

Hurricane Sandy Coastal Management Division

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June 23, 2014

USACE National Dredging Meetings



US Army Corps of Engineers
BUILDING STRONG®



BRIDGING THE ATLANTIC

Sandy's Impacts

- October 29, 2012
- Impacts to Life/Property
 - 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

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

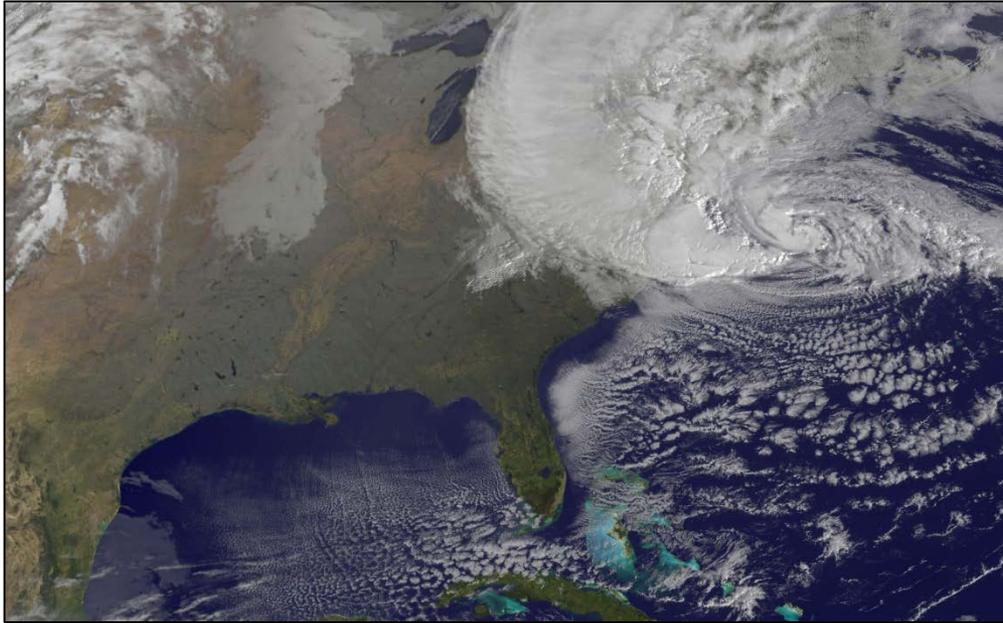
212,000 cubic feet of material collected with **3 drift collection vessels** in waterways around New York and New Jersey

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

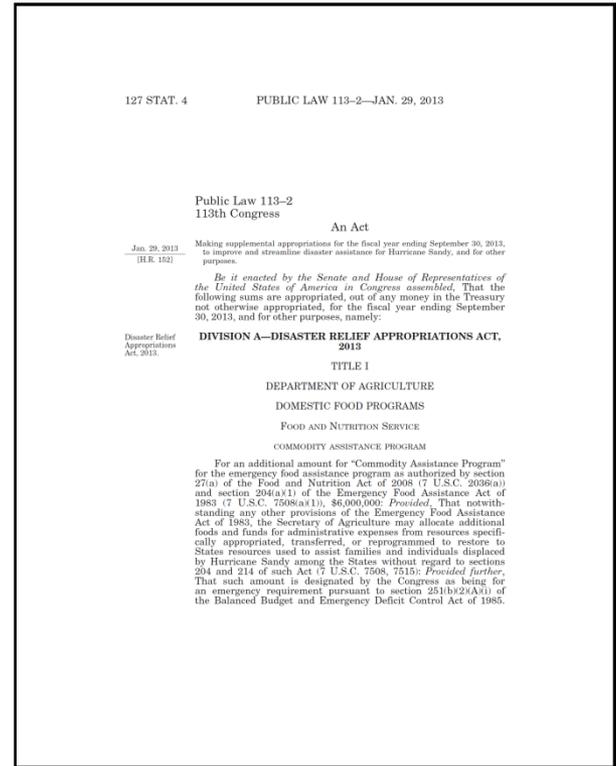
Silver lining: Army Corps' projects credited with an estimated **\$1.9 billion in damages prevented**



