

# Raritan Bay and Sandy Hook Bay, Highlands, NJ Coastal Storm Risk Management

## Public Meeting

USACE - New York District  
July 22, 2015



US Army Corps of Engineers  
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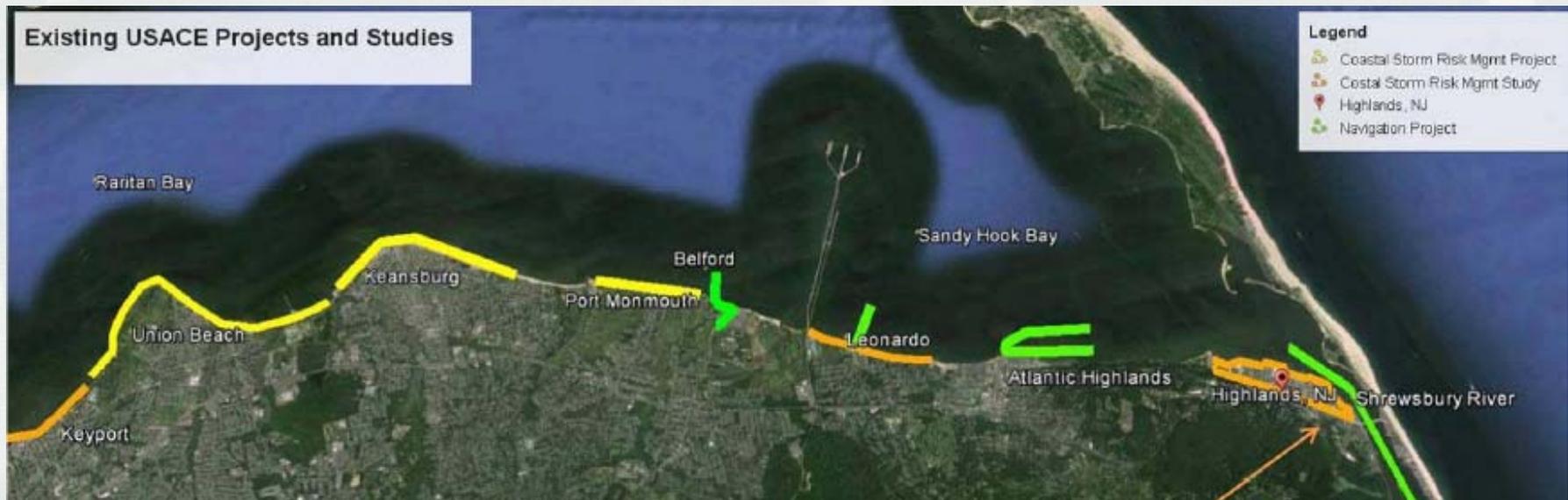
# Purpose of Tonight's Meeting

- Overview of Study Findings
- Overview of USACE Process
- Announcement of Public Comment Period
- Release of Draft Report



# Study Authority

- Study Resolution adopted by House Committee on Public Works and Transportation, on 1 August, 1990, to  
*“...provide erosion control and storm damage prevention for the Raritan Bay and Sandy Hook Bay.”*



# Civil Works Process

- Reconnaissance Phase
  - ▶ Determine Federal Interest
  - ▶ Identify Local Partner to Cost Share 50/50
- Feasibility Phase
  - ▶ Presents the Recommended Plan
  - ▶ Congressional Authorization to Proceed to →
- Pre-Construction Engineering & Design (PED)
  - ▶ Detailed Design the Authorized Plan
- Construction
- Operation & Maintenance

