisions for a sunset review every five years to encourage the Policy Board to revisit its goals. It also contains a formula to secure the funding commitments necessary to ensure the maintenance of the TBEP's operations. Finally, the IA contains complex voting procedures. A unanimous vote of the Policy Board is required to adopt by laws, remove a party from the IA, or to amend the CCMP or its goals. An affirmative majority vote is needed to approve action plans or reexamine CCMP goals. No action during the sunset review means maintenance of the status quo.[251]

Progress Implementing the CCMP

Progress implementing the IA and the CCMP has been impressive. In part, this is due to the presence of strong, stable funding for CCMP implementation that comes from federal, state, regional, and local agencies. As previously noted, Florida has an aggressive land acquisition programs, many local governments have stormwater utility fees to generate revenue for stormwater improvements, and the SWFWMD has taxing authority to generate revenue for projects as well. Moreover, the TBEP has been successful in obtaining federal funds to assist in its efforts. Since adoption of the CCMP in November 1996, the EPA has contributed approximately $861,000 for activities related to CCMP implementation and oversight. This includes $570,000 in Section 320 funds, $111,000 for demonstration projects, $180,000 in Great Waters Program funds to help fund atmospheric deposition research. The EPA has also pledged to provide approximately $300,000 per year for four years for CCMP implementation.[252] To date, this federal funding as been matched by $665,000 in cash from local governments and the SWFWMD's basin boards as well as substantial in-kind contributions such as installation of stormwater BMPs and habitat restoration projects.[253]

Another interesting feature of the IA is that it contains commitments for funding the TBEP's operations. For the period commencing October 1, 1998 through September 30, 2000, the Policy Board members agreed to fund the annual cost of the TBEP office in the same amount as its fiscal year 1997 – 1998 contribution , subject to annual approval of each member of the Policy Board [Table 8]. From that point forward, the budget (excluding EPA or other federal funds) shall be funded 1/3 by the SWFWMD and 2/3 by the six local governments with shares allocated on a pro-rate share based on population size.[254] Moreover, the local officials we interviewed were supportive of this arrangement and maintaining a line item in their respective budgets to fund the TBEP's operations.

The aforementioned funding doesn't include the costs of in-kind services associated with the actions partners committed to in their annual work plans. While these costs have not been estimated in a systematic manner, they will be substantial. For example, costs necessary to complete the habitat restoration projects by SWFWMD, FDEP, and local government partners are expected to exceed $3 million for their portion alone. As another example, the coordinated monitoring program is expected to cost the EPC alone more than $550,000.[255] The TBEP also has applied for hundreds of thousands of dollars in grant proposals for a wide range of projects.[256]

Implementing the CCMP and Interlocal Agreement

The Interlocal Agreement (IA) is designed to secure commitments from each TBEP partner to achieve specific goals for the restoration and protection of Tampa Bay within an agreed-upon timeframe. How the goals are met was left for the individual governments to decide so that they could choose the most affordable and environmentally beneficial options for their community. Pursuant to the agreement, all parties submitted a detailed five-year action plan (1995 – 1999)[257] that describes the projects they will take, or plan to take during the period.[258] On a parallel track, the TBEP's Nitrogen Management Consortium and its public and private partners developed action plans to meet the CCMP's nitrogen reduction goals.

Progress to date has been impressive [Tables 5, 6, and 7]. Individual partners have committed to more than 200 actions and projects.[259] The 105 projects included in the Nitrogen Management Action Plan are expected to remove or prevent the discharge of approximately 120 tons per year with about half of the reductions coming from the industry members of the Consortium.[260] Collectively, these efforts are expected to exceed the CCMP's goal by 60 percent or 30 tons per year [Table 5].[261] In terms of habitat restoration, the TBEP partners should achieve or surpass many of the CCMP's goals. During 1995 – 1999, SWFWMD, FDEP, local governments, and other TBEP partners are expected to complete 1,600 acres of habitat restoration including 250 acres of low-salinity habitat that will be created or restored, well exceeding the five year goal of 100 acres [Table 6].[262]

The TBEP is also involved in a wide range of research, technical assistance, and public participation activities. The TBEP is currently conducting research on three priority issues: 1) the causes and effects of atmospheric deposition of nitrogen compounds and toxic contaminants;[263] 2) developing numeric targets for sediment quality in the bay; and, 3)

Table 8: TBEP Annual Funding Contributions for 1998 to 2000

Organization	Funding Source	Amount
EPA	CWA, Section 320	$260,000
Clearwater	City Appropriation	$8,406
St. Petersburg	City Appropriation	$20,072
Tampa	City Appropriation	$23,694
Manatee County	County Appropriation	$19,373
Pinellas County	County Appropriation	$44,327
Hillsborough County	County Appropriation	$50,496
SWFWMD – Alafia River Basin Board	Basin Board Appropriation	$33,273
SWFWMD – Manasota Basin Board	Basin Board Appropriation	$33,273
SWFWMD – Hillsborough River Basin Board	Basin Board Appropriation	$33,273
SWFWMD – NW Hillsborough Basin Board	Basin Board Appropriation	$33,273
SWFWMD – Pinellas-Anclote Basin Board	Basin Board Appropriation	$33,273

Source: TBEP, *Tampa Bay Estuary Program Biennial Review: October 1998* (St. Petersburg, FL: TBEP, October 1998), 51.

identifying appropriate public health indicators for subtropical areas such as Tampa Bay. The goal of this research is to develop a scientifically sound basis for actions addressing these issues.

In terms of technical assistance, the TAC remains an important forum for scientists, technocrats, and decisionmakers to discuss issues. The TBEP continues to produce technical reports and staff makes numerous presentations and responds to requests for information from the public and decisionmakers. The TBEP's staff also provides technical support to other groups by sitting on various advisory committees of other local and regional environmental protection efforts. The TBEP's staff have also served as facilitators and moderators for various groups.[264]

The TBEP currently maintains an aggressive public participation program. The TBEP's primary mechanism for public involvement remains its Community Advisory Committee (CAC). This group meets every other month and more often if necessary.[265] Once the CCMP was approved, the CAC struggled as it tried to find a new identity and be more than a passive entity that responded to TBEP proposals. One way it did this was by developing its own action plan for promoting public education. They also created a Speakers Bureau which uses CAC volunteers to make presentations on Tampa Bay and the CCMP to local groups. Thus, it allows citizens to teach citizens about Tampa Bay and its importance to the community.

One of the drawbacks, however, has been the staff time that must be invested in terms of educating CAC members and encouraging them to spread what they have learned to the community. Many CAC members also expressed frustration because the NEP structure prevents them from voicing their opinion on controversial issues (e.g., proposal for the use of Orimulsion fuel by a local power plant). Instead, the CAC's opinions are forwarded to the Management and Policy Boards, which may or may not embrace their views. At the present time, the Boards maintain a relatively neutral position on controversial issues, a source of frustration for some CAC members. For some long-time community and environmental activists this is a particularly

disappointing aspect of the TBEP, even though it may be necessary for the TBEP and the IA to function effectively.[266]

In terms of public education, many action plans continue, expand, and create additional public education and outreach programs. The TBEP's newsletter is distributed to more than 2,000 individuals and organizations. The program also maintains a World Wide Web (WWW) site that was redesigned in 1998 to improve its usefulness. The TBEP also runs a mini-grant program and provides up to $5,000 to local community groups. The TBEP continues to distribute its popular *Boaters Guide to Tampa Bay* and the *Tampa Bay Repair Kit*. The *Florida Yards and Neighborhoods (FY&N) Program* is ongoing and continues to expand to new areas.[267]

The TBEP's partners have begun incorporating the CCMP's goals into various decision-making processes. The FDEP and EPA have incorporated the Nitrogen Management Strategy into nitrogen Total Maximum Daily Loads (TMDLs) for Tampa Bay segments, one of the first approved TMDLs in Florida. The SWFWMD agreed to incorporate the nitrogen goals into its revised SWIM and Comprehensive Water Management (CWM) plans. The EPA agreed to incorporate the CCMP goals into all NPDES MS4 permits within the watershed. In March 1998, Manatee County incorporated applicable goals, objectives, and actions into its Comprehensive Plan. Other local governments have incorporated their action plans into their Capital Improvement Programs (CIPs). The TBEP's "restoring the balance" approach and restoration targets are being used by various agencies involved in restoration efforts such as the SWFWMD, local governments, FWCC,[268] and the USFWS.[269] Properties identified for protection have been incorporated into regional P2000 and SOR as top priorities for acquisition.[270] Hillsborough County's Stormwater Management Section is identifying sites during the preparation of watershed plans for the county's 17 drainage basins to identify areas where restoration work in low-salinity tidal streams can be done in conjunction with stormwater treatment facilities.[271]

Less progress has been made in other areas. No progress has been made towards the goal of improving on-water enforcement of fishing and environmental regulations. In part this is due to the reorganization and creation of the new FWCC. Due to major differences in contracting procedures between the TBRPC (on behalf of TBEP) and the COE, work on the proposed Dredged Material Management Plan is behind schedule. While progress is being made towards the development of sediment quality goals, it is behind schedule. The timeliness of seagrass monitoring results is also an issue. As of March 1999, results of seagrass mapping based on 1996 aerial photography had not been completed.[272] It is also unclear at this time how the requirements for regulatory flexibility on the part of the permitting agencies are implemented.[273] This is due to the lack of a large number of projects that have requested this flexibility. Thus, we were unable to make any judgements on the effectiveness of the flexibility requirements at this point in time.

Analysis

The analysis of this case study is divided into two sections. The first identifies those factors that appear influence the success of a watershed management initiative, whether it be positively or negatively. In some cases, the Academy requested we explore the importance of certain factors (e.g., public and community involvement). In other cases, the factors emerged

from our comparative analysis and review of the applicable literature. The second section examines the institutional performance of the Tampa Bay Estuary Program (TBEP) using criteria provided by the Academy as well as criteria drawn from the literature.

Components of a Successful Watershed Management Program

Our analysis of the six case studies suggests that the following factors have some influence on the development and implementation of watershed management programs: 1) a program's contextual situation; 2) public and community involvement; 3) use of science and other technical information; 4) well managed decision making process; 5) program administration; 6) collaboration; 7) EPA's programs and action forcing mechanisms; and, 8) performance-based management. The following sections discuss the importance of these factors. A more detailed discussion of the definitions and concepts discussed in this analysis, please consult the main report entitled *Environmental Governance in Watersheds: The Importance of Collaboration to Institutional Performance.*

Context Matters

Contextual factors played a strong role in influencing the development and implementation of the TBEP's CCMP. Of particular importance appeared to be the configuration of the watershed, the region's socio-economic and cultural environment, the nature of the problem, and the structure and history of the institutional arrangement managing the watershed. While a detailed analysis of the contextual factors is beyond the scope of this analysis, three examples are provided below while others are noted in subsequent sections of this report.

The configuration of watershed makes Tampa Bay the most prominent geographic feature in the region. A large portion of the local economy also benefits from a healthy bay (i.e., tourism) and much of the growing population is attracted to the region because of the environmental amenities it provides. Not surprisingly, the public is generally supportive of environmental measures which translates into political support and helps elevate environmental issues on the political agenda. However, the watershed is also quite large. While the population may identify with the Bay, there is less recognition of the watershed or how inland activities influence the Bay. This creates a real need for systematic public education efforts. These factors may explain why the TBEP's efforts have been Bay-oriented and somewhat less focused on upland or "watershed" issues.

One of the keys to the program's success also appeared to be its ability to find one focal issue to center the planning efforts around – in this case, better management of nutrient loadings from stormwater and other nonpoint sources. Because stormwater management is primarily a local government function in Florida, this meant that strong local involvement would be critical. Fortunately, there were strong incentives for local involvement because they are subject to regulatory requirements for improving stormwater at both the federal and state level. Thus, the initial incentive for local involvement was to protect their interests. Over time, local interest shifted to using the program to reduce regulatory problems. Local governments also have incentives to address stormwater problems beyond those created by regulatory requirements.

Public pressure often exists to address local flooding problems. Stable funding for implementation projects exists such as local stormwater utility fees, the state's land acquisition programs, and SWFWMD's various programs. This funding reduces one of the major disincentives for local government participation.

Finally, the structure of the institutional arrangement governing Tampa Bay and the history of previous planning efforts influenced the development of the TBEP. Previous planning focused the issues and identified priorities. They also identified data gaps and needs. The existence of a collaborative forum such as the ABM also meant that many of the actors had experience working together and were able to "hit the ground running".

We also concluded that while the NEP requires a relatively standardized planning process, it does provide the actors with enough flexibility to tailor their planning and implementation efforts fit contextual conditions. The NEP allowed the TBEP to pick an institutional home during the planning process that fit its particular setting. They were also free to structure their efforts around any particular water quality issue. Moreover, while they are expected to use some variant of the Management Conference described in this case, the TBEP was free to structure their committees and decision-making process in a manner that complemented these contextual factors.

Public and Community Involvement

The NEP places great importance on public and community involvement. Programs are expected to use a complex advisory committee structure, provide opportunities for public involvement, and to develop effective public education programs. The underlying assumption is that these activities improve an estuary program's effectiveness. Our analysis of this case study suggests that public and community involvement played an important role in the development and implementation of the TBEP's CCMP.

The TBEP appears to have developed a very effective Management Conference structure that ensured good representation of local governments, stakeholders, and the general public. They also provided numerous opportunities for public involvement and developed a number of highly effective public education programs. Strong local government involvement was instrumental to the program's development and the CCMP's implementation. The TBEP largely represents a partnership between local governments and regulatory agencies. The program also had strong federal, state, and regional agency involvement during the planning process and the execution of the IA. As a result, the program appears to have been effective in building relationships among decisionmakers. The TBEP was also effective at educating decisionmakers about Bay issues by providing technical information in a form useful to them.

What is less clear what influence public and stakeholder involvement had. While most stakeholders were represented in the management conference, involvement was limited primarily to the TAC and CAC. While both committees were instrumental to the development of the CCMP, it doesn't appear that these committees were effective in building a broad constituency for the CCMP among either the general public or industry groups. That should not be surprising. In a heavily urbanized watershed with a heterogeneous population, it is unlikely that a 30

member CAC could have represented the wide range of interests present in the watershed. Moreover, several respondents noted that despite attempts, the program has had only limited success in reaching certain segments of the population such as low income and minority communities.

The case also illustrates the advantages of being strategic in terms of committee membership and working directly with potential collaborators. The TBEP limited initial local involvement to the six main local governments. This appears to have been done for two reasons. First, involving the other 26 local governments would have created a large and unwieldy Policy and Management Committee. Second, these governments are much smaller and generally do not have the same capacity or resources as the local governments involved in the TBEP. The strategy was to get a management framework in place first and to then try to get other local governments involved.

A similar approach was taken to industry involvement. Industry representatives were explicitly left off of the Policy and Management Committees because agency officials were worried that their involvement might be counter productive or that the representatives would work to "water down" the plan. There was also a sentiment among many Policy and Management Committee members that it made more sense to figure out what needed to be done and make local commitments for action before they went seeking commitments from industry. This strategy proved to be highly effective. After determining the nutrient reduction targets and local government's share of the reductions, they established the Nutrient Management Consortium to work directly with specific companies to achieve specific commitments. It is unlikely that simply having an industry representative on the Policy or Management Committee would have resulted in similar commitments. Accordingly, the case demonstrates the value of working directly with the potential collaborators instead of through some representative of a group of *potential* collaborators. This suggests that a central challenge for the TBEP in the future will be to expand collaborative efforts to other local governments and industry members to achieve greater nutrient reductions.

Use of Science and Other Technical Information

One of the major features of the NEP is that programs are given substantial resources during the planning process to do the basic and applied research necessary to develop, modify, and refine management strategies. This is one reason that the TBEP spent a disproportionate amount of funding on planning compared to implementation. Programs are also encouraged to maintain an active research agenda during the implementation phase, although they are expected to leverage this research money from other sources. Our analysis suggests that science can play an important role in the development and implementation of a CCMP, particularly when it is "nested" in the decision-making process.

The TBEP appears to have used its research dollars effectively by filling important gaps in scientific understanding and providing information needed by decisionmakers. There are several reasons why this was the case. First, one of the advantages of having numerous agencies with technical expertise, good monitoring data, having undertaken previous planning efforts, and holding the BASIS symposiums was that there was a good understanding about what was known

and not known about the Bay. As a result, there was a good understanding of the TBEP's information needs. Second, the TBEP developed an effective TAC. The high capacity of the local institutions meant that the TAC was largely comprised of technical experts working in different agencies rather than in some other estuary programs that are forced to rely primarily on university faculty and consultants. This gave the TAC a healthy appreciation for the information needs of decisionmakers. It also provided an important opportunity for ongoing collaboration among technical experts. The TAC remains an important forum for discussing technical issues in the implementation phase. Third, the Management Committee was actively engaged in technical discussions related to the development of the TBEP's goals. Since many of their subordinates were the members of the TAC, they seemed willing to trust the TAC's technical judgements. Finally, agencies like SWFWMD and FDEP were actively involved in the TAC and viewed themselves as clients for the research funded by the TBEP. This helped ensure that the models and technical work would be of value to them in their regular decision-making processes. The ability of the FDEP to adopt the CCMP and its nutrient reduction targets as a TMDL and other agencies adoption of the TBEP's priority restoration sites are evidence of the value that the science and technical information generated by the TBEP had to other decisionmakers.