Bottom Line Up Front

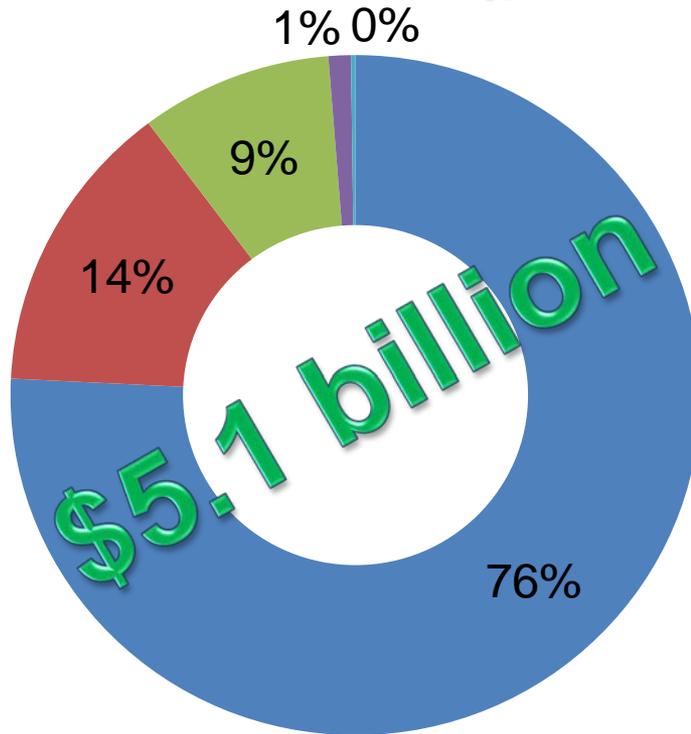


- Hurricane Sandy Oct. 29, 2012



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

USACE Sandy Recovery Program (post Sequestration)

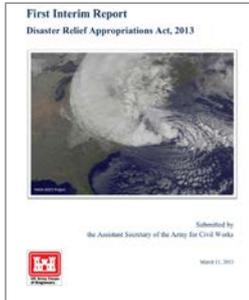


- Construction of flood risk reduction projects
- Beach repair and restoration
- Repair of navigation channels and structures
- Investigations and studies
- General expenses

For every dollar the federal government spends on flood mitigation, it saves an average of \$4 in disaster relief after the next devastating storm.

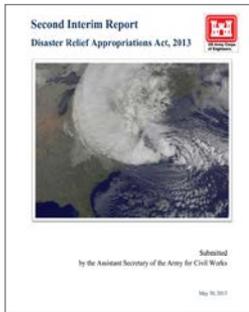
– [Multihazard Mitigation Council, 2005](#)

Requirements of Legislation



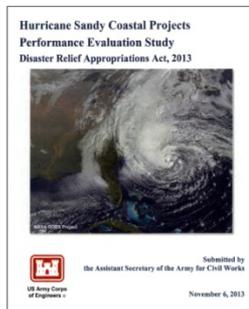
First Interim Report

*“That an interim report with an assessment of authorized Corps projects for reducing flooding and storm risks in the affected area **that have been constructed or are under construction**, including construction cost estimates, shall be submitted”*



Second Interim Report

*“That an interim report identifying **any previously authorized but unconstructed Corps project and any project under study** by the Corps for reducing flooding and storm damage risks in the affected area, including updated construction cost estimates, that are, or would be, consistent with the comprehensive study shall be submitted”*



