

Climate Change

Why would NPS make or authorize investment in historic structures at Sandy Hook?

What guides resilient rehabilitation of historic structures within a coastal National Park?

How does GATE evaluate management alternatives and investments when it is clear that it is not “forever”? (a case study from GATE Jamaica Bay Unit)

Climate Change

Why would NPS make or authorize investment in historic structures at Sandy Hook?

- **Organic Act 1916**
- **National Historic Preservation Act 1966**
- **Public Law 92-592 1972**
- **NPS Policies 2006**
- **GATE General Management Plan 2014**

Organic Act 1916

“[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

National Historic Preservation Act

“The law is perhaps the nation's most important advocate for the past. Buildings and landscapes that serve as witnesses to our national narrative have been saved. The quality of life in our cities and towns has been improved by a greater appreciation—reflected in the law—of such intangible qualities as aesthetics, identity, and the legacy of the past.”

[National Historic Preservation Act - Historic Preservation \(U.S. National Park Service\) \(nps.gov\)](https://www.nps.gov/learn/act/national-historic-preservation-act)

National Historic Preservation Act

1966

- Provides a clearly defined process for the preservation and management of historic resources to ensure that preservation is fully considered in federal actions
- Requires Federal agencies to establish preservation programs for the identification, evaluation and nomination of historic properties to the National Register of Historic Places
- Requires consultation to identify, assess and seek ways to avoid, minimize or mitigate adverse effects of proposed federal actions on historic properties
- Does not require preservation of historic properties



**Public Law 92-592 October 27, 1972
Gateway National Recreation Area
Enabling Legislation Section 3 (g)**

“In the Sandy Hook and Staten Island Units, the Secretary shall inventory and evaluate all sites and structures having present and potential historical, cultural, or architectural significance and shall provide for appropriate programs for the preservation, restoration, interpretation, and utilization of them.”

NPS Policies 2006 Section 5.3.3

The National Park Service may permit the use of a historic property through a lease or cooperative agreement if the lease or cooperative agreement will ensure the property's preservation. Proposed uses must not unduly limit public appreciation of the property; interfere with visitor use and enjoyment of the park; or preclude use of the property for park administration, employee residences, or other management purposes judged more appropriate or cost effective.

If a lease or cooperative agreement requires or allows the lessee or cooperator to maintain, repair, rehabilitate, restore, or build upon the property, the work must be done in accordance with applicable Secretary of the Interior's standards and guidelines and other NPS policies, guidelines

GATE General Management Plan 2014

Fundamental Resources and Values

“Fundamental resources and values are the park’s attributes—its features, systems, processes, experiences, stories, scenes, sounds, smells, opportunities for visitor enjoyment, or others—that are critical to achieving the park’s purpose and to maintaining its significance. These fundamental resources and values provide Gateway managers and staff with a focus on what is truly most important about this park. They help focus efforts and funding on the resources and experiences that matter most.”

GATE General Management Plan 2014

Fort Hancock's coastal defense fortifications and military areas are fundamental resources:

- Endicott/Taft-era batteries
- Parade Ground, including Officers' Row, barracks, and cultural landscape
- Nike Missile Launch and Radar Sites

GATE General Management Plan 2014

Historic Preservation Banding

“Using a variety of information sources, a group of park and NPS staff with expertise in history, historic architecture, conservation, cultural landscapes and business services, created a process to evaluate over 330 structures and associated landscapes that are contributing resources to the park’s nine National Register Districts” to prioritize preservation investment in the park’s historic resources.

GATE General Management Plan 2014

Historic Preservation Banding

Eight factors used to evaluate and prioritize historic structures:

- **Fundamental Resource**
- **National Register Status**
- **National Register Level of Significance**
- **Condition**
- **Uniqueness to Gateway**
- **Visibility**
- **Potential Use**
- **Vulnerability to Future Storm Events**

GATE General Management Plan 2014

Historic Preservation Banding

Preservation Bands:

- **Preserve**: Maintain these structures in their current condition or move these structures into good condition through preservation or rehabilitation by NPS or partners to support visitor programs, interpretation, operations and appropriate commercial uses.
- **Stabilize**: Make unsafe, damaged, or deteriorated property stable. Unless a use and/or funding is found, the structure may fall into disrepair.
- **Ruin**: Structures in poor condition without viable reuse options. Safety hazards may be mitigated but won't actively invest to better the condition of the resource.



Case Study: Gateway National Recreation Area

Gateway National Recreation Area (GATE), located in New York City and New Jersey, is made up of three park units. These include a large and diverse array of cultural resources, including a National Historic Landmark (Fort Hancock and Sandy Proving Ground), nine historic districts (cultural landscapes) and more than 600 historic structures, numerous gun batteries, airfields, missile silos, and prehistoric archeological sites. To better manage this inventory and its maintenance needs, GATE created a prioritization process for cultural resources, identifying management banding (preserve, stabilize, and ruin) that considered characteristics such as resource condition, use potential, and uniqueness.

Unfortunately, the effects of climate change do not wait for planning. GATE's prioritization work was incomplete when Hurricane Sandy hit on October 29, 2012, and had not yet incorporated climate change vulnerability. The experience of Hurricane Sandy made this an imperative. NPS staff used Sandy's damage patterns to identify levels of resource vulnerability, as updated flood maps were not yet available. This data reorganized some of the resource prioritization orders, and a programmatic agreement between GATE and the New York and New Jersey Historic Preservation Office outlined a path for consultation regarding resources within the ruin band. The updated prioritization banding is now part of the GATE General Management Plan (GMP). While acknowledging that prioritizing the preservation of certain sites over others can be an uncomfortable fit with the ideals of the NPS mission, GATE's experience with Hurricane Sandy confirmed that prioritization will help with good rapid decisions in the face of future challenges, and that planning is an important part of adaptation. Other NPS units, including but not limited to Yellowstone and Grand Teton National Parks and the National Capitol Region, are also undertaking prioritization processes for their cultural resources. Coordination of similar approaches across the Service, with cultural resource subject matter experts, will be an important next step.

(Source: GATE park staff, personal communications, 2013-16)

Historic Preservation Banding

GATE banding system for prioritization of historic structures has been recognized as an effective tool for adaptation planning.

From NPS Cultural Resources Climate Change Strategy 2016

Climate Change

What guides resilient rehabilitation of historic structures within a coastal National Park?

