Miami-Dade County Beach Erosion Control

MASTER PLAN

MIAMI-DADE COUNTY

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Executive Summary

The Miami-Dade County Beach Erosion Control Master Plan is intended to provide a comprehensive summary of the current status of the Miami-Dade shore protection project status, and to identify key needs and issues for the future management of the project. The plan addresses the history and past performance of the project, the identification of problem areas, a summary of completed or proposed projects to address these areas, and a discussion of future challenges regarding the long-term management of the project.

The Miami-Dade County Beach Erosion Control and Hurricane Surge Protection Project was authorized by Congress in 1966 to address severe beach erosion along the Miami-Dade County shoreline, and the associated economic and social impacts to the community. The resulting plan, developed and implemented through the U.S. Army Corps of Engineers, called for the construction of a 10.5-mile protective beach fill extending from Government Cut through Haulover Beach Park. The project was constructed through a series of six contracts from 1975 through 1982 utilizing sand dredged from offshore borrow sources. In 1986, Congress authorized a second phase to the project for Sunny Isles Beach. This 2.5-mile segment adjoined the previously completed segment at Haulover Park, and extended north to the Town Of Golden Beach. Construction of this second phase was completed in 1988.

An integral part of a comprehensive shore protection program is the implementation of periodic nourishment of the project on an as needed basis to maintain the storm protection and recreational benefits of the project. While the performance of the overall project has exceeded original design estimates, a number of areas have required multiple nourishment events to maintain a viable beachfront. These erosional hotspots have accounted for a large percentage of the required nourishment activity since the completion of the project. In an effort to improve the performance cost-effectiveness of the project, a number of project-wide, and site-specific, studies have been conducted to better identify these problem areas, assess the causal factors for the high erosion rates, and develop recommendations for remediating these areas. The studies identified a total of seven areas that could be categorized as erosional hotspots:

1) The North end of Sunny Isles Beach;
2) Bal Harbour Beach;
3) 63rd Street on Miami Beach;
4) 55th Street on Miami Beach;
5) 44th Street on Miami Beach;
6) 32nd Street on Miami Beach; and
7) North of Government Cut.

The recommendations for managing these hotspots range from no action, to structural solutions such as breakwaters and groins. To date, the recommended actions have been completed at four of the seven hotspots, which include breakwater structures at Sunny Isles Beach and 32nd Street on Miami Beach, nourishment and continued evaluation at 44th Street, and structural improvements and sand tightening at the Government Cut north jetty. For the Bal Harbour Beach area, a design modification is currently in the final review phase within the Corps, which recommends the removal and replacement of the existing groin field within Bal Harbour. This project, if approved, will be constructed in conjunction with the next scheduled nourishment. For the 63rd Street hotspot, a submerged breakwater structure has been designed under the Corp's Section 227 Innovative Erosion Control Program, and is scheduled for construction within the next year. For the 55th Street area, a small-scale nourishment project is currently underway, after which erosion rates will be monitored to determine if a series of breakwater structures,

proposed in a previously completed study, is required. A table showing the estimated schedules for these projects is included as Table 1.

While addressing known existing and future erosional hotspots will continue to be an important element for the ongoing management of the project, the identification of sand sources for nourishment of the project will be a major challenge for the future. The large number of nourishment projects completed in Miami-Dade County has largely depleted known offshore sand sources. In addition, changing environmental constraints have limited or eliminated the use of other potential offshore borrow sites. In recognition of this, the Corps and Miami-Dade County initiated the Miami-Dade County Sustainability of Renourishment project (also known as the Test Beach project) to identify potential sand sources for future nourishment of the project. While the project was originally intended as a field test of Bahamian aragonite sand, the use of that source is currently prohibited by Congressional language, which states that non-domestic sand can only be used if no economically viable domestic sources are available. In order to fully evaluate the availability of domestic sources, the Corps developed a sand specification for Miami-Dade beaches, which would be used to allow industry to identify potential sources. An initial bid in 2003, limited to inland quarries could not be awarded due to cost. In preparation for a second solicitation in 2005 open to any domestic source, the dredging industry proposed the use of several large shoals in Federal waters offshore of Martin and St. Lucie counties. The proposed use of these shoals met heavy public and political opposition during public scoping, and they have been eliminated from consideration. At present, the Corps is evaluating whether sand sources offshore of Palm Beach County might be used to supply sand for the Miami-Dade project. Preliminary indications are that there are insufficient quantities of beach quality sand to even full provide for the future needs for Palm Beach County, making it highly unlikely that these areas can be used for Miami-Dade. If this is the case, the Corps may conclude that no viable domestic sources are available, and seek authorization to pursue non-domestic sources.

To provide for shorter-term needs, Miami-Dade County has a number of investigations underway to identify sources of nourishment material. These include deep-water sand searches, geotechnical evaluations of previously-used borrow sites to determine if small, but usable quantities of sand remain in them, the use of flood and ebb shoals at Haulover Inlet, and backpassing of sand from accretional to erosional areas. With regard to the last option, a consultant to Miami-Dade County is currently conducting an analysis of potential methodologies to backpass sand from these accretional areas in a cost effective manner, while minimizing disruption to existing beach uses. Sand back passing may prove to be the most cost-effective sand source for conducting periodic small nourishment projects.

Lumus Park at South Beach

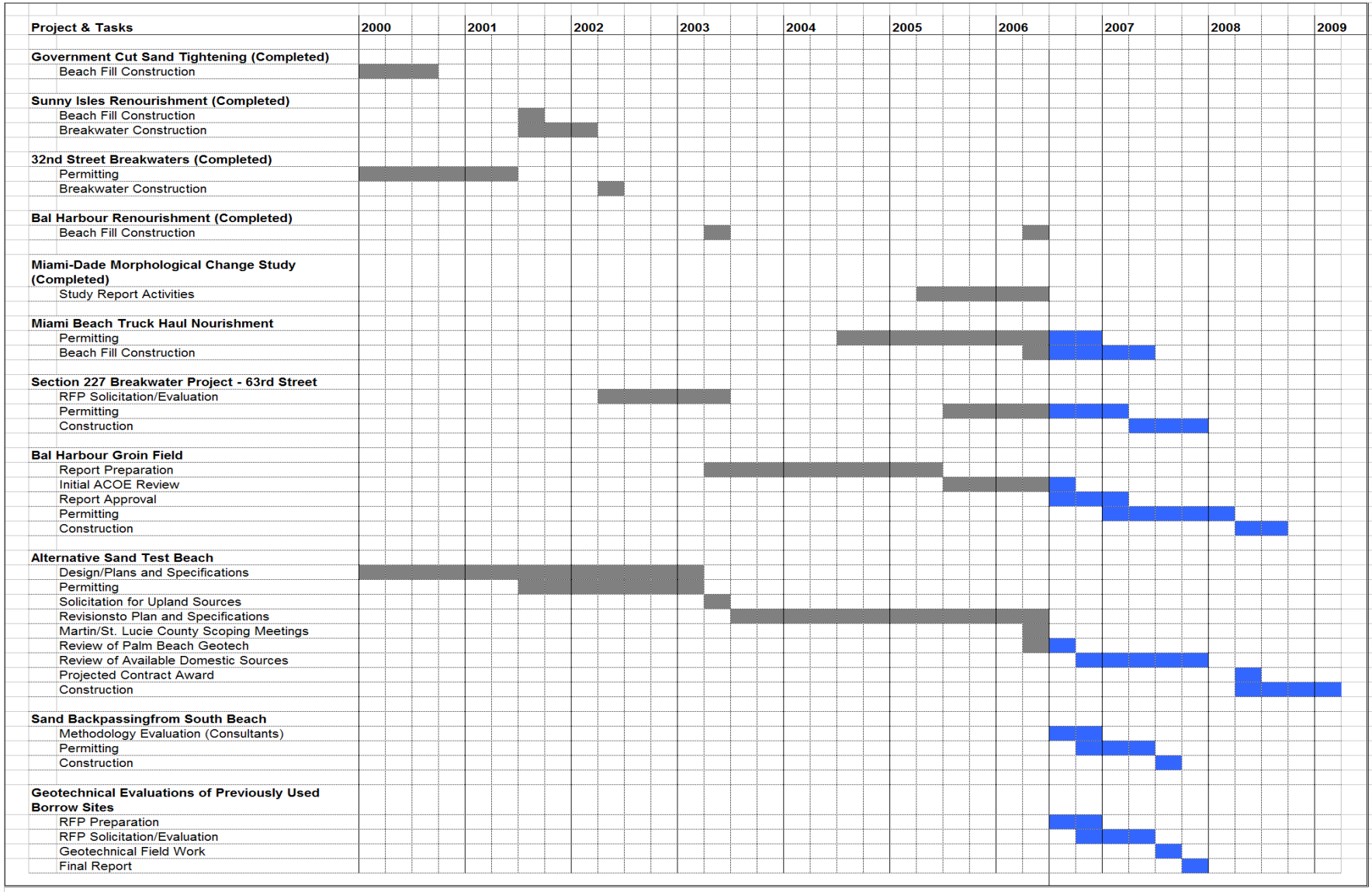
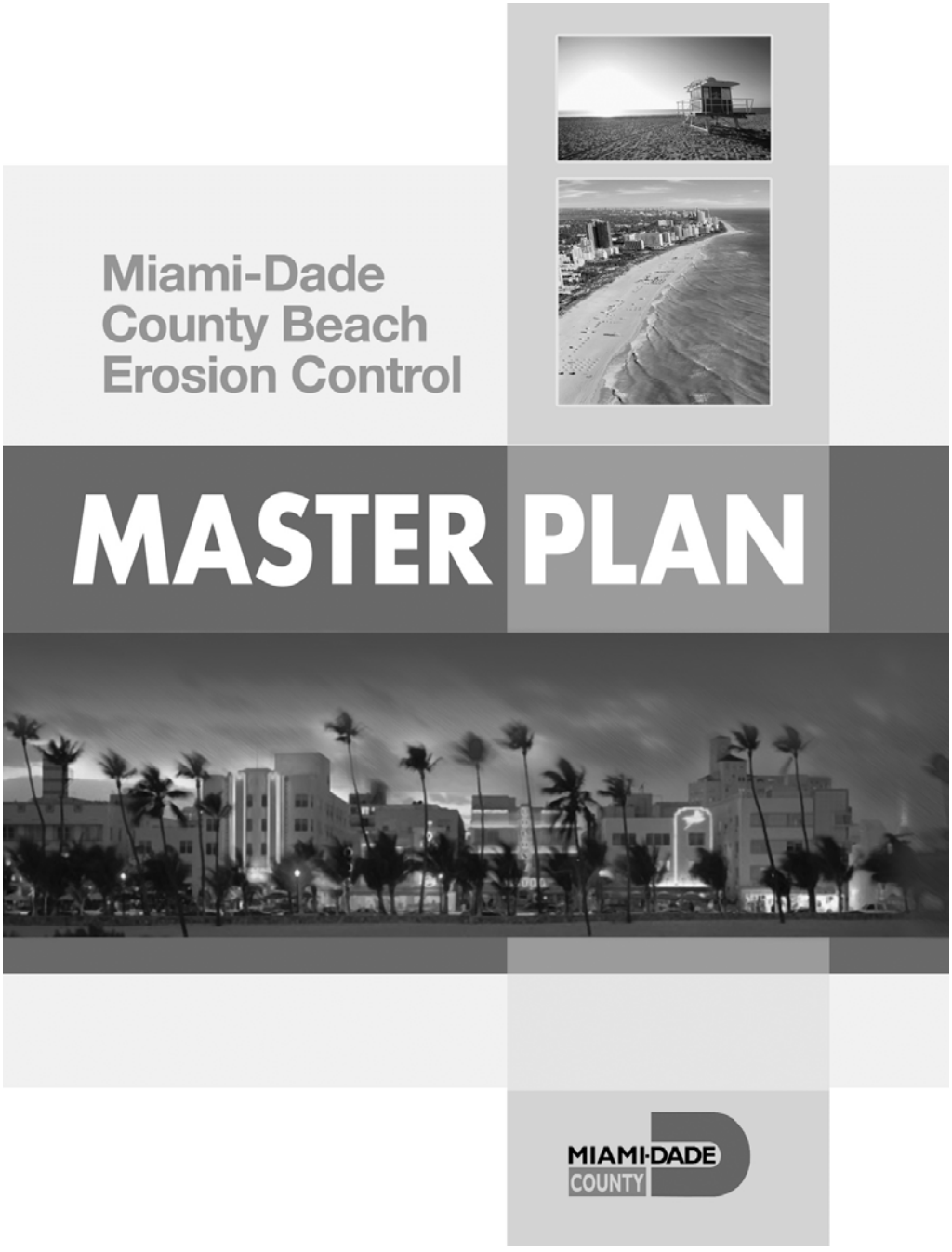


