

Beach Nourishment Provides a Legacy for Future Generations

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Legacy Beaches

- Critics claim beach nourishment performs poorly and is not worth the cost
- We believe beach nourishment provides a legacy for future generations by maintaining the important benefits of natural beaches
- Case studies of “legacy” beaches
 - Nourished beaches that successfully provide key benefits (esthetic, recreational, environmental, storm-damage reduction, and economic)
 - Lessons learned from these nourishments



Santa Monica Bay Beaches

- Santa Monica Bay beaches are icons of the Southern California lifestyle



Venice boardwalk



The Beach Boys



Beach volleyball

- Most assume these beaches are naturally wide, but river diversions/dams made many, “... too badly eroded to be of value as bathing beaches”. - Johnson (1935)



Venice Beach
1925
100 ft beach



Almost 90
years later
Venice Beach
is 500 - 700 ft
wide

Santa Monica Bay – Sand as Resource

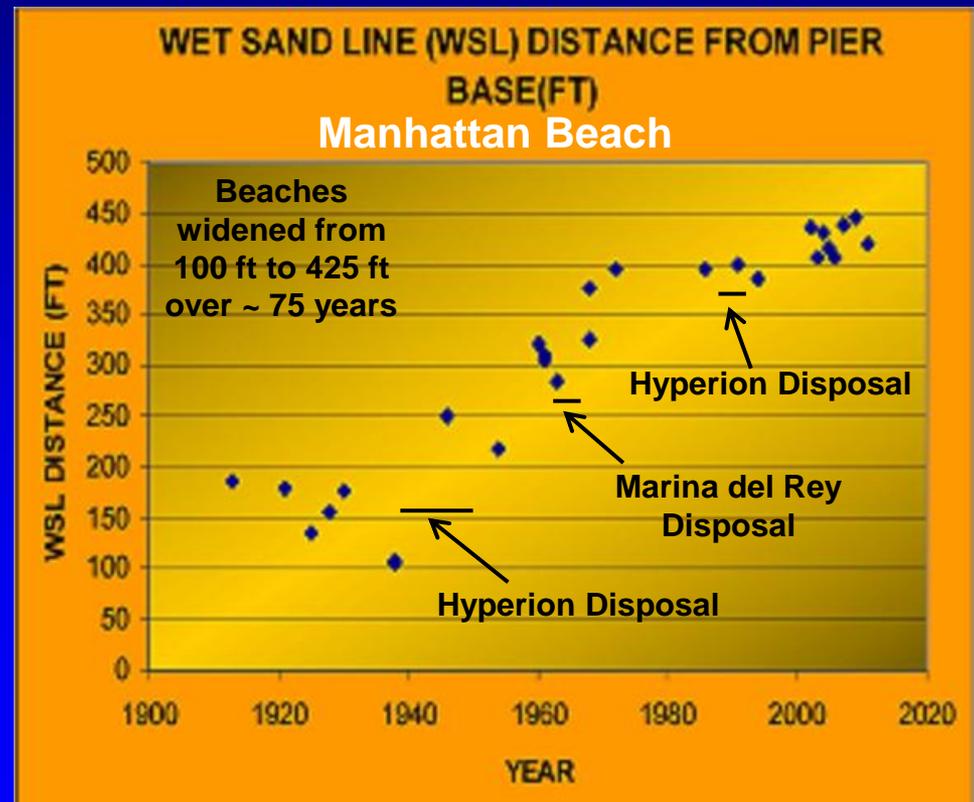
- Construction sand disposed on Venice/Dockweiler Beaches

