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TAMPA BAY MANAGEMENT STUDY

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TAMPA BAY MANAGEMENT STUDY

DECEMBER 1983

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INTRODUCTION

CHAPTER 1

Tampa Bay is one of the largest estuaries in the world (400 square miles) with 1.5 million people living in the three counties bordering its shores. This population represents a 45 percent increase since 1970. Rapid urban and industrial development have radically changed the character and ecology of the Tampa Bay. For instance, studies have indicated that 44 percent of the original 25,000 acres of mangroves and marshes have been destroyed and 81 percent of the original 76,500 acres of seagrasses have disappeared. This habitat loss has resulted in declining populations of commercially valuable fish and shellfish, including a complete collapse of such fisheries as those for scallops and oysters and major declines for bait shrimp and spotted sea trout.

Many economically important activities have developed in conjunction with the rapid urbanization. Many commercial enterprises are dependent on Tampa Bay, both directly and indirectly, for their livelihood. These include tourist and recreational support industries, port facilities and related activities, and many new enterprises locating in the region. The Port of Tampa is the nation's seventh largest port and Port Manatee is another large port serving the Tampa Bay Area. With the Tampa Bay Channel presently being deepened to 43 feet, this will facilitate more intensive shipping activity and an overall increase in commerce through the region.

Tampa Bay is also a major boating and recreational amenity. The area hosts several annual activities such as sailing regattas, Gasparilla Day and other activities which draw crowds from other areas of the state and nation. This emphasis on recreation supports a multitude of commercial enterprises, including a major boat building industry, area restaurants and hotels, marinas, etc.

Increasing commercial traffic, recreational activities and the trend toward increased ecological degradation of Tampa Bay have caused both conflicts and concern by many individuals involved in the study, use or management of Tampa Bay.

At the present time, local governments surrounding Tampa Bay, regulatory agencies and many other groups presently carry out their activities independently. The effect of bay management by a multitude of overlapping and often conflicting jurisdictional boundaries and interests of the user groups has not been investigated. Thus, a comprehensive program is needed to identify impacts and develop a management strategy for Tampa Bay.

The Tampa Bay Area Scientific Information Symposium (BASIS), held on May 3-6, 1982, summarized all available scientific information and data relevant to Tampa Bay. A major conclusion of the symposium was that scientists and managers must take a comprehensive view of Tampa Bay when undertaking studies or making management decisions.

BASIS organizers suggested that the Tampa Bay Regional Planning Council form a Bay Management Committee to initiate a comprehensive investigation of Tampa from a variety of viewpoints. On May 10, 1982, a motion was passed by the Council to establish the Tampa Bay Study Committee. The Committee was charged with the task of identifying critical bay problems and evaluating potential solutions for those problems. In December 1982, a grant was received from the Florida Department of Environmental Regulation to help support committee activities for one year and to develop a management plan for Tampa Bay.

PLANNING PROCESS

The Tampa Bay Study Committee is composed of representatives from local, regional, state and federal agencies, the academic community and commerical, industrial, recreational and environmental interests. Initially, five subcommittees were formed to specifically address ecological, industrial, institutional, economic and recreational aspects of Tampa Bay.

The planning process consisted of six steps: identification of the management boundary, adoption of goals and objectives, identification of major Bay management concerns, development of bay management guidelines and identification of existing and potential implementation programs and activities.

MANAGEMENT BOUNDARY

A two-fold definition was developed to delineate the management boundary, "Tampa Bay" and the "Tampa Bay area" (Figure 1). The purpose was to concentrate the efforts and goals on improving the area defined as Tampa Bay. However, it was decided that, in terms of activities and associated effects, Tampa Bay could not be entirely separated from the Tampa Bay area. Following is the precise definition of each that was adopted:

Tampa Bay

Tampa Bay is a connected group of estuaries; its seaward limit is arbitrarily given as a line connecting the barrier beaches of Boca Ciega Bay and Anna Maria Sound. Its upriver limit is approximately at the transition of shoreline vegetation from tidal to freshwater forms. The upland limit is that line above which terrestrial land forms and vegetation occurs. Further, the zones of Tampa Bay as defined by Lewis and Whitman (1982) (1) were also recognized as the official subdivisions of Tampa Bay (Figure 2).

Tampa Bay Area

The committee recognized that the domain of impacts affecting Tampa Bay occupies a larger geographic area. The "Tampa Bay Area" was defined as uplands and freshwaters within the combined watersheds of the bay.

GOALS AND OBJECTIVES OF THE STUDY COMMITTEE

Following are the goals established by the subcommittee and approved by the full committee:

Ecology	-	To establish and maintain Tampa Bay as an estuarine ecosystem in which commonly recognized ranges of scientifically valid parameters in comparable, healthy estuaries are consistently present.
Economics	-	To identify the economic value of public and private enterprises that provide goods and services to the community and need Tampa Bay as a resource essential to their existence.
Industry	-	To achieve a balance between the commercial uses of Tampa Bay and the Bay's natural environment for their mutual benefit.
Institution	-	To provide the framework for implementing the Tampa Bay Study Committee recommendations.
Recreation	-	To maximize current and future recreational benefits for the public of Tampa Bay with due concern for the environment.

Objectives towards developing a management program for Tampa Bay included:

- Identify uses of Tampa Bay and associated environmental impacts.
- Identify methods to resolve existing and potential conflicts between uses of Tampa Bay.
- Address and resolve jurisdictional issues.
- Identify shoreline areas where increased activities will have minimum (and maximum) impacts on Tampa Bay.
- Identify resource needs for uses of Tampa Bay.
- Develop a strategy for the restoration and protection of Tampa Bay.

Figure 1
DELINEATION OF MANAGEMENT BOUNDARIES

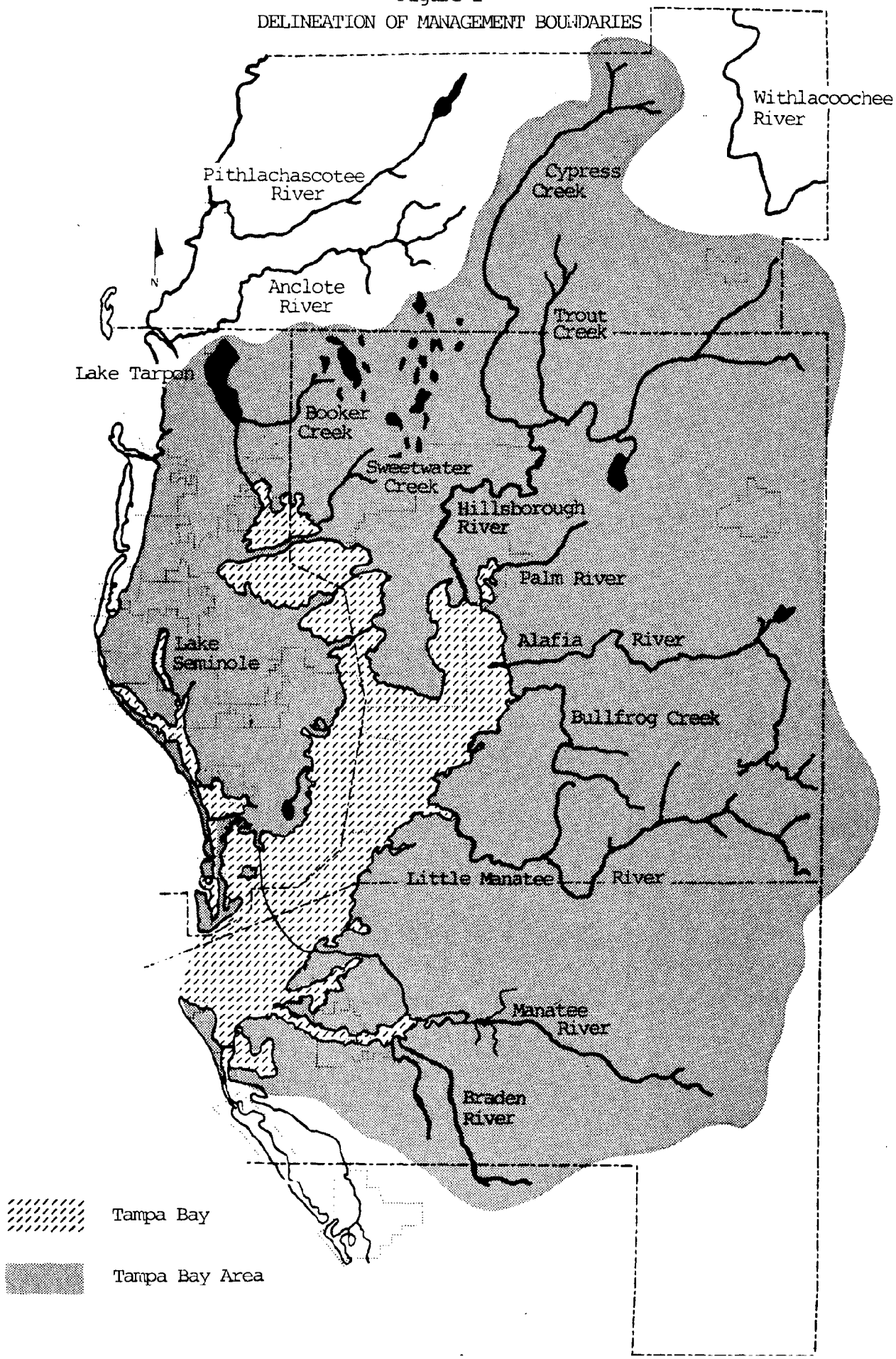
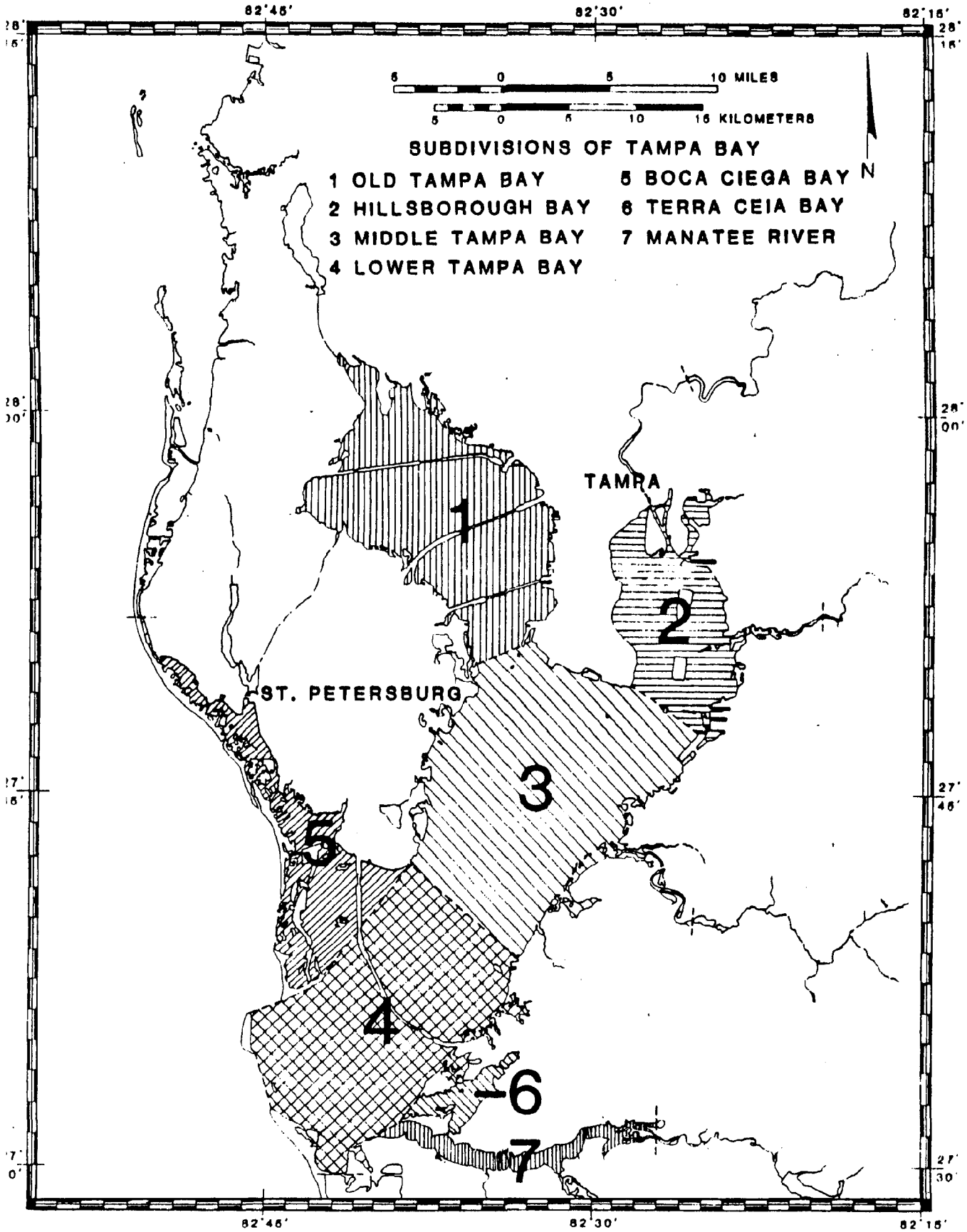


FIGURE 2



SUBDIVISIONS OF TAMPA BAY-LEWIS AND WHITMAN, 1982

CHAPTER 2

OVERVIEW OF THE TAMPA BAY AREA

Tampa Bay is an important amenity to the region. It is a highly productive natural resource providing seafood for man and natural habitat for wildlife. It also functions as a major hub for shipping and commerce and offers a wide variety of recreational opportunities for residents and visitors. To provide a brief summary of all that Tampa Bay offers the region, the following is a description of the natural systems, the uses of the bay and water related uses of the shoreline, and the current management of Tampa Bay.

NATURAL SYSTEMS

Tampa Bay is a complex system composed of many components which are interrelated and activities affecting one component can and do affect others as well. The make-up and problems of the entire drainage basin significantly impact the functions and inter relationships of the Bay proper. The weather, air, land, water, plants and animals all form a complex web of interdependencies which together make up the Tampa Bay ecosystem.

Humans are an important and very dependent part of this overall system. Past activities and current growth-related problems have caused long-term changes in Tampa Bay. An understanding of the complexity of the Tampa Bay ecosystem is necessary to solve current environmental problems and to maintain the Bay in a manner which all citizens can be proud of. Proposed solutions to specific problems must be evaluated in light of their effect on all other elements within the system.

To assist in this evaluation, a review of the following natural systems is presented: climate, geology, water quality, and biological resources. These areas are summarized in terms of man's influences on the natural systems and the declines in the beneficial uses of the bay.

CLIMATE

The climate of the Tampa Bay Region is humid subtropical dominated by moist maritime tropical air masses. The latitude, proximity to the Gulf of Mexico, and numerous inland water bodies, are the chief factors creating the climatic conditions. Summers are long, warm and relatively humid with frequent rainfall, while winters are mild and drier. Summer temperatures (from June to September) average between 80-82 degrees F with maximum temperatures averaging near 90 degrees F along the shore and slightly higher inland. Winter temperatures for the months January through March average around 65 degrees F.

The distribution and volume of the rainfall is a reflection of the climatic conditions of the region. The relatively high regional rainfall in summer is of convectional origin while winter low rainfall is due to middle latitude cyclonic or frontal activities which extend into Florida during the winter. The Tampa Bay Region is situated in the southern limit of frontal activity and, therefore, the precipitation in winter is relatively low.

The total mean rainfall from October through May is 17.8 inches or 27% of the annual mean precipitation. Low rainfall during the winter season is compensated by a summer high rainy season which occurs from May or June through September. The percentage of the annual rainfall during these months exceeds 60 percent. The summer rainfall is of the convectional origin caused by tropical maritime air masses coming from northeastern oceanic high pressure cells. In addition to the convective storms, the summer rainfall can be increased by tropical storms and hurricanes; however, its occurrence varies from year to year.

GEOLOGY

Tampa Bay as we know it today is the result of thousands of years of continous changes. Nature continues to rework the details. Some modifications enhance the bay while others seem to detract from it; but all affect the ecosystem and its interdependent parts. Humans are becoming more involved in the reshaping process, often inadvertently initiating chains of events which reverberate through the Bay's ecosystem. Because human activities can have a potentially devastating effect on the entire system, it is essential that managers develop an adequate understanding of the Bay's geological underpinnings.

Tampa Bay lies in the midst of the Florida Platform, a sedimentary rock platform over 5,000 meters deep which forms the basis of the Florida peninsula. The surface of the area surrounding the Bay is covered by Pleistocene quartz sands. The lithologies of the formations beneath are complex and represent closely spaced depositional paleoenvironments from marine through estuarine, riverine and even lake systems. (1)

Like most estuaries, Tampa Bay is a product of the fluctuations in sea level caused by past glacial events. During times of lower sea level, the four rivers (Hillsborough, Alafia, Little Manatee and Manatee) which now empty into the Bay cut the valley which, when sea level rose again during glacial retreat, was flooded and became Tampa Bay. The detailed history of these streams (and probably others) is complex with each glacially triggered event tending to obscure the next. Geologic data reveal a complex set of environments associated with the fluctuating sea-level. These fluctuations will continue to occur with a present trend of rising sea level.

Since its creation, Tampa Bay's shoreline has undergone constant modification by erosion, transport and deposition of sediments. In this process, areas of strong relief, like peninsulas and headlands, are eroded and smoothed by currents and tides with the materials being deposited in other areas of the Bay. Several modifying processes continue to build and

erode land. The speed at which these modifying processes progress is determined by a multitude of factors, including weather, currents, composition of the affected land, tides, wind and human activities. (2)

The surface sediments in Tampa Bay are mostly quartz sand with varying amounts of carbonate, mostly in the form of mollusc shells. According to Doyle (3), these sediments were probably derived from the Hillsborough, Alafia, Little Manatee and Manatee Rivers during the last sea level rise. Currently, no sand-sized material is being added to the system under the present high stand of sea level. These streams are also carrying only small loads of fine sediments although considerable amounts can be added through surface runoff.

While little sediment is currently being transported by area streams, several other factors are currently reworking the shorelines and geology of Tampa Bay. Rising sea level is changing the shapes of the shorelines and reworking some of the sediments through erosion and sediment transport. Sediments are constantly being reworked by tidal currents and wind-generated waves. Dredging activities are also changing sediment conditions. Dredging can mobilize mud deposits located beneath the surface and be a "fining process" for Bay sediments. When spoil is impounded in the physical process of dredging, coarser material is selectively removed but the fine fraction tends to leak back into the system. (4)

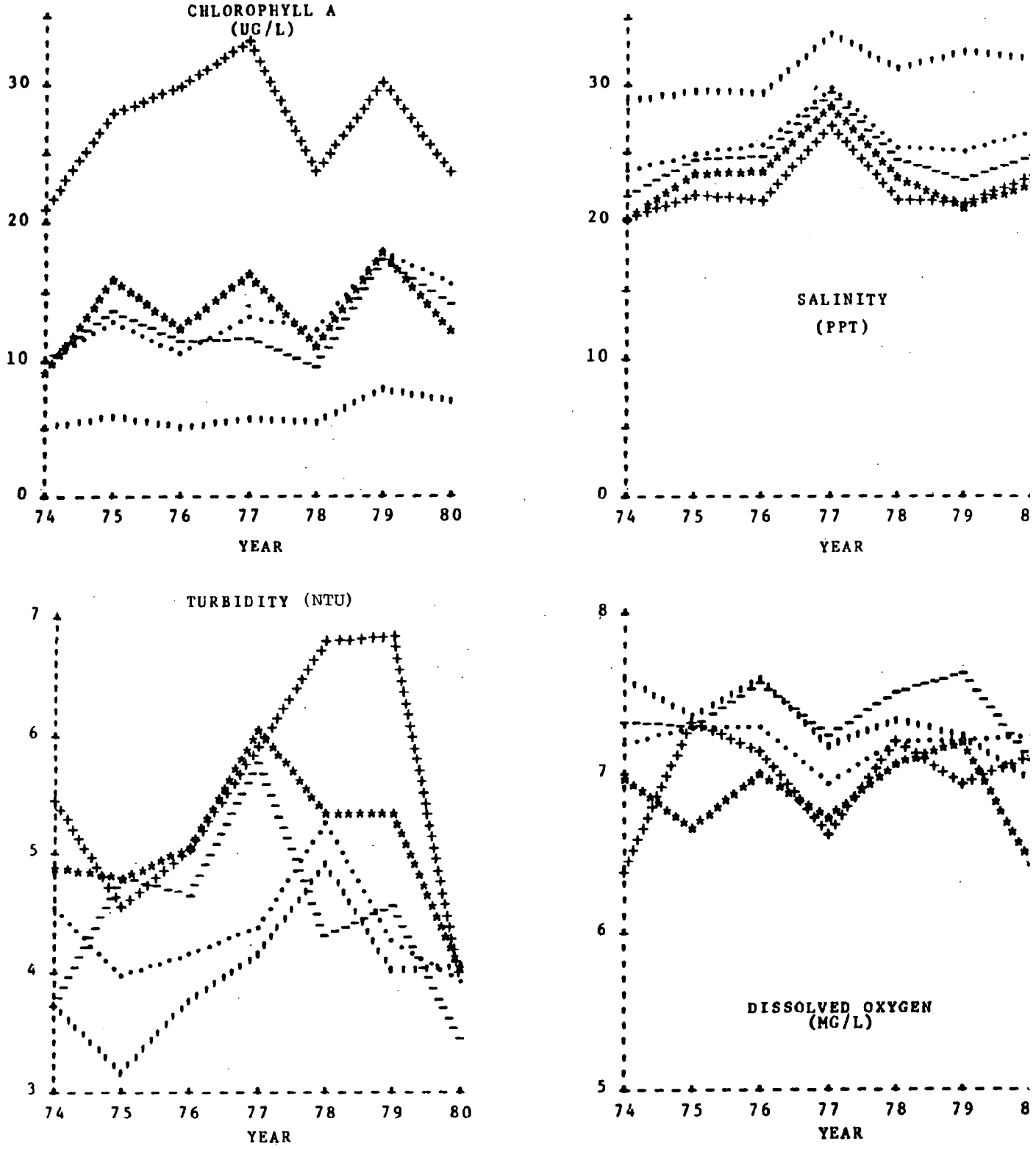
WATER QUALITY

An estuary is defined as a "semi-enclosed body of water which has free connection with the open sea and within which sea water is measurably diluted by freshwater from land drainage". (5) Within an estuary, freshwater mixes with salt water, each contributing its own variety of chemical and physical characteristics. This creates unique environments, each of which supports different communities of organisms particularly suited to that type of water. The greater the number of environments available within a body of water, the greater the variety of life that is likely to be sustained within. (6)

Physical Parameters - The physical characteristics controlling the distribution and stability of Bay environments are temperature, salinity and circulation, all of which are interrelated. Temperature affects the rates of chemical and biochemical reactions within the water. Salinity, or the concentration of dissolved salts in the water, is highly variable in estuaries. Salinity is the highest where seawater enters Tampa Bay at its mouth and gradually diminishes as one moves north into Old Tampa Bay, Hillsborough Bay and up the freshwater tributaries. Salinity levels also vary at any one place depending on the volume of freshwater flowing into the Bay (Figure 3). (7)

In addition, since the presence of salts increases the density of water, the lighter freshwater tends to remain at the surface, while salinity increases with depth. Perhaps the most important aspect of Tampa Bay's graduated salinity levels is their effect on the distribution and well-being of the various biological populations living in the Bay. (8)

FIGURE 3
TRENDS IN WATER QUALITY, 1974-1980



Source: Hillsborough County
Environmental Protection Commission

Estuarine circulation is also important. Water movement transports plankton, eggs of fishes, shellfish larvae, sediments, dissolved oxygen, minerals, nutrients and other chemicals. One of the primary factors driving circulation of the Bay is the effects on salinity from freshwater rivers, streams and runoff. As freshwater flows seaward over a layer of saltier, denser seawater, intensive mixing occurs. In this area, bottom sediments are suspended and nutrients are mixed. This general pattern of circulation is also altered by meteorological and tidal forces. Freshwater inflow is greatest during the rainy season and winds, tides, barometric pressure and other factors may increase or change the circulation patterns.

Chemical Parameters - The waters of Tampa Bay are a complex chemical mixture, containing dissolved organic and inorganic materials, including nutrients, dissolved gases and a variety of other chemicals. Among the important chemical constituents found in Tampa Bay are: dissolved oxygen, carbon dioxide, nitrogen and phosphorus.

Dissolved oxygen is essential for all plants and animals inhabiting the Bay. It is transferred from the atmosphere into the surface waters by the aerating action of the wind and it is added as a by-product of plant photosynthesis. Dissolved oxygen is a sensitive constituent because other chemicals present in the water, biological processes and temperature exert a major influence on its availability during the year. For instance, the maximum amount of oxygen which can be dissolved in a given unit of water increases as the water becomes colder and decreases as the water becomes more saline.

Carbon dioxide is important because it acts as a buffer against rapid shifts acidity and it provides carbon for plant tissue production during photosynthesis. It is highly soluble in water and its availability is affected by termperature and salinity.

Nitrogen is one of the major nutrients in the production of plant and animal tissue. Its primary role is in the synthesis and maintenance of protein. Nitrogen enters the ecosystem in several chemical forms, including ammonia, nitrate, nitrite and other dissolved organic and particulate forms. Through the process of nitrogen fixation, some bacteria and blue-green algae can extract nitrogen gas from the atmosphere and transform it into organic nitrogen. (9)

Another key nutrient, phosphorus is essential to cellular growth and reproduction. It is found in the water as dissolved organic and inorganic phosphorus as well as in the particulate form. The nutrients, nitrogen and phosphorus, are essential to the well-being of the Bay. However, it is also necessary to maintain a proper equilibrium of nutrients entering and being recycled in a natural ecosystem. A reduction of the natural supply of nutrients to Tampa Bay by alterations in the freshwater inflow can have grave consequences while, conversely, increases in nutrients from sewage, crop fertilizers, can also lead to adverse degradation of the water body.

These chemical and physical processes play a major role in defining the physiological limits to the relative abundance and distribution of plants and animals within the Bay. Each parameter contributes to the dynamic balance among organisms, water and sediments. In many cases, human activities have altered portions of the balance causing changes in the

overall system. Often these changes are hard to predict and cause and effect relationships difficult to determine.

BIOLOGICAL RESOURCES

Tampa Bay supports a wide variety of marine organisms including over 200 species of macroalgae, over 200 species of fish and over 1200 species of macroinvertebrates (sponges, crabs, etc.). (10) All depend on the Bay and their fellow inhabitants for food and shelter. Each, in turn, contributes to the life of the ecosystem. The health of this system depends on a proper balance between each biological, chemical and physical component. The food-chains that support recreational and commercial fisheries in the bay begin with marine plants in the form of mangroves, tidal marsh grasses, phytoplankton, seaweeds and submerged grasses. These plants are used as food by small fish and invertebrates, which in turn become food for larger fish, birds, marine mammals and reptiles, and eventually man (Figure 4).

In addition, each type of organism has a set of physical and chemical requirements that must be satisfied in order for it to live. Different species have different requirements for temperature, water, salinity, nutrients, substrate, light, oxygen and shelter. (11) These physical and chemical variables largely determine which species will be found in a particular habitat.

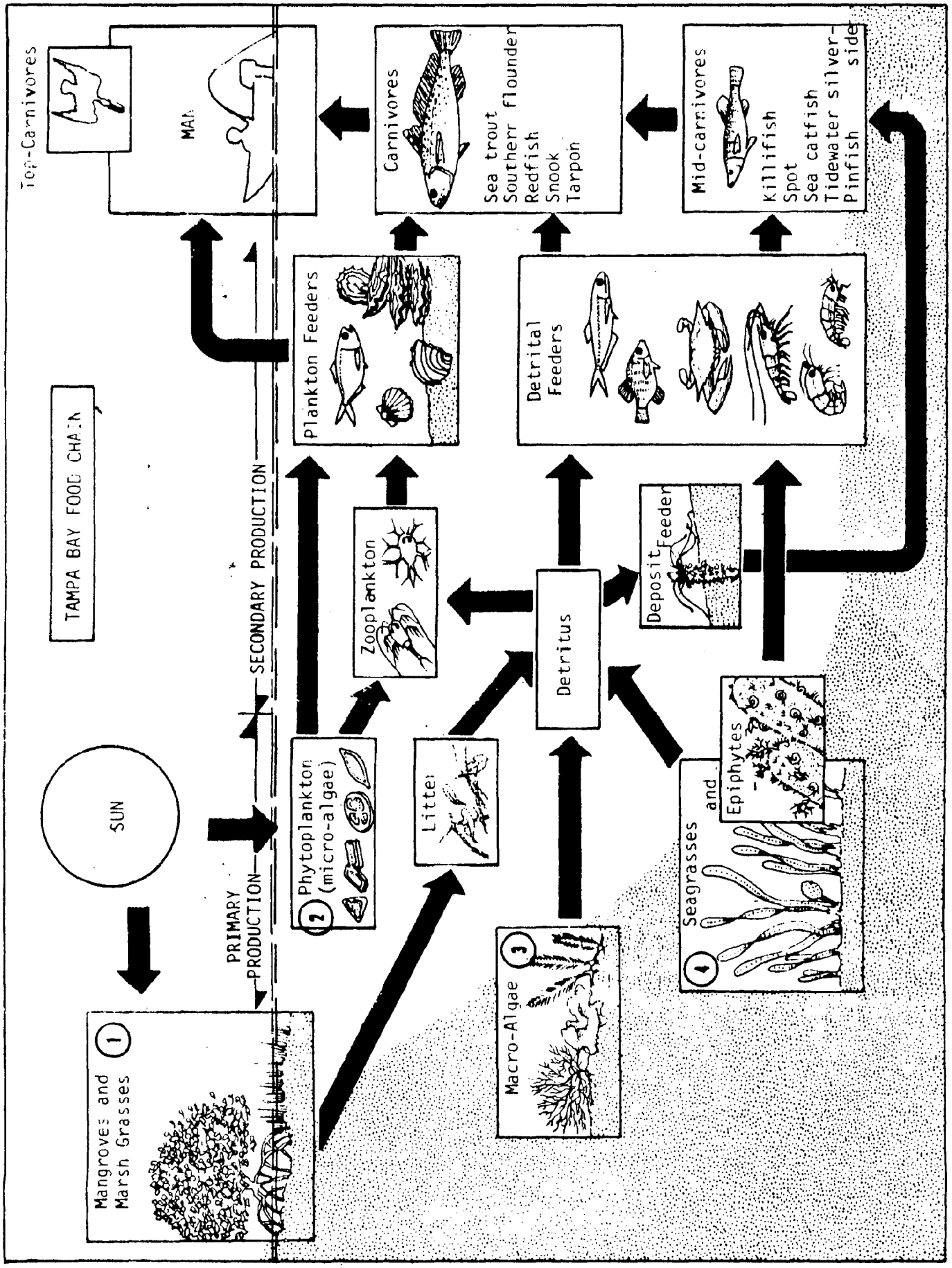
Within every habitat, communities of organisms are found which exist in a close relationship with each other. Some provide shelter while others serve as prey or act as predators. These relationships are numerous and can fluctuate widely. Bay communities can be as small as an oyster bar or as large as an entire bay. But whatever the size, these communities overlap and intertwine with each other.

For ease of discussion and understanding the biological resources of Tampa Bay, six representative communities are presented: Mangrove, Tidal Marsh, Seagrass, Plankton, Benthic and Nekton Communities. The first three communities are defined by representative plants and their associated fauna, while the last three are defined by the characteristics of the organisms present in the communities. Consequently, the relative scale of the community varies as well as the interdependence between communities.