Table 1
Miami-Dade County
Beach Erosion Control Master Plan
Estimate Project Schedules (From 2000)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Introduction and Purpose

This document is intended to provide a comprehensive summary of past and planned beach erosion control activities for the segment of shoreline extending from Government Cut through Sunny Isles Beach. This beach area constitutes the limits of the Miami-Dade County Beach Erosion Control and Hurricane Surge Protection Project, which is authorized by Congress, and administered by the U.S. Army Corps of Engineers. In addition to the Federal and non-federal beach erosion control projects, the plan will also provide information on past studies conducted, their conclusions and recommendations, and plans and time-lines for implementation, where applicable.

Conditions

Miami-Dade County's sandy beach areas are located on the Atlantic side of several coastal barrier islands separated from the mainland by Biscayne Bay. The project area covered in this document is 13.2 miles in length, extending from Government Cut on the South to the southern limit of the Town of Golden Beach on the north. The barrier islands in this section are relatively low, with natural elevations ranging from +5 to +10 feet Mean Low Water (MLW). Unlike most natural barrier islands that migrate landward over time, the Miami-Dade barrier island system is situated atop a rock ridge, and maintains its location relative to the mainland. Wave energy is in the project area is low relative to other portions of Florida, primarily due to the proximity of the Bahamas Banks, which provides a sheltering effect from most oceanic storm waves. The project area includes only two inlets, both of which were artificially created. Government Cut, which is located at the southern terminus of the project, was created by dredging activities through the southern tip of Miami Beach in 1904 to improve shipping access to the Miami River. Bakers Haulover Inlet, located nine miles north of Government Cut, was created in 1925 by dredging through a narrow section of the barrier island to provide boating access to Biscayne Bay. The project area is currently heavily developed with multi-story commercial and residential buildings. The area includes the municipalities of Miami Beach, Surfside, Bal Harbour, and Sunny Isles beach, as well as the County-owned Haulover Beach Park.

Project Need

Upland development in the project area is relatively recent, with major growth occurring in the late 1930's. Beach erosion problems were negligible until the passage of the 1926 hurricane. This Category 3 storm caused structural and flood damage to existing buildings and infrastructure on the island, as well as significant beach erosion. This damage prompted the first efforts at beach erosion control, largely consisting of the installation of sheet pile or wood groin fields. The use of these structures became so extensive that littoral sand movement was restricted, and sand lost to offshore areas began to occur during storm events, leading to additional shore erosion. By the mid 1950's, over 56% of the shoreline within the project area had no dry beach at high tide (U.S. Corps of Engineers, 1974). In addition to the impacts the lack of a beach had on the tourism economy, the lack of a protective beach often led to extensive property damage during storm events.

To address these problems, local interests requested Federal assistance. In the 1966 Flood Control Act, Congress authorized the Corps to evaluate the beach erosion problem and develop a recommended course of action. While a number of alternatives were considered, the Corps ultimately recommended the construction of a 10.5-mile beach nourishment project from Government Cut through Haulover Beach Park, to provide protection from storms, as well as a

viable recreational beach. A local cooperation agreement between the Federal government and the County was executed in October of 1972, providing the terms for cost sharing and establishing a ten-year project life. This agreement was amended in 1986 by the Water Resources Development Act (WRDA), which added the 2.5-mile Sunny Isles Beach segment to the original project, and extended cost sharing for both sections to fifty years.

Project Design

After consideration of a number of potential alternatives, the Corps selected plan was comprised of a beach fill placement extending the 10.5 mile length from Government Cut through the north limit of Haulover Beach Park (Figure 1). For the highly developed segment from Government Cut through Bakers Haulover Inlet, the plan called for a 75' wide surge protection dune, followed by a 50' flat berm at an elevation of +9.0 feet, with natural seaward slopes. In Haulover Beach Park, which has little upland development, the surge protection dune feature was eliminated. The project design is intended to provide an 80% reduction in storm damage during a 100-year storm event. Sand for the project would be dredged from a series of offshore borrow sites located along the length of the project. Following Congressional authorization in 1986, the Corps initiated design work on extending the protective beach north an additional 2.5 miles throughout the Sunny Isles area. The Sunny Isles Beach plan called for the construction of a 20'-wide level berm at an elevation of +9.0 feet, with natural seaward slopes.

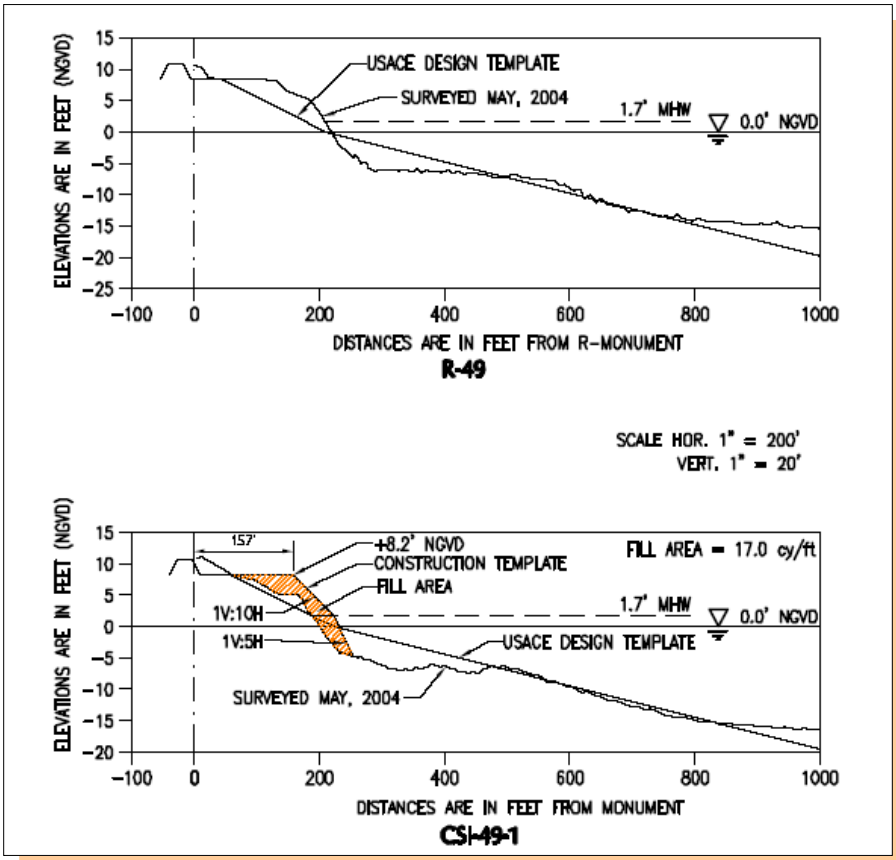


Figure 1

Design Template for the Corps Selected Planof Beach Fill Placement at 55th Street Area in Miami Beach

Project Funding

Initial Project Funding **-** Pursuant to the terms of the existing Local Cooperation Agreement (LCA) between the Federal Government and the County (Appendix 1), the Federal Government provides approximately 50% of the total cost of project implementation, including engineering and design. This Federal share is subject to Congressional appropriations. At the time of initial construction, the Florida Department of Natural Resources (now the Florida Department of Environmental Protection) provided up to 75% of the remaining non-federal project cost-share through a grants program funded through annual line item appropriations from the State General Revenue Fund, with the remaining non-federal funds provided by the County.

The $9.1 million County share for initial construction of the segment from Government Cut through Haulover Beach Park was provided by the Decade of Development bond issue, which was passed by Miami-Dade voters in 1972. In addition to funding the beach restoration project, these bonds were utilized to fund a number of large capital infrastructure projects throughout the County. Construction of the Sunny Isles segment of the project was conducted well after the issuance of the Decade of Development bonds, so the $2.6 million County share of the project cost was allocated from the County's Capital Outlay Reserve Fund.