1938 – 1947, Hyperion Sewage Facility 15.9 m/yr³

1960 – 1963, Marina Del Rey 10.1 m/yr³

1988 – 1989, Hyperion 1.2 m/yr³

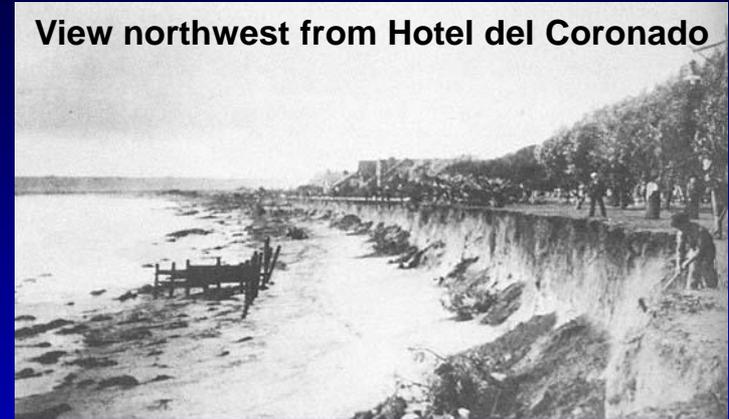
- Result - Venice Beach is the most visited beach in the U.S. and 400 - 600 feet wider than it was almost 90 years ago
- The disposals dramatically increased beach width a dozen miles downdrift



10-12 miles downdrift of disposals

Coronado/Silver Stand – San Diego

- Beaches were sand starved because of river damming



- Over 100 years later, beaches are 500 - 700 feet wide

Coronado/Silver Stand – Sand a Resource

- Beaches received 28.2 m/yd³ sand from 1941 - 1946, as the Navy “disposed” of sand dredged from San Diego Harbor



- Coronado/Silver Strand has had wide beaches for ~ 70 yrs
- San Diego was California's leading tourist destination in 2012 with “**the beach the marquee attraction**” (San Diego Business Journal, U.S. News Travel, 2012)

Delray Beach, FL, Consistent Program



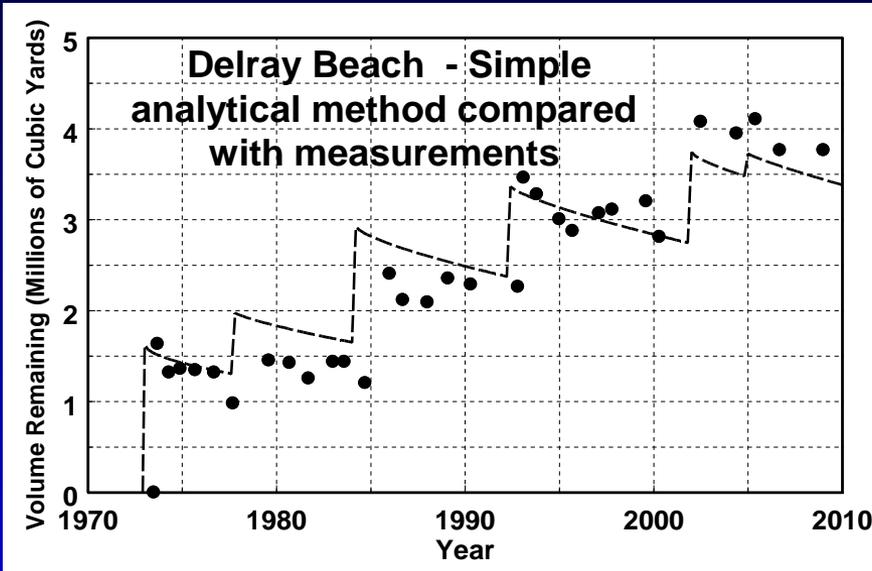
Emergency protection for coastal road Interlocking revetment tried and failed



Revetment covered by beach nourishment (first nourishment early 1970s)

Delray Beach, Consistent Program

- Series of beach nourishments with predictable responses



- Rand McNally/USA Today named Delray Beach the 2012 Most Fun Small Town in America
- ASBPA gave it a 2013 Best Restored Beach Award



Florida Beaches – Consistent Program

June 1970

Looking north along shore of Atlantic Beach (see line Mark south of photo) June 9, 1970



Atlantic Beach Aug. 1978
Jacksonville



March 2010



- A consistently funded State-led program of beach nourishment has transformed eroded Florida beaches into world-class recreational beaches that have had a significant economic impact



