THE JUPITER INLET MANAGEMENT PLAN

The purpose of the Jupiter Inlet Management Plan is to recommend improvements to the existing engineering management protocol with respect to three main issues: beach erosion control, navigational safety, and control of sediment influx into the Loxahatchee River. The study, undertaken by the University of Florida Coastal and Oceanographic Engineering Department, was initiated in January of 1990. The final management plan was adopted by the District's governing board August 12, 1992. Based upon engineering investigations and related correspondence with the Jupiter Inlet District, the University of Florida team considered a number of options based on what might be practical at Jupiter Inlet.

The engineering investigations included offshore wave measurement over a 15-month period, tide and current measurements, bottom sediment sampling, sand tracing studies, and seagrass and mangrove mapping. A physical scale model of the inlet area was constructed and tested at the University. In addition, a number of mathematical models were used to help analyze the data collected in this as well as several previous studies to develop an understanding of the physical processes, the sediment budget for the inlet region, and the likely physical and ecological impacts resulting from the actions considered.

Recommendations and Improvements

A. Recommended Phased, Interdependent Actions

1. Sand Trap Expansion and Sand Placement Modification

The Jupiter Inlet District sand trap, located approximately 1,000 feet west of the inlet mouth, was originally dredged in 1966. Its purpose was threefold: to maintain the channel, to minimize the influx of sand into the Loxahatchee River, and to manage the beach to the south of the south jetty by placement of sand derived from the trap. To minimize the erosion problem occurring south of the south jetty, the University has recommended that a minimum of 60,000 cubic yards be pumped to the south beach on an average annual basis. Jupiter Inlet Sand Trap Dredging History

The Jupiter Inlet District trap is typically dredged by or before the end of each April, prior to the peak sea turtle nesting season. If at times insufficient sand accumulates in the trap for this dredging window, the University has recommended dredging in November. The Corps is encouraged to dredge each November during those years in which the District's trap is dredged in April. At other times, the Corps is encouraged to dredge before the end of April.

The University also recommended that a sand placement plan that is different from the current plan be tried to increase the retention time of sand placed on the beach. This was accomplished by spreading the sand over a wider section of the public beach than the existing stretch.

2. Raising of North and South Jetties and Extension of South Jetty

This project involved raising the seaward end of the two jetties by two feet and lengthening the south jetty by 200 feet; it was completed in 1997.

Raising the height of the south jetty by two feet has reduced beach erosion immediately south of the jetty, resulting from a reduction in the transport of sand over the jetty during significant storms. Raising the north jetty has similarly reduced incoming sand from the north.

The 200-foot extension of the south jetty in a southeastward dog-leg or hook further reduced erosion immediately south of the south jetty by enhancing the region sheltered against wave action and by reducing the sand-laden water movement around the modified jetty, thus promoting the retention of beach sand.

3. North Jetty Extension and Installation of Beach Sand Bypassing Facility

This action would have involved an extension of the north jetty by 400 feet, coupled with the installation of a sand bypassing plant to prevent the extended jetty from causing further erosion of the south beach. According to the University of Florida study, the sand "catching" efficiency of bypassing plants typically does not exceed 75 percent, so this option was not implemented.

An alternative to the fixed sand bypassing plant is a fluidizer system. This system takes fluidized sand from the ocean or, alternately, from the inlet, and pumps it through pipes to the south beach as fill. The feasibility of this system, as applied to the Jupiter Inlet, awaits continuing experiments currently being conducted at Oceanside Harbor, California, by the Corps of Engineers.

B. Recommended Independent Actions

1. Modification of Corps Trap Dredging Protocol

The recommendation to ask the Corps to coordinate its dredging and sand pumping activity with that of the Jupiter Inlet District is to ensure the recommended 60,000 cubic yards are pumped to the south beach on an average annual basis. Complimentary dredging of the Corps' trap after the non-pumping window (October to November) and placement on the south beach can provide a significant buffer volume at the start of the winter season. This is not insignificant, as many major storm events occur at this time.

2. Regulating Boat Speed

The potential benefits to navigational safety of controlling boat speed are obviously high. Although boat speed regulation would not tangibly affect erosion of the south beach, it would reduce interior bank erosion associated with boat wakes. The effect of regulating boat speed has the additional benefit of helping to diminish the potential for mortality to manatees from boat collisions. Although there are undoubtedly many benefits associated with controlling boat speed, the Jupiter Inlet District's Board of Commissioners rejected this management option based on discussion with the Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Coast Guard as well as with members of the boating community.

3. Placement of Beacons

The plan recommended the placement of two beacons at the tip of the jetties. The beacons were installed as part of the jetty improvements undertaken in 1997, and a third beacon was added approximately fifty (50) feet west of the tip of the south jetty (in the closest proximity to the interior inlet channel).

4. Dredging Offshore Navigation Channel

The main purpose of this offshore navigation channel would be to provide an eastern access through the ebb shoal. However, since this channel would tend to close each fall and remain closed during the subsequent winter and spring, the benefit will be less than that for a year-round channel. The Jupiter Inlet District Board of Commissioners elected not to endorse this management option.

5. Offshore Dredging for Sand Equity

Offshore dredging can benefit beach erosion control, provided that the placement is made on the south beach and the dredged material is of suitable beach quality. The study recommended the dredging of approximately 150,000 cubic yards once every ten years. This would satisfy the requirement to bypass all littoral sand on a long-term basis.

The University cautioned, however, that dredging of large quantities of sand from the ebb shoal region would reduce the shoal height, thus increasing wave action on the beach and resulting in a potentially negative impact.

6. Interior Trap Dredging

The Jupiter Inlet Management Plan called for the dredging of a third trap immediately east of the FECRR Bridge. The purpose of this trap would have been to control the accretion of littoral sand in the area of the Central Embayment.

However, a Sedimentation Study of the Loxahatchee River Central Embayment, conducted for the District by the University of Florida in 2003, showed that relatively little sediment actually enters the estuary from the Intracoastal Waterway. This is attributed to the District's decision to enlarge the sand trap, as recommended in A (1). For this reason, this management option was never acted upon.

Sedimentation Study Of The Loxahatchee River