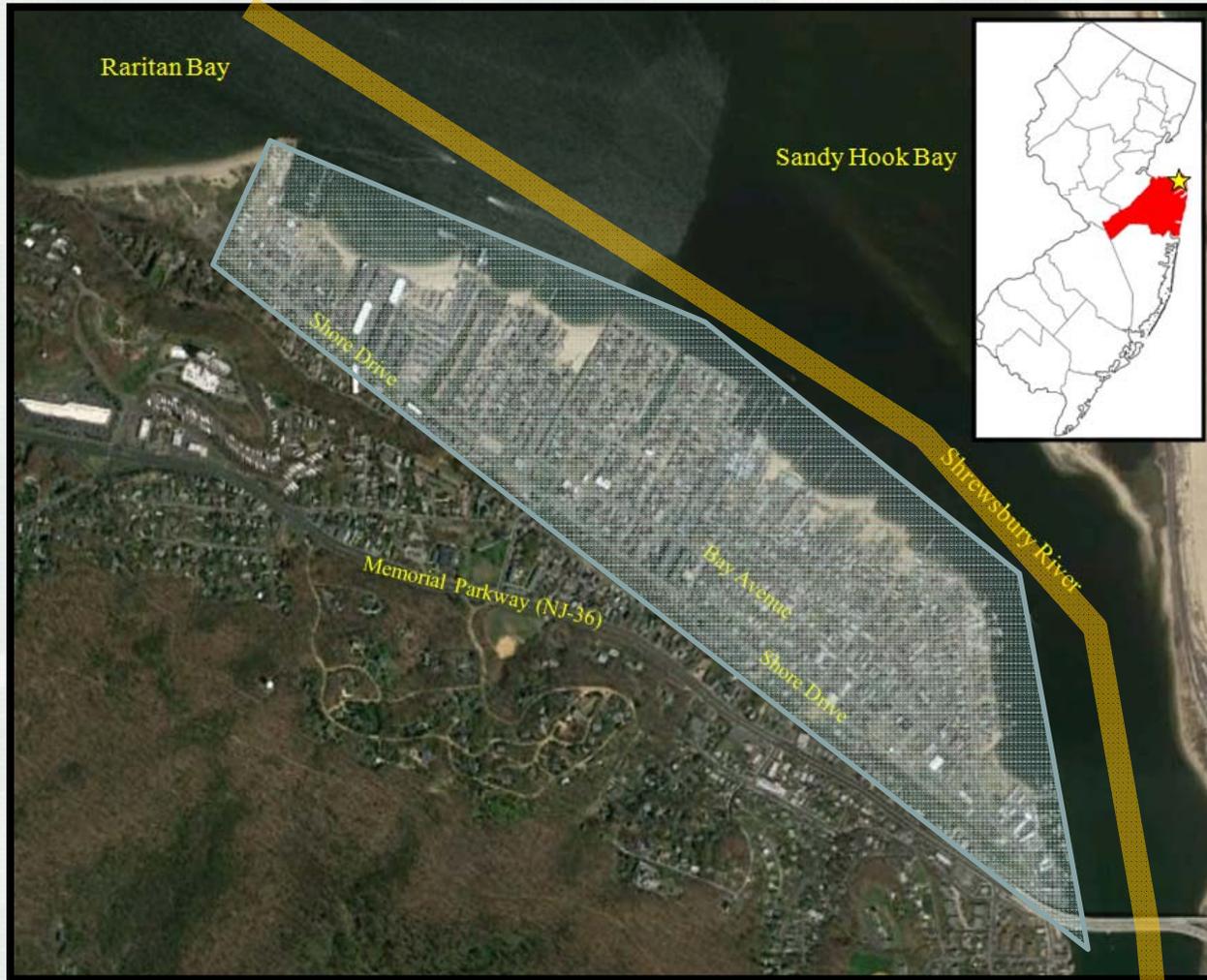


# Reconnaissance Phase

- Raritan Bay and Sandy Hook Bay Reconnaissance Report - 1993
  - ▶ Focus on Port Monmouth, NJ
- Pre-Feasibility for Highlands – 2000
- Feasibility Cost Sharing Agreement with NJDEP – 2001
- Study stalled in 2003.



# Study Area



 Highlands Study Area

 Federal Navigation Channel



# Study Area



# Status of Feasibility Work

- *Existing Conditions and Problem ID*
- *Future Without Project/No Action*
- *Alternatives Developed*
- *Analysis of Alternatives*
- **Draft Report / Public Input**
- **Completion of Feasibility Report**



# “Sandy Bill”, Public Law 113-2

- Sandy Disaster Relief Appropriations
  - ▶ \$5.34B to USACE from Maine to Virginia for “***necessary expenses related to the consequences of Hurricane Sandy...***” including:
    - **Complete Existing Studies**
    - Construct Authorized Projects
    - Operations & Maintenance of Completed Projects
    - Emergency Rehabilitation of Damaged Projects



# Implications of PL 113-2 for Highlands

- Highlands included as an ongoing “Sandy” feasibility study.
  - ▶ Remaining \$1.5M in Federal funds to complete study at full Federal expense, accounting for post-Sandy conditions.
  - ▶ PL 113-2 provides construction authorization for Highlands (*do not need to go back to Congress after feasibility report is complete*).



# Hurricane Sandy Damages



# Future Without Project Conditions

- Future conditions predicted, based on past events.
- Hurricane Sandy was estimated to be a 190 yr storm at Highlands
  - 1,200 out of 1,500 structures damaged by Hurricane Sandy
  - Sea level rise: 0.7 ft increase expected over next 50 years
- Long history of flood damages will continue.



# Alternative Plans

- Alternative 1 – Update of Pre-Feasibility Plan
- Alternative 2 – Non-Structural Plan
- Alternative 3 – Offshore Closure Plan
- Alternative 4 – Beach and Dune Plan
- Alternative 5 – Hybrid Plan
  - Several variations of Alternative 5 - Alternative 5e Selected
  
- Alternative 5e – Tentatively Selected Plan
  - Approximately 8000-ft. Shoreline, Includes:
    - Raised Roadways
    - Raised Ground Surface (grass berm with interior floodwall)
    - Dune Barriers (sand dune with interior floodwall)
    - Floodwalls
    - Raise/Cap Existing State Bulkheads (protect from corrosion with concrete)
    - Raise Existing Borough Bulkheads (includes toe protection)
    - Non-Structural Measures



# Response to Previous Public Meetings

## **TWO MAJOR TAKEAWAYS:**

- ***Maintain Waterfront Access!***
- ***What will the project look like?***



➤ **Waterfront Access**



➤ **Waterfront Access**



## ➤ Waterfront Access



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## ➤ Waterfront Access



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*Levee with road access*



**Waterfront Access**



➤ ***What will the project look like?***



Raised Roadways



Floodwall & Raised Ground Surface (grass berm with interior floodwall)



➤ ***What will the project look like?***



**Road Closure Gate**



Road Closure Gate

8/28/2011 4:19pm

Bulkheads



## Outfall Flap Valves



## Raised Ground Surface (grass berm with interior floodwall)



# Floodwalls



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## Floodwalls

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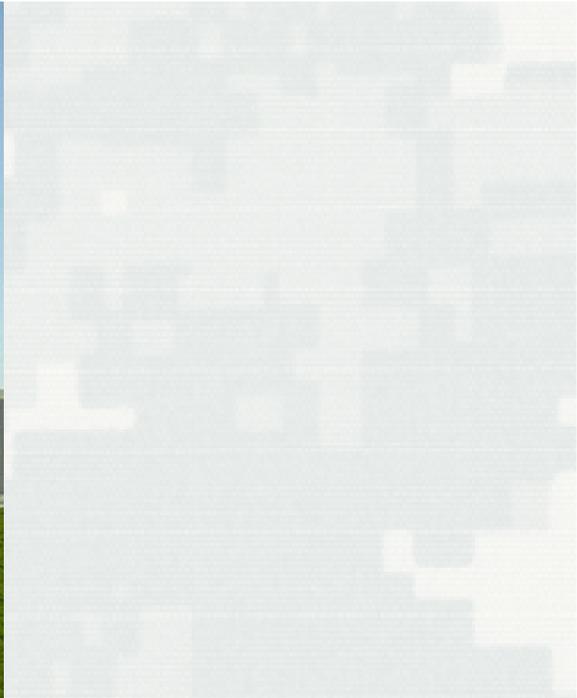


