# Marco Island: Tropical Paradise or Environmental Disaster

*Hubert B. Stroud*
*Professor of Geography*
*Arkansas State University*

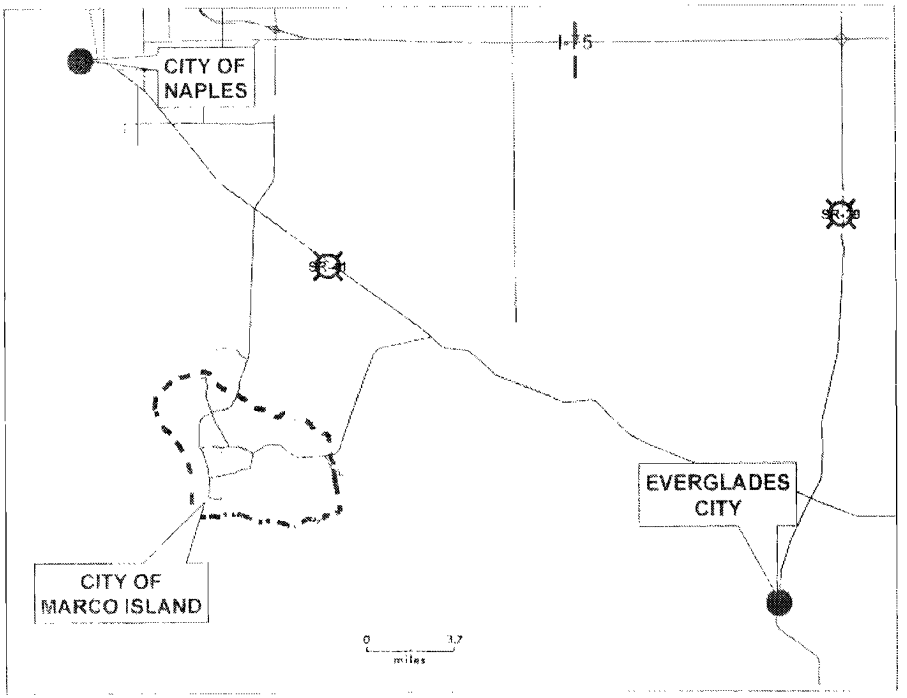
*Jason D. Self*
*Environmental Sciences Program*
*Arkansas State University*

**Introduction**

Deltona Corporation was one of several large land development companies that specialized in selling recreational and retirement property to a distant clientele. Much of this type of so-called "land development" activity took place during the decades of the 1950s, 1960s, and early 1970s prior to the implementation of laws and regulations designed to monitor land sales activity and to promote wise land use development techniques (Finotti, 1996). Deltona's Marco Island project began in 1964 and is a good example of problems that occur when developers make poor site selection decisions and then stubbornly adhere to their original development plan in spite of growing concern over the environmental and economic value of the property that had been selected for development.

As evidence of the value of its property mounted, Deltona found it harder and harder to obtain government permits to dredge and fill. Yet it continued to sell lots until mid-1973, promising that the land would someday be raised above the water level. Early in 1976, the U. S. Army Corp of Engineers, in a nearly unprecedented decision, refused Deltona permission to dredge and fill over 2,000 acres of mangrove swamp planned for conversion into 4,300 home sites on the eastern side of the island. Consequently, the company's plans for its star development were dealt a shattering blow. In the meantime, consumers had invested millions of dollars in land which in its natural state is uninhabitable. For these consumers and for Deltona itself, the consequences of the Corps' decision to deny permits