The TBEP appears to get a high return on their investment in scientific research. They were able to develop models that linked nutrient loadings to seagrass health. This allowed them to develop quantifiable goals that form the basis of the CCMP and the IA. The TBEP was effective at developing other technical information needed to support CCMP implementation. For example, a guidance document describing how much nutrient reduction credit would be given to implementation actions was developed along with techniques for monitoring seagrass recovery. The TBEP also developed a habitat restoration plan with revised priorities for land acquisition. The TBEP also improved its capacity for environmental monitoring by integrating existing environmental monitoring programs. The TBEP also funded some path-breaking research in such areas as the impacts of atmospheric deposition on nutrient loadings to the Bay.

Well Managed Decision-Making Process

An important observation that emerged from this analysis was the importance of a well-managed decision-making process and the importance of: paying attention to the committee structure and the roles of these committees; having clear rules to govern decision making; a focal problem or issue to structure the planning effort around; and having a clear vision of what the "plan" will become in the implementation phase. The analysis also revealed the importance of leadership and having someone play the role of a champion (i.e., fixer or broker)[274] for the IA as well as the constructive role that a professional facilitator can play in helping resolve and manage conflict.

Our analysis suggests that the TBEP was effective at managing the decision making process that produced the CCMP. First, the TBEP maintained a formal committee structure with clearly differentiated roles and responsibilities with well defined relationships and good interaction between the committees. They also had clear access rules with respect to who could sit on committees and who would appoint members to the committees. This formality was particularly important given the past history of conflict between many of the committee members. Second, the TBEP had clear decision rules. While voting was used, it was mostly

used to keep the process on track and not to push through anything that was controversial. The understanding was that the committee would try to reach consensus before going to a vote. Over all, the program was effective in developing consensus among the decisionmakers with most respondents unable to identify any substantive or controversial issues that were decided strictly on the basis of a majority vote. Under the IA, they developed a more complicated set of voting procedures whereby depending on the issue, different voting rules apply. Third, the program was largely structured around a couple of interrelated issues, namely nutrient loadings from NPS and habitat restoration. This kept the process focused. Fourth, several Policy and Management Committee members took on the role of "fixer/broker" and "devil's advocate" to ensure that the group "kept their eye on the ball". These individuals kept the process from being side tracked by peripheral issues. It is also likely that these individuals helped prevent social-psychological problems such as groupthink from occurring. The committees were also chaired by individuals with experience in managing group discussions, which helped keep the meetings on track. Fifth, there was good leadership at all levels and stability among the committees' membership. The Policy Committee was dominated by politicians and agency directors with key subordinates sitting on the Management Committee. Active involvement of high-level officials also sent the message to their subordinates that this was something that was important to the agencies and local politicians. Each committee also appeared to have good leadership and a healthy group dynamic that was reported by nearly all of the respondents. Sixth, since the early days of the program several committee members were adamant that they were there to produce more than just a plan. Most participants wanted some sort of binding commitment to do the things in the plan because all had been involved personally in one or more planing efforts where the plans did little more than gather dust on some shelf. As they neared the end of the planning process, one individual was particularly instrumental in being a "champion" and pushing the group to start the discussions that ultimately led to the IA. Finally, the TBEP relied on an outside facilitation team to help develop the IA. Many of the respondents viewed their efforts and ability to manage the inherent conflict that was generated as a key to the TBEP's ability to develop the IA.

The case also illustrates the role that politics and values can play in a collaborative effort. While this will be discussed in more detail in the main report it is important to mention a few examples. First, politics and lobbying are one of the reasons that there is a long history of planning in Tampa Bay and requirements such as having all wastewater treatment plants at advanced treatment. Politicking also helped get them into the NEP. Second, the program was effective in avoiding the politicization of science that occurred in some estuary programs (e.g., Delaware Inland Bays). However, it should be clear that the goals and objectives selected by the TBEP were also political decisions. While science and technical information was important in framing the issues, it did not make decisions for local politicians. The parties still needed to decide on benchmarks such as the goal for seagrass restoration and whether to use 1950 as the reference point. As one respondent noted, 1950 was chosen because "we want the bay to look like it did when a lot of people who're in the office now were kids. . . . People remember the way it was before. They also realize we are not going to get back to a pristine condition. This is a very urbanized estuary. There are a lot of people and they aren't going to go away. We wanted to make an aggressive but realistic goal." It also turned out that 1950 was the beginning of rapid population growth in the region and there were good aerial photos to estimate seagrass coverage.

Program Administration

There also appears to be no substitute for well-managed program and building an effective organization. Factors such as having an effective program director, staffing (e.g., recruitment, hiring, retention, training) and personnel management (e.g., personnel evaluations, grievance procedures), budgeting, grants management, and contracting procedures had an important affect on a CCMP's development or implementation. Financial resources also played an important role in the development and implementation of a CCMP. The stability of resources also appears to be at least as important as having adequate funding to undertake the implementation actions necessary to address problems like NPS and habitat restoration.

Many respondents noted that the TBEP's staff deserved a great deal of credit for the success of the program and almost no one identified any significant problems related to program administration. By all accounts, the TBEP's director was effective at managing the planning process and working behind the scenes to address the concerns of particular actors. As one respondent noted: "We [TBEP participants] were fortunate to hire an executive director who had the art of negotiating and was not combative with anyone and was able to put together a good staff." It also helped that the director had worked on the development of the SWIM plan for Tampa Bay and knew many of the key actors. The TBEP also benefited from it's relationship with the TBRPC, which had the capacity to manage the approximately $1 million per year received from the EPA during the planning process and had experience working with other agencies contracting procedures. We expect that the TBEP will benefit from using the TBRPC for administrative support during the implementation of the IA. Overall, these factors contributed to the development of a well-managed program.

Another factor that contributed to the TBEP's success to date is the stable revenue sources available for CCMP implementation. Florida's land acquisition programs (e.g., P2000, CARL, SOR, etc.), SWFWMD, and local stormwater utility fees are just three sources of funding for CCMP implementation. Funding stability is important because it allows the actors to systematically address local problems and lets the CCMP's priorities drive implementation efforts rather than the priorities in federal grant programs. The TBEP also benefits because the partners contribute real dollars to match the EPA's funding. This provides additional stability. For example, it increases staff's job security because they are not working exclusively off "soft" (i.e., discretionary or short-term) grant money. This helps reduce staff turnover. The contribution of actual financial resources to the TBEP is also a strong indicator of the commitment and support the TBEP has among its partners while the contributors have a corresponding interest in ensuring that their funding is used effectively.

Collaboration and Building Effective Partnerships

This case also illustrates how watershed management may be better viewed as an attempt at intergovernmental management (IGM). Its value hinges on its ability to develop, manage, and sustain collaborative relationships that add public value. As one FDEP official observed: "To me, the power of the watershed approach is in the collaboration." This is clearly a challenge because the jurisdictional boundaries of state and local governments rarely coincides with watershed boundaries. As one local official noted: "I know there are jurisdictional, invisible

barriers between communities, states, and local governments. They don't communicate. They don't share resources. They seem to be in competition with each other most of the time." The TBEP overcame these challenges.

While the TBEP was a collaborative planning effort, its real value may lie in the other forms of collaboration that were the by-products of the planning process. One way value was added was by creating new collaborative partnerships. Examples include: the collaborative monitoring program that has now expanded into other estuary programs; the development of the Florida Yards & Neighborhoods Program; the IA; and, the Nutrient Management Consortium. These examples illustrate the fact that watershed management is more than just "planning" or having one big centralized "program" or "Bay Authority". Rather, it focuses on improving agency decision making and finding ways to work together in a collaborative fashion to improve the operation of existing programs (e.g., the monitoring program). As one respondent observed:

> "The collaboration between counties was not that great; there had always been some conflict there. But once they all got together sitting on the Policy and Management Boards, they finally realized that they were all going after the same thing basically and any improvements in the watershed really benefit them all. We're all dealing with our own set of peculiar little problems but we're dealing with it in an organized fashion. That was one big thing that came out of the CCMP and the action plan process."

This adds public value to existing institutions. Increased collaboration can also improve the capacity for problem solving. As one local official noted: "I think the estuary program has a nice balance of management and technical expertise that it has now become a good sounding board. I am always seeking and needing technical advice and it is nice to know that I have an agency and the management board to sound off on and seek advice from." The development of new collaborative organizations (e.g., TBEP) also creates additional institutional infrastructure that future watershed management efforts can build on in the future. An example would be the FDEP's use of the IA to satisfy its requirements for developing a TMDL for Tampa Bay.

Collaboration extended well beyond the development of new collaborative organizations (an organization created by the joining of other organizations in a partnership). The TBEP produced joint policy documents such as the TBEP's habitat restoration plan and developed a new forum for discussing technical issues (e.g., TAC). The TBEP developed a process for coordinating the actions of local governments with respect to stormwater management that ensures that their resources are spent more effectively and are designed to do more than simply satisfy their NPDES permits. There was also project (i.e., operational) level collaboration occurring. For example, a habitat restoration project might involve one organization providing the funding for land acquisition, another doing providing the technical expertise, another doing the engineering design work, another doing the actual construction, and yet another doing the maintenance and management of the site. If volunteers are used to assist in the construction activities, another organization may help recruit the volunteers.

These collaborative activities added public value in various ways. First, the collaborative efforts helped leverage funding. The TBEP was able to obtain additional research funding. The development of shared policies (e.g., habitat restoration) helped some partners leverage

additional funding. For example, the U.S. Fish and Wildlife office is in a better position to obtain discretionary project level funding. Second, even where it is questionable whether the TBEP leveraged "new" funding (e.g., existing expenditures for stormwater improvements or land acquisition would have occurred anyway), the evidence suggests that existing funding was spent more effectively. Third, collaboration improved the coordination of existing programs. Land acquisition programs adopting the same priorities as the CCMP is just one of many examples. Fourth, collaboration improved the integration of some programs (e.g., environmental monitoring). As one respondent noted: "One benefit of collaborating was this economizing. The other was that we needed to be sure we were measuring the same thing. We even share equipment now." Other examples include Manatee County incorporating provisions of the CCMP into its comprehensive plan and local governments incorporating elements of their action plans into local CIPs. Fifth, project level collaboration added value by allowing projects to get completed that otherwise would not be done. It also allowed projects to be completed at less cost to the taxpayers (e.g., using volunteers instead of paid laborers). Sixth, collaborative efforts helped the partners to leverage each other's policy networks so that they can lobby more effectively for federal and state grant funding and special appropriations. Finally, collaborative efforts were effective at building trust and social relationships that could then be leveraged in the future. As one TBEP participant noted: "I think we have created a meaningful partnership where participants trust each other and where they have a lot of peer pressure to make this work."

These different forms of collaboration and the benefits provided suggest that watershed management is more about governance than it is about planning. While planning can be useful in helping to develop such things as nutrient reduction targets or shared priorities for habitat restoration, implementing the plans and shared policies is a governance challenge – and advanced governance at that. One of the reasons the TBEP was a engaged in a wide range of collaborative activities was that the organizations:

- Were well-managed and had the managerial capacity for engaging in collaborative endeavors
- Had the slack resources (e.g., staff and funding) necessary to make meaningful commitments and contribute to these efforts
- Had well-developed institutions and the staff working in them realized that they needed to collaborate to achieve greater environmental improvements
- Had some history of collaboration in previous planning efforts and collaborative organizations (i.e., ABM and TBRPC) meant that there was previous collaborative experience
- Were not hung up with who got the credit for the collaborative effort or in pointing fingers for blame

Moreover, as one respondent observed: "In order for partnerships to have any meaning, there has to be some incentive for everyone involved."

We also concluded that it was important that the individuals participating in a collaborative effort were supportive of a team-based work environment. Several respondents noted problems with staff who resisted participating in collaborative efforts because they did not like working in teams or viewed it as wasted effort. Our data suggests that these tended to be the

older staff as well as those working in traditional command and control programs with well-defined responsibilities and requirements. However, the same respondents noted that these attitudes could be changed through involvement in an effective collaborative arrangement. As one respondent observed: "Some of the strongest opponents became the strongest proponents when they began to see that it could actually increase their ability to get things done rather than just taking time away from them." Accordingly, an organization's ability to collaborate internally or with other organizations depended on developing an organizational culture that supports collaboration and on recruiting staff with the skills necessary to organize and manage work teams. It was also important that upper management recognized the values and limitations of collaborative activities and rewarded employees for engaging in this behavior when it benefits the organization.

It was also clear that collaboration could occur among actors who had a history of conflict when they could find areas of mutual agreement and were willing to agree to disagree in other areas where conflict exists. Many of the local governments in the watershed are involved in intense conflicts with each other and other agencies (e.g., SWFWMD, and FDEP) with respect to other issues (e.g., water supply issues). Many of the local government respondents shared "horror" or "war" stories about these conflicts. This conflict is one of the reasons that there is still some institutional distrust, even though interpersonal trust developed as a result of the planning process. Despite this conflict, these parties were able to effectively work together to develop the commitments contained in the IA. The key was to find areas of agreement while at the same time being willing to agree to disagree on other issues. These areas of disagreement were then left off the table or dealt with in a fashion that avoided creating conflict. One example was to avoid placing heavy emphasis on water supply issues that caused water quality impacts. Another example was avoiding the politically contentious issue of land use and growth management. Instead, the CCMP developed a nutrient reduction strategy that takes existing development pressure as a given. Another example is the TBEP's practice of not commenting on controversial projects. The partners may disagree on the merits of these projects and if the TBEP were to take sides in the broader policy disputes, it could generate conflict that could disrupt collaborative activities. The strategies of staying focused on issues where there is mutual interest while simultaneously agreeing to disagree in other areas appear to be important to developing an effective collaborative organization. This finding also suggests that you might be better off trying to create several targeted and focused collaborative efforts instead of trying to deal with every issue or problem in the watershed using one large collaborative organization.

EPA's Role in Watershed Management

The role of the EPA and the FDEP (i.e., its state counter part) and their various water quality and NPS programs (e.g., NEP, Section 319), reinvention activities (e.g., Project XLC), and action forcing mechanisms (e.g., TMDLs, NPDES general stormwater requirements) varied considerably. In some cases, the EPA and the FDEP programs had relatively little role. The best example of this is the EPA's Section 319 program. While it has served as a source of funding for projects in the watershed, the relative amount of funding is small compared to the other funding sources. The same can be said for using the Clean Water State Revolving Fund (CWSRF) to address NPS water quality problems, although it remains an important funding source for upgrades to wastewater treatment plants.

The EPA program that had the largest role was obviously the NEP. The NEP played several constructive roles. First, the EPA funding provided the TBEP partners with a chance to fill existing gaps in technical knowledge and to refine the technical basis for existing decision-making processes such as habitat restoration. It also provided them with the funding necessary to manage the collaborative decision-making process used to develop the CCMP and the IA. This is particularly important given the high transaction costs associated with managing a collaborative decision-making process. The EPA's implementation funding also helps cover the TBEP's administrative costs. Second, the EPA designation and presence appears to have been important to local officials if only in symbolic terms. As one respondent noted: "EPA's involvement here has been very important to lend credibility to this approach. They have not directed anything and that's been important too. The folks here feel like they've been a big part of this; they've developed the goals and how to get there." Several respondents also noted that their hope was that the designation as a "National Estuary Program" would bring federal attention to their local problems and help attract additional federal and state dollars to address the Bay's problems. Third, the EPA provided some valuable guidance and technical assistance to TBEP project staff, an example of which is noted in the following section. Being part of the NEP was also beneficial because it allowed the TBEP to learn from other program's experiences in trying to accomplish a similar task, produce a CCMP. Finally, most respondents noted that the key to their success has been the flexibility that EPA provided to the TBEP. As one respondent observed: "Neither the state nor the EPA has told this program what to do; it's been entirely locally driven."

In terms of EPA reinvention activities and action forcing mechanisms, EPA's role was somewhat less constructive. As previously noted, the TBEP explored using the EPA's Project XLC to help implement the CCMP and withdrew its application when it could find no meaningful incentive for participation. The EPA's NPDES permits for stormwater have more of a mixed record. On the one hand, it is clear that these requirements stimulated the development of much greater capacity for managing stormwater at the local level (e.g., development of sophisticated engineering departments) and in developing funding mechanisms (e.g., stormwater utility fees). The EPA requirements also stimulated additional expenditures on stormwater improvements. At the same time, the NPDES permit process and EPA's administration of the program is a source of great frustration to local officials. Many of the activities require additional permits which increased the interaction between local officials and regulatory agencies, led some delays in getting permits, frustration with the lack of flexibility, and sometimes increased project costs with little associated environmental gains. This increased the level of conflict between local governments and regulators and led to the IA's provisions for regulatory flexibility.

The EPA's requirements for Total Maximum Daily Loads (TMDLs) appear to have the potential for creating major obstacles to the implementation of the IA. At this point, the FDEP is proposing to use the CCMP as a TMDL for nutrients. However, given the fact that the FDEP only received statutory for TMDLs during the last legislative session and the EPA has proposed new TMDL regulations, there is a lot of uncertainty with respect to the future of the TMDL for Tampa Bay. This uncertainty is counter productive and the source of many concerns, which may or may not be justified. In fact, numerous local officials, often without any prompting on the

part of the interviewers, identified TMDLs as one of the major potential obstacles to the future implementation of the IA. Most also see TMDLs has having the potential to drive a wedge between the partners and turn it from a collective effort to achieve goals into another command and control permitting process focused on achieving local permit requirements. Others see it as a flawed approach to water quality management and in conflict with the approach used to develop the TBEP. As one local official put it: "It [the TMDL process] is actually diametric to what the NEP has gone through methodology wise. It is totally diametric to that method and contrary to the last ten years of thinking we have had in a holistic approach to environmental clean-up. It is kind of contrary to environmental resource permitting, contrary to ecosystem management." This quote is very representative of the sentiments among local government officials.