Floodwalls

# Floodwalls



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## **Floodwalls**

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**Floodwalls**

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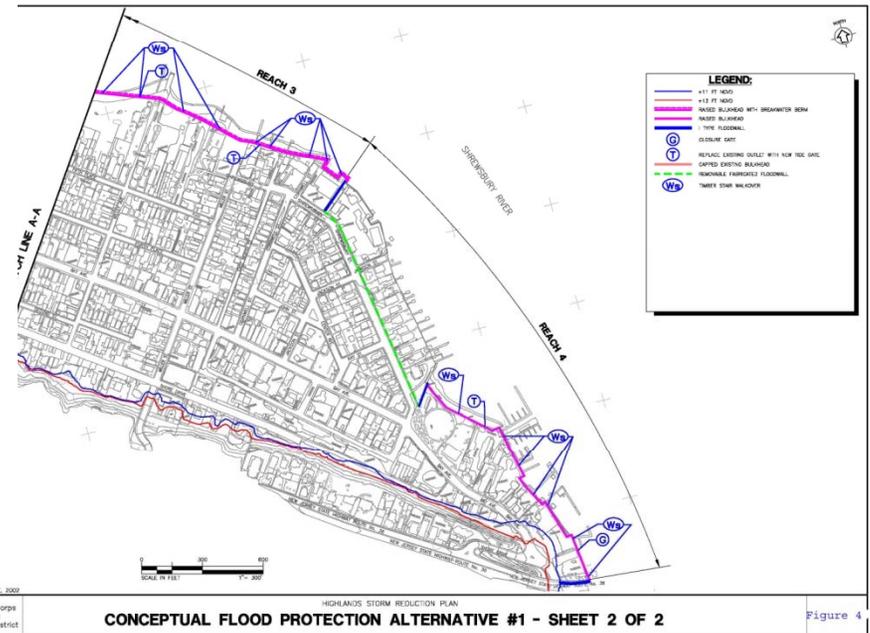
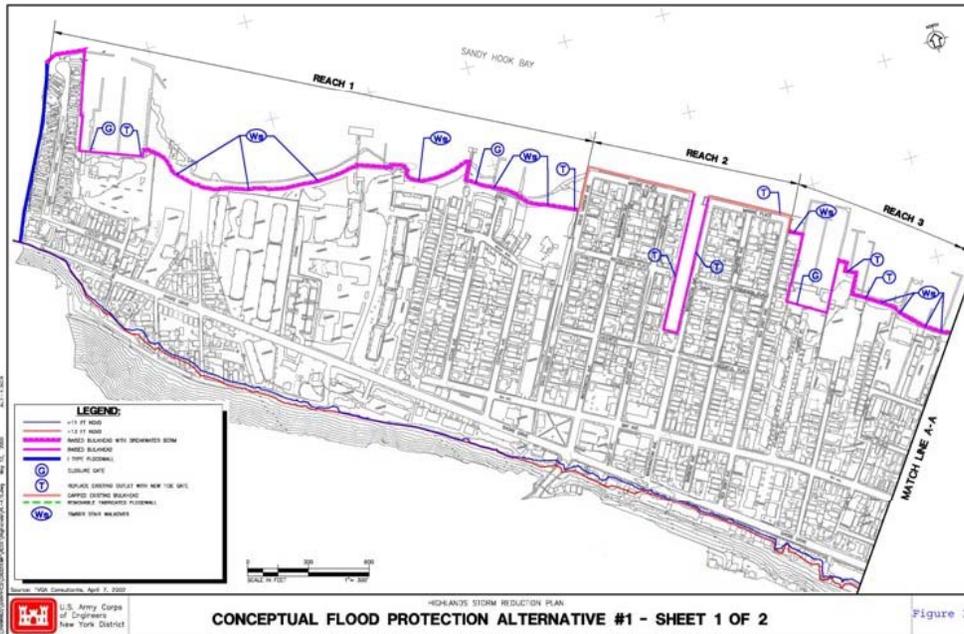
HAYFIELDS

1878 - 1890

MCCOYS

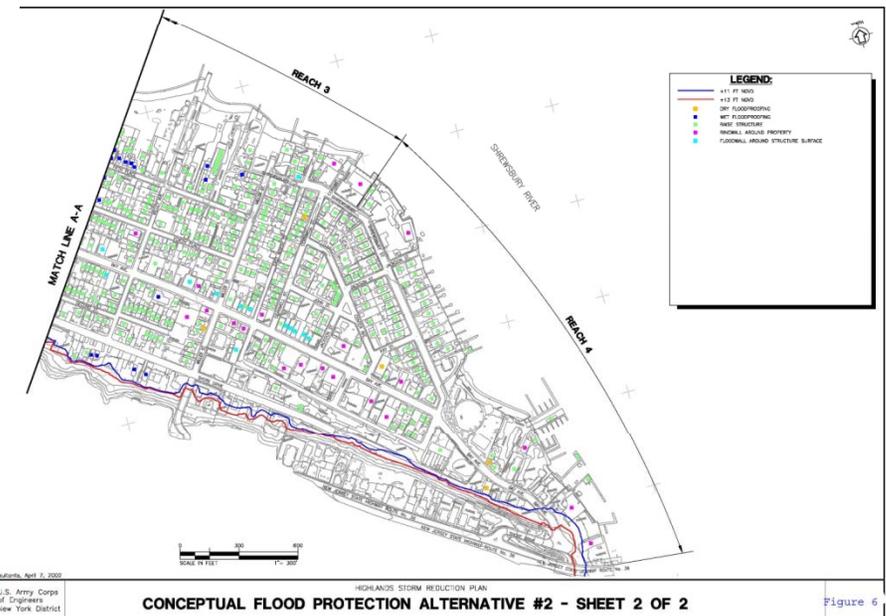
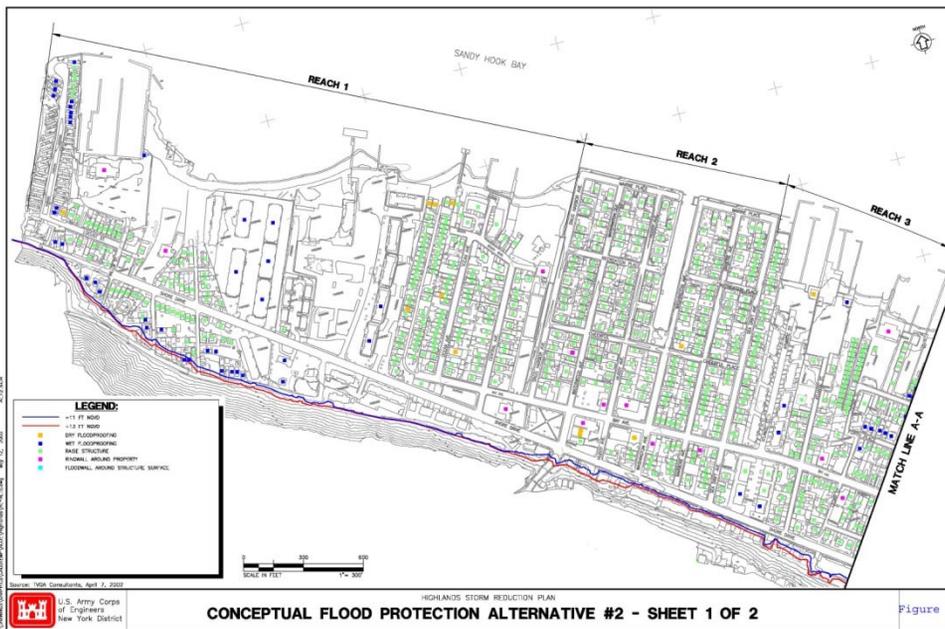
# Alternative 1 – Update of Pre-Feasibility Plan