Mangrove and Tidal Marsh Communities - These communities are composed of emergent vegetation which occurs along the low energy shorelines of Tampa Bay. They indicate areas of frequent to infrequent saline inundation. Mangroves and tidal marshes occupy similar zones and perform similar functions. While the communities are sometimes mixed, mangroves are more dominant in Tampa Bay with tidal marshes prevalent upstream of mangroves in the tidal reaches of rivers flowing to the Bay.

In addition, Tampa Bay occurs near the northern limits for mangrove growth and, consequently, mangrove growth is most luxuriant in southern bay areas. In the northern bay areas, freeze damage retards mangrove growth and forest regeneration. (12) Tidal marshes frequently occur in these areas, particularly along the shorelines of upper Old Tampa Bay.

FIGURE 4



Source: Lewis, 1982

Four tree species characterize the mangrove community: the red mangrove (Rhizophora mangle), the black mangrove (Avicennia germinans), the white mangrove (Laguncularia racemosa), and buttonwood (Conocarpus erectus). Primary tidal marsh species are Spartina alterniflora and Juncus roemerianus, although the fern Acrostichum is also present. (13)

Mangroves and tidal marshes serve several functions important to the ecological well-being of Tampa Bay. These include:

- The extensive root networks recycle nutrients and minerals from the anaerobic soil substrate. These nutrient contributions are eventually returned to the estuary as decomposed plant material (detritus). Detritus provides a major input to the estuary's food chain and productivity. (14,15)

- They provide valuable habitat for many marine and estuarine organisms. (16)

- The plant communities buffer adjacent uplands from storm tides and winds and serve as a storage area for those waters. (17)

Several natural and man-induced stresses have altered these communities. For mangroves, natural or biotic stresses include freezes, hurricanes, rising sea-level, gall-forming fungi, boring insects and burrowing isopods. Man-induced stresses include direct distruction from dredge and fill and indirect damages from changes in upland drainage, bulkhead placement and other changes. Recent analyses indicate that 44 percent of the original 25,000 acres of mangroves and marshes have been destroyed. (18)

Seagrass Communities - Seagrasses are submerged flowering plants, of which five species occur in Tampa Bay: Thalassia testudinum (turtle grass), Syringodium filiforme (manatee grass), Halodule wrightii (shoal grass), Ruppia maritima (widgeon grass) and Halophila engelmannii. The dominant species are turtle grass and shoal grass.

Extremely productive habitat, seagrasses serve the following important functions: (19, 20, 21)

- Seagrasses have high growth and production rates.

- The leaves support large numbers of epiphytic organisms with biomass approaching that of the seagrasses themselves.

- Although few organisms feed directly on them, seagrasses produce large quantities of detritus which serves as a major food source for many species.

- Seagrasses bind sediments and prevent erosion, in turn providing a quiescent environment in which a great variety of organisms can grow.

- Seagrasses act as nutrient buffers, taking up nitrogen and phosphorus and releasing them later when the plants decay.

The distribution and abundance of seagrasses is affected by many factors, including light penetration, substrate, salinity, turbulence, water

chemistry, toxic substances and nutrients. Changes in these factors and direct destruction of seagrases from dredge and fill, boat propellers, bait shrimp dredging, etc. have caused serious long-term losses in seagrass acreage in Tampa Bay. Recovery is often very limited as seagrasses are sensitive to turbidity, water quality changes and damage by boating activities. For instance, Thalassia can take from two to five years to revegetate once disturbed by boat propellers or other impacts. (22)

It is estimated that approximately 76,500 acres of seagrasses historically occurred in Tampa Bay. Due to various stresses, an estimated 19% of those acres remain today. This drastic alteration of one of the largest and most productive communities has had severe repercussions on the overall health of Tampa Bay. For instance, the drastic loss of seagrass habitat in Boca Ciega Bay and resultant fisheries loss has been estimated as an annual monetary loss of $1.4 million. (23)

Plankton Community - These are composed of predominantly microscopic species, plankton include phytoplankton, zooplankton and bacteria. An important and representative community, these organisms exist at the mercy of the currents and tides, floating and drifting with the water's movements.

Phytoplankton are tiny, one-celled plants which often occur in colonies known as algae. There are numerous varieties and the number and diversity of species can fluctuate widely. These fluctuations are a result of a variety of natural and man-induced changes in the bay, such as temperature and weather changes, water quality changes, and nutrient enrichment.

Because phytoplankton reproduce quickly, changes in chemical conditions, such as addition of nutrients, may cause rapid changes in the number and diversity of species. Such changes may result in the increased abundance of a single species, often called an algae bloom. Bloom conditions can result in lowered levels of dissolved oxygen, light penetration, and other physical and chemical changes. These changes affect other organisms and communities with visible results such as fish kills.

Using chlorophyll a as a measure of planktonic standing stock, phytoplankton levels are highest in Hillsborough Bay and upper Old Tampa Bay. Freshwater discharges, poor circulation and slow mixing in these upper reaches of the estuary act as nutrient or particulate "sinks" which can lead to algal blooms and low oxygen conditions. Some of the causes of slow mixing and poor circulation are natural and man-made constrictions, such as bridges and causeways. Total numbers of plankton per volume of seawater decrease with distance from freshwater or other discharge influences while diversity (number of species) increases. (24)

Zooplankton are microscopic animals which feed on phytoplankton, other zooplankton, plant matter and bacteria. Zooplankton include the larvae of benthic animals and fish. Most of the different zooplankton species are found throughout Tampa Bay and have maximum levels of abundance during the warmer seasons. Little is known about the specific feeding habits of zooplankton in Tampa Bay and the utilization of these zooplankton as food by organisms at higher trophic levels. (25)

Bacteria are the decomposers and their primary function is to break down dead matter, particularly plants. They feed on the detritus and are then eaten by larger organisms and so on up the food chain. This process makes the nutrients in dead plants and animals available for consumption by larger organisms.

Bacteria are either normal residents of the Bay or can be introduced through various pathways including human sewage and surface runoff. The variety that specializes in feeding on human waste are called coliform bacteria. Coliforms in themselves are not normally harmful. They are, however, an indicator that pathogens (disease-producing bacteria) may be present. More coliforms are likely to be found near large population centers. (26)

Most of the bacteriological data available on Tampa Bay are assessments of sanitary significance, primarily coliform counts. Sanitary water quality trends are mixed. During the 1970's there were significantly positive improvements in the treatment of some sewage discharged to the bay. As population and urbanization continue to increase in the Tampa Bay drainage basin, maintenance of adequate water quality will depend on uniform application of high sewage treatment standards and on the control of urban runoff. (27)

Benthic Communities - The organisms that live on and in the bottom of the Bay form a complex assemblage of communities. Commonly termed benthos, they are considered in terms of the animal components. However, the plant and bacterial components are also important. The roots and lower portions of submerged aquatic vegetation, such as seagrasses, supply physical support for a wide variety of organisms. An oyster bar that supports many small organisms is an example of a benthic community. Benthic communities also exist on bare, unvegetated sediments, but numbers may be more limited because there is less protection against predators. (28)

Factors influencing the occurrence, numbers, and types of species occurring in a benthic community include salinity, sediment type, oxygen, pollution and habitat alteration. Commercially valuable benthic organisms include oysters and blue crabs. Less commercially important benthic species include barnacles, sponges, worms, and clams.

The benthic community has an important effect on the physical and chemical condition of the sediments, especially the upper eight to ten inches. Filter feeders, such as oysters and clams, pump large volumes of water through their bodies and extract food from it. Infaunal deposit feeders, such as worms, plough through the sediments in search of food. Predators such as the blue crab scurry across the sediment surface. These activities all help to keep the sediments stirred up, increasing the rate of diffusion, or exchange, of materials into the water and facilitating the passage of oxygen into the sediments.

Benthic animals also affect the structure of the sediments. Some build tubes or burrows through which they pump water. Many benthic animals bind sediments together in fecal pellets which settle more readily. If toxic chemicals are present in the sediments, they can be taken up by benthic fauna, and in some cases harm them. (29)

A recent analysis of studies on the benthos of Tampa Bay came to the following conclusions: (30)

(1) Approximately 1,200 infaunal and epifaunal benthic species inhabit Tampa Bay; (2) Seasonal fluctuations in the abundance and diversity of benthic macroinvertebrates are pronounced; (3) Long-term cyclic defaunation (approximately 5 years) appears to occur on a regular basis; (4) Seagrass beds have declined with a concomitant decrease in faunal diversity; (5) Opportunistic and "pollution indicator" species are abundant at several locations of the Bay, particularly in Hillsborough Bay; (6) Sediment type appears to be the controlling factor in determining faunal distribution in the Bay; (7) A general increase in species richness and a decrease in abundance is evident on a north to south gradient in the Bay. Changes in salinity and sediment type, the influence of the Gulf of Mexico in the southern reaches of the Bay and the lower incidence of pollution and habitat alteration in lower Tampa Bay are inferred as causes for this gradient.

Nekton - The swimmers of the bay, nekton control and direct their movements throughout the bay. They include fish, marine mammals, certain crustaceans, squid and other invertebrates. Tampa Bay supports at least 203 species of fish, many of important sport and commercial fishing value. (31)

Since nekton can control and direct their movements, many spend only part of their life cycle within Tampa Bay. The bay provides nursery areas for larval and juvenile fishes and many species utilize Tampa Bay during their early life stages. One study reports that 80-90% of the commercial and sport fish species depend on the bay during all or part of their life cycle. (32)

Records of seasonal migration and distribution indicate that most spawning occurs during the spring and early summer in the nearby Gulf and throughout much of Tampa Bay. A smaller spawning peak occurs in the fall. During and following these spawning periods, the larval and juvenile fish migrate to the shallow, protected areas of the bay where they mature.

Factors governing the abundance of nekton include salinity variations, habitat type, predation, fishing pressure, etc. In the past, the loss of habitat has caused a serious decline in the fishery resources, particularly the dredging and filling of Boca Ciega Bay. The loss of estuarine habitat is a major concern since numerous species depend on the availability of nurseries for their survival, and, eventually, recruitment into the adult population. (33)

MAN'S INFLUENCES ON THE NATURAL SYSTEMS

During the history of man's presence along the shores of Tampa Bay, several modifications to the natural systems have taken place. Early activities included the building of shell mounds in mangrove forests by Indians and the dredging of shoals for navigation improvements in the 1880's.

These modifications greatly altered small areas of the bay but generally left the natural systems functioning normally. However, large scale alterations began in the early 1950's and accelerated during the 1960's. Massive dredging and filling and increased untreated sewage discharges altered the balance of plant types and eliminated large areas of important habitat. For example, 44% of the marshes and mangroves and 80% of the submerged seagrass meadows that once existed in Tampa Bay have disappeared.

This has resulted in long-term changes to the other biological communities and negative impacts on the quality of water and other bay resources. For instance, commercial harvests of fish and shellfish within the bay have declined, scallop and oyster fisheries have collapsed completely and major declines for bait shrimp and spotted seatrout have also occurred. (34)

With the realization that severe environmental damage had been done to the bay, laws and regulations were passed during the late 1960's and early 1970's in an effort to stop the degradation of the bay. These laws included those to prevent damaging physical alteration of the bay, such as dredging and filling of valuable shoreline areas of mangroves and seagrasses, and those attempting to stop chemical alteration of the bay through control of discharges of industrial wastes and municipal wastes such as partially treated sewage.

While these laws currently control or address most of the flagrant alterations of the bay, some physical alteration is still occurring (primarily harbor deepening) and chemical alterations are still poorly understood. Several studies are being conducted to understand and control, from a regulatory point of view, these alterations. However, more work is needed to understand and control the activities that may negatively impact the bay. In particular the over-enrichment of the bay due to excess nutrients from sewage, urban runoff and agricultural fertilizers in rural runoff are still a major problem contributing to the continued decline of submerged seagrass meadows and periodic noxious algal blooms, such as those that historically have occurred in Hillsborough Bay next to downtown Tampa.

Through past and current activities, man continues to influence the natural systems of Tampa Bay. It is necessary to not only control destructive activities but to seek ways to constructively correct past mistakes. In order to understand the effects of individual, apparently insignificant actions, it is necessary to understand the major components and dynamic processes governing the Bay. By understanding these interacting principals and how pollutants are affected by them, resource managers and residents of Tampa Bay can strive to improve and maintain the Bay as an important regional resource.

USES OF THE BAY AND WATER-RELATED USES OF THE SHORELINE

Tampa Bay is used for many different activities including recreational pursuits, commercial enterprises, and transportation. Uses of the bay for water related activities occur in the water itself and along the shoreline. In addition, many of these activities are either related to other activities or support larger industries which may or may not be located along the shoreline. This section is divided into three areas: Major in-bay uses, water dependent uses, and additional uses or enterprises dependent on bay use.

MAJOR IN-BAY USES

Many uses of the water column are recreational in nature and include boating, water-skiing, skin and scuba diving, spear fishing, sport fishing, swimming and viewing. Other uses include commercial fishing, living facilities (houseboats and liveaboards), transportation, utility corridors and receiving waters.

Recreational Boating

Little information exists on actual boating use in Tampa Bay. All types of boating activities take place in Tampa Bay although much of the recreational boating also occurs in the Gulf of Mexico. There are also several sponsored boating events which attract people to Tampa Bay from other areas of the state. For instance, the St. Petersburg Yacht Club sponsored approximately 150 yachting events in Tampa Bay (and, in some cases, including surrounding areas). These included all types of sailing races, regattas, wind surfer events and other boating activities.

Quality of available boating activities and accessibility are two main factors that can limit recreational boating. Several factors can limit the quality of available activities or the desirability to pursue those activities and include the boater's perception of water quality, water clarity, scenic amenities, etc. Access to the water and boating facilities are important factors in the use of Tampa Bay for recreational boating. Boaters gain access to Tampa Bay in three ways: by using boat ramps, individual slips (residential or marina) or marina launching facilities. These are discussed in the section on marinas and launching facilities.

Boating Related Activities

Boating related activities include water-skiing, skin and scuba diving, spear fishing, sport fishing, swimming, collecting and viewing. The intensity of these activities varies according to such factors as season of year, day of the week, weather, accessibility, income of the boat owner, and desirability of an area for undertaking the activity.

Many areas of the bay are not suitable for some of these activities. On many days, most of the open bay is too rough for waterskiing while visibility is poor in most areas of the bay, particularly the upper portions, so that skin and scuba diving is rarely undertaken. In addition,

many areas of the bay are not always suitable for body contact with the water due to health factors. However, it is difficult to assess the health impacts of many areas due to lack of sampling and information provided by health agencies.

Swimming

Local health departments sample coliform levels at approved public swimming areas to determine suitability for swimming in accordance with Chapter 10D-5, Florida Administrative Code. In most cases, a sanitary survey and routine monitoring of the water for bacteriological quality are performed. While many areas of Tampa Bay are safe for swimming, individuals must do so at their own risk outside of areas approved for public swimming. In addition, there are areas which are generally " not recommended" by the health departments for swimming or body contact due to a high probability of poor water quality. These areas include the northern portions of Boca Ciega Bay, an area approximately 1/4 - 1/2 mile east of the DeSoto Bridge in Bradenton (near a sewage treatment and industrial outfall), and any area in Hillsborough County outside the five approved swimming beaches. (35)

Some public bathing areas are periodically closed due to high coliform bacteria levels and the indicated potential health hazard. In many areas around Tampa Bay, this occurs after periods of heavy rainfalls when pollutants are carried from urban areas into public waters. These areas are re-opened when coliform levels are reduced to a safe level.

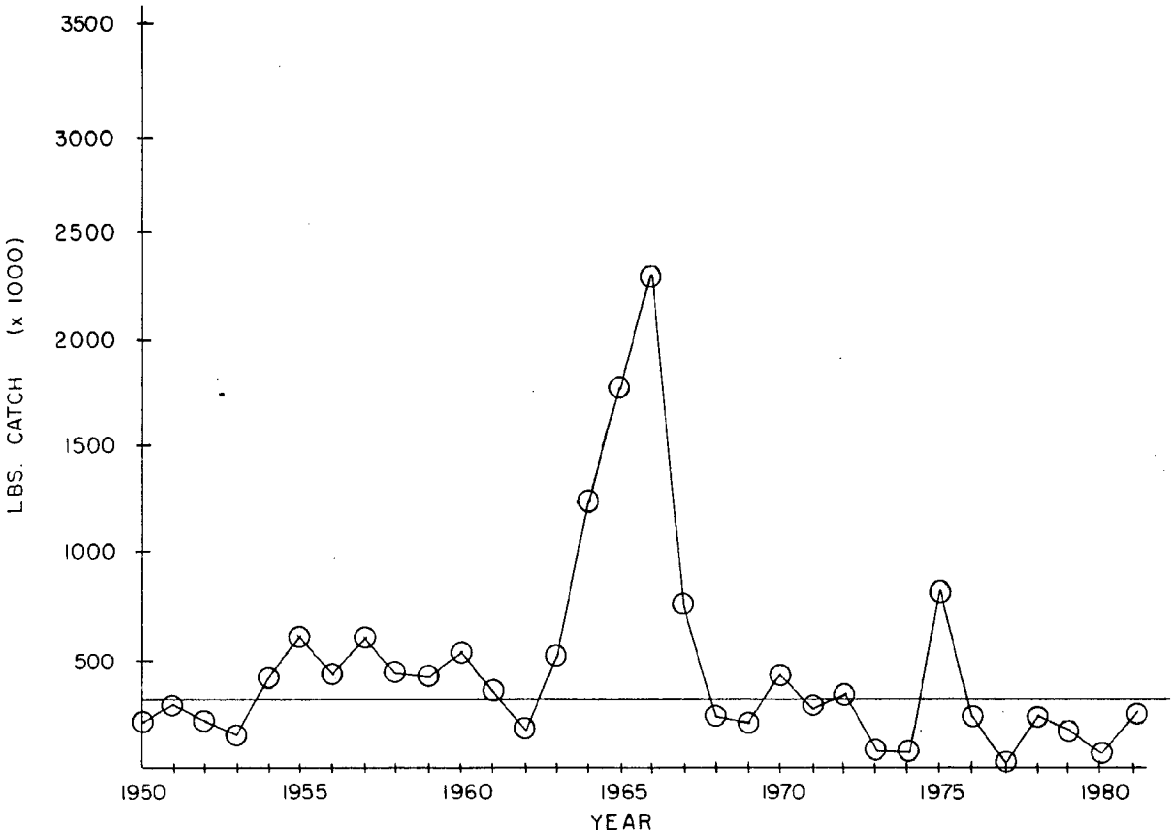
Commercial Fishing

Tampa Bay serves as a nursery and habitat area for many commercially valuable species of fish and shellfish. Figure 5 shows landings data for Manatee, Hillsborough and Pinellas Counties for the following important estuarine dependent species: spotted sea trout, black mullet, red drum, blue crab, and bait shrimp. Landings data show only data for species which were landed in these counties and may have been caught outside the county boundary. In particular, the data include landings in Tarpon Springs which may have been fished in estuarine and offshore areas to the north. Only estuarine dependent species were chosen in order to get a more accurate estimate of the importance of Tampa Bay to commercial fishing.

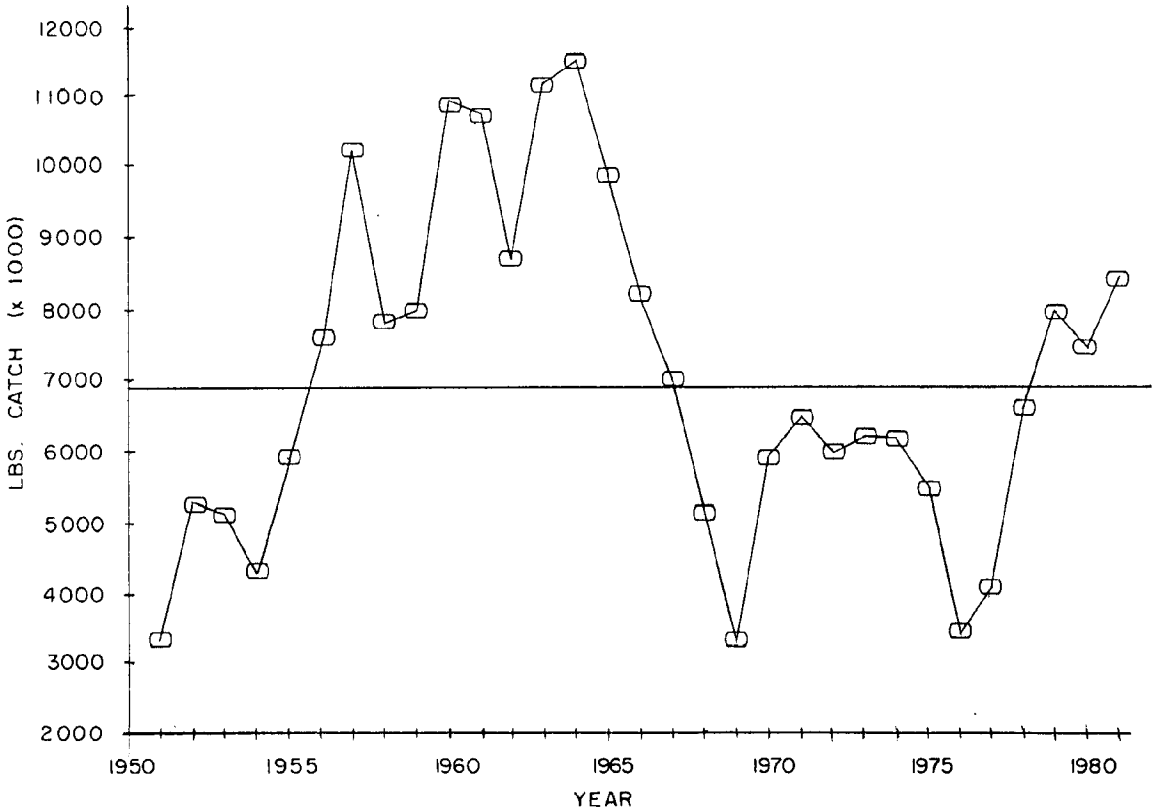
The data vary considerably from year to year with spotted sea trout and bait shrimp showing a marked decline in recent years. Several factors could account for this including an overall decline in numbers of organisms, loss of habitat, change in fishing pressure, etc.

Figure 6 indicates the percent of Florida's west coast catch for blue crab, black mullet, red drum and spotted seatrout. As would be expected the importance of spotted sea trout catch has shown a steady decline but not as dramatically as the pounds of catch. Black mullet have the largest market of west coast catch of any of the species with generally between 20 and 30 percent of Florida's west coast catch.

