

North Atlantic Division

Hurricane Sandy: Response, Recovery, Resilience and Risk Reduction

Presenter Name

Presenter Title

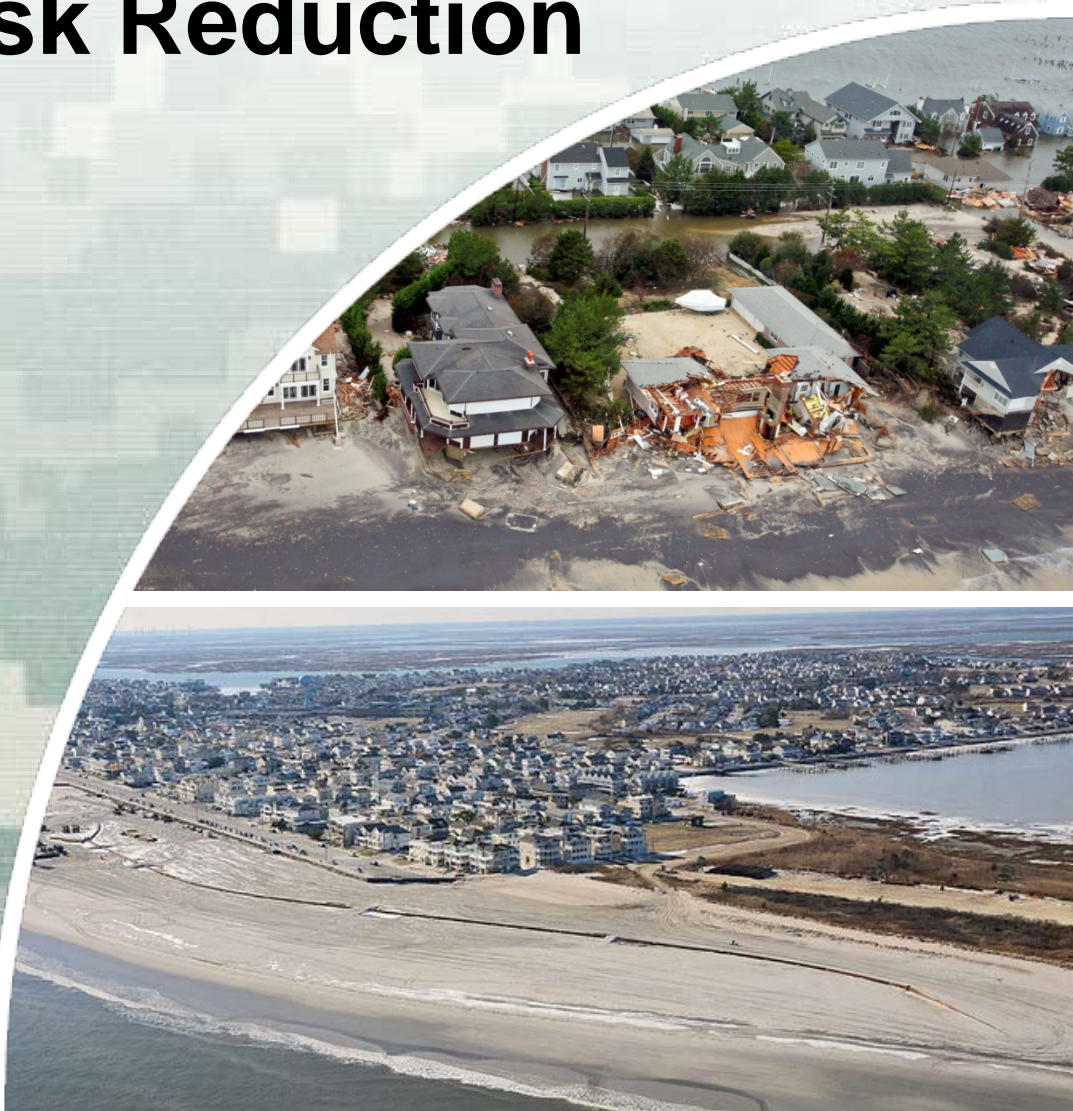
North Atlantic Division

November 2013



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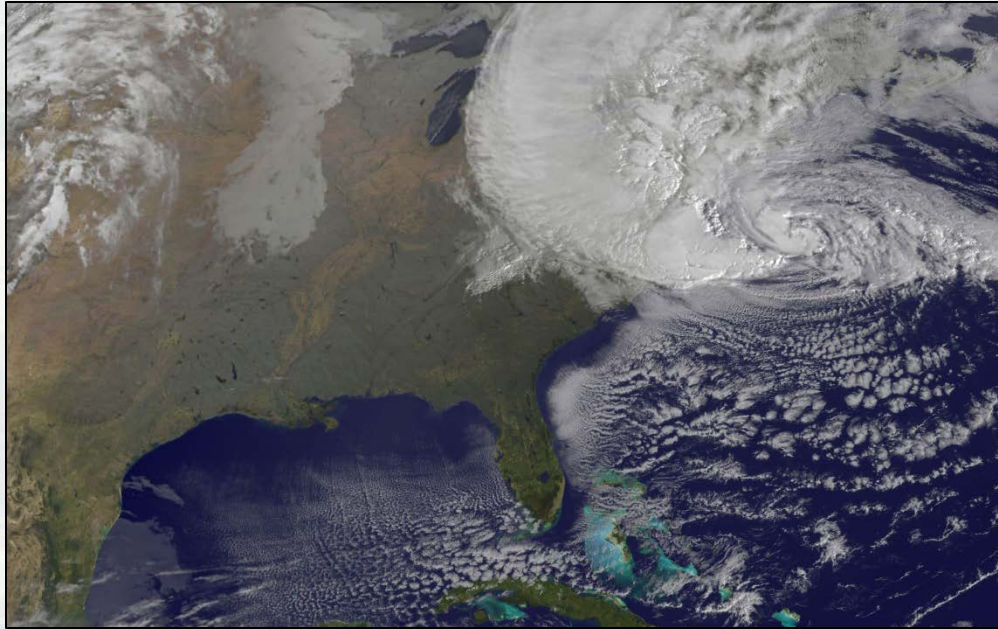


Agenda

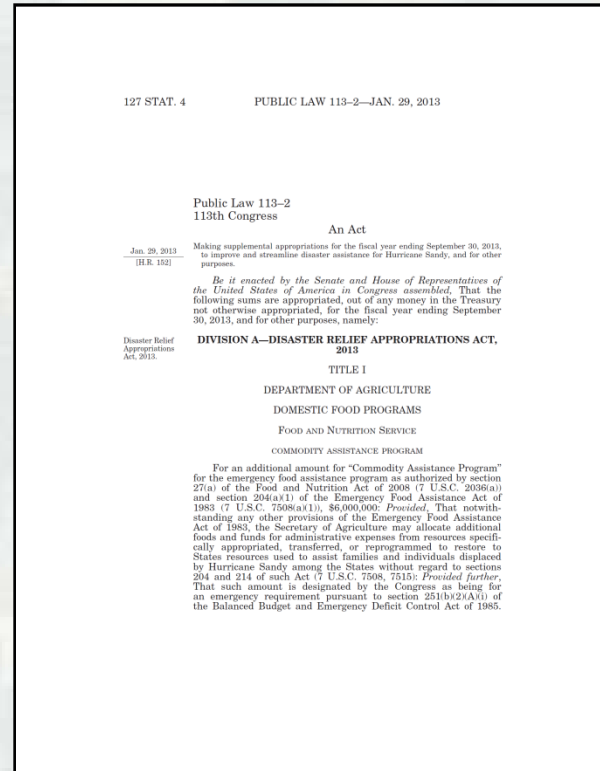
- Overview
- Response
- Recovery
- Resilience
- Risk reduction



Bottom Line Up Front



Hurricane Sandy Oct. 29, 2012



Public Law 113-2, Disaster Relief Appropriations Act, 2013



Overview of Sandy Recovery Mission

1 Responsibilities

- Flood and storm damage risk reduction
- Maintenance of federal navigation channels, harbors and waterways