- Mostly a Bulkhead Plan
- Also Includes:
  - Floodwalls
  - Fabricated Floodwalls (removable)



# Alternative 2 – Non-Structural Plan

- Buyouts
- Elevating (raising)
- Individual Protection (ringwall, berm)
- “Wet” Flood Proofing (elevate utilities, allow structure to get wet below 1<sup>st</sup> floor)
- “Dry” Flood Proofing (wall surface waterproofing)



# Alternative 3 – Offshore Closure Plan

- 4500-ft breakwater from Highlands to Sandy Hook

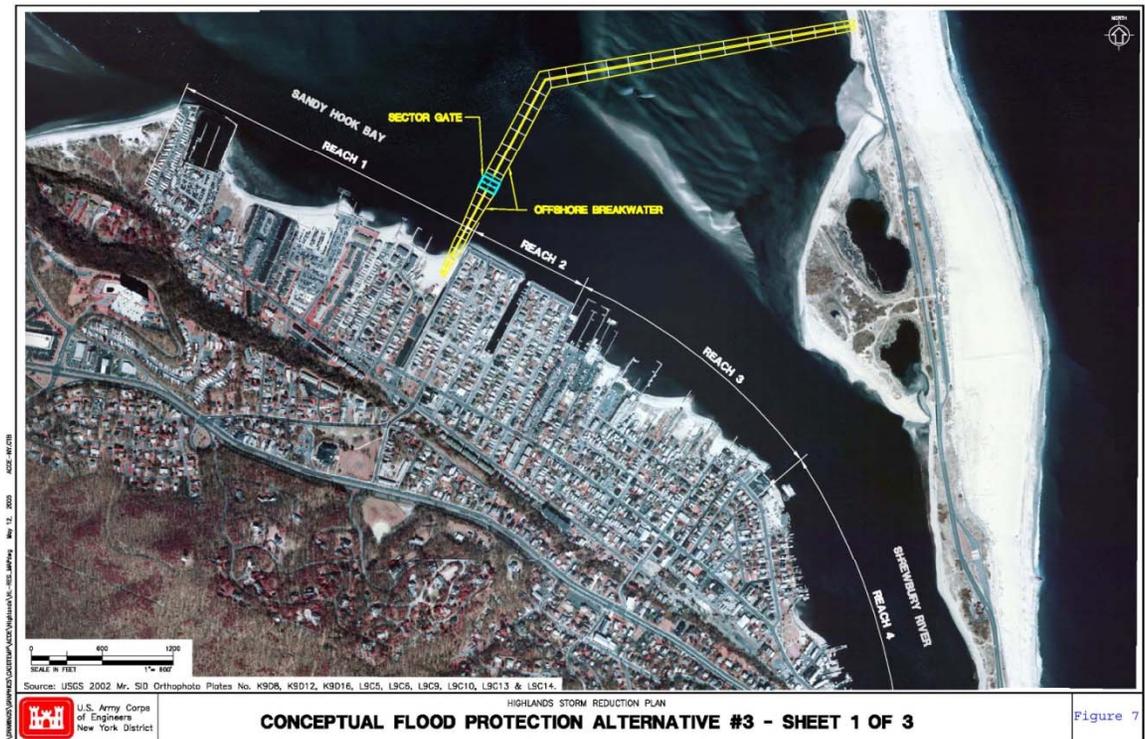
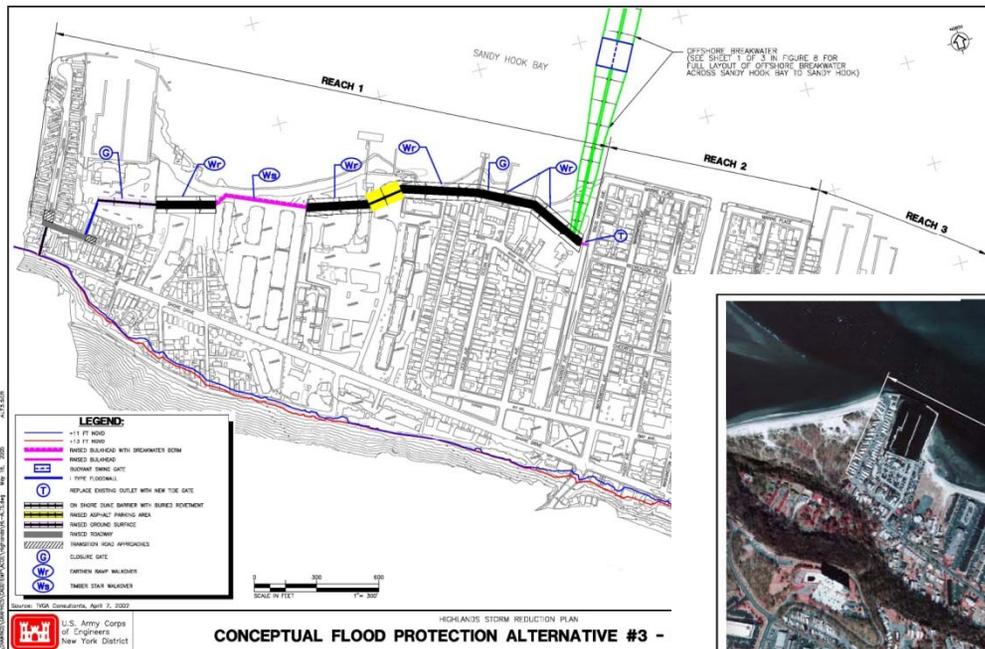


Figure 7





# Alternative Plans

- Alternative 1 – Update of Pre-Feasibility Plan
- Alternative 2 – Non-Structural Plan
- Alternative 3 – Offshore Closure Plan
- Alternative 4 – Beach and Dune Plan
- Alternative 5 – Hybrid Plan