Performance-Based Management

One of the central features of the CCMP is its reliance on clear, quantifiable, and measurable goals for monitoring implementation efforts. As one respondent noted: "Because we have these numeric goals, it's easy to see if we're meeting them or not. That's probably our most important achievement." The development of these measures had a profound influence on the TBEP. It focused the TBEP's research agenda. It provided focus to the planning effort. "Working with the community to identify a limited number of measurable and achievable goals brought focus to bay restoration and protection that had not previously existed. Although an extraordinary effort was devoted to developing the goals, their value was not fully appreciated until the Interlocal Agreement took shape."[275] The regulators likely would have been unwilling to provide regulatory flexibility without some commitment to nutrient reductions. It would also have been difficult to secure voluntary commitments from industry for nutrient reductions without local government commitments. While having a numerical target helped focus these discussions, having the ability to monitor and track whether the targets are reached is perhaps more important. It minimizes the potential for free-riding and shirking. The Interlocal Agreement also creates a visible process for monitoring and tracking implementation actions. Although, the parties to the IA have resisted putting information in a form that would amount to "finger pointing" or present things in any way that one partner stands out. The TBEP even tries to avoid situations that might lend themselves to finger pointing. Instead, they have chosen to rely on more of a peer-pressure system that many respondents identified as being the key to sustained collaboration and making local commitments to nutrient reductions.

The EPA also played a constructive role in helping the TBEP develop its performance measures. Early in the TBEP's planning process, the EPA hired the Urban Institute to develop a guidance manual on performance measurement.[276] The contractors worked closely with staff from the TBEP in the development of the guidance manual. Several respondents noted that this experience was useful in helping them refine their vision of the CCMP and its goals.

Institutional Performance

When examining the performance of an institutional arrangement, it is important to use a variety of criteria to gain a better understanding of its strengths and limitations. It is also important to recognize that there may be a disconnect between the performance of an institutional arrangement and its ability to achieve desired environmental outcomes.[277] For

example, you could have a well functioning institutional arrangement but the underlying policy is flawed and unable to achieve the desired outcomes. The nature of watershed management also makes it difficult to determine causality. Numerous federal, state, regional, and local programs have an impact on the outcomes of interest (i.e., changes in water quality and habitat). It is difficult to disaggregate the effects of each program let alone determine which marginal changes in these programs were due exclusively to a watershed management program. Moreover, given the prevalence of collaborative (i.e., networked) arrangements in this case study, it is important to assess performance form the perspective of different actors since one's measure of success might change as you move from node to node in the network.

In this analysis, we rely on criteria provided by the Academy. These criteria included: 1) risk reduction; 2) potential for short- and long-term gain; 3) cost-effectiveness; 4) predictability of the process; 5) certainty of effect; 6) accountability; 7) equity; 8) adaptability; and, 9) capacity building. For a more detailed discussion of the definitions, concepts, criteria, and the application of these criteria, please consult the main report entitled *Environmental Governance in Watersheds: The Importance of Collaboration to Institutional Performance*.

Risk Reduction

This criterion is concerned with the question of whether the program has demonstrated an ability to achieve environmental outcomes. We are primarily concerned with the TBEP's ability to achieve its nutrient reduction and habitat restoration goals. Despite the aforementioned causality problems and the relatively short implementation history, there is reason to believe that the program is currently on track to meet its goals in these two areas. As indicated in Tables 5, 6, and 7 and elsewhere in the report, the TBEP has already made great strides towards achieving the CCMP goals during the first five-year implementation cycle. Currently, local governments and private industry have agreed to implement projects that would satisfy the CCMP's crucial goals regarding nutrient reductions and habitat restoration. As noted in the previous section on collaboration, there is also reason to suspect that the TBEP has made the types of intermediate-level changes in decision making that offer the potential for improving environmental outcomes. Examples would include better land acquisition and habitat restoration decisions and targeted stormwater management activities. It also appears that collaboration helped develop more effective projects and that additional environmental improvements are expected. Accordingly, these data suggested to us that TBEP has achieved some notable environmental improvements.

Potential for Short- and Long-Term Gains

It also appears that there is a reasonably high potential for continued environmental improvements over the short-term (3 to 5 years). Work continues to progress on the first five-year work plan and there appears to be a high probability that the vast majority of the projects contained in the action plans will be implemented. Given the relative ease that the TBEP had in reaching its nutrient reduction and habitat restoration targets during this first five-year work plan, we also expect similar success as they enter the next five-year implementation cycle. Especially when one considers the political and financial support the TBEP currently enjoys. The five-year work-plan process also creates strong incentives for the parties to continue the development of

projects and to maintain existing efforts (e.g., Florida Yards & Neighborhoods program) in order to continue getting nutrient reduction credits.

It is less certain what will happen over the long term (5 to 20 years). The "hold the line" strategy must still be tested from a scientific perspective. For example, the assumption is that 1992 to 1994 nutrient levels are sufficient to maintain the 500-acre per year recovery rate. Only time will tell if this is really the case. Accordingly, long-term success may hinge on the TBEP's ability to modify and change its goals based on new research and environmental monitoring data. Another question pertains to whether there are diminishing returns with respect to many of the stormwater management and habitat restoration activities. As one respondent noted: "We're in it for the long haul. The next five years will be harder and the ones after that even more so. We've done the easy part." Many local officials reported targeting their efforts where they could achieve the highest returns from their investments. If this is the case, one would expect with time that there will be diminishing returns with respect to these investments. It is also questionable whether it will be possible to "hold the line" if growth continues into the future at present rates. It may also be particularly difficult to meet the habitat goals since increased growth will result in lost habitat. Finally, the potential for long-term gains may hinge on the TBEP's success in getting other local governments and industry partners involved in the IA and the Nutrient Management Consortium.

Cost-Effectiveness

Efficiency is an important principle of public administration and we are concerned with how effectively the TBEP used its resources. What complicated the analysis was the wide range of intangible costs and benefits associated with these programs as well as the transaction costs involved with developing and implementing the CCMP.

A central feature of the NEP is that it invests a disproportionate amount of its resources in planning activities compared to implementation efforts with a large portion of the planning money used to fund scientific and technical work and public outreach and education. Accordingly, judgements about the cost-effectiveness of the planning process largely depend on judgements about the cost-effectiveness of these expenditures. On both counts, the TBEP fairs well. The scientific and technical work was critical to determining the CCMP goals and the substance of action plans and management strategies. In terms of public education, the TBEP developed several effective public education programs that it continues to implement. In addition, few respondents noted any significant examples of wasted expenditures. From a transaction cost perspective, the planning process incurred significant costs to the TBEP which staffed the effort and the partners also invested considerable staff resources by participating in the Management Conference process. Although the process was time-consuming, most respondents viewed this investment in positive terms and noted that there did not appear to be any way to shorten the process. The decision-making process was also well managed which this likely helped reduce transaction costs. Based on this rationale, it appears that the planning funds were well spent.

The TBEP receives less funding for implementation. Essentially, it is enough to maintain a small core office staff and undertake a few small projects. In our view, the measure of the

TBEP's cost effectiveness during the implementation process is whether it does more than simply spend EPA's small appropriation of $300,000 per year. To date the TBEP appears to be highly effective in leveraging resources for CCMP implementation as indicated by the projects and commitments included in the first five-year action plan. The TBEP secured annual contributions from many of the TBEP partners to fund additional implementation activities. These benefits appear to outweigh the higher transaction costs associated with developing and maintaining the collaborative institutional arrangements (e.g., IA, Nutrient Management Consortium, Monitoring program, etc.) that oversee these activities.

Predictability of the Process

Institutional performance can also be judged in terms of the predictability of the process. We are concerned with two related questions: 1) the ability of the planning process to produce the intended result; and, 2) whether the program creates predictable conditions or requirements that allows its participants to plan and budget with confidence.

One of the NEP's strengths is that it employs a predictable process that results in the development of a voluntary CCMP. The TBEP followed the recommended process and ended up with a CCMP that is similar in form to other estuary programs. However, it is also possible that the process resulted in a wasted step. Several respondents suggested that if they had it all to do over again they would have skipped the completion of the final CCMP and moved directly to developing the IA.[278] Moreover, the NEP's prevailing expectation was only to produce a voluntary plan without the sort of binding commitments that the program ultimately adopted in the IA. Accordingly, committee members such as the "champion" had to continually push to get other committee members to move beyond the NEP's norms of developing a voluntary plan. It is possible that the NEP might be more effective in generating CCMPs with binding commitments if it had no norm or expectation for producing a voluntary plan. We believe that this norm only can serve as a disincentive for those who enter the NEP's process with higher expectations. After all, if the NEP had no norms or expectations, the worst the EPA would end up with is a voluntary plan with no binding commitments for CCMP implementation.

From an implementation standpoint, a clear strength of the IA is that it creates a predictable process that allows the TBEP partners to plan and budget with confidence. Evidence of this can be seen in the fact that the TBEP appropriation is now a line-item in agency budgets. The five-year work plan process allows local government partners to better manage their expenditures and due the long-range planning associated with getting implementation efforts included in local CIPs. Moreover, the stability of available funding sources helps the partners to plan and develop long-range implementation actions.

Certainty of Effect

At the most basic level, the ultimate measure of success for any planning effort is whether the "plan" is actually implemented. This involved making two distinct judgements. First, we determined whether the action plans recommended in the CCMP were implemented or were likely to be implemented. Second, if this did not occur, we examined whether the participants were engaged in a substitute set of activities designed to achieve the CCMP's goals.

One of the downsides of the NEP's emphasis on producing voluntary "plans" is that there tends to be little certainty that specific action plans are implemented. This appears to be the case in the TBEP. Even with the commitments contained in the IA, there is no requirement that the parties implement the action plans. Rather, the expectation is that the partners will use the action plans as suggestions to guide their development of the five-year action plans that provide the foundation of the IA. Even with the relatively short implementation experience, the evidence suggests that some actors have begun to deviate from the specific provisions of some action plans. Although, the evidence also suggests that some social norms developed such that some action plans appear to be more likely to be followed than others are.

While there is little certainty that the provisions of the action plans will be followed, there is a high certainty that the goals of the CCMP will be achieved over the short- if not the long-term. A clear strength of the TBEP, especially when compared to other estuary programs was that there are clear and unambiguous binding commitments for achieving the CCMP's goals. Moreover, the goals that are most likely to be achieved are those pertaining to nutrient loadings and habitat restoration, two of the more pervasive problems affecting the Bay. Moreover, in addition to the binding commitments, other factors appeared to increase the certainty that the goals will be achieved including political support, monitoring both implementation activities and environmental outcomes, the development of an effective peer pressure system, and the availability of stable funding sources for implementation activities.

Accountability

It is important that there are mechanisms to hold officials accountable for their actions and the allocation of scarce resources. We identified a wide range of accountability mechanisms, some of which have already been highlighted in the report:

- the Policy Board's control and oversight over the TBEP staff as well as the Management Board, CAC, and TACs' activities
- EPA's oversight of the TBEP through its biennial review process and its approval of annual work plans
- The five-year work plans and TBEP reporting create a peer pressure system that allows the board members to monitor each other's progress
- Professional accountability is enhanced by having the Policy Board defer to the Management Board who often defers to the TAC
- Political accountability is enhanced through provisions such as open meetings (i.e., sunshine requirements), provisions for public notice on some TBEP activities such as approval of the annual budget, reporting requirements
- The IA's sunset provisions and provisions that encourage parties to revisit the CCMP's goals are designed to hold the parties accountable for progress in achieving the goals

However, the most important accountability mechanism is likely to be the binding IA. Unlike other CCMPs, a binding agreement was developed to ensure that its goals are achieved. It also

creates many of the accountability mechanisms noted above. This suggests to us that there is a relatively high degree of accountability with respect to the TBEP.

Equity

Another useful criterion for examining institutional performance is equity or fairness. There are a lot of different ways to view equity. Fiscal equivalence holds that those who benefit from a service should bear the burden of financing it. Thus, those who derive greater benefits are expected to pay more. Redistributional equity concerns structuring program activities around differential abilities to pay. Considerations about the equality of the process and the equality of the results are also important. Overall, the TBEP did a good job of minimizing equity problems. In part this can be attributed to the commitment to a consensus-based process and the time spent negotiating the IA.

The TBEP fairs well in terms of fiscal equivalence because the partners to the TBEP who receive benefits from the program also provide substantial implementation funding. The program also addressed potential distributional problems by structuring a funding formula around differential abilities to pay [Table 8]. Other aspects of the TBEP and the IA appear to minimize potential equity problems. The TBEP's use of a five-year planning cycle provides local governments with flexibility to address periodic fluctuations in local financial situations. The use of a recent goal (1992 to 1994 nutrient loadings) avoided potential conflicts surrounding historic nutrient reduction efforts. They also back-dated the first five-year agreement so the partners were not penalized if they started implementation efforts prior to adopting the CCMP or IA. The monitoring procedures and peer-pressure system embedded in the IA help minimize free-riding and shirking activities that can create equity problems.

A potential equity problem that surfaced concerned the targeting of local efforts on the Tampa Bay watershed as compared to other watersheds in these political jurisdictions. This is particularly problematic for Pinellas and Manatee Counties and could create obstacles in the future. Both have significant portions of their counties located in other watersheds. In Manatee County, a portion of the watershed is located in the SBNEP watershed. In Pinellas County, much of their tourism revenue is generated in coastal communities located outside of the Tampa Bay watershed. In both cases, targeting nutrient reduction efforts and habitat restoration efforts in the Tampa Bay watershed means that these public expenditures can not be spent in other county areas. This creates potential equity problems because residents and businesses in one watershed will benefit at the expense of those in other watersheds. While these problems do not appear to be particularly problematic at this point in time, they could become obstacles to CCMP implementation in the future.

Another potential equity problem was created by the IA's allowance for water quality trading. The issue is whether it is appropriate or politically feasible to have a local government spend its taxpayers money constructing projects in other political jurisdictions. Many of the local officials we interviewed were uncomfortable with this scenario and stated that the option is not on the table for discussion. Currently, it is not a pressing issue because there are plenty of cost-effective opportunities for projects in each community. However, over time this issue is likely to increase in visibility as nutrient reductions and restoration activities increase in cost.

Adaptability

Unless institutional arrangements have the capacity to respond to their ever-changing environments, performance is likely to suffer. Reflected here are concerns similar to those who argue for adaptive approaches to ecosystem-based or community-based management. The TBEP appears to have several provisions that encourage adaptability and learning. The five-year work plan and annual supplements were designed to encourage flexibility and allow local governments to adapt to changing environmental, political, and financial circumstances. The IA's monitoring provisions should help the participants determine the adequacy of their goals. The IA contains provisions to encourage the modification of these goals. The IA's sunset provisions encourage the partners to revisit its provisions and adapt or modify its goals. Therefore, there are provisions that both encourage adaptation as well as social learning. There is also some evidence that suggests that other programs in Florida (e.g., FDEP's Ecosystem Management Initiative) are learning from the TBEP's experience.

It is less clear how effective the TBEP will actually be in adapting. Long time periods may be necessary to determine trends in water quality or habitat restoration and to determine the efficacy of the program's goals. Changing some goals such as those developed for nutrient reduction could be difficult and require related changes (e.g., seagrass recovery). Some changes in the IA such as adding the TBRPC to the Policy Board require a unanimous vote, which may limit their use. It is also unlikely that after the months spent negotiating the IA, the partners will want to make major changes to the agreement. Accordingly, we would expect that there will be more adaptation at the program management level (e.g., making changes to five-year work plans) and social learning than substantive changes to the structure of the IA.

Capacity Building

A final criterion that can be used to assess a watershed management effort's performance is whether it was effective at building the capacity for solving the complex environmental problems confronting the participants in the program. Our analysis has previously noted a number of areas where the TBEP was effective at building the capacity of different institutions. These include:

- Filling important gaps in science and technical information needed to make management decisions
- The TAC improved communication among scientists and technical staff and created new opportunities for collaboration
- It legitimized and rewarded ongoing collaboration at the project level (e.g., habitat restoration) and provided information to encourage additional projects
- The program improved local government problem solving and capacity for taking action in such areas as improved stormwater management and habitat restoration
- Developed new collaborative institutions (e.g., monitoring program, Florida Yards and Neighborhoods, IA, Nutrient Management Consortium) to complement those that already existed (e.g., TBRPC, ABM)
- Developed new policies in areas such as nutrient reduction and habitat restoration that are now integrated into other agency decision-making processes

- Improved the administration of existing programs (e.g., monitoring programs)

It is also important to recognize that there was already a high capacity in many of these institutions. Thus, the capacity building that occurred consisted mostly of incremental changes or "fine-tuning" of existing institutions and filling important gaps rather than significant development of new problem solving capacity. Accordingly, our analysis suggests that the watershed effort resulted in improved governance of existing institutions and the creation of new institutions. We believe that this has improved the management of the watershed and increased the likelihood that these institutions can effectively address the problems confronting Tampa Bay.

Summary and Conclusions

The TBEP and its collaborative approach to improving the governance of the Tampa Bay watershed appears to be a true "success story". The TBEP's achievements were recognized by the EPA in May 1998 when it awarded a Bronze Medal for its CCMP.[279] The Nitrogen Management Consortium has also been recognized with a Sustainable Florida Award for Leadership by the Governor's Council for Sustainable Florida. The case has already described many of the TBEP's strengths. These included the program's ability to nest science within a well-managed decision making process and in developing both quantifiable goals and a process to measure and track progress on a regular basis. The program was also able to refine its existing institutions and to develop new collaborative arrangements that add public value and improve watershed governance. Perhaps its greatest strength is that it appears to have the political commitments and resources to make significant improvements in environmental conditions.