2 Results

- Preserve coastal populations, property and infrastructure
- Contribute to safe, reliable, efficient, and environmentally sustainable waterways for movement of commerce, national security needs, and recreation

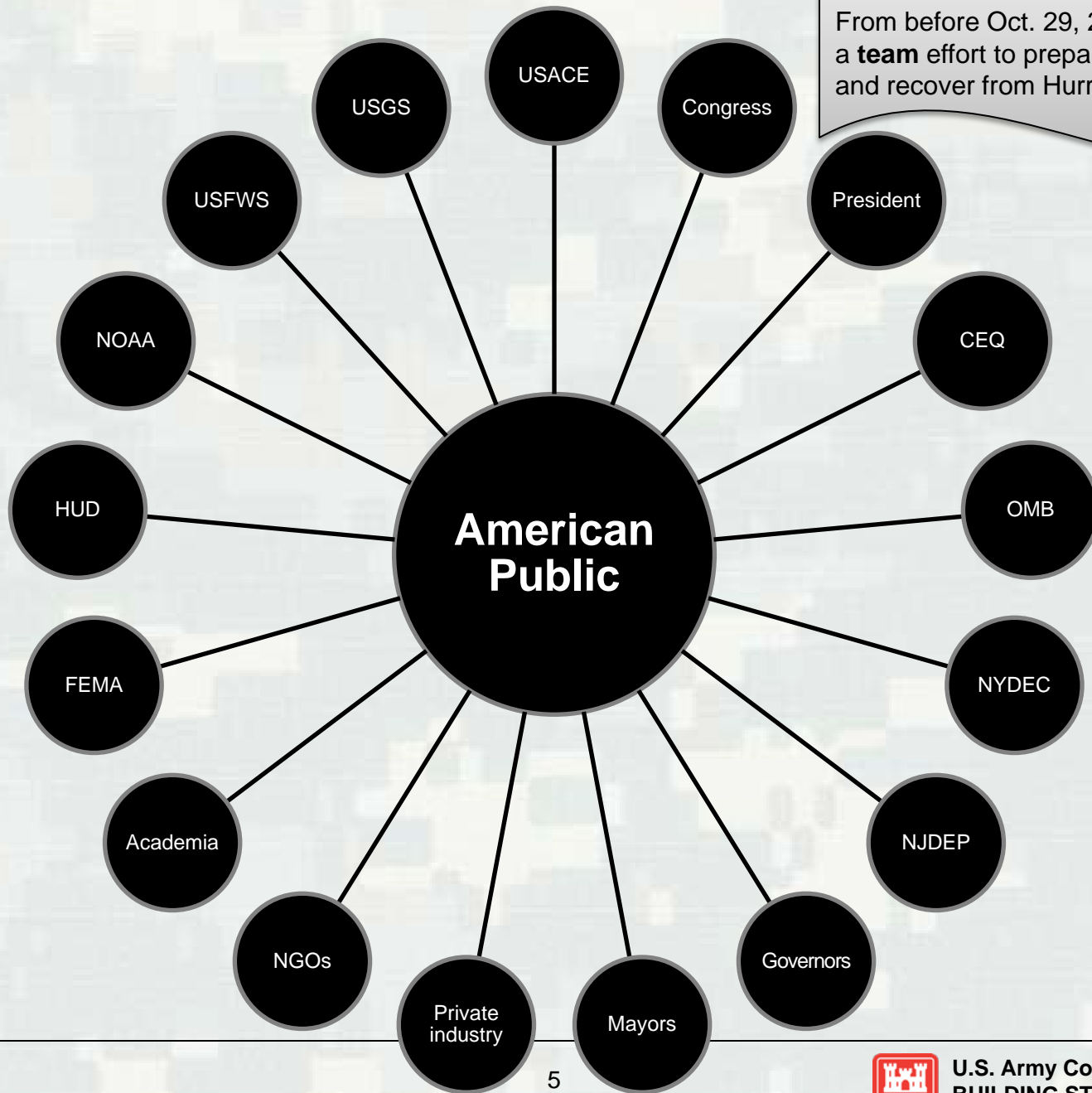
3 Research

- Anticipate future scenarios
- Identify solution sets
- Contribute to knowledge sharing for a comprehensive, collaborative, synchronized approach to increased resilience to future extreme weather



Who's Involved

From before Oct. 29, 2012, this has been a **team** effort to prepare for, respond to, and recover from Hurricane Sandy.



Agenda

- Overview
- **Response**
- Recovery
- Resilience
- Risk reduction



Sandy's Impacts

- More than \$50 billion in damage
- Geographically widespread from Maine to Florida and west into Ohio
- Approximately \$351 million cost to execute FEMA mission requests to support Response



Soon after the storm, USACE partnered with NOAA to develop [Infrastructure Systems Rebuilding Principles](#) to promote a unified strategy for each agency's approach to activities associated with rebuilding and restoration efforts in the wake of Hurricane Sandy.

Hurricane Sandy Response Numbers

Removed more than **900,000 cubic yards** of debris in New York City alone

15,000 trees down in New York City

Installed more than **200 generators**

Provided more than **9 million liters** of bottled water

Unwatered approximately **475 million gallons** of saltwater

More than **800 experts** from around the Nation to support local Army Corps employees

212,000 cubic feet of material collected with **3 drift collection vessels** in waterways around New York and New Jersey

Emergency Operations Center operated nearly **200 days on 24/7 operations** to prepare and respond to the storm.

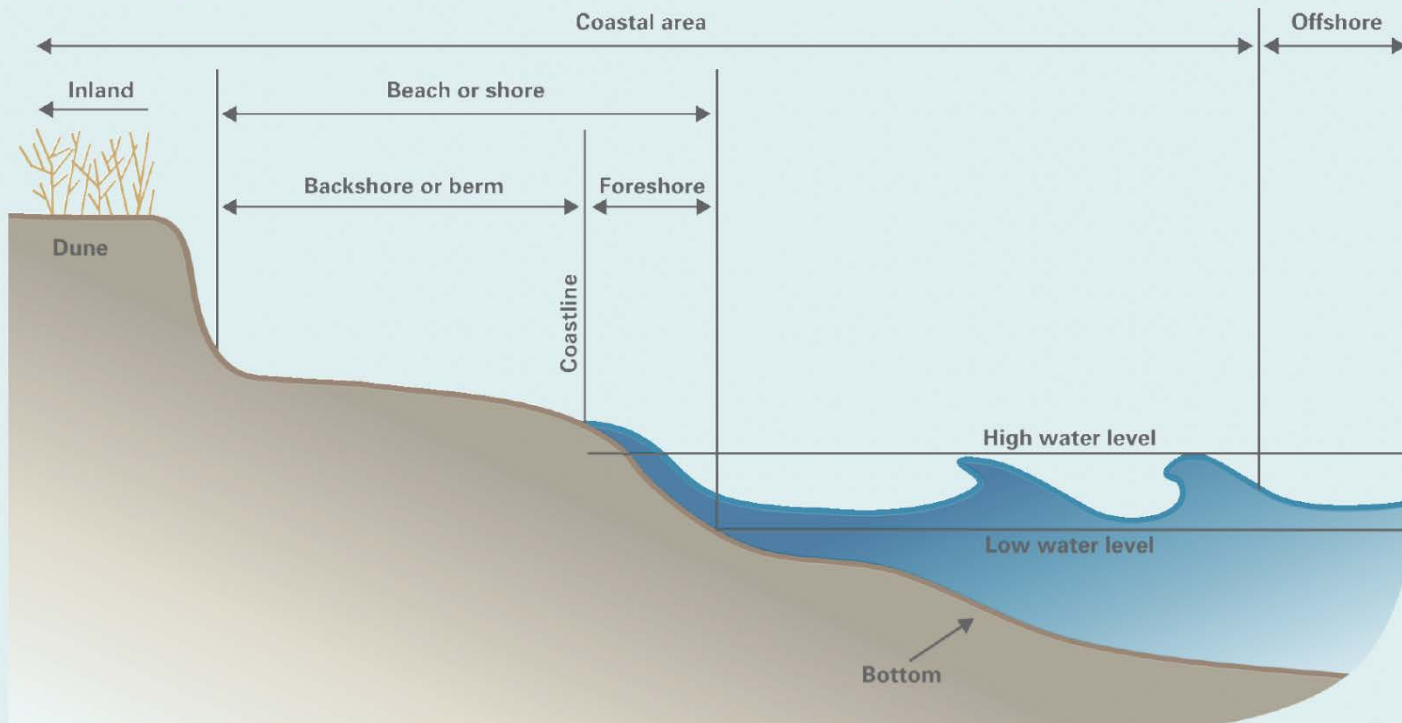
Silver lining: Army Corps' projects credited with an estimated **\$1.9 billion in damages prevented**