Alternative	Completeness	Effectiveness	Efficiency	Acceptability
No Action	N	N	N	N
Alternative 1	Y	Y	N	Y
Alternative 2	Y	N	N	Y
Alternative 3	Y	N	N	Y
Alternative 4	Y	Y	N	Y
Alternative 5	Y	Y	Y	Y

Net Benefit and Benefit to Cost Ratio (October 2010 P.L.)				
Alternative	Cost	Benefit	Net Benefit	B/C ratio
1	\$2,679,355	\$3,142,600	\$463,200	1.2
2	\$6,475,535	\$4,791,770	-\$1,683,765	0.7
3	\$7,185,426	\$3,123,530	-\$4,061,426	0.4
4	\$2,441,555	\$3,121,230	\$679,675	1.3
5	\$2,080,378	\$3,121,230	\$1,040,492	1.5



# Alternative 5 – Hybrid Plan

- 5a – Minus the Buoyant Swing Gate in Reach 2 (Washington Ave.)
- 5b – Minus Fabricated Floodwall, Plus +12.0 ft. NGVD Bulkhead, Plus Non-Structural Measures
- 5c – Minus Fabricated Floodwall, Plus +13.2 ft. NGVD Bulkhead, Plus Non-Structural Measures
- 5d – Minus Fabricated Floodwall, Plus +13.9 ft. NGVD Bulkhead
- 5e – Minus the buoyant swing gate (Reach 2) & Minus Fabricated Floodwall (Reach 4)

Alt	Reach 1	Reach 2	Reach 3	Reach 4	
5A	Combination of raised bulkheads and reinforced dunes	Raised bulkhead	Combination of raised bulkheads and reinforced dunes	Removable floodwalls	Combination of reinforced dunes and floodwall
5B		Buoyant swing gate		Nonstructural and raised bulkhead +10.9ft NAVD88	
5C				Nonstructural and raised bulkhead +12.1ft NAVD88	
5D				Raised bulkhead +12.4ft NAVD88	
5E		Raised bulkhead			



## Alternative 5 – Hybrid Plan

<b>(October 2014 price level)</b>					
	<b>Alternative 5A</b>	<b>Alternative 5B</b>	<b>Alternative 5C</b>	<b>Alternative 5D</b>	<b>Alternative 5E</b>
<b>Total First Cost</b>	\$78,628,000	\$84,824,000	\$81,978,000	\$80,454,000	\$78,904,000
<b>Interest During Construction</b>	\$2,596,000	\$2,801,000	\$2,707,000	\$2,657,000	\$2,605,000
<b>Total Investment Cost</b>	\$81,224,000	\$87,625,000	\$84,685,000	\$83,111,000	\$81,509,000
<b>Annualized Total Investment Cost*</b>	\$3,385,000	\$3,652,000	\$3,529,000	\$3,464,000	\$3,397,000
<b>Annualized OMRR&amp;R Cost*</b>	\$319,000	\$207,000	\$211,000	\$213,000	\$92,000
<b>Total Annual Cost</b>	<b>\$3,705,000</b>	<b>\$3,859,000</b>	<b>\$3,740,000</b>	<b>\$3,677,000</b>	<b>\$3,489,000</b>

\*Discount rate 3.375% over a 50 year period of analysis.

<b>Highlands Alternatives 5A to 5E</b>				
<b>(Oct. 2014 P.L.)</b>				
<b>Alternative</b>	<b>Cost</b>	<b>Benefit</b>	<b>Net Benefit</b>	<b>B/C ratio</b>
5A	\$3,705,000	\$9,376,000	\$5,671,000	2.5
5B	\$3,859,000	\$9,376,000	\$5,517,000	2.4
5C	\$3,740,000	\$9,376,000	\$5,636,000	2.5
5D	\$3,677,000	\$9,376,000	\$5,699,000	2.5
<b>5E</b>	<b>\$3,489,000</b>	<b>\$9,376,000</b>	<b>\$5,887,000</b>	<b>2.7</b>