While these successes are notable, it is important to recognize that the TBEP and its IA are new and still evolving. Only time will tell if the program will mature into an effective governance arrangement with the ability overcome the political, environmental, and resource challenges that it is likely to encounter. It may also prove challenging for the TBEP to sustain the energy, support, and leadership necessary to remain effective over the long run. There are also some potential weaknesses in the TBEP that could present challenges.

The first obstacle to long-term effectiveness might be the program's lack of a substantive linkage between land use to water quality management, which is reflected in the CCMP's focus on the Bay rather than on the watershed. The TBEP approach is one that largely takes current growth and land development patterns as a given and then seeks to achieve nutrient reductions necessary to accommodate increased growth. While this approach is likely to work in the short term, it raises questions about the sustainability of the policy over the long-term. It is also possible that effective growth management might reduce the costs associated with nutrient controls over the long-term. Moreover, even if the agencies accommodate the nutrient loading concerns, increased development will result in lost habitat.

However, the TBEP should not be faulted too much for the failure to link land use and water use planning. While Florida has comprehensive requirements for both land and water use plans, these programs are not well integrated at the state level. There is also a continued need for coordinating the implementation of these programs. Various state-level commissions over the

last twenty years have all recommended that land and water use regulation and planning efforts be coordinated and integrated. However, other than a few periodic reorganizations of state environmental programs, there has been no concerted effort to link the two sets of programs. The result is a complex, fragmented institutional framework that is good at developing discrete programs to address specific problems. The current system in Florida is often not particularly good at developing coordinated solutions to interrelated problems.[280]

The second challenge will be whether the TBEP is able to bring in more private sector and local government participation in the Nutrient Management Consortium and the IA. As one respondent commented: "You have got to bring in the private sector and they have to figure out how to do that effectively . . . It has got to be more of a feature because EPA is decreasing their funding which means everybody else has to increase their funding." It will also be important to bring in more local government involvement. Both should help achieve additional nutrient reductions and enlarge the resource base that funds TBEP operations. The challenge will be to figure out how to do it without disrupting the successes that have already been achieved.

The third challenge will be for the TBEP to figure out how to address isolated NPS problems affecting small embayments or tributary segments. The existing approach is one that focuses on collective and regional goals. It is possible that progress towards these goals can be sustained over time without addressing isolated water quality and habitat problems. Thus, additional efforts at smaller scales may be required to further improve water quality and habitat throughout the watershed.

Even with these minor criticisms, our analysis concludes that the TBEP represents an effective watershed governance program. However, the most important measure of success, particularly for a collaborative program like the TBEP, may be that the collaborators view the program and its various activities as successful and believe that there is value in their continued collaboration and expenditure of resources to assist in implementation efforts. In fact, the respondents we interviewed were hard-pressed to identify substantive problems with the planning process, the CCMP, or the Interlocal Agreement. All praised the program, often in glowing terms like the following comments of one local official:

> "[TBEP Director] did not pay me to say this either . . . but this has been the most impressive, and I have been in government for more than 20 years, and I have never seen anything like this where you had the support of politicians and scientists and even the commercial side and the residential side, the citizens, actually wanting to do something so much that they were willing to sit around a table and work it out. I mean it was incredible."

Accordingly, we believe that much can be learned from the TBEP in terms of developing and implementing a watershed governance program as well as the role that collaboration plays in these efforts.

End Notes

[1] Originally the program was called the Tampa Bay National Estuary Program (TBNEP) and was renamed as the Tampa Bay Estuary Program when it entered the implementation phase. This was done to distinguish the new locally led implementation effort. To simplify the discussion the program will be referred to as the TBEP throughout the case study.

[2] The EPA identifies nationally significant estuaries threatened by pollution, development, or overuse and assists estuary projects with the preparation of a Comprehensive Conservation and Management Plan (CCMP). The NEP currently has 28 estuary projects in 18 states and the commonwealth of Puerto Rico. The estuaries comprise a diverse set of ecosystems including both heavily urbanized and rural watersheds. The TBEP entered in the Third Tier of programs in 1990. The latest group of programs (Tier Five) entered the program in 1995 through a streamlined Governors nomination process. For more information on the governors nomination process see: EPA, *The Streamlined National Estuary Program: Instructions on the Preparation of a Governor's Nomination* (Washington, DC: Environmental Protection Agency, Office of Water, December 1994); and, EPA, *The National Estuary Program: Final Guidance on the Contents of a Governor's Nomination* (Washington, DC: EPA, Office of Water, January 1990).

[3] For more information on the history of the NEP and its development see: Mark T. Imperial, *Developing Integrated Coastal Resource Management Programs: Applying the NEP's Experience to Developing Nations* (Kingston, RI: University of Rhode Island, Coastal Resources Center, July 1995); Mark T. Imperial, *Public Participation in the National Estuary Program: A Descriptive and Empirical Analysis*, Masters Thesis (Kingston, RI: Department of Marine Affairs, University of Rhode Island, May 1993); Mark Imperial, Timothy Hennessey, and Donald Robadue, Jr., "The Evolution of Adaptive Management for Estuarine Ecosystems: The National Estuary Program and its Precursors," *Ocean and Coastal Management* 20 (no. 2, 1993): 147-180; Mark T. Imperial, Donald Robadue, Jr., and Timothy Hennessey, "An Evolutionary Perspective on the Development and Assessment of the National Estuary Program," *Coastal Management* 20 (no. 4, 1992): 311-341; EPA, *The National Estuary Program After Four Years: A Report to Congress*, EPA 503/9-92/007 (Washington, DC: EPA, Office of Water, April 1992); EPA, *Progress in the National Estuary Program: Report to Congress*, EPA 503/9-90-005 (Washington, DC: EPA, Office of Water, February 1990).

For more information on the development and implementation of individual estuary programs see: Renu Khator, "Networking to Achieve Alternative Regulation: Case Studies from Florida's National Estuary Programs," *Policy Studies Review* 16 (no. 1, Spring 1999), 66 – 85; Katrina Smith Korfmacher, "Invisible Successes, Visible Failures: Paradoxes of Ecosystem Management in the Abermarle-Pamlico Estuarine Study," *Coastal Management* 26 (no. 3, 1998): 191 – 211; Ames Borden Colt, "The First Step in Comprehensively Evaluating Implementation of an Integrated Estuarine Management Plan: Developing Evaluation Criteria," *Ocean and Coastal Management* 24 (1994): 85-108; Michael Healey and Timothy M. Hennessey, "The Utilization of Scientific Information in the Management of Estuarine Ecosystems," *Ocean & Coastal Management* 23 (1994): 167 – 191; W. S. Touhy, "Neglect of Market Incentives in Local Environmental Planning: A Case Study in the National Estuary Program," *Coastal Management* 22 (1994): 81 – 95; W. S. Touhy, "Characterizing the San Francisco Estuary: A Case Study in Science Management in the National Estuary Program," *Coastal Management* 21 (1993): 113 – 129; Katherine Fletcher, "Protecting Puget Sound: An Experiment in Regional Governance," *Washington Law Review* 65 (1990): 359 – 375; and, Thomas M. Leschine, "Setting the Agenda for Estuarine Water Quality Management: Lessons from Puget Sound," *Ocean and Shoreline Management* 13 (1990): 295 – 313.

[4] Since the program's inception, the EPA Headquarters office has devolved a great deal of the day to day responsibility for supervising the individual programs to the EPA's Regional offices.

[5] EPA, *The National Estuary Program After Four Years*; and, EPA, *Progress in the National Estuary Program*.

[6] 33 U.S.C.S. § 1330 et. seq.

[7] Mark T. Imperial and Timothy M. Hennessey, "An Ecosystem-Based Approach to Managing Estuaries: An Assessment of the National Estuary Program," *Coastal Management* 24 (no. 1, 1996): 115 – 139.

[8] 33 U.S.C.S. § 1330 (c).

[9] The members of this committee are the ultimate signatories of the CCMP and direct the activities of the management conference (Imperial and Hennessey, "An Ecosystem-Based Approach.").

[10] While the policy committee oversees management conference activities, it is the management committee, which is the focal point of consensus building. The members of the management committee represent state water quality and natural resource management agencies, members of the regulatory community, as well as representatives of the general public and interest groups. Some of the typical responsibilities of the management committee include: the identification and definition of environmental problems in the estuary; advising the policy committee on major decisions such as funding priorities and the development of annual work plans; and, guiding the development and approval of the CCMP. The management committee also supports and monitors activities of the other standing committees or work groups which reflect the local jurisdictional conditions, attitudes, and requirements of individual estuary programs (Imperial and Hennessey, "An Ecosystem-Based Approach.").

[11] Imperial and Hennessey, "An Ecosystem-Based Approach."

[12] Ibid.

[13] For more discussion of the EPA's requirements see: EPA, *National Estuary Program Guidance: Base Program Analysis*, EPA 842-B-93-001 (Washington, DC: EPA, Office of Water, March 1993); EPA, *Comprehensive Conservation and Management Plans: Content and Approval Requirements*, EPA 842-B-92-002 (Washington, DC: EPA, Office of Water, October 1992); EPA, *The Economics of Improved Estuarine Water Quality: An NEP Manual for Measuring Benefits*, EPA 503/5-90-001 (Washington, DC: EPA, Office of Water, September 1990); EPA, *Saving the Bays and Estuaries: A Primer for Establishing and Managing Estuary Programs Appendices G, H, and I*, EPA 503/8-90-005 (Washington, DC: EPA, Office of Water, September 1990); EPA, *Saving the Bays and Estuaries: A Primer for Establishing and Managing Estuary Projects*, EPA/503/8-89-001 (Washington, DC: EPA, Office of Water, August 1989); and, EPA, *Guide for Preparation of Quality Assurance Project Plans for the National Estuarine Program*, Interim Final, EPA 556/2-88-001 (Washington, DC: EPA, Office of Marine and Estuarine Protection, June 1988).

[14] 33 U.S.C.S. § 1330 (b).

[15] The EPA defines seven key activities and products of a management conference: 1) Identification of priority problems based on public or other input; 2) An inventory of applicable federal programs that identifies potential conflicts with the CCMP; 3) An analysis of the scope and effectiveness of existing federal, state, and local resource management programs to evaluate gaps, target opportunities, and have the potential to be leveraged as part of the effort to develop and implement the CCMP; 4) A financing plan based on state and public input that considers the costs ad benefits of pollution control options and identifies how the options will be financed; 5) Final reports on the estuary's status and trends, probable causes of environmental problems, and pollutant loadings; 6) A Draft CCMP that includes a federal consistency report and plans for its coordinated implementation and monitoring; and, 7) A final CCMP that identifies action plans for implementing the CCMP including a discussion of their likelihood for success, lead implementation agencies; funding required and the sources of this funding, and a schedule for implementation (TBEP, *Tampa Bay National Estuary Program Management Conference Agreement* (St. Petersburg, FL: TBEP, March 25, 1991), 4).

[16] For more discussion of the NEP's public participation requirements and the effectiveness of these efforts see: Imperial, *Public Participation in the National Estuary Program*.

[17] Imperial and Hennessey, "An Ecosystem-Based Approach." For more information on the use of these demonstration projects see: EPA, *A Summary of Implementation and Demonstration Projects in Bays and Estuaries* (Washington, DC: EPA, Office of Water, November 1992).

[18] Imperial and Hennessey, "An Ecosystem-Based Approach"; and, EPA, *Saving the Bays and Estuaries*.

[19] For the EPA's guidance on monitoring implementation activities see: EPA, *Measuring Progress of Estuary Programs: A Manual*, EPA 842-B-94-008 (Washington, DC: EPA, Office of Water, November 1994); EPA, *Volunteer Estuary Monitoring: A Methods Manual*, EPA 842-B-93-004 (Washington, DC: EPA, Office of Water, December 1993); and, EPA, *Monitoring Guidance for the National Estuary Program*, EPA 842-B-92-004 (Washington, DC: EPA, Office of Water, September 1992).

[20] The choice of strategies is left up to the estuary programs. Many states are attempting to leverage existing Clean Water Act (CWA) grants (e.g., §104(b)(3), 604(b), and §319(h)) or use state revolving loan funds to implement CCMP recommendations. Others have used new taxes to help finance water pollution control efforts. For example, a cigarette tax finances the implementation of the Puget Sound Water Quality Management Plan (Puget Sound's CCMP). Finally, estuary projects could design their CCMP such that it is implemented through existing programs (Imperial and Hennessey, "An Ecosystem-Based Approach."

[21] For EPA's guidance on financing and organizing implementation activities see: EPA, *Beyond SRF: A Workbook for Financing CCMP Implementation*, EPA 842-B-96-002 (Washington, DC: EPA, Office of Water, August 1996); EPA, *Case Studies: Organizational Structures Relevant to Implementation of Comprehensive Conservation and Management Plans*, EPA 842-B-95-003 (Washington, DC: EPA, Office of Water, July 1995); EPA, *Using Nonprofit Organizations to Advance Estuary Program Goals*, EPA 842-B-093-008 (Washington, DC: EPA, Office of Water, November 1993); and, *Financing Marine and Estuarine Programs: A Guide to Resources*, EPA 503/8-88/001 (Washington, DC: EPA, Office of Marine and Estuarine Protection, September 1988).

[22] Qualitative research employs an intense investigative process that contrasts, compares, replicates, catalogues, and classifies objects and events to provide decisionmakers with the information necessary to improve program performance. For more information on approaches to qualitative analysis see: Norman K. Denzin, and Yvonna S. Lincoln (eds.), *Strategies for Qualitative Inquiry* (Thousand Oaks, CA: Sage Publications, 1998); Norman K. Denzin, and Yvonna S. Lincoln (eds.), *Collecting and Interpreting Qualitative Materials* (Thousand Oaks, CA: Sage Publications, 1998); Joseph A. Maxwell, *Qualitative Research Design: An Interactive Approach* (Thousand Oaks, CA: SAGE Publications, 1996); Sharon L. Caudle, "Using Qualitative Approaches," in Joseph S. Wholey, Harry P. Hatry, and Kathryn E. Newcomer (eds.) *Handbook of Practical Program Evaluation* (San Francisco, CA: Jossey-Bass Publishers, 1994); Matthew B. Miles and Michael A. Huberman, *Qualitative Data Analysis: An Expanded Sourcebook*. Second Edition (Thousand Oaks, CA: SAGE Publications, 1994); Mary Ann Scheirer, "Designing and Using Process Evaluation," in Joseph S. Wholey, Harry P. Hatry, and Kathryn E. Newcomer (eds.) *Handbook of Practical Program Evaluation* (San Francisco, CA: Jossey-Bass Publishers, 1994); and, Michael Quinn Patton, *Qualitative Evaluation and Research Methods*, Second Edition (Newbury Park, CA: SAGE Publications, 1990).

[23] Maxwell, *Qualitative Research Design*; Miles and Huberman, *Qualitative Data Analysis*; Scheirer, "Designing and Using Process Evaluation"; and, Patton, *Qualitative Evaluation and Research Methods*.

[24] Mark T. Imperial, "Analyzing Institutional Arrangements for Ecosystem-Based Management: The Institutional Analysis and Development Framework," *Environmental Management* 24 (1999): 449 -465.

[25] For some discussion of the IAD framework and its application in environmental settings see: Elinor Ostrom, Roy Gardner, and James Walker, *Rules, Games, & Common-Pool Resources* (Ann Arbor, MI: The University of Michigan Press, 1994); Elinor Ostrom, Larry Schroeder, and Susan Wynne, *Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspective* (Boulder, CO: Westview Press, 1993); Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (New York, NY: Cambridge University Press, 1990); Elinor Ostrom, "An Agenda for the Study of Institutions," *Public Choice* 48 (no. 1, 1986): 3 – 25; Imperial, "Analyzing Institutional Arrangements"; Mark T. Imperial, "Analyzing Institutional Arrangements for Ecosystem-Based Management: Lessons From the Rhode Island Salt Ponds SAM Plan," *Coastal Management* 27(no. 1, 1999): 31 – 56; Sue E. S. Crawford, and Elinor Ostrom, "A Grammar of Institutions," *American Political Science Review* 89 (no. 3, September 1995): 582 – 600; Timothy M. Hennessey, "Governance and Adaptive Management for Estuarine Ecosystems: The Case of Chesapeake Bay," *Coastal Management* 22 (1994): 119 – 145;

Mark H. Sproule-Jones, *Governments At Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto, Canada: University of Toronto Press, 1993);William Blomquist, *Dividing the Waters: Governing Groundwater in Southern California* (San Francisco, CA: ICS Press. 1992); and, Larry L. Kiser and Elinor Ostrom, "The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches," in Elinor Ostrom (ed.) *Strategies for Political Inquiry* (Beverly Hills, CA: Sage, 1982), 179 – 222.

[26] Triangulation involves using independent measures derived from different sources to support, or at least not contradict, a research finding (Miles and Huberman, *Qualitative Data Analysis*; and, Robert K. Yin, *Case Study Research: Design and Methods*, Second Edition (Thousand Oaks, CA: SAGE Publications, 1994)).

[27] An estuary is where freshwater and salt water meet.

[28] TBEP, *Tampa Bay Environmental Monitoring Report, 1992-1993*, Technical Publication #15-96 (St. Petersburg, FL: TBEP, 1996), 3-4.

[29] Ibid.

[30] The watershed can be further subdivided into 10 major drainage basins or 435 subbasins. In addition, approximately 5 percent of the watershed is internally drained and does not contribute runoff except in rare circumstances (TBEP, *Tampa Bay Environmental Monitoring Report, 1992-1993*, 3-3).