FIGURE 5
LANDINGS DATA

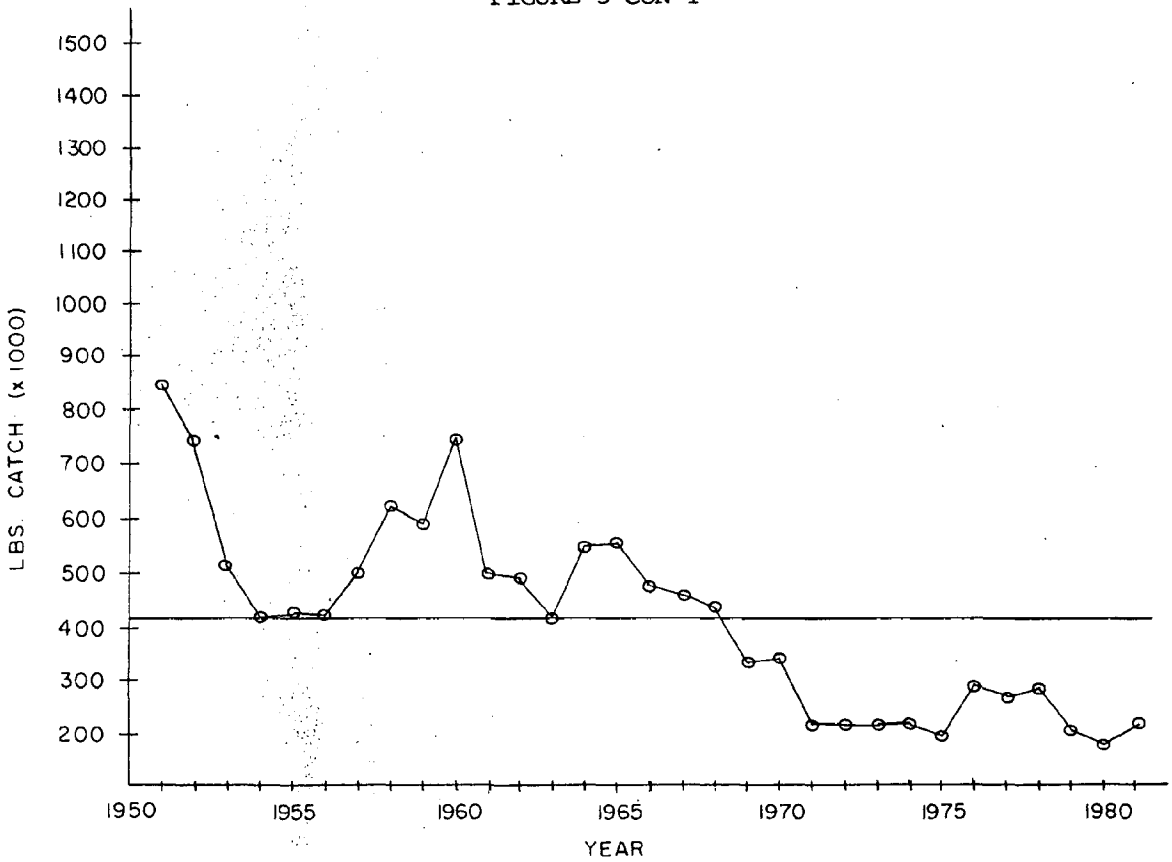


TAMPA BAY: BLUE CRAB

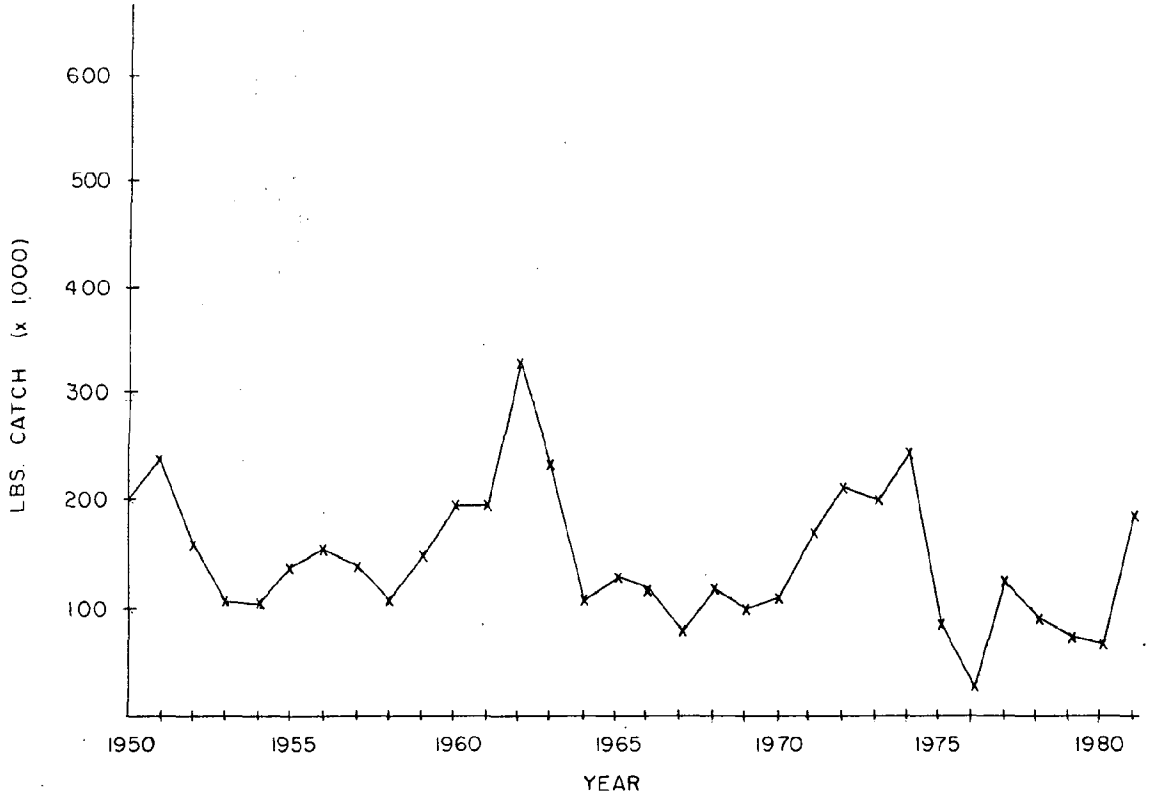


TAMPA BAY: BLACK MULLET

FIGURE 5 CON'T

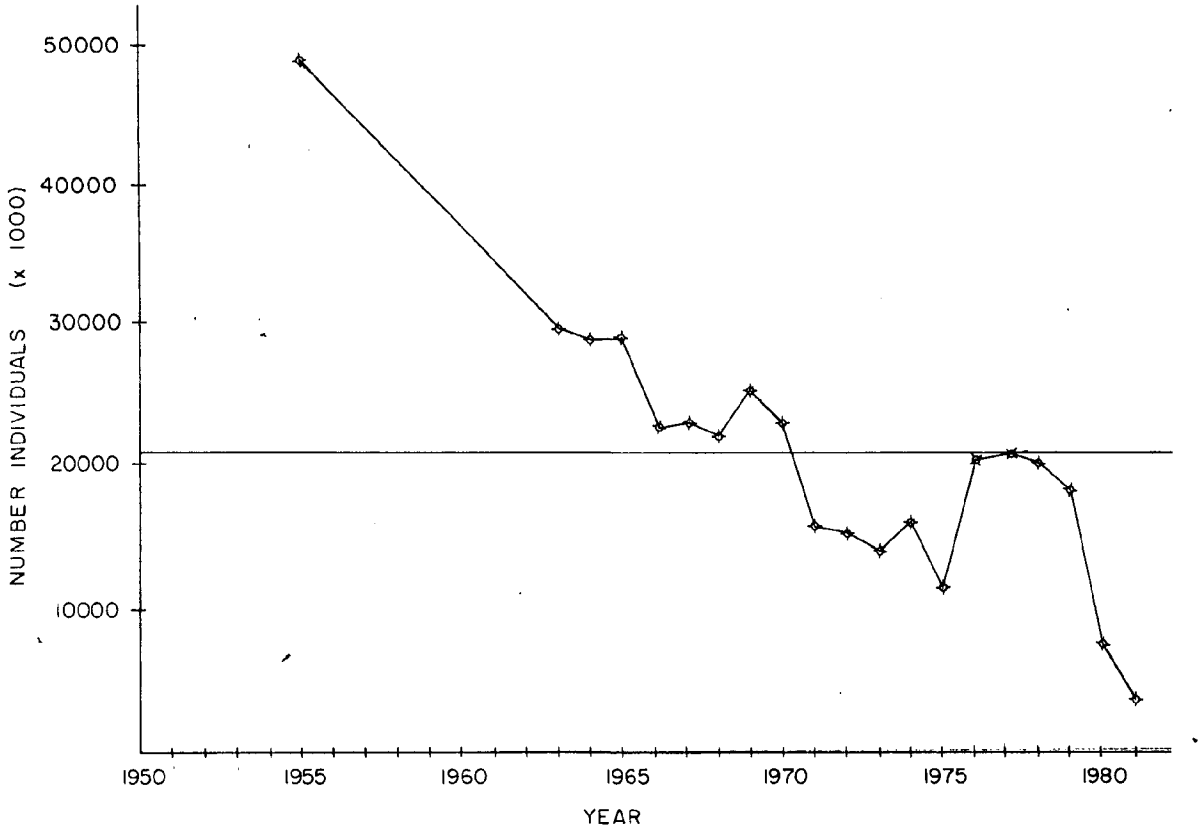


TAMPA BAY: SPOTTED SEATROUT



TAMPA BAY: RED DRUM

FIGURE 5 CON'T

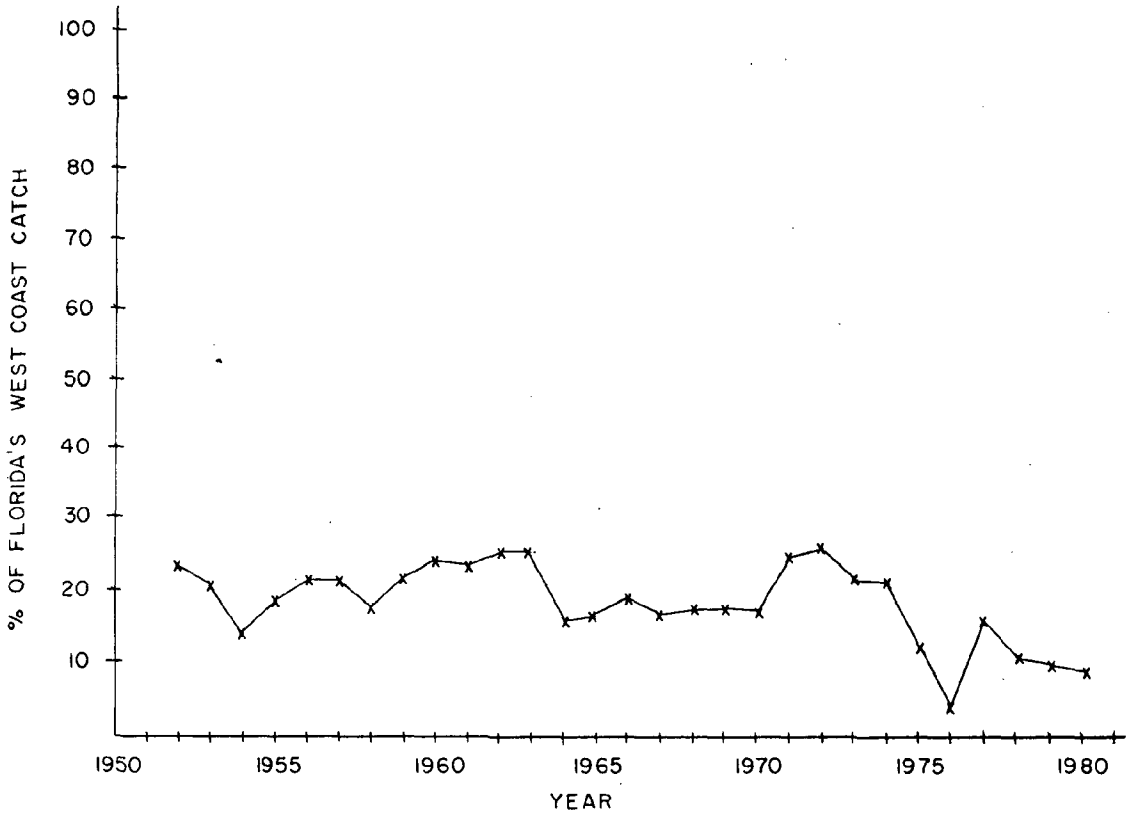


TAMPA BAY: BAIT SHRIMP

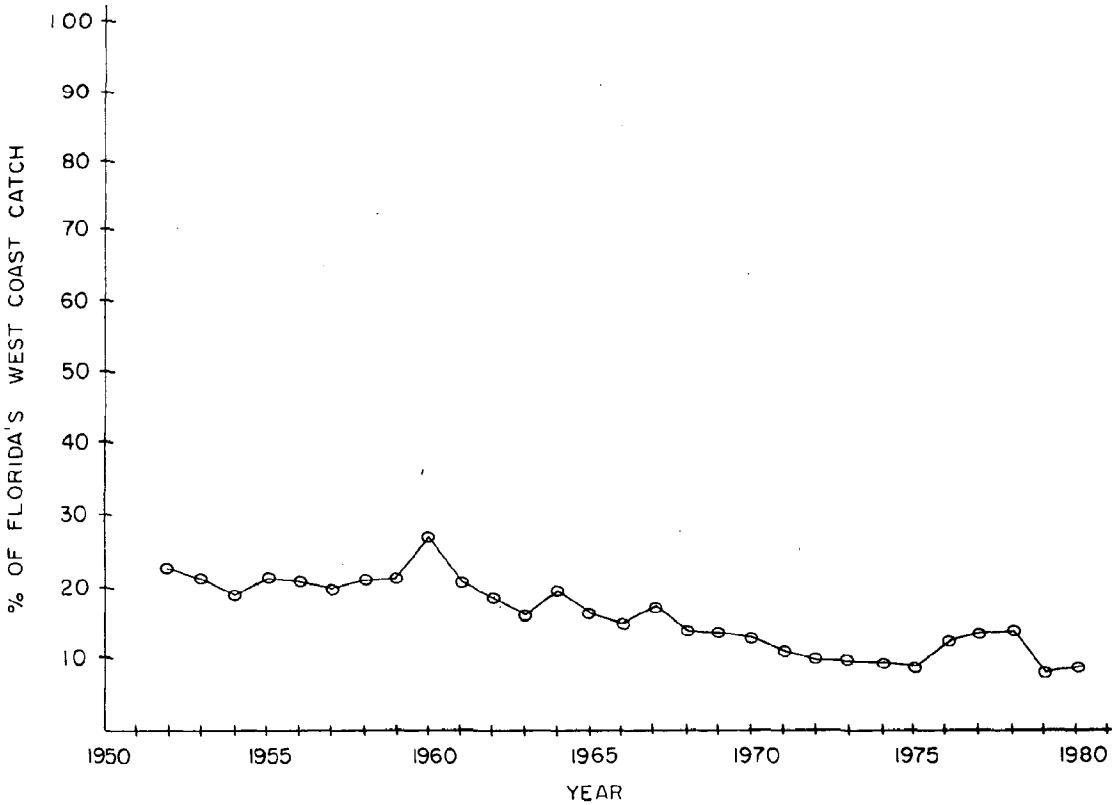
Source: Department of Natural Resources
National Marine Fisheries Service

FIGURE 6

PERCENTAGE OF WEST COAST FISH CATCH

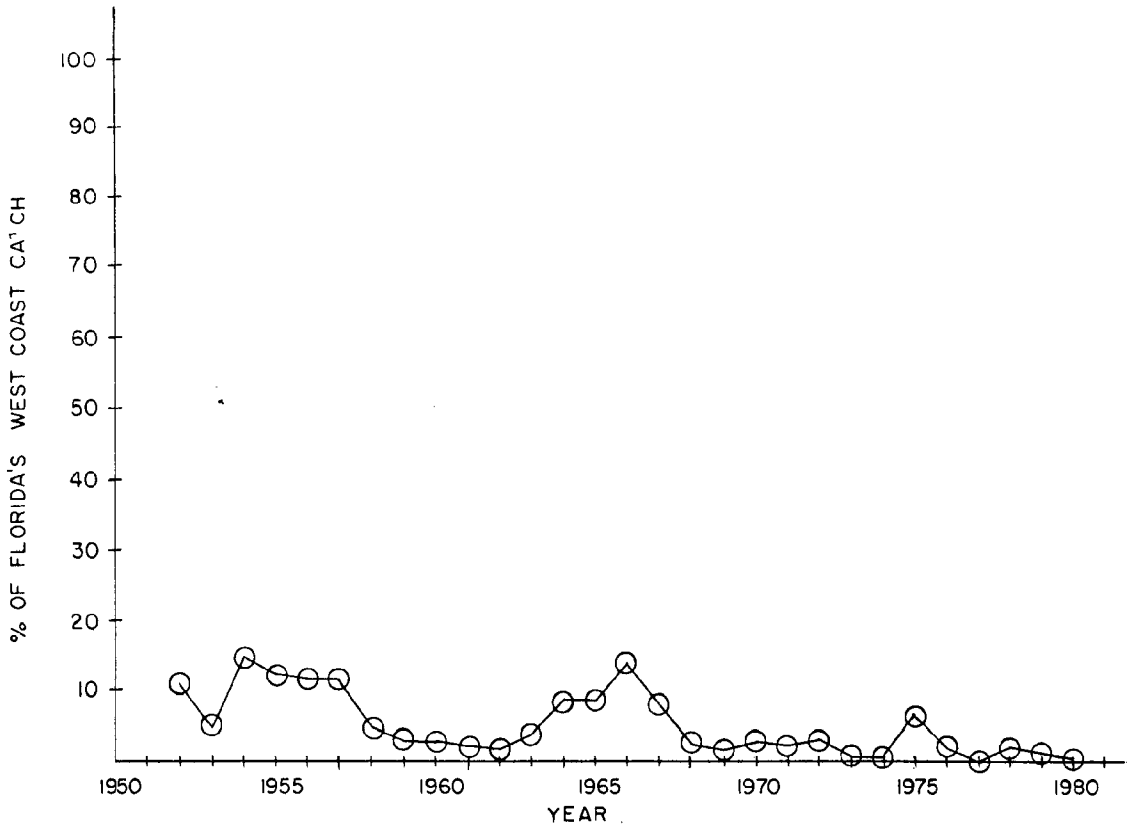


TAMPA BAY: RED DRUM

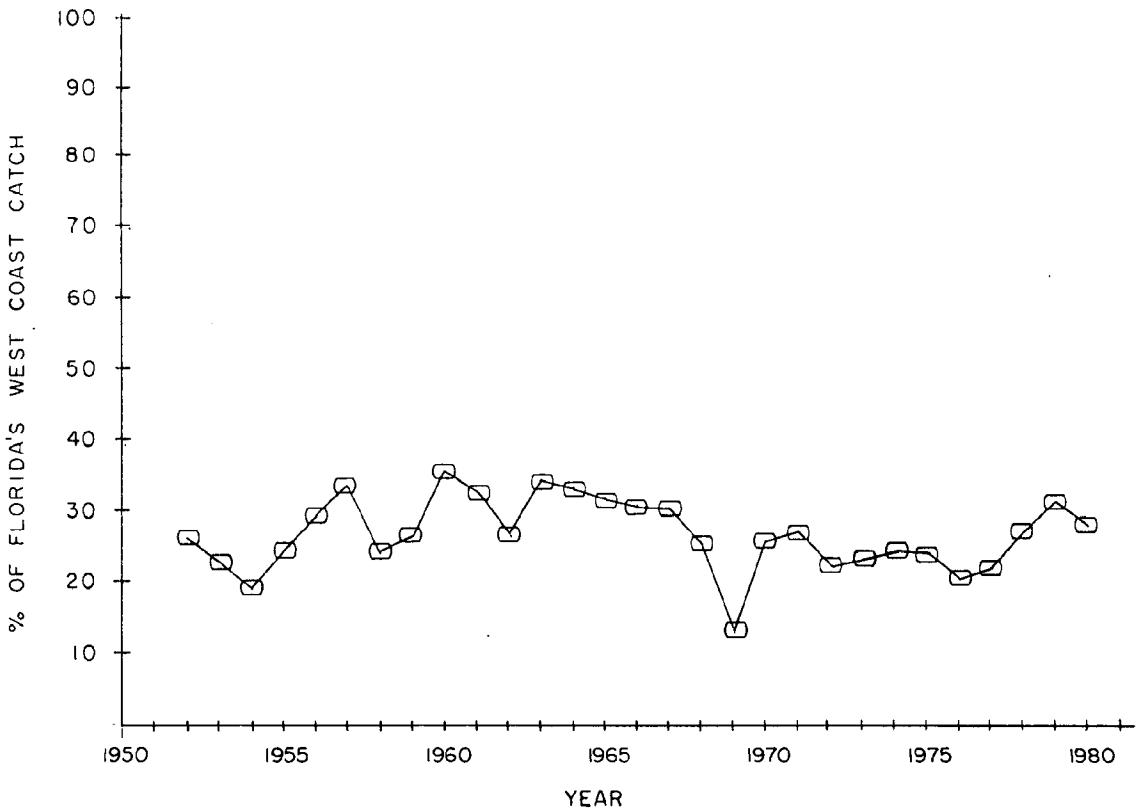


TAMPA BAY: SPOTTED SEATROUT

FIGURE 6 CON'T



TAMPA BAY: BLUE CRAB



TAMPA BAY: BLACK MULLET

Source: Department of Natural Resources
National Marine Fisheries Service

Living Facilities

Tampa Bay is used as a living facility by many boatowners on a permanent or transient basis. Liveaboard dockage is provided at five marinas in the area: Bahia Beach, St. Petersburg Municipal Marina, Blind Plass Marina, South Pasadena Marina and Hubers Yacht Harbor. Zoning and other restrictions prohibit liveaboards in most other areas of Tampa Bay.

Receiving Waters for Poor Quality Water

Currently Tampa Bay is used as a receiving water for treated waste water effluent, industrial discharges and as a receiving body for poor quality stormwater runoff. A survey conducted by the Florida Department of Environmental Regulation (DER) in 1980 concluded that non-point sources were a major contributor of nutrients and recommended that point source reduction of sewage discharge was necessary. (36)

In 1982, surface waters received domestic effluent from 49 permitted sources which include facilities with design capacities ranging from 10,000 to 60 million gallons per day. Domestic point sources in 1982 discharged 61.75 billion gallons of effluent to Tampa Bay and its associated tributaries as compared to 59.28 billion in 1980, a 4.16% increase in total annual flow. Moon (1983) attributes the increase to population growth, higher than average rainfall and associated infiltration problems with collection systems. However, in the same time period, from 1980 to 1982, total nitrogen values decreased 6% and total phosphorus values decreased 11%. Four kinds of changes account for these decreases: (37)

1. Several large facilities have been taken off line and now serve as pumping stations to a larger facility;

2. Several plants have provided alternative treatment techniques such as spray irrigation, deep well injection and pumping to larger facilities;

3. A trend to hook up small facilities (less than 10,000 gallons per day) with larger, more efficient plants, and

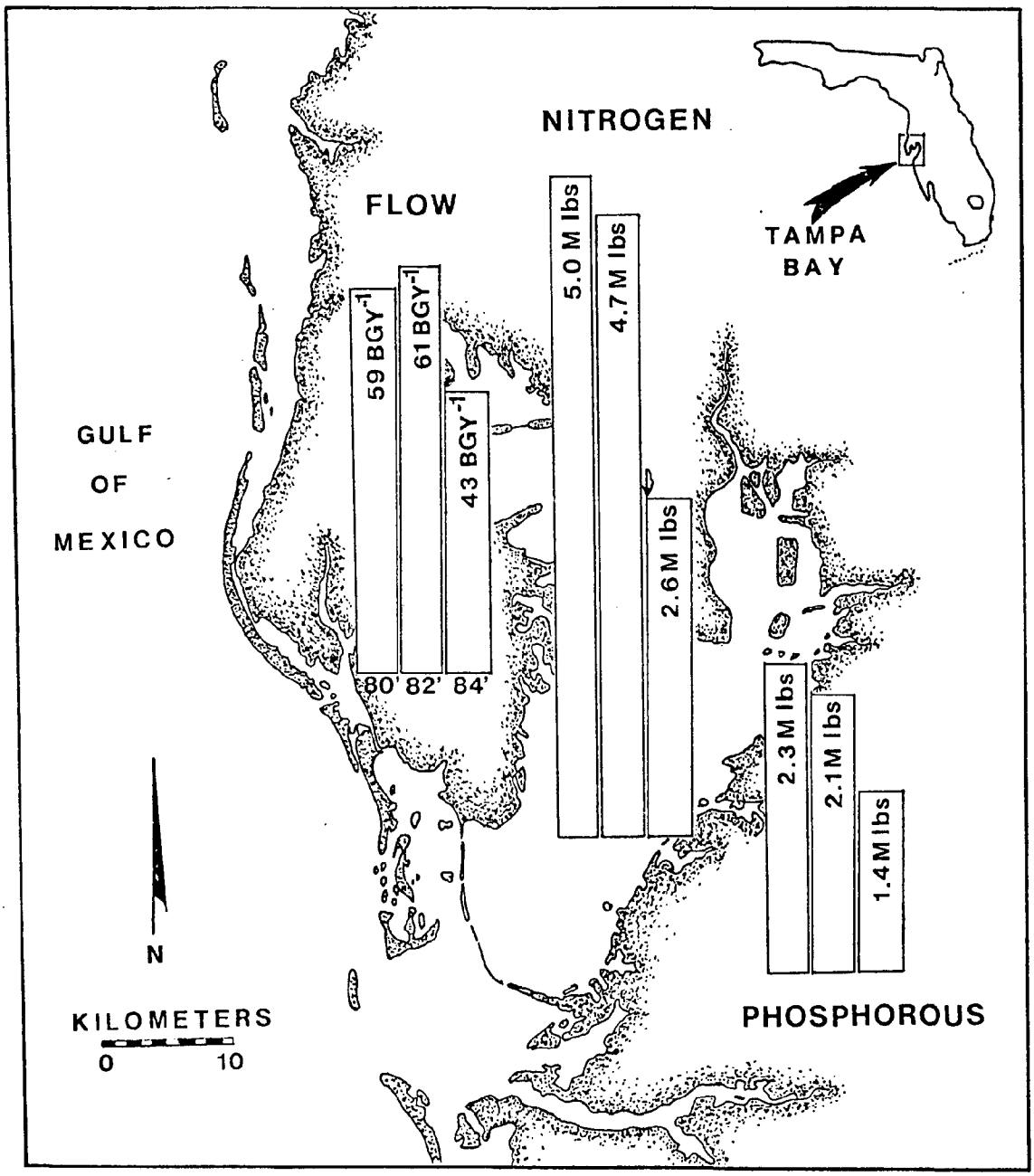
4. Improved plant efficiency.

Many facilities are being redesigned to accomodate land disposal, deep well injection or be tied to larger, more efficient facilities. As a result of these projected changes, Moon (1983) estimates a 30% decrease in total flow to Tampa Bay from domestic sources resulting in a projected 45% decrease in total nitrogen and a 35% decrease in total phosphorus (Figure 7).

There are currently 23 industries which are permitted to discharge directly into Tampa Bay waters according to DER's National Pollutant Disharge Elimination System (NPDES) permit files (Table 1). In addition there are 116 industries which are permitted to discharge into the tributaries of Tampa Bay. Table 2 lists the type of activities (based on the Standard Industrial Classification Code) and number of each facility currently permitted to discharge into the tributaries of Tampa Bay. (38)

FIGURE 7

PROJECTED NITROGEN
AND PHOSPHOROUS DECREASES



Source: Moon, 1983

TABLE 1
INDUSTRIES PERMITTED TO DISCHARGE INTO TAMPA BAY
HILLSBOROUGH BAY, OLD TAMPA BAY, BOCA CIEGA BAY

County	Facility Name	SIC Code*	Type of Facility	Receiving Water/ City Location
Hillsborough	Cities Service Oil Co.	5171	Petroleum Bulk Stations & Terminals	Tampa Bay/Tampa
	Donald Graves Fish Farm	0279	Animal Specialities	Tampa Bay/Ruskin
	Gardinier East	2819	Industrial Inorganic	Hillsborough Bay/ Hillsborough Cty.
	Gulf Oil	5172	Petroleum Products	Old Tampa Bay/ Tampa
	Honeywell Info. Systems	3679	Electronic Components	Old Tampa Bay/ Hillsborough Cty.
	Ideal Cement	5039	Construction Materials	Hillsborough Bay/ Tampa
	International Minerals & Chemicals	1475	Phosphate Rocks	Hillsborough Bay/ Hillsborough Cty.
	McDill Defense Fuel Supply	5171	Petroleum Bulk Stations & Terminals	Old Tampa Bay/ Tampa
	Murphy Oil Corp.	5171	Petroleum bulk Stations & Terminals	Tampa Bay/Tampa
	Proctor & Sons Tropical Fish Farm	0279	Animal Specialties	Tampa Bay/Ruskin
	St. Tringali Co.	2092	Fresh or Frozen Packaged Fish	Tampa Bay/Tampa
	Shell Oil, Port Tampa	5171	Petroleum bulk stations & Terminals	Tampa Bay/Tampa
	Tampa Electric-Big Bend Steam	4911	Electric Services	Hillsborough Bay/ Hillsborough Cty.
	Tampa Electric-Big Bend Unit #4	4911	Electric Services	Hillsborough Bay/ Ruskin

TABLE 1 (continued)

	Tampa Electric-Gannon Steam	4911	Electric Services	Hillsborough Bay/ Hillsborough Cty.
	Tampa Electric-Hookers Point Steam	4911	Electric Services	Hillsborough Bay/ Tampa
	Union Carbide	2813	Industrial Gases	Tampa Bay/Tampa
	U.S.A.F. MacDill AFB	9711	National Security	Hillsborough Bay/ Hillsborough Cty.
Pinellas	C & G Devco	4952	Sewerage Systems	Tampa Bay/Pinellas County
	Doe Pinellas Plant	9631	Regulation, Administration of Utilities	Boca Ciega Bay/ Pinellas Cty.
	Florida Power Corp.-Bartow Steam	4911	Electric Services	Tampa Bay/Pinellas County
	Florida Power Corp.-Higgins Steam	4911	Electric Services	Tampa Bay/Pinellas County
	USN-Naval Res. Center	9711	National Security	Tampa Bay/St.Pete

Source: Florida Department of Environmental Regulation, 1983

*SIC = Standard Industrial Classification

TABLE 2

INDUSTRIAL FACILITIES PERMITTED TO DISCHARGE INTO TRIBUTARIES OF TAMPA BAY*

SIC CODE	TYPE OF ACTIVITIES	NUMBER OF FACILITIES
0241	Dairy farms	1
0279	Animal specialities	46
0723	Crop preparation services for market	1
0921	Fish hatcheries and preserves	16
1422	Crushed and broken limestone	1
1475	Phosphate rock	5
2033	Canned fruits and vegetables	1
2034	Dehydrated fruits, vegetables, soups	1
2037	Frozen fruits and vegetables	1
2082	Malt beverages	1
2092	Fresh or frozen packaged fish	1
2873	Nitrogenous fertilizers	2
2874	Phosphatic fertilizers	2
2879	Agriculteral chemicals	1
2911	Petroleum refining	1
3241	Cement, hydraulic	1
3341	Secondary nonferrous metals	2
3411	Metal cans	1
3471	Plating and polishing	2
3811	Engineering & scientific instruments	1
4011	Railroads, line-haul operating	1
4222	Refrigerated warehousing	1
4226	Special warehousing and storage	1
4911	Electric services	1
4922	Natural gas transmission	1
4941	Water supply	1
4952	Sewerage systems	8
5171	Petroleum bulk stations & terminals	3
6515	Mobile home site operators	6
7033	Trailering parks for transients	2
7215	Coin-operated laundries and cleaning	2
7394	Equipment rental & leasing	1
		115

Source: Florida Department of Environmental Regulation, 1983

*Based on National Pollutent Discharge Elimination System (NPDES) Permits.

WATER DEPENDENT USES OF THE SHORELINE

There are a number of land uses that depend on Tampa Bay for their existence and frequently require a landside base directly at the water's edge. In addition, many commercial, recreational, or navigation and shipping activities are also either water dependent or substantially water oriented.

Stationary Fishing

In spite of extensive waterfront development, there are still some areas along the Bay shoreline that provide good stationary fishing. These include bridges, canal outlets, public seawalled areas, and several fishing piers located along Tampa Bay (Figure 8). Table 3 identifies the services and features provided at area fishing piers. (39)

Marinas and Launching Facilities

There are 47 public and private marinas located within the boundaries of Tampa Bay (Figure 9). This figure does not include private facilities at condominiums, residences, private clubs, etc. which are not available to the public. The publicly-available marinas provide 3562 wet and 1310 dry slips, respectively. In addition, some of them provide many other services including boat ramps, pump out facilities, fuel, eating facilities, boat lifts, rentals and repair, etc. A summary of available facilities for each marina is provided in Appendix I.

In addition to marinas, there are numerous boating launching facilities located along the shores of Tampa Bay. A large portion of recreational boaters, particularly those with smaller boats, use boat ramps. Factors determining use of boat ramps include proximity to residence, proximity to destination point, quality of ramp and facilities available at ramp. An analysis of boat ramps along Tampa Bay indicated that there were an adequate number of launching facilities. However, many of the boat ramps needed improvements such as general maintenance, increased parking facilities, lights, and restroom facilities.

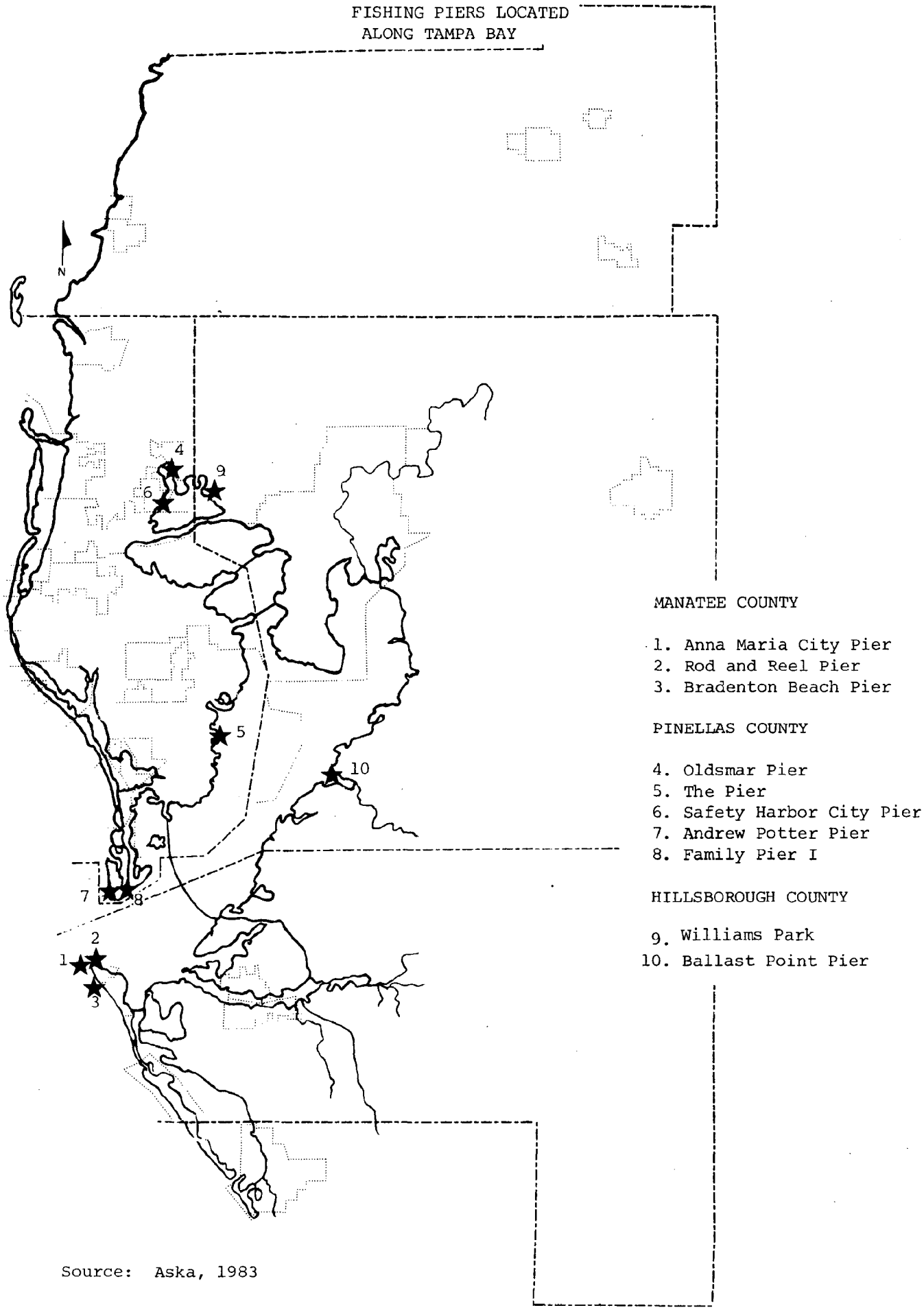
Port Facilities

There are several port facilities and shipping terminals located along Tampa Bay. The nine major facilities include Bayboro Harbor, Port Tampa, Rattlesnake, Hooker's Point, Rock Port, Port Sutton, Port Redwing, Big Bend, and Port Manatee (Figure 10). Tables 4 and 5 summarize the land available, management data and facility data for each of these sites.