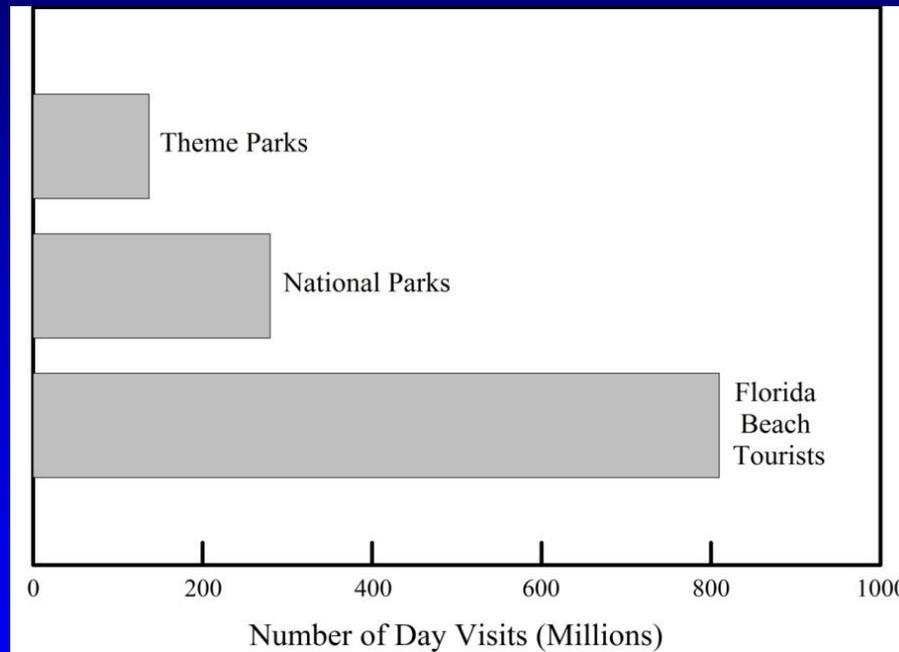
Captiva Island Beach



Ft Myers Beach

Florida Beaches – Consistent Program

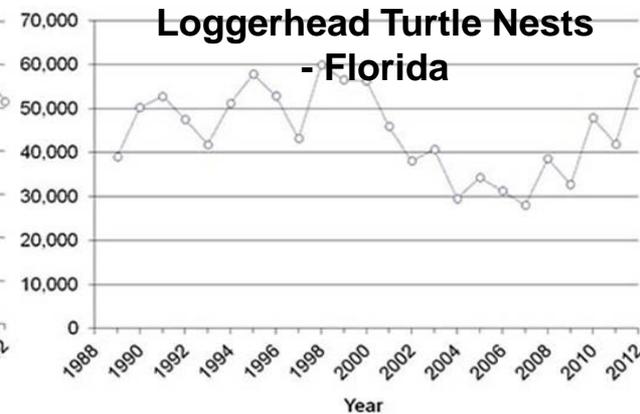
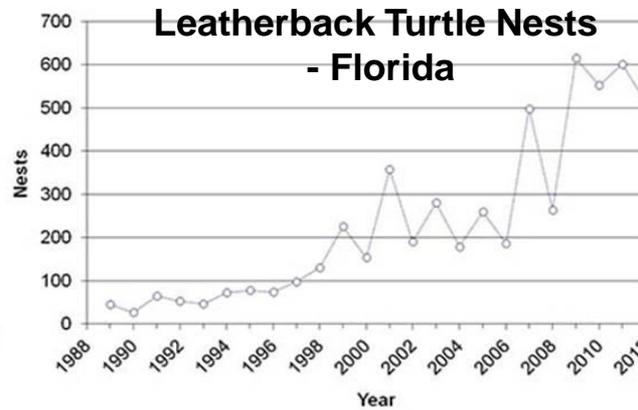
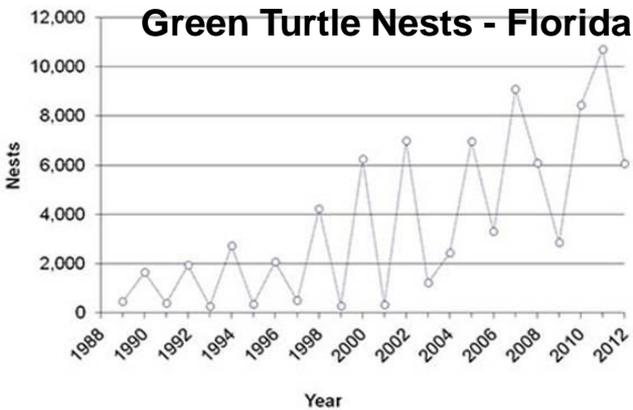
- Florida has more beach tourist visits (810 million) annually than any other state or country and more than visits to all theme parks and National Parks combined (Houston, 2013)