Federal Funding - Miami-Dade County requests funds annually to support the Federally administered portion of the project, with appropriated funds being allocated to the U.S. Army Corps of Engineers, Jacksonville District. While for the past dozen years, there has been little support for beach nourishment from the administration, Congress has strongly supported these projects through Congressional adds. For FY 2007-08 Miami-Dade County has requested $7.5 million to provide the Federal share of the pending Alternative Sand Test Beach Project.

State Funding - State funds are provided to Miami-Dade County through the State Florida Department of Environmental Protection's Beach Erosion Control grants program. This program is allocated $30 million per year from State documentary tax stamp revenues to provide the State share of beach erosion control activities. Program guidelines allow for the State to provide up to 50% of the non-Federal cost of these activities. The percentage of State funding allowed is based on ranking criteria, which include public access parking, project need, and a number of other factors. Miami-Dade County has requested $6,250,000 in State funding for FY 2007-08 to fund the State share of the Alternative Sand Test Beach, and a pilot project to backpass sand from accretional to erosional areas. A copy of Miami-Dade's Ten Year Beach Erosion Control Capital Plan for FY 2007-08, which is updated and submitted to the State annually, is attached as in the Appendix.

Local Funding - Historically, the County share for most recent beach erosion control projects was derived from direct appropriations as needed from the County's Capital Outlay Reserve Fund. In 2005, County voters approved the issuance of a new bond series to fund a variety of major capital improvements projects throughout the county. A total of $17.5 million in bond funds have been earmarked for the County share of beach erosion control projects.

Initial Project Construction

The initial 10.5-mile construction phase was initiated in 1975, and continued through a series of six separate construction contracts through 1980 (Figure 2). Constructing the project designs required the placement of 13,878,000 cubic yards of sand, at a cost of approximately $56.8 million. Initial construction of the Sunny Isles Beach segment was initiated and completed in 1988. This project required 1,496,000 cubic yards of sand at a cost of $19.3 million. At the present time, projects to address the erosion concern in these areas are shown in the following sketch.

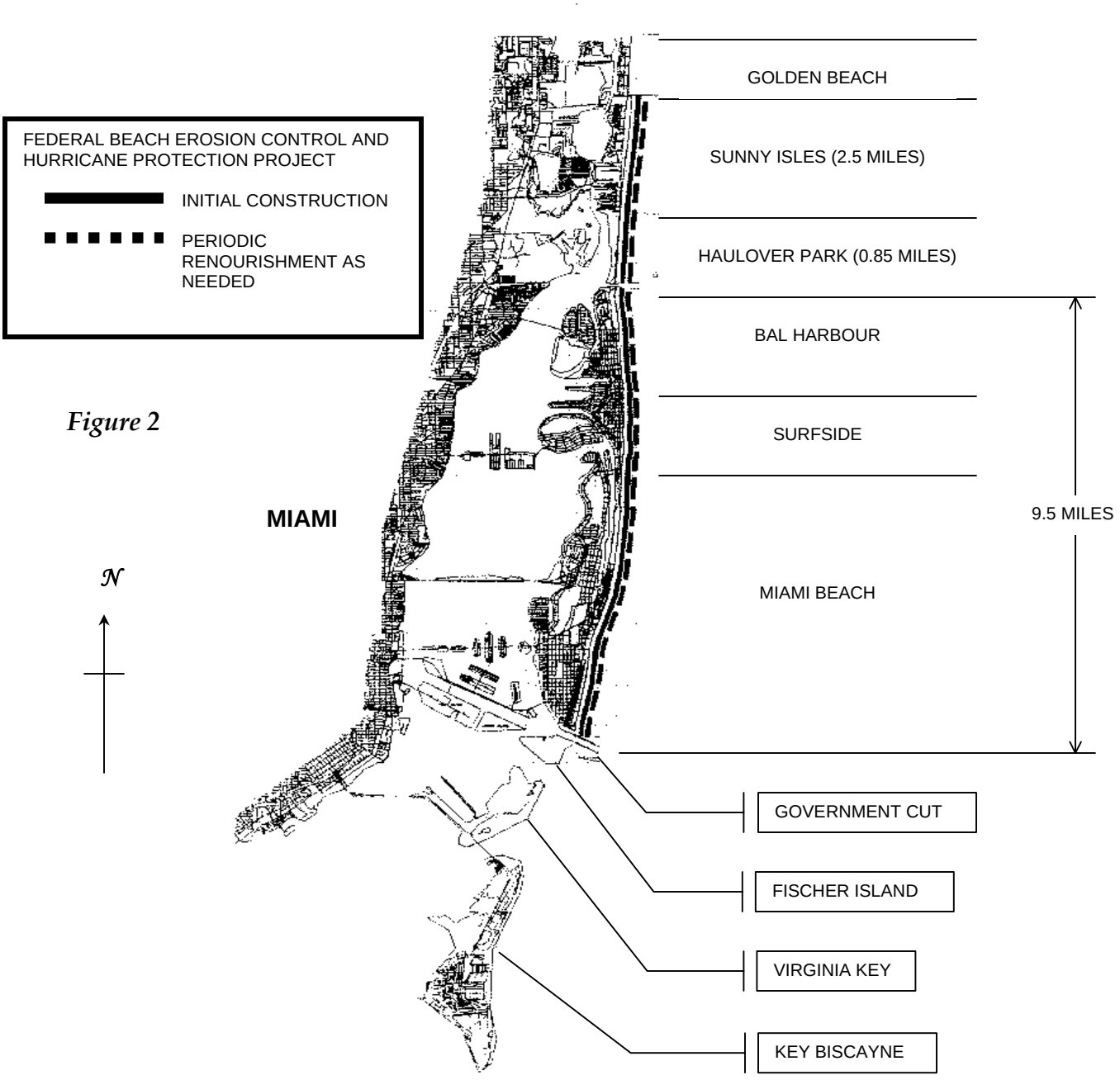


Figure 2

DADE COUNTY BEC & HP

Since the initiation of the project in 1975, a total of 18,401,000 cubic yards of sand has been excavated from these borrow sites to provide material for the initial construction and periodic maintenance of the Miami-Dade project. Because of the length of time these sites have been utilized, and the large number of projects completed, almost all of these sites have been depleted of usable sand. Also, unlike some borrow areas such as shoals that can refill through natural processes, the sand in the Miami-Dade offshore borrow sites is biologically produced (shell and coral fragments, etc.), a very slow process which makes refilling of previously used sites unlikely within a reasonable time frame. At the present time, only one borrow site (SGC-EXT-1-southernmost site offshore of Key Biscayne) contains sufficient sand to conduct a major nourishment project. Currently, the SCG-EXT-1 borrow site is planned to serve as an emergency reserve sand source while viable alternative sources are identified. This section is intended to provide an update on all projects currently underway or in the development phase. For pending projects, schedules are based on current information, and are subject to revision.

On-Going Projects

Miami Beach Truck Haul Nourishment Project - This project is a relatively small nourishment of three localized erosional hotspots located at approximately 27th, 44, and 55th Streets in Miami Beach (Figure 3). The project will place a total of 110,000 cubic yards (30,000, 50,000, and 30,000 cubic yards. at 27th 44th, and 55th Streets, respectively) of beach quality sand trucked in from inland quarries. Construction at was initiated in April 2006, and is to be completed by the end of November 2006. The total estimated cost of this project is approximately $3.2 million, which will be cost shared equally between the State and County.

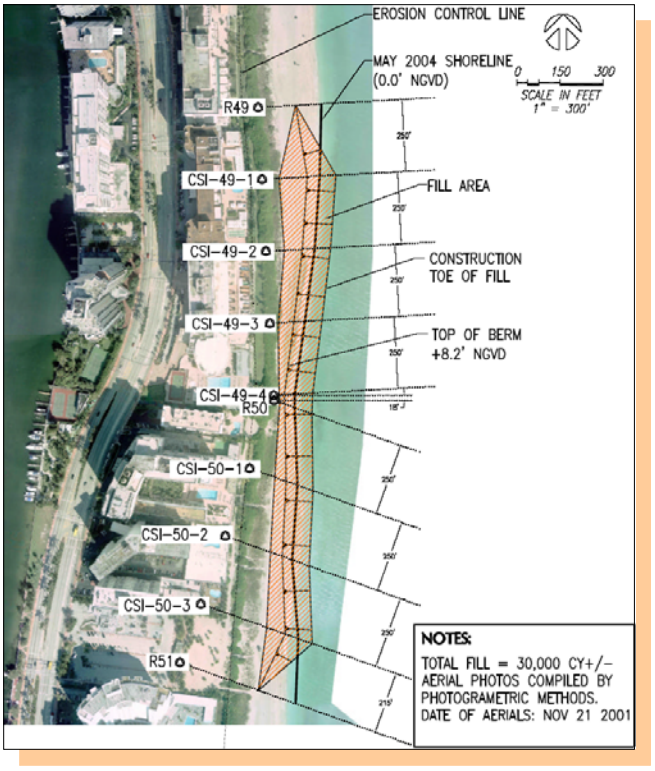


Figure 3

Miami Beach Truck Haul Project 55th Street Area

Alternative Sand Test Beach Project - As was discussed previously, this project will utilize a sand specification to solicit potential sand sources for future nourishment of the Miami-Dade County project to replace depleted offshore borrow sites. The project itself calls for the placement of 1.1 million cubic yards of sand from 63rd to 84th Streets in Miami Beach. In addition, Miami-Dade County has requested that the Corps evaluate the possibility of including erosional areas to the south at 55th 44th, and 27th Streets as a bid option to the project to provide for a large-scale nourishment of those areas. The current estimated cost of this project is $30.0 million, with Federal, State, and local cost shares of $15.0 million, $7.05 million, and $7.95 million, respectively. The history of this project dates back to the mid-1990's, and was originally intended to be a field test of Bahamian aragonite sand. This effort was precluded by language contained in the 1986 WRDA bill, which prohibits the expenditure of Federal funds on non-domestic sand sources unless it can be demonstrated that no viable domestic sources are available. Since that time, the project has been re-directed in an attempt to identify domestic sources that are economically and environmentally viable. In 2003, the Corps conducted a solicitation for the project that was limited to domestic, inland quarries supplying sand meeting the Miami-Dade County sand specification. In addition to the sand quality, the bid required that the sand be delivered by water to the beach since it was felt that a trucking project of that magnitude was not viable due to infrastructure impacts and public safety. Although three bids were received, none were economically viable.