Beaches: A Vital Resource

- Beaches serve to reduce flood risk by absorbing wave energy and avoiding water overtopping dunes and flooding communities situated behind behind the beach.
- Beaches are sacrificial in nature, which means they absorb the wave energy, but the trade-off is millions of gallons of salt water washing the sand into the ocean. A storm of Sandy's magnitude is capable of completely wiping out a dune and leaving the resulting beach (berm) much narrower.

The components of a coastal beach work together as a system



Coastal beaches function as a system. The beach not only includes the dunes and berm, or the dry part of the beach, but also the wet part of the beach that slopes underwater.

Did Army Corps Projects Hold Up?

Performance Evaluation Report

- [PL 113-2](#) provided \$500,000 in Investigations allocation to complete a Performance Evaluation Report to evaluate the effectiveness of Army Corps projects during Hurricane Sandy and include recommendations for further improvements.
- The PER currently is under final review and will be available at www.nad.usace.army.mil/Sandy when finalized.



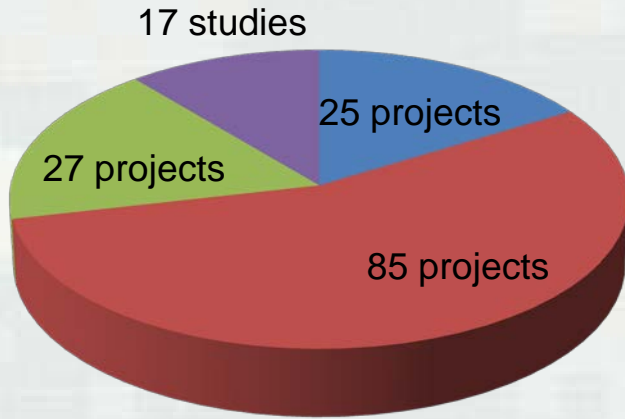
Agenda

- Overview
- Response
- **Recovery**
- Resilience
- Risk reduction

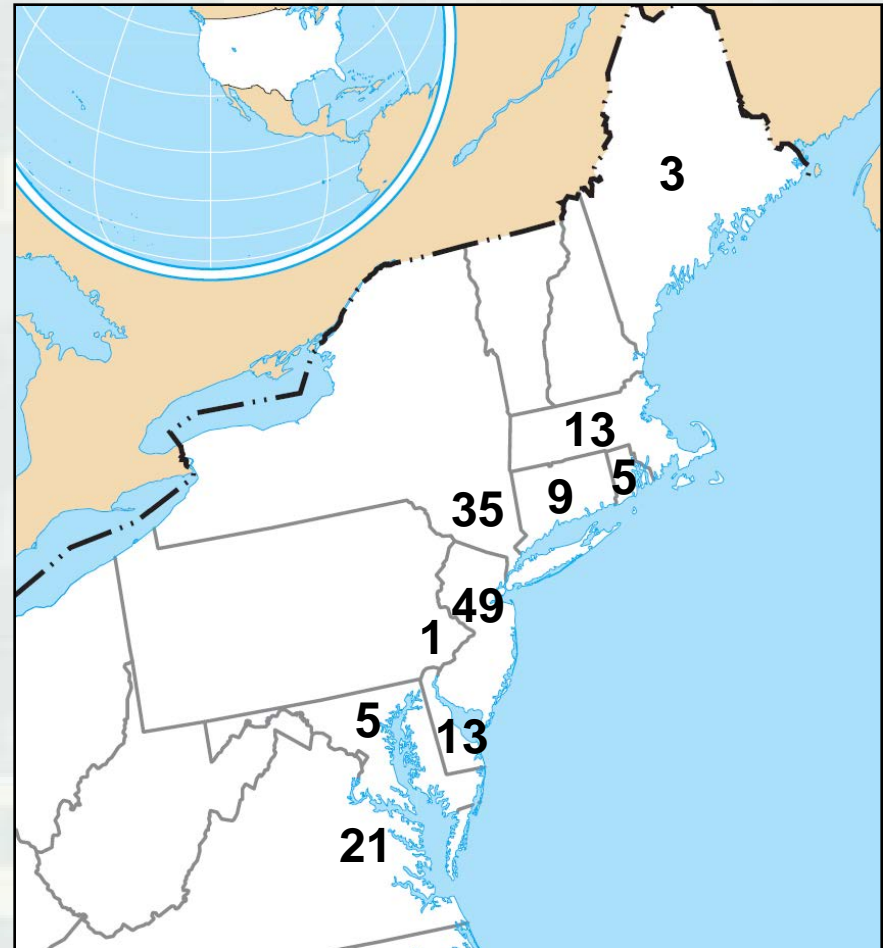


North Atlantic Division Projects

154 projects



- Beach repair and restoration
- Repair of navigation channels and structures
- Construction of flood risk reduction projects
- Ongoing studies



NAD Projects and Studies – New England

Count	State	Project
1	ME	Wells Harbor dredging
2	ME	Scarborough River dredging
3	ME	Kennebunk River dredging

Count	State	Project
1	MA	Green Harbor jetty repair
2	MA	New Bedford Fairhaven and Acushnet Hurricane Barrier unwater and repair
3	MA	Newburyport Harbor breakwater repairs
4	MA	Hyannis Harbor dredging
5	MA	Buttermilk Bay Channel dredging
6	MA	Falmouth Harbor dredging
7	MA	Cuttyhunk Harbor dredging
8	MA	Nantucket Harbor of Refuge breakwater repairs
9	MA	Menemsha Creek jetty repair
10	MA	Rockport Harbor jetty repair
11	MA	Cohasset Harbor dredging
12	MA	Coastal Areas, Marshfield erosion and storm damage reduction
13	MA	Nantasket Beach, Hull erosion and storm damage reduction

Count	State	Project
1	CT	Prospect Beach, West Haven beach restoration
2	CT	Woodmont Beach, Milford beach restoration
3	CT	Bridgeport Harbor breakwater repairs
4	CT	New Haven Harbor breakwater repairs and dredging
5	CT	Stamford Hurricane Barrier cable repairs
6	CT	Clinton Harbor dredging
7	CT/RI	Little Narragansett Bay dredging
8	CT	Guilford Harbor dredging
9	CT	Morris Cove, New Haven erosion and storm damage reduction

Count	State	Project
1	RI	Misquamicut Beach, Westerly erosion control and beach berm
2	RI	Block Island Harbor of Refuge east backwater repair, wharf repair
3	RI	Point Judith Harbor of Refuge jetty, camp cronin, east shore arm repairs
4	RI	Sakonnet Harbor breakwater repairs
5	RI	Pawcatuck River and Rhode Island coastal investigation
6	RI	Pawcatuck River flood study