**Figure 1. Map depicting the location of Marco Island along the southern Gulf Coast of Florida.**



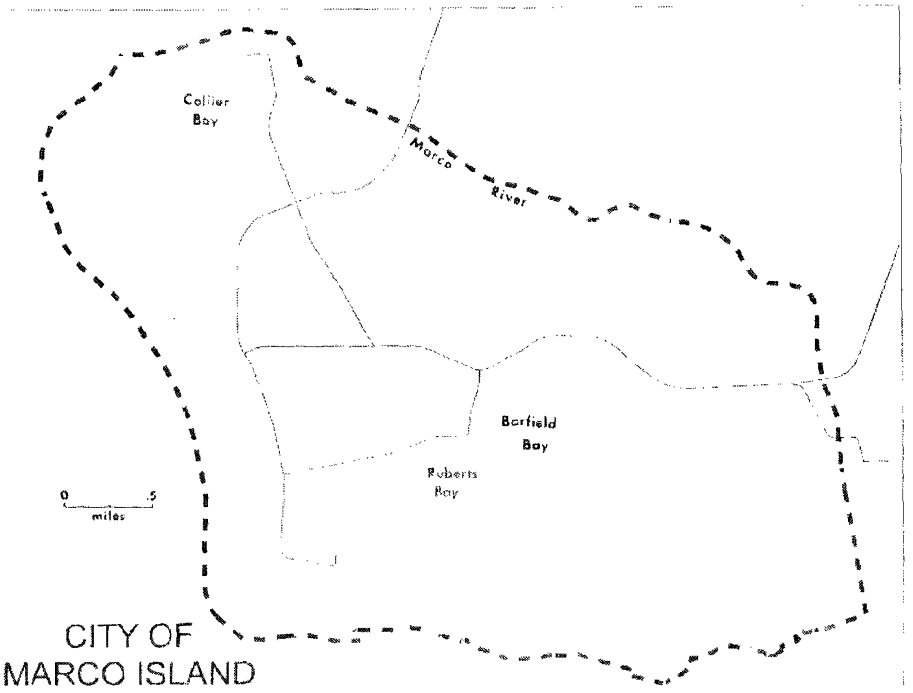

*Source: Zoning and GIS Department, City of Marco Island, Florida, 2007.*

resulted in refunds, exchanges, lawsuits, and enormous costs (Allan, Kuder and Oakes, 1976).

Marco Island is located in Collier County, along Florida's southern Gulf Coast, approximately 16 miles south of the City of Naples (Figure 1). It is the largest of the islands within the 10,000 Islands coastal zone and is part of an environmentally significant and highly productive region that includes Rookery Bay Sanctuary, Collier-Seminole State Park, the State of Florida Aquatic Preserve, the Big Cypress Swamp, and the Everglades National Park only a few miles away (Pittman, 2006).

This article assesses some of the many problems that result when environmentally sensitive lands, such as barrier islands, are

**Figure 2. Map depicting areas of dredge and fill within Marco Island including the Marco River, Collier Bay, and Roberts Bay sections.**




*Source: Zoning and GIS Department, City of Marco Island, Florida, 2007.*

chosen for development. In the case of Marco Island, the destruction has been particularly devastating. This paper provides a brief history of the conflict that arose between the developer, governmental officials, and environmentalists, assesses the more significant environmental problems that were created and examines mitigation techniques the city is using to rectify some of the many mistakes made by the original developer.

## The Conflict

Marco Island itself, a 7,300 to 8,400-acre barrier island, includes the substantially developed Marco River and Roberts Bay ar-

eas and the partially developed Collier Bay section (Figure 2). At the eastern end of the island is Barfield Bay and Big Key area where over 2,500 acres have been subdivided into 4,000 home sites. These lots have been sold but not developed since dredge and fill permits were denied (Allan, Kuder and Oakes, 1976).

Unfortunately for Deltona, the conflict over the development of Marco Island coincided with the evolution of environmental awareness in South Florida. Just when the land development company was poised to make substantial "progress" toward completion of the project, the value of barrier islands and estuaries emerged from the esoterica of academia to a frequent topic in daily newspapers. Barrier islands, when left undisturbed, were now viewed as vital to the protection of coastal wetlands against the forces of the wind, hurricane surges, and ocean waves. Energy from oncoming hurricanes or tidal surges are absorbed or deflected by these islands, thus protecting the mainland from storm damage. Mangrove swamps, which were dismissed in 1964, the year the development began, as noxious and mosquito-laden, by 1970 were understood to be the keystone of a unique and complex ecological system. Such systems are ideal nesting sites for shorebirds and nurture and protect a majority of Florida's commercial and sports fish. Florida's coastal wetland region was now considered to be an essential component of Florida's economy and ecology rather than developable land. The beaches, dunes, and wetlands within coastal zones also provide desirable habitat for various recreational activities (Milk, 2005 and Stone, Sheremet, and Braud, 1997).