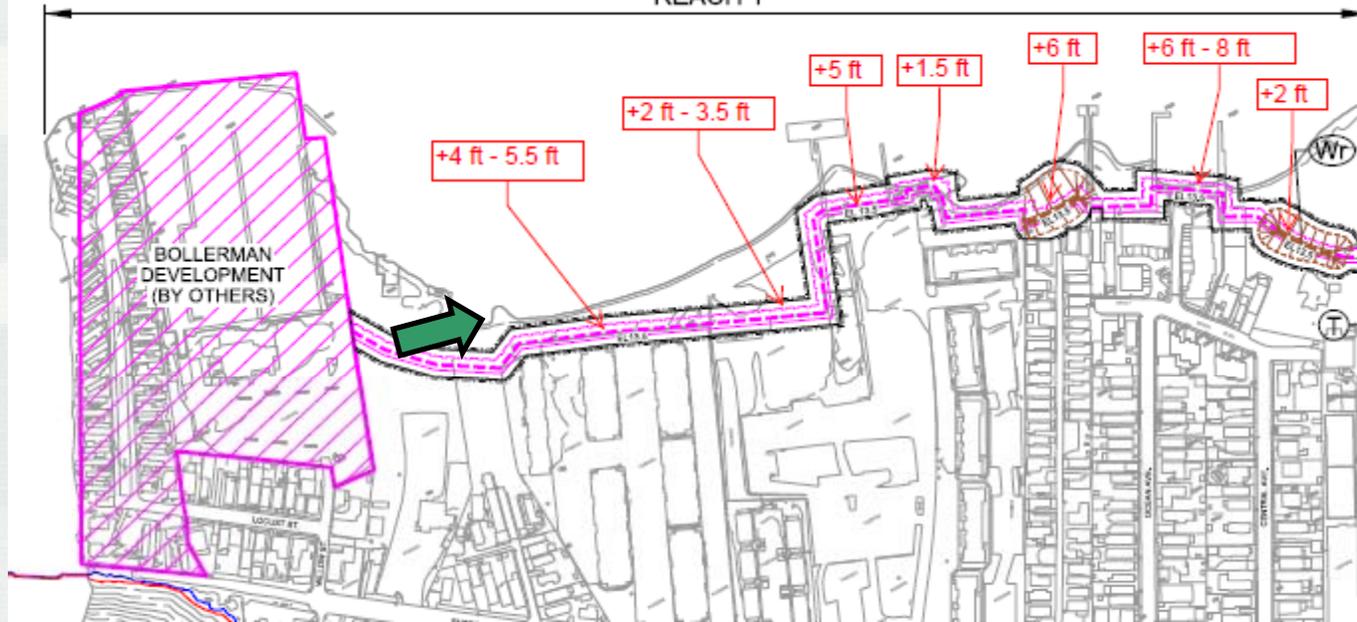
# Alternative 5E Reach 1

**LEGEND:**

-  +11 FT NGVD
-  +13 FT NGVD
-  RAISED BULKHEAD WITH BREAKWATER BERM
-  ONSHORE DUNE BARRIER WITH BURIED BULKHEAD
-  CAPPED EXISTING STATE BULKHEAD
-  I TYPE FLOODWALL
-  PERMANENT EASEMENT
-  TEMPORARY CONSTRUCTION EASEMENT
-  CLOSURE GATE
-  REPLACE EXISTING OUTLET WITH NEW TIDE GATE
-  EARTHEN RAMP WALKOVER
-  TIMBER STAIR WALKOVER
-  EXISTING MONUMENT TO BE RAISED



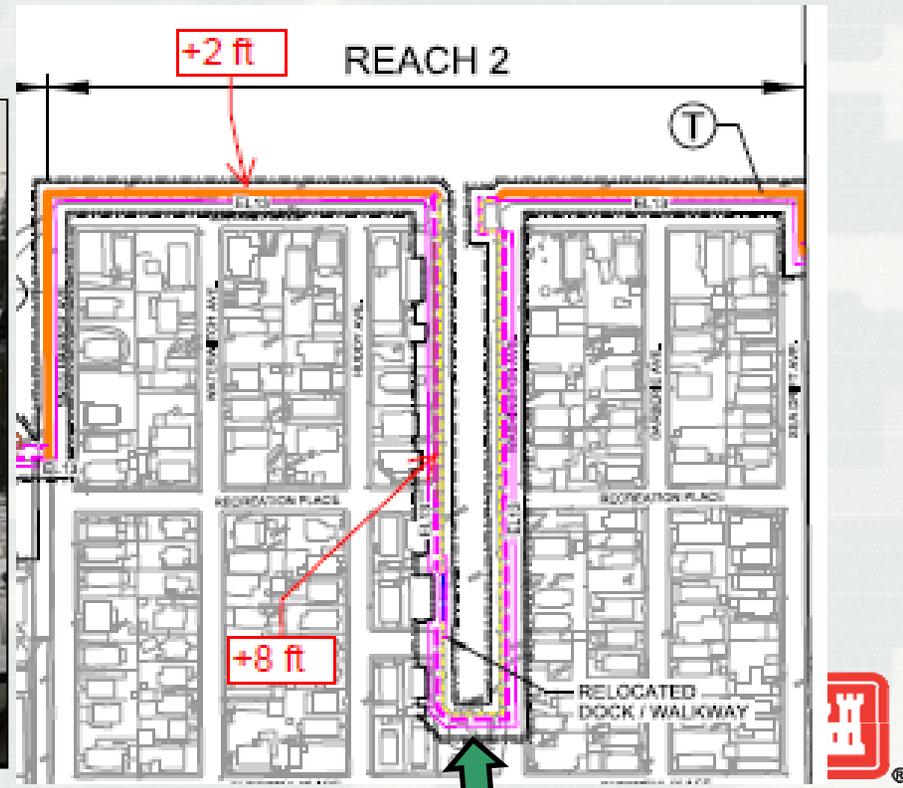
REACH 1



# Alternative 5E Reach 2

**LEGEND:**

	+11 FT NGVD
	+13 FT NGVD
	RAISED BULKHEAD WITH BREAKWATER BERM
	ONSHORE DUNE BARRIER WITH BURIED BULKHEAD
	CAPPED EXISTING STATE BULKHEAD
	I TYPE FLOODWALL
	PERMANENT EASEMENT
	TEMPORARY CONSTRUCTION EASEMENT
	CLOSURE GATE
	REPLACE EXISTING OUTLET WITH NEW TIDE GATE
	EARTHEN RAMP WALKOVER
	TIMBER STAIR WALKOVER
	EXISTING MONUMENT TO BE RAISED