[31] Only a small portion of Polk, Pasco, and Sarasota counties is within the watershed. Because of the limited land areas, small population, and rural nature of these areas, they are relatively small contributors to Tampa Bay's water quality and habitat problems. Accordingly, these counties have had limited involvement in the Tampa Bay Estuary Program.

[32] TBEP, *Tampa Bay Environmental Monitoring Report, 1992-1993*, 3-4.

[33] Ibid., 3-1.

[34] TBEP, *Charting the Course: The Comprehensive Conservation and Management Plan for Tampa Bay* (St. Petersburg, FL: TBEP, December 1996), 3.

[35] Tampa Bay Regional Planning Council (TBRPC), *Future of the Region: A Strategic Regional Policy Plan for the Tampa Bay Region* (St. Petersburg, FL: TBRPC, December 1995).

[36] Most species of edible fish and shellfish spend a portion of their lifecycles in the estuary and the bay is a home, feeding ground, or nursery area for more than 270 species of resident and migratory fish.

[37] During a record count of 1,856 manatees made during January 1992, 126 manatees (6.8 percent of the state's total) were counted in Tampa Bay. In addition, nearly one-sixth of the manatees located along the state's Gulf Coast winter near the warm water discharges of the region's power plants. For more information see: TBEP, *Tampa Bay Environmental Monitoring Report*, 10-1.

[38] TBEP, *Setting Priorities for Tampa Bay Habitat Protection and Restoration: Restoring the Balance, Final Report*, Technical Publication #09-95 (St. Petersburg, FL: TBEP, March 1996), 1.

[39] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-1; and, TBRPC, *Future of the Region*, 4-18.

[40] TBEP, *Setting Priorities for Tampa Bay*, 1.

[41] TBRPC, *Future of the Region*, 4-15.

[42] TBEP, *Charting the Course*, 41.

[43] Ibid.

[44]Ibid., 43.

[45] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-1; and, TBEP, *Charting the Course*, 1.

[46] This happens to coincide with the availability of affordable air conditioning

[47] TBRPC, *Future of the Region*, 4-15.

[48] Ibid., 4-16.

[49] Ibid., 4-15.

[50] In 1982, the surface waters of Tampa Bay received effluent from 49 permitted sources with capacities ranging from 10,000 gallons per day (GPD) to 60 million gallons per day (MGD) (TBRPC, *Future of the Region*, 4-2).

[51] For more information on water quality trends see: TBEP, *Tampa Bay Environmental Monitoring Report*; Environmental Protection Commission (EPC) of Hillsborough County, *Surface Water Quality 1995 – 1997* (Tampa, FL: EPC Undated); A. P. Squires, G. A. Vargo, R. H. Weisberg, K. A. Fanning, and B. Galperin, "Review and Synthesis of Historical Tampa Bay Water Quality Data," *Florida Scientist* 58 (no. 2, 1995), 228 – 233; E. Howard Rutherford, Brian J. Bendis, Gabriel A. Vargo and Kent A. Fanning, "Review of Historical Tampa Bay Water Quality Data," Florida Scientist 58 (no. 2, 1995), 67 – 81.

[52] Nonpoint source pollution is a big water quality problem in Florida in general. Nonpoint source pollution is responsible for approximately half of the total pollutant loadings entering Florida's surface waters. Stormwater is responsible for 450 times the amount of suspended solids and nine times the biological oxygen demand and nutrient loads of secondarily treated wastewater. Stormwater also accounts for 80 to 95 percent of the heavy metals and coliform bacteria entering Florida's waters (FDEP, *Nonpoint Source Components of Total Maximum Daily Loads* (Tallahassee, FL: FDEP, November 3, 1998), 5).

[53] TBEP, *Tampa Bay Environmental Monitoring Report*, 4-1.

[54] For more information on the relationship between nitrogen and chlorophyll see: Gerald Morrison, Anthony Janicki, David Wade, James Martin, Gabriel Vargo, Roger Johansson, "Estimated Nitrogen fluxes and Nitrogen-Chlorophyll Relationships in Tampa Bay, 1985 – 1994," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 249 – 268.

[55] TBEP, *Tampa Bay Environmental Monitoring Report*, 4-1.

[56] TBEP, *Charting the Course*, 28.

[57] For more information on the historical trends of sea grasses see: J. O. R. Johansson, and T. Ries. "Seagrass in Tampa Bay: Historic Trends and Future Expectations," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 139 - 150; W. Avery, "Distribution and Abundance of Macroalgae and Seagrass in Hillsborough Bay, Florida, From 1986 to 1995," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 151 – 165; and, Holly Greening and Richard Eckenrod, "Watershed Management in Tampa Bay: A Progress Report May 1994," *Florida Scientist* 58 (no. 2, 1995), 117 – 122.

[58] TBEP, *Tampa Bay Environmental Monitoring Report*, 7-1.

[59] TBEP, *Setting Priorities for Tampa Bay Habitat*, 1.

[60] TBEP, *Charting the Course*, 28; TBRPC, *Future of the Region*, 4-14; and TBEP, *Tampa Bay Environmental Monitoring Report*.

[61] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 1.

[62] TBEP, *Charting the Course*, 41.

[63] TBRPC, *Future of the Region*, 4-2.

[64] TBEP, *Charting the Course*, 28.

[65] TBEP, *Setting Priorities for Tampa Bay*, 43.

[66] Ibid., vii.

[67] Ibid.

[68] Ibid.

[69] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-1.

[70] TBRPC, *Future of the Region*, 4-17.

[71] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-1; and, TBEP, *Charting the Course*, 2.

[72] Some of the declines are surely due to mismanagement of the fisheries as well.

[73] TBEP, *Charting the Course*, 43.

[74] Ibid.

[75] The management and protection of Tampa Bay and its resources has long been of concern to federal, state, and local officials. The wide variety of special designations granted to the Tampa Bay region illustrate its importance to the region, the state, and the nation: four aquatic preserves (Boca Ciega Bay, Pinellas County, Cockroach Bay, and Terra Ceia Bay) have been designated; two national estuary programs (Tampa Bay and Sarasota Bay) are found in the region; Hillsborough River designated as one of six pilot areas under the Florida Department of Environmental Protection's (FDEP's) ecosystem management initiative; ten aquatic protection areas have been designated by the Tampa Port Authority; and Tampa Bay as a SWIM priority waterbody by the state legislature and is the Southwest Florida Water Management District (SWFWMD).

[76] Federal Water Pollution Control Administration (FWPCA), *Problems and Management of Water Quality in Hillsborough Bay, Florida* (Washington, DC: FWPCA, 1969).

[77] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 16 - 17.

[78] TBEP, *Charting the Course*, 46.

[79] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 17.

[80] Ibid.

[81] This was followed by BASIS 2 in 1991 and BASIS 3 in 1996.

[82] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-2.

[83] Ibid.

[84] Ibid.

[85] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 17.

[86] It remains the only statutory basis for identifying priority water bodies and establishing watershed restoration and protection plans under public review and using an explicit intergovernmental review process (FDEP, *Nonpoint Source Components*, 55-56).

[87] FDEP, *Nonpoint Source Components*, 55.

[88] It should be noted that one of the major problems with the SWIM program has been inconsistent funding level over time. This has hampered restoration and protection efforts under the program.

[89] FDEP, *Nonpoint Source Components*, 56.

[90] TBRPC, *State of Tampa Bay 1998* (St. Petersburg, FL: TBRPC, March 1999), 37.

[91] The City of Tampa's Bay Study Group is the other organization that monitors seagrass coverage.

[92] TBEP, *Tampa Bay Environmental Monitoring Report*, 1-3.

[93] FDEP, *Nonpoint Source Components*, 56.

[94] TBEP, *Charting the Course*, 47.

[95] Ibid., 47 – 48.

[96] The EPA's National Estuary Program funded the development of the TBEP as well as the implementation of the CCMP. The EPA also administers a number of programs pursuant to a variety of federal statutes. Some of these programs have been delegated to the DEP and its six regional offices while the DEP has delegated some of these functions to the SWFWMD and the Environmental Protection Commission (EPC) of Hillsborough County.

[97] The COE also implements a number of programs of interest to the case study. In addition to its dredging operations, the COE implements permit programs that regulate dredging and the alteration of wetland areas.

[98] In addition to operating the country's ? largest port facility, the TPA has permitting authority over submerged lands located within Hillsborough County. Thus, the TPA is actively involved in the regulation of dredging and shoreline alteration activities. It also undertakes a number of dredging and habitat restoration projects.

[99] Tampa BayWatch is a nonprofit environmental stewardship program for Tampa Bay, which was incorporated in 1993. The organization relies on a small professionally trained staff and thousands of volunteers, students, and other community groups and organizations to undertake a number of projects that benefit Tampa Bay. To date, over 7,072 volunteers have been involved in bay restoration activities. Some of their activities include providing labor for restoration projects, protecting bird nesting islands, coastal and river cleanup activities, and environmental education (TBRPC, *State of Tampa Bay 1998*, 51).

[100] The Florida Marine Research Institute (FMRI) was moved from the FDEP to the Florida Fish and Wildlife Conservation Commission in 1999. The FMRI conducts applied research and provides information that can be used to improve the management of marine resources. This research is often done in collaboration with other academic, nonprofit, and private marine research institutions. The FMRI's headquarters is in St. Petersburg and it maintains 10 filed sites around the state. The FMRI's staff was actively involved in a number of the TBEP's advisory committees and it is an important resource in terms of scientific and technical expertise for federal, state, and local agencies.

[101] The FDEP's Watershed Management Program is currently under development and ultimately will provide a watershed-based approach for managing water quality in the state. The plan is to monitor, assess, develop TMDLs as necessary, and implement management activities in all of the state's river basins (defined in terms of the 8-didgit hydrologic unit code boundaries) on a five-year rotating basis thereby providing a framework for the development of Basin Management Plans that will implement the TMDLs (FDEP, *Nonpoint Source Components*, 64).

[102] FDEP, *Nonpoint Source Components*, 6.

[103] It requires that the pollutant loadings from these systems shall be reduced to restore or maintain the beneficial uses of waters.

[104] FDEP, *Nonpoint Source Components*, 6.

[105] An ERP is required before beginning any construction activity that would affect wetlands, alter surface water flows, or contribute to stormwater pollution.

[106] The 1993 merger of the DNR and DER combined the wetland resource, stormwater quality, and stormwater quantity permitting into a new ERP in 1995. The FDEP and WMDs share implementation depending on the type of activity.

[107] It also allows the WMDs to coordinate the water quantity aspects of the WMDs surface water management permits with the FDEP's water quality concerns in the stormwater permits.

[108] The PLRGs will be a major part of the TMDLs that the state is currently developing. The TBEP's CCMP contains nitrogen goals for bay segments, which have now modified the PLRGs identified in the SWIM plan.

[109] The district's responsibilities were further expanded in the mid-1960s when regulatory programs for regional well fields serving the Tampa Bay region were initiated.

[110] Chapter 373 of the *Florida Statutes*.

[111] Over time, the WMDs, due largely to their *ad valorem* taxing authority, have gained the bulk of the resources related to water quality and supply management in the state. This has produced a situation where the oversight agency, the DEP, has less capability for planning and evaluating than do the implementing agencies (Jeff Wade and John Tucker, *Current and Emerging Issues in Florida Water Policy*, (Florida Water Law and Policy Program, Center for Governmental Responsibility, University of Florida College of Law, September 12, 1996), 69).

[112] One mill equals one dollar per thousand dollars of assessed value.

[113] After 30 years the EPC remains the only local environmental protection program in the state empowered by a legislative act (Chapter 84-446, Laws of Florida (Hillsborough County Environmental Protection Act)).

[114] For more information on the activities of the EPC see: EPC, *1997 Annual Report* (Tampa, FL: EPC, Undated; EPC, *1996 – 1998 Air Quality Report* (Tampa, FL: EPC, Undated); and, EPC, *State of the Environment: 1996 Annual Report* (Tampa, FL: EPC, Undated).

[115] EPC, *1996 – 1998 Air Quality Report*, 4.

[116] EPC, *State of the Environment*, 2.

[117] Ibid., 20.

[118] Ibid.

[119] Ibid., 21.

[120] Environmental Protection Commission (EPC) of Hillsborough County, *Surface Water Quality 1995 – 1997* (Tampa, FL: EPC Undated), 1-1.

[121] EPC, *State of the Environment*, 21.

[122] EPC, *1997 Annual Report*, 23-24 and, EPC, *State of the Environment*, 21.

[123] It was also the first regional planning council in the country to adopt a Comprehensive Regional Policy Plan and its plan, *Future of the Region*, served as a model for the ten other regional planning councils in the state.

[124] By law, Hillsborough, Manatee, Pinellas, and Pasco counties are required to exercise regional cooperation through participation on the Council. There is more discretion concerning local government participation.

[125] It is important to note that the TBSC recommended that a regulatory agency be created. This idea was rejected and what emerged instead was an advisory committee that collaborates in a number of areas.

[126] TBRPC, *Organizational Statement Agency on Bay Management* (St. Petersburg, FL: TBRPC, October 14, 1985, Revised January 14, 1999).

[127] This report documents the work of the ABM as well as the efforts of various projects and programs affecting the bay. For an example see: TBRPC, *State of Tampa Bay 1998* (St. Petersburg, FL: TBRPC, March 1999).

[128] While there are five counties and many incorporated municipalities in the watershed, only the three counties bordering the bay and the three main cities have been actively involved in the Tampa Bay Estuary Program.

[129] TBRPC, *Future of the Region*, vii.

[130] Ibid.

[131] Ibid., vii – viii.

[132] There is some variation in the level of capacity that corresponds closely to the size of the counties and there resources. Hillsborough County has the highest capacity followed by Pinellas and Manatee counties. Tampa has the highest capacity followed by St. Petersburg and Clearwater.

[133] This program is overseen by the Florida Department of Community Affairs (FDCA), which reviews the local plans, regulations, and amendments to ensure that they are consistent with the *State Comprehensive Plan* (SCP) as well as other relevant resource management policies.

[134] Local governments typically use stormwater utility fees to help finance these activities.

[135] FDEP, *Nonpoint Source Components*, 49.

[136] TBRPC, *State of Tampa Bay 1998*.

[137] For a discussion of some of the watershed management efforts in Pinellas County see: Donald D. Moores, "Watershed Management – What Have We Learned," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 363 – 374.

[138] City of Clearwater, *1997 Watershed Action Plan* (Clearwater, FL: City of Clearwater, December 1997).

[139] In addition to the improvements in water quality and habitat associated with these efforts, the programs produced a wealth of local technical expertise in managing the region's environmental problems. Moreover, the planning and implementation efforts helped develop a spirit of cooperation and citizen involvement that subsequent efforts could build upon.

[140] TBEP, *Tampa Bay Environmental Monitoring Report*, 5-9.

[141] For a more detailed discussion of these trends in water quality over time see: EPC, *Surface Water Quality*; TBEP, *Tampa Bay Environmental Monitoring Report*.

[142] The Howard F. Curren Advanced Wastewater Treatment Plant has a capacity of 96 million gallons per day (MGD) with an average flow of approximately 56 MGD. It removes 99.s percent of the BOD, 99.3 percent of TSS, and 92.7 percent of total nitrogen.

[143] TBEP, *Charting the Course*, 2.

[144] Ibid., 3.

[145] Ibid.

[146] Advanced wastewater treatment (AWT) uses processes that substantially reduce nitrogen levels in the effluent.

[147] For example, it is estimated that these actions alone resulted in greater than a 50 percent reduction of nutrient loading to Hillsborough Bay and the subsequent reduction in loads to Tampa Bay as a whole.

[148] Several state officials claim that Florida often spends more money per year on land acquisition than the federal government.

[149] FDEP, *Nonpoint Source Components*, 78.

[150] TBRPC, *Future of the Region*, 4-18.

[151] EPC, *1997 Annual Report*, 13.

[152] TBEP, *Charting the Course*, 16.

[153] EPC, *Surface Water Quality 1995 – 1997*; TBEP, *Tampa Bay Environmental Monitoring Report*.

[154] The vast majority of this recovery has occurred naturally. Although a few local transplanting projects have been successful, the success rate varies and it is still experimental. The TBEP will evaluate suitable areas for transplanting projects as part of its habitat restoration efforts (TBEP, *Charting the Course*, 31).

[155] While much of this increase was a thickening of areas of patchy coverage, it also included more than 500 acres of coverage in areas that used to be bare bottom (TBEP, *Tampa Bay Environmental Monitoring Report*, 1-1).

[156] TBEP, *Charting the Course*, 3, 29.

[157] TBEP, *Partnership for Progress* (St. Petersburg, FL: TBEP, Undated), AP 2; TBEP, *Tampa Bay Environmental Monitoring Report*, 6-2; TBRPC, *State of Tampa Bay 1998*, 18, 38.

[158] TBEP, *Partnership for Progress*, AP 2.

[159] TBEP, *Setting Priorities for Tampa Bay*, 5.

[160] Ibid., 12.

[161] Ibid.

[162] TBEP, *Charting the Course*, 3.

[163] We do not mean to imply that point source discharges are not important. sewage treatment plants still contribute about 10 percent of the bay's annual nitrogen loadings and roughly 36 billion gallons of effluent are still discharged into the bay each year (TBEP, *Charting the Course*, 25)). Rather, nonpoint source problems are now of larger concern to bay managers.

[164] TBEP, *Charting the Course*, 21.

[165] Ibid., 70.