- Florida beaches have an estimated annual recreational value of \$50 billion (Houston, 2013)

Florida Beaches - Environmental Benefits

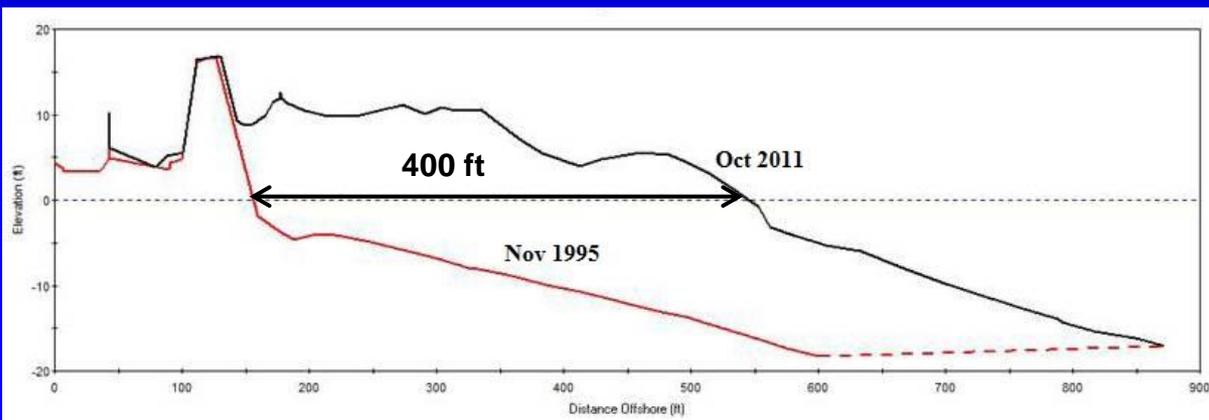
- Beach nourishment has benefited sea turtle nesting throughout Florida and the Southeast



- “Loggerhead sea turtle nesting in Georgia hit a new high for the fourth straight year” (Savannah Morning News, 2013)

New Jersey, Sea Bright - Protection

- The President of the American Littoral Society said the 21-mile long beach nourishment in 1995 at Sea Bright, NJ, would last 1 year. Orrin Pilkey said 2 years.



30 - 40 ft average initial beach loss in NJ

New Jersey - Storm Damage Reduction

- Mayor Mancini estimated that had beach nourishment been in place at Long Beach, NJ, as it was 6 miles away at Brant Beach, damage would have been reduced by ~ **\$500 million**
- On the 18-mile Long Beach island, only Brant Beach had a Corps beach nourishment (1-mile long) placed just before Hurricane Sandy



Long Beach

**“Complete destruction -
it’s like a war zone”**



Pre-Sandy

Same Bench →



Post-Sandy

Brant Beach

“No overwash or wave damage”