The Marco Island Development Corporation (MIDC), a Deltona subsidiary, initially purchased 10,327 acres of uplands and submerged lands on and around Marco Island. At the time, developers were only required to obtain approval in three specific areas. These included the bulk head line from the county and the Trustees of the Internal Improvement Trust Fund; approval of dredge and fill activity in navigable waters from the Army Corps of Engineers; and approval of the right to sell lots from the Florida Land Sales Board (now the Division of Florida Land Sales). At the time, none of these agencies

put a high priority on preserving wetlands. The County's primary concern was that the land be filled sufficiently to limit flooding. The Trustees' concern was that it be paid for the fill dredged from state-owned bottom lands and that there was no trespassing on state lands. The Corps of Engineers wanted only to be sure that development would not interfere with navigation (Allan, Kuder and Oakes, 1976).

Based on prevailing attitudes at the time, it is not surprising that the company received approval to proceed with the project. The Collier County Commission reviewed the master plan for the Marco Island development project and established the bulkhead lines which the Trustees approved. Deltona recorded its plats with the County and posted corporate bonds for the completion of development. And the Florida Land Sales Board approved the company's sales materials. As a result, Deltona was able to begin selling its submerged home sites in 1965. It needed only the Corps of Engineers' permission to convert them into habitable land.

Permits from the Corps of Engineers' were limited to a three-year period. Since Marco Island was so large and required such extensive dredging and filling, Deltona divided it into five sections: Marco River, Roberts Bay, Barfield Bay, Big Key and Collier Bay. The company planned to apply for the necessary permits one section at a time. In October, 1964, the Corps routinely issued a permit for the Marco River section, the first phase of the dredge and fill operation.

Deltona experienced fairly smooth sailing for the next two years. However, as the Naples Star later recounted, it was not long before "a revolution" was underway, catching Deltona in the middle holding a half developed island (Drake, 1974). Mangroves suddenly became important and, by 1967, the ecological value of estuaries was more widely appreciated. The company's efforts to develop environmentally sensitive land encountered a changing attitude concerning wetlands with its application to begin dredging and filling the second area of Marco Island. In September, 1967, it requested permission to dredge 10 million cubic yards of fill from Roberts Bay. While the Florida Trustees issued the permit in April, 1968, the Corps delayed.

Under the Memorandum of Understanding, the Department of the Interior, Bureau of Sports Fisheries and Wildlife (now the U. S. Fish and Wildlife Service), had to review the plans before the Corps could approve the project. In September, 1968, after months of meetings and discussions with Deltona, the Director of the Bureau's Southeast Regional Office informed Deltona that his agency regarded any dredging as detrimental to conservation in the area. According to a Deltona statement, the company understood this to mean that the agency would recommend denial of any dredge and fill permit (Allan, Kuder and Oakes, 1976).

Although Deltona continued to subdivide and sell lots, it did, in February of 1969, agree to make design changes to accommodate some of the Bureau's objections. The changes included reducing the 306-acre area to be dredged by a third, creating, by transplant, a 10-acre mangrove island, installing a sanitary sewer system, and employing an ecologist on the project. The Bureau's objections continued, however, and the issue went up the ranks of the Department of the Interior.

Deltona chose to ignore several warnings from regulatory agencies and the accumulation of extensive evidence of the environmental consequences of creating lots from coastal wetlands. They also ignored the vast evidence that dredge and fill permission would no longer be a routine matter. In spite of all that had happened, the company continued to sell submerged lots on Marco Island and began plans to subdivide other parcels of land off the island.