Performance Evaluation Report

Findings

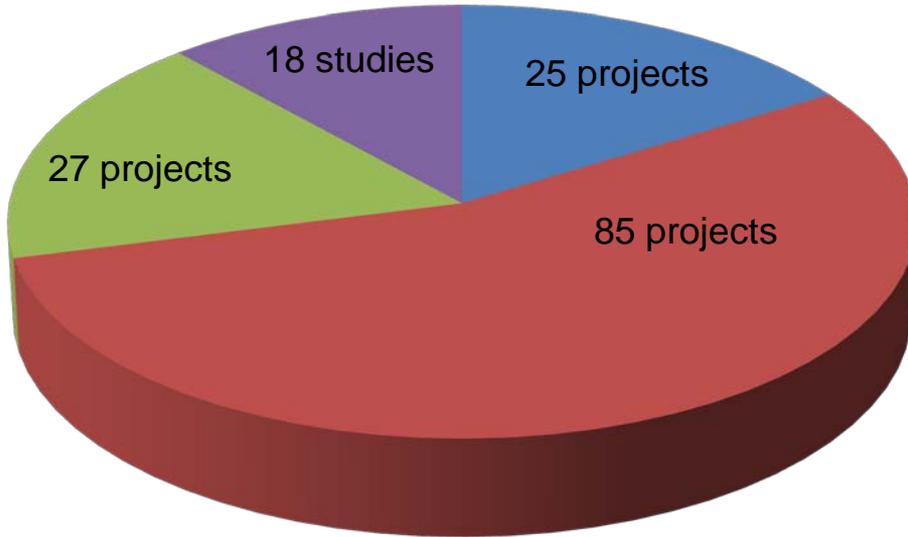
- 6 projects in NY/NJ experienced >200 year event
- 8 projects experienced between 30 and 200 year event
- Significant back-bay flooding
- Projects generally performed well

Recommendations

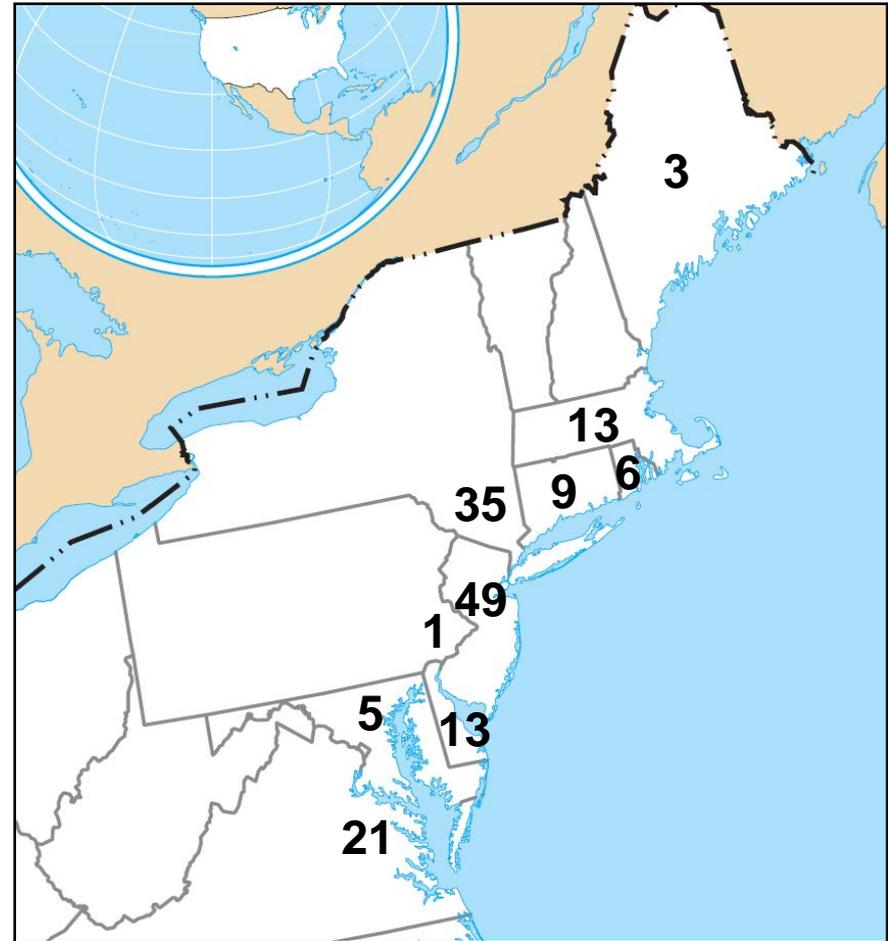
- Employ broader approach to project planning
- Need for more data
- Use of Regional Sediment Management
- Develop Adaptive Management Plans
- Address Back-bay flooding
- Evaluate efficacy of dunes
- Incorporate wider range of project benefits

