DNREC Shoreline Management Presented to

The Delaware Bay Beach Management Work Group
November 29,2010

Tony Pratt

Shoreline and Waterway Management Section

DNREC

Legal Authority

Beach Preservation Act, Title 7, Chapter 68

- Originally passed in 1972
- Transferred responsibility of beach management to new DNREC
- Established Beach Fund
- Established regulatory authority

SHORELINE AND WATERWAY MANAGEMENT SECTION

- Legislatively Defined Beach – From north end of Pickering Beach south to the MD state line
- Construction Regulation:

1. Building Line
2. Permits
3. Letters of Approval
4. Nourishment consideration

SHORELINE AND WATERWAY MANAGEMENT SECTION

- Beach fund

1. Match for Corps projects
2. State funded nourishment (DE Bay beaches)
3. Supplies/Materials (dune grass, fencing, fuel, computers, etc)
4. Equipment (trucks, loaders, dozers, etc
5. Contractors
6. Bypass Plant
7. Anything related to beach preservation

SHORELINE AND WATERWAY MANAGEMENT SECTION

- Support Staff

1. Program management
2. Regulators
3. Scientists
4. Surveyors
5. Conservation Technicians (field operations)
6. Engineer (?)

THE FUTURE
SOLUTIONS (?)

- Better sediment management (efficiencies: cost reduction)
- Broader funding partnerships and/or new, innovative funding sources
- Better understanding of erosion forces
- Reduced economic losses and human suffering – safer, sustainable communities

CHALLENGES

- Storms
- Sea level rise
- Erosion
- Funding partners
- Sustainable development

Management Plan for the Delaware Bay Beaches

Prepared for:

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Prepared by:

PBSJ

April 19, 2010

Overview

- Seven communities
  - Pickering Beach
  - Kitts Hummock
  - Bowers Beach
  - South Bowers
  - Slaughter Beach
  - Primehook Beach
  - Broadkill Beach

Observed Beach Erosion Patterns

- Pickering Beach
  - Sediment spreads north and south from center
- Kitts Hummock
  - Sand largely moves northward
- Bowers Beach
  - Sand spreads north and south from center
- South Bowers
  - Northerly transport dominates
- Slaughter Beach
  - Northward transport; southern end has greatest need
- Primehook Beach
  - Transport direction possibly southerly; northern third has greatest need
- Broadkill Beach
  - Sand spreads north and south from center of community

Historical Beach Fill Placements

Location	Fill Event Dates	Historical Demand (yd^3/yr)	
		Total	1970s to present
Pickering Beach	1962 to 2001	5,862	8,000
Kitts Hummock	1961 to 2008	7,482	6,056
Bowers Beach	1962 to 2009	6,257	6,326
South Bowers	1961 to 1997	2,483	2,409
Slaughter Beach	1958 to 2005	17,006	17,623
Primehook Beach*	1962	20,626	25,090
Broadkill Beach	1957 to 2005	23,970	28,931

*average of Slaughter Beach and Broadkill Beach

Design Beach Nourishment Width

- Three scenarios developed
  1. Strategic fill placement: targeted beach nourishment based on previous nourishment efforts
  2. Five Year Protection: protection from a 5 year return period storm event plus 5 years of advance fill
  3. Ten Year Protection: protection from a 10 year return period storm event plus 10 years of advance fill
- Each design includes a dune feature

Advance Fill Component

- Due to uncertainty, utilized largest shoreline recession rate at each location from USACE (1991) and French (1990)
- Combine storm berm with product of shoreline recession rate and anticipated project life to get design berm width

Location	Storm Berm Width (ft)		Historical Loss Rate (ft/yr)	Total Berm Width (ft)	
	5 Year	10 Year		5 Year	10 Year
Pickering Beach	0	20	-4.9	25	69
Kitts Hummock	0	13	-4.3	21	56
Bowers Beach	0	13	-3.0	15	43
South Bowers	0	20	-3.0	15	50
Slaughter Beach	0	20	-2.0	10	39
Primehook Beach	0	7	-3.0	15	36
Broadkill Beach	0	7	-4.6	23	53

Cost Summary – South Reach

Location	Scenario	Initial Placement Cost	Total Cost Over 10 Years
Slaughter Beach	Strategic	$499,975	$1,342,478
	5 Year	$2,112,800	$4,107,503
	10 Year	$3,680,800	$4,260,503
Primehook Beach	Strategic	$416,835	$984,924
	5 Year	$787,800	$1,623,289
	10 Year	$1,522,800	$1,775,589
Broadkill Beach	Strategic	$983,250	$2,216,869
	5 Year	$2,229,500	$4,295,279
	10 Year	$4,074,000	$4,674,379