As the years passed, Deltona was finding it necessary to apply to the appropriate authorities for renewal of its permits in the first two development areas: the Marco River and Roberts Bay sections of Marco Island. Because of the two-year delay in obtaining federal approval of Roberts Bay, Deltona had not been able to complete the work that had already been authorized. In 1971, Deltona asked for an extension of both the Marco River and Roberts Bay permits. This request for renewal and extension began a lengthy controversy.

A major part of the controversy was associated with a request by Deltona in 1971 that the state reissue permits that should have not

been issued in the first place. Unfortunately, lots had already been sold in these areas despite official warnings against the practice of prematurely subdividing and selling land.

Mounting opposition from the Audubon Society and the Florida Department of Natural Resources forced Deltona to retreat and regroup. The company, rather than attempt to obtain dredge and fill permits for new areas, decided to concentrate on getting approval to continue and complete the development of Marco Island itself. This included Collier Bay on the northwestern side of the island and Big Key and Barfield Bay on the east, where lots had been sold but no dredging and filling had occurred. Deltona marshaled teams of scientists who conducted studies and slightly modified some of the company's original plans. These studies and plans were presented to the Pollution Control Board in an attempt to obtain state certification.

The Department of Pollution Control staff reviewed all of Deltona's new plans and studies and prepared an official presentation for its Board in February, 1974. It reported that the proposed project would disturb 2,200 acres of mangrove vegetation. The staff estimated the economic value of the affected mangrove areas and indicated that considerable deterioration of water quality could result from their destruction. In view of these negative consequences, the Department's staff recommended that the project, as proposed, be denied. Interestingly, the Pollution Control Board, despite the negative recommendations of its own expert staff, approved Deltona's plans for development in April, 1974. The Board certified that the proposed development would comply with applicable state water-quality standards. Approval hinged on the modification of tributary canals so that mid-canal depths would not exceed 6 feet during mean low tide at distances beyond 800 feet from the mouth of the canal (Allan, Kuder and Oakes, 1976).

The next step was for the Corps of Engineers to review the proposed project. During 1975 the Corps prepared Environmental Impact Statements that included a discussion of the adverse impact associated with the loss of 2,200 acres of mangroves and consequent disruption of the total natural productivity of the area. Despite the

widespread destruction that was occurring, the Corps' discussion tended to favor the development. Criticism of the Corps' Environmental Impact Statement emerged rapidly from several private and governmental agencies. Some of the greatest opposition to the development came from the National and Florida Audubon Societies, the Environmental Defense Fund, and the Natural Resources Defense Council. The end result was a compromise whereby the Corps granted permission for Deltona to complete the development of Collier Bay but denied permission to dredge and fill the more environmentally productive and valuable Big Key and Barfield Bay areas on the eastern side of the island (Allan, Kuder and Oakes, 1976).

**Mitigation or Status Quo**

Obviously, many of the problems created by Deltona are associated with the extreme environmental sensitivity of the site chosen for development. In its natural state, Deltona's property was a wet wilderness composed of barrier islands and keys separated by bays, marshes, mangrove swamps, and flooded lowlands. Much of the property was underwater during high tide, it was vital aquatic habitat, contained nine significant archeological sites, and supported many endangered species. The inhabitants included innumerable species of birds, crustaceans, fish, reptiles, and animals. It also lies almost entirely in a hurricane zone and flood-hazard area. These and other limitations provide a strong indication as to why the development should not have taken place. The extent of this area's inhospitality to man without radical transformation is evidenced by the fact that 85% of the land platted at Marco Island required fill to raise it to 5.5 feet above mean sea level (Milk, 2005).

Deltona did plan to develop the site in phases, a generally accepted very sound planning method. With development taking place a step at a time, Deltona could have revised its original Marco Island design to be consistent with the emerging awareness of the importance of estuarine resources. Yet, the company did not limit contracts to five-year or shorter periods, nor did it coordinate its contracts with receipt of the necessary dredge-and-fill permits. By selling thousands

of lots on two- to twelve-year contracts before receiving state and federal permission to create them, Deltona locked itself into an outmoded plan and left itself vulnerable to unforeseen events. Consequently, the Marco Island project was unable to adapt to the ever more stringent regulation of coastal wetlands (South Florida Water Management District, 2006).