Power Plants

There are six power generating plants existing along the shores of Tampa Bay (Figure 11). The three plants owned by Florida Power Corporation are the A.W. Higgins Plants located near Oldsmar on Old Tampa Bay, the P.L. Bartow Plant located south of Gandy Bridge in Pinellas County and the Bayboro Plant located adjacent to Bayboro Harbor in St. Petersburg. The three plants owned by Tampa Electric Company are the Hooker's Point Station in Tampa, the Gannon Station, also located adjacent to Hillsborough Bay and the Big Bend Station located south of the Alafia River. In addition, the

FIGURE 8
FISHING PIERS LOCATED
ALONG TAMPA BAY



Source: Aska, 1983

TABLE 3
TAMPA BAY FISHING PIERS

Pier Name/City	Services Provided	Pier Features						
		Daily Operating Hours	Length from Shore(Ft)	Depth at Face(Ft)	Lighted	Capacity	Best Fishing Months	Restrictions
1.Oldsmar Pier/ Oldsmar	Free Parking	7a.m.-11p.m.	500	3	No	Unknown	1-4	(e)
2.The Pier/St. Petersburg	Food,Bait,Tackle Sale, Public Telephone,Free Parking,First Aid, Facilities,Rest Rooms.	24hrs	1800	16	Yes	200	1-6;10-12	(N/R)
3.Safety Harbor City Pier/ Safety Harbor	Food,Bait,Ice,Tackle Sale,Tackle Rental,Free Parking	24hrs	650	4	Yes	50	1-3;10-12	(N/R)
4.Andrew Potter Pier/Tierra Verde	Food,Bait,Ice,Tackle Sale,Tackle Rental, Public Telephone, Free Parking,Rest Rooms.	6a.m.-8p.m. 24hrs fishing	1000	10-12	Yes	3-400	1-5;9-12	(b,c,e)
5.Family Pier I/ Tierra Verde	Food,Bait,Ice,Tackle Sale,Tackle Rental, Public Telephone,Free Parking,First Aid,Facilities,Rest Rooms.	8a.m.-5p.m.	500	19	Yes	150	1-12	(b,c,e)
6. Williams Park/ Gibsonton	Free Parking, Rest Rooms.	24hrs	100	6	No	40	3-6;10-12	(h)
7. Ballast Point/ Tampa	Food,Bait,Ice,Tackle Sale,Tackle Rental, Tournament Scales,Public Telephone,Free Parking,First Aid Facilities,Rest Rooms.	6a.m.-1a.m.	1400	8-10	Yes	2-300	6-12	(c,d,e)

TABLE 3 (Continued)
TAMPA BAY FISHING PIERS

Pier Name/City	Services Provided	Pier Features						
		Daily Operating Hours	Length from Shore (Ft)	Depth at Face (Ft)	Lighted	Capacity	Best Fishing Months	Restrictions
8. Anna Maria City Pier/Anna Maria	Food, Bait, Ice, Tackle Sale, Tackle Rental, Free Parking First Aid Facilities, Rest Rooms.	7a.m.-11p.m.	735	14	Yes	250	5-9	(c,d,e)
9. Rod and Reel Pier/Anna Maria	Food, Bait, Ice, Tackle Sale, Tackle Rental, Public Telephone, Free Parking, First Aid Facilities, Rest Room.	7a.m.-6p.m. 24 hrs fishing	300	21	No	100	1-12	(a)

Source: Aska 1983

(a) No short fishing (or during specified times only)

(b) No spear fishing

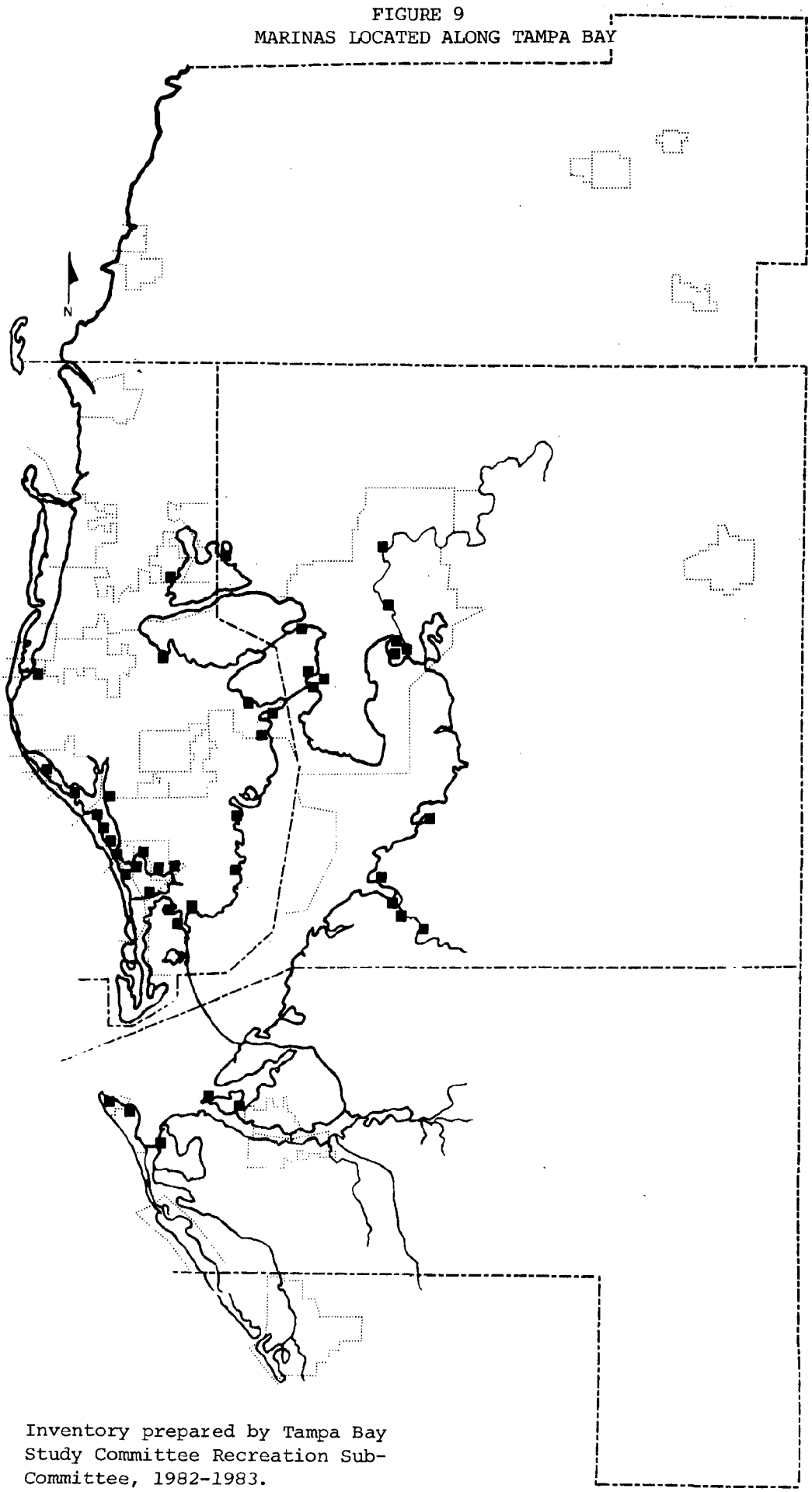
(c) No cast netting or snag hooks

(d) No swimming or diving

(e) Miscellaneous restrictions; pier rules generally posted

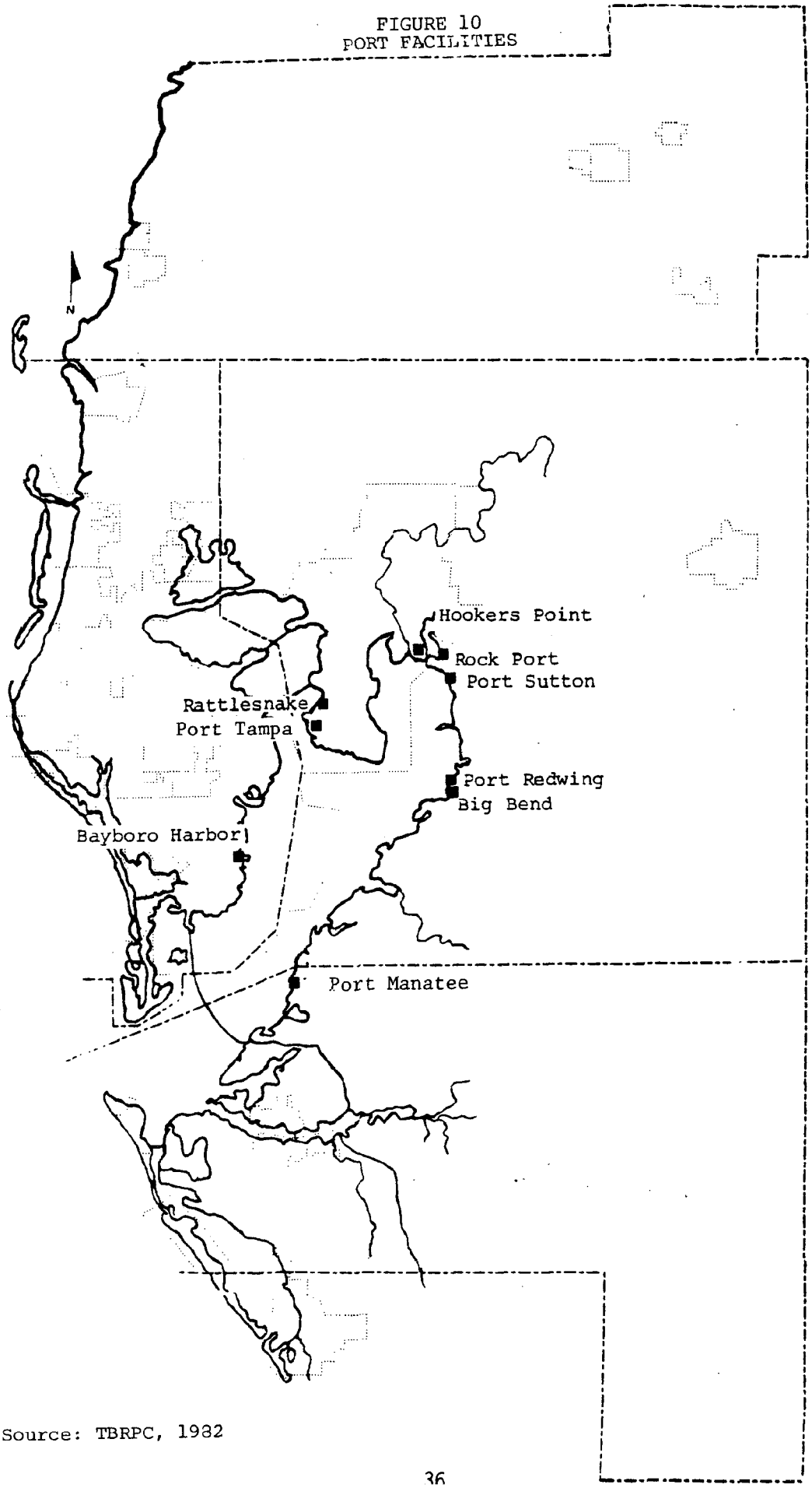
(N/R) None reported; look for local posting

FIGURE 9
MARINAS LOCATED ALONG TAMPA BAY



Source: Inventory prepared by Tampa Bay Study Committee Recreation Sub-Committee, 1982-1983.

FIGURE 10
PORT FACILITIES



Source: TBRPC, 1982

TABLE 4
PORT FACILITIES LOCATED ALONG TAMPA BAY
MANATEE AND PINELLAS COUNTIES

PORT MANATEE, MANATEE COUNTY

Land Available (approx.)

Total acreage:	675
Available for expansion:	397

Facility Information

Present activities:	warehousing, petroleum tank farm, manufacturing and open storage
Channel depth:	40'
Wharf area:	4350' (five 750' and one 600' barge)
Heavy dockside derrick:	no
Ship repair and dry dock:	yes - Florida Ship Repair
Barge construction:	no

BAYBORO HARBOR, ST. PETERSBURG

Land Available (approx.)

Total acreage:	363 acres
Available for expansion:	0 (no large single tract)

Facility Information (Not under a single land manager)

Present activities:	Albert Whitted Municipal Airport Military Operations Bayfront Center USF Bayboro Campus Marine Research Laboratory Port of St. Petersburg Marine related and miscellaneous industries
Channel depth:	19'
Wharf area:	1500' (Note: Only 900' readily available to the Port. 600' dedicated to Navy and Coast Guard operations, available for ship berthing when not in use by military craft)
Heavy dockside derrick:	no
Ship repair and dry dock:	no
Barge construction:	no

TABLE 5
PORT FACILITIES LOCATED ALONG TAMPA BAY
HILLSBOROUGH COUNTY

1. BIG BEND, HILLSBOROUGH COUNTY

Land Available (approx.)

Total acreage:	500 acres (1,187 acres owned by TECO)
Available for expansion:	286

Facility Information

Present activities:	electrical generation, petroleum and phosphate storage
Channel depth:	35'
Wharf area:	5750' available 2250' with Agrico, will need deepening
Heavy dockside derrick:	no
Ship repair and dry dock:	no
Barge construction:	no

2. HOOKER'S POINT, TAMPA

Land Available (approx.)

Total acreage:	1,200
Available for expansion:	300 (not in single tract)

Facility Information

Present activities:	heavy manufacturing, offices, warehousing, open storage, refrigerated storage, frozen storage, terminal storage, bonded warehouse
Channel depth:	34'
Wharf area:	2,400' general cargo
Heavy dockside derrick:	yes
Ship repair and dry dock:	yes
Barge construction:	no

3. PORT REDWING, HILLSBOROUGH COUNTY

Land Available (approx.)

Total acreage:	286 (adjacent to Big Bend)
Available for expansion:	186

Facility Information

Present activities:	phosphate and petroleum storage
Channel depth:	35'
Wharf area:	non-available 5000'
Heavy dockside derrick:	no
Ship repair and dry dock:	no
Barge construction:	no

TABLE 5 (Continued)

4. PORT SUTTON, HILLSBOROUGH COUNTY

Land Available (approx.)

Total acreage:	350
Available for expansion:	150

Facility Information

Present activites:	deep water terminal site
Channel depth:	34'
Wharf area:	3000'
Heavy dockside derrick:	no
Shipyard and dry dock:	no
Barge construction:	no

5. PORT TAMPA, TAMPA

Land Available (approx.)

Total acreage:	550
Available for expansion:	300

Facility Information

Present activities:	petroleum storage, bulk storage construction, general cargo
Channel depth:	34'
Wharf area:	3000'
Heavy dockside derrick:	no
Ship repair and dry dock:	no
Barge construction:	no

6. RATTLESNAKE, TAMPA

Land Available (approx.)

Total acreage:	40 acres (Misener property)
Available for expansion:	no available

Facility Information (Not under a single land manager)

Present activities:	private marinas, heavy industry, barge construction, petroleum storage
Channel Depth:	12' natural
Wharf area:	approx. 1200' (Misener)
Heavy dockside derrick:	no
Ship repair and dry dock:	yes
Barge construction:	yes

7. ROCKPORT, HILLSBORUGH COUNTY

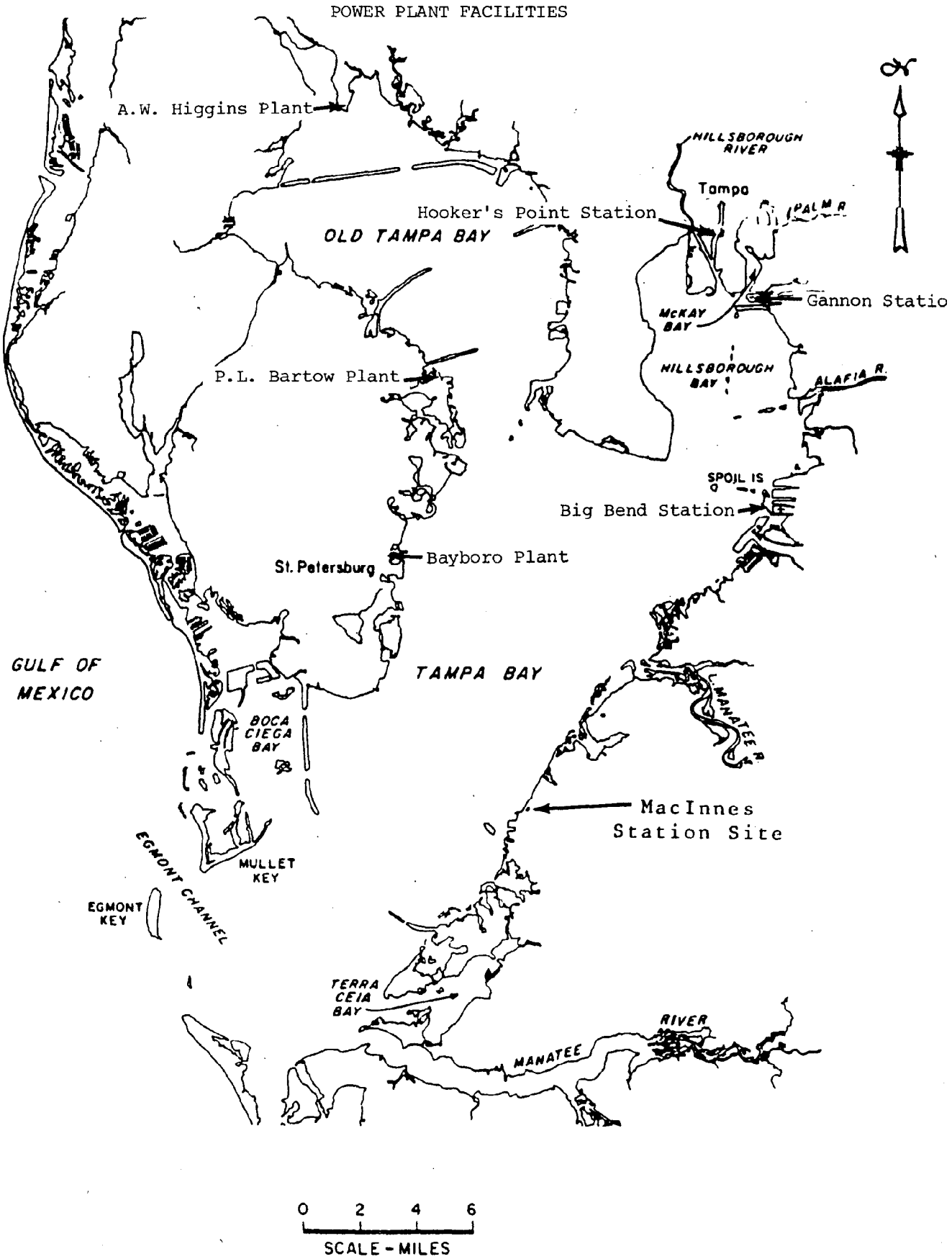
Land Available (approx.)

Total acreage:	265
Available for expansion:	0

Facility Information

Present activities:	phosphate terminal
Channel depth:	34'
Wharf area:	1000' berth - 3000' additional
Heavy dockside derrick:	no
Ship repair and dry dock:	no
Barge construction:	no

FIGURE 11
POWER PLANT FACILITIES



Source: Florida Power
Florida Power and Light
Tampa Electric Company

THE TAMPA BAY SYSTEM

Tampa Electric Company has had plans to develop a plan at the MacInnes Station site near Port Manatee. Original plans called for the MacInnes site to begin operations during the early 1990's. While the plans are still on the books, they are currently on hold due to power conservation by consumers, economic and other planning factors. It is not known when the Tampa Electric Company will resume studies and initiate permit applications for this proposed site.

Power plants are sited along the bay partly due to the need for large quantities of cooling water. Tables 6 and 7 summarize facility information for each site. While it is not neccessary to site a power plant on the bay, large quantities of water are necessary and not easily obtained from other sources.

ADDITIONAL FACILITIES AND COMMERCIAL ENTERPRISES

There are many facilities and commercial enterprises which do not need to locate on the bay but which may be publicly desirable or may depend on bay use for their livelihood. Publicly desirable facilities include shoreline parks, scenic vistas and restaurants with a scenic view of Tampa Bay. Commercial enterprises not necessarily located on the bay but dependent on the recreational value of the area include sporting goods establishments, bait and tackle shops, boat rentals, and other marine businesses.

Shoreline Parks and Scenic Vistas

There are 77 parks located along the shores of Tampa Bay. These range from small neighborhood parks and picnic tables located adjacent to a boat ramp to large acreages of natural and urban parks. An important public amenity, shoreline parks provide residents with access to the waterfront. Large acreages of natural parks also provide habitat for fish and wildlife and help preserve the natural integrity of an area.

Scenic vistas are an important public amenity which is often overlooked when planning the development of an area. Although it often occurs, it is not necessary for urbanization to eliminate aesthetic public views of Tampa Bay.

Marine Related Commercial Enterprises

Several enterprises may not necessarily locate along the shores of Tampa Bay but are dependent on the recreational condition and value of the bay for their livelihood. These enterprises include sporting goods stores, bait and tackle shops, boat rentals and other marine businesses. There are approximately 50 businesses located along the shores of Tampa Bay that provide bait and tackle. There are approximately sixteen businesses providing boat rentals on Tampa Bay although there are many additional businesses in the entire region. Other marine businesses include boat building, boat sales, yacht charters, sailing schools, boating safety courses, diving instruction, environmental and outdoor education programs.

TABLE 6
FACILITY DATA FOR POWER PLANTS LOCATED ON TAMPA BAY
TAMPA ELECTRIC COMPANY

1. BIG BEND STATION - Big Bend Road at Tampa Bay, North Ruskin, Florida.

Units(1)	Year in Service	Fuel	Fuel Transport	North Ruskin, Cooling Water (CFS)	Generator Nameplate MW
1	1970	Coal	Water	537	445.5
2	1973	Coal	Water	537	445.5
3	1976	Coal	Water	537	445.5
4	1985	Coal	Water	537	486.0
					1822.5

Notes: (1) This station also has 3 gas turbine units (No. 2 oil, 175.5 MW total).

Other information: In 1982, a total of 2,821, 578 tons of coal were burned for a net of 6,514,684 kilowatt hours. The wastewater system is composed of settling ponds which are recycled for plant use and spray irrigation. The slag handling system uses 7 MGD average seawater with a settling pond which discharges into Tampa Bay.

2. HOOKERS POINT STATION - Port of Tampa, Sparkman Channel at Hemlock St.

Units	Year in Service	Fuel	Fuel Transport	Cooling Water (CFS)	Generator Nameplate MW
1	1948	Oil	Water	66.8	33.0
2	1950	Oil	Water	66.8	34.5
3	1950	Oil	Water	66.8	34.5
4	1953	Oil	Water	89.1	49.0
5	1955	Oil	Water	108.0	81.6
					232.6

Note: In 1983, the wastewater will be connected to City of Tampa. Prior to that, it was barged to the Gannon Station.

Source: Tampa Electric Company, 1983.

TABLE 6 (Continued)

3. FRANCIS J. GANNON STATION - Port Sutton Rd., Tampa, Florida (Hillsborough Bay).

EXISTING SYSTEM

Units	Year in Service	Coal Re-Conversion (1)	Fuel	Fuel Transport	Cooling Water (CSF)	Generator Nameplate MW
1	1957	1986	Oil (1)	Water	233.9	125.0
2	1958	1985	Oil (1)	Water	233.9	125.0
3	1960	1984	Oil (1)	Water	283.7	179.5
4	1963	1983	Oil (1)	Water	282.9	187.5
5	1965		Coal	Rail (2)	392.0	239.4
6	1967		Coal	Rail (2)	534.6	414.0
						1270.4

Notes: (1) Units 1-4 are planned for coal re-conversion as noted. Fuel transport will be by rail.

(2) Transport by water is used as an alternate transport system.

Other information: Wastewater system - settling ponds, recycle for plant use, spary irrigation.

Slag handling system - 2 MGD average seawater, settling pond discharges to bay. Units 1-4 conversion will increase to 4.2 MGD average.

TABLE 7
FACILITY DATA FOR POWER PLANTS LOCATED ON TAMPA BAY
FLORIDA POWER CORPORATION

1. A.W. HIGGINS PLANT - Booth Point, Oldsmar, Florida. (1)

Units	Year in Service	Fuel	Fuel Transport	Cooling Water(CFS)	Generator Name Plate MW
1	1951	Oil (2)	Barge	116.9	46.0
2	1953	Oil (2)	Barge	122.5	46.0
3	1954	Oil (2)	Barge	122.5	46.0
					138.0
P1(3)	1969	(see footnote 3)		not applicable	33.8
P2	1969	"		"	33.8
P3	1970	"		"	42.9
P4	1972	"		"	42.9
					153.4

Notes: (1) This plant is used primarily for load peaking as it is relatively old and less efficient.

(2) Some natural gas is used also.

(3) Combustion turbines - burn distillate oil and natural gas. Oil is transported by barge and natural gas arrives by pipeline.

Other information: The plant has a permit allowing chlorination but condensor tube cleaning is accomplished by mechanical means. Septic tanks are used for sewage disposal and chemical wastes are treated by four percolation ponds. There is no discharge to the bay. Excess liquids are removed by a monitored spray irrigation system.

2. P.L. BARTOW PLANT - Weedon Island, St. Petersburg, Florida.

Units	Service	Fuel	Fuel Transport	Cooling Waters(CFS)	Generator Nameplate MW
1	1958	Coal/Oil	Tanker	245.0	127.5
2	1961	Oil	Tanker	245.0	127.5
3	1963	Oil	Tanker	378.6	239.4
					494.4
P1	1972	Oil	Tanker	Not applicable	55.7
P2	1972	"	"	"	55.7
P3	1972	"	"	"	55.7
P4	1972	"	"	"	55.7
					222.8

Notes: (1) Sometimes burns natural gas which is delivered by pipeline.

Other information: The plant has a permit allowing chlorination but condensor tube cleaning is accomplished by mechanical means. Septic tanks are used for sewage disposal and chemical wastes are treated by two percolation ponds. There is no discharge to the bay.

3. BAYBORO PLANT - Bayboro Harbor, St. Petersburg, Florida. (1)

Units	Year in Service	Fuel	Fuel Transport	Generator Nameplate MW
P1	1974	Oil	Barge	56.7
P2	1974	Oil	Barge	56.7
P3	1974	Oil	Barge	56.7
P4	1974	Oil	Barge	56.7
				226.8

Note: (1) This plant is used for load peaking.

Source: Florida Power Corporation, 1983.

CURRENT MANAGEMENT OF TAMPA BAY

Tampa Bay is bordered by three counties and 20 municipalities. There are three state managed aquatic preserves within Tampa Bay and four islands which are national wildlife sanctuaries. Authority to regulate any function within the bay system is split among and within various levels of government. While regulatory agencies have substantial authority over specific functions or problems in Tampa Bay, each must operate within the scope of its enabling legislation. In many cases, this can lead to overlapping jurisdictions, conflicting authority, and lack of consistent management from one area to the next.

Jurisdictional control over Tampa Bay is divided among many agencies and governments and depends on the specific activity or issue. To assist in understanding the current management of Tampa Bay, the following discussion outlines the roles of the various agencies by three major activities which occur in Tampa Bay. These activities are: resource utilization, resource management and coastal construction.

RESOURCE UTILIZATION

Agency involvement in the use of the bay's resources is summarized according to the following: navigation and boating, fishing and related activities and public access. Many federal, state and local agencies have broad regulatory powers over these activities.

Navigation and Boating

The U.S. Coast Guard and the U.S. Army Corps of Engineers are the primary federal agencies with regulatory and enforcement authority for navigation and boating. The U.S. Coast Guard has broad regulatory and enforcement powers over navigation, design, and placement of navigation aids. It is also responsible for boating safety and vessel movement and the regulation of anchorages and moorings, construction of bridges, piers and water control structures. The U.S. Army Corps is responsible for the removal of wrecks and obstructions in navigational channels.

At the state level, the Florida Department of Natural Resources (DNR) is the primary agency responsible for navigation and boating. Chapter 371, Florida Statutes (F.S.), provides DNR with the power to promulgate regulations and enforce laws and regulations on boating, operating safety, licensing and registration, navigation and accident reporting. The DNR Marine Patrol is the enforcement division of the department.

Regarding navigation and boating, agency action at the local level is restricted to local ordinaces establishing speed and/or wake restrictions in certain areas and local governments have participated as local sponsors in U.S. Army Corps projects involving boating navigation. There are also several locally owned and operated public marinas.

Fishing and Related Activities

Two federal agencies regulate or are involved with fishing regulations: the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). On a national level, the FWS establishes policy for commercial fisheries development, protects fish which are endangered species, conducts general investigations and research projects, and coordinates fisheries management efforts with the state. The NMFS conducts fisheries research and is involved in four major areas: fisheries management, fisheries development, habitat protection and law enforcement. Under the Magnuson Fisheries Conservation and Management Act, the NMFS is responsible for the management of marine fisheries from the edge of state jurisdiction out to 200 miles. It is also responsible for preparing and enforcing fishery management plans for the stock in need of management. Since most of these species are estuarine dependent at some point in their life cycle, this responsibility must be coordinated with other federal, state and local agencies. Both NMFS and FWS are responsible for enforcing the provisions of the Marine Mammal Act and the Endangered Species Act; they work closely with the U.S. Army Corps of Engineers, U.S. Coast Guard, customs, state enforcement agencies and state coastal zone management programs and provide input on any applicable federal Environmental Impact Statements.

The DNR is the primary state agency responsible for regulating saltwater fisheries. Chapter 370, F.S., provides DNR with the authority to promulgate rules and regulations, and enforce statutes regarding seafood dealers, use of nets, protection of crustacea, marine animals and fish. Chapter 370 also provides specific regulations regarding saltwater finfish, stone crabs, blue crabs, oysters and shellfish. In addition, DNR conducts considerable fisheries related research. Current studies for Tampa Bay include a study of habitat loss and fisheries decline in Tampa Bay, Sciaenid life history in Tampa Bay, and a Tampa Bay trapping survey for blue crabs, 1980-1983.

Local regulations regarding fishing and related activities have primarily been in the form of special acts of the state legislature which have been enacted for local areas. These laws vary for the counties in Tampa Bay and are discussed below:

Hillsborough County - Four special acts have been enacted regulating fishing in Hillsborough County. The first, Chapter 15379, Special Acts (S.A.) 1931, as amended, regulates netting and seining north of Gandy Bridge (also applies to Pinellas County). Chapter 21289, S.A. 1941, prohibits fishing from bridges within Hillsborough County except where walkways or passageways for pedestrians are provided. Chapter 30829, S.A. 1955, prohibits spearfishing in all salt waters located in Hillsborough County, including all parts of Tampa Bay, McKay Bay, and Old Tampa Bay, together with their salt water tributaries which may be located in Hillsborough County. Chapter 67-2111, S.A. 1967, regulates commercial fishing in salt water areas within the City of Tampa and empowers the city to enact ordinances controlling the use of nets or seines.

Manatee County - Nine special acts have been enacted regulating fishing in Manatee County. Chapter 19961, S.A. 1939, prohibits and establishes fines for fishing with seines or nets (except for hand cast net or common hand dip net) within 1500 feet of the corporate limits of any incorporated municipality in the County. Chapter 21365, S.A. 1941, regulates the same for Manatee River and any of its tributaries, and Terra Ceia Bay and any of its tributaries, bayous and inlets. Chapter 26000, S.A. 1949, prohibits and establishes fines for the use of haul seines, drag nets or stop nets in the inside salt waters of the county. Chapter 27697 S.A., 1961, 63-1585 S.A. 1963 (as amended) and 67-1685, S.A. 1967 as amended regulate commercial fishing in Manatee County. Chapter 67-1883, S.A. 1967, prohibits the use of nets or seines within certain bodies of water within the City of Palmetto. Chapter 70-795, S.A. 1970, prohibits seining or netting for menhaden-like fish within three marine leagues of shore in Manatee County.

Pinellas County - Five special acts have been enacted regulating fishing in the waters of Tampa Bay in Pinellas County. Chapter 15464, S.A. 1931, authorizes the City of Safety Harbor to establish ordinances to prohibit fishing. Chapter 29432, S.A. 1953, is a comprehensive act regulating the use of nets and seines in the salt water areas of Pinellas County. Chapter 29433, S.A. 1953, prohibits and establishes a fine for the use of all nets or seines, except cast nets within one hundred yards of any bridge, dock, pier, causeway or jetty while Chapter 76-482, S.A. 1976, prohibits the use of nets or seines, except hand cast nets, within all salt water areas of the City of St. Petersburg. In addition Chapter 65-2, General Acts 1965, amends Section 309.01, F.S., to permit Pinellas County to place certain material for increasing fish potential in Tampa Bay.

Public Access

Four federal agencies are involved with the development and regulation of public access: 1) the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Coast Zone Management (CZM); 2) the U.S. Department of the Interior, Heritage Conservation and Recreation Program (HCR), and the U.S. Fish and Wildlife Service (FWS). Under the provisions of the Coastal Zone Management Act of 1972, CZM sets guidelines for state coastal zone management plans and assists and reviews those plans. The multiple objectives of the Coastal Zone Management Act are to preserve, protect, develop and, where possible, to restore and enhance the resources of the coastal zone, which includes providing public access. (40) The HCR has a number of public access programs and is involved in the disposal of federal surplus real property for recreation and historical monuments, the Urban Park and Recreation Recovery Program, and the acquisition, development and planning for outdoor recreation.

In addition, in Tampa Bay the FWS manages public access to three national wildlife refuges: Egmont Key, Passage Key and Pinellas National Wildlife Refuges. Passage Key and Egmont Key are heavily used for recreation and are accessible to the public most of the year. However, because Passage Key is also an important bird rookery, it is closed to the public during the nesting season, April 1st to September 1st. Egmont Key is accessible all year during daylight hours.

Two state agencies have responsibilities involving public access. The Florida Department of Natural Resources (DNR) has broad powers through the State Parks and Preserves Act, Chapter 258, F.S. DNR also has authority to purchase environmentally endangered lands for preservation and recreation under the 1979 Environmentally Endangered Lands Act. The Florida Department of Environmental Regulation (DER) has provisions for public access as part of any water restoration project under Chapter 17, Florida Administrative Code (F.A.C.).