The project specifications were revised to allow for any domestic source of sand in anticipation of a 2006 solicitation. Although any source of sand meeting the specification was allowed, all prospective bidders indicated that they intended to propose using several large shoals located approximately 5 miles offshore of the Martin/ St. Lucie County line. These areas contain approximately 25 million cubic yards of sand and are located in Federal waters administered by the U.S. Minerals Management Service. In advance of the solicitation, as part of the required environmental coordination of the project, the Corps held a series of environmental scoping meetings in Martin, St. Lucie, and Miami-Dade counties to gather information regarding the use of these areas. The meetings generated significant public and political opposition, and the Corps has removed these areas from consideration.

The only other known viable sand sources are those located offshore of Palm Beach County. The 1994 Coast of Florida Study conducted by the Corps identified up to 635 million cubic yards of sand offshore of Palm Beach based on available geotechnical information. In May 2006, an interagency meeting was convened in Palm Beach to evaluate the potential use of these sand sources to provide future nourishment material for the Miami-Dade County project. At the meeting, Palm Beach staff indicated that additional geotechnical work conducted after the completion of the Coast of Florida Study indicated that much of that potential material did not meet current beach renourishment quality requirements for beach placement, significantly reducing the quantity of sand available. In addition, a large number of existing and significant pending projects in Palm Beach County will require that most of the identified borrow sites be maintained in order to provide for future nourishment needs.

At present, the Corps is evaluating all available geotechnical information for beach renourishment sources offshore of Palm Beach County to determine if sufficient quantity is available to supply Miami-Dade County. If it is determined that Adequate sand supplies do not exist offshore of Palm Beach County, the Corps may seek relief from the

restrictive language that prohibits consideration of non-domestic sources. The current schedule calls for the Corps to make this determination in mid 2007.

National Shoreline Erosion Control Development and Demonstration Program Section 227 Innovative Erosion Control Program: 63rd Street Breakwater - The Section 227 program was authorized by Congress to allow the Corps to construct and evaluate innovative erosion control technologies that might then be used to improve project performance of existing or future Federal shore protection projects. In its initial phase, a total of six sites, including the 63rd Street hotpot in Miami Beach, were selected nationwide to implement the program. Following a Request For Proposals, the selection committee selected a 2,000 foot-long submerged breakwater structure for the Miami Beach site. Although delayed for months, the project is currently funded and proceeding towards construction. At present, $2.0 million is available for construction of the project. URS Corporation is currently evaluating whether available funds will be adequate to construct the project as originally proposed. If available funding is not sufficient, the project may be scaled back if it will not compromise the effectiveness of the breakwaters, or the County may provide additional funds to accomplish the desired outcome. Construction is anticipated in the summer of 2007.

Bal Harbour Design Memorandum - The Corps has completed a Design Memorandum for the Bal Harbour segment of the Miami-Dade shore protection project which contains recommendations to improve project performance. Bal Harbour currently has 6 rubble mound and timber groin structures that were constructed in the early 1970's. These structures are uniform in length and have deteriorated significantly in some cases. The Design Memorandum recommends the removal of these structures and replacing them with a series of 5 T-head groins. The groins would be progressively shorter in length going from north to south. The function of the groins is to improve the durability of the beach fill by compartmentalizing it and providing some wave energy attenuation because of the T-head. The Design Memorandum is currently undergoing internal review within the Jacksonville District, after which it will be forwarded to the South Atlantic Division Office for formal approval. Once approved, project permitting will be initiated. The current project schedule calls for construction of the groin improvements to occur in late 2008 immediately prior to or in conjunction with the next scheduled nourishment of the Bal Harbour area.

Sand Backpassing from Accretional to Erosional Areas - The southern portion of Miami Beach from approximately 22nd to 5th Streets has been accretional since the initial construction of that area in 1980. Given the scarcity of offshore sand sources, this excess material can provide a very cost effective source of borrow material for relatively small nourishment projects. The Miami-Dade County Morphological Change Study (Coastal Systems International, 2006) stated that approximately 60,000 cubic yards per year could be backpassed to erosional areas without impacting the existing shoreline. In 2002, when the 32nd Street breakwaters were constructed, approximately 125,000 cubic yards of sand was excavated from this area and used to backfill behind the structures to minimize any downdrift effects that might otherwise occur. For that project, material was loaded into all-terrain dump trucks and transported north to the breakwater site. While this method was very cost effective, there were concerns regarding the disruption of the beach and possible public safety issues. In order to evaluate alternative methodologies for backpassing sand,, Miami-Dade County has contracted with a consulting firm to provide an analysis of methodologies and their associated cost. The analysis will evaluate the feasibility of moving the sand hydraulically by water or shore based dredge,

trucking, and other methods that would be cost-effective and less disruptive to the use of the beach. This report should be completed in November 2006. In anticipation of this report, Miami-dade County has included a funding request in its FY 2007-08 State Beach Erosion Capital Plan to provide for the implementation of periodic sand backpassing from accretional to erosional areas to the north. The County is currently in the process of awarding a blanket contract to provide earth moving services by dredging or trucking to allow for the excavation and transport of sand as needed. This contract will also allow for rapid response to storm impacts should they occur. Depending on the report recommendations and permitting of the preferred method, it is expected that backpassing could begin by the summer of 2007.

Geotechnical Assessment of Previously Used Borrow Sites - While most of the borrow sites offshore of Miami-Dade County have been depleted, there may be small, but usable quantities of sand available within and around these sites. In addition, in the original geotechnical design for the project areas with less than 10' of sand depth were not evaluated due to the fact that the dredges used at that time required thick sand deposits in order to operate efficiently. Dredging technology today can efficiently utilize, much thinner beach renourishment layers, making these areas not considered initially viable sand sources. Miami-Dade County has State grant funds under contract to conduct a geotechnical assessment of these areas to determine the quantities of sand potentially available. A general Scope of Work is currently being developed which will be utilized to issue a Request for Proposals for conducting the assessment. It is anticipated that the RFP selection process will be completed within the summer of 2007, with the assessment requiring an additional 6 to 8 months to complete.

Developing Alternative Sand Source And Usage Programs

The exploration of Florida's available sand resources and accompanying solutions to coastal erosion are the major intent of the BECMP. Addressing technical and regulatory concerns associated with beach renourishment management in a systematic and consistent manner across Miami-Dade County's coastline is critical if such management and solutions are to succeed. This program guides through receiver site evaluation, source material identification, testing protocols, implementation, and monitoring.

Bahamian/ Caribbean Sand Sources

The need to identify alternative sources of future nourishment material for the maintenance of the project was recognized in the early 1990's. Early in the evaluation of potential alternatives, sand from the Bahamas Bank was identified as the prime candidate to provide sand for the future nourishment of southeast Florida beaches. The Bahamas Bank is an extensive platform comprised largely of ollitically-produced calcium carbonate sand banks located as close to 55 miles from the Florida coast. These areas are largely devoid of resources, and could provide very high quality sand. In 1995, a series of conferences sponsored by the Corps were held in Miami, Tallahassee, and Jacksonville, Florida entitled "the Miami-Dade County Sustainability of Renourishment". The objectives of the meetings were to bring together agencies, industry representatives, and the private sector, to initiate the identification of potential long-term sand sources for the Miami-Dade project. Although numerous sources were discussed, the Bahamian sources appeared to be having the most promise. Following the conferences work was initiated at many levels to pursue Bahamian sources. Miami-dade

County Department of Environmental resources Management (DERM) initiated a multi-year study to assess the possible effects of Bahamian sand on sea turtle hatchlings. The Corps began to develop a plan for geotechnical investigations and worked through the State department to initiate conversations with the Bahamian Government regarding permission to sample several areas of the Bahamas Bank. In addition, the Corps began to develop plans and specifications for what was to be a large-scale test nourishment using Bahamian aragonite in northern Miami Beach called the Alternative Sand test Beach Project. Further Federal work on non-domestic sand sources was effectively halted in 1996 when the Corps Office of General Counsel determined that language inserted in the 1986 Water Resources Development Act (WRDA) did not permit the Corps to consider expending Federal funds on non-domestic sand sources for beach nourishment, unless it could be demonstrated that no viable domestic sources were available. This language, developed at the request of the United States dredging industry, was intended to protect the domestic fleet from foreign competition.

Alternative Sand Test Beach Project

As a result of the above-mentioned determination, the focus of the Alternative Sand test Beach project turned from Bahamian to potential domestic sources. In order to allow for the broadest range of potential sand sources, a multi-agency committee was established to determine a specification for sand specific to the Miami-Dade County project. The specification would be used to bid the project, thereby allowing industry the ability to utilize any sand source meeting the specification. An initial solicitation using the specification was made in 2003, limiting the bid to domestic inland sand sources. Three proposals were received, however the prices associated with the proposals were beyond the limits under which the Corps could award the contract. A second solicitation was prepared, expanding the allowable sources to all domestic sources. The dredging industry unanimously converged on a large shoal system offshore of Martin and St. Lucie counties in central Florida. At a series of public environmental scoping meeting prior to bidding the project, strong public and political opposition to the use of those sources for Miami-Dade County was encountered, and the Corps has eliminated that source from consideration. At present the Corps is evaluating possible sources offshore of Palm Beach County, but preliminary meetings indicate that similar opposition will be experienced for those proposed sources. In addition, it is likely that the quantities currently identified may not even be sufficient to sustain existing and planned projects in West Palm Beach into the foreseeable future. Should the Palm Beach sources prove to be not viable, the Corps may opt to examine whether the WRDA requirements prohibiting the consideration of non-domestic sources have been met. In addition, Miami-Dade County has been communicating with representatives of the dredging industry to attempt to lift the prohibition on domestic sources while protecting their interests.

