2010 Beach Monitoring Results

ISLE OF PALMS BEACH RESTORATION PROJECT
Sediment Transport at Isle of Palms

- Secondary Channel
- Predominant Wave Approach
- Shoal Migration
- Sediment Transport Reversal
- Isle Of Palms
- Atlantic Ocean
- Barrier Island Drumstick Model
- Spit Growth
- Breach Inlet
Shoal Bypassing at Isle of Palms

1996

1997

1998

SEPTEMBER 1982

STAGE 1

AGGRESSION ZONE

SHOALS

HIGH TIDE LEVEL

Initial Shoreline

JUNE 1983

STAGE 2

AGGRESSION

SHOAL

Initial Shoreline

JUNE 1983

SEPTEMBER 1984

STAGE 3

AGGRESSION

SHOAL

Initial Shoreline

JUNE 1983

RENOURISHED BEACH

ALTERED B dreaming

RENOURISHED BEACH

ALTERED B DREAMING
Channel Avulsion at Isle of Palms

1944
Channel Avulsion at Isle of Palms

1949
Channel Avulsion at Isle of Palms

1953
Channel Avulsion at Isle of Palms

1957
Channel Avulsion at Isle of Palms
Renourishment History

- 1984 - ~350,000 cy from Marina
- 1980-1990’s sand scraping from attaching shoals
- 2008 – 900,000 cy from offshore
- Minor additions from upland sources
Determine fill volume by creating ideal profile, then adding additional fill based on historical erosion.
2008 Beach Restoration Project

- Pumping between May 24th and June 25th 2008
- ~ 934,000 cy of sand added to ~10,200 linear ft of beach
- Fill volumes ranged from 27 cy/ft to ~180 cy/ft
- Removal of ~9,400 large sand bags and ~5,400 cy of small bags
- Contractor – Weeks Marine Dredging Company
Beach Monitoring

- 7 Monitoring Reaches over ~7 miles of shoreline
- Over 120 monitoring stations and 220 miles of survey lines
Beach Monitoring

March 2009 Monitoring Survey
Reach 7

Unit Volume Relative to Pre-Nourishment (March 2008)
Reach 7 - Dewees Inlet

- **Accretion**
- **Erosion**
- **Project Limit**
- **Groin**

Sept 09 – Sept ’10 Change
+21,000 cy
+5.3 cy/ft
Shoal was attached by September 2010

28 April 2010 Photo

Sept 09 – Sept '10 Change
-96,700 cy
-19.7 cy/ft
Reach 5

Unit Volume (cy/ft) - Reach 5

Sept 09 – Sept '10 Change
-46,300 cy
-7.7 cy/ft
Reaches 1-4

Unit Volume Change Since March 2009 (cy/ft)

Reach 1  Reach 2  Reach 3  Reach 4

6th Ave  14th Ave  31st Ave  53rd Ave

+4.8  +11.7  +9.3

Sept 09 – Sept '10 Change
+213,000 cy
+9.6 cy/ft

+12.1

Erosion

Accretion

Station (Distance from Breach Inlet)
Project Areas

Overall, project areas retain ~72% of the volume gain and 86% of the design volume.
Overall, the island gained 91,100 cy (2.5 cy/ft) between Sept ‘09 and Sept ’10

Net erosion between Sept ‘09 and March 2010 [-26,200 cy (0.7 cy/ft)]

Net accretion between March and Sept ’10 [+117,300 cy (3.2 cy/ft)]

Reach 5-7 lost 126,700 cy (8.5 cy/ft) from Sept 09 to March ‘10 but gained 4,900 cy (0.3 cy/ft) from March to Sept ‘10
Changes at Dewees Inlet
Changes at Breach Inlet

Station: Shoal Section 01

\[ \approx 630 \text{ ft/yr} \]
Changes at Dewees Inlet

Station: 280+00 BEACH CLUB VILLAS

~475 ft/yr
Changes at Dewees Inlet

Station: 296+00 (Shipwatch)
Changes at Breach Inlet

Development of New Main Channel
September ‘09 to March ’10 showed net erosion of 0.7 cy/ft (26,200 cy)
March ‘10 to Sept ‘10 was accretional, gaining 3.2 cy/ft (117,300 cy)
Most areas north of 53rd Ave were stable or accretional between March and Sept ‘10
Beach between Breach Inlet and 53rd Ave has gained 213,000 cy (9.6 cy/ft) over the past year
Status of Permit Application

- Environmental documents were submitted last week.
- Permitting agencies have received comments from public and resource agencies (one public letter is still pending until 2/18).
- Agencies are compiling comments, and will seek the City’s response to concerns.