Hurricane Sandy Recovery

- 220 Projects and Studies
- 155 Projects and Studies (NAD)



- Beach Repair & Restoration
- Repair of federal navigation channels & structures
- Construction of coastal risk reduction projects
 - Regular Construction
 - Continuing Authorization Program
- Ongoing Studies



Program Overview

More than 150 projects and studies from Virginia to Maine totaling more than \$4 billion

Near-Term Coastal Restoration

Funded through Flood Control and Coastal Emergencies (FCCE) appropriations, this work restores previously constructed Corps projects that were severely impacted by Hurricane Sandy. Degraded coastal features increase risks and vulnerability from future storm events. This work entails placing more than 26 million cubic yards sand.

Operations and Maintenance (O&M)

Work in this category entails repair of Sandy-damaged navigation channels and structures that the Corps has built and maintains. These projects include surveys and repairs to breakwaters, storm surge barriers, jetties, bulkheads and revetments, as well as restoration of federal navigation channels that experienced shoaling as a result of Hurricane Sandy.

Authorized But Not Yet Constructed (ABU)

Work under this category includes constructing flood and storm damage risk reduction projects at sites where either an authorized but not yet constructed Corps project or a partially constructed Corps project exists.

Coastal Storm Damage Risk Reduction Studies

Work under this category includes completion of ongoing Corps of Engineers flood and storm damage risk reduction studies that were underway at the time of Hurricane Sandy and received funding in any of the three fiscal years prior to enactment of the Disaster Relief Appropriations Act of 2013.

Continuing Authorities Program (CAP)

This program allows the Corps of Engineers to plan, design, and construct smaller projects under existing program authorities in place from Congress.

The North Atlantic Coast Comprehensive Study (NACCS)

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 (\$19 million after sequestration) and will be submitted to Congress in January 2015. For more information on this study please visit

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



NAD Projects and Studies – New England

Count	State	Project
1	ME	Wells Harbor dredging (O&M)
2	ME	Scarborough River dredging (O&M)
3	ME	Kennebunk River dredging (O&M)

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

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

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



NAD Projects and Studies – New York

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



NAD Projects and Studies – New Jersey

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

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

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



NAD Projects and Studies – Mid-Atlantic

Count	State	Project
1	MD	Atlantic Coast of Maryland (Rehab) shoreline and dunes (FCCE)
2	MD	Dredge Baltimore Harbor to 50 feet (O&M)
3	MD	Ocean City Harbor & Inlet dredging (O&M)
4	MD	Wicomico River dredging (O&M)
5	MD	Jane's Island, Somerset County beach erosion and storm damage risk reduction (CAP)
Count	State	Project
1	DE	Roosevelt Inlet to Lewes (FCCE)
2	DE	Rehoboth to Dewey (FCCE)
3	DE	Fenwick Island (FCCE)
4	DE	Delaware Coast Protection (FCCE)
5	DE	Bethany/South Bethany (FCCE)
6	DE	Delaware River, Philadelphia to Sea (O&M)
7	DE	Indian River Inlet and Bay (O&M)
8	DE/MD	Intracoastal Waterway, Delaware to Chesapeake Bay (O&M)
9	DE	Wilmington Harbor (O&M)
10	DE	Project Condition Surveys (O&M)
11	DE	Broadkill Beach (ABU)
12	DE	Delaware River Dredged Material Utilization
13	DE	Pennsylvania Ave. Improvement, Bethany (CAP)