Other Sand Sources

In addition to the utilization of the sand specification to identify sand sources, a number of evaluations are completed or are underway to determine if other sand sources might be used to maintain the project while other longer-term options are developed. Among the sources being considered are:

1) Upland Sand Sources- numerous sources of sand meeting the Miami-Dade County sand specification are available and have been utilized on a number of small nourishment projects. A disadvantage is that size of the projects that can be completed with these sources is limited due to the use of trucks.
2) Deep Water Sand Sources- In 2000 Coastal Planning and Engineering completed an initial assessment of potential sand sources in water depths of 170' to 350'. The study indicated that there may be some potentially viable sources in water depths of greater than 250'. The United States dredge fleet does not currently possess equipment capable of dredging at those depths, so new equipment would either need to be fabricated or purchased from another source.
3) Re-evaluation of Previously Used Borrow Sites- Previously developed borrow sites, while largely depleted during the initial construction and maintenance of the Miami-Dade project may still contain usable quantities of sand to conduct smaller nourishment projects. Funding for a geotechnical evaluation of these areas is currently available and a Request for Proposals to conduct a geotechnical assessment of these areas is currently in preparation.
4) Bakers Haulover Ebb and Flood Shoals- Shoals formed inshore and offshore of Baker's Haulover Inlet can provide a good, though limited source of sand for the nourishment of beach areas adjacent to the inlet. These sources do regenerate due to sand loss at the inlet, and so can be used repeatedly.
5) Backpassing of Sand from Accretional to Erosional Areas- South Miami Beach from approximately 22nd Street to Government Cut has acted as a repository for sand migrating from the north and has had significant accretion since initial construction. Because of this, it is feasible to utilize this material to nourish erosional areas to the north without impacting the storm protective functions or recreational uses of the beach. The Morphological Change Study (Coastal Systems International, 2006) concluded that this area is accreting approximately 60,000 cubic yards per year, which could be used on an ongoing basis as a source of nourishment material. Miami-Dade County has a consultant currently conducting an evaluation of methodologies available for moving the material while minimizing disruption of the beach.

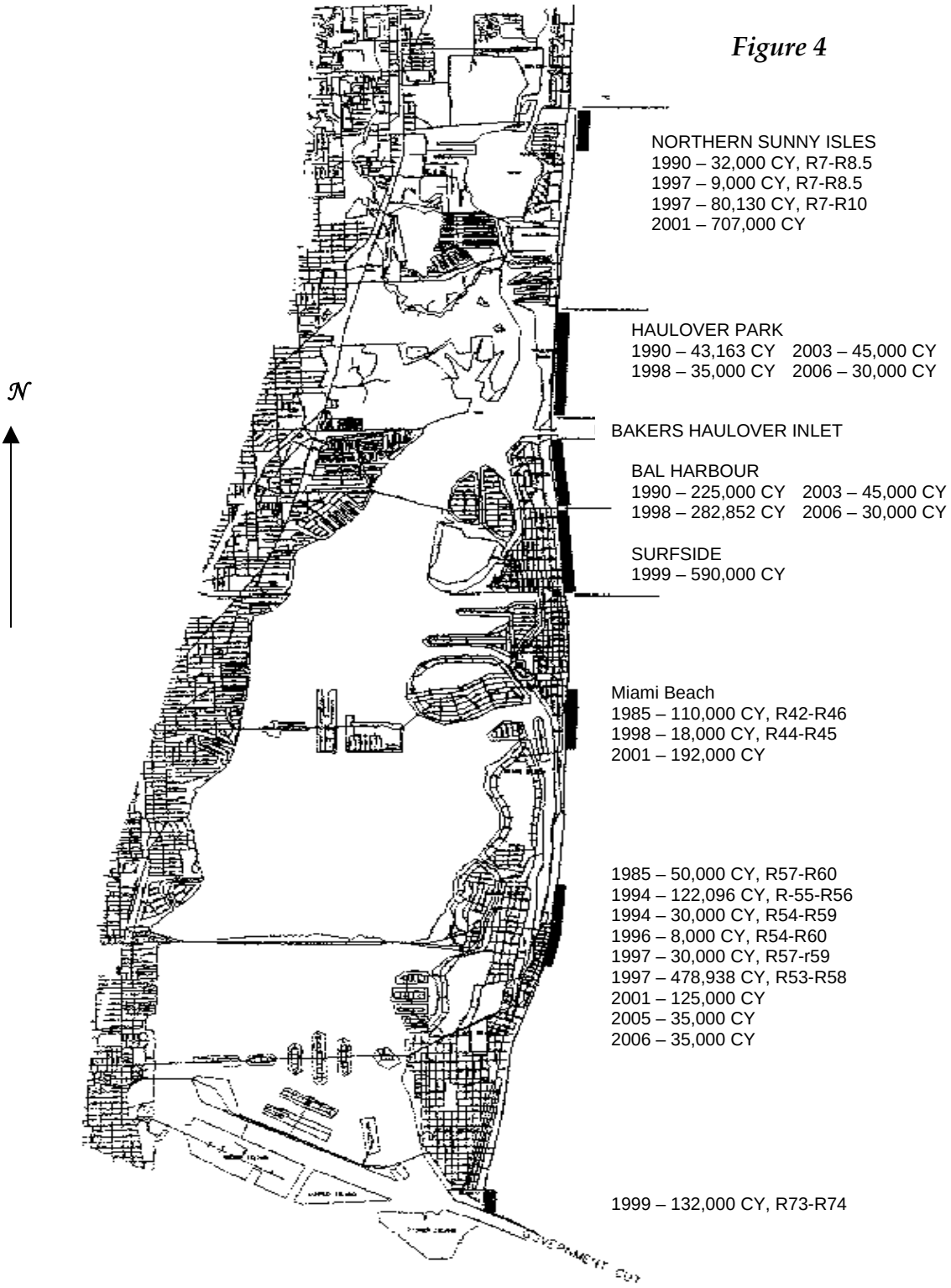
Periodic Nourishment and Maintenance

Following initial construction of the beach fill, it is necessary to conduct periodic nourishment of the project through the placement of additional sand to offset losses to storms and other factors. These nourishment projects may either be large dredging projects administered by the Corps, or in the cases of more localized erosion, smaller projects utilizing sand trucked in from inland quarries or other sources. In Miami-Dade County, nourishment projects are planned and implemented on an as-needed basis. The County conducts surveys of the entire Miami-Dade shoreline minimally on an annual basis.

These annual surveys are supplemented by permit-required monitoring related to specific projects, and post-storm surveys of eroded areas as necessary. The resulting profiles are subsequently compared to the design sections of the Federal project by County consultants and the Corps. Areas where the profiles are nearing the Federal design section are targeted for nourishment and the design and permitting is initiated for those areas.

Figure 4 provides a summary of nourishment activities conducted on the project since its initiation in 1975. Through mid-2006, a total of 26 nourishment projects have occurred, with 11 of these major nourishment events in excess of 100,000 cubic yards. Many of the remaining smaller placements were emergency truck haul projects to address several persistent erosional hotspots, particularly at the north end of Sunny Isles Beach (3 small projects), and from 27th to 34th Streets in Miami Beach (7 small projects). Breakwater structures have been installed at both these locations to moderate the high erosion rates with some success, and are discussed in a subsequent portion of this report. The four projects shown for Haulover Park are not indicative of highly erosional conditions, but rather that the area has been used as a disposal area for maintenance dredging of beach quality sand from the Intracoastal Waterway just west of the park. More recently, these maintenance-dredging events have utilized Bal Harbour beach as the preferred disposal site for dredged material.

Figure 4



DADE COUNTY BEC & HP
PERIODIC RENOURISHMENTS

Project Studies

The Miami-Dade County Shore Protection project currently has one on the longest histories of any program in the country. This history has enabled the Corps and the local sponsor the ability to assess project performance in a long-term sense, and determine ways to improve performance and effectiveness. These assessments may be qualitative, by the observation of persistent erosion areas that occur across the project length, or may be more subtle quantitative trends documented through the evaluation of survey data. There have been a number of studies conducted on various aspects of the project to assess performance. While each of these studies played a role in influencing the management of the project, three in particular were critical in influencing how specific problem areas were identified and addressed. A summary of each of these studies is provided below:

Dade County Regional Sediment Budget Report (Coastal Systems International, 1997)

This study was the first comprehensive evaluation of long-term volumetric and shoreline position change trends conducted since the initial restoration of the project. The intent of the study was to identify large-scale beach renourishment transport along the project length, as well as possible causes for known erosional hotspots. The study identified serious erosional hotspots at 32nd street, 63rd street, and the extreme north end of the project in Sunny Isles Beach. Based on this report, site-specific studies were conducted on the hotspots identified to better define the causes and develop recommendations to address them. The study also identified and quantified the high rates of accretion occurring in the southern portion of the project from Government Cut through 32nd Street.

Dade County, Florida-Beach Erosion Control and Hurricane Protection Project Evaluation Report (U.S. Army Corps of Engineers, 2001)

This report conducted by the Corps was a re-evaluation of the project since initial construction, combined with recommended modifications to improve project performance and cost-effectiveness. In general, the report was in agreement with the beach renourishment budget previously completed (Coastal Systems International, 1997) but identified two additional erosional hotspots located within Bal Harbour, and immediately north of Government Cut. The study also recognized that sand sources offshore of the project area historically used to nourish the beaches were rapidly being depleted, and it would be critical to identify alternative sources for future project maintenance.

Miami-Dade Morphological Change Study (Coastal Systems International, 2006)

This study was intended to fulfill a number of purposes:

1) Update the 1997 regional beach renourishment budget. Since the completion of that study multiple large-scale nourishment projects and

several structural modifications to the shoreline had occurred which would significantly influence beach renourishment transport.
2) Assess the status of previously identified erosional hotspots, and identify any less severe, but persistent areas of erosion.
3) Quantify high rates of accretion at the southern portion of the project and assess the feasibility and methodologies available to backpass sand from accretional to erosional areas.

The morphological change study noted much larger quantities of beach renourishment transport across the project than the 1997 regional beach renourishment budget. These increases were attributed to several large nourishment projects which had recently been completed, as well as higher levels of storm activity than had occurred during the previous evaluation period. In addition to the five erosional hotspots previously noted, the study also identified two "second tier" erosional hotspots located at approximately 44th and 55th streets.