Storm-Damage Reduction

Restored beaches protect – e.g., Hurricane Sandy in NJ



With Nourished Protective Beach

Atlantic City, NJ, was up and serving tourists 4 days after Sandy



Without Nourished Protective Beach

Ortley Beach, NJ, was still a disaster 6 Months after Sandy

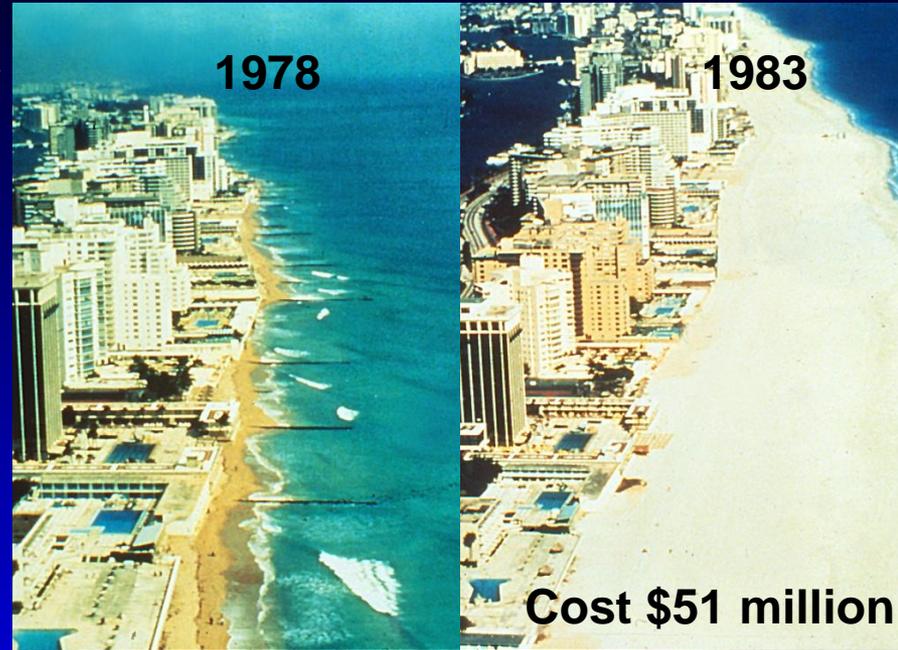
Miami Beach, FL, Economic Benefits

- In the 50s and 60s, hotel owners constructed bulkheads up to 75 ft seaward of Mean High Water
- By early 1970s beaches at many locations were completely gone
- By 1977, Time Magazine wrote, *“So rapidly has the seven-mile-long island degenerated that it can be fairly described as a seedy backwater of debt-ridden hotels.”*
- In 1977, Miami Beach Mayor, Neisen Kasdin, said, *“Business was so bad in Miami Beach I was happy just to see prostitutes.”*



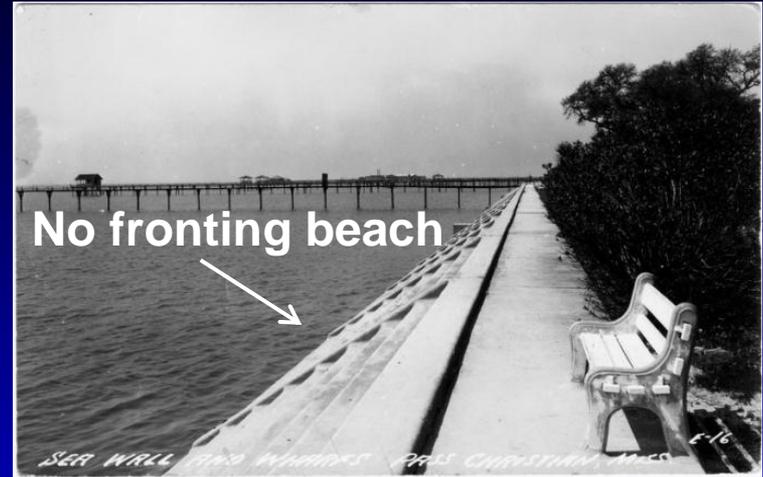
Miami Beach, Economic Benefits

- Beach nourishment completely rejuvenated Miami Beach
- It is the 2nd most visited U.S. beach with more than twice as many visits as Yellowstone, Yosemite, and the Grand Canyon combined
- Miami Beach tourists contribute **\$5.7 billion** to the economy
- For every **\$1** in annual capitalized cost of the nourishment, the U.S. receives **\$1800** annually just from **international tourists** at Miami Beach (Houston, 2013)



Harrison County, MS, Economic Benefits

- 26-mile sea wall was built at various times from 1926 to 1950 and damaged multiple times



- In 1951 a 6 m/yd³ beach fill was placed along the 26 miles to protect the sea wall from being undermined by waves

Harrison County, Economic Benefits

Little beach change



The fill withstood Hurricanes Camille and Katrina



Beaches have lasted for over 60 years and made tourism Harrison County's #1 business