The site's basic layout would be labeled poor by most environmentally concerned planners. Lots and streets are arranged in what is essentially a grid pattern within the network of finger canals. Clustering, which would have allowed preservation of significant natural areas and parks, was not employed.

Not surprisingly, Deltona did not conform to any of the basic sound land use practices at Marco Island. One of the significant issues is associated with the development of areas of critical environmental concern that included wetlands, beaches and dunes, habitats of endangered species, and prime aesthetic, archeological, and recreational resources. Moreover, it has created an entire subdivision in an area hazardous for building. Since Marco Island is in Florida's hurricane zone, its coastal location and low elevation pose a special flood risk for residents. The mangrove zones have, in the past, acted as buffers, slowing down massive tides produced by hurricanes. Without these mangrove and island buffers, hurricane-produced waves and tides will buffet the development.

Land alteration is another significant problem. The dredging and filling of wetlands inevitably resulted in the wholesale devegetation of the areas involved. Because the natural soils were covered with sand dredged from the bottoms of bays, re-vegetation, an important technique to prevent soil erosion, was extremely difficult and slow. While Deltona re-vegetated rights-of-way after road and utility construction, lot owners were responsible for re-vegetating home sites. This policy meant that lots would remain barren for a long period of time. Although re-vegetation remains an issue today, it is not as significant as it was earlier. Most of the vacant lots are now covered with a natural or native grass that flourishes in part because of the long rainy season and temperate climate. Some of the lots even

have trees (Blalock, 2007). The grass-covered vacant lots are home to the burrowing owl. In fact, Marco Island currently has approximately 100 burrows per nesting season with 65% of these producing chicks (Rickie, 2007).

Deltona's water resources protection practices were nearly as inadequate as its land use practices. Most of the subdivision's waterways are canals, many of which were not designed to minimize stagnation. Deltona also failed to utilize numerous known techniques to protect canals and nearby waters from pollution caused by runoff and sewage effluent.

The canals are artificial, deep, and dead-end with little current or tidal flushing action. As a result, they tend to stagnate and become foul-smelling, mosquito-laden lagoons which can be a source of disease as well as discomfort. The City has made a few "cut-throughs" to help alleviate the stagnation problem. While these have helped, city officials seem to think that there will always be a canal stagnation problem at Marco Island (Blalock, 2007).

Deltona's difficulty in maintaining water quality in the canals is exacerbated by its failure to use many of the techniques available for preventing pollution from runoff. Failure to provide an adequate number of buffer filter strips, retention ponds, and swales has created significant problems particularly during periods of heavy rain. This problem is being slowly corrected since the City requires swales for all new single family development and retention basins for all new commercial, multi-family, and any re-development "mixed-use" properties.

Another significant problem is created by pollution from sewage. Deltona provided a central sewage-treatment facility but it served only a small portion of the development. Most homeowners had to rely on individual septic systems. A high density of septic tanks in a relatively small area is often a source of what could become a serious water pollution problem. Now that the city is extending a central system to all lots, many lot owners will pay twice for sewage disposal. One significant expense was for the installation of an individual septic system. A second expense will occur when individuals

are assessed for their share of the central system. A recent decision by city officials illustrates just how expensive it can be to correct some of the shortcomings of the original developer. Homeowners (lot owners) at Marco Island are being assessed more than $20,000 as their individual share of the cost of the mandatory connection to the central waste disposal system designed to cover the entire island (McCann, 2005; Milk, 2005). As would be expected, the septic replacement program is being met with some opposition by current residents who think it is unnecessary or believes that the City should bare the cost of the installation rather than individual property owners (Blalock, 2007).