Identifying and Prioritizing Projects

An evaluation of each of the reports above clearly indicates that erosion, measured as either volumetric changes or shoreline position, is not uniform across the length of the project. To date, approximately 40% of the project length has required no maintenance nourishment since the initial restoration in the late 1970's, while other areas have required multiple nourishments to maintain the beach. As such, the identification and remediation of these persistent erosional hotspots is a key element to successfully managing the shore protection project. The three studies identified a total of seven erosional hotspots:

	Location	***Suspected Cause***
1)	*55th Street- Miami Beach*	*Unknown- Possible Headland Effects*
2)	*44th Street-Miami Beach*	*Unknown*
3)	*32nd Street- Miami Beach*	*Change in Shoreline Orientation*
4)	*North End of Sunny Isles Beach*	*End losses to Golden Beach*
5)	*Bal Harbour*	*Downdrift Inlet Effects*
6)	*63rd Street- Miami Beach*	*Unknown- Possible Headland Effects*
7)	*North of Government Cut*	*Permeable Jetty*

North End of Sunny Isles Beach

This area has experienced high erosion rates since the completion of the project in 1988. Beach renourishment budgets completed to date clearly indicate that the erosion is the result of end losses from the northern 1,000 feet of Sunny Isles Beach into the Town of Golden Beach, which has shown a consistent rate of accretion. These losses are common feature at the end of beach nourishment projects due to the discontinuities between the restored and un-restored shorelines. This area has required four nourishment events since 1988 to maintain a viable beachfront. In 1995, as part of its project re-evaluation process, the U.S. Army Corps of Engineers completed a Design Memorandum (DM) for the Sunny Isles segment, which evaluated project performance and provided recommendations for improving it in the future. Because the northern end of the project had already been identified as a severe erosion hotspot, addressing that

area was a major component of the report. The DM recommended two new project features to address the erosion in that area:

- A transitional beach fill extending north for 1,300 feet offshore of the Town of Golden Beach. This submerged beach fill would in effect suffer the end losses previously experienced by the north end of Sunny Isles Beach, allowing the beach in that area to maintain its full width for a greater length of time.

- Construction of two submerged breakwater structure offshore of the erosional area. Wave energy striking the beach is the driving force for sand movement into Golden Beach. The intent of the breakwaters is to reduce wave energy, thereby reducing the beach renourishment transport potential.

The recommended project modifications were implemented in 2001 as part of a nourishment contract for Sunny Isles Beach. In addition to the full nourishment of Sunny Isles Beach, an additional 2,800 cubic yards of sand was placed below the waterline offshore of the Town of Golden Beach to provide a transition zone. In addition, two 375'-long breakwater structures were constructed from limestone boulders approximately 450' from shore. Since construction of the transition fill and breakwaters in 2001, the area has not required nourishment to maintain the project design width.

Bal Harbour Beach

Bal Harbour is located immediately south of Bakers Haulover Inlet, which are the likely causes of the erosional conditions observed there. Areas immediately south of most inlets typically experience erosion due to sand being lost, creating a deficit on the downdrift side. At Bakers Haulover Inlet, sand is lost due to high current velocities, which tends to jet sand coming into the inlet either offshore or into Biscayne Bay, where it accumulates in ebb and flood shoals, respectively. While these shoals are periodically dredged and the sand placed on the beach, there are inherent losses which create erosional conditions. In addition to the direct effects of the inlet, the curved jetty structure on the south side of the inlet can result in wave refraction under certain weather conditions that can accelerate the loss of sand from the beach in the vicinity of the jetty.

Because this erosion was recognized in the 1995 Corps project evaluation report, a design review of the Bal Harbour area was initiated. A draft of the Design Memorandum has been completed, and is currently undergoing internal review within the Corps. The recommended plan calls for the removal of the five existing rubble-mound groin structures, replacing them with a stepped series of T-head groins. The T-head groins will moderately compartmentalize the beach fill and slightly reduce wave energy, which will extend the life of the beach. Because the draft document is still under review, the Corps has not set forth a project construction schedule.

63rd Street- Miami Beach

This area was identified in each of the three reports mentioned above as being erosional. The area has required two major nourishment projects, and one smaller truck haul nourishment since its initial construction. Initial site-specific evaluations of this site

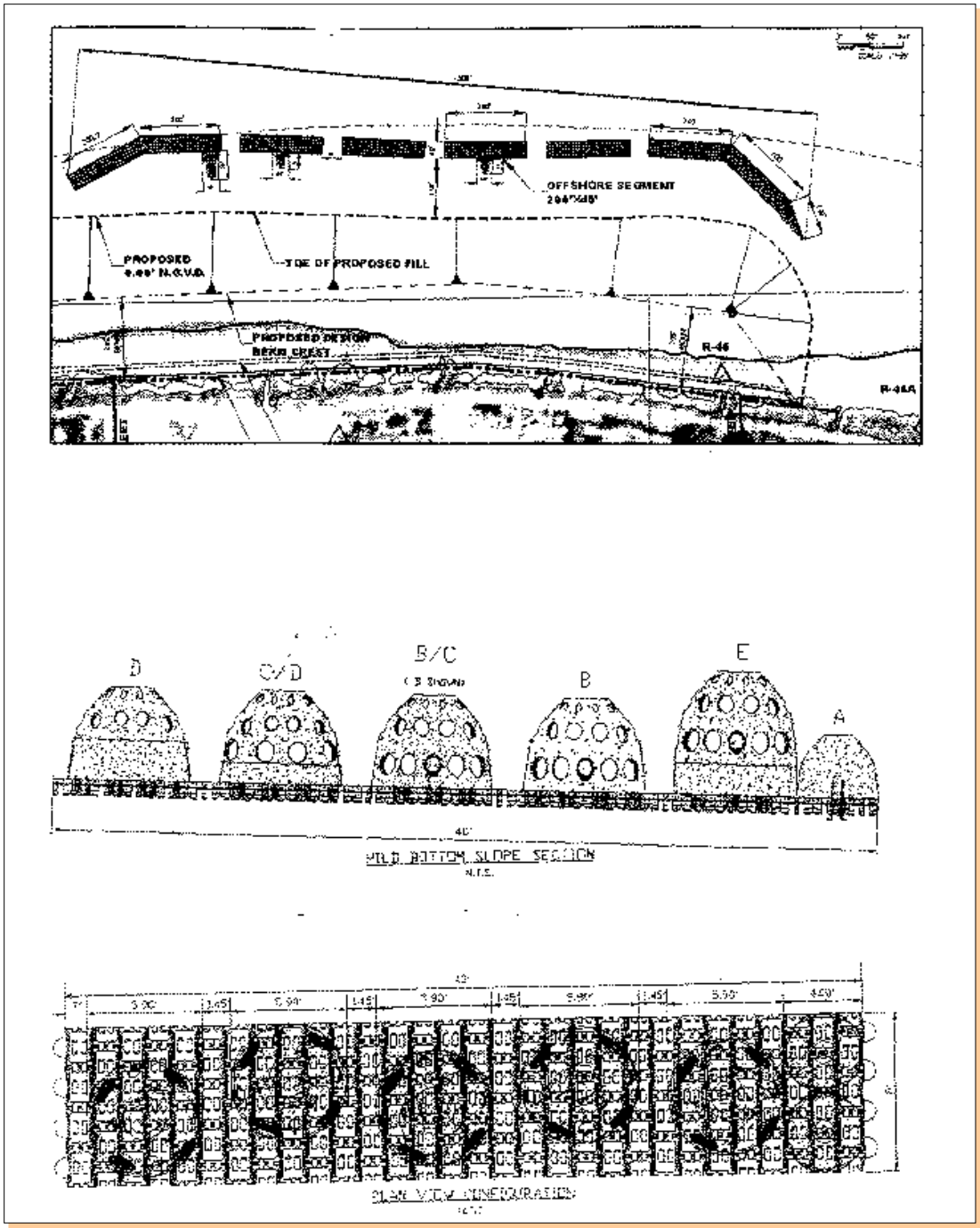
were inconclusive as to the cause of the accelerated erosion rates, however it is thought that a slight protrusion of the shoreline exists which would create a moderate headland condition.

In 2001, Congress authorized the Corps to initiate the Section 227 Innovative Shoreline Erosion Control Program. The objective of the program was to allow the Corps to assess the effectiveness of various erosion control technologies at selected test sites across the country, in order to allow the use of successful technologies to improve the performance of other Corps projects. Funding for project design and construction is 100% Federal. In 2001, the 63rd street hotspot was selected as one of six experimental test sites in the country. A Request for Proposals process was administered by the Corps, and a final design selected in 2003. The design selected for the 63rd Street site consists of a submerged breakwater constructed of rows of concrete domed structures referred to as Reefballs©. These structures are commonly used to construct artificial reefs, but have also been used in numerous areas of the Caribbean to reduce beach erosion. The Reefballs will be integrated onto articulated concrete mats to minimize settling into the sand (Figure 5) and to simplify installation. The original design called for the breakwater to be approximately 2,000' feet in length. As with the Sunny Isles breakwaters discussed above, the intent of the breakwaters is to reduce wave energy in the vicinity of the hotspot thereby reducing the movement of sand from that area.

The project design was completed in late 2003, and permitting initiated. The construction of the project was delayed at that time due to a lack of available funding. The project was further delayed in 2005 when the Congressional authority for the program expired (reauthorization language was included in a pending Water resources Development Act). Recently, construction funds were appropriated, and the program reauthorized, and the project is moving forward. Construction is expected in Summer 2007.

Figure 5

Reefball Structure
and Installation



55th Street- Miami Beach

This is a minor hotspot that was identified only recently. As with 63rd Street, a precise cause for these conditions has not been identified, however aerial photographs seem to indicate a slight shoreline protrusion creating a headland effect. A site-specific assessment of this area was conducted as part of the Miami-Dade County Morphological Change Study (Coastal Systems International, 2006), which recommended the construction of two emergent, and one submerged breakwaters to anchor the beach fill. At the present time, a small truck haul nourishment of this area conducted by the County is underway to address the immediate conditions. Following nourishment of the area, the area will be assessed to determine if the erosion recently documented is a persistent feature, and if a structural solution is warranted.

44th Street-Miami Beach

This area is a persistent erosional hotspot that has been nourished numerous times. No clear cause has been identified, however extremely high erosion rates slightly south of this area are thought to have contributed to accelerated sand loss. This area was also evaluated as part of the Miami-Dade County Morphological Change Study (Coastal Systems International, 2006). The study recommended that no immediate action be taken since this hotspot is within the long-term area of influence of breakwater structures constructed to the south. As material continues to accrete on the beach areas north of the breakwaters, areas as far as 5,000 feet to the north, including the 44th street area are anticipated to increase in width and become stabilized. As such no structures are anticipated at this time.

Within the past year, the 44th street site has experienced severe erosion seasonally resulting in dune impacts and loss of the beach. Over this past summer there was significant natural recovery of up to 40' of dry beach. A truck haul nourishment of the area conducted by the County is currently underway to increase berm elevation and width and provide for enhanced beach use.