Many of the provisions for public access are under local government jurisdication. Local governments own and operate a considerable portion of the public waterfront lands as parks, marinas and other facilities. The parks surrounding Tampa Bay provide a large portion of the shoreline accessible to the public. The counties are responsible for activities and projects within local parks in the unincorporated areas while the individual city park and recreation departments are responsible within the municipal areas. In addition, local governments have additional controls over public access through zoning, land use and facility planning (i.e. public easements), ordinances and policy development.

RESOURCE MANAGEMENT

Resource management is divided into two sections: habitat management and protection of water quality. Habitat management includes the protection of wildlife and fisheries, the monitoring of natural resources and the designation and control of aquatic preserves and parks. In Tampa Bay, a wide range of agencies are involved in these activities.

Habitat Management

The U.S. Department of the Interior, Fish and Wildlife Servie (FWS), and the National Oceanic and Atmospheric Administration (NOAA) are the primary federal agencies with responsibilities for habitat management in Tampa Bay. Under the Endangered Species Act, the Marine Mammal Protection Act, and the Fish and Wildlife Coordination Act, the FWS has general regulatory and enforcement powers over the protection of certain types of wildlife. In addition, FWS manages three national wildlife refuges in Tampa Bay: Egmont Key, Passage Key and Pinellas National Wildlife Refuges.

Located at the mouth of Tampa Bay, Egmont Key is managed as a public use area with management responsibilities being primarily custodial and law enforcement. Passage Key is managed as a bird nesting area for laughing gulls, royal terns, black skimmers, oyster catchers, sandwich terns and brown pelicans. It is closed to the public during the nesting season (April 1 - September 1) each year but is a popular boating and picnic area during the rest of the year.

The Pinellas National Wildlife Refuge is composed of six mangrove islands located in Boca Ciega Bay. Because these islands are predominantly mangroves, they are not readily used by the public and are managed as bird habitat. In particular, Tarpon Key is an important pelican rookery and is closed to the public.

The National Audubon Society also manages several habitat preserves in Tampa Bay including the Alafia Bank composed of Bird Island and Sunken Island; Whiskey Slim and Green Keys, located adjacent to Port Redwing; Tampa Port Authority's designated Bullfrog Creek Marine Preserve and Bird Key in Terra Ceia Bay.

A major department within NOAA with responsibilities affecting Tampa Bay is the National Marine Fisheries Service (NMFS). Under the Magnuson Fisheries Conservation and Management Act, NMFS is responsible for the habitat protection and fisheries management of several estuarine dependent fish. As with the Fish and Wildlife Service, NMFS is empowered to enforce the provisions of the Endangered Species Act and the Marine Mammal Protection Act. The NMFS also comments on any U.S. Army Corps of Engineers (COE) permit application involving habitat alteration. Through a COE/NMFS memorandum of understanding, the Corps will not make a positive decision over substantial negative NMFS comment. (41)

NOAA also administers and directs the National Sea Grant Program by providing grants to institutions for marine research, education and advisory services; develops a data system for obtaining and disseminating marine environmental data; and promotes the development of marine technology. Through the funding of research and other assistance programs, Sea Grant provides valuable assistance with habitat management in Tampa Bay.

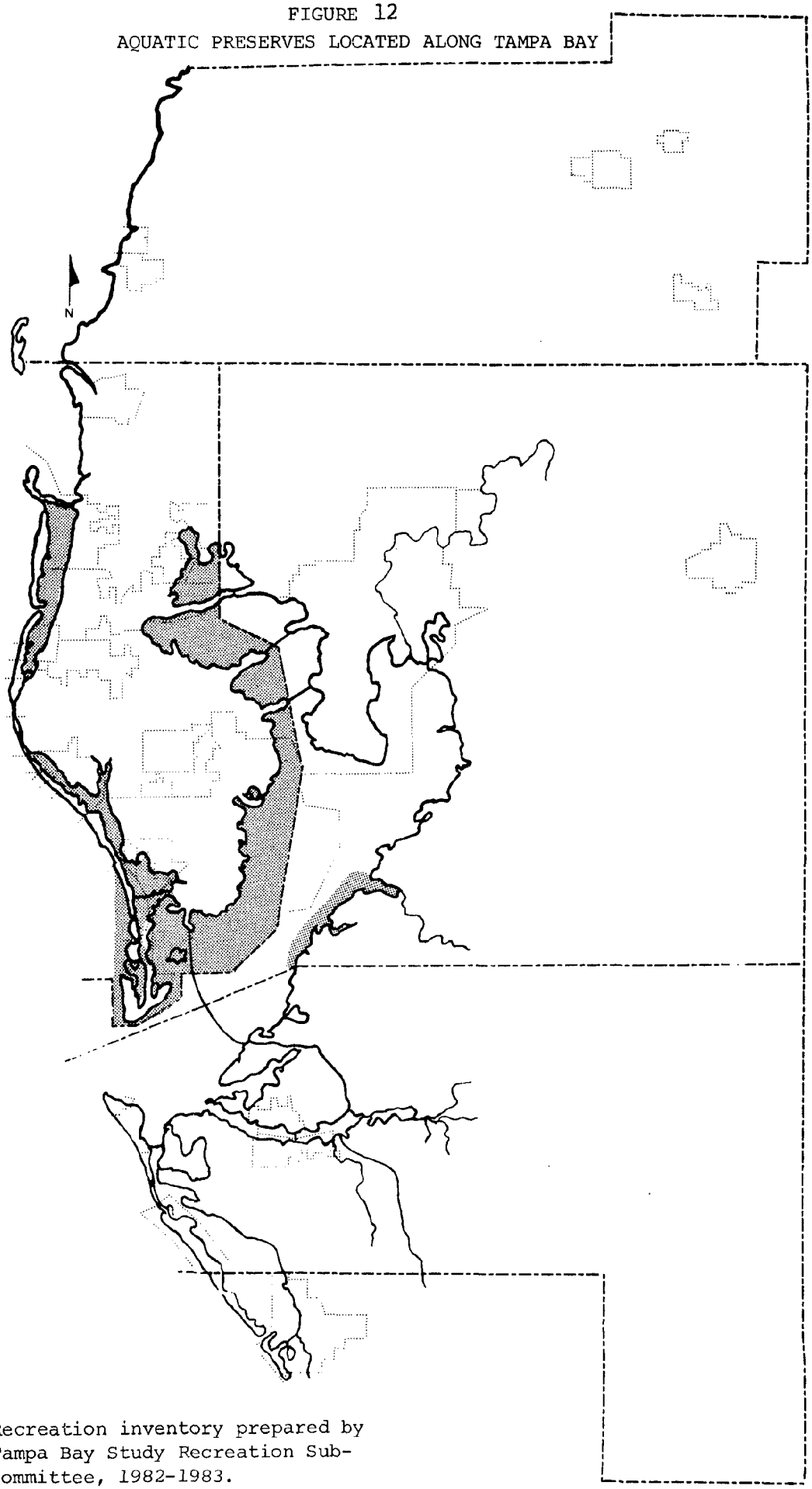
State responsibility for habitat management is divided primarily between two agencies: the Florida Department of Natural Resources (DNR) and the Florida Game and Fresh Water Fish Commission. However, to accomplish effective management, considerable coordination with programs in other agencies is undertaken. As authorized in the Florida Endangered and Threatened Species Act of 1972, Chapter 372, F.S., the Florida Game and Fresh Water Fish Commission is responsible for research and the conservation and management of fresh water and upland species, particularly endangered or threatened species. DNR is responsible for the saltwater fisheries in Florida, the management of aquatic preserves, marine research which includes habitat management studies, and the promulgation and enforcement of regulations for game and wildlife preservation. In addition, the Governor and Cabinet, as the Board of Trustees of the Internal Improvement Fund and head of DNR, retain title and administrative control for all state owned submerged lands.

Current research being conducted by DNR that affects habitat management in Tampa Bay includes a comprehensive study of habitat loss and fisheries decline in Tampa Bay, and several specific fisheries studies. The following enforcement responsibilities may also affect habitat: the protection of manatees, marine turtles and threatened and endangered species, enforcing the pollutant spill prevention and control program and conducting the beach and shore erosion program which includes research and processing applications for all coastal construction below the mean high water line.

In addition, there are three aquatic preserves in Tampa Bay which DNR is responsible for managing: the Cockroach Bay Aquatic Preserve, Pinellas County Aquatic Preserve and Boca Ciega Bay Aquatic Preserve (Figure 12). DNR is currently developing management plans for aquatic preserves. The

FIGURE 12

AQUATIC PRESERVES LOCATED ALONG TAMPA BAY



Source: Recreation inventory prepared by Tampa Bay Study Recreation Sub-committee, 1982-1983.

first plan to be completed was for Charlotte Harbor and was unanimously adopted by the Governor and Cabinet on May 18, 1983. Plans have not been initiated for the aquatic preserves in Tampa Bay.

In many cases, other state programs affect habitats under the management of DNR and the Game and Fresh Water Fish Commission. To accomplish effective habitat management, these two agencies coordinate their management activities with other state programs, including the following: (42)

- DER's water quality program, including the DER/COE joint permitting process for dredge and fill;

- The Florida Department of Community Affairs' (DCA) development of regional impact, areas of critical state concern, and coastal energy impact programs;

- The Department of State, Division of Archive's programs regarding the preservation and management of Florida's archaeological and historical resources; and

- The Department of Health and Rehabilitative Services' septic tank regulations and mosquito control programs.

The local governments also have jurisdiction over certain aspects of habitat management. Several shoreline parks with important natural habitat are managed by local governments, including Upper Tampa Bay Park, Cockroach Bay Park and DeSoto Park. Local planning departments are responsible for land use planning, the coordination of many conservation and preservation efforts, and the preparation of local government comprehensive plans which must address coastal issues. Through zoning and ordinances, many local governments also control activities occurring in submerged areas and along the shorelines, in many cases strictly limiting the activities and subsequent impacts on those areas.

Protection of Water Quality

Federal responsibility for the protection of water quality is divided among the U.S. Environmental Protection Agency (EPA), the U.S. Coast Guard and the U.S. Army Corps of Engineers (COE). The U.S. Coast Guard has control over water quality through rule promulgation and enforcement responsibilities to regulate and prevent oil pollution from onshore and offshore facilities and vessels. The COE regulates discharge of dredge and/or fill materials and has the authority to remove wrecks, derelict vessels and other obstructions in navigable waters. EPA has maintained responsibilities for the protection of water quality, including the following:

- Establishing and enforcing national water pollution control standards through the Water Pollution Control Act Amendments of 1972;

- Operating and enforcing the National Pollutant Discharge Elimination System (NPDES);

- Assisting in the prevention and control of oil pollution;

- Providing grants for pollution research and control programs; and

- Requiring permits for discharging wastes in wetlands (NPDES) and restricting the discharge of solid waste in wetlands (Resource Conservation and Recovery Act).

Two state agencies are responsible for the protection of water quality: the Florida Department of Environmental Regulation (DER) and the Florida Department of Natural Resources (DNR). DNR is authorized to protect water quality by the Pollutant Spill Prevention Control Act (Chapter 376, F.S.). Under this act, DNR's responsibilities include:

- Issuing registration certificates to terminal facilities;

- Promulgating and enforcing rules and regulations relating to the discharge of pollutants into state waters or on to coastlines; and

- Administering the Florida Coastal Protection Trust Fund.

DER has broad regulatory and enforcement powers for the protection of water quality, including:

- Promulgation and enforcement of regulations for a water pollution and abatement control program;

- Implementation and enforcement of a resource recovery and management program;

- Licensing of all solid waste disposal facilities; and

- Providing consultation and technical services in the prevention of oil pollution.

For many of the water quality programs, DER has delegated responsibilities to a local county or municipal program. DER retains exclusive authority to issue permits; however, they may delegate power to a local program. Local programs must be approved by DER, their rules must be stricter or equal to DER's and they must be enforced. In conjunction with the local program, many local governments also conduct special studies and routine monitoring of water quality parameters. One special study regarding a portion of Tampa Bay is the Manatee County Estuary Study being conducted by Manatee County. This is an intensive one and a half year monitoring study of water quality and biological parameters in the estuarine portions of the Manatee River from Tampa Bay to Lake Manatee.

In addition, most of the local governments have developed ordinances, policies and other provisions for requiring water quality protection. Many of these are related to development activities which may impact water quality. For instance, the City of Clearwater has developed "Stormwater Design Criteria" and an "Erosion and Siltation Control Policy" to assist developers in meeting the City's water quality protection requirements. Also, water quality impacts are addressed in the development of regional impact review process and usually through site plan reviews and rezoning requests.

COASTAL CONSTRUCTION

The regulation of coastal construction is important for controlling impacts on the systems of Tampa Bay. There are a variety of agencies regulating coastal construction activities. These activities are discussed below and include: dredge and fill; docks, moorings and bulkheads; port and marina facilities; bridges, causeways and roads; canals, levees, and salinity structures; and other coastal construction activities.

Dredge and Fill

Jurisdictional authority over dredge and fill operations is vested in many federal, state and local agencies. Regulations apply to dredging and/or filling activities which take place below mean high water and in wetlands. Federal agencies involved with these regulations include the U.S. Army Corps of Engineers (COE), the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS) and the U.S. Department of Housing and Urban Development (HUD).

The COE is the major federal agency involved with dredge and fill operations and has broad regulatory and permitting responsibilities. The majority of current COE regulatory functions are based on Section 10 of the River and Harbor Act of 1899, Section 404 of the Clean Water Act of 1977, and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. Section 10 requires COE authorization for work in or affecting navigable waters, Section 404 requires COE authorization for activities involving discharge of dredged or fill material into the waters and wetlands of the U.S. Section 103 requires a permit for transporting dredged materials for the purpose of dumping it into ocean waters. Several types of permits are issued by the COE and a joint permit application process is currently used by COE and the state DER to streamline the dredge and fill application process.

Both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service review dredge and fill applications and advise the Army Corps on the impacts on fish and wildlife resources. In addition, HUD is involved with flood plain regulation under the National Environmental Policy Act and Executive Order #11514.

The state dredge and fill permitting program is administered by DER while certain activities may also require approval from DNR. As discussed earlier, a joint application program has been established to coordinate state and federal permitting procedures.

The regulations pertaining to dredge and fill permits detail activities requiring permits, activities exempted from the permit requirement, and activities which may only require submision of a short-form application. Activities requiring a permit include, but are not limited to, the following: (43)

1. The construction or emplacement of piers, wharfs, docks, dolphins, mooring pilings, riprap and revetments, retaining walls, groins, breakwaters, jetties, beach restoration, levees, wires or cables over

or under the water, pipes and tunnels under the water, artificial fishing reefs, channels and upland canals, intake and outfall pipes or structures, navigational aids, platforms, ramps, signs, and fences;

2. Excavation, clearing, and commercial sand and gravel dredging;

3. Filling or disposal of dredged material; and

4. Transportation and deposition of dredged material in open water. Detailed information concerning exemptions and short-form eligibility can be obtained from Chapter 17-4, Florida Administrative Code.

Applications for groin or jetty construction, beach restoration, or other activities regulated by the Beach and Shore Preservation Act must receive permit approval from DNR. For activities involving state-owned land, the applicant must receive consent of use from DNR. Such consent must be obtained before the DER will issue a dredge and fill permit.

Fill activities in navigable waters also require local approval pursuant to Chapter 253, Florida Statutes, for fill placed waterward of the mean high water mark. Any private person, firm, or corporation conducting fill activities in the unincorporated area of any county bordering on or in the navigable waters of the state must receive a permit from the appropriate board of county commissioners. Within the territory of any municipality, such application for a construction or fill permit shall be made to the governing body of such municipality. Written application shall be accompanied by a plan or drawing showing the proposed construction. Local permits are subject to the approval of the DER.

Most dredge and fill permit applications are reviewed by TBRPC and the local governments. In addition, Manatee County has a local program for administering and reviewing permit applications. The City of Clearwater requires an additional marine construction permit and any dredge or fill in excess of 4,000 cubic yards (except for emergency or maintenance) requires approval by the electorate via referendum.

Docks, Mooring and Bulkheads

The same agencies that have regulatory control over dredge and fill also exercise permitting authority over docks, moorings and bulkhead projects. Small projects pursuant to Chapters 253 and 403, F.S., and defined in the Florida Administrative Code under Section 17-4.04, are exempt from the state permitting process. (44) Also, in most counties or municipalities permits and/or review are required for marine construction.

Port and Marina Facilities

A variety of jurisdictional controls control the construction of ports, marinas, and their attendant facilities. In Tampa Bay, dredging operations are generally needed and the U.S. Coast Guard is responsible for access to these facilities and the protection and security of waterfront facilities.

At the state level, DNR administers and enforces regulations for submerged and tidal lands, as authorized in Chapter 253, F.S. Procedures for the administration of submerged lands, including commercial and industrial docking facility leases, is provided in Chapter 160-17, Florida Administrative Code.

At the local level, the construction of port and marina facilities requires construction permits, zoning approval, review by the local government technical staff (usually in the engineering and environmental management departments), and approval of all associated activities (i.e. dredge and fill).

Bridges, Causeways and Roads

Three federal agencies are involved in the construction of bridges, causeways and roads along Tampa Bay: the U.S. Coast Guard, the U.S. Army Corps of Engineers (COE) and the U.S. Department of Transportation (DOT). DOT is responsible for the construction of all federal bridges, causeways and roads. The U.S. Coast Guard regulates the construction and operation of bridges and regulates causeways and roads that are fixed structures in navigable waters. The COE establishes and enforces the regulation and issuance of permits for the construction of structures, including bridges and causeways, in navigable waters of the United States.

The Florida Department of Transportation (FDOT) is the state agency responsible for the construction of bridges, causeways and roads. In this regard, FDOT administers and regulates rights-of-way acquisition, directs short and long range planning functions and project coordination, and directs the design, construction, maintenance and related activities of the Florida Highway System, including highway drainage systems. FDOT is also involved with three urban area transportation studies in the Tampa Bay region: the Pinellas Urban Area Transportation Study, the Sarasota-Manatee Urban Area Transportation Study, and the Tampa Urban Area Transportation Study. These studies are being conducted by the local Metropolitan Planning Organizations (MPO's) which, in cooperation with the state, are responsible for carry out the transportation planning process and developing the planning work programs, transportation plan, and transportation improvement program.

At the local level, the construction of bridges, causeways and roads is also addressed in the transportation elements of the local government comprehensive plans. In addition, the public works departments are generally responsible for local construction and maintenance programs.

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CHAPTER 3
ISSUES IDENTIFIED IN SUBCOMMITTEES

During meetings from July 1982 to March 1983, the subcommittees identified local and regional issues, including many site specific concerns. A summary list of bay concerns and management issues was approved at the March 22, 1983 Study Committee meeting (Table 8). Many of the concerns are related to changes that have occurred in Tampa Bay, including declines in visual quality, harvestable resources, valuable habitat and changes to tidal creeks, bay circulation, salinity patterns etc. which were discussed in Chapter Two. These changes are a result of the overall development and growth that has occurred in the area and the resultant impacts from industrial, municipal, transportation and other development activities.

The major focus of the subcommittee meetings has been to identify specific problems occurring in the bay, to identify additional information needs and to develop strategies and recommendations for rectifying the identified problems. Most of these specific problems are part of the management issues identified in Table 8. Following is a summary of each problem identified by the subcommittees. These summaries were reviewed at the April and May 1983 subcommittee meetings and then the Institution Subcommittee developed implementation strategies specific to each concern. Figure 13 locates the specific areas mentioned in the following problem summaries while Table 9 lists the priority rankings of the Bay management problem issues approved by the Tampa Bay Study Committee at its August 30, 1983 meeting. The full policy board of the Council adopted the ranked issues at its October 10, 1983 meeting.

TABLE 8

LIST OF MAJOR BAY CONCERNS AND MANAGEMENT ISSUES IDENTIFIED BY SUBCOMMITTEES

BAYWIDE CONCERNS:

Development and Growth
Industrial, Municipal and Transportation Impacts on Tampa Bay
Impacts from Changes to Tidal Creeks
Declining Visual Quality
Decline in Harvestable Resources
Habitat Loss and Restoration
Changes in Bay Circulation
Loss of Resource Based Recreational Opportunities
Changes to Species Composition and Communtiy Structure (Excessive Blooms, Mass Mortalities, Reduced Diversity, etc.)
Loss of Assimilative Capacity
Long Term Changes in Salinity Patterns
Changes in Hydrography
Contamination of Life Forms

MANAGEMENT ISSUES:

Intergovernmental Coordination and Jurisdictional Control Over Tampa Bay
Public Participation and Education
User Conflicts and Limits on Activities
Ownership of Submerged Lands
Bay Management Alternatives and Implementation Measures
Public/Visual Access and Shoreline Recreation Facilities
Funding
Value of Tampa Bay for Commerce
Controls on Industry
Water Quality Management and Violations of Standards
Wildlife Management
Management and Acquisition of Public Lands

TABLE 9

TAMPA BAY STUDY COMMITTEE NUMERICAL PRIORITY LIST

1. Funding
2. Loss of Seagrass in Tampa Bay
3. Non-Point Source Discharges Entering Tampa Bay
4. Spoil Disposal and Management of Spoil Islands
5. Hazardous Waste Disposal and Management
6. Enforcement
7. Control of Septage Waste
8. Aquatic Preserves
9. Seagrass and Mangrove Habitat Creation
10. Municipal and Industrial Discharges
11. Stronger State Wetlands Regulation
12. Study and Management of Tidal Creeks and Rivers
13. Wasteload Allocation for Tampa Bay
14. Assessment of Fishery Stocks in Tampa Bay
15. Gypsum Decommissioning, Hillsborough County
16. Commercial & Sport Fishing Regulation
17. Documenting the Economic Importance of Tampa Bay
18. Public Education
19. Shoreline Development and Public Access
20. Load Relief for Major Sewage Treatment Plants
21. Water Quality Improvement for Recreational Uses
22. Stormwater Detention Requirements for Redevelopment
23. Review of Rules and Regulations
24. McKay Bay Management Plan
25. Shellfish Classification
26. Power Plant Entrainment
27. Hendry Fill Restoration Project
28. Contingency Planning for Post-Hurricane Acquisition of Habitat
29. Mitigation Banking
30. Management of Bower Tract and Adjacent Wetlands
31. Management of Passage Key
32. Management and Restoration of Shorelines in Boca Ciega Bay
33. Urban Waterfront Shorelines
34. Channel A Restoration
35. Water Quality Improvements Using Tidal Gates and Pumps
36. User Conflicts and Limits on Activities
37. Marina Siting Policy
38. Construction of New Skyway Bridge Pier Protection System
39. Extension of 49th Street (St. Petersburg) Across Tampa Bay
40. Sailboat Launching
41. Odor
42. Manatee River Derelict Train Trestle, Manatee County

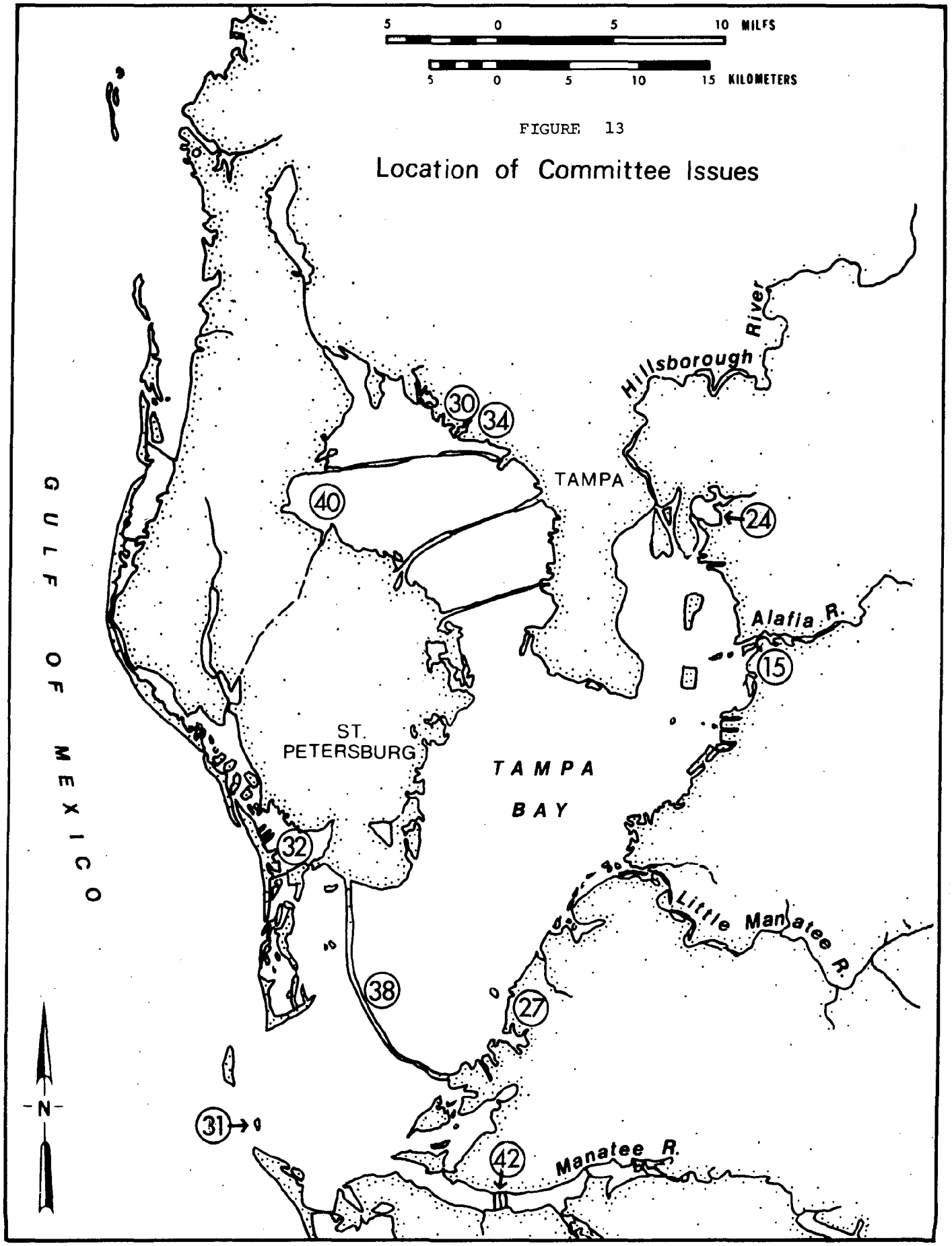

FIGURE 13

Location of Committee Issues

ITEM #1 Funding

REFERENCE: Regional Issue; Economics Meeting 1/10/83; Recreation Meeting 2/1/83

ANALYSIS:

Many of the studies and needs proposed by the Tampa Bay Study committee will require funding. These activities include: ecological restoration, recreation programs and facilities, impact studies, and many more. However, in some cases, many existing sources of funds could be put to better economic use.

DESIRED ACTIONS:

A. Assessment of priorities and costs of proposed studies and programs along with assessment of existing and possible sources of funding.

B. Compiling a list of all state, federal, and local sources of funding.

C. Saltwater fishing licenses and/or other broadly based fees should continue to be pursued by state legislators.

D. Impacts of current funding reductions on recreational pursuits in Tampa Bay should be investigated.

DESIRED RESULTS:

Increased efficiency and best use of all available funds.
Adequate maintenance and improvements of existing facilities and programs.
Construction of new facilities and programs to meet the recreational needs of a growing population.

IMPLEMENTATION COMENTS:

Assessing the costs of proposed studies and programs and compiling a list of available funding should be conducted as part of the Tampa Bay Study Committee. Sources to be examined for funding include the Federal Catalog of Domestic Assistance and the new shore side facilities financing administered by National Marine Fisheries Service. Where there is a need for increased funding, appropriations will be needed at a federal, state, and/or local level. This would require adequate justification for the expenditures and strong public support. In addition, maintenance costs and requirements should also be considered. In some cases, it may be desirable to combine land acquisitions with shore side recreational development programs.

ITEM #2 Loss of Seagrasses in Tampa Bay

REFERENCE: Regional Issue; Ecology Meetings 4/13/83 and 1/27/83; Study Committee Meeting 6/28/83

ANALYSIS:

Seagrass coverage in Tampa Bay has declined for numerous reasons by about 80% over the years. Identification of causes for this loss and restoration is needed. Following are specific concerns and proposed actions.

1. Seagrass Loss at Weedon Island, Pinellas County - Initial operation of a power-generating station probably caused loss by thermal impact of approximately 200 acres of seagrass. While all standards and requirements of permits were met at that time, no mitigation has been attempted to remedy this loss of habitat.

DESIRED ACTIONS:

A. Comparison of thermal to non-thermal impacts on seagrasses in the vicinity.

B. Either evaluation of discharge alternatives and modification to confine thermal effects or planting of seagrasses in suitable areas to offset other losses in Tampa Bay.

DESIRED RESULT:

Reclamation of 200 acres of seagrass habitat valuable as fishery refuge, nursery and feeding area or mitigation by other means.

IMPLEMENTATION COMMENTS:

The power plant at Weedon Island is considered a "model" plant and a demonstration of habitat improvement may be considered valuable as a demonstration project. Funding would be the main deterrent. Future implementation may be possible through more creative mitigative alternatives.

2. Boating Damage to Seagrass - Controversy exists about whether current bait shrimping practices and groundings by boaters cause considerable damage to seagrass meadows in Tampa Bay. While the acreage of total seagrass areas has been diminishing over the years, the number of bait shrimpers has increased. Commercial bait shrimpers can cause damage with boat props and by dragging trawls in shallow water. Other boaters often stray from deeper navigable waters to seagrass shoals, leaving behind "propeller trails". However, no scientific documentation exists concerning damage attributable to shrimping operations and/or propellers in Tampa Bay.

Current law requires that bait shrimpers possess free state permits, maintain their catch in live bait tanks, and keep no more than five pounds of dead shrimp aboard their boats. In 1981-82, 48 live bait shrimp permits were issued; in 1982-83, 53 permits were issued for the Tampa Bay area. The law in no way regulates the trawls or boats used.

DESIRED ACTION:

An assessment of the effects of activities such as bait shrimping, pleasure boating, net fishing, etc. on seagrass meadows.

DESIRED RESULTS:

Determination and control of damage attributable to commercial shrimping and other boating practices.

IMPLEMENTATION COMMENTS:

Initial study would require funding. If the results of the assessment indicate that shrimpers are causing the damage, legislated action and enforcement would be required to implement. If, however, all boating activities contribute equally to seagrass losses, then strategies for regulatory control would need to be implemented. Possible agencies involved would include the U.S. Army Corps of Engineers, the Department of the Interior, the Florida Departments of Natural Resources, Environmental Regulation and Game and Freshwater Fish Commission, and the Tampa Bay Regional Planning Council.

ITEM #3 Non-point Source Discharges Entering Tampa Bay

REFERENCE: Regional Issue; Industry Meeting 5/5/83

ANALYSIS:

Non-point source discharges (stormwater runoff) have been identified as major pollutant contributors to Tampa Bay yet little information exists on quantity, quality and site specific contributions.

DESIRED ACTION:

Study of non-point sources draining into Tampa Bay. This should include locating major discharge points, identifying drainage basin characteristics (area, land use, etc.), and, where possible, relating stormwater discharges to problem areas of Tampa Bay. It should also include coordination with EPA's National Urban Runoff Program studies, local studies and a literature review and assessment.

DESIRED RESULTS:

Focal point for public awareness.
Remedying problems associated with stormwater discharges.

IMPLEMENTATION COMMENTS:

Several local governments have on-going studies or programs and direct access to needed information. Local governments could assist in identifying problems and overall study could be coordinated regionally by the Tampa Bay Regional Planning Council or the Southwest Florida Water Management District (as part of stormwater permitting program). Much of the work could be accomplished by the Tampa Bay Study Committee; however, funding is currently a major need.