[166] For more information on the impacts of atmospheric deposition to Tampa Bay see: Greening, Holly, L. Kellie Dixon, Andy Squires, Peter Hessling, Tony D'Acquila, Tom Rogers, "Contribution of Atmospheric Deposition to Nitrogen and Toxic Materials Loadings to Tampa Bay," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 269 – 280.

[167] Septic systems serve about 20 percent of the watersheds population and contributes upwards of 4 percent of the bay's total nitrogen loadings, although it can be a key part of the problem in some subbasins (TBEP, *Charting the Course*, 26).

[168] TBEP, *Charting the Course*, 26.

[169] Ibid., 17.

[170] TBEP, *Partnership for Progress*, AP 2; and, TBRPC, *State of Tampa Bay 1998*, 12.

[171] Ibid.

[172] TBEP, *Charting the Course*, 15.

[173] The TBEP estimates that this released approximately 8 tons of nitrogen, the equivalent of approximately 1 percent of the total nitrogen loads that this bay segment receives. Since the water released was of the same quality as that entering the reuse system, there were no detectable fecal coliform bacteria in the reclaimed water during this period.

[174] For more information on the impacts of atmospheric deposition to Tampa Bay see: Greening, Holly, L. Kellie Dixon, Andy Squires, Peter Hessling, Tony D'Acquila, Tom Rogers, "Contribution of Atmospheric Deposition to Nitrogen and Toxic Materials Loadings to Tampa Bay," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 269 – 280.

[175] TBEP, *Charting the Course*, 24.

[176] Many of these duplications were removed when the 1994 reorganization and formation of the FDEP also resulted in the new streamlined Environmental Resource Permit in October 1995.

[177] TBEP, *Charting the Course*, 47.

[178] The SWIM program has made progress in streamlining based on its record of success, close monitoring and reporting to regulatory agencies, and monthly meetings with all affected jurisdictional agencies (TBEP, *Charting the Course*, 49).

[179] It should be noted that the new ERP helps streamline the process and waives monitoring requirements for restoration projects (TBEP, *Charting the Course*, 49).

[180] TBEP, *Charting the Course*, 49.

[181] For example, the City of St. Petersburg is facing the abandonment of its deep injection wastewater wells due to the movement of fluid into the Underground Source of Drinking Water (as classified by the EPA). The ABM recommended that the EPA change its rules that would allow for the continued operation of the city's wells where the overlying strata is not proposed for public use. Otherwise, the city would be forced to treat the water to tertiary standards and discharge it into Tampa Bay and Boca Ciega Bay. Aside from the cost, the change would add an additional 114 tons of nitrogen per year to the already over-nutrified estuaries.

[182] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 1.

[183] It is important to note the name was changed when the parties signed the interlocal agreement. The renaming and dropping "national" was intentional and symbolized that this was a local partnership.

[184] EPA, *The Streamlined National Estuary Program: Instructions on the Preparation of a Governor's Nomination* (Washington, DC: Environmental Protection Agency, Office of Water, December 1994); and, EPA, *The National Estuary Program: Final Guidance on the Contents of a Governor's Nomination* (Washington, DC: EPA, Office of Water, January 1990).

[185] Renu Khator, "Networking to Achieve Alternative Regulation: Case Studies from Florida's National Estuary Programs," *Policy Studies Review* 16 (no. 1, Spring 1999), 76.

[186] It is also likely that as local governments increased their capacity they have more technical capacity to question the wisdom of regulatory agency dictates.

[187] This start up grant included $150,000 in federal EPA funding and the required 25 percent match of $50,000 provided by the SWFWMD. It was used primarily to get the program started and satisfy two of the EPA's preliminary requirements: 1) develop a state-EPA management conference agreement; and, 2) develop the 1991 work plan.

[188] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 10.

[189] As a result, during the planing process some minor conflicts emerged between the Policy Committee and the TBRPC over the administration of the TBEP.

[190] No local government advisory committee was used because the other committees were dominated by local officials.

[191] TBEP, *Tampa Bay Estuary Program Biennial Review: October 1998* (St. Petersburg, FL: TBEP, October 1998), 60.

[192] Ibid., 69.

[193] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 17.

[194] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*; and, TBEP, *Charting the Course*, 6.

[195] TBEP, *Tampa Bay National Estuary Program Management Conference Agreement*, 18.

[196] Imperial and Hennessey, "An Ecosystem-Based Approach."

[197] TBEP, *Tampa Bay Environmental Monitoring Report*, 4-2.

[198] TBEP, *Tampa Bay Estuary Program Biennial Review*, 70.

[199] TBEP, *Charting the Course*, 253.

[200] "Notes on Estuaries: Citizen Involvement Hailed as Cornerstone of Tampa Bay Restoration," *Nonpoint Source News-Notes* 55 (December 1998): 13.

[201] TBEP, *Tampa Bay Estuary Program Biennial Review*, 65.

[202] National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, *Evaluation Findings for the Florida Coastal Resources Management Program December 1991 to September 1995* (Silver Spring, MD: Office of Ocean and Coastal Resource Management, NOAA. January 16, 1996).

[203] For more discussion of the role that volunteerism plays in the efforts to manage Tampa Bay see: Peter A. Clark, Mary Hoppe, and Fred Webb, "Development of the Conservation Corps Volunteer Network," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 385 – 389.

[204] "Notes on Estuaries," 13.

[205] "Notes on Estuaries," 13.

[206] "Notes on Estuaries," 13.

[207] TBEP, *Tampa Bay Environmental Monitoring Report*, 2-1.

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[208] TBEP, *Tampa Bay Estuary Program Biennial Review*, 70.

[209] TBEP, *Tampa Bay Environmental Monitoring Report*, iv.

[210] TBEP, *Tampa Bay Estuary Program Biennial Review*, 70.

[211] TBEP, *Charting the Course*, ii.

[212] For Holly Greening and Richard Eckenrod, "Watershed Management in Tampa Bay: A Progress Report May 1994," *Florida Scientist* 58 (no. 2, 1995), 117 – 122.

[213] To determine how much credit a partner receives for both structural and non-structural projects, the TBEP produced technical guidance that summarizes the various land uses and reductions that could be achieved by utilizing BMPs. It serves as the foundation for assigning pollution reduction credits. (See TBEP, *Guidelines for Calculating Nitrogen Load Reduction Credits*, Technical Report 02-97 (St. Petersburg, FL: TBEP, 1997)).

[214] For more information on these goals see: TBEP, *Partnership for Progress*.

[215] TBEP, *Charting the Course*, 231.

[216] TBEP, *Partnership for Progress*, AP 2.

[217] Although Tampa Electric Company (TEC) and Florida Power Corporation are not members of the Consortium, they have been observing and occasionally participating in discussions (TBEP, *Partnership for Progress*, AP 3).

[218] For more information on the projects being used to achieve the nitrogen reductions see: TBEP, *Partnership for Progress*.

[219] TBEP, *Partnership for Progress*.

[220] TBEP, *Partnership for Progress*, AP 6.

[221] TBEP, *Setting Priorities for Tampa Bay*, 43.

[222] Ibid.

[223] Ibid.

[224] Ibid. 91.

[225] TBEP, *Charting the Course*, 231.

[226] TBEP, *Setting Priorities for Tampa Bay*, 46.

[227] Ibid., 47.

[228] Ibid., 61.

[229] Although there was some support for creating a new "Bay Authority" among the members of the TAC.

[230] TBEP, *Tampa Bay Estuary Program Biennial Review*, 69.

[231] The Interlocal Agreement changed the name from the Tampa Bay National Estuary Program to the Tampa Bay Estuary Program.

[232] For more information on the development of the Interlocal Agreement see: Khator, "Networking to Achieve Alternative Regulation."

[233] Ibid., 77.

[234] Ibid., 78.

[235] Ibid.

[236] Ibid.

[237] Ibid.

[238] Ibid.

[239] Ibid., 79.

[240] Ibid., 80.

[241] A former policy board member who was a prominent local attorney volunteered his law firm's services to help draft the agreement, which saved the TBEP thousands of dollars in legal fees.

[242] The facilitation team used a national conference that was going to be held in the region and was to be attended by Carol Browner as an "artificial" deadline that helped generate the final push to complete the agreement.

[243] The Interlocal Agreement changed the name from the Tampa Bay National Estuary Program to the Tampa Bay Estuary Program.

[244] Chapter 163 of the Florida Statutes (Florida Interlocal Cooperation Act of 1969).

[245] TBEP, *Tampa Bay Estuary Program Interlocal Agreement*, (St. Petersburg, FL: TBEP, February 1998).

[246] Chapter 163 of the Florida Statutes (Florida Interlocal Cooperation Act of 1969).

[247] TBEP, *Tampa Bay Estuary Program Interlocal Agreement*, 11.

[248] TBEP, *Tampa Bay Estuary Program Interlocal Agreement*.

[249] Ibid.

[250] TBEP, *Tampa Bay Estuary Program Biennial Review*, 59; and, TBEP, *Tampa Bay Estuary Program Interlocal Agreement*.

[251] TBEP, *Tampa Bay Estuary Program Interlocal Agreement*.

[252] These federal funds require a 25 percent nonfederal match that is provided by the Policy Board members.

[253] TBEP, *Tampa Bay Estuary Program Biennial Review*, 50.

[254] TBEP, *Tampa Bay Estuary Program Interlocal Agreement*.

[255] TBEP, *Tampa Bay Estuary Program Biennial Review*, 52.

[256] For a discussion of these grant applications see: TBEP, *Tampa Bay Estuary Program Biennial Review*, 53 - 55.

[257] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans* (St. Petersburg, FL: TBEP, March 1999).

[258] There is also a provision in the IA that calls for annual supplements that describe any changes to the action plans or additional actions necessary to satisfy CCMP goals (TBEP, *Tampa Bay Estuary Program Interlocal Agreement*).

[259] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans*.

[260] TBEP, *Tampa Bay Estuary Program Biennial Review*, 13.

[261] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans*.

[262] Ibid.

[263] The TBEP and other partners are currently working on eight separate but related projects addressing the characterization of sources and impacts of atmospheric deposition as well as ongoing intensive monitoring of wet and dry deposition of nitrogen.

[264] TBEP, *Tampa Bay Estuary Program Biennial Review*, 63 - 64.

[265] Ibid., 59.

[266] Ibid., 61.

[267] TBEP, *Tampa Bay Estuary Program Biennial Review*.

[268] The Florida Fish and Wildlife Conservation Commission (FWCC) was created effective July 1, 1999 and includes the former Florida Game and Freshwater Fish Commission and Marine Fisheries Commission as well as the FDEP's Marine Research Institute (FMRI) and several additional FDEP programs.

[269] The FDEP supported the idea of a restoration master plan such as the one developed by the TBEP because it will be a useful tool for all parties involved in restoration and acquisition. However, the FDEP has maintained that the way their programs are administered (i.e., state and local governments submit plans for the FDEP's consideration) does not always allow the FDEP to focus its efforts on the projects or sites recommended in the plan.

[270] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans*.

[271] TBEP, *Tampa Bay Estuary Program Biennial Review*.

[272] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans*, iii - iv.

[273] TBEP, *Tampa Bay Estuary Program 1995 – 1999 Action Plans*, 5.

[274] Khator, "Networking to Achieve Alternative Regulation," 83.

[275] TBEP, *Tampa Bay Estuary Program Biennial Review*, 70.

[276] EPA, *Measuring Progress of Estuary Programs*.

[277] Imperial and Hennessey, "An Ecosystem-Based Approach"; and, Imperial, "Analyzing Institutional Arrangements for Ecosystem-Based Management".

[278] While the many aspects of the CCMP's development may have been necessary to produce the CCMP, the respondents are alluding to the fact that once the goals were set and the decision had been made to proceed with the IA, the remaining time invested in finishing the CCMP and satisfying the EPA's requirements was unproductive and would have been better spent on the IA. Most of the respondents view the IA and work plans as the critical program documents, not the CCMP. However, the EPA continues to view Tampa Bay's CCMP as the critical program document.

[279] "Notes on Estuaries," 13.

[280] Wade and Tucker, *Current and Emerging Issues in Florida Water Policy*.

Appendix A

Additional Environmental Innovations of Interest to the Academy

Introduction

In addition to the TBEP case study, the research team uncovered some additional innovations that may be of interest to the Academy. These included: 1) the FDEP's Ecosystem Management initiative that includes a place-based management effort as well as team-based permitting process designed to streamline permitting procedures; 2) The TBEP considered submitting an application to implement part of the CCMP through the EPA's Project XLC; and, 3) the FDEP's efforts at performance-based management.

Ecosystem Management Initiative

Ecosystem management, as it is currently practiced in Florida, began with the merger of the Departments of Environmental Regulation (DER) and Natural Resources (DNR) in 1993. The legislature required the new FDEP to "Protect the functions of entire ecological systems through enhanced coordination of public land acquisition, regulatory, and planning programs." The program began with six ecosystem management areas (EMAs), one of which was Hillsborough River. It has since been expanded to 24 EMAs. As a result of this initiative, the FDEP adopted three ecosystem management goals:

- Better protection and management of Florida's ecosystems
- An agency structure and culture based on a systems approach to environmental protection and management
- An ethic within the citizenry of shared responsibility and participation in the protection of the environment

To develop its approach to ecosystem management, the FDEP created an Ecosystem Management Implementation Strategy Committee consisting of the chairs of eleven subcommittees that tackled a wide range of environmental, economic, and social issues that were viewed as essential parts of ecosystem management. More than 300 citizens (e.g., business, university researchers, environmentalists, and others) worked with federal, state, and local officials to develop the FDEP's Ecosystem Management Implementation Strategy (EMIS) that includes 52 specific tasks that the FDEP will undertake to make ecosystem management a reality. This strategy is based on four cornerstones:

- Cultural change
- Common-sense regulation
- Place-based management
- Foundations of ecosystem management

Cultural change refers to the belief that ecosystem management requires changing the attitudes and beliefs of agency employees and the citizens of the state and altering the way that government and the public interacts to achieve environmental goals. Government command and control programs must give way to partnerships with business and citizens while the public needs to assume responsibility for and participate in ecosystem management. The FDEP believes that cultural change involves developing new and better ways to do what they have been doing.

One of the ways that the FDEP believes that cultural change occur is through common sense regulation. This cornerstone recognizes the important role that traditional regulatory programs play but emphasizes alternatives to traditional regulation such as pollution prevention, the use of BMPs, and team permitting. It focuses on environmental results, improved efficiency, better stewardship of resources, and more equitable treatment of applicants.

The FDEP's team permitting efforts are likely to be of particular interest to the Academy. An example of a team-permitting project located in the Tampa Bay watershed is the CF Industries (CFI) Team Permitting Project, which was the first in the state.[1] In Florida, it can take years to obtain the permits and approvals necessary to conduct some major development projects such as the expansion of a gypsum stack. In part, this is because the projects encompass a wide variety of potential environmental problems that require and equally diverse range of federal, state, and local permits. Under the team permitting process, all agencies that may be involved in granting permission to conduct an activity as well as other identifiable third parties such as community groups, environmental groups, and business organizations are invited to participate. The proposal is considered in its entirety even though individual permits will still be issued. This allows a process that might normally take 4 or 5 years (or more) to be completed in a much shorter time frame. In return for these expedited procedures, the parties agree that there will be a net ecosystem benefit (NEB) from the activity that is permitted. While individual regulatory requirements are not relaxed, some procedural or monitoring requirements might be.

CFI is a phosphate fertilizer producer with a plan located in the northeastern portion of Hillsborough County. The company hoped to construct a new lined gypsum stack and to shut down a 30-year-old unlined stack. Possible environmental problems included groundwater contamination, the possibility of sinkhole formation, and habitat loss. To construct the new gypsum stack, CFI would have needed permits from eleven local, state, and federal agencies that each had different permit requirements. Under the team permitting process, CFI worked with the eleven agencies as well interested third parties such as the Sierra Club, the Audubon Society, Hillsborough River Greenways Task Force (HRGTF), and private citizens.

The key to the team permitting process is the emphasis on NEB. NEB is defined as those benefits that are gained from a project above and beyond those that would be achieved from traditional regulatory requirements. The regulatory agencies were willing to give up some of the process and reporting requirements that mean real dollars to permit applicants if in turn the applicants are willing to convert those dollars into a NEB. In this case, the team identified several positive benefits that exceeded normal permitting thresholds including:

- Early closure (by 2 years) of a major contamination source
- Installation of a double as compared to a single liner underneath the stack

- Development of a detailed restoration plan
- Land swap with Hillsborough County to create a critical greenways linkage to the Green Swamp
- Air monitoring
- Restoration of public lands
- Up front mitigation
- Use of reuse water[2]

Moreover, as a result of the team process, CFI used a higher level of subsurface investigation that would normally be required which gave agency officials better information to make their decisions. In return, CFI received all of its land use and environmental permits in just 20 months. This process proved so successful that the FDEP sought and received legislative approval in Chapter 403 of the Florida Statutes to do what are called Ecosystem Management Agreements, which essentially are team permits.

The FDEP also believes that cultural change will help with the efforts to implement place-based ecosystem management, the third foundation of their ecosystem management program. It is focused on bringing local citizens into the decision-making process to help solve environmental problems at the community level. Place-based management focuses on complete ecosystems that are typically defined in terms of watersheds.[3] The FDEP divided the state into 24 primary EMAs, one of which is the Greater Tampa Bay EMA that includes the TBEP and the Hillsborough River and Bay Demonstration Project area (Hillsborough EMA).[4] Each EMA established at least one team to work on environmental problems and issues. Teams are open to everyone and typically include local citizens, business and agricultural issues, representatives of environmental groups, local, regional, and state agency staff, and the federal government when appropriate.