Some Lessons Learned

- **Sand is a valuable resource**

- Dams, river diversions, and sand mining stop sand from naturally reaching the coast
- But for “waste” sand disposals, Southern California beaches would not be the world’s most iconic beaches

- Dean et al (1988) showed that 80 - 85% of erosion on east coast of Florida caused by navigation channels

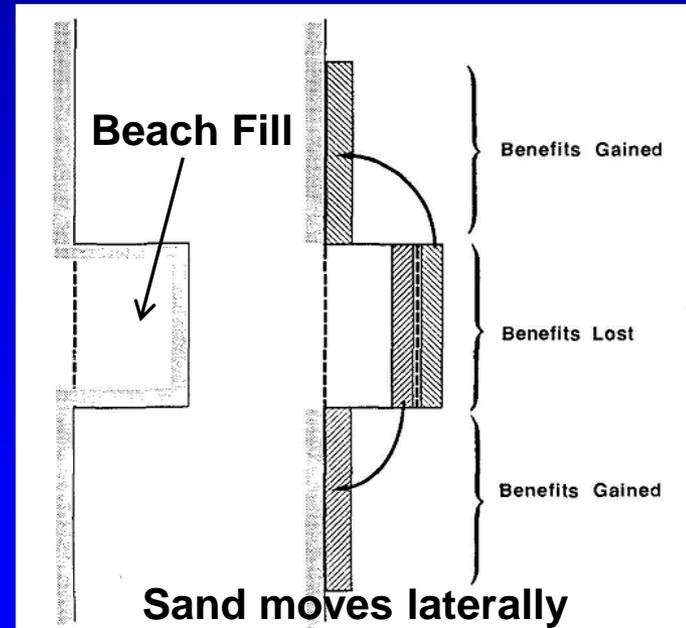
- **“Beach nourishment is the only engineered shore protection alternative that directly addresses the problem of a sand budget deficit”**

- National Research Council, 1995



Lessons Learned

- **Beach fill length important for longevity**
 - Dean and Dalrymple (2002) show longevity of a beach fill depends on its length squared
 - The 124 New Jersey beach fills cited by Pilkey as having an average “life” of 2 years had an average length of only ~ 1 mile
 - * 21-mile Seabright, NJ, fill 18+ years and going strong
 - * 26-mile Harrison County, MS, fill 60+ years
 - Small communities should try to partner with adjacent communities



Lessons Learned

- **Wide beaches and high dunes provide substantial storm protection**
 - **“It really, really works. Where there was a federal beach fill in place, there was no major damage - no homes destroyed, no sand piles in the streets”**
 - **Dr. Stewart Farrell, Director, Coastal Research Center, New Jersey**

**Without
nourished
beach**



With nourished beach

Lessons Learned

- **Restored beaches attract tourists, growing the economy**
 - Florida beaches have been consistently nourished and have the most visitors in the world (810 million) that annually spend \$36 billion and generate \$6.5 billion in taxes



Conclusion

- Restored beaches provide remarkable legacies for future generations by providing :

Esthetic Benefits

Restored beaches consistently win awards such as “America’s Best Beach” (e.g., 2012 Coronado/Silver Strand)



Destin , FL - Best Family Beach in the World (Travel Channel, 2013)

Recreational Benefits

Consistently nourished Florida legacy beaches have more tourists than any beaches in the world and an estimated recreational value of **\$50 billion annually**

Environmental Benefits

No beaches, no sea turtles



Delray Beach

Storm-Damage Reduction Benefits

The protective power of nourished beaches was proven during Hurricane Sandy



“
After all you've dealt with,
after all you've been through,
the Jersey Shore
is back
and open for business.
”

—President Obama, 5/28/13

Economic Benefits

Miami Beach's experience of returned prosperity after beach restoration is repeated as beach tourists contribute **\$225 billion** to the Nation's economy (Houston, 2013)

Coney island, NY



Ocean City, MD



Myrtle Beach, SC



South Padre Island, TX



Newport Beach, CA



The #1 Benefit of Legacy Beaches

The End



- Esthetic
- Recreational
- Storm-Damage Reduction
- Environmental
- Economic