**Summary and Conclusion**

Although the development of Marco Island got caught in a period of greater environmental awareness and concern over protection of wetlands, the developers succeeded in completing a significant portion of their original plans. The numerous attempts to save Marco Island from development largely failed (Christopherson, 2006). It is now an incorporated city of 15,000 permanent residents and a peak winter season population of 35,000. Marco Island serves as a prime example of how difficult it is to protect an area of critical concern after the fact (i.e. after land development plans have been set in motion). It also shows what persistence on the part of a land development company can mean even in the face of mounting pressure from numerous environmental groups and concerned citizens (Patterson, 1986).

Fortunately, Marco Island is a relatively small project compared to many interstate land sales subdivisions. Yet, in many ways, its environmental impact has been greater than some larger projects in less environmentally sensitive locations. Marco Island's extremely valuable estuarine resource made it incompatible in virtually every way with traditional subdivision and development. Deltona's original plan would have transformed thousands of acres of productive mangrove swamps and bay bottoms into potential home sites and eliminated the habitat of many endangered species and economically vital

fish and shellfish. Although the subdivision is smaller than the developer's original plan, it has placed thousands of people in an area prone to dangerous flooding, particularly during hurricanes. This was clearly evident during the relatively recent strike by Hurricane Rita. The number of vulnerable property owners and the destruction of valuable wetlands would have been higher if the U. S. Army Corps of Engineers had not denied the dredge and fill permits for the eastern portion of the island.

The result of Deltona's long history of subdividing and selling environmentally valuable lands in the hope that regulations would bend to accommodate its practices have been disastrous. Through lack of foresight in a business which puts a premium on an ability to deal with long time spans, Deltona embroiled itself, thousands of consumers, and numerous state and federal agencies in a massive controversy that took years to resolve. The end result of the controversy was the permission to dredge and fill approximately 80% of the island which allowed more than 7,000 home sites to be raised to 5.5 feet above mean sea level. These home sites are being developed at a steady pace with approximately 250 homes being built per year over the last seven years (Milk, 2005). As the island approaches build-out, city officials must do what they can to protect the city from hazards created by many ill-conceived land development practices.

The residents of Marco Island, as other platted lands communities have done in the past, opted to incorporate in August of 1997 as a means to cope with many of the needs of a growing community (McCann, 2005). The council-manager form of government was chosen to address serious island infrastructure problems and issues associated with the layout and design of the community. Some of the most significant problems include bridge and road repair, storm drainage problems, the elimination of septic tanks, the provision of a reliable water supply, increased water treatment capacity, and expansion of the waste water collection system. These needs plus the need to protect residents from hurricanes and frequent flooding are all part of the legacy created by the Mackle brothers and the Deltona Corporation. While this sun-drenched island is considered to be a "tropical

paradise" for some, there are many problems that are yet to be resolved and there is no way to alleviate all of the damage that was done to this environmentally sensitive coastal zone.

One of the few remaining options for city officials and local residents is to tackle one problem at a time and slowly correct some of the many mistakes of the past. Examples include the septic tank elimination plan, efforts to reduce canal stagnation, and reduce the intensity of storm water runoff. Other concerns include the availability of an adequate water supply to meet future needs, problems associated with the lot density reduction program, and the need to provide better protection for the burrowing owl. All of these problems or issues are being addressed by the current city government although progress in some areas has been slow.

Since the Everglades was dedicated as a park back in 1947, the re-plumbing of south Florida has placed the region on ecological life support (Sartore and Levin, 2007). While Marco Island is not technically within the Everglades, it is situated along the southwestern fringe and is part of the development that has led to the re-plumbing of the region. Unfortunately, according to Sartore and Levin, as much as $10 billion has been pledged to repair at least some of the damage but restoration languishes. While some progress has been made with several different Everglades restoration projects such South Golden Gate Estates, a huge failed subdivision located a few miles to the east of Marco Island, it is extremely difficult to implement an environmental restoration plan after an area is occupied by a substantial permanent population such as the City of Marco Island. As a result, local officials must do the best they can to resolve problems in a piecemeal fashion.

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