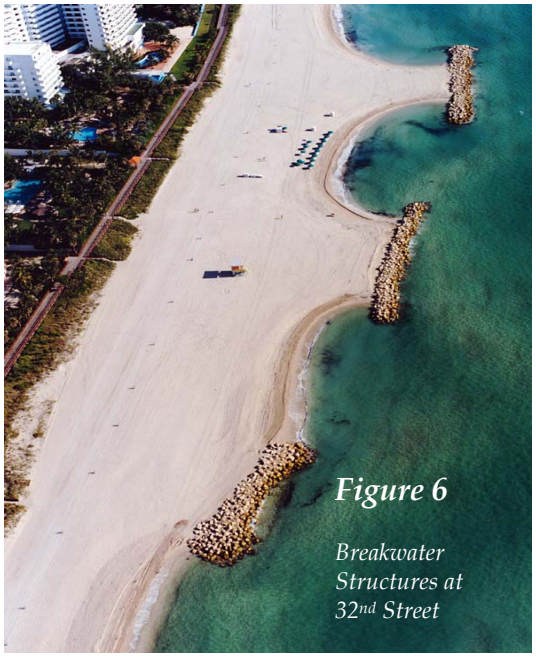


Figure 6

Breakwater Structures at 32nd Street

32nd Street- Miami Beach

Following its initial restoration in 1979, this area experienced the highest rates of beach renourishment transport and erosional losses of any area in Miami-Dade County. Since that time, over ten separate nourishment events have been required to maintain even a minimal beach, including several major projects conducted by the Corps. Due to these high erosion rates, this area was the focus of the County's earliest efforts to address erosional hotspots, and continues to receive a high level of scrutiny today.

In 2000, Coastal Systems International completed the first comprehensive assessment of this erosional hotspot. It was determined that the high erosion rates were

the result of a change in the shoreline orientation at approximately 32nd Street from a direct North/ South to a more westerly direction. This change resulted in a curve in the shoreline which was highly susceptible to wave attack from the northeast, which would essentially push sand from the "curve" to the south. The study concluded that in order to maintain a beach in that area, it would necessary to anchor the fill through the use of structures, and transition from the erosional area, to the more stable areas to the south. Although there was initial resistance from the permitting agencies, a design consisting of three, a shore-attached emergent breakwater structure was approved. The limerock structures (Figure 6) decreased in size and distance from the beach going from north to south, with the largest being 215' in length, and the smallest 75'. As the structures were constructed, approximately 125,000 cubic yards of sand was excavated from an accretional area south of the project, and used to backfill behind the structures in an attempt to minimize downdrift impacts. Construction was completed in July 2002.

In general the project has been successful in reducing the previously high erosion rates. The area behind the structures has remained stable with no nourishment required since construction. Areas to the north of the structures have continued to accrete and increase in width. This is expected to continue until the beaches to the north widen sufficiently that the northernmost structure can no longer impound sand, and bypassing around the structures resumes. Until that occurs, an erosional hotspot immediately south of the southernmost structure will likely persist. A nourishment of that area was conducted in 2005 and a second one is currently underway to address this downdrift erosion. Until the areas north of the structures reach equilibrium and begin to bypass sand to the south, it cannot be determined if this downdrift erosion is a permanent or temporary feature. When that equilibrium is achieved, a comprehensive evaluation of whether modifications to the structures, or additional structures, are required. In the interim periodic nourishment of the area south of the structures will be conducted on an as needed basis.

North of Government Cut

The 1995 Corps project evaluation report identified this area as an erosional hotspot. Typically the shoreline north of navigational inlets accretes significant amounts of sand as it moves south in the littoral system and becomes trapped by jetties or other structures used to maintain the inlet. Prior to 1999, survey data and visual observations of the area north of Government Cut indicated no accretion was occurring, and in fact, a significant amount of erosion was noted. A channel-deepening project conducted in Government Cut in 1996 confirmed that sand was leaking through the jetty when large shoals were encountered directly adjacent to the base of the jetty.

To remediate this problem a rehabilitation and sand tightening of the north jetty was developed in conjunction with a planned nourishment of the area in 1999. The first 1,000 feet of the jetty was disassembled, a core layer of bedding stone constructed, armor stone replaced, and then grouted with concrete to form an impermeable barrier. The project appears to be successful, as the area has remained slightly accretional since its completion.

Factors Affecting Future Project Management

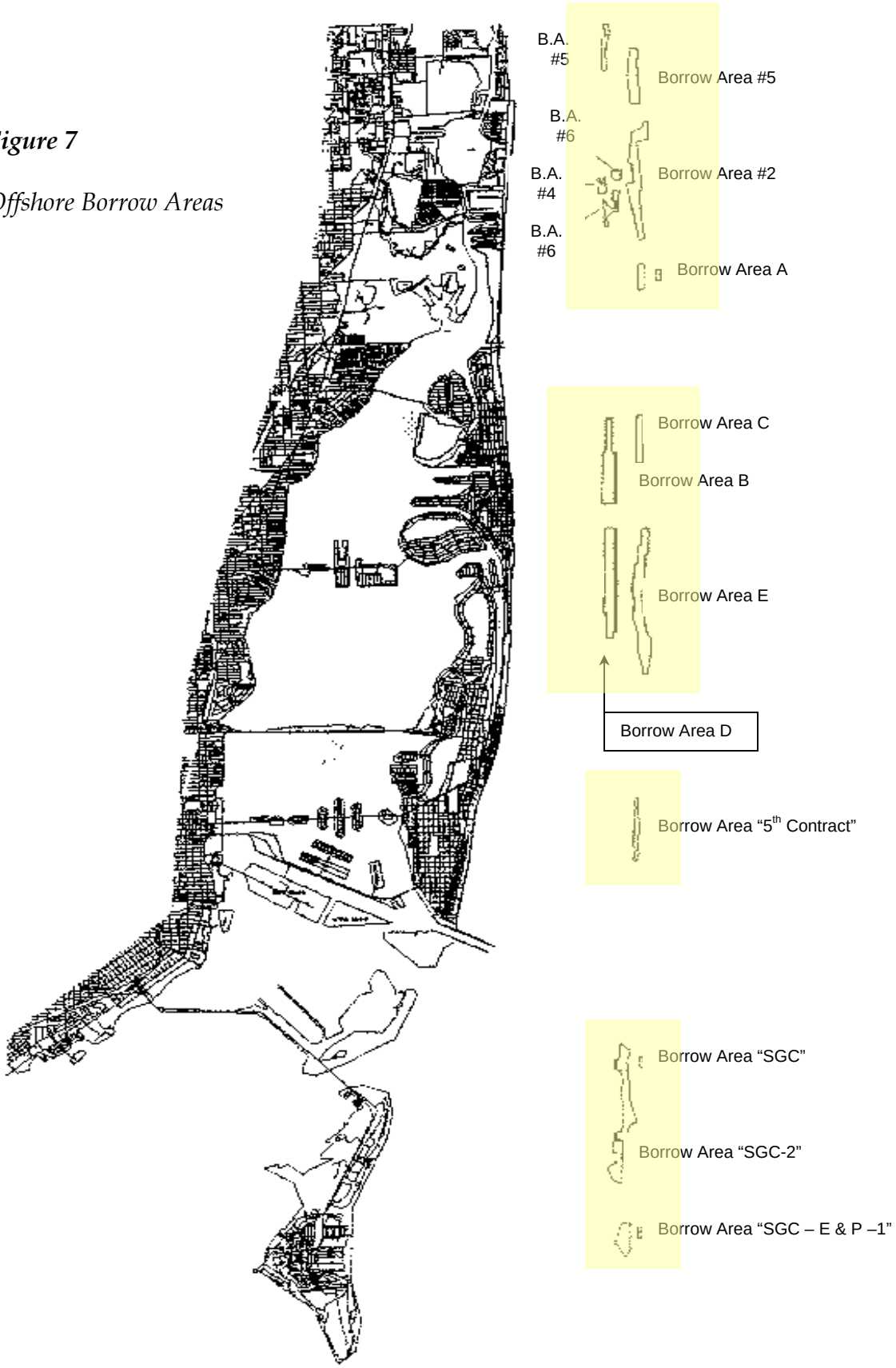
There are two primary objectives in developing a plan for future project management:

1. The first is to reduce high erosional losses within the project, primarily at erosional hotspots. The emphasis on the effective remediation of erosional hotspots is an important first step in the long-term management of the Miami-Dade shore protection project. If erosion at persistent hotspots can be addressed, the cost of maintaining the design dimensions needed for storm protection and recreational use of the beach can be dramatically reduced. Hotspot management will continue to be a priority as the effectiveness of existing and planned projects are assessed, and new hotspots develop.

2. The second key factor affecting the future management of the project is developing sand sources for future nourishment projects. In the initial design of the project, the Corps conducted extensive geotechnical evaluations offshore of Miami-Dade County to identify sand sources for the initial construction and long term maintenance of the project. In developing these offshore borrow sites, a number of factors are considered, including the physical and chemical qualities of the beach renourishment, the depth of the sand deposits, presence of rock, and proximity of adjacent natural resources, such as reefs, which must be avoided. In addition to these considerations the physical and biological features of the areas offshore of Miami-Dade County further limit the potential for suitable borrow sites. Unlike most other areas of the state, Miami-Dade has a very narrow continental shelf, being only 1.5 miles wide in some areas. This is critical in that most areas beyond the continental shelf are too deep to obtain material from. This lack of available area is further compounded by the fact that a significant amount of this available area is composed of reef/hard bottom or other significant habitat that precludes its use. In spite of these limitations, these initial assessments, and subsequent project-specific refinements of these areas, identified a total of fourteen offshore borrow sites.

Figure 7

Offshore Borrow Areas



Long-Term Program Funding and Administration Issues

While a total of $17.5 million in County funds were allocated for beach erosion control activities in the recent General Obligation Bond issue, other sources of program funds will need to be identified in order to execute a well planned maintenance program in future years. This issue will take on greater importance given the lack of locally available sand sources. By necessity, future nourishment projects will utilize more distant domestic or non-domestic sand sources, which will result in dramatically increased project costs.

Because of these anticipated cost increases, and likely increases in the complexity of funding and implementing these projects, it is recommended that a multi-governmental authority or other body to provide administrative oversight to the beach erosion control program be considered. This authority could be comprised of representatives of Miami-Dade County, the coastal municipalities, tourism boards, and other parties with a vested interest in maintaining an effective countywide erosion control program. The authority would function to establish program priorities and needs, and perhaps most importantly, the development of cost-sharing strategies among the program beneficiaries to provide for stable funding in light of greatly increased program costs.