There are a number of place-based environmental protection efforts in the Greater Tampa Bay EMA in addition to the TBEP,[5] but perhaps the best example is the HRGTF created in 1992.[6] The HRGTF is a nonprofit, public-private partnership with a relatively open membership.[7] Its objective was to facilitate the implementation of a regional plan for the protection of natural resources of the Hillsborough River watershed, with special emphasis on the Upper Hillsborough River-Green Swamp Corridor. The HRGTF also interacts with other regional planning efforts such as the TBEP and the Interlocal planning board. The intent was not to be another governmental body but rather a voluntary, goal-driven, action-oriented group. After several years of defining issues, conducting research, and performing analyses, the HRGTF reached consensus on 20 major issues affecting the river and released its guiding report in 1995. Since then, the HRGTF has been working to implement the recommendations. Upon completion of its project goals, the HRGTF plans to transfer its monitoring and resource management activities to appropriate public or private organizations.[8]

In addition to serving as a vehicle for improved environmental protection and restoration, the HRGTF has become its own collaborative organization that now comments on local watershed management plans and development projects in order to ensure that their interests in protecting and restoring Hillsborough River are heard in various public forums.

The final cornerstone of Florida's ecosystem management program is the foundations of ecosystem management. These are the tools that make ecosystem management possible, including science and technology (including the monitoring data necessary to make decisions), staff training, and environmental education. Accordingly, the FDEP supports a wide range of monitoring and research programs, efforts to develop environmental indicators to measure progress, staff training programs, development of GIS systems, and a wide range of environmental education efforts.

Project XL for Communities

The Project XL for Communities (XLC) program was created by President Clinton with his March 16, 1995 Reinventing Environmental Regulation initiatives. The idea behind the program was to give the regulated community the opportunity to demonstrate "eXcellence and Leadership" and the flexibility to replace the requirements of the current regulatory system with an alternative strategy developed by the local community. The TBEP proposed to implement portions of their CCMP covered by the Interlocal Agreement as an XLC project. However, the TBEP ended up withdrawing their application. As one respondent put it: "When we were considering how to do this cooperative approach, we thought we could use Project XLC as a way of getting industry and governments involved. Then it became obvious that the paperwork and legal aspects were way beyond what we wanted. . . . We asked EPA what they could do through XLC that they couldn't do otherwise and they said nothing." Accordingly, they determined that they could not achieve any additional flexibility that could not be achieved pursuant to the IA. Moreover, the monitoring, reporting, and other administrative requirements of Project XLC created unnecessary costs. Thus, there was no "real" incentive to participate.

Managing for Results

The State of Florida and the FDEP have been engaged in a number of "reinvention" activities that might be of interest to the Academy. However, we did not uncover any relationship between the activities and the development and implementation of the CCMP.

As indicated in Table 3, the legislature has reorganized the State's environmental agencies periodically over the last several decades in an attempt to improve the performance of these programs. The product of these efforts was a merger between the DER and DNR. There have also been some efforts to reform the environmental permitting system in Florida other than the ecosystem team-permitting program noted above. The 1994 merger, which created the FDEP, also resulted in the coordination of various permitting programs. Prior to the merger, permitting time was on the increase in both the DER and the WMDs.[9] Two separate permitting programs, the DNR's Dredge and Fill permit on sovereign State lands and the DER's Dredge and Fill permit for activities above the mean high water line, were merged into one permit under one set of regulations. Other streamlining efforts were undertaken as part of the merger. One state wetland delineation line was established. Standards were established that assured the equitable implementation for these programs throughout FDEP regional offices. All permits for activities involving dredging and filling, management and storage of surface water including storm water control, and the alteration of mangroves were also consolidated into a single type of permit know

as an environmental resource permit (ERP). The FDEP and the WMDs administer this new permit program.[10]

Strategic planning and performance-based management are also principles that have been embraced by the FDEP. Each state agency must submit a draft three to five year strategic plan to the Governor's Office of Planning and Budgeting (OPB) and the legislature for review by June 1 of each year. Each state agency must also prepare a report on its performance in implementing the previous year's strategic plan. The FDEP uses its Agency Strategic Plan (ASP) to describe how it plans to implement the State Comprehensive Plan (SCP) as well as other statutory duties and responsibilities. It also uses the ASP to establish directions for new and existing programs. Over time, the ASP is driving FDEP decision making in terms of resource allocation.[11]

To help communicate these "results oriented" policies to the public, the FDEP began publishing the *Secretary's Quarterly Performance Report* in the fall of 1997.[12] The FDEP took on the challenge of developing meaningful performance measures and communicating the information to the EPA, agencies, and the public. They have also begun using this information to refine and improve their strategies for solving and managing environmental problems. One of the FDEP's hopes in undertaking this effort is that it will improve accountability, which eventually might cause the public and the legislature to grant them greater operational flexibility.[13] The FDEP's efforts in reporting these results led the agency being recognized as a finalist in 1999 for Innovations in American Government awards program administered by the Ford Foundation and Harvard University.[14] These efforts also facilitated the FDEP's participation in the EPA's National Environmental Performance Partnership system (NEPPS).[15] The FDEP has also been supportive of other efforts to improve reporting, integrate information management systems, and develop new performance indicators.[16]

Endnotes

[1] Another example of an ecosystem team permit in the Tampa Bay watershed is the Tampa Water Resource Recovery Project. The goal of this project is to find the Tampa Bay area additional sources of potable water through reuse.

[2] Jemy W. Hinton, and Katherine P. Liles, "Integration and Implementation of Ecosystem Management Objectives in the Hillsborough River and Bay Ecosystem Demonstration Project Area," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 357 – 361; and, Department of Environmental Protection, *Ecosystem Management: At Work in Florida* (Tallahassee, FL: FLDEP. October 1998).

[3] For a discussion of some of projects currently underway see: Department of Environmental Protection, *A Spring 1997 Snapshot of Ecosystem Management Activities in Florida*. (Tallahassee, FL: FLDEP. Undated).

[4] The Hillsborough EMA is implemented under the umbrella of the Hillsborough river Integration and Coordination Committee (HRICC). Agencies participating in the HRICC include the FDEP, TBEP, Hillsborough River Greenways Task Force (HRGTF) (another interagency taskforce), SWFWMD, Hillsborough River Interlocal Planning Board, City of Tampa, and the EPC.

[5] Another example is the Strategic Management Initiative for McKay Bay. This project resulted in a comprehensive management plan to support environmental preservation, enhancement, and restoration of McKay Bay and its associated watershed to address the legacy of over 100 years of development impacts. McKay Bay is

and important estuary and urban wildlife sanctuary in the heart of a heavy industrial area in the City of Tampa. It was directed by the city of Tampa with the support of Tampa BAYWATCH, the SWFWMD SWIM program, the Bay Area Environmental Action Team, the Tampa Audubon Society. For more information see: NOAA, *Evaluation Findings*.

[6] There are a number of place-based environmental protection efforts in the three county area including: efforts to develop watershed management plans in the subbasins of the counties; the Egmont Key Alliance; Cockroach Bay Aquatic Preserve Management Advisory Team; and, the Strategic Management Initiative for McCay Bay. While these initiatives are not all part of the FDEP's ecosystem management initiative, they do illustrate the opportunities for local involvement in place-based initiatives within their community. Many of these efforts have also become organizations in their own right that now comment on other planning efforts and development projects.

[7] For a discussion of how the FDEP's ecosystem management approach has been applied in the Hillsborough River and Bay Ecosystem Demonstration Project Area (Hillsborough EMA) see: Hinton, Jemy W. and Katherine P. Liles, "Integration and Implementation of Ecosystem Management Objectives in the Hillsborough River and Bay Ecosystem Demonstration Project Area," in *Proceedings: Tampa Bay Area Scientific Information Symposium 3: Applying Our Knowledge*, edited by Sally F. Treat (St. Petersburg, FL: Tampa Bay Regional Planning Council. 1997), 357 – 361.

[8] TBRPC, *State of Tampa Bay 1998*, 22.

[9] NOAA, *Evaluation Findings*, 32.

[10] However, the merger created some concerns. For example, NOAA's Section 312 evaluation in 1996 expressed some concerns regarding the need for a mechanism that allows input of other agencies to the permit process and the need for greater public awareness of changes in the permitting process resulting from the delegation of permitting to the regions (For more information see: NOAA, *Evaluation Findings*.

[11] Department of Environmental Protection, *People, Progress, and the Environment: Agency Strategic Plan for FYs 1999-2000 through 2003-2004* (Tallahassee, FL: FLDEP, March 1999), 4.

[12] Department of Environmental Protection (DEP), *Secretary's Quarterly Performance Report*, Volume 2, Number 2, (Tallahassee, FL: FLDEP, March 1999); and, DEP, *Secretary's Quarterly Performance Report*, Volume 2, Number 1, (Tallahassee, FL: FLDEP, December 1998).

[13] DEP, *Secretary's Quarterly Performance Report*, Volume 2, Number 1, 1.

[14] Ford Foundation, *Innovations In American Government 1999*, Special Sponsored Section of the Ford Foundation (Cambridge, MA: Kennedy School of Government and the Ford Foundation, 1999), A18.

[15] DEP, *Environmental Performance Partnership Agreement*, (Tallahassee, FL: FLDEP. December 1996).

[16] For example, the Florida Center of Public Management developed a system of coastal indicators for the FDEP that collectively measure the current status and trends of environmental, economic, and social values of Florida's 35 coastal counties. This has allowed the development of a Florida State of the Coast report. For more discussion of these efforts see: NOAA, *Evaluation Findings*.

Appendix B

Timeline of Environmental Governance Activities in Florida

1949	Legislature adopts the Flood Control Act, which allowed for the formation of flood control districts. These "Chapter 378 districts" had no regulatory powers and were limited to cooperating with the federal government in its flood control projects (Ch. 25209, 1949 *Florida Laws*, codified in *Florida Statutes* Ch. 378 (1949)).
1950s	Air conditioning becomes widely available. This is the beginning of a tremendous period of population growth in the Tampa Bay region
1955	Florida Water Resources Study Commission was established to determine the need for comprehensive water law in Florida and issued its report to the legislature in 1957
1957	Florida Legislature adopted a Water Resources Law (Ch. 57-380, 1957 *Florida Laws*, codified in *Florida Statutes* Ch. 373 (1957)) which created a Department of Water Resources within the State Board of Conservation and gave the department broad powers to manage water resources.
1959 and 1960	Disastrous floods in the Tampa Bay region including flooding from Hurricane Donna.
1961	Legislature creates the Southwest Florida Water Management District (SWFWMD) as a Chapter 378 district. It was created to be the local sponsor of a major flood control project that followed the massive flood damage.
1962	The Tampa Bay Regional Planning Council was created when representatives from Tampa, St. Petersburg, and Clearwater began to recognize the need for coordination to address issues that spanned community boundaries. By law Hillsborough, Manatee, Pinellas, and Pasco counties are required to exercise regional cooperation through participation on the Council. Two thirds of the council's membership is composed of representatives of the counties and local municipalities (43 jurisdictions in all are represented). These members are elected officials appointed by their local boards. The remaining one third of the membership is comprised of members appointed by the Governor. Three ex-officio members representing SWFWMD, FDEP, and the Florida Department of Transportation (FDOT) were added to the Council in 1993.
1967	Legislature creates the Environmental Protection Commission (EPC) of Hillsborough County
1967	Florida Air and Water Pollution control Act (Chapter 403, Florida Statutes) which is the keystone of Florida's pollution control efforts is adopted by the legislature. It is much expanded today. In 1968 Chapter 403 totaled 11 pages while the 1990s version is more than 125 pages
1969	Federal Water Pollution Control Administration issues its report *Problems and Management of Water Quality in Hillsborough Bay, Florida* identifies eutrophication problems resulting from nutrient enrichment from discharges of partially treated sewage, fertilizer processing facilities, and the Alafia River.
1970 – 1971	Severe drought focused attention on the problems of the present system of water planning and management.
1971	*A Model Water Code* was developed by Frank Maloney and Richard Ausness of the University of Florida and Scott Morris of SMU. Galleys of the document were made available to the legislature in 1972 while they debated new environmental legislation.

1971	Environmental Protection Act of 1971 allows Florida citizens to sue the state for the failure to enforce environmental laws.
1972	Environmental Protection Commission (EPC) of Hillsborough County begins continuous ongoing surface water quality monitoring program
1972	Florida Environmental Land and Water Management Act (Chapter 380, Florida Statutes) created the Development of Regional Impact (DRI) procedures and authorized the creation of Areas of Critical Concern
1972	Florida Water Resources Act of 1972 (Ch. 373, F.S.) was adopted. While it followed the basic structure of *A Model Water Code*, the legislature altered several key provisions. It set up a two tiered management structure headed by the Department of Natural Resources (DNR) and the water management districts (WMDs). The DNR was given supervisory authority over the WMDs as well as the authority to exercise any of the WMD's powers. Over the years, most regulatory functions have been delegated to the WMDs.
1972	State Constitution was amended to authorize some $240,000,000 in state bonds that allowed the Department of Natural Resources to purchase environmentally endangered and recreational lands.
1973	The Florida Environmental Protection Act (Ch. 403, F.S.) renamed the Department of Pollution Control as the Department of Environmental Regulation (DER) and broadened its powers, duties, and programs.
1974	Sufficient funding for planning purposes pursuant to the Florida Water Resources Act of 1972 is not forthcoming and the agency delegates its planning responsibilities to the WMDs. SWFWMD (and South Florida WMD) immediately begin extensive planning. When the DER was created in 1975 and initiated additional planning efforts it was confronted with a diversity of more mature programs.
1975	The Local Government Comprehensive Planning Act (LGCPA) (Ch. 163, F.S.), the state's first growth management legislation, required all cities and counties to prepare a comprehensive plan to be reviewed by the Department of Community Affairs. State authority is limited and local governments are under no requirement to revise their draft plans based on state agency comments.
1975	Legislature reorganized the state's environmental agencies under the umbrella of the Department of Environmental Regulation (FDER)
June 1976	Florida Department of Regulation (FDER) began receiving Section 208 funding pursuant to the Clean Water Act to begin developing area-wide water quality management plans to abate point and nonpoint sources of pollution.
1977	Legislature revises the dredge and fill jurisdiction of the Department of Environmental Regulation
1979	FDER's *Agricultural Nonpoint Source Management Plan* and *Forestry Nonpoint Source Management Plan* were approved by the EPA
1979	Legislature creates the Conservation and Recreation Lands program including a new Division of State Lands within the Department of Natural Resources. It also expanded the definitions of lands to be acquired to include floodplains and wetlands

1979	First official state stormwater management regulations (Chapter 17-4.248, F.A.C.) were adopted in which the DER's decision to require a permit was based upon a determination of the "insignificance" or "significance" of a stormwater discharge.
Late 1970s to early 1980s	Period where water quality was the worst for most parameters
1981	Passage of the Save Our Rivers Act authorized water management districts to use funds from a documentary stamp tax increase to purchase lands along rivers. The program proposed to spend $320 million over 10 years to purchase wetlands, floodplains, and other lands necessary for water management, water supply, and conservation and protection of water resources.
1981	A five-year $275,000,000 Save our Coasts bond issue was approved to purchase coastal property. The program purchased coastal lands such as beaches, shorelines, and sensitive habitat areas.
October 1981	Florida's State Stormwater Rule was adopted by the Environmental Regulation Commission (ERC)
February 1982	A revised stormwater rule (Chapter 17-25, F.A.C.) was adopted by the state's Environmental Regulatory Commission (ERC) after two years of workshops and 29 official drafts of the proposed rules. It required a stormwater permit for all new discharges and for modifications to existing discharges if flows or pollutant loading increased. This new rule was implemented within the framework of the federal Clean Water Act (CWA) using technology-based effluent limitations (TBELs).
1982	Legislature protects Outstanding Florida Waters, revises the state's dredge and fill laws by expanding jurisdiction.
1982	First Tampa Bay Area Scientific Information Symposium (BASIS)
1982	Legislature passes law that requires that waste discharged into Tampa Bay and other Southwest Florida waters receive advanced waste treatment (AWT). This law is credited with the dramatic increase in Sea Grasses in Tampa Bay
1982	Initial development of a GIS system at the Florida Marine Research Institute (MRI) began with funding from the Florida Coastal management program.
1983	Legislature creates the Tampa Bay Management Study Commission with the charge of examining the opportunities and constraints associated with developing a unified, comprehensive management strategy for Tampa Bay.
1984	Legislature passed the Warren S. Henderson Wetlands Protection Act, which greatly increased the protection of these natural filters.
1984	Tampa Bay Management Study Commission issues its landmark report *The Future of Tampa Bay*. It contains 42 recommendations to the legislature, state agencies and local governments. The three highest priority issues were funding, loss of seagrass, and nonpoint source discharges. The report also recommended the creation of a Bay Management Authority with regulatory powers over the management of Tampa Bay.