ITEM #4 Spoil Disposal and Management of Spoil Islands

REFERENCE: Regional Issues; Ecology Meetings 3/11/83 and 3/24/83 and 4/13/83; Recreation Meeting 2/1/83.

ANALYSIS:

During subcommittee meetings, several specific and general concerns were identified relating to spoil disposal and management of spoil islands. These are discussed individually below.

1. Hillsborough Bay Spoil Islands - Existing Spoil Islands are seriously eroding on unprotected faces, thereby weakening their design, causing sedimentation of the ship channel, and causing the need for additional maintenance dredging.

DESIRED ACTION:

Stabilize eroding shores of the spoil islands and add new spoil as minimally necessary to benefit their long-term stability. Present and improved shorelines should be vegetated with species approved in the original Environmental Impact Statements.

DESIRED RESULTS:

Long-term stability of islands.
Habitat creation.
Reduced need for maintenance dredging.

IMPLEMENTATION COMMENTS:

Currently the main obstacle to implementation is funding. The U.S. Army Corps of Engineers, the Florida Department of Environmental Regulation, and the Tampa Port Authority have jurisdiction under existing legislation (Federal Rivers and Harbors Act; Chapter 404, Florida Statutes).

2. Long Term Plan for Tampa Harbor Spoil Disposal - Tampa Harbor generates very large quantities of spoil from new and maintenance dredging projects. The Harbor is the single most significant physical impact on the bay, yet no long term plan for maintenance, construction or disposal of spoil exists. Impacts include a reduction of water surface area and an increase in total water volume which results in increased average depth and decreased tidal prism.

DESIRED ACTIONS:

For all Bay Ports, adopt a long range spoil plan which includes:

A. Constructive use of high quality spoil materials,

B. Sequestering of toxic and/or poor construction material on existing spoil islands.

C. Provides for environmentally acceptable disposal of non toxic material of poor construction quality,

D. Consider all alternatives, including upland disposal, and

E. Adopts the principle that no significant area of bay bottom be lost to further filling or spoiling.

DESIRED RESULTS:

Uniform and environmentally acceptable long range spoil disposal plan and the protection of bay resources vulnerable to impacts of dredging, spoiling, or related activities.

IMPLEMENTATION COMMENTS:

The primary agency involved is the Tampa Port Authority. However, assistance may be provided from the U.S. Army Corps of Engineers and the Florida Department of Environmental Regulation and Florida Department of Natural Resources may also be involved. Possible funding sources include the Coastal Protection Trust Fund and the Coastal Energy Impact Program (administered by the Florida Department of Community Affairs).

3. Intracoastal Waterway Spoil Disposal - Disposal of Intracoastal Waterway maintenance spoil will be difficult since no more bay bottom should be filled and most uplands are developed. Yet pressure for recreational traffic is considerable. The U.S. Army Corps of Engineers has funded a study of this issue for Intracoastal Waterway areas north of the Narrows.

DESIRED ACTIONS:

A. Expand and present U.S. Army Corps study to include Boca Ciega Bay and Anna Maria sound.

B. Implement plan to identify and use beach compatible spoil on gulf beaches. This plan should also identify and sequester toxic spoil and provide for offshore disposal of materials neither toxic or of beach quality.

C. Develop long range plans which are consistent with the Tampa Harbor Spoil Disposal Plan.

DESIRED RESULT:

Diminished burden on all alternatives and constructive use of good materials while providing minimal environmental impact.

IMPLEMENTATION COMMENTS:

There is a short-term opportunity to expand U.S. Army Corps study to include Boca Ciega Bay. Authorization is probably existing and would require only an expansion of plans and, possibly, additional funding.

Other agencies may include local governments surrounding Intracoastal Waterway and possibly a local sponsor of the project.

4. Management Program for Spoil Islands - Spoil islands offer the potential for a variety of recreational opportunities, including picnic areas for boaters, bird sanctuaries, etc. While several studies have been done on spoil islands, many islands are not managed for any specific use.

DESIRED ACTION:

Review spoil islands in Tampa Bay with consideration given to maintenance spoil placement, bird sanctuaries and recreational potential. Bay-wide management plans should be established.

DESIRED RESULTS:

Increased recreational site for boaters, and improved wildlife habitat.

IMPLEMENTATION COMMENTS:

The main agencies involved include the U.S. Army Corps of Engineers (spoil disposal), the Port Authority, and local governments. A management program could also be developed as part overall education program on Tampa Bay. (See also Item #18: Public Education).

ITEM: #5 Hazardous Wastes Disposal and Management

REFERENCE: Regional Concern; Ecology Meeting 4/13/83

ANALYSIS:

Centralized disposal/processing sites for plating wastes, septage, oils and greases, and other hazardous wastes are lacking in the bay area. This has resulted in opportunistic disposal on land and in wells and surface waters. Materials are reaching bays and tributaries, leading to contamination.

DESIRED ACTION:

Establish a network of facilities for centralized storage and subsequent transfer of hazardous wastes. Enforce participation and penalize illegal dischargers (i.e. those who are required to use the centralized facilities, but do not).

DESIRED RESULT:

Control of hazardous waste contamination.

IMPLEMENTATION COMMENTS:

Hazardous wastes issues have received a high priority for action at both the state and federal levels. There are currently numerous studies and committees initiating action for the entire Tampa Bay region. The Tampa Bay Regional Planning Council is currently under contract with the Florida Department of Environmental Regulation (DER) to conduct a hazardous waste facility siting project for the Tampa Bay Region.

ITEM #6 Enforcement

REFERENCE: Regional Issue; All recreation meetings: Recreation survey administered at boat show.

ANALYSIS:

Limited enforcement of boating activities, environmental laws and other activities have hampered current efforts to manage Tampa Bay. In addition, the general public and some agency personnel are unaware of appropriate enforcement agencies to report violations.

DESIRED ACTIONS:

Increased funding for enforcement personnel, improved public education and other management improvements are needed to remedy this situation. Specially, (a) funds from enforcement fees levied in a particular area should be returned to the enforcement entity in that area and (b) phone numbers of the Florida Department of Natural Resources Marine Patrol, the U.S. Fish & Wildlife Service, and U.S. Coast Guard and the enforcement responsibilities of each agency should be published in newspapers, brochures, etc. and placed in locations accessible to the recreational public.

DESIRED RESULTS:

Increased compliance with rules and regulations.
Improved safety, ecology, and recreational benefits of Tampa Bay.

IMPLEMENTATION COMMENTS:

This is primarily a funding issue and requires additional state and federal appropriations to the Florida Department of Natural Resources, the U.S. Coast Guard, and the U.S. Fish and Wildlife Service to carry out enforcement responsibilities. In addition, appropriations for enforcement at the local level should also be considered.

ITEM #7 Control of Septage Waste

REFERENCE: Regional Issue; Institution Meeting 5/4/83

ANALYSIS:

The control and disposal of septage wastes (septic tank septage, including grease traps, oil, sludge and non-toxic industrial wastes) is a chronic problem in many areas. Illegal disposal into canals, streams and storm sewers may be placing an unknown discharge burden on Tampa Bay.

DESIRED ACTIONS:

A. To establish treatment facilities for these wastes as a long-term solution.

B. Improved monitoring and enforcement of septage disposal.

C. Designating additional disposal sites for septic tank septage, including grease trap, oil, sludge and non-toxic industrial wastes.

DESIRED RESULTS:

Proper disposal of wastes, elimination of potential health hazards, improved regional water quality.

IMPLEMENTATION COMMENTS:

This is a wide-spread problem which most local governments are currently attempting to solve. Funding for enforcement and development of adequate disposal sites is a major problem. In addition, stronger penalty fees and state codes may also be needed. The disposal of septage waste is currently regulated by the Florida Department of Health and Rehabilitative Services through its County Health Units and according to Chapter 10D-6, F.A.C. In addition, septage waste disposal must also comply with regulations issued by the Florida Department of Environmental Regulation. Regarding impacts on Tampa Bay, further investigation is needed to determine cumulative impacts, incidences of direct illegal discharges (i.e. via storm drains, tidal creeks, etc.) enforcement issues and specific problem areas.

ITEM #8 Aquatic Preserves

REFERENCE: Regional Issues; Ecology Meetings 11/15/82, 12/13/82, 1/27/83, 2/4/83 and 4/13/83

ANALYSIS:

During the Ecology Subcommittee meetings, several concerns were presented regarding existing and proposed aquatic preserves in Tampa Bay. These are discussed individually below.

1. Upland Buffers for the Cockroach Bay Aquatic Preserve - The aquatic preserve boundary is limited on the shore side by mean high water yet much development around the bay is leading to its degradation. Long-term protection of the bay is dependent upon some measure of buffering.

DESIRED ACTION:

Identify incentive programs to leave blue belts and green belts around the preserve.

DESIRED RESULT:

Maintenance of water quality and shoreline habitat in the preserve, and involvement of adjacent property owners in its management.

IMPLEMENTATION COMMENTS:

Local governments have primary responsibility for regulating upland areas through zoning and land use measures. It is also possible to have state incentive programs through special tax incentives, etc. for keeping buffer areas preserved. This would require an act of the legislature as a new land use protection measure (i.e. similar to existing preferential tax assessment given to agricultural areas).

2. Boundaries of Cockroach Bay Aquatic Preserve - Present boundaries of the Cockroach Bay Aquatic Preserve do not extend up the Little Manatee River or across the river to its north bank. Little Manatee River is currently designated as an Outstanding Florida Water (OFW) from the headwaters to the U.S. 41 bridge. This gap within an area in preserved status presents ecological inconsistencies for management.

DESIRED ACTION:

Extend boundaries to north bank of the Little Manatee River and upriver to Outstanding Florida Water boundary.

DESIRED RESULT:

Inclusion of lower river area presently excluded from the preserve into a management program intended to protect Cockroach Bay.

IMPLEMENTATION COMMENTS:

Agencies that would be involved in such a designation include Florida Department of Natural Resources, Hillsborough County and the Tampa Port Authority. The boundary change would require legislative action.

3. Manatee County Aquatic Preserve Proposal - Water and habitats of Bishop Harbor, Terra Ceia Bay and adjacent areas are largely pristine and recognized as valuable coastal resources. Current and proposed upland development and activities in or near submerged lands endanger the area.

DESIRED ACTION:

Designate waters of Manatee County from the north shore of the Manatee River north to a point south of Port Manatee, from mean high water to a suitable offshore line, as a Florida Aquatic Preserve.

DESIRED RESULT:

Reclassification of waters as Outstanding Florida Waters; controls on discharges; development of management plan and controls on use of submerged lands.

IMPLEMENTATION COMMENTS:

Implementation will require legislative act, either through local legislative delegation or through submittal by Florida Department of Natural Resources. Procedures are established in the Florida Aquatic Preserve Act, Chapter 258, F.S.

4. Designation of Aquatic Preserves for Management Plans - Cockroach Bay (Hillsborough County) and waters of Pinellas County are Florida Aquatic Preserves. Florida Department of Natural Resources rules require management plans for preserves and their designation as "urban" or "wilderness" in the plans. Plans have not been developed for Cockroach Bay or Pinellas County Aquatic Preserves.

DESIRED ACTIONS:

A. Designate Cockroach Bay and waters of Pinellas County in Old and Lower Tampa Bay as wilderness type preserves. Pinellas County waters in Middle Tampa Bay and Boca Ciega Bay should be designated as urban preserves.

B. Encourage adjacent landowners to be involved in the development of management plans.

DESIRED RESULT:

Fine tune development of management plans for urban preserves with emphasis on restoration for urban preserves and emphasis on maintenance of natural conditions for wilderness preserves.

IMPLEMENTATION COMMENTS:

Management plans are developed by the Florida Department of Natural Resources (DNR). Development of plans for Cockroach Bay and Pinellas County Aquatic Preserves are not anticipated until after September 1984. However, this could be accomplished sooner should funding or other assistance become available. In other areas of the state, agencies and individuals (such as graduate students) have assisted in developing management plans. It should also be noted that Cockroach Bay Aquatic Preserve is leased to DNR by the Tampa Port Authority. Tampa Port Authority should be involved in developing plans and provide long-term leasing commitments for assuring that the plans are followed.

ITEM #9 Seagrass and Mangrove Habitat Creation

REFERENCE: Regional Issue: Ecology Meetings 1/27/83 and 2/4/83

ANALYSIS:

Seagrass and mangrove habitat loss has been extensive in Tampa Bay. Several sites along the bay offer potential large and small scale restoration opportunities. Once such site is the shallow shoreline area south of MacDill Air Force Base on Interbay Penninsula.

DESIRED ACTIONS:

A. Identify potential sites for restoration opportunities.

B. Evaluate suitability of MacDill site for seagrass and/or mangrove planting, with emphasis on bathymetry, circulation, sources of fill (as needed) and mosquito control. Develop plan and implement.

DESIRED RESULTS:

Restoration of significant areas of bay vegetation; stimulation of fisheries and improvement to water quality; valuable ecological improvement in close proximity to a large degraded area.

IMPLEMENTATION COMMENTS:

Desired Action A. is a proposed study and could be funded by several agencies, including Sea Grant, DER's Coastal Zone Management program, local governments, etc. Implementation of Desired Action B. would have to be coordinated between environmental interests, the Department of Defense (MacDill Air Force Base), the U.S. Army Corps of Eginers, the Florida Department of Environmental Regulation (dredge and fill permitting), and the Tampa Port Authority. It is also suggested that a smaller area be developed and studied as a test plot to determine feasibility, perhaps as a student research project.

ITEM #10 Municipal and Industrial Discharges

REFERENCE: Regional Issue; Industry Meeting 1/4/83

ANALYSIS:

Industrial and municipal discharges enter Tampa Bay and its tributaries in many locations. The full impacts associated with these discharges are not known. Current laws regulate discharges although there are exceptions and many regulations are changing.

DESIRED ACTIONS:

A comprehensive study of the following: Tracking system for sources of discharges, application of current laws, need for new laws, and impacts on Tampa Bay.

DESIRED RESULTS:

Improved water quality and ecological benefits.
Better understanding of impacts of discharges.
Improved legislation.

IMPLEMENTATION COMMENTS:

The U.S. Environmental Protection Agency and Florida Department of Environmental Regulation (DER) are the main agencies responsible for permitting point source discharges under the National Pollutant Discharge Elimination System (NPDES). DER is currently undertaking the desired actions; however, discharges to Tampa Bay remain a concern and warrant study committee review, particularly in terms of the need for new laws and continued studies on the impacts of Tampa Bay (see also Item #4: Wasteload Allocation for Tampa Bay Basin).

ITEM #11 Stronger State Wetlands Regulations

REFERENCE: Regional Issue; Study Committee Meeting 6/28/83

ANALYSIS:

Tampa Bay is losing wetlands at an alarming rate, especially wetlands above the mean high water mark and wetlands occurring in the headwaters of the riverine systems which flow into Tampa Bay. Tampa Bay's water quality is related to and dependent upon these wetlands. Current state statutes and regulations do not adequately protect many of these wetland areas. At the present time, little or no consideration is given to loss of fish and wildlife habitat above the mean high water mark, soils as indicators of wetlands, or the biological integrity of wetland and associated transitional areas.

DESIRED ACTIONS:

A. Stricter state regulations which consider fish and wildlife impacts above the mean high water mark, protect all wetlands associated with the tributaries of Tampa Bay, add soils indicators to regulations, and strengthen current rules concerning biological integrity.

B. The U.S. Army Corps of Engineers (COE) should exercise discretionary jurisdiction over all wetlands on the Alafia, the Little Manatee and Manatee Rivers above 5 cubic feet per second (CFS).

C. Develop and adopt local ordinances prohibiting activities adversely affecting wetlands associated with riverine systems.

DESIRED RESULTS:

Reduction in loss of wetlands associated with Tampa Bay.

Improve management of the riverine wetlands of the rivers flowing into Tampa Bay.

IMPLEMENTATION COMMENTS:

Strengthening the state rules and regulations would require a change in the legislative act. Other agencies involved with stronger policies and regulations include COE, DER, Hillsborough County, Manatee County, Pinellas County, and TBRPC.

ITEM # 12 Study and Management of Tidal Creeks and Rivers

REFERENCE: Regional Issue; All Ecology Meetings; Institution meetings 4/29/83 and 5/4/83

ANALYSIS:

General - Tidal creeks and rivers are extremely important as fresh water tributaries, mixing zones, fishery habitat and water quality buffers, but many have been filled, hardened, channelized, or otherwise modified. Several are now water quality liabilities.

Specific Concerns-

- Optimal Freshwater Supplies for Braden River Estuary - The lower Braden River is a productive estuary dependent on freshwater. The City of Bradenton plans to expand the existing reservoir on the Braden River to meet the City's need for increased withdrawal for public water supply. There are currently no plans or studies to determine whether the proposed expansion will provide adequate freshwater flows to maintain the downstream estuary.

- Management of Salt and Booker Creeks - These creeks have direct impact on Bayboro Harbor and the Port of St. Petersburg. Both creeks have serious infilling, sediment contamination, and hydrological problems.

- Hillsborough River Shoreline Improvement - Studies have shown that much shoreline of the lower Hillsborough River could be restored into productive habitat and provide indirect water quality benefits (City of Tampa 1983).

- Other creeks requiring specific local attention include Double Branch Creek, Allen's Creek and Lake Tarpon Outfall.

DESIRED ACTIONS:

A. Develop a bay-wide program for the rehabilitation of highly modified creeks and the protection of still natural ones (including upland buffer areas). This should include a study of each creek and identification of needs specific to each creek. There should be an emphasis placed on 208 concerns, control of point source discharges, habitat improvement, shoreline restoration, flood hazard potential, local maintenance needs, and cost effectiveness.

B. Regulatory, engineering and scientific attention is needed to determine and provide optimal quantities and timing of freshwater to Lower Braden River.

C. The City and Port of St. Petersburg should develop and implement specific management plans for Salt and Booker Creeks. Plans to develop the Gas Plant area provide an excellent opportunity to "showcase" shoreline and habitat restoration of an urban creek. Rehabilitation of this and other public areas into an urban amenity should be tied to the development of the harbor area.

D. Investigate the use of special zoning or taxing districts along river shorelines to promote private restoration projects and develop a uniform plan for increasing and improving public shores. Specific policies should be incorporated into regional plans and local government coomprehensive plans to address shoreline and habitat improvements (e.g. encourage the replacement of failing concrete seawalls with natural shoreline stabilizers).

DESIRED RESULTS:

- Eventual rehabilitation of tidal creeks through implementation of old 208 policies supplemented by coordinated local government restoration projects and protection of healthy creeks.

- Improved water quality and significant increases in fishery resources productive habitats and improved aesthetics.

- Develop a constituency for protection and improvement of local rivers.

- Rational plans for long-term maintenance dredging in creeks, control of point and non-point source contaminants, and establishment of urban creeks as waterfront redevelopment assets. In addition, improving shoreline vegetation may reduce the rate of infilling, thereby reducing the need for maintenance dredging.

IMPLEMENTATION COMMENTS:

A. Implementing a bay-wide program would involve initial studies to assess needs for each specific tidal creek or river entering into Tampa Bay, a long-term commitment on the part of several agencies and local governments, and strong public support. While there are no agencies specifically addressing this issue, it would be an extension of many existing authorities. These include local governments (environmental control, community development, parks and recreation, planning departments and local government comprehensive plans), Tampa Bay Regional Planning Council, various state agencies (FDER, FDNR, FDCA) and federal agencies. Lack of funding and agency commitment would be a major impediment to implementation.

B. Optimal Freshwater Supplies for the Braden River Estuary - The proposed study would need to be undertaken by the City of Bradenton and/or the Southwest Water Management District (SWFWMD). SWFWMD may require the City of Bradenton to undertake the study as a result of Bradenton's request to the District to increase water withdrawals (consumptive use permit).

C. City of St. Petersburg may elect to showcase shoreline restoration at the Gas plant site as part of the overall development. If this occurs, such work should be commended and used as a regional demonstration for restoration of urban creeks.

D. This could be accomplished in conjunction with A) above or prior to such an undertaking as part of the Bay Study Committee Plan.

ITEM #13 Wasteload Allocation for Tampa Bay Basin

REFERENCE: Regional Issue; All Ecology meetings

ANALYSIS:

Nutrients reaching Tampa Bay from incomplete or overloaded sewage treatment systems continue to aggravate eutrophic conditions. Discharge limits for particular plants are based on site specific determinations while cumulative impacts are ignored.

DESIRED ACTIONS:

A. Develop wasteload allocations for the Tampa Bay basin, including all tributaries, with priorities given to protection of resources. The allocation should result from a series of investigations performed systematically through time over all pertinent factors.

B. Periodic (i.e. at least every five years) re-assessment of wasteload allocation figures to determine accuracy and continual updating of wasteload allocation analysis.

C. Dischargers should be required to include in their revenue budgets a set precent of total income (i.e. 2%) for funding the periodic re-assessment.

DESIRED RESULT:

Better understanding of role of nutrients in the bay and resource-justified limits to all sewage treatment plant discharges to the bay and its tributaries.

IMPLEMENTATION COMMENTS:

As required by the U.S. Environmental Protection Agency, the Florida Department of Environmental Regulation has initiated and has contracted the wasteload allocation study. The study will require the input and cooperation of the local governments surrounding Tampa Bay and the Tampa Bay Regional Planning Council plans to establish the public participation phase of the study (as approved by DER). The first meeting is tentatively planned for July 1983. Controversy exists concerning the design of the study and the long-term implications of living with the results should they be inaccurate.

In addition to initial studies, funding will be needed to assess and update wasteload allocation analysis and to fund improved studies.

ITEM: #14 Assessment of Fishery Stocks in Tampa Bay

REFERENCE: Regional Issue; Study Committee Meetings 6/22/83 and 8/9/83

ANALYSIS:

Tampa Bay is an important recreational and commercial fishery. Little is known about the losses in production which may be attributed to habitat loss, overfishing, entrainment and other activities.

1. Assessment of Standing Stock - The standing stock and production of fishes in Tampa Bay are not known. This lack of information seriously hinders the development of regulations which govern catches by sport and commercial fisherman. In addition, it is difficult to quantify losses in production that may be attributable to habitat loss, overfishing, etc, if information regarding standing stock is not available.

DESIRED ACTION:

Implement a study that will determine, to the extent possible, the standing stock, recruitment and production of fishes in Tampa Bay.

DESIRED RESULT:

The information would allow scientists to determine more accurately whether or not serious depletions in fishery resources are occurring. It would also allow a better assessment of the relationship(s) between habitat loss and decreasing production. Also if fishery production improves as a result of the implementation of any or all of the committee's recommendations, the improvement may be quantifiable if accurate baseline data are available.

IMPLEMENTATION COMMENTS:

Assessing standing stocks in an open estuarine system is extremely difficult. However, the subcommittee can acknowledge the shortcomings of such a study and still recommend that it be attempted. Otherwise, it may appear that a critical "need" was overlooked.

2. Power Plant Entrainment - Power plant entrainment causes approximately 100% mortality of larval and juvenile marine life. Fine mesh screens (FMS) are being constructed for use at two units at Tampa Electric Company's Big Bend Station and recognized by the U.S. Environmental Protection Agency as Best Available Technology for the Big Bend Station. Retrofitting existing units would further protect the resource.

DESIRED ACTIONS:

A. Recommend that power companies study the feasibility and use of FMS and other mitigative alternative at existing installations, where not currently in use.

B. Encourage retrofitting power plants on Tampa Bay with appropriate mitigative measures to offset other impacts with priority on basis of cooling volumes.

DESIRED RESULT:

Reduction of ichthyoplankton (and other plankton) mortality by power plant entrainment as a cause of wastage in fishery stocks of Tampa Bay.

IMPLEMENTATION COMMENTS:

The main impediment to implementation will be the cost of funding and maintenance requirements. There are currently no statutory requirements for retrofitting existing plants so implementation is also dependent on the good will of the power companies or the possibility of using retrofitting as a mitigative measure to offset impacts associated with new proposals. Agencies that may be involved in either the studies, proposals or permitting include: U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Fisheries Division, Florida Department of Natural Resources, Florida Department of Environmental Regulation, Florida Department of Community Affairs/Tampa Bay Regional Planning Council (power plant site plan reviews) and local governments. Power companies with plants along Tampa Bay are Florida Power Corporation and Tampa Electric Company.

TEM #15 Gypsum Field Decommissioning, Hillsborough County

REFERENCE: Regional Issue; Ecology Meetings 3/11/83 and 3/24/83

ANALYSIS:

The gypsum field west of U.S. 41 and north of the Alafia River poses a real and continuing hazard to the bay due to leaching of acidic waters, fluoride and radionuclide enrichment, and erosion. It also poses a long term hazard and flood inundation concern.

DESIRED ACTION:

Develop a plan for the decommissioning of the field, which is nearing design limits, which either provides for its dismantling or perpetual maintenance.

DESIRED RESULT:

Prevention of major impacts to bay from perpetual seepage of wastes or collapse of the field.

IMPLEMENTATION COMMENTS:

At the time the gypsum stack is closed, the current owner is required to submit plans for maintenance to the U.S. Environmental Protection Agency and the Florida Department of Environmental Regulation (DER) as part of the discharge permits (National Pollutant Discharge Elimination System). There are currently no specific guidelines for these plans. However, once plans are received by DER, there will be an opportunity for outside agency and public review prior to approval.

Since this is a unique location for a gypsum stack with its own existing and anticipated long-term problems, funding may be available to conduct an in-depth study on long-term maintenance through the phosphate industry taxes collected by the Florida Department of Natural Resources, Bureau of Mines.

ITEM #16 Commercial and Sport Fishing Regulation

REFERENCE: Regional Issue; Ecology Meeting 3/24/83; Economics Meeting 2/10/83

ANALYSIS:

The regulation of commercial and sports fisheries is a complex problem. There are indications that fish stocks are declining in Tampa Bay and overharvesting can contribute significantly to this problem. Neither sport nor commercial fishing regulations reflect biological data specific to bay fisheries and a number of local controls over the latter are conflicting, overlapping or redundant. This lack of uniformity from one area to another make current laws nearly unenforceable. However, it is also difficult to regulate the fisheries due to a lack of biological data.

DESIRED ACTIONS:

A. Standardization of rules and regulations concerning sport and commercial fishing to reflect bay-specific information and a coordinated process for applying and enforcing local controls.

B. Continue to monitor the catches within the Bay and Gulf region; continue biological research (i.e. studies of standing stock, fish production and recruitment, etc.).

DESIRED RESULT:

Maximizing fishery stocks and yields by fine-tuning regulations to actual conditions in Tampa Bay and standardizing these controls throughout local governments.

IMPLEMENTATION COMMENTS:

A major review of current laws, effectiveness, and needed legislation should be accomplished first. To set "management levels" or other types of regulation on any specific stock will be difficult due to lack of data. However, conservative limits may be determined based on best available data and continued monitoring of catches in the Bay and Gulf. Limits can be adjusted upward or downward as more information becomes available. A review of solutions used to regulate other areas would also be helpful. Agencies involved include National Marine Fisheries, Florida Department of Natural Resources, and local governments. New state regulations would also be required.

ITEM #17 Documenting the Economic Importance of Tampa Bay

REFERENCE: Regional Issue; Economics meeting 2/10/83; Industry meeting 1/4/83

ANALYSIS:

Tampa Bay is directly and indirectly an economic asset to the region. The status of the bay (i.e. clean, dirty, etc.) and the value placed on that status varies from activity to activity. In order to judge the needs for Tampa Bay, an overall economic assessment is desirable. Tampa Bay also provides secondary benefits to many commercial activities. It is identified nationally as a nice area for locating new businesses and is used as an indirect attraction in many ways.

DESIRED ACTIONS:

A. Study of economic importance of Tampa Bay for commercial enterprizes, recreation and other identifiable uses.

B. Assessment of the value of Tampa Bay in different hypothetical conditions.

C. Identify types of secondary benefits and commercial enterprizes capitalizing on those benefits.

DESIRED RESULTS:

Documentation on the overall economic benefits of Tampa Bay to the area. Maximum economic benefits derived from Tampa Bay with minimum impacts.

IMPLEMENTATION COMMENTS:

This is a proposed study not under any agency's jurisdiction. Area Chambers of Commerce, the Tampa Bay Regional Planning Council, Sea Grant or the academic community may be able to undertake this study. Funding sources are the primary consideration at this point.

ITEM #18 Public Education

REFERENCE: Regional Issue; Recreation Meeting 2/1/83; Ecology Meeting 4/13/83

ANALYSIS:

A large urban population surrounds Tampa Bay and uses it for recreation. The public is largely uninformed on the value of managing shorelines, waterfronts, lawns, etc. to protect bay; habitats of the bay and their value; or what to do to protect the bay.

DESIRED ACTIONS:

A. Production and distribution of a guide to Tampa Bay describing its history, geography, resources, problems, and potential. Included in this guide should be guidelines for restoration, sources of native plants, and the identity of local agencies and responsibilities. Provisions for including specific information on each area of the bay should be made.

B. As offshoot of guide to Tampa Bay, develop series of newspaper articles for widespread circulation of information.

C. Funding should be sought to publish and disseminate the recreation inventory.

D. More educational information on Tampa Bay should be disseminated through existing programs, such as adult education programs, boating safety courses, etc.

E. Develop travelling exhibit for libraries, civic groups, school programs, etc.

DESIRED RESULTS:

Improved understanding by general public of value of Tampa Bay and steps that can be taken to restore and improve the bay.

IMPLEMENTATION COMMENTS:

To successfully implement this item, funding and the development of strong public support is required. Initially, agencies with existing public education programs may be sought for support (i.e. Sea Grant, County Extension Agents, community colleges). Other agencies that should be involved include the local governments, Florida Department of Natural Resources, Florida Department of Environmental Regulation, Tampa Bay Regional Planning Council, and the U.S. Environmental Protection Agency. Local conservation and recreation groups could also play a large role in developing this program.

ITEM #19 Shoreline Development and Public Access

REFERENCE: Regional Issue; Recreation Meeting 2/1/83, Recreation Survey

ANALYSIS:

Public access and the need for public shoreline facilities varies for different areas of Tampa Bay. Contributing factors include: varying population densities, lack of information on public needs, the use of the shoreline for some uses will preclude other possible uses, and potential impacts on the natural systems of Tampa Bay. Respondents to the recreation questionnaire specifically noted a need for more regional parks with camping facilities and more parks in middle Tampa Bay on the Hillsborough County side.

DESIRED ACTIONS:

A. An analysis and needs assessment of public access and visual access to Tampa Bay should be conducted. This assessment should also include an analysis of aesthetic quality considerations.

B. A high priority should be given to maintaining and improving existing parks and public facilities.

C. Policies should be established at the local, regional and state level requiring optimum use of the shorelines of Tampa Bay for the public benefit.

DESIRED RESULTS:

Improved public access, including visual access and improved aesthetic quality.
Adequate shoreline facilities to meet local and regional recreational needs.

IMPLEMENTATION COMMENTS:

Major implementation can be accomplished at the local level through a review of current and future needs, existing policies, local government comprehensive plans, current land use and zoning. Agencies which may provide assistance include Tampa Bay Regional Planning Council, U.S. Fish and Wildlife Service, and the Florida Division of Archives (for archaeological sites). Anticipated problems include funding, enforcement and regional overview. Zoning measures have been developed to zone for clear space and public access. A model should be provided as part of the bay management plan.