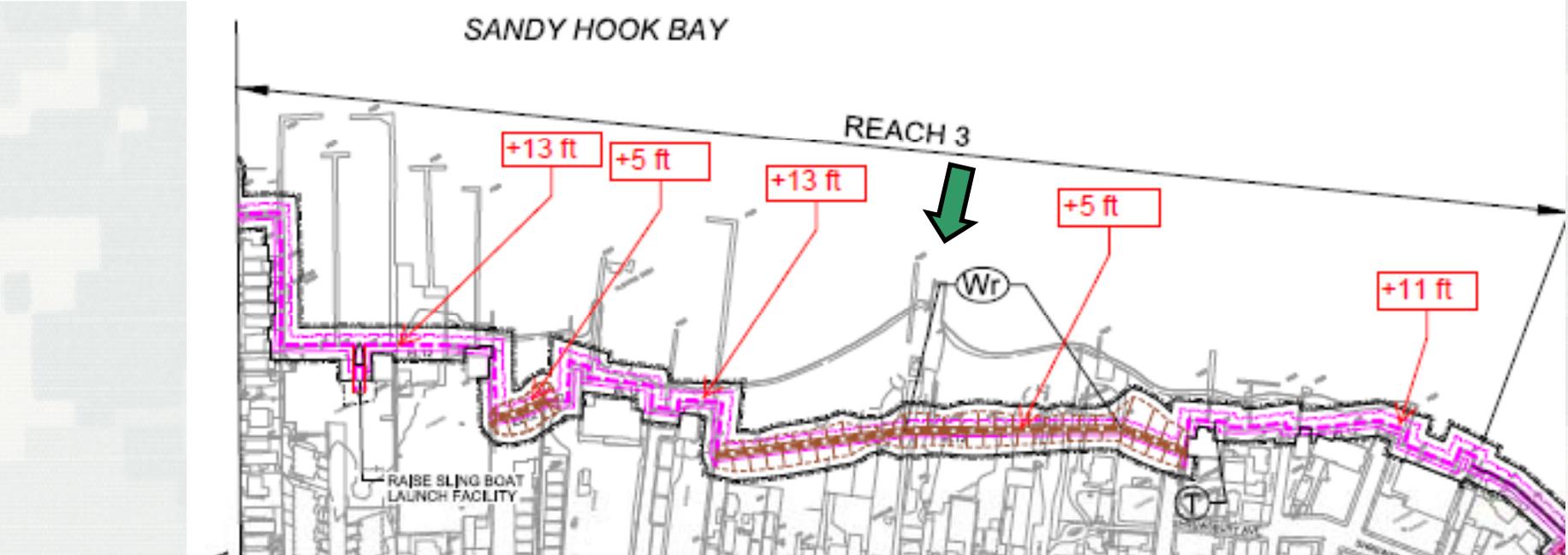


# Alternative 5E Reach 3

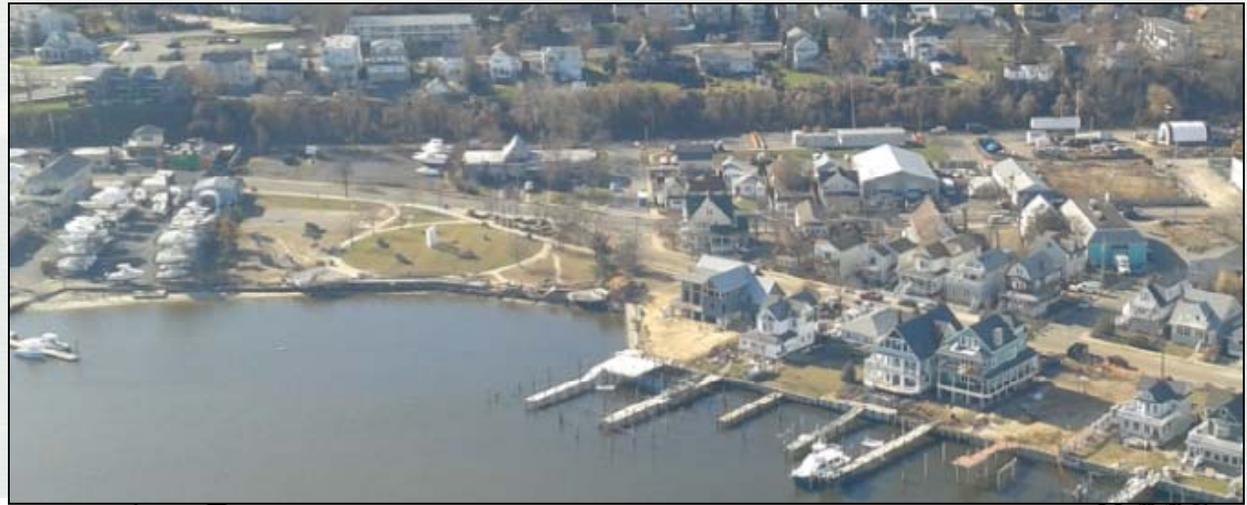


**LEGEND:**

- +11 FT NGVD
- +13 FT NGVD
- ▨ RAISED BULKHEAD WITH BREAKWATER BERM
- ▨ ONSHORE DUNE BARRIER WITH BURIED BULKHEAD
- ▨ CAPPED EXISTING STATE BULKHEAD
- I TYPE FLOODWALL
- PERMANENT EASEMENT
- - - TEMPORARY CONSTRUCTION EASEMENT
- G CLOSURE GATE
- T REPLACE EXISTING OUTLET WITH NEW TIDE GATE
- Wr EARTHEN RAMP WALKOVER
- Ws TIMBER STAIR WALKOVER
- \* EXISTING MONUMENT TO BE RAISED



# Alternative 5E Reach 4

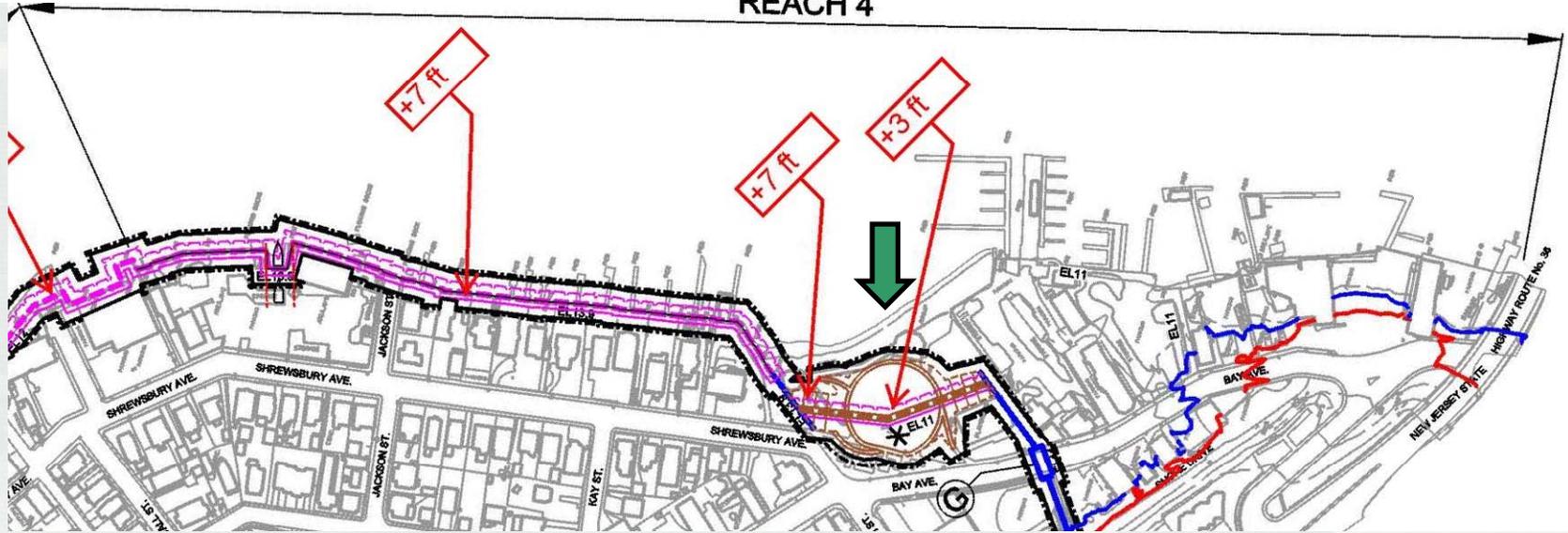


SHREWSBURY RIVER

**LEGEND:**

	+11 FT NGVD
	+13 FT NGVD
	RAISED BULKHEAD WITH BREAKWATER BERM
	ONSHORE DUNE BARRIER WITH BURIED BULKHEAD
	CAPPED EXISTING STATE BULKHEAD
	I TYPE FLOODWALL
	PERMANENT EASEMENT
	TEMPORARY CONSTRUCTION EASEMENT
	CLOSURE GATE
	REPLACE EXISTING OUTLET WITH NEW TIDE GATE
	EARTHEN RAMP WALKOVER
	TIMBER STAIR WALKOVER
	EXISTING MONUMENT TO BE RAISED