1985	Legislature enacted the *State Comprehensive Plan* (SCP) and major growth management legislation. The SCP contains important goals and policies in 25 different elements including water resources, coastal and marine resources, natural systems and recreation, air quality, waste management, land use, mining, agriculture, public facilities, and transportation. The legislation required agency plans, regional plans, and local comprehensive plans to be consistent with the plan. The legislation also required the FDER to prepare a State Water Use Plan.
1985	Agency on Bay Management (ABM) is formed as a standing committee of the Tampa Bay Regional Planning Council (TBRPC).
1985	Local Government Comprehensive Planning and Land Development Regulation Act of 1985 (Ch. 163, F.S.). This law required all local governments to prepare comprehensive plans and implementing regulations which must be consistent with the goals and policies of the SCP and regional policy plans developed by regional planning councils. Local plans must accommodate the objections of state and regional officials.
June 1986	Five WMDs enter into an interagency agreement in the summer of 1985 to conduct a comprehensive review of water resource policies, planning, and implementation programs in Florida. The goal was to provide coordinated input to the FDER in its preparation of a State Water Use Plan. The five-volume report entitled *Comprehensive Review of Water Resources Policies, Planning, and Programs in Florida* endorsed the regional approach used in Florida, argues that the trend will be away from state-level comprehensive planning towards issue analysis and policy planning. It also notes some of the problems in dealing with emerging issues and the lack of coordination with the comprehensive planning legislation.
1986	Section 403.0891, Florida Statutes authorizes municipalities to establish stormwater utility fees. By 1998, over 85 cities and counties have adopted a stormwater utility to provide a dedicated source of revenue for their stormwater programs.
1986	ABM publishes its first Annual *State of the Bay* report for Tampa Bay
1986	TBRPC prepares the first habitat restoration plan for Tampa Bay
1986	City of Tampa, Bay Study Group (BSG) begins monitoring sea grass in Hillsborough Bay
1987	Legislature passes the Surface Water Improvement and Management (SWIM) act. It required water management districts to prioritize water bodies according to the need for restoration or cleanup and provided a funding process for the program (although funding has been inconsistent). The legislature designates Tampa Bay as a priority water body and directed the SWFWMD to "design and implement plans and programs for the improvement and management" of the estuary (Ch. 87-97, Laws of Florida).
1988	Florida's Section 319 Nonpoint Source Assessment and Management Plan were approved by the EPA.
August 1988	SWFWMD Governing Board approves the SWIM plan for Tampa Bay and its tributaries
October 1988	The FDEP in cooperation with the SWFWMD and the TBRPC's ABM submits the Florida Governor's Nomination Report to the EPA to justify convening the Tampa Bay Management Conference and gain admission to the National Estuary Program (NEP).

1989	Legislature requires water management districts to shoulder most of the stormwater management responsibility along with local governments.
1989	Sarasota Bay National Estuary Program was created.
April – Dec. 1989	Governor Bob Martinez signed an executive order creating the Governor's Water Resource Commission directing it to analyze the state's water resources. The product of this effort was the *Governor's Water Resource Commission: Final Report*, which notes the lack of a comprehensive, integrated planning process that joins land and water use planning for the entire state.
April 1990	EPA Administrator William K. Reilly adds Tampa Bay to the National Estuary Program.
August 1990	SWFWMD makes the initial application for NEP funding
Sept. 1990	A cooperative agreement is awarded to the SWFWMD
Oct. 1990	TBNEP's Policy Committee votes to have the TBRPC serve as the administrative agency for the program. Initially, the SWFWMD passed the federal and matching funds along to the TBRPC in accordance with a letter of agreement between the agencies.
Nov. 1990	A cooperative agreement between SWFWMD and the EPA is signed in November 1990 enabling the initial development work to begin on the Tampa Bay NEP. The start-up phase of funding included $150,000 in federal funding and the SWFWMD provided the required $50,000 in matching funds. The funds were to perform specific tasks related to getting the program started and achieve two key NEP requirements: developing the State-EPA Management Conference Agreement and the 1991 Annual Work Plan.
1990	Legislature created the Preservation 2000 (P-2000) program designed to provide a permanent funding source for the State's land acquisition programs. This ten-year land acquisition program had a goal of spending $300 million per year with available funding divided among seven programs: Carl, Save Our Rivers, Florida Communities Trust, State Parks, State Forests, State Wildlife Areas, and Rails to Trails.
January 1991	List of priority problems for Tampa Bay adopted by the TBEP
1991 – 1996	TBEP assesses bay conditions and needs
March 1991	The State-EPA Management Conference Agreement is signed formally establishing the Tampa Bay National Estuary Program (TBNEP) and its management conference structure. The agreement also details the commitments to work that will be accomplished and schedule that will lead to the development of a final Comprehensive Conservation and Management Plan (CCMP) by April 1995.
1991	Second BASIS symposium focused on the watershed and the management of the Tampa Bay system
1992	Hillsborough River Greenways Task Force (HRGTF) is formed
1993	Legislature creates the Department of Environmental Protection (FDEP) by merging the Department of Natural Resources and Department of Environmental Regulation.

1993	Legislature requires local governments to establish a process for setting priorities for coastal land acquisition. It also established additional criteria pertaining to coastal areas to be considered by the state Conservation and Recreation Lands program and directing State agency cooperation with the LAAC in choosing lands for acquisition under various state programs.
August 1993	Two barges and a freighter collide at the mouth of the bay in a fiery explosion that spills nearly 330,000 gallons of oil.
November 1993	Staff of the Senate Committee on Natural Resources and Conservation reviewed the activities of the WMDs and the FDEP undertake when developing a policy framework for water management. The resulting report, *A review of Water Management Policy and Planning Activities*, notes that a multitude of documents addressing water policies and strategies exist without a clear, universally understood relationship between and among the documents. Accordingly, it is not clear which policies should guide water management in Florida.
1993	Ban on purse seining in Tampa Bay
1993	TBNEP releases its *Status and Trends* report
1993	Tampa BayWatch is Incorporated
1993 -1994	Legislature directed the Governor to appoint a Task Force with local, regional, state agency, and private sector membership to recommend the appropriate relationship between various land and water plans including the WMDs management plans, the growth management portion of the SCP, the strategic regional policy plans of the regional planning councils, and local comprehensive land use plans. The report issued in December 1994, *Recommendations of the Land Use and Water Planning Task Force: Final Report*, calls for improved coordination between the plans and repealing unnecessary layers of plans.
1993 - 1994	The Environmental Resource Permit program was revamped, which revised the State's wetlands protection and dredge and fill programs. Many of these permitting actions were directed to the state's water management districts.
1994	The legislature ratified the FDEP's reorganization during its 1994 session.
1994	The FDEP begins developing its new ecosystem management approach
1994 - 1995	Florida legislature created a 21 member Water Management District Review Commission and directed it to conduct a comprehensive review of Florida's regional system of water management. Seventeen public hearings were held to gather public comment. Their report, *Bridge over Troubled Water: Recommendations of the Water Management District Review Commission* (December 1995) contains over 80 recommendations. It concludes that the legislature's ability to adjust the WMDs' statutory millage rates remains an effective check on *ad valorem* taxation, district accountability could be strengthened by both executive and legislative representatives, there is a lack of coordination among various land acquisition programs, and there is a need for alternative resource protection methods.
April 1995	Completion date for the final CCMP as contained in the State-EPA Management Conference Agreement.

July 1995	Constitutional ban on gill netting, in part triggered by declining mullet stocks, takes effect.
December 1995	Florida's House of Representatives established a Select Committee on Water Policy to address water policy issues and to create or amend water policy for the state during the 1994- 1996 legislative session. The Committee's interim report titled *Water Supply Policy Considerations: Interim Project Report* (December 1995) examined the differences between the present system and the one envisioned by *A Model Water Code*. It concludes that many of the problems are the result of the incomplete adoption or implementation the *Code*. It also argues that there is insufficient programmatic supervision of the WMDs.
1993 - 1996	TBEP works to establish specific goals for Tampa Bay
1994 - 1996	TBEP develops and reviews management options for inclusion in the CCMP
1995	HRGTF unveils its final report containing action plans and recommendations
1995	Mangrove Trimming and Preservation Act passed
1995	Defenders of Wildlife issues a report entitled *Endangered Ecosystems: A Status Report on America's Vanishing Habitat and Wildlife* ranks Florida first in the nation in terms of risk of ecosystem loss and second in terms of percentage of species at risk.
December 1995	Tampa Bay Regional Planning Council (TBRPC) adopts a revised *Tampa Bay Strategic Regional Policy Plan*
January 1996	Draft CCMP released
Spring 1996	Over 250 residents attend a series of town meetings on Tampa Bay organized TBEP to discuss the draft CCMP with a panel of experts drawn from the local community. The TBEP and its citizens advisors also hold a series of smaller focus groups to discuss the CCMP with specific interest groups.
August 1996	The management committee joined with joined with key industries in the Tampa Bay region to create a unique public private partnership known as the Tampa Bay Nitrogen Management Consortium.
October 1996	Third BASIS symposium
November 1996	Management Conference approves the CCMP
December 1996	Policy committee unanimously adopted the CCMP and submitted it to the Governor and EPA for their approval
1997	Heavy rainfall associated with El-Nino
March 1997	EPC issues permit to CFI culminating an 18-month Ecosystem Management/Team permitting effort to construct a 576 acre phosphogypsum stack.
May 1997	EPC becomes involved in second Ecosystem Management/Team permitting effort for the Tampa Water Use Recovery Project

March 26, 1998	The name is changed to the Tampa Bay Estuary Program (TBEP) when the local governments and nonfederal agencies represented on the policy and management committee entered into an interlocal agreement which: adopted the goals and priorities of the CCMP; defined responsibilities of the signature parties including the development of action plans to achieve the CCMP's goals; created guidelines for regulatory flexibility to facilitate implementation of action plans; and, established the CCMP as an ecosystem management conceptual design upon which more detailed ecosystem management agreements may be entered into pursuant to Section 27 of 97-164, Laws of Florida (Codified as Section 403.0752, Florida Statutes). The COE and EPA enter into separate MOUs with the TBEP.

Appendix C

Action Plans in the TBEP's CCMP

Water and Sediment Quality

Actions to reduce stormwater runoff and associated pollution:

1. Continue implementation of the Florida Yards and Neighborhoods Program
2. Assist businesses in implementing BMPs to reduce stormwater runoff
3. Encourage local governments to adopt integrated pest management policies and beneficial landscape practices
4. Reduce impervious paved surfaces
5. Require older properties being redeveloped to meet current stormwater standards
6. Promote compact urban development and redevelopment
7. Improve compliance with and enforcement of stormwater permits
8. Enforce the consent orders for cleanup of fertilizer facilities in the East Bay sector
9. Encourage "fertigation" and low-flow irrigation on farms
10. Improve compliance with agricultural ground and surface water management plans
11. Determine minimum widths for vegetated buffers along tributaries

Actions to reduce the effects of air pollution to the bay:

1. Identify sources and monitor the effects of atmospheric deposition
2. Promote public and business energy conservation

Actions to reduce the impact of wastewater discharged to the bay:

1. Expand the use of reclaimed water if it benefits the bay
2. Establish limits on nitrogen in industrial wastewater
3. Extend central sewer service to priority areas around the bay served by ISDSs
4. Require standardized monitoring of discharges from POTWs and industry
5. Revise HRS rules to incorporate environmental performance standards for septic tanks

Actions to decrease toxic contamination in the bay:

1. Direct stormwater improvements and other resources to hot spots
2. Improve business and homeowner opportunities for hazardous waste disposal
3. Reduce toxic contaminants from ports and marinas
4. Promote integrated pest management on farms
5. Establish discharge limitations on toxics

Actions to reduce pathogens:

1. Establish water quality standards for saltwater beaches
2. Assess opportunities to reclassify shellfish beds closed to harvesting
3. Install additional marine pump-out facilities

Bay Habitats

Actions to increase and preserve the number and diversity of healthy habitats:

1. Implement the Tampa Bay master plan for coastal habitat protection
2. Establish and implement mitigation criteria for Tampa Bay

3. Reduce propeller scaring of seagrass
4. Evaluate whether to establish a special management area for the protection of coastal habitat
5. Restrict impacts to hard bottom communities
6. Restrict off-road vehicle access along causeways and coastal areas
7. Require mandatory education of boaters
8. Encourage waterfront homeowners to soften shorelines and limit runoff
9. Improve compliance with and enforcement of wetland permits
10. Expand habitat mapping programs

Actions to establish and preserve adequate freshwater to Tampa Bay:

1. Establish and maintain minimum freshwater flows downstream of dams

Fish and Wildlife

Actions to protect bay fish and wildlife:

1. Improve on-water enforcement of environmental regulations
2. Establish and enforce manatee protection zones
3. Support restoration of the bay scallop
4. Improve public awareness of hazards to bay wildlife
5. Assess the need to investigate the cumulative effects of power plan entrainment on fisheries
6. Continue to expand the Critical Fisheries Monitoring Program

Dredging and Dredged Material Management

Actions to reduce the impact of dredging and improve disposal options:

1. Develop a long-term, coordinated plan for port dredging and dredged material disposal
2. Develop a dredge disposal plan for residential canals

Spill Prevention and Response

Actions to improve spill prevention and response:

1. Establish and integrated ship tracking system for the bay and permanently fund PORTS system
2. Install permanent boom anchors near environmentally sensitive areas
3. Evaluate state piloting requirements and improve state authority over federal vessels carrying hazardous waste
4. Identify the appropriate entity to inspect coastal bulk oil storage facilities
5. Improve fueling and bilge-pumping practices among pleasure boaters

Implementation

1. Interlocal Agreement
2. Agreement with EPA
3. Agreement with COE
4. Bay management goals incorporated into the local comprehensive plans
5. Action plans incorporated into local capital improvement programs

About the Contributors to the Report

Mark T. Imperial graduated with a Master of Arts in Marine Affairs from the University of Rhode Island in 1993. From 1991 to 1994, Imperial worked as a policy analyst with the Rhode Island Coastal Resources Management Council. Mark is currently a Ph.D. candidate in the Public Affairs program at the School of Public and Environmental Affairs, Indiana University. His concentrations are Public Management and Policy Analysis with a minor in Environmental Science. His dissertation research focuses on collaboration in the development and implementation of watershed management programs. In addition to these activities, Mark has had articles published in the journals *Coastal Management*, *Ocean and Coastal Management*, *Environmental Management*, and *Public Works Management and Policy*.

Timothy M. Hennessey is a Professor of Political Science and Marine Affairs and the Associate Director of the Rhode Island Public Administration Program at the University of Rhode Island. He has over twenty years of experience studying the management and governance of coastal and estuarine ecosystems. In 1985, he and his colleagues at the Coastal Resources Center at the University of Rhode Island conducted a five-year Sea Grant funded comparative analysis of the governance structure and process in five estuaries; Narragansett Bay, Galveston Bay, San Francisco Bay, Albermarle-Pamlico Sound, and Puget Sound. More recently, Hennessey conducted a major study of the Chesapeake Bay Program and worked with Mark Imperial on a research project examining the National Estuary Program. He has also studied the role of science in the management of estuaries through a comparative analysis of Puget Sound and the Fraser River Estuary in Canada. Professor Hennessey has published numerous articles in journals such as *Marine Policy*, *Coastal Management*, and *Ocean and Coastal Management* as well as chapters in edited books.

Derek Kauneckis received a Masters of Science degree in International Development with an emphasis on Natural Resource Management and Policy in 1997 from the University of California, Davis. Currently he is a Ph.D. student in Public Policy at the Department of Political Science and the School for Public and Environmental Affairs at Indiana University, Bloomington. Derek's professional experience includes working with the US Forest Service in Alaska on Cultural Resource Management and Community Development programs, the Division of Natural Resources at Winrock International Institute for Agricultural Development and various environmental consulting firms in the Western United States. Derek's dissertation research uses a comparative approach to examine the effect of political decentralization on local public policy decision-making regarding natural resource management.

Leslie Koziol graduated Magna Cum Laude from Northland College, Ashland, Wisconsin, with a Bachelors of Science degree. Leslie has received numerous awards and achievements including the Aldo Leopold Award in Environmental Ethics, The Northern States Power Environmental Achievement Award, and Distinction in the Social Sciences. Leslie is currently pursuing a Masters degree in Environmental Science at Indiana University. Her

research interests include Wetland Ecology and Environmental Policy and she has worked as an assistant instructor and a lab assistant at Indiana University for the Indiana Clean Lakes Program. Prior to her graduate work, Leslie conducted research on acid mine drainage sites in Southwest Colorado. In particular, the research focused on the philosophical underpinnings of science and its role in policy formulation. Leslie has also worked as an Assistant Environmental Specialist at the Bad River Department of Natural Resources, Odanah, Wisconsin.

Katheryn Summers received a Bachelor of Science degree, with a concentration in Zoology and a minor in Wildlife Ecology, from the University of Florida in 1994. From 1994 to 1995, she conducted research University of Florida's Neurobiology Lab and provided staff support at the National Biological Survey-s Sirenia Project. Katheryn then worked for The Nature Conservancy's in Gainesville, Florida where she produced the 1995 Eglin Air Force Base Annual Research Report, a compilation of inventory, monitoring and research conducted in support of ecosystem management. She also participated in the development of an agreement to conduct joint ecosystem management on 750,000 acres near Eglin Air Force Base. In 1996, she began her graduate studies at Indiana University and graduated in May 1999 with a Master of Environmental Science and a Master of Public Affairs, concentrating in Environmental Policy and Natural Resource Management. Katheryn is also working as a research assistant at the Center for the Study of Institutions, Population, and Environmental Change (CIPEC) on a project examining the private ownership of forested lands in Indiana.

Sally McGee is a graduate of Smith College where she received her B.A. in economics in 1989. She lived in Washington, DC for several years, working with environmental groups including Greenpeace and Conservation International. This work inspired her to experience the marine environment first hand, so she left Washington to study and then work for Sea Education Association in Woods Hole, MA. Sally has worked aboard a number of traditionally rigged sailing vessels and has sailed the eastern seaboard of the US and Canada, the Caribbean, and in the North and South Pacific. She returned to the US in 1997 and worked for Mystic Seaport (Mystic, CT) before entering the Marine Affairs Program at the University of Rhode Island in the Fall of 1998. The focus of her studies at URI is environmental conflict resolution.