Beach Erosion Control Project Permitting

The implementation of beach erosion control construction activities requires regulatory approvals from one or more Federal, State, or local agencies. The number and types of permits required depends upon the type of work, and where the construction activities occur relative to several jurisdictional lines. A description of these jurisdictional boundaries follows.

Regulatory Boundaries Affecting Permitting Beach Erosion Control Activities

Mean High Water Line (MHWL)

The Mean High Waterline (MHWL) is one of the most important lines in determining the types of permits required for a particular activity. From a technical standpoint, the MHWL represents the average high tide level at a particular location for the previous 19 years; from a practical standpoint, it generally is represented as the landward extent of wet beach. For the purposes of establishing the location of the MHWL in a project area, previously established elevation data specific to the project area may be used, or an actual survey may be required.

Coastal Construction Control Line (CCCL)

The Coastal Construction Control Line (CCCL) is a jurisdictional line established for each county by the Florida Department of Environmental Protection (DEP) to allow for State regulation of activities that may affect the beach and dune system. The line represents the landward extent of where significant impacts could be expected during a 100-year storm event, and are established specific to each county shore elevations, wave climate, offshore bathymetry and a number of

other factors. In Miami-dade County, the general location of the CCCL is approximately the midpoint of parcels located directly on the beach (ie: half way between A1A and the seaward property line) Under the current regulations, any construction activity occurring seaward of the established CCCL, but landward of the MHWL, be reviewed and approved by the DEP prior to commencement of construction. It is important to note that the CCCL does not prohibit construction beyond its location, but rather establishes jurisdiction for the activity to be reviewed by DEP.

Erosion Control Line

Under Florida law, all land located seaward of the MHWL (with certain exceptions) is the property of the State of Florida. In implementing a beach nourishment or other activity that will artificially move the MHWL seaward, the State requires, pursuant to Chapter 161, F.S., that the project sponsor establish an Erosion Control Line in order to allow the State to maintain ownership of these previously submerged areas. Prior to the establishment of an ECL, a riparian owner's seaward property line is the MHWL, and is subject to fluctuation based on naturally occurring erosion or accretion. The establishment of an ECL occurs by surveying the location of the pre-project MHWL prior to the project using established survey procedures. This surveyed shoreline position then becomes a fixed property line known as the ECL. Once established, this line remains the seaward extent of the riparian owner, regardless of the change on the MHWL by fill placement or other means. In most cases, any new beach established seaward of the ECL is under State ownership and is available as public beach.

Permits Required for Beach Erosion Control Projects

The agency approvals and types of permits required are determined by the location of the proposed activities relative to the boundary lines described above. In many cases multiple permits and approvals from various Federal, State, and local agencies may be required.

Federal Permits and Approvals

A Federal permit issued by the U.S. Army Corps of Engineers is required for any non-Federal construction activity that occurs wholly or partially seaward of the MHWL. Activities which occur completely landward of the MHWL do not require Federal approvals, except in the case where the project may affect endangered species. In most cases for beach erosion control projects, a Dredge and Fill permit is required for either the excavation or placement of beach fill material or materials used to construct erosion control structures such as breakwaters. Although only one permit is issued by the Corps for a specific activity, the process leading to that issuance includes extensive coordination with other Federal agencies such as the National Marine Fisheries Service (NMFS- fisheries resources) and the U.S. Fish and Wildlife Service (USFWS- primarily endangered species). For activities that may adversely affect endangered species, the USFWS must generally issue a Biological Opinion (BO) prior to the issuance of a Corps permit. The BO establishes the allowable levels of effects to endangered species and the protective guidelines that must be used during the implementation of the project.

For projects implemented through the Corps of Engineers, a Federal permit is not required. In this case, the comprehensive evaluation of the project is done through the requirements of the National Environmental Policy Act (NEPA). This process requires coordination with other Federal agencies to determine the potential impacts of the project on environmental, historical, social, and economic resources. Based on the findings of the NEPA process, the Corps will issue one of two decision documents, which effectively substitute for he Federal permit:

1) Environmental Impact Statement (EIS)- Highest level of review for projects with a significant potential for impacts. This process can take a year or more to complete.
2) Environmental Assessment (EA)- Similar to an EIS in format, but with a lower level of review for less impactive projects. The final document may be the issuance of a formal EA, or for projects with minimal effect, a Finding of No Significant Impact (FONSI), which is an abbreviated form of an EA.

State Permits and Approvals

As with the Federal permits, the types of State permits and approvals needed for projects is dependent upon its location relative to the lines described above. For projects located wholly or partially seaward of the CCCL, but landward of the MHWL, the State requires the issuance of a CCCL permit. These permits are typically required for coastal building development, beach fill and other erosion control projects landward of the CCCL, and various types of special beach use activities. The evaluation criteria for the CCCL permit will depend the potential adverse effects to the beach/dune system. For activities occurring seaward of an established ECL, but landward of the MHWL, approvals from the Division of State Lands will also be required to authorize work on State-owned lands.

For non-Federal projects occurring seaward of the CCCL, which also extend beyond the MHWL, the State requires the issuance of a Joint Coastal Permit (JCP). This permit is submitted to the DEP, which then forwards it to the Corps for review (joint permit). The JCP evaluation includes many of the same evaluation criteria as the CCCL permit, however also considers a broad range of other factors such as potential impacts to water quality, and effects on natural resources in the near shore and offshore zones. By definition, a JCP authorizes work beyond the MHWL, which is State-owned land, and as such, approval will also be required from the Division of State Lands prior to construction. Generally due to the concurrent Federal review associated with a JCP application, the State will not issue their approvals prior to the issuance of the Corps permit.

For Federal beach erosion control projects conducted by the Corps, a State Water Quality Certification (WQC) is issued in lieu of a State permit. The scope of the WQC is limited only to issues and factors regulated under Federal law. Any additional requirements and special conditions typically associated with the State permits are contained in other documents outside he scope of the WQC, such as in the project plans and specifications, and agreements between the DEP and the local project sponsor.

Local Permits and Approvals

Chapter 24 of the Miami-Dade County Code requires that all activities seaward of the MHWL receive a Class I Coastal Construction permit prior to construction. Unlike the State and Federal permits that strongly consider coastal engineering issues, the evaluation criteria for the Class I permit for beach erosion control projects are generally limited to water quality and resource impacts. When an application for a Class I permit is complete, it must be forwarded to the Miami-Dade County Board of County Commissioners for approval prior to permit issuance. In order to be submitted to the Board for approval, it is required by code that the permission of the landowner be secured. Because of this, and the fact that most beach erosion control projects occur on State-owned land, the issuance of the State permit, including Division of State Lands approval, is required prior to consideration by the Miami-Dade County Board.

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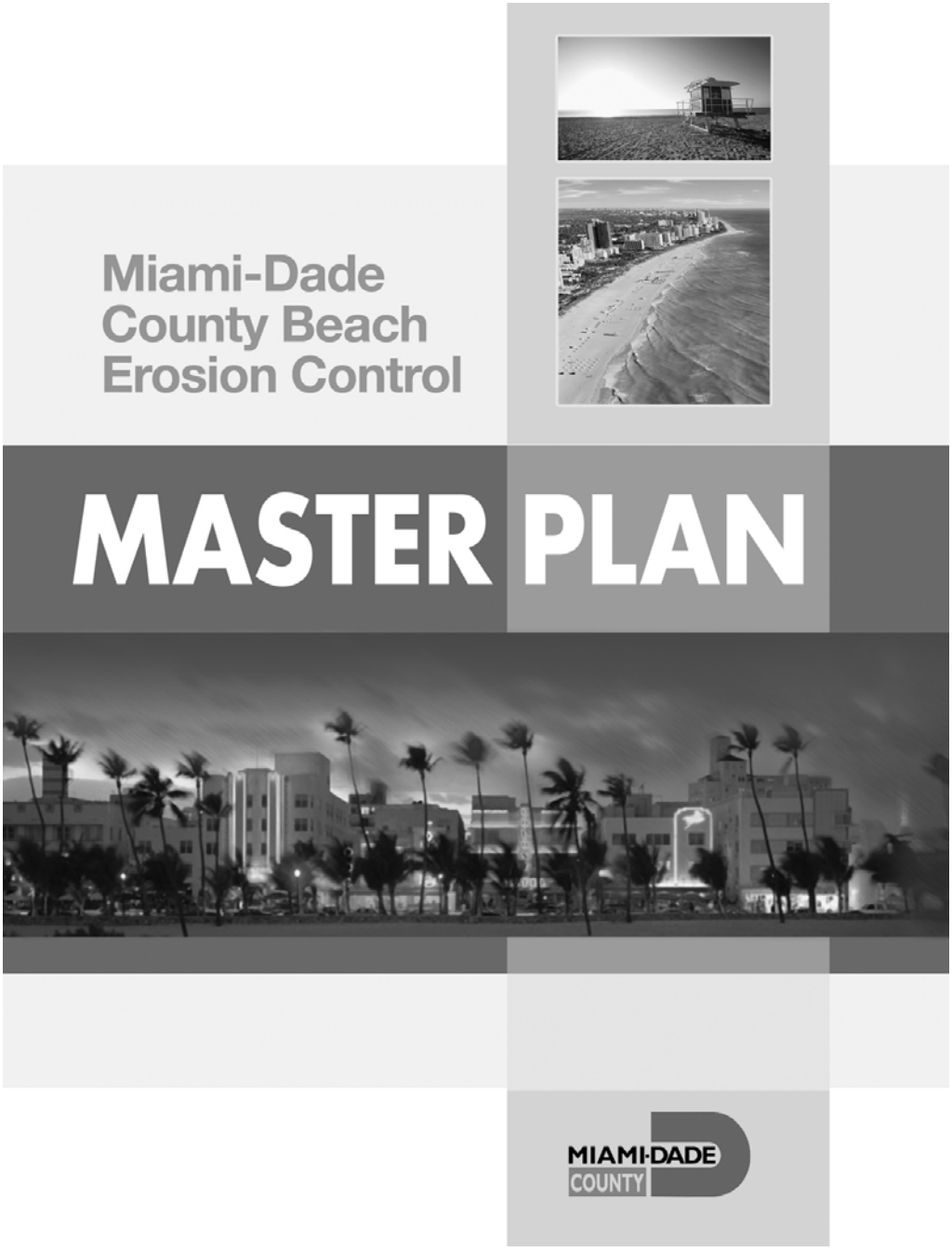

APPENDIX

Appendix