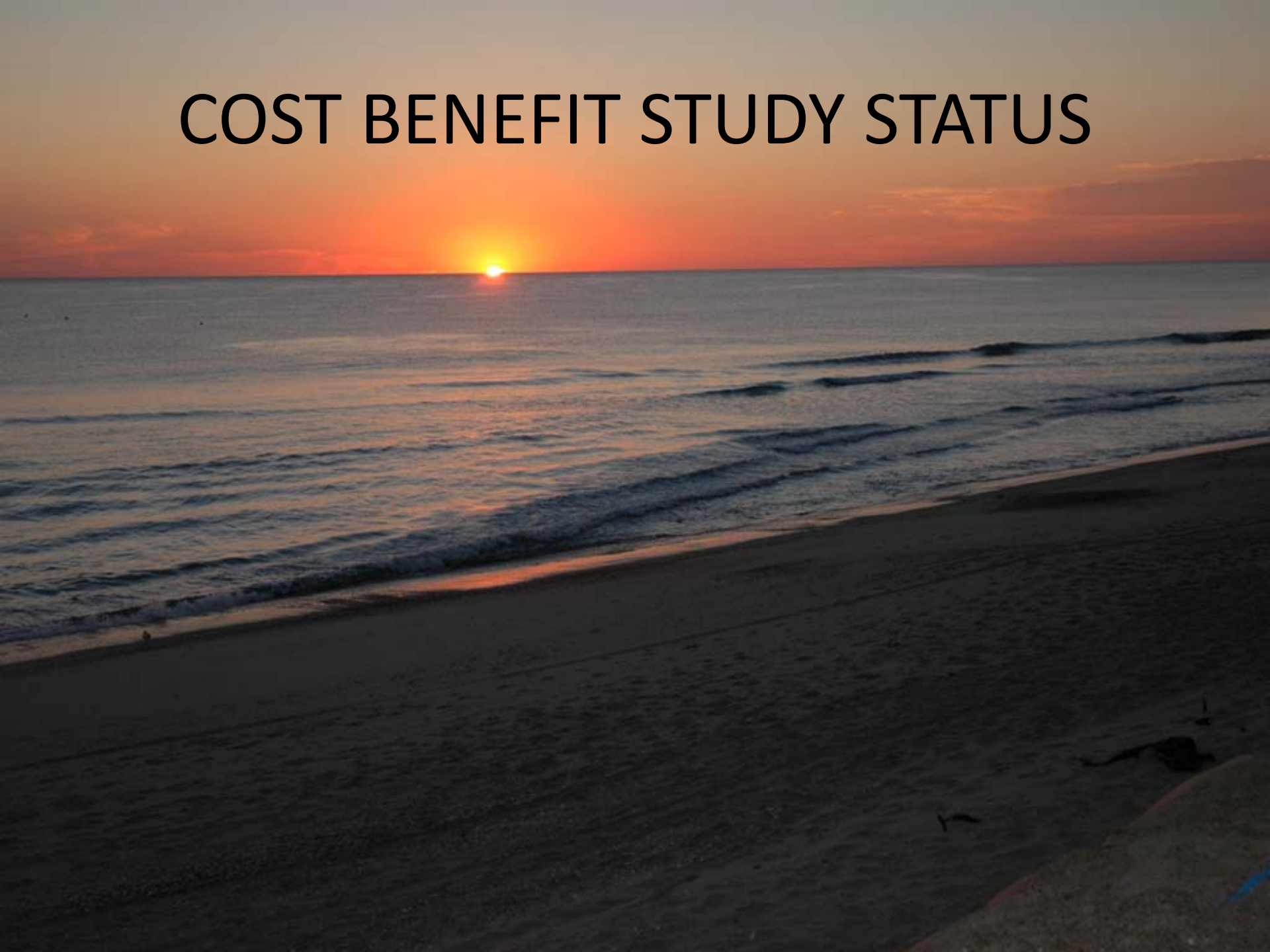
*strategic and 5 year scenarios include one renourishment event over the 10 year period

Cost Summary – North Reach

Location	Scenario	Initial Placement Cost	Total Cost Over 10 Years
Pickering Beach	Strategic	$470,635	$1,120,102
	5 Year	$571,435	$1,246,382
	10 Year	$1,180,435	$1,416,582
Kitts Hummock	Strategic	$503,765	$1,121,796
	5 Year	$988,410	$1,956,321
	10 Year	$1,656,210	$1,976,581
Bowers Beach	Strategic	$331,910	$756,859
	5 Year	$491,950	$1,002,299
	10 Year	$746,750	$894,449
South Bowers	Strategic	$295,245	$910,599
	5 Year	$478,625	$1,298,935
	10 Year	$772,625	$1,045,535

Ten Year Cost Outlook

Scenario	North Reach Total	South Reach Total	Overall Cost
Strategic	$3,909,356	$4,544,271	$8,453,627
5 Year	$5,503,937	$10,026,071	$15,530,008
10 Year	$5,333,147	$10,710,471	$16,043,618

*strategic and 5 year scenarios include one renourishment event over the 10 year period

COST BENEFIT STUDY STATUS