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



Sandy Program Schedule

SANDY LANDFALL
29 OCT 2012

29 JAN 2013
PL113-2

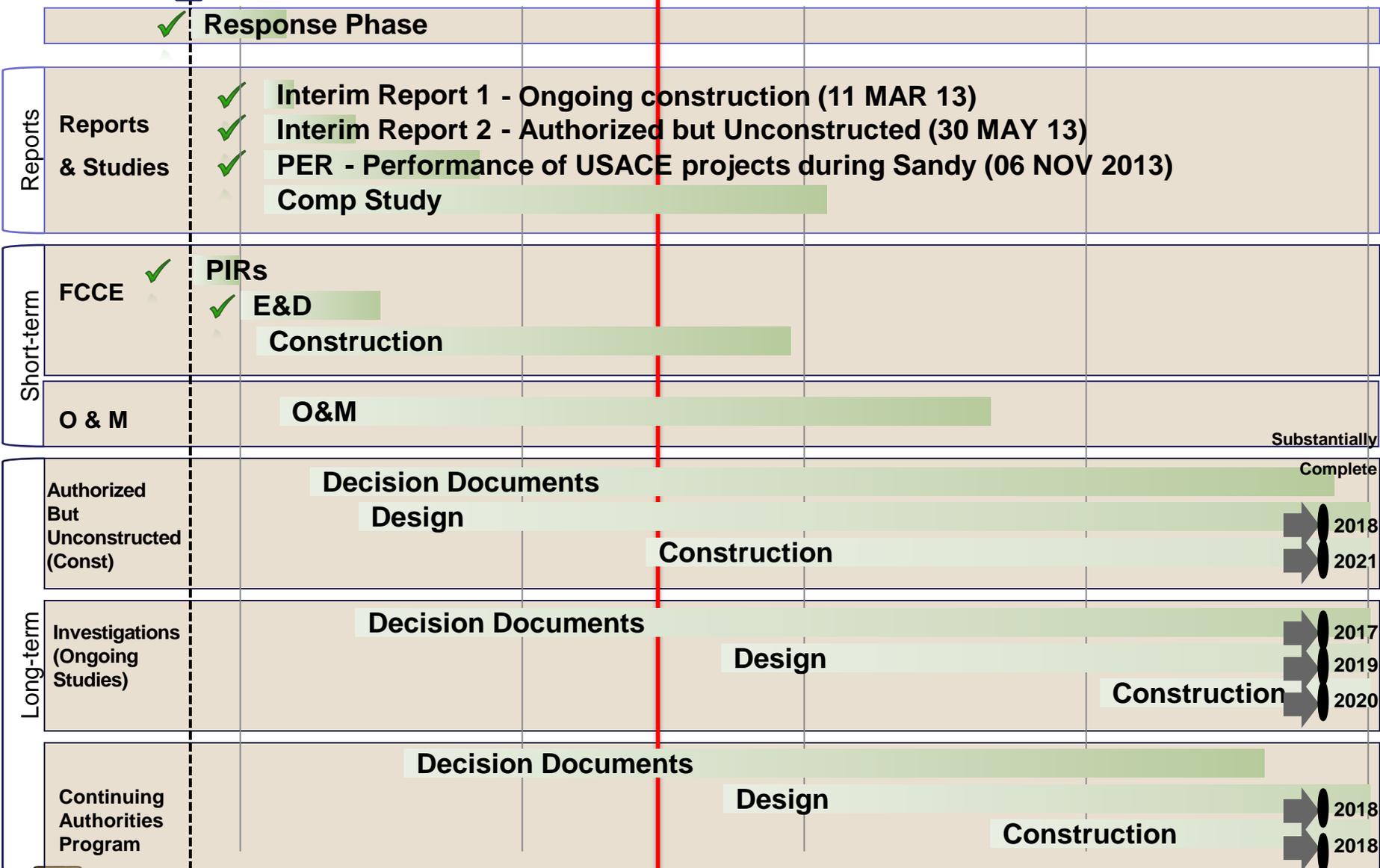
Current

2014

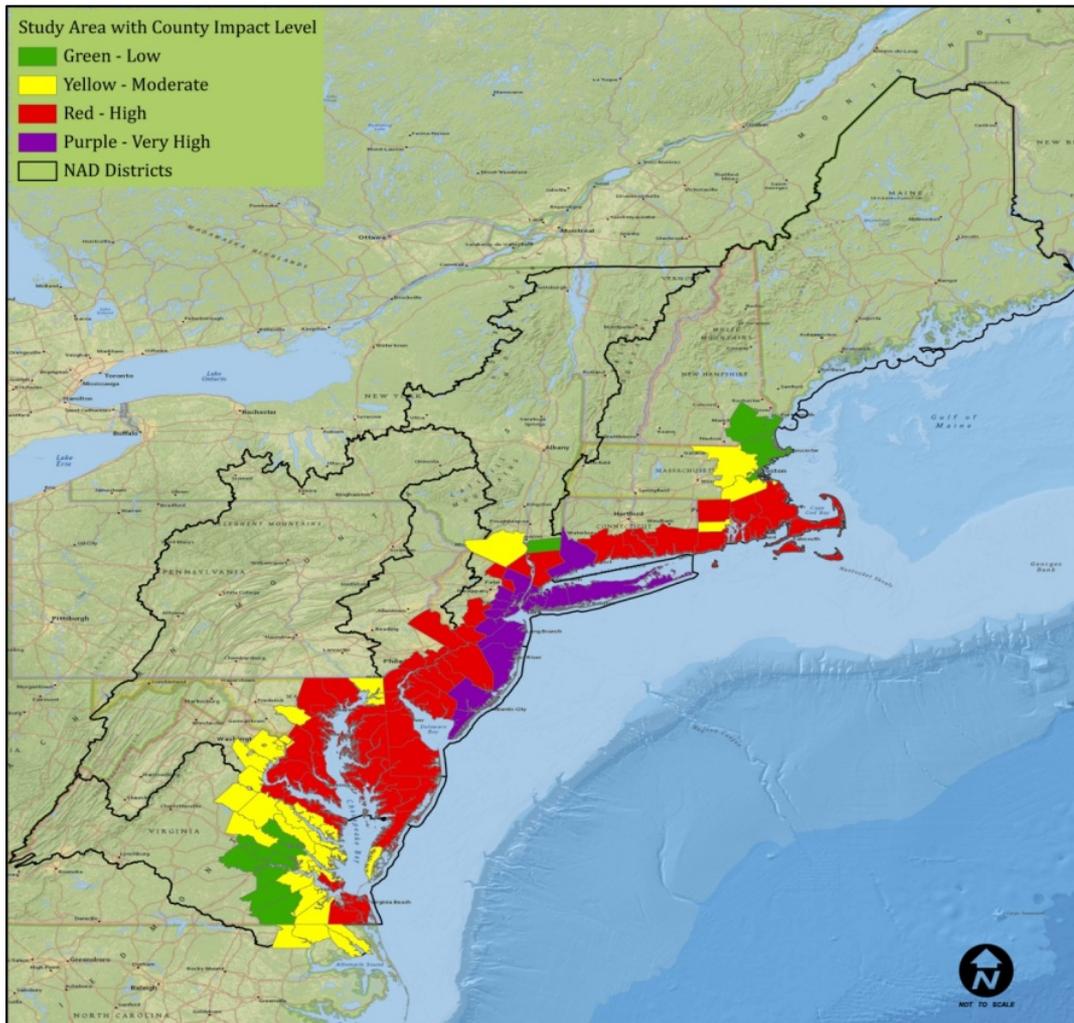
2015

2016

2017+



Comprehensive Study



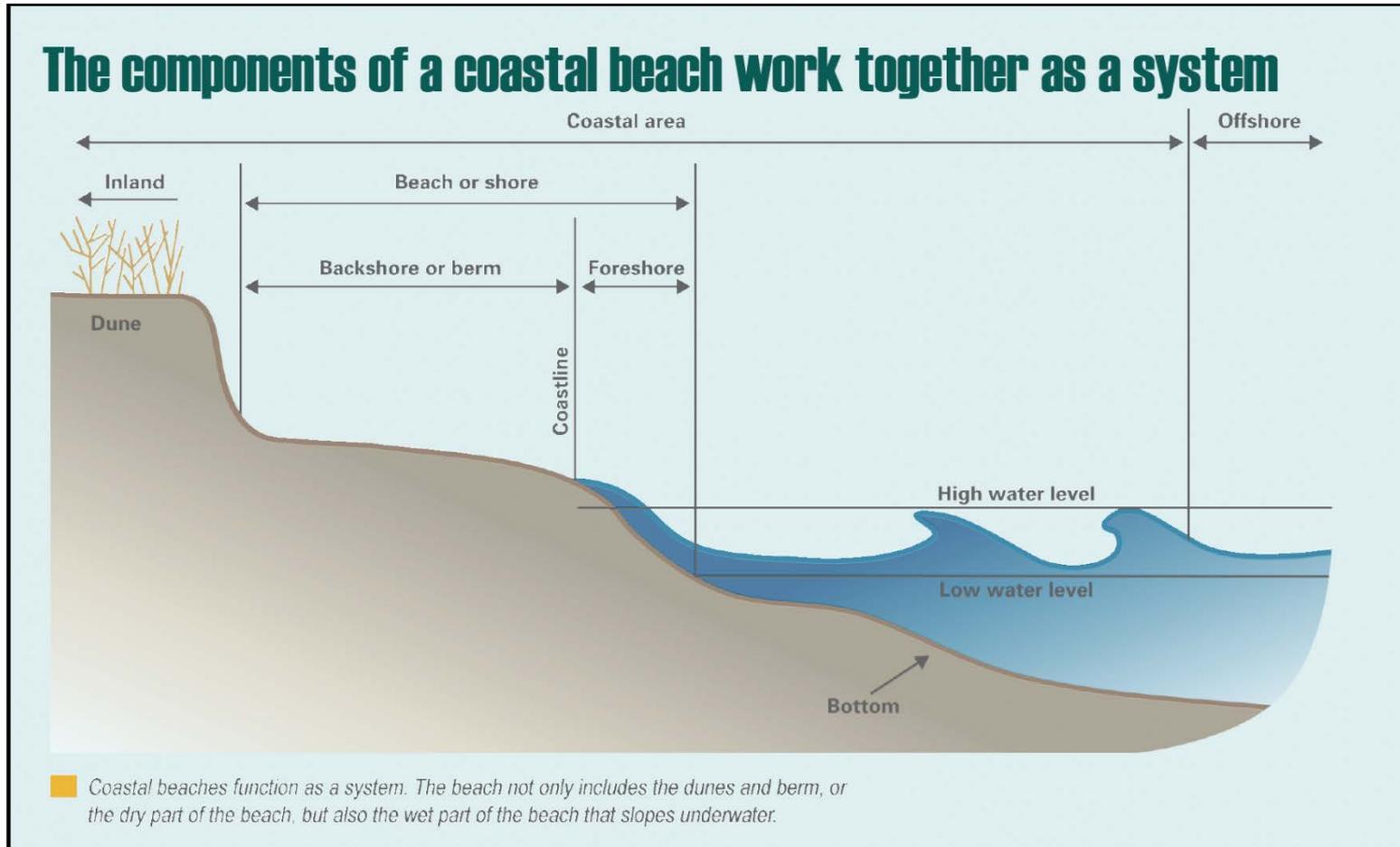
Study Area Map

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>

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.



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](#).



Resources for Further Information

www.facebook.com/HurricaneSandyCoastalRecovery

www.nad.usace.army.mil/CompStudy

www.twitter.com/ArmyCorpsNAD

[Monthly commander's update](#)

[Monthly facts and figures](#)

www.nad.usace.army.mil/Sandy



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



Key Points of Contact

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For more information about projects in your area, contact our nearest Corps office or centers of expertise

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Closing Remarks / Discussion

- Hurricane Sandy recovery program is one of USACE's top priorities
- Continue to work closely with our partners to complete the recovery mission
- Sustain open communication and transparency throughout execution of PL113-2