ITEM #20 Load Relief for Major Sewage Treatment Plants

REFERENCE: Federal, Regional & Local Issue; Ecology Meetings 3/11/83 and 3/24/83

ANALYSIS:

With continued growth, area sewage treatment plants (STP's); including Hooker's Point STP, may be approaching design limits in future years. Water quality in Tampa Bay remains an important issue of concern and is one reason why appropriate load relief strategies should be carefully planned.

DESIRED ACTIONS:

A. Review area 201 Facilities Plans and Environmental Impact Statements so that appropriate treatment strategies and effluent discharge limits are maintained.

B. Evaluate alternative methods of STP effluent discharge presently or potentially hooked to sewage treatment plants and give priority to land disposal at satellite plants, especially where new service areas are being developed.

C. Continued monitoring of regional sewage treatment plants and improved monitoring of smaller sewage treatment plants.

D. Evaluate need for growth control measures.

DESIRED RESULTS:

Local responsibility of STP effluent disposal; relief for treatment facilities; improvement in regional water quality.

IMPLEMENTATION COMMENTS:

Local governments operate major areawide sewage treatment plants while the Florida Department of Environmental Regulation (DER) has regulatory responsibility over sewage treatment plants. DER's current policies encourage land disposal at satellite plants which, in many cases, is a costly alternative but one which should receive appropriate evaluation.

Local governments should consider recycling or reuse options of effluent whenever available. For instance, the City of Tampa is presently conducting a Water Reuse Feasibility Study in which several different reuse alternatives are under evaluation.

An innovative solution in some communities for reducing loads to sewage treatment plants has been mandatory retro-fitting of water saving devices with the burden of cost placed on local governments. Reduced loads have been as high as 30%.

ITEM #21 Water Quality Improvement for Recreational Uses

REFERENCE: Regional Issue; Recreation survey administered at boat show

ANALYSIS:

Many recreational uses are severely limited in areas of Tampa Bay due to poor water quality. These uses include: prohibited shellfishing, poor fishing, limited swimming and almost non-existent scuba diving opportunities. Areas specifically noted in the survey included- Hillsborough Bay (all activities), Old Tampa Bay (poor fishing), and a general concern for swimming in many areas, including publicly approved beaches.

DESIRED ACTION:

A long-term program to restore and enhance Tampa Bay is needed to improve the region's water-based recreational opportunities. This should include establishing specific levels of water quality parameters for each area and improved monitoring, particularly in areas not currently monitored.

DESIRED RESULTS:

More areas open to shellfishing.
Improved fishing.
Increased opportunities for swimming and scuba diving.

IMPLEMENTATION COMMENTS:

This item includes many of the other issues presented by the subcommittees with an emphasis on recreational benefits. To successfully implement, this would require considerable public support, increased funding and the cooperation and long-term commitment of most of the agencies involved with Tampa Bay. One basic approach would be to document the current loss of recreational opportunities (i.e. closed swimming areas, closed shellfishing areas) and assess the potential for increasing these opportunities. (Some of the preliminary information has been gathered by the Recreation Subcommittee). Once a complete assessment is made, a program can be developed to involve all applicable agencies, the public, etc.

ITEM: 22 Stormwater Detention Requirements for Redevelopment

REFERENCE: Regional Issue; Individualy submitted

ANALYSIS:

As land becomes available through redevelopment, existing urbanized areas should be retrofitted with stormwater detention facilities to help clean up some existing water quality impacts from urban non-point source pollution. Current rules and regulations require detention for new impervious areas only and, therefore, in highly developed areas maintain status quo only. There is also a need to develop better regional detention facilities to control urban runoff and reduce maintenance burdens on local governments. (It is easier to control runoff with one large facility than several tiny ones).

DESIRED ACTIONS:

A. Require developers to install stormwater detention as if the "pre-development" condition was pervious, undeveloped land.

B. Identify areas and mechanisms for local governments to develop regional detention facilities.

DESIRED RESULTS:

Improved water quality in those areas of the Bay currently impacted by urban stormwater runoff.

Improved runoff control and reduced maintenance problems.

IMPLEMENTATION COMMENTS:

State regulatory changes are needed to implement desired action A) on a region-wide basis. Current agencies involved with stormwater permitting are Florida Department of Environmental Regulation and the Southwest Florida Water Management District. However, local governments may implement regulations stricter than the state statutes through local ordinances. desired action B) requires a regional study of redevelopment issues, regional detention facilities and control alternatives available at the local and state level. A model ordinance incorporating both actions maybe desirable and could be modelled after existing programs (i.e. City of Clearwater). Getting the ordinance passed in each of the municipalities and counties around Tampa Bay would be dependent upon the individual area, local public pressure, etc.

ITEM #23 Review of Rules and Regulations

REFERENCE: Regional Issue, Industry meeting 1/4/83

ANALYSIS:

Controversy exists over the adequacy of current rules and regulations which directly impact the ecological, recreational or economic aspects of Tampa Bay (too many rules vs. not enough rules). Many jurisdictions overlap while there are also gaps where current rules and regulations may not adequately meet the original legislated mandates or the needs of the area or they may be so narrowly defined that they restrict the use of the best possible solution to a particular conflict. In addition, permitting and other review procedures place a costly burden on the applicant and the public.

DESIRED ACTION:

Analysis of rules and regulations affecting Tampa Bay - to include cost-effectiveness of current permitting procedures and identification of overlaps, gaps and needed improvements.

DESIRED RESULTS:

Improved benefits from permitting and other rules and regulations.
Improved efficiency, reduced costs.

IMPLEMENTATION COMMENTS:

This is a proposed, somewhat academic, study not currently under the jurisdiction of any single agency. However, most agencies involved with Tampa Bay may be affected. In addition, the major jurisdictional controls and many specific regulatory issues have been identified by the Tampa Bay Study Committee and are discussed within this plan.

ITEM #24 McKay Bay Management Plan, Tampa

REFERENCE: Local Issue; Ecology Meetings 3/11/83 anad 3/24/83

ANALYSIS:

McKay Bay is a major destination for migratory birds and a critical habitat and feeding area for sea and shore birds. The Bay also functions as a fish nursery for some sport and commercial species. Protection of the Bay and shoreline areas is needed to prevent loss of critical habitat and nursery areas. An opportunity for a comprehensive plan for managing McKay Bay exists and would result in the permanent preservation of productive shores and bottom.

DESIRED ACTIONS:

A. Request assistance from the U.S. Fish and Wildlife Service to develop a management plan for acquisition of perimeter shores of McKay Bay.

B. Restoration and control of effluents.

C Study biomagnification of sedimentary contaminants in avifauna. (Biomagnification is the increased contaminant accumalation in animal tissue as the contaminants move through the food chain).

D. Seek local assistance and/or sponsorship.

DESIRED RESULT:

Establishment of inner-city, inner-harbor wildlife refuge and conservation area and long-term protection of critical bird habitat and fish nursery.

IMPLEMENTATION COMMENTS:

Anticipated problems include funding and possible resistance from shoreline owners. Agencies involved may include U.S. Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, Southwest Florida Water Management District, Tampa Bay Regional Planning Council, Hillsborough County and the Tampa Port Authority. It may also be possible to provide graduate student assistance (and funding) under the S.T.A.R. program and the Florida Department of Natural Resources and the Florida Department of Environmental Regulation for the development of a management plan.

ITEM #25 Shellfish Classification

REFERENCE: Regional Issue; Ecology Meetings 11/15/82 and 12/13/82; Recreation Meeting 2/1/83

ANALYSIS:

Not all parts of lower Tampa Bay are classified for shellfish sanitation, so these areas are closed (unapproved) for harvesting, including recreational harvests. In addition, the public is not always aware of which areas are open to shellfishing.

DESIRED ACTIONS:

A. Classification of lower Tampa Bay as to shellfish sanitation, including additional funding for staff review.

B. Expand public information on areas open and closed to shellfishing through public newspapers, mailings to marinas, etc.

C. Additional patrolling of closed shellfishing areas.

DESIRED RESULTS:

Valuable scientific, commercial and popular insight into water quality of the lower bay.
Increased recreational opportunities for shellfishing.
Prevention of health hazards associated with shellfishing in closed areas.

IMPLEMENTATION COMMENTS:

Classification of lower Tampa Bay will require additional state appropriations for staff or a change in priorities within the Florida Department of Natural Resources (DNR). Patrolling may also require additional staff time. Public information will require cooperation from local newspapers, marinas, etc. and increased mailings of information from DNR.

ITEM #26 Power Plant Entrainment

REFERENCE: Regional Issue; Ecology Meeting 4/13/83

ANALYSIS:

Power plant entrainment causes approximately 100% mortality of larval and juvenile marine life. Fine mesh screens (FMS) are being constructed for use at two units at Tampa Electric Company's Big Bend Station and recognized by the U.S. Environmental Protection Agency as Best Available Technology for the Big Bend Station. Retrofitting existing units would further protect the resource.

DESIRED ACTIONS:

A. Recommend that power companies study the feasibility and use of FMS at existing installations, where not currently in use.

B. Encourage FMS retrofitting of power plants on Tampa Bay as a mitigative measure to offset other impacts with priority on basis of cooling volumes.

DESIRED RESULT:

Reduction of ichthyoplankton (and other plankton) mortality by power plant entrainment as a cause of wastage in fishery stocks of Tampa Bay.

IMPLEMENTATION COMMENTS:

The main impediment to implementation will be the cost of funding and maintenance requirements. There are currently no statutory requirements for retrofitting existing plants so implementation is also dependent on the good will of the power companies or the possibility of using retrofitting as a mitigative measure to offset impacts associated with new proposals. Agencies that may be involved in either the studies, proposals or permitting include: U.S. Environmental Protection Agency, Florida Department of Natural Resources, Florida Department of Environmental Regulation, Florida Department of Community Affairs/Tampa Bay Regional Planning Council (power plant site plan reviews) and local governments. Power companies with plants along Tampa Bay are Florida Power Corporation and Tampa Electric Company.

ITEM #27 Hendry Fill Restoration Project, Manatee County

REFERENCE: Local Issue; Ecology Meetings 11/15/82 and 12/13/82

ANALYSIS:

A settlement resulted in fines and title to lands adjoining Bishop Harbor in Manatee County being given to the State of Florida. Restoration of the disturbed area known as the Hendry Fill restoration project is required but has not begun.

DESIRED ACTION:

Applying fine revenue to restoration of creeks, grading of banks, and some new planting to restore the filled area as a wetland.

DESIRED RESULT:

Recovery of an ecologically significant shoreline area and creation of a buffer between Port Manatee and Bishop Harbor.

IMPLEMENTATION COMMENTS:

Florida Department of Environmental Regulation has approximately $80,000 for restoration work and the lands are currently in state ownership. The only impediments to completion is time delays and the possible need for additional funds for completion.

ITEM #28 Contingency Planning for Post-Hurricane Acquisition of Habitat

REFERENCE: Regional Issue; Ecology Meeting 4/13/83

ANALYSIS:

The opportunities for reclamation of ecological resources is significantly limited in areas which are extensively altered such as Boca Ciega Bay. In addition, the potential for major damage during a hurricane is high. The opportunity exists for the public to acquire newly formed or extensively altered barrier beaches, inlets, and other natural features in these areas following storms. However, acquisition mechanisms must be in place prior to the storm.

DESIRED ACTION:

Urge the adoption of the following policy by the State, TBRPC and local governments:
For the barrier islands along Tampa Bay, including Boca Ciega Bay, all possible mechanisms shall be used to prevent inadvisable reconstruction following natural disasters such as hurricanes. In addition, the public acquisition of these lands and/or public access shall be encouraged.

DESIRED RESULT:

Acquisition of new or extensively altered habitats in a much-impacted area of Tampa Bay plus prevention of recurring losses to life and property due to barrier island development and redevelopment.

IMPLEMENTATION COMMENTS:

Policy recommendation should be adopted by the Tampa Bay Regional Planning Council and all other applicable agencies should be encouraged to adopt same.

ITEM #29 Mitigation Banking

REFERNCE: Regional Issue; Industry Meeting 1/4/83

ANALYSIS:

Mitigation banking is the general concept of allowing industries or developers to "bank" excess mitigation measures used at one site against related or future projects. It can provide greater flexibility for mitigating impacts associated with a proposed or existing project.

DESIRED ACTIONS:

Study of the potential to apply mitigation banking to programs involving Tampa Bay. If determined desireable, incorporate mitigation banking concepts into local and regional policies.

DERSIRED RESULTS:

Overall reduction in impacts associated with industry and development along Tampa Bay. Possible improvements through mitigation measures to existing sites. Greater flexibility for applicants.

IMPLEMENTATION COMMENTS:

When administering mitigation banking, "deficits" from existing conditions and projects should be considered and mitigation banking should be permitted only when a net ecological benefit results. All agencies involved with permitting activities and development on or along the shores of Tampa Bay could be potentially involved with mitigation banking, including the U.S. Army Corps of Engineers, the Florida Department of Environmental Regulation, Florida Department of Natural Resources, TBRPC, and local governments. Studies could be accomplished at any level.

ITEM #30 Management of Bower Tract and Adjacent Wetlands, Hillsborough County

REFERENCE: Regional Issue; Ecology Meetings 1/27/83 and 2/4/83

ANALYSIS:

The wetlands in Hillsborough County north of Courtney Campbell Causeway have moderate to extensive spoils, channel alternations, and other impediments to circulation and mixing. These barriers retard water quality improvement and degrade habitat.

DESIRED ACTIONS:

A. Program of wetland improvements and management including Sweetwater and Rocky Creeks, and the Bower Tract of land.

B. Eliminate spoil areas and recreate original stream beds in marsh areas.

C. Active uniform management from Double Branch Creek Park by Hillsborough County.

DESIRED RESULTS:

Improved circulation, water quality and habitat value of disturbed marshes in Old Tampa Bay with management coordinated at one central location.

IMPLEMENTATION COMMENTS:

The Bower Tract is currently being purchased by the State of Florida (Department of Environmental Regulation) as part of the Conservation and Recreational Lands acquisition (C.A.R.L.) program. The state has the authority via local agreement to convey management responsibility for Bower Tract to Hillsborough County. Hillsborough County currently manages a large tract of park land (Double Branch Creek Park) adjacent to the Bower Tract.

Wetlands improvements and management may involve several agencies and groups including the Florida Department of Natural Resources, the Florida Department of Environmental Regulation and Hillsborough County and should include the Mosquito Control Department (and inclusion in the Local Government Comprehensive Plan). Elimination of spoils and re-creation of original stream beds would require dredge and fill permits.

ITEM #31 Management of Passage Key, Manatee County

REFERENCE: Regional Issue; Ecology meetings 11/15/82 and 12/13/82

ANALYSIS:

Passage Key National Wildlife Refuge is a valuable regional bird rookery vulnerable to pedestrian disturbance during nesting season. As a National Wildlife Refuge, Passage Key is currently patrolled by the U.S. Fish and Wildlife Service to reduce unauthorized human entry to breeding bird colonies. However, because the Key is a popular boating destination even during restricted periods, enforcement is difficult. Better public information and local awareness of this important bird colony is needed.

DESIRED ACTIONS:

A. Implement a shoreline information program at Anna Maria and St. Petersburg focusing on marinas, boat ramps, and the boating trade during restricted periods.

B. Continued enforcement of limits to access, with possible emphasis on patrolling during the early evening.

C. Notify sports and recreation editors sot that the restricted areas and times can be published in local newspapers.

DESIRED RESULT:

Improved management of critical seabird and shorebird nesting area, resulting in higher nesting and fledge rates for the affected species.

IMPLEMENTATION COMMENTS:

The main agency responsible for the management of Passage Key is the U.S. Fish and Wildlife Service. However, their ability to continually patrol the Key during the nesting season and educate local residents is limited. There is considerable room for assistance with education programs by local environmenta groups and also the Marine Advisory Sea Grant Program. The "adopt-a-refuge" program announced two years ago by the National Audubon Society provides a precedent for action in Audubon policy.

ITEM #32 Management & Restoration of Shorelines in Boca Ciega Bay, Pinellas County

REFERENCE: Regional Issue; Ecology Meeting 4/13/83, Study Committee Meeting 6/28/83

ANALYSIS:

Boca Ciega Bay is known internationally for extensive dredge and fill. Most shorelines are hardened causing habitat loss and contributing to water quality problems. Habitat destruction has been extensive and occurred relatively recently. Existing policies are fragmented across several local governments and many local provisions are not enforced.

DESIRED ACTIONS:

A. Consolidation of several policies and regulation among local governments, following Pinellas County model; incorporation into Local Government Comprehensive Plans uniform language for bay-wide enforcement and monitoring.

B. Where possible, replant seagrasses and shoreline vegetation in denuded areas of Boca Ciega Bay.

DESIRED RESULTS:

Consistent and effective management of shorelines in Boca Ciega Bay with goal of habitat and water quality restoration.

Restoration of seagrass habitat.

IMPLEMENTATION COMMENTS:

Implementation would require review of and amendments to all applicable local government comprehensive plans for consistency of policies. Bay-wide enforcement and monitoring may require administrative changes and inter-governmental agreements. Implementation should be accompanied by analysis and strict control of point and non-point source discharges (particularly storm sewers) that frequently cause water quality problems in highly urbanized areas.

In addition, replanting efforts could be conducted by local citizens and through programs such as the DWI works projects and school projects.

ITEM #33 Urban Waterfront Shorelines

REFERENCE: Regional Issue; Ecology Meeting 3/11/83; Tampa Bay Study Committee Meeting 6/28/83

ANALYSIS:

Considerable waterfront shorelines along Tampa Bay occur in areas which are urban or rapidly becoming urbanized. The preservation and restoration of native vegetation in these areas could provide ecological benefits to disturbed areas of Tampa Bay and reduce many urban impacts. In addition, the aesthetic quality of urban waterfront shorelines should also be addressed.

DESIRED ACTIONS:

A. Encourage developers and regulatory agencies to maximize use of native, salt-tolerant and intertidal vegetation in landscaping and shoreline protection.

B. Establish policies at the state, regional and local level to encourage the restoration of native shoreline vegetation, particularly in areas considered for re-development. Policies on aesthetic quality should also be adopted.

C. Identify and encourage "showcase" developments, such as Harbour Island, Tampa, to apply these practices as ecological improvements in an urban setting.

DESIRED RESULTS:

Preservation and restoration of shoreline vegetation in urban areas. Reduction of urban impacts and improvements to disturbed areas.

IMPLEMENTATION COMMENTS:

This can be accomplished at several levels. Permitting agencies, such as DER and local governments, should evaluate criteria for increased restoration opportunities. Regional and local agencies should review policies and other programs where urban restoration can be accomplished.

In showcase developments, implementation is also dependent upon the developer and any marketing merit to demonstrating the shoreline as a modern "natural" environment in a highly urbanized setting.

ITEM #34 Channel A Restoration, Old Tampa Bay, Hillsborough County

REFERENCE: Local Issue; Ecology Meetings 1/27/83 and 2/4/83

ANALYSIS:

The mouth of Channel A is isolated from marsh systems on either side by levees. Therefore, channel discharge is shunted directly to bay without opportunity to be cleansed by marshes. The hydrology of the marshes is also affected.

DESIRED ACTION:

Install culverts in levees, perhaps with one-way gates, to promote travel of discharge into marshes. This should be followed with studies and the eventual removal of the levees extending beyond the natural shoreline and the re-creation of natural meanders to the extent feasible.

DESIRED RESULTS:

Improved natural treatment of Channel A discharge and restoration of marsh hydrology.

IMPLEMENTATION COMMENTS:

Anticipated problems include funding, ownership, and the possiblity of local boating and flooding concerns. Dredge and fill permits would be required (U.S. Army Corps of Engineers, Florida Department of Environmental Regulation and Tampa Port Authority/Hillsborough County) and a sponsoring agency/individual is needed. It is possible that the Southwest Florida Water Management District may consider such a proposal if submitted by the Committee and providing recommendations regarding the projects feasibility, although funding is questionable. Some funding may currently be provided for the maintenance of the levees.

ITEM #35 Water Quality Improvements Using Tidal Gates and Pumps

REFERENCE: Regional Issue; Ecology Meetings 1/27/83, 2/4/83, 4/13/83

ANALYSIS:

Numerous areas on the periphery of Tampa Bay have pockets of poor quality water due to finger canals, causeways, or other modifications to circulation. One such place adjacent to Old Tampa Bay in Hillsborough County has been remedied by the installation of a one-way gate operated by tides.

DESIRED ACTIONS:

A. Reconnaissance and selection of potential sites;

B. Water quality and feasibility evaluations;

C. Modelling to predict improvement; and

D. Locating and applying funds for construction.

DESIRED RESULT:

Where possible, elimination of zones of poor water quality in shallow areas around the Bay through the use of tidal-powered structural controls.

IMPLEMENTATION COMMENTS:

The main obstacle to implementation will be funding. It is possible that the initial reconnaissance studies can be conducted by the U.S. Geological Survey. Placement of the structures may involve U.S. Army Corps of Engineers/Florida Department of Environmental Regulation (dredge and fill permitting), Florida Department of Natural Resources, and the local governments. Florida Department of Transportation would also be involved when it is possible to place one-way gates in conjunction with roadway improvements.

ITEM #36 User Conflicts and Limits on Activities

REFERENCE: Regional Issue; Recreation Meeting 2/1/83

ANALYSIS:

Conflicts exist between individuals involved with various recreational activities and the use of areas of Tampa Bay. Contributing factors include: 1) unregulated placement of crab pots and fish nets can cause hazards or conflicts with boaters and, 2) the use of an area for one activity may preclude the use of that area for other activities.

DESIRED ACTIONS:

The designation of some areas for particular activities should be investigated. In particular, the following should be considered:

A. Certain areas where conflicts frequently occur, such as navigation channels and bridges, should be authorized for specific uses and patrolled to avoid user conflicts and safety hazards.

B. Safety should be considered when placing limitations on any activity.

C. The opportunity for artificial reef development should be considered in areas designated for fishing.

DESIRED RESULTS:

Improved safety, maximum use of an area without user conflicts.

IMPLEMENTATION COMMENTS:

Two main agencies involved with enforcement are the Florida Department of Natural Resources Marine Patrol and the U.S. Coast Guard. At the present time, this issue requires further study which would require funding. Changing laws and placing limits on activities would require legislative action. It may also be desirable to involve the Coast Guard auxillary and education programs encouraging safe boating.

ITEM #37 Florida's Marina Siting Policy

REFERENCE: Regional Issue; Recreation Meeting 2/1/83

ANALYSIS:

In early 1982, the Governor appointed a Blue Ribbon Marina Committee to develop recommendations for a more comprehensive solution to marina siting and levying lease fees. The Blue Ribbon Marina Committee submitted a final report in January 1983 and among the recommendations, it established speciic criteria for a marina siting policy. In general, the Recreation Subcommittee supports the proposed marina siting policy; however, the Subcommittee proposes specific changes to the wording to clarify the intent.

DESIRED ACTIONS:

Following is the marina siting policy as proposed by the Governor's Blue Ribbon Marina Committee with the recommendations for changes proposed by the Recreation Subcommittee. Recommended additions are underlined (addition), deletions are crossed out (~~deletion~~), and notes are in parathesis (Note:).

Marina Siting Policy

Meaningful recommendations for site-specific locations of marina facilities are dependent on many factors including demand for such facilities and private entrepreneurial development. As discussed in another section of this report, comprehensive data to make these site-specific recommendations based on supply-demand-needs assessments and economics of the industry does not exist at this time.

The Committee feels, however, that general recommendations for marina siting can be made based on certain demographic, socio-economic and environmental characteristics.

In recognition of the tremendous regional diversity for marina siting needs, provisions for local goverment and regional agency review should be established. Decisions should take into full consideration local and regional input.

- The state should give ~~priority~~ consideration to the expansion of existing facilities, if environmentally sound, over new facilities. It should also encourage location of marinas in previously disturbed areas and in areas that have historically been used for marine related activities.

- ~~Marinas should be located as close as possible to demand.~~

- The state should encourage marina development where adequate uplands are available to develop related support activities and allow for possible future expansion.

- Hurricane protection needs for marinas should be considered.

- Input from local governments should be considered in evaluating lease requests.

- Location of marinas in highly productive habitat should be discouraged. (Note: As presently worded, this policy is vague. "Highly productive habitat" should be defined).

- Location of marinas in or near well flushed, deep water areas should be encouraged.
  (Note: Specific criteria for determining well flushed, deep water should be established).

- Piling construction and other non-dredge and fill techniques should be utilized where possible to minimize habitat destruction.

- Pollution prevention including sanitation and spill containment needs should be assessed and safeguards required as appropriate.

- Impact upon state designated manatee sanctuaries should be considered. Particular marina locations or design features which threaten manatees in these sanctuaries should be discouraged.

Additional Recommendation:

On page 17 of the Blue Ribbon Marina Committee's Final Report, recommendation #19 states, "There should be a discount of 2 cents per square foot per year for all uses requiring a lease that are open to the public on a first come, first serve basis." If the state intends to give a reduction in fees to first come, first serve marinas, the Recreation Subcommittee recommends that the state require an annual written certification from owners or operators, under penalty of perjury, that they operate on a first come, first serve basis and that they maintain a publicly available waiting list.

DESIRED RESULTS:

Improved clarity of policy.
Equal consideration of marina siting proposals.

IMPLEMENTATION COMMENTS:

The Recreation Subcommittee recommendations should be submitted to the Governor for consideration.

ITEM #38 Construction of New Skyway Bridge Pier Protection System

REFERENCE: Regional Issue; Study Committee Meeting 6/28/83

ANALYSIS:

The design of the proposed preferred alternative for the new bridge pier protection system is projected to cause increased current velocities in the vicinity of the bridge, with possible changes in flushing rates of the bay as a whole. Such changes are difficult to predict prior to construction and may or may not have detrimental effects on Tampa Bay.

DESIRED ACTION:

A thorough study of the impacts of the new bridge pier protection system to identify effects on Tampa Bay and, if needed, identify possible mitigative measures such as installing subsidiary channels.

DESIRED RESULT:

Reduce possible detrimental effects of pier protection system on Tampa Bay.

IMPLEMENTATION COMMENTS:

The Florida Department of Transportation (FDOT) is the main agency responsible for the pier protection system. Some studies have been completed by FDOT, including a finding of no significant impact for the preferred alternative for the pier protection system. However, this finding is currently controversial and additional studies are needed to determine the long term consequences of the proposed system. Additional agencies involved, either through permitting or interagency coordination, include U.S. Army Corps of Engineers, USGS, DER, DNR, the Governor's Office, TBRPC and local governments.

ITEM #39 Extension of 49th Street (St. Petersburg) Across Tampa Bay

REFERENCE: Local Issue; Ecology Meetings 1/27/83 and 2/4/83

ANALYSIS:

Definite policy regarding the environmental impacts of a proposed extension of 49th Street across Tampa Bay is not explicit in the Local Government Comprehensive Plan elements (Transportation, CZM, etc). The extension of 49th Street could have a tremendous regional impact on circulation and water quality in Old Tampa Bay, particularly if a causeway were built.

DESIRED ACTION:

Explicit recognition in the Local Government Comprehensive Plans of the potential for adverse environmental impacts resulting from an extension of 49th Street across Tampa Bay. Commitment to eliminate plans for extension or to design and construct the bridge to avoid adverse environmental impacts.

DESIRED RESULT:

Elimination of ambiguity in plan regarding policy of local government on protection of water quality and habitat in the area.

IMPLEMENTATION COMMENTS:

At the present time, implementation would involve only the clarification of the above concerns in the local government comprehensive plans. Long term implementation will require further studies and participation of Florida Department of Transportation.

ITEM #40 Sailboat Launching

REFERENCE: Local Issue; Recreation survey administered at boat show

ANALYSIS:

Several popular areas for the launching of small sailboats such as Hobie Cats have been altered to restrict such launching. In most cases, rock rip-rap has been placed along the shorelines as erosion control measures. However, in many instances, small beach areas could remain or be developed to provide launching space. Noted in the survey was to provide space along the Courtney Campbell Causeway.

DESIRED ACTION:

Shallow launching areas for small sailboats, canoes, etc. should be developed as part of local parks planning.

DESIRED RESULT:

Increased recreational opportunity for small day sailing crafts.

IMPLEMENTATION COMMENTS:

Implementation should occur at the local level with park planning and development programs. However, policies may be established at the regional and state level requiring consideration of alternative launching areas as part of plan approvals and funding programs.

ITEM #41 Odor along Bayshore Boulevard, Tampa; Courtney Campbell Causeway

REFERENCE: Local Issue; Recreation survey administered at boat show

ANALYSIS:

Several survey respondents noted odor problems along the Bayshore Boulevard, Tampa and also along areas of Courtney Campbell Causeway. Bayshore Boulevard is one of the few downtown areas in Tampa providing scenic access to the bay area. In addition, many other areas around the bay have periodic odor problems due to stagnant water conditions (i.e. dead end canals), fish kills, etc.

DESIRED ACTION:

An investigation into causes and possible solutions is needed.

DESIRED RESULTS:

Improved aesthetics along a public urban scenic area.

IMPLEMENTATION COMMENTS:

This is a study need requiring funding rather than any specific agency action. Local governments have addressed this issue on occasion and the DER wasteload allocation study will also be addressing some of the ecological concerns associated with odor.

ITEM #42 Manatee River Derelict Train Trestle, Manatee County

REFERENCE: Local Issue; Ecology Meeting 3/24/83

ANALYSIS:

An old train trestle which is no longer in use crosses the Manatee River west of the U.S. 41 bridge. Preliminary studies have shown that this trestle is a significant impediment to flow in an area which is near two points of discharge. The trestle is also a popular recreational fishing spot.

DESIRED ACTION:

Remove trestle or salvage part of it for recreational fishing if additional analysis indicates that the hydrologic and water quality benefits justify the costs. Additional analysis is needed to investigate other alternatives, to determine how much trestle may need to be removed to improve circulation, and for further determination of the hydrologic and water quality benefits.

DESIRED RESULT:

Improved circulation and flow of river resulting in better water quality.

IMPLEMENTATION COMMENTS:

The main implementation problem will be the cost of removing the trestle. If the materials are suitable for reef material, funds and action may be possible through local artificial reef construction groups. Sea Grant coordinates many such programs while the Florida Department of Natural Resources, Sea Board Coast Line and Manatee County may also be involved.

CHAPTER 4

REVIEW AND ANALYSIS OF BAY MANAGEMENT STRATEGIES USED ELSEWHERE

Many bay management programs are initiated and conducted at the regional and local level. However, in many cases, state legislation or action at the state level was required to provide the funding and/or enforcement needed to carry out management plans. Federal involvement has been limited to funding specific projects and federal authority over activities such as navigation, water quality management and coastal construction projects. Following is a general discussion of the possible roles in bay management available at the federal, state, regional and local level. Specific case studies are discussed to highlight the implementation of other bay management programs and are followed by an evaluation of the bay management programs relative to Tampa Bay.

FEDERAL ROLE IN BAY MANAGEMENT

Except in specific cases involving federally owned lands, such as national parks and marine sanctuaries, federal involvement in bay management planning has been restricted to:

1. Navigation and boating where the U.S. Army Corps of Engineers and the U.S. Coast Guard have primary jurisdiction.

2. Water quality management programs involving the U.S. Environmental Protection Agency.

3. Coastal construction activities including (a) the dredge and fill program and construction of docks, moorings and bulkhead over which the U.S. Army Corps of Engineers has jurisdication; (b) the development of ports and marinas (U.S. Coast Guard); (c) the building of bridges, causeways and roads (U.S. Department of Transportation, U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency); and (d) the construction of canals, levees, and salinity structures (U.S. Army Corps of Engineers).