## REACH 4



# Next Steps

- Draft Feasibility Report
  - ▶ 30 Day Public Review – 17 August 2015
  - ▶ Independent External Peer Review
  - ▶ USACE Headquarters Review
  
- Final Report – January 2016
- Washington Level Briefing – March 2016
- Project Partnership Agreement – July 2016
  - ▶ Local Commitment to Project



# http://www.nan.usace.army.mil



## NEW YORK DISTRICT

### US Army Corps of Engineers

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#### New flight center takes off



In the skies somewhere above the Middle East, several Blackhawk helicopters hover. Their doors open and American service members exit and swiftly descend by rope to the ground. They move in on high value targets of interest and confiscate their weapons, ammunition and intel. What helped to make this mission a success was the fast rope system installed on the Blackhawks by the Flight Activity...

Story



#### Contact the Corps

#### Obtaining a Regulatory PERMIT

#### Congressional Budget Briefing FY16

#### Most Requested

- Navigation - Federal O&M Public Notices
- Rockaways and Jamaica Bay Reformulation Study
- Rahway NJ Feasibility Study
- FIMP Reformulation Study
- New York and New Jersey Harbor
- Obtaining a Permit (Regulatory Branch)
- Contact Us
- Controlling Depth Reports
- Jamaica Bay Marsh Island Restoration
- Find a Regulatory Public Notice
- Staten Island Feasibility Study

#### News Releases

Army Corps announces availability of Draft Feasibility Report for the Raritan Bay and Sandy Hook Bay, Highlands, NJ, Coastal Storm Risk Management Feasibility Study  
7/17/2015

Army Corps announces availability of Draft Environmental Impact Statement and Draft Feasibility Report for proposed South Shore of Staten Island Coastal Storm Risk Management Project  
6/16/2015



#### HURRICANE SANDY Recovery Operations

#### Photos



News Release Archive	
2015	(8)
2014	(17)
2013	(34)
2012	(20)
2011	(1)

## Army Corps announces availability of Draft Feasibility Report for the Raritan Bay and Sandy Hook Bay, Highlands, NJ, Coastal Storm Risk Management Feasibility Study

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Posted 7/17/2015  
Release no. 15-008

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**Public comment period open until August 17, 2015**

**NEW YORK** – The U.S. Army Corps of Engineers, New York District, in partnership with the New Jersey Department of Environmental Protection (NJDEP), is pleased to announce the release of the Draft Feasibility Report for the Raritan Bay and Sandy Hook Bay, Highlands, NJ, Coastal Storm Risk Management Feasibility Study and the opening of the public comment period on those documents. The public review and comment period is scheduled begin on July 17, 2015 and end August 17, 2015.

With the passage of the Disaster Relief Appropriations Act of 2013, the Army Corps has been given the authority and funding to complete ongoing coastal storm damage risk management projects and studies in the Northeast, including the Raritan Bay and Sandy Hook Bay, Highlands, NJ, Coastal Storm Risk Management Feasibility Study. The draft feasibility study and associated documents are available on New York District's web site at:

**REPORT**



[Missions/CivilWorks/ProjectsInNewJersey/RaritanBayandSandyHookBay,Highlands.aspx](http://Missions/CivilWorks/ProjectsInNewJersey/RaritanBayandSandyHookBay,Highlands.aspx)

Public comments on the draft feasibility study should be submitted to:

**E-mail Comments**



The U.S. Army Corps of Engineers, New York District  
Planning Division-Environmental Branch (ATTN: **Matthew Voisine**)  
26 Federal Plaza, New York, New York 10278-0090

Public comments can also be submitted by e-mail to Project Planner [olivia.n.cackler@usace.army.mil](mailto:olivia.n.cackler@usace.army.mil) and Project Manager [david.t.gentile@usace.army.mil](mailto:david.t.gentile@usace.army.mil)

Further instructions for submitting comments can be found in the Notice of Availability of Environmental Assessment document on the District's site. Comments received by August 17<sup>th</sup> regarding the draft feasibility study will assist in the agency's evaluation of the project changes and will be reflected in the project record.

# COMMENTS / QUESTIONS

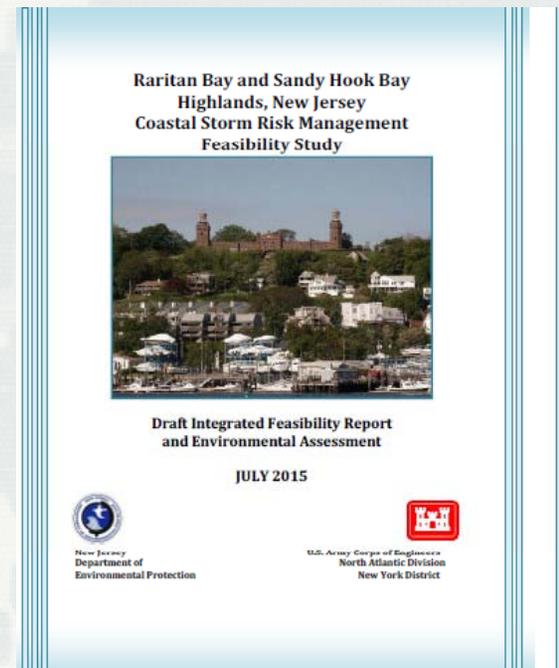
Tonight is for clarification of the technical details.

Comments formally submitted in writing:

- Email
- US Postal Service

Link to Draft Report:

<http://www.nan.usace.army.mil>



# COMMENTS / QUESTIONS

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**Report and Comment Submission:**

<http://www.nan.usace.army.mil>

## NJDEP

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New York, NY 10278  
Attn. Jason Shea, Planning Division