NAD Projects and Studies – New York

	State	Project		State	Project
1	NY	Fire Island Inlet to Montauk Point, West of Shinnecock Inlet (WOSI) beachfill	20	NY	Moriches Inlet dredging
2	NY	Fire Island Inlet to Montauk Point (Westhampton) beachfill	21	NY	New York Harbor, Drift Remove
3	NY	Fire Island Inlet and Shores West to Jones Inlet (Gilgo Beach) beachfill	22	NY	Sag Harbor breakwater rehabilitation
4	NY	East Rockaway Inlet to Rockaway Inlet and Jamaica Bay beachfill	23	NY	Project Condition Survey
5	NY	Atlantic Coast of New York City, Rockaway Inlet (Coney Island) beachfill	24	NY	Coney Island sea gate and erosion control
6	NY	Oakwood Beach levee repair	25	NY	Fire Island Inlet to Montauk Point (FIMP) - Westhampton Interim erosion control and hurricane protection
7	NY	Bay Ridge and Red Hook Channel dredging	26	NY	Long Beach re-analysis of groin fields
8	NY	Browns Creek dredging	27	NY	Montauk Point reformulation study
9	NY	East Rockaway Inlet dredging	28	NY	Rockaway Beach storm damage reduction and nourishment
10	NY	Fire Island Inlet to Jones Inlet dredging	29	NY	Hashamomuck Cove streambank stabilization, navigation, flood damage reduction
11	NY	Great Kills Harbor dredging	30	NY	Jamaica Bay environmental restoration
12	NY	Great South Bay dredging	31	NY	Lake Montauk feasibility study
13	NY	Hudson River Channel dredging	32	NY	Bayville erosion and flood control
14	NY	Hudson River maintenance dredging	33	NY	Asharoken erosion and flood control
15	NY	Jamaica Bay dredging	34	NY	Staten Island coastal storm damage reduction
16	NY	Jones Inlet dredging	35	NY	Island Park Beach erosion and hurricane protection
17	NY	Lake Montauk Harbor dredging			
18	NY	Long Island Intracoastal Waterway dredging			
19	NY	Mattituck Harbor dredging			



NAD Projects and Studies – New Jersey

	State	Project
1	NJ	Raritan Bay and Sandy Hook Bay, (Keansburg) beachfill
2	NJ	Sandy Hook to Barnegat Inlet (Sea Bright to Manasquan) beachfill
3	NJ	Barnegat Inlet to Little Egg Harbor Inlet beachfill
4	NJ	Brigantine Island beachfill
5	NJ	Absecon Island beachfill
6	NJ	Great Egg Harbor/Peck Beach beachfill
7	NJ	Townsend Inlet to Cape May beachfill
8	NJ	Cape May to Lower Township beachfill
9	NJ	Cheesequake Creek dredging
10	NJ	New York and New Jersey Channels dredging
11	NJ	New York Harbor dredging
12	NJ	Newark Bay dredging
13	NJ	Raritan River to Arthur Kill dredging
14	NJ	Raritan River dredging
15	NJ	Sandy Hook Bay at Leonardo dredging
16	NJ	Shark River dredging
17	NJ	Shoal Harbor And Compton Creek dredging

	State	Project
18	NJ	Shrewsbury River, Main Channel dredging
19	NJ	Keyport Harbor dredging
20	NJ	Project Condition Surveys
21	NJ	Barnegat Inlet dredging
22	NJ	Cold Spring Inlet dredging
23	NJ	Manasquan River dredging
24	NJ	New Jersey Intracoastal Waterway dredging
25	NJ	Salem River dredging
26	NJ	Absecon Inlet dredging
27	NJ	Project Condition Surveys
28	NJ	Toms River dredging
29	NJ	Minish Park flood risk mitigation
30	NJ	Passaic River Mainstem tidal and non-tidal re-evaluation
31	NJ	Port Monmouth flood risk mitigation
32	NJ	Union Beach flood risk mitigation
33	NJ	Sandy Hook to Barnegat Inlet flood risk mitigation
34	NJ	South River, Raritan flood risk mitigation

	State	Project
35	NJ	Barnegat Inlet to Little Egg Harbor Inlet flood risk mitigation
36	NJ	Abescon Island flood risk mitigation
37	NJ	Oakwood Beach flood risk mitigation
38	NJ	Great Egg Harbor Inlet to Townsends Inlet
39	NJ	Manasquan Inlet to Barnegat Inlet
40	NJ	Rahway River Basin study
41	NJ	Highlands Storm Damage study
42	NJ	Leonardo study
43	NJ	Shrewsbury River study
44	NJ	Wreck Pond study
45	NJ	Alternative Long Term Nourishment study
46	NJ	Delaware River Comprehensive study
47	NJ	Hereford Inlet / Cape May Inlet study
48	NJ	Delaware River Dredged Material study
49	NJ	Seaside Park beach erosion and storm damage reduction



NAD Projects and Studies – Mid-Atlantic

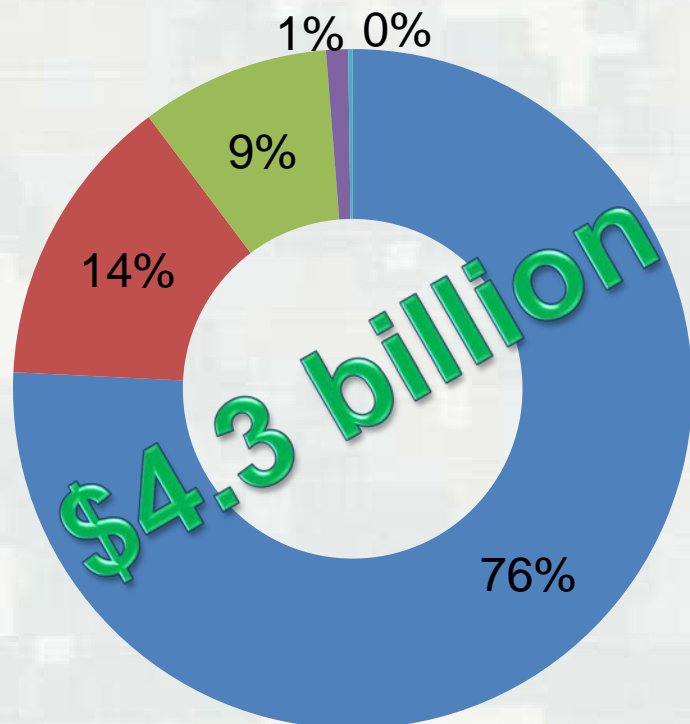
Count	State	Project
1	MD	Atlantic Coast of Maryland (Rehab) shoreline and dunes
2	MD	Dredge Baltimore Harbor to 50 feet
3	MD	Ocean City Harbor & Inlet dredging
4	MD	Wicomico River dredging
5	MD	Jane's Island, Somerset County beach erosion and storm damage risk reduction

Count	State	Project
1	DE	Roosevelt Inlet to Lewes
2	DE	Rehoboth to Dewey
3	DE	Fenwick Island
4	DE	Delaware Coast Protection
5	DE	Bethany/South Bethany
6	DE	Delaware River, Philadelphia to Sea
7	DE	Indian River Inlet and Bay
8	DE/MD	Intracoastal Waterway, Delaware to Chesapeake Bay
9	DE	Wilmington Harbor
10	DE	Project Condition Surveys
11	DE	Broadkill Beach
12	DE	Delaware River Dredged Material Utilization
13	DE	Pennsylvania Ave. Improvement, Bethany

	State	Project
1	VA	Virginia Beach storm damage risk reduction
2	VA	Sandbridge Beach beachfill
3	VA	Little Wicomico River dredging
4	VA	Cape Charles City dredging
5	VA	Chincoteague Inlet dredging
6	VA	Norfolk Harbor Channel dredging
7	VA	Project Condition Surveys
8	VA	Rudee Inlet dredging
9	VA	Tangier Channel dredging
10	VA	Waterway Coast Of Virginia dredging
11	VA	Norfolk Harbor Craney Island revetment
12	VA	Tylers Beach dredging
13	VA	Bennett Creek dredging
14	VA	Onancock River dredging
15	VA	Starlings Harbor dredging
16	VA	Blackwater River dredging
17	VA	James River dredging
18	VA	Lynnhaven Inlet dredging
19	VA	Willoughby Spit, Norfolk berm and beachfill
20	VA	Pretty Lake flood damage reduction
21	VA	Hague flood damage reduction