4. Permitting and regulation activities of the programs noted above.

5. Cooperative studies and research.

While these federal programs and federally authorized projects have had undeniable long-term impacts on bay management in many areas, the federal agencies have not taken a lead role in overall management in any bay areas. However, funding for study and the establishment of bay management programs have often been provided by the federal government through such programs as Coastal Zone Management, the Coastal Energy Impact Program and U.S. Army Corps of Engineers studies. (1,2,3)

STATE ROLE IN BAY MANAGEMENT

Several states have initiated action to form bay-wide management programs or provided needed legislation for regional authorities to accomplish the same. In the state of Florida, the Environmental Land and Water Management Act (Chapter 380, F.S.) has been used to nominate bays and rivers as "Areas of Critical State Concern." This Act emphasizes the primary role of local governments in land use decisions yet empowers the state to intervene if an area is lacking adequate land-use controls or having a significant impact upon environmental or natural resources of regional or statewide importance.(4) An area may also be designated (1) if it contains or impacts significant historical or archaeological resources; or (2) if it is an area having a significant impact upon, or being significantly impacted by, an existing or proposed major public facility or other area of major public investment.

One provision of Chapter 380 which has been successful with management programs is the use of a Resource Planning and Management Committee prior to final designation as an Area of Critical State Concern (ACSC). The Committee can provide local governments with an alternative by setting forth goals and objectives and prescribing implementation steps which must be adopted by local governments in lieu of ACSC designation. This has been a useful mechanism for resolving land use problems short of a full scale intervention through ACSC designation. This measure was used sucessfully both in the Charlotte Harbor area and the uwannee iver area to establish stronger local controls for the preservation of these areas. (5,6)

REGIONAL/LOCAL ROLE IN BAY MANAGEMENT

Most bay management programs have been initiated at the regional or local level. In the case of Biscayne Bay (discussed below as a case study), most of the study area lies within the jurisdiction of Dade County. Dade County appropriated $50,000 in 1978 to develop a management plan and funds were later received from several other sources (the state legislature, U.S. Army Corps of Engineers) to conduct additional studies and assist with implementing the plan.

In several other areas around the country, studies and plans have been developed by regional planning councils, some as part of the 208 planning process, and, in a few areas, regional authorities have been established by the state legislature. In the case of San Francisco Bay (discussed in detail below), the San Francisco Bay Conservation and Development Commission was granted permitting authority over any "substantial" change or development within a 100-foot wide strip of shoreline. In other areas, regional port authorities have been granted specific jurisdiction over many in-bay and shoreline uses (i.e. Saginaw Bay, Michigan).

Several control mechanisms are available at the local level which can be implemented for protecting a natural resource such as an estuarine bay. These include zoning, building codes, subdivision regulations, sanitary and well codes, and special permit regulations.(7) The local comprehensive planning process provides a long-range planning vehicle for preserving an area and establishing important mitigative measures through local planning and decision-making. Florida's Local Government Comprehensive Planning Act (Chapter 163, F.S.) also establishes procedures for regional review so that

there can be some measures of consistency in the management of a regional resource. For successful implementation, it is important that the local plan's goals, objectives and policies are written with specificity, precision and clarity. It is also important for successful plan implementation that progress toward meeting objectives is routinely measured. (8)

On a regional basis (i.e. a bay area incorporating several municipalities and counties), the main problems are establishing uniform planning objectives and policies that are consistent throughout the many municipalities and counties. Local governments operate independently and many planning objectives and policies are inconsistent across local government boundaries. Regional management requires considerable cooperation and coordination of efforts. It has been most successful where a regional or state agency has had the authority to require interjurisdictional resolution of an issue and compliance with any proposed measures. Uniform enforcement and implementation of the plans is also critical.

CASE STUDY: Biscayne Bay

Biscayne Bay is within the boundaries of Dade County and action for management has been initiated and carried out at the county level. However, the Bay is also bordered by 13 municipalities and encompasses a national park and a state aquatic preserve. A complex web of jurisdictional controls over the Bay has created a need for a unified plan for the entire bay system.

History: In November 1978 in recognition of the problems and opportunities related to Biscayne Bay, the County declared the bay as an "Aquatic Park and Conservation Area" and empowered the County Manager to develop a management plan for that area. The project was undertaken jointly by the Dade County Planning and Environmental Resources Management Departments. A five member Policy Advisory Committee was appointed to oversee the general scope and direction of the Bay projects. Members included two attorneys, and representatives from The Marine Council, Greater Miami Chamber of Commerce and Florida Power and Light Company. Two additional committees were appointed to provide assistance: A Scientific/Technical Committee, composed of local university faculty members, and federal and state agency technical staff, and a Local Government Liaison Committee, composed of representatives from each of the shoreline communities. (9)

With assistance from the committees, the County staff completed a management plan in early 1981. In accordance with the plan recommendations, the Biscayne Bay Management Committee was created by Dade County ordinance as a committee of the county commission, "to review progress on the Bay Management Plan and to make policy decisions regarding programs and actions that are specified within this Plan". (10,11) The committee has policy and review authority but not direct planning or regulatory authority.

Committee Structure: Of the 13 committee members, nine are appointed by the county commission. They include three county commissioners, two members recommended for appointment by the Dade League of Cities, and four members from the Dade County community appointed by the Dade County

Manager. The remaining four members are the District Engineer of the U.S. Army Corps of Engineers, the Superintendent of the Biscayne National Park, the Secretary of the Florida Department of Environmental Regulation and the Executive Director of the Florida Department of Natural Resources. Subcommittees were formed to develop recommendations for the full committee on assignment of priorities to bay management and enhancement activities proposed in the Plan. Subcommittee membership can include noncommittee members, at the discretion of the subcommittee chairperson with review by the full committee's officers. (12)

Evaluation of Success: Although it is premature to predict the committee's success in achieving its goals, early assignment of priorities to the Plan's recommended bay management tasks established committee interest in result-related tasks. Many of these tasks are currently being implemented by Dade County and with assistance from the state. However, process-related activities like developing a strategy for committee and subcommittee operation have not been as fully discussed. Many of the process-related issues will be important to the Committee's future success and include: (13)

- The relationship of subcommittee activity to the full committee functioning;
- The extent to which non-county interests, such as municipalities, participate on the committee; and
- The mechanism that the committee develops for resolving potential conflict between the various interests either represented or not represented on the committee.

CASE STUDY: Charlotte Harbor

The Charlotte Harbor estuary includes coastal regions of Sarasota, Charlotte and Lee Counties. The total watershed for the Charlotte Harbor encompasses more than 3 million acres and includes the major river systems of the Caloosahatchee, the Peace and the Myakka Rivers, six bays, six major islands and large areas on the mainland within the three counties. Serious problems threatening the Charlotte Harbor system include the supply of fresh water of high quality to the estuarine areas and threats of intense development of coastal areas and islands.

History: Prompted by these threats, a confederation of environmental interests nominated the Charlotte Harbor estuary in 1975 as an Area of Critical State Concern (ACSC), under Chapter 380, Florida Statutes. At the time of the nomination, existing platted subdivisions alone had the potential of adding more than two million new residents to the area. (14)

An ACSC designation would have allowed the state to review and approve land-use and related decisions made by local governments within the designated boundaries. Following the ACSC nomination, the state Division of State Planning undertook a study of the Charlotte Harbor area and held a series of meetings among state and regional agencies. As a result, in 1977 the state decided to develop solutions for land use and water-related problems but not to designate the area as an Area of Critical State Concern at that time. The Charlotte Harbor Resource Planning and Management

Committee was formed to address these issues. (15)

Committee Structure: Chapter 380.05 F.S. requires the establishment of a resource management committee comprised of state, regional and local representatives prior to determination of ACSC designation. Established in 1980, the Governor appointed 39 members to the Charlotte Harbor Committee. These members included one elected official and one planning official from each of the three counties (Sarasota, Charlotte, Lee) and from each of the eight cities. Agency members included one representative from each of the two water management districts, the regional planning council, four state agencies (DER, DNR, DVCA, HRS) and a representative of the Governor. Also appointed were eight members, four representing environmental interests and four representing business interests.

Evaluation of Success: On December 11, 1981, the committee held its final meeting for the purpose of voting on its final recommendations. A key question for committee vote was whether to recommend designation of the Charlotte Harbor area or parts of it as an Area of Critical State Concern. The ACSC designation was perceived by local governments as an unwelcome state intervention in local land use decisions. However, this threat prompted active participation in the Committee by local governments and, as a result of local government action, several of the problems that spurred the original nomination have improved. Those actions included local comprehensive land use planning and improved sewerage systems which were supported and partly funded by state agencies represented on the committee. In addition, DNR assigned two field personnel for managing the Charlotte Harbor Aquatic Preserve and gave top priority to developing management plans for this area. (The management plan was unanimously adopted by the Governor and Cabinet on May 18, 1983).

Rather than recommending ACSC designation, the Committee voted 26 to 7 to recommend ACSC designation only for those local governments that failed to adopt the committee recommendations by July 1982. By July 1982, all counties and municipalities had either adopted the recommendations or were in the process. In only one case, Lee County, was action brought before the Cabinet to designate that area as an Area of Critical State Concern. However, at the time, the Cabinet tabled the issue for one month and Lee County adopted the recommendations in the interim.

The committee recommendations included strong proposals for local government action to protect Charlotte Harbor. Analysis by Abrams (1982) emphasized that these proposals are the product of a consensus-building process that required the committee members to reach agreement on specific plans of action, not merely broad statements of intent. Recommendations included local government action on:

- Planning and regulation aimed at improving the quality of the stormwater and wastewater that enters the estuary;
- Promoting coordinated development on the mainland; and
- Discouraging further development on barrier islands and in other high hazard flood zones.

It is premature to evaluate the ultimate success of the Charlotte Harbor Committee. The Committee established an effective mechanism for state and local collaboration to manage a coastal resource on a short to mid-term basis. However, the committee's dissolution at the time of the final recommendations leaves a vacuum for continuing the state and local collaboration. The main responsibility for monitoring the implementation of the recommendations has been carried out by the Southwest Florida Regional Planning Council. In addition, the state may proceed with critical area designation at any point if a local government does not follow the Charlotte Harbor Plan. To evaluate local government compliance, the Department of Community Affairs monitors dredge and fill applications, changes in adopted ordinances, and relies heavily on the regional planning council, area environmentalists and concerned citizens for information on local activities. To date, a high level of local interest has helped continue, on an informal basis, the communication network initially established by the committee. (16)

CASE STUDY: San Francisco Bay

Established in 1965, the San Francisco Bay Conservation and Development Commission is the first intergovernmental committee established to manage a coastal resource in the United States.

History: Alarmed at the rate of filling occurring in San Francisco Bay, area residents had first appealed to the University of California's Institute of Governmental Studies to conduct a comprehensive review of the bay and its problems. The result was a landmark report, The Future of San Francisco Bay, which discussed in detail ownership, resource values, pressures on the bay, and various land use and political choices for the future. (17)

As outlined in the report, the bay dilemma was clearly regional in nature - a question of regional planning and control of shoreline development. The regional planning agency, the Association of Bay Area Governments, recognized problems in bay development but had limited power and resources and dealt with the bay as part of an overall regional plan. Its staff prepared and recommended a voluntary model fill moratorium for its member governments. This proved ineffective because no one would sign without reserving the right to fill. (18)

The bay conservationists turned to the state legislature and, after a difficult two year battle, the California Legislature passed the McAteer-Petris Act in 1965 - the enabling legislation for the San Francisco Bay Conservation and Development Commission (BCDC). The Commission originally was given a four year life span and assigned the task of preparing a plan for the Bay. In 1969, the Commission submitted the completed plan to the Governor and Legislature who subsequently decided that the Commission should become a permanent agency to carry out the Plan. The McAteer-Petris Act was amended in 1969 giving the Commission permanent status and the following three major areas of responsibility: (19)

- In accordance with the law and the Bay Plan, to regulate by permit all filling, changes in existing uses, and dredging in San Francisco Bay;

- To have limited jurisdiction within a 100-foot strip inland from the Bay. Within this shoreline band, the Commission's responsibility is two-fold: (1) to require public access to the Bay to the maximum extent feasible, consistent with the nature of new shoreline developments; and (2) to ensure that the limited amount of existing shoreline property suitable for high priority purposes is reserved for these purposes; thus minimizing pressures to fill the Bay. (The six high priority uses of shoreline land specified in the law and the Bay Plan are ports, water-related industry, water-related recreation, airports, wildlife areas, and desalinization and power plants).

- To have limited jurisdiction over any proposed filling of salt ponds or managed wetlands (areas diked off from the Bay and used for salt production, duck-hunting preserves, etc.). These areas, although not subject to the tides of the Bay, provide wildlife habitat and water surface important to the climate of the bay area. If filling of these areas is proposed, the Commission is to encourage dedication or public purchase to retain water surface area. If development is authorized, the Commission is to ensure that the development provides public access to the Bay and retains the maximum amount of water surface consistent with the development.

In 1977, the Legislature gave the Commission a fourth major area of responsibility:

- To implement, in cooperation with local government and the Department of Fish and Game, the Suisun Marsh Preservation Act of 1977. This legislation requires local governments and special districts within the Marsh to prepare a local protection program, consistent with the Act and the Protection Plan, and submit it to BCDC. The legislation provides specific controls which must be included in the local protection program.

Committee Structure: The BCDC is comprised of 27 members, two from federal agencies, four from state agencies, one from a regional agency, nine from counties, four from cities and seven at large public members. Five of the public members are appointed by the Governor (including the chair and vice-chair of the Commission) and one each by the State Senate and State Assembly.

Evaluation of Success: From 1965 through 1972, the BCDC was successful in accomplishing the following: (20)

- Reduced the rate of filling from 94 to 29 acres per year;

- Added 30,000 linear feet of public access to bay shoreline through actions requiring public access improvements as conditions for approval of public and private shoreline development permits; and

- Dozens of proposed developments were reviewed by specially-established professional boards to improve engineering and architectural design plans for both public and private developments.

In continuing to achieve its goals, several characteristics underlie the BCDC's effectiveness. Perhaps, the most important is that the Commission provides a mechanism for handling conflict between competing interests for use of bay resources. The Commission developed the plan that it would implement through its regulatory activities. During the process of plan development, consensus was built among Commissioners prior to their actual application of the plan's policies to regulatory decisions. One mechanism credited with consensus-building was the commission's practice of working as a full committee, rather than dividing into subcommittees. (21,22) The size of the Commission permits working as a group and the range of membership helps to assure that varying opinions are expressed and discussed.

Another mechanism for dealing with conflict is the reduced potential for special interest pressure on commissioners. Diverse membership minimized parochial pressure - while a spirit of cooperation is maintained with local governments through membership and timing of permit decisions. BCDC's permit decisions are made independently of local governments and are made after local government decisions. This assures that applicants cannot attempt to use BCDC permits as leverage in a local government permit decisions.

According to Swanson (23), the most critical lessons to be learned from the BCDC are: to involve the public; define clear, understandable goals; recruit able, professional staff; and develop a structure insulated from interest group politics so that the committee is able to make decisions in the wider public interest. The BCDC operates on a comprehensive planning basis yet it has police power for controlling uses of the resource it seeks to protect. While the purposes of the BCDC are narrow in scope, its membership, structure, and methods of operation exemplify how to achieve significant state and local coordination by design.

CASE STUDY: Grays Harbor Estuary, Washington.

Located on the southwest coast of Washington, Grays Harbor consists of 62,000 acres of water, intertidal mud flats, salt marshes and partially developed shoreline. Thirty-four thousand people live near the shores of the estuary. Fishing and resort towns are located on two fingers of land which protect the estuary. The waters of the estuary are shallow but a deep draft navigation channel provides access to heavily industrialized ports with major wood products factories. (25)

History: A long, intense conflict between economic expansion and natural resource protection has occurred in Grays Harbor. Nearly 4,000 acres of intertidal habitat has been altered between 1940 and 1975 due to maintenance dredging for navigation and filling to create level water front industrial sites. In 1975, two applications for U.S. Army Corps of Engineers (COE) dredge and fill permits brought the conflict into focus.

In the first case, the applicant proposed to bulkhead and fill 1348 linear feet of shoreline for a sawmill project which had been approved by the City of Aberdeen in 1973. The U.S. Fish and Wildlife Service (FWS) objected due to (1) impacts on fisheries and bird habitats (particularly, migratory waterfowl) and (2) the overall concern that piecemeal and indiscriminate filling of wetlands was chronic in Grays Harbor. The second application

was by the Port of Grays Harbor to fill 39 acres of wetlands in order to create a site for new waterfront industry. Federal and state agencies objected to the permit, including FWS, the U.S. Environmental Protection Agency (EPA) and the National Marine Fisheries Service (NMFS). Local support was high for both projects due to economic development needs. Objections were withdrawn after an agreement was reached that a comprehensive plan would be developed for the entire area.

In the meantime, Grays Harbor Regional Planning Commission established an Estuary Planning Task Force and secured a Coastal Zone Management grant to prepare a management plan. The Task Force produced a draft plan in 1978 that established eight land and water use classifications and a set of uses was permitted for each classification (outright or subject to conditions). The vast bulk of the estuary was proposed for protection. The Port of Grays Harbor agreed to abandon its plan to develop the entire 2200 acres it owned for assurances that it could develop 500 acres in the Bowerman Basin over the next 50 years. The remaining 1700 acres would be transferred to a State agency for resource management.

The 1978 draft plan was not adopted for two primary reasons:

1. EPA considered the compromises it had to agree to inconsistent with its own section 404 (b)(1) guidelines. The guidelines require evaluation of the environmental effects of each development and of alternative sites for development on a case-by-case basis.

2. The FWS and environmental organizations objected to the development of the Bowerman Basin. The basin contained important shore bird and water fowl habitat and was considered by some to be the most important ecosystem in the entire Grays Harbor area. Of particular importance was the finding that the birds in the basin were hunted by endangered predator species, particulary the Peregrine Falcon.

Committee Structure: Established by the regional planning commission, the Grays Harbor Estuary Planning Task Force consisted of representatives of the Port, the county, all nearby municipalities, four state departments (Natural Resources, Ecology, Fisheries and Game) and four federal agencies (the Corps, EPA, FWS, NMFS). Environmental organizations, industries and the public at large were invited to make suggestions and attend Task Force planning sessions but were not allowed to participate in the decision making process. Decisions were made by concensus.

Evaluation of Success: It is premature to determine the effectiveness of the Task Force. To date, no plan has been adopted; however, several revisions have been made to the plan which now appear to be acceptable to all the entities on the Task Force. These amendments include: 1) specifying the degree to which specific U.S. Army Corps 404 tests could be met in a long range plan; 2) specifying that each development must qualify for an individual permit; and 3) revisions in the location and area to be permitted for industrial development. The plan will be published along with an Environmental Impact Statement (EIS) which includes "Letters of Intent" explaining how the plan will be used by the state and each federal agency. The local governments have agreed to incorporate the plan's provisions into their shoreline master programs.

While the planning process for Gray's Harbor Estuary has taken a long time to develop, it has also dealt with a number of issues of national importance. These include: (26)

- Integrating the section 404 process into land and water use planning;
- Integrating the Endangered Species Act into land and water use planning;
- Integrating large scale mitigation efforts into land and water use planning; and
- Initiating the concept of advanced designation of dredged material disposal sites.

EVALUTION RELATIVE TO TAMPA BAY

The problems associated with Tampa Bay are similar in many respects to other bay areas. These similarities include a maze of jurisdictional controls over Tampa Bay, impacts from upland activities, and other growth related issues. However, there are important differences which must be considered in an overall management strategy. The first is that there is no single issue or problem which needs to be rectified. For instance, in San Francisco Bay, the overriding concern was to stop filling in the Bay while, in Charlotte Harbor, the concern was to preserve the many existing natural areas.

In Tampa Bay, many of the historical problems such as dredging and filling, municipal discharges, etc. are not controlled by regulatory programs. Instead, there are numerous, chronic problems contributing to the long-term degradation of the bay. Taken individually, many of the problems are minor or insignificant; however, the cumulative impacts are presenting long-term regional problems. Examples identified by the Study Committee include non-point source discharges entering Tampa Bay, proposed bridge construction, the long-term disposal of maintenance spoil and alterations to shorelines and tidal creeks (see Chapter 3, Item #'s 2, 8, 9 and 14 respectively). The second major difference is that many of the problems in Tampa Bay are due to past activities. The shorelines of Boca Ciega Bay have been almost completely altered and most of the tributaries, large and small, have been altered. Problems associated with urbanization (bridge and causeway impacts, permitted and illegal discharges, stormwater runoff, land use impacts, etc.) are readily apparent in all but the lower portions of Tampa Bay.

Biscayne Bay is in a similar situation and is undertaking a large effort to quantify the many problems and develop long-term restoration programs. An advantage is that Biscayne Bay is within one county and Dade County has been the lead agency in addressing the issues. If a similar strategy is adopted for Tampa Bay, the cooperation and support of the three counties and numerous municipalities will be needed. It would also require a considerable coordination of efforts.

Currently there is no single agency with the legislated authority to implement a long-term management program for Tampa Bay. As presently structured, the Tampa Bay Study Committee serves in an advisory capacity to the regional planning council and local governments. It is currently up to the good will of the local governments to undertake any proposed implementation measures. Possible action from state agencies is also limited. As presently worded, Chapter 380, Florida Statutes, provides

little opportunity to designate Tampa Bay as an Area of Critical State Concern.

Another difference separating Tampa Bay from other bay management programs is the current lack of public concern. Informal surveys have shown that the public considers Tampa Bay to be in poor quality and should be cleaned up. (27) However, this public attitude currently has little direction. It is apparent that there is a need to demonstrate that Tampa Bay is a resource vital to this area and that there are courses of action both in the short term and long term that can be taken to improve this resource for current and future residents.

In summary, there are actions that can be taken to improve the quality of Tampa Bay. Several actions are proposed in Chapter Three, including restoring shorelines in many areas, developing management programs for areas such as McKay Bay and Passage Key, identifying mitigative measures such as tide gates, contingency planning for post-hurricane acquisition of habitat and imporvements in regulations, enforcement and public education. Many of the actions are restorative in nature; others are preventative. A recent survey of local resource managers has shown that many of these actions will contribute importantly to the protection of Tampa Bay. However, there is a need for a unified approach, either through legislative action or strong local government participation. To accomplish this, improved public awareness and support is also needed.

CHAPTER 5
TAMPA BAY MANAGEMENT STRATEGY

FUTURE PROJECTION OF TAMPA BAY

The future of Tampa Bay will be influenced by several factors. These include a continuation of several known trends: the area's population and growth related impacts will increase, port activities and related transportation impacts will continue, recreation demands will increase and the costs of public facility improvements and maintenance (i.e. municipal waste treatment) will increase.

The future of Tampa Bay, as currently managed, is also dependent on the results and consequent actions of current studies and programs designed directly or indirectly to control and manage the known trends. These are the wasteload allocations studies being prepared by the Florida Department of Environmental Regulation (DER), aerial interpretation of habitat loss being conducted by the Florida Department of Natural Resources (DNR), long-range planning by the area ports and the comprehensive plans of local government environmental programs.

TAMPA BAY MANAGEMENT STRATEGY

Because of the large number and complex nature of the issues affecting Tampa Bay, the Tampa Bay Study Committee could not reach a consensus regarding a recommended strategy to direct a coordinated approach to management of the bay. As a result, the committee recommended and the Council approved the establishment of a 15 to 20 member Tampa Bay Management Steering Committee in October, 1983. The composition of this committee provides effective representation for the wide range of Tampa Bay's business, environmental, and industrial interests as well as for the regulatory agencies having jurisdiction over the Bay.

The Tampa Bay Management Steering Committee will be chaired by Senator Jeanne Malchon who chaired the original Tampa Bay Management Study Committee. The new Steeering Committee will meet on a regular basis to devise strategies for addressing the priority bay management issues developed by the original Bay Study Committee, and to provide necessary guidance to the Council in its review and decision making responsibilities regarding projects affecting Tampa Bay. Specific objectives of the committee include the following:

1. Develop a recommended Bay Management Program and make a formal recommendation to the Council 30 days prior to the 1985 session of the Florida Legislature;

2. Prepare a preliminary three-to-five year work program to address priority bay management issues in conjunction with ongoing efforts by Congress, the U.S. Fish and Wildlife Service, state agencies, port authorities and others, for submittal prior to the 1984 and 1985 legislative sessions.

3. Seek new sources of funding as well as assist in coordinating existing funded efforts to implement studies or actions to address priority bay management issues. Such funding should not be limited to just funding efforts of the Council but also essential work by other public and private groups.

4. Monitor proposals falling under the review responsibilities of the Council for compliance with bay management recommendations.

The Tampa Bay Management Steering Committee will utilize two subcommittees to better address management and work program issues. The short term work program subcommittee, headed by Dr. Ernest Estevez of Mote Marine Laboratory, will begin determining and implementing feasible solutions to priority bay managment issues. The existing management authorities subcommittee, headed by Ms. Laura Dennison of the League of Women Voters, will identify the existing institutional framework, and ways to better effect and coordinate a cohesive long-term management plan into this framework.

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APPENDIX I
SUMMARY OF MARINA FACILITIES

County	MARINA NAME	LOCATION	# of Wet Slips	# of Dry Slips	Pub-lic Ramp	Pump-out Station	Fish Clean-ing	Fish-ing Pier	Eating Facility	Gas	Diesel	Boat Lift	Painting/ Bottom Work	Engine Repair	Bait Tackle	Boat Rental
MANATEE	Anna Maria Yacht Basin Marina	P.O. Box 309 902 S. Bay Blvd. Anna Maria	94	150		x	x	x	x	x	x	x	x	x	x	x
	Asa Pillsbury Marina	4204 13th St. Ct. West, Palmetto	25									x	x			
	Boca Del Rio Marina	2504 88th St. Ct. N.W. Bradenton	35									x	x			
	Galati's Boats and Motors, Inc.	900 S. Bay Blvd. Anna Maria	10	150		x	x	x	x	x	x	x	x	x	x	x
	Hidden Harbor Marina	4010 Snead Island Road - Palmetto	40							x		x	x	x		
HILLS - BOROUGH	Apollo Beach Marina	6511 Surfside Blvd. Apollo Beach	26	0	x					x						
	Bahia Beach Marina	3301 Sea Grape Dr. Ruskin	290	0	x	(1)	x	x	x	x	x	x	x	x		
	Bayshore Blvd. Marina	Bayshore Drive at Platt St. - Tampa	37	0												
	Cedar Grove Marina	Cedar Drive at the Little Manatee River - Ruskin	8	0												
	Davis Islands Towers Marina	84 Davis Blvd. Tampa	10	0												
	EJ Marine Service	6304 Otis Ave. Tampa	30	0												
	Hideaway Camp-ground Marina	2206 Chaney Dr. Ruskin	33		x											

(1) Fee may be charged

APPENDIX I CONTINUED

County	MARINA NAME	LOCATION	# of Wet Slips	# of Dry Slips	Public Ramp	Pump-out Station	Fish Cleaning	Fishing Pier	Eating Facility	Gas	Diesel	Boat Lift	Painting/ Bottom Work	Engine Repair	Bait Tackle	Boat Rental
HILLS-BOROUGH (Cont.)	Imperial Yacht Basin, Inc.	5000 Gandy Blvd. Tampa	157	76	(2)					x	x	x(3)	x	x	x	
	Imperial Yacht Basin, Inc.	205 South Hoover Tampa	12													
	Interbay Marine Ways	5200 Tyson Tampa	0	160								x				
	Marjorie Park Marina	155 Columbia Drive Tampa	73		x					x						
	Pipers Marine	8888 W. Hillsborough Avenue - Tampa	20	50						x			x	x	x	
	River Heights Marine	2305 N. Willow Ave. Tampa	40	0	x	(1)				x						
	Tampa Bay Moorings	5001 Gandy Blvd. Tampa	60	0	x	(1)										
	Tampa South Trailer Park	2900 Tamiami Trail South - Ruskin	15	0												
*Fee may be charged																
PINELLAS COUNTY	Brenners	106 Ave. N.E., Brenner Road St. Petersburg	40	0	x	(1)										
	Caulfield Marina	1351 Bay St. S.E. St. Petersburg	10	0												
	Gandy Marine	13050 Gandy Blvd. St. Petersburg	35	0	x	(1)										
	Huber Yacht Harbor	5950-34th St. South St. Petersburg	225	200						x	x	x	x	x	x	

(1) Fee may be charged
(2) Small lift for boats up to 24 feet
(3) 60 ton

APPENDIX I CONTINUED

County	MARINA NAME	LOCATION	# of Wet Slips	# of Dry Slips	Pub-lic Ramp	Pump-out Station	Fish Clean-ing	Fish-ing Pier	Eating Facility	Gas	Diesel	Boat Lift	Painting/ Bottom Work	Engine Repair	Bait Tackle	Boat Rental
PINELLAS COUNTY (Cont.)	O'Neill's Skyway Boat Basin	6701 34th St. S. St. Petersburg	200	0	x											
	Safety Harbor Municipal	South Blvd. at Bayshore Drive S. Safety Harbor	37	0	x			x								
	St. Petersburg Municipal	400-2nd Ave. N.E. St. Petersburg	619	0	x	x				x	x					
	Seffens Marine	12022 Gandy Blvd. St. Petersburg	17	0								x	x	x		
	Sheraton Marina	6800-34th St. S. St. Petersburg	25	0					x							x (4)
	Un-named Private Marine (closed-estate ownership)	164th Ave. at 48th St. N. Clearwater	9	0												
PINELLAS COUNTY (Boca Ciega Bay)	Blind Pass Marina	9555 Blind Pass Rd. St. Petersburg Bch.	70													
	Boca Bay Marine	112-31st Ave. South Madiera Beach	16	80												
	Dave Steinke's Mariners Cove	5018-31st Ave. South - Gulfport	0	100												
	David Stoller's Pass-a-Grill High and Dry Marina	1901 Pass-a-Grill Way-St. Peters-burg Beach	20	120												
	Gulfport Municipal	4630-29th Ave. S. Gulfport	254	0	x (1)	x				x					x	
	Isla Del Sol Marina	6000 Sun Blvd. St. Petersburg	42	0		x	x		x							

(1) fee may be charged
(4) sailboats only

APPENDIX I CONTINUED

County	MARINA NAME	LOCATION	# of Wet Slips	# of Dry Slips	Pub-lic Ramp	Pump-out Station	Fish Clean-ing	Fish-ing Pier	Eating Facility	Gas	Diesel	Boat Lift	Painting/ Bottom Work	Engine Repair	Bait Tackle	Boat Rental
PINELLAS COUNTY (Boca Ciega Bay) (Cont.)	Harborside Marina and Yacht Basin	9333 Blind Pass Road - St. Petersburg Beach	0	100												
	Indian Springs Marina	15151-113th Ave. N. Largo	55	130						x		x	x	x		
	John's Pass Marina	12795 Kingfish Dr. Treasure Island	8	120			x		x(5)	x	x		x	x	x	
	Madeira Beach Municipal Marina	503-150th Ave. Madeira Beach	90	0												
	Maximo Moorings, Inc.	4801-37th St. S. St. Petersburg	350	150		x	x		x	x	x	x	x	x	x	
	Pasadena Bayside Marina	1444 Pasadena Ave. Pasadena	142	0												
	Roc's Marina	17815 Gulf Blvd. Redington Shores	3	0												
	Scampi's Marina	8550 Bay Pines Boulevard	24	0												
	South Pasadena Marina	6810 Gulfport Boulevard South St. Petersburg Beach	129	0												
	Treasure Island Municipal	120-108th Avenue Treasure Island	18	0												

(1) Fee may be charged
(2) Small lift for boats up to 24 feet
(3) 60 ton
(4) Sailboat Only
(5) Adjacent to Marina

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