North Atlantic Division Sandy Recovery Budget

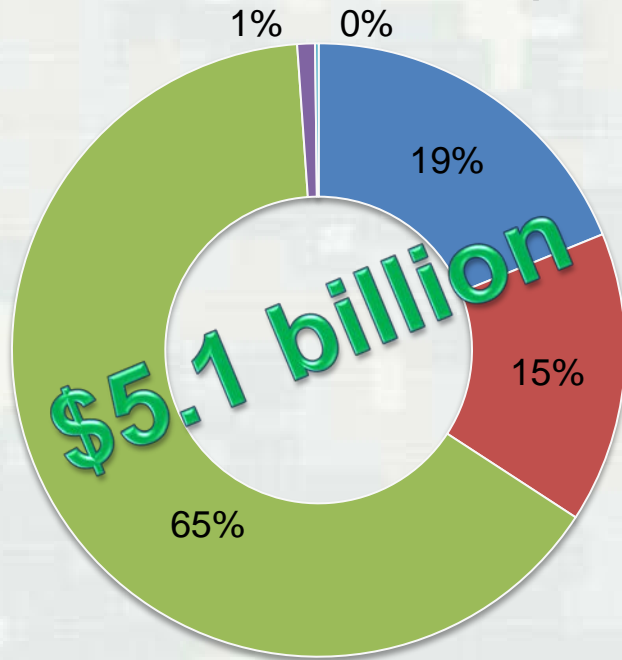


- Construction of flood risk reduction projects
- Beach repair and restoration
- Repair of navigation channels and structures
- Investigations and studies
- General expenses

For every dollar the federal government spends on flood mitigation, it saves an average of \$4 in disaster relief after the next devastating storm. – [Multihazard Mitigation Council, 2005](#)



USACE Hurricane Sandy Recovery Budget (After Sequestration)



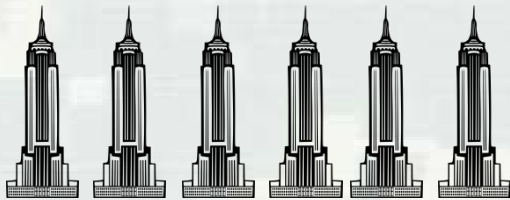
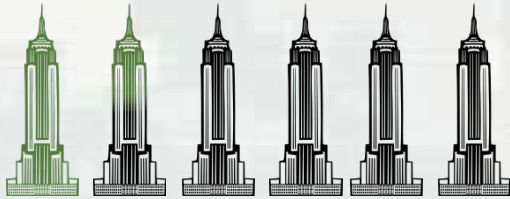
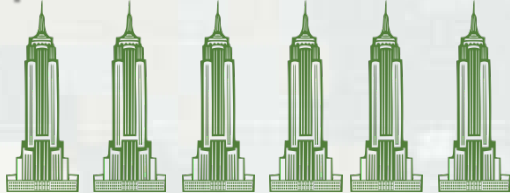
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Sandy Near-Term Coastal Restoration

More than 40% of sand placed in 8 months

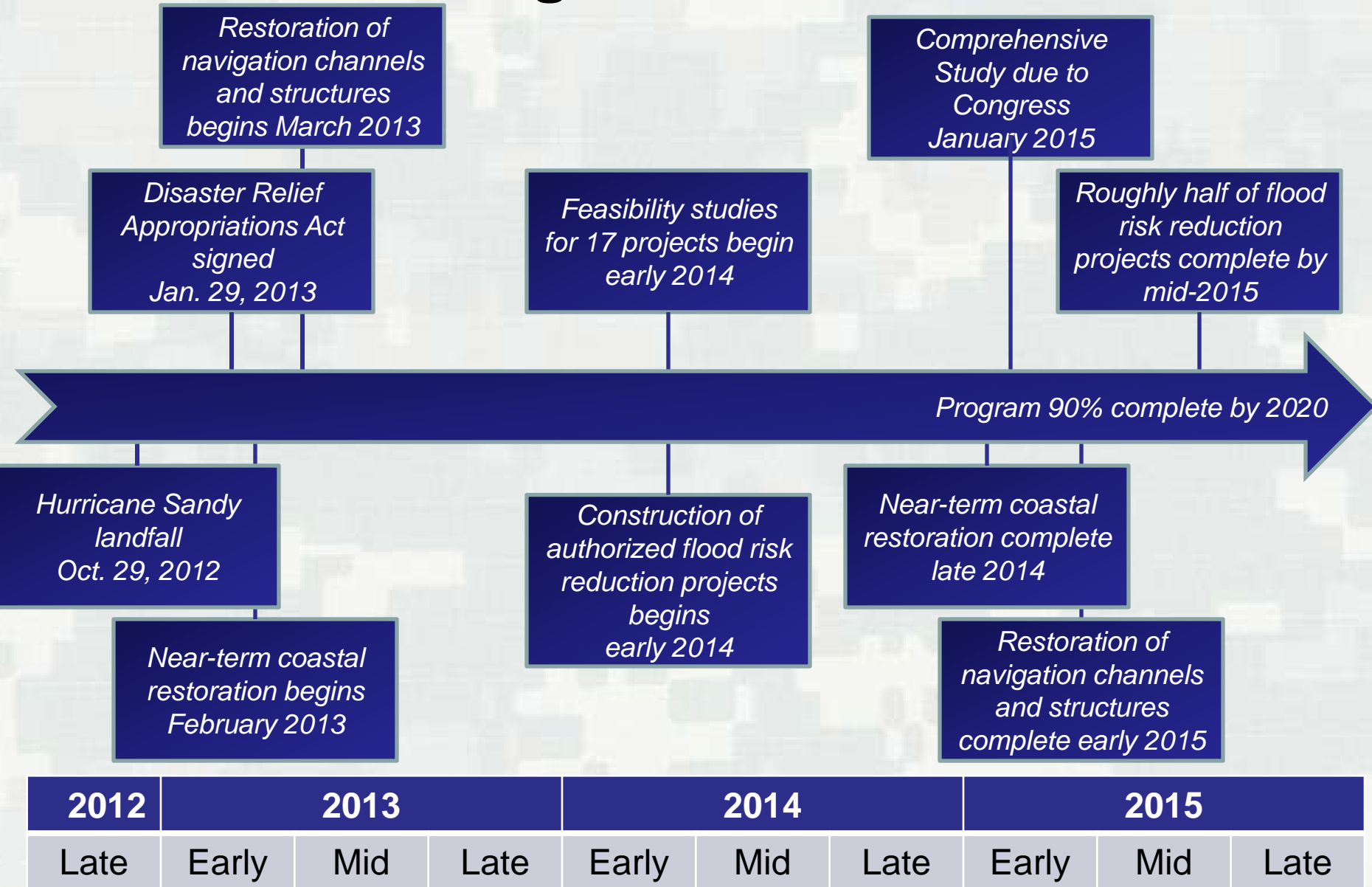


Total estimated
26 million
cubic yards of sand;
enough to fill the
Empire State Building
19 times



31,000 miles
of coastline

Program Timeline

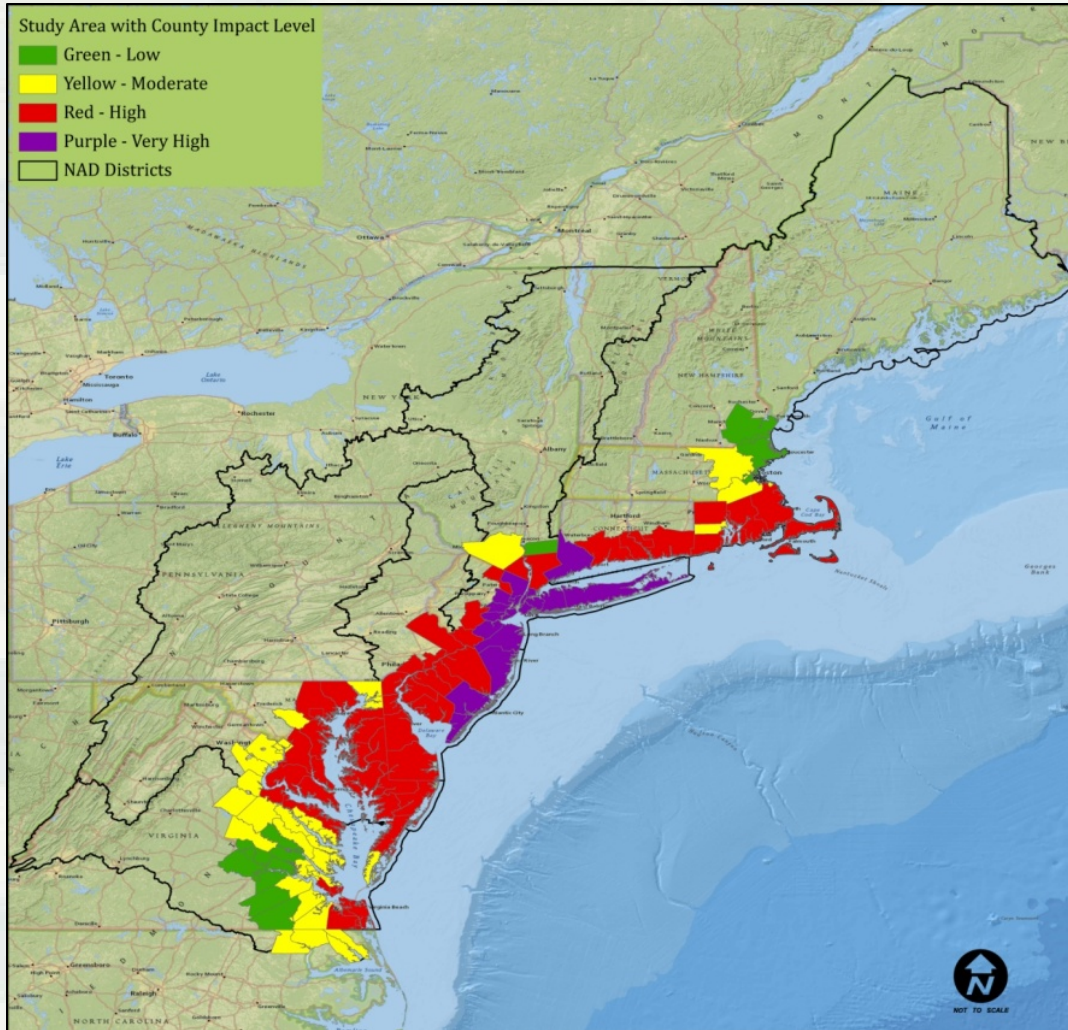


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Comprehensive Study

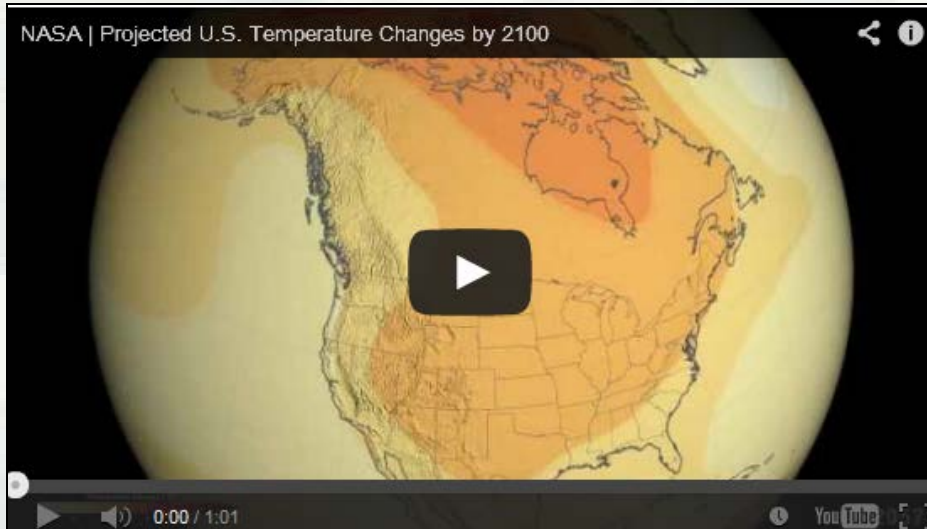


Study Area Map

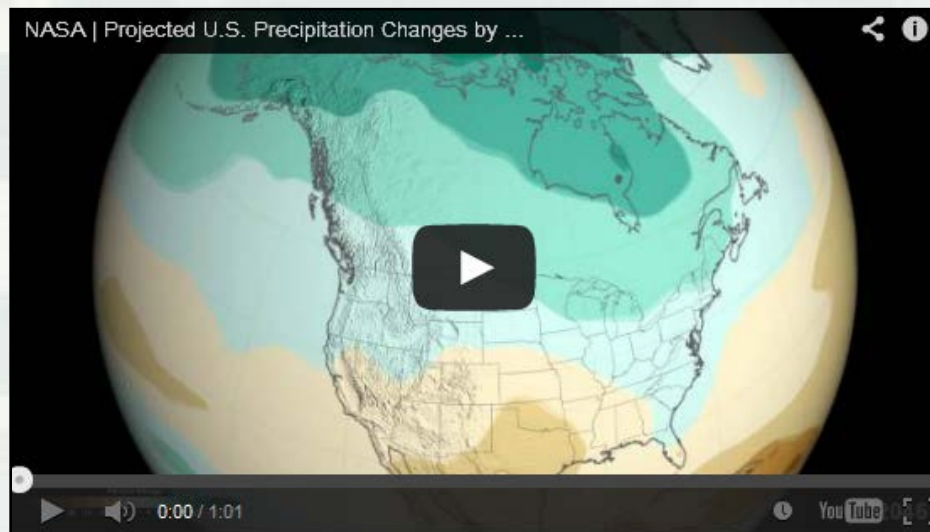
The North Atlantic Coast Comprehensive Study (NACCS) is a collaborative effort, bringing together governmental, academic, and non-governmental experts in coastal planning, engineering and science to collaboratively develop a risk reduction framework for the 31,000 miles of coastline within the North Atlantic Division that were affected by Hurricane Sandy. The study is authorized up to \$20 million and will be submitted to Congress in January 2015.

<http://www.nad.usace.army.mil/CompStudy>

Climate Change



<http://youtu.be/39cBqY1sszY>



<http://youtu.be/ipOcTpNI5rs>

- There is increasing concern among the public and the scientific community about climate change.
- The most important influences of climate change on Corps missions are changes in temperature; changes in precipitation quantity, intensity and form (snow vs. rain); and changes in sea levels, winds and wave patterns.

Sea-Level Rise



- More than 8 million people live in areas at risk of coastal flooding. Along the U.S. Atlantic Coast alone, almost 60 percent of the land that is within a meter of sea level is planned for further development, with inadequate information on the potential rates and amount of sea level rise.
- Range of rise varies on low end, 12 inches and high end, 6 feet over a 100-year period.
- USACE contributed to the [Sea Level Rise Tool for Sandy Recovery](#) to create a set of map services to help communities, residents, and other stakeholders consider risks from future sea level rise in planning for reconstruction following Hurricane Sandy.

Sea-Level Rise



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12 inches is equivalent to the height of most wine bottles



6 feet is equivalent to the height of a beach umbrella

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Risk Reduction Nature-Based Solution Sets



Dunes and Beaches

Vegetated Features

Oyster and Coral Reefs

Barrier Islands

Maritime Forests/Shrub Communities

Benefits/Processes

- Breaking of offshore waves
- Attenuation of wave energy
- Slow inland water transfer

Benefits/Processes

- Breaking of offshore waves
- Attenuation of wave energy
- Slow inland water transfer
- Increased infiltration

Benefits/Processes

- Breaking of offshore waves
- Attenuation of wave energy
- Slow inland water transfer

Benefits/Processes

- Wave attenuation and/or dissipation
- Sediment stabilization

Benefits/Processes

- Wave attenuation and/or dissipation
- Shoreline erosion stabilization
- Soil retention

Performance Factors

- Berm height and width
- Beach slope
- Sediment grain size and supply
- Dune height, crest, and width
- Presence of vegetation

Performance Factors

- Marsh, wetland, or SAV elevation and continuity
- Vegetation type and density

Performance Factors

- Reef width, elevation, and roughness

Performance Factors

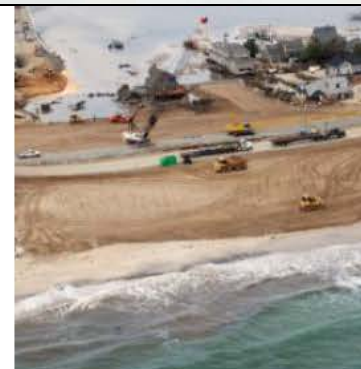
- Island elevation, length, and width
- Land cover
- Breach susceptibility
- Proximity to mainland shore

Performance Factors

- Vegetation height and density
- Forest dimension
- Sediment composition
- Platform elevation



Risk Reduction Structural Solution Sets



Levees

Storm Surge Barriers

Seawalls and Revetments

Groins

Detached Breakwaters

Benefits/Processes

- Surge and wave attenuation and/or dissipation
- Reduced flooding
- Reduced risk for vulnerable areas

Benefits/Processes

- Surge and wave attenuation
- Reduced salinity intrusion

Benefits/Processes

- Reduced flooding
- Reduced wave overtopping
- Shoreline stabilization behind structure

Benefits/Processes

- Shoreline stabilization

Benefits/Processes

- Shoreline stabilization behind structure
- Wave attenuation

Performance Factors

- Levee height, crest width, and slope
- Wave height and period
- Water level

Performance Factors

- Barrier height
- Wave height
- Wave period
- Water level

Performance Factors

- Wave height
- Wave period
- Water level
- Scour protection

Performance Factors

- Groin length, height, orientation, permeability, and spacing
- Depth at seaward end
- Wave height
- Water level
- Longshore transportation rates and distribution

Performance Factors

- Breakwater height and width
- Breakwater permeability, proximity to shoreline, orientation, and spacing



Risk Reduction Non-Structural Solution Sets



Floodplain Policy and Management

Benefits/Processes

- Improved and controlled floodplain development
- Reduced opportunity for damages
- Improved natural coast environment

Performance Factors

- Wave height
- Water level
- Storm duration
- Agency collaboration

Floodproofing and Impact Reduction

Benefits/Processes

- Reduced opportunity for damages
- Increased community resiliency
- No increase in flood potential elsewhere

Performance Factors

- Wave height
- Water level
- Storm duration

Flood Warning and Preparedness

Benefits/Processes

- Reduced opportunity for damages
- Increased community resiliency
- Improved public awareness and responsibility

Performance Factors

- Wave height
- Water level
- Storm duration

Relocation

Benefits/Processes

- Reduced opportunity for damages
- No increase in flood potential elsewhere
- Improved natural coast environment

Performance Factors

- Wave height
- Water level
- Storm duration

Reducing Risk

Residents

- Avoid purchasing property in flood-prone areas
- Raise homes that already exist in flood-prone areas
- Secure appropriate insurance coverage
- Prepare for and follow evacuation orders

State and Local Governments

- Execute zoning and building codes for property development
- Establish, promote and execute evacuation plans
- Share cost with federal government to construct projects that reduce risk from storm damage

Federal Government

- Coordination of all federal entities to provide comprehensive storm damage risk reduction for coastal populations
- Army Corps implements projects to absorb and disperse wave energy

Despite every effort and abundant resources, there still is **residual risk** for the more than [50 percent of Americans who live in coastal regions](#).



How You Can Help

Contractors

Looking for contracting information? Please visit the Federal Business Opportunities website at www.fbo.gov and type in the following codes in the “Keyword/Solicitation#” search box to find contracting opportunities in your local area. We actively work to ensure small business participation in Sandy contracts, to the maximum extent practicable, in both prime and subcontracting opportunities.

New York District - W912DS

Philadelphia District - W912BU

Baltimore District - W912DR

Norfolk District - W91236

New England District - W912WJ

Partners

- Our Sandy recovery cell includes experts in coastal engineering, emergency management, program management, procurement, real estate, public affairs, geographic information systems and many more. For more information or to speak with these experts, call 347-370-4799.

Public Information

- We welcome input on Sandy recovery. To submit questions or comments, e-mail DLL-CENADO-PA@usace.army.mil



Resources for Further Information

Hurricane Sandy Coastal Recovery
 You are posting, commenting, and liking as Hurricane Sandy Coastal Recovery — Change to Alison Kohler

Hurricane Sandy Coastal R... Timeline Recent Admin Panel

Hurricane Sandy Coastal Recovery
 86 likes · 91 talking about this

Government Organization
 The USACE Hurricane Sandy Coastal Management Division oversees the recovery of the North Atlantic Coast following the Oct. 29, 2012 storm.

Update Page Info Liked

86 We're on Instagram

About Photos Likes Instagram feed

www.facebook.com/HurricaneSandyCoastalRecovery

Evaluating North Atlantic Coastal Risks

Collaboration

Federal Agencies
 FEMA
 HHD
 NOAA
 Presidential Task Force
 USFWS
 USGS

States
 Connecticut
 Delaware
 District of Columbia
 Maine
 Maryland | MDE | DNR
 Massachusetts
 New Hampshire
 New Jersey | NJDEP
 New York | NYDEC | NYC
 Pennsylvania
 Rhode Island
 Virginia

NOAs
 Ducks Unlimited | MOU
 Fish & Wildlife Foundation | MOU
 National Audubon Society | MOU
 The Conservation Fund | MOU
 The Nature Conservancy | MOU
 Union of Concerned Scientists
 Watershed Alliance

Webinar series
 July 30, 2013
 Nature-Based Features Webinar Slides
 Nature Based Webinar Audio
 Aug 29, 2013
 Ecosystem Goods and Services opening slides

Background
 The Congressional response to the devastation in the wake of Hurricane Sandy represents a need to address as a regional system the vulnerability of populations at risk in coastal regions in the U.S. Army Corps of Engineers (USACE) North Atlantic Division. Along with a recent increase in high magnitude storm events such as Hurricanes Katrina and Rita in 2005, and recent storms with larger areal extents creating larger damage areas as evident by the size of Hurricane Irene in 2011 and Hurricane Sandy in 2012, as well as the reality of sea level rise as a probable future condition, there is a need to comprehensively evaluate the existing and planned measures to reduce the flooding risk from tidally-influenced storm surges as well as other alternatives for areas at risk to future storm damages.

The goals of the Comprehensive Study are to (1) provide risk reduction strategies to reduce risk to which vulnerable coastal populations are subject, and (2) promote coastal resilient communities to ensure a sustainable and robust coastal landscape system, considering future sea level rise and climate change scenarios, to reduce risk to vulnerable population, property, ecosystems, and infrastructure. The Comprehensive Study will include a coastal framework (submitted to Congress within 24 months) as well as storm suite modeling, coastal GIS analysis, and related evaluations, for the affected coastlines. The study will identify existing nature-based infrastructure, include an evaluation of the performance of nature-based infrastructure during Hurricane Sandy and other recent storms, and compare the performance of nature-based infrastructure to including the impacts of coastal storms.

www.nad.usace.army.mil/CompStudy

USACE NAD @ArmyCorpsNAD
 Welcome to the official Twitter page for the U.S. Army Corps of Engineers North Atlantic Division. Following does not equal endorsement.
 Brooklyn, NY · nad.usace.army.mil

2,076 Tweets · 246 Followers · 1,068 Following

Followed by USACE NY District

Tweets No replies

ASCE Headquarters @ASCEHQ · 17 Sep
 "90% of the goods we create, sell, import, & ship around the world go through our nation's bustling seaports" @USACEHQ

NOAA @NOAA · 17 Sep
 JUST IN: #NOAA 2013 global report being held at 1990, 2003, 2005 & 2009 to meet tonight per @USACEHQ

USACE NAD @ArmyCorpsNAD · 16 Sep
 News Update: History of the USACE Deployment Center - The U.S. Army Corps of Engineers' response to Sept. 11, 2001 - @USACEHQ

Corps of Engineers @ArmyCorpsNAD · 16 Sep
 JOE (@JoeC) as they work to cleanup the #NOAA and coastline. Post a challenge to your area today. @USACEHQ

www.twitter.com/ArmyCorpsNAD

Hurricane Sandy Recovery Mission

Commander's Update September 2013
 U.S. Army Corps of Engineers
 North Atlantic Division

Brig. Gen. Kent Savre

Stakeholders and Partners
 We're nearing the end of the summer season, and we were able to make steady and significant progress on many of our projects and studies on the North Atlantic coast thanks in large part to your continued support and partnership. It's been about 10 months since Hurricane Sandy battered our coast, and while we realize this is a multi-year effort, we are encouraged by the progress made so far.

Senior leaders' visit to New York
 We were honored to host the Honorable Eli Darcy, the Assistant Secretary of the Army for Civil Works along with Lt. Gen. Thomas Bostick, the commanding general of U.S. Army Corps of Engineers and Chief of Engineers, in late August to receive an update on Sandy recovery in New York. During their visit, we met with New York City Mayor Michael Bloomberg, senior staff in Governor Andrew Cuomo's office, Rep. Haltermann and staff from Rep. Gregory Meeks' office. We arranged the engagements to continue communication between the Corps and our partners at the city, region and state level. The engagements accomplished a great deal to enhance strong relationships with our governmental partners. We expect our senior leaders to make a similar visit to New Jersey in the months ahead.

Progress on near-term coastal restoration
 I'm pleased to report that we've achieved completion on four of our near-term coastal restoration projects—two in Virginia and two on the southern New Jersey coast. Restoration work is underway on the world's largest beachfill project by volume from Sea Bright to Manasquan on the northern New Jersey coast. As you may have seen in the news media, New York City Mayor Michael Bloomberg and Senator Charles Schumer announced the near-term coastal restoration project beginning at Rockaway Beach in Queens, NY, around mid-August.

Flood risk reduction
 We're glad that our work didn't significantly impede beach recreation season, but our effort is primarily for flood risk reduction. The majority of the work underway involves dredging material from the surfline, carrying it through a hopper to fill out dunes and then pumping sand onto beaches to rebuild dunes and widen the beach. The dunes and berms absorb the brunt of storm surge and wave energy, which reduces the risk of flooding the property and infrastructure behind them. This is a process that fully anticipates needing to repeat if we get more severe storms that wash away dunes and berms or through time with beach erosion.

Safety
 The safety of the public is our number one priority. To that end, it is crucial that beachgoers know that newly placed sand will naturally shift around in the first few months. This shift could make slopes different from what has previously been experienced. Also, for residents who live near coastlines that haven't yet been repaired and restored, they are vulnerable in the event of another storm, which is why we are committed to expediting these projects as much as possible. We have 36 percent of our funds for the near-term coastal restoration already obligated, and are scheduled to have 100 percent of the funds obligated by summer 2014. We expect to complete the near-term coastal restoration in the fall of 2014.

To get updated information about Hurricane Sandy Coastal Recovery on the North Atlantic coast, visit our website:
<http://www.nad.usace.army.mil/CompStudy>
<http://www.nad.usace.army.mil/CompStudy>
<https://www.facebook.com/HurricaneSandyCoastalRecovery>
<https://www.facebook.com/HurricaneSandyCoastalRecovery>

I sincerely appreciate your patience, understanding and collaboration as we restore our North Atlantic coast.

Building Strong - Bridging the Atlantic

Kent D. Savre
 Brigadier General, U.S. Army
 Division Commander

[Monthly commander's update](#)

Hurricane Sandy Coastal Management

Facts and Figures
 September 2013

With the passage of the Hurricane Sandy Disaster Relief Appropriations Act of 2013, the U.S. Army Corps of Engineers has both the authority and the funding to repair and complete ongoing coastal storm damage risk reduction projects and studies in the Northeast. These projects and studies will reduce the vulnerability of the region from future storms.

U.S. Army Corps of Engineers
 North Atlantic Division

[Monthly facts and figures](#)

NORTH ATLANTIC DIVISION

US Army Corps of Engineers

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Commander's Update
 Hurricane Sandy - Coastal Recovery

Commander's Update
 September 2013

Sandy Facts & Figures
 September 2013

Maps
 Philadelphia District projects and studies

Near-Term Coastal Restoration Projects

Projects by state
 (These previously constructed Corps projects were severely impacted by Hurricane Sandy and are being or will soon be replenished. Please visit the local district sites, below, for more information and fact sheets.)

Rhode Island (Roughly 95,000 cubic yards of sand placement)
 Management Beach, Westerly
 New England District

www.nad.usace.army.mil/Sandy

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North Atlantic Division



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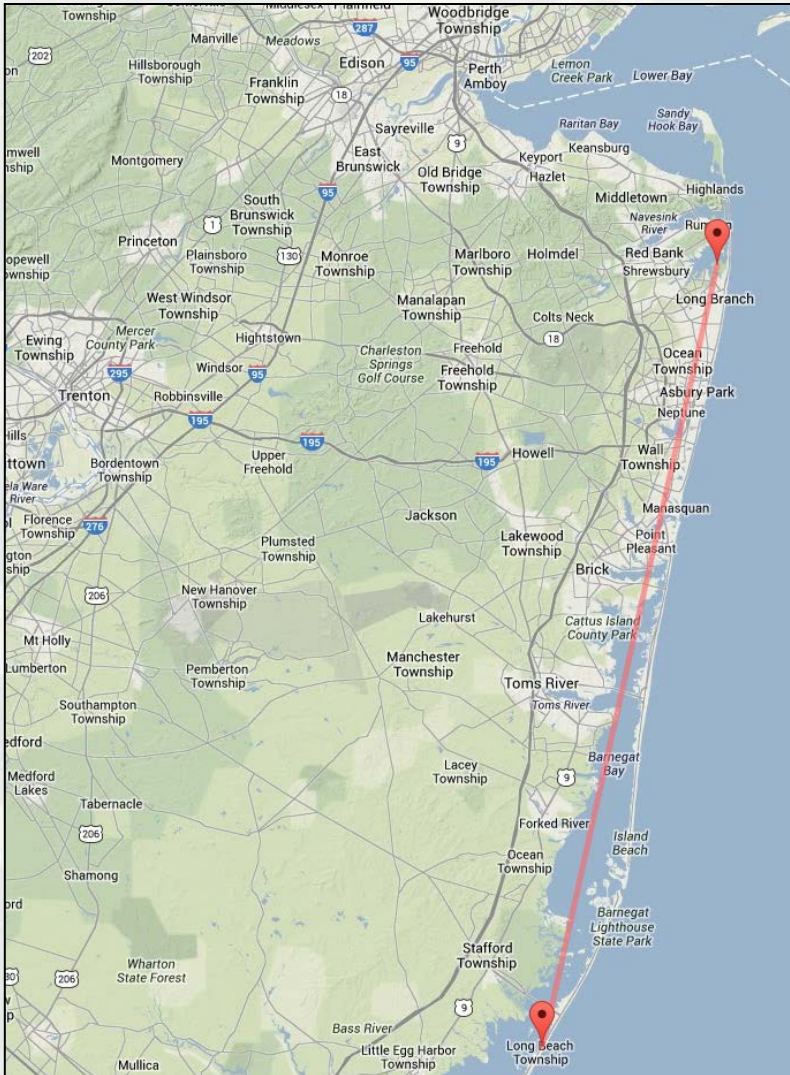
Institute for Water Resources
703.428.8015



Conclusion



Conclusion and Discussion



With Project



Without Project

30 miles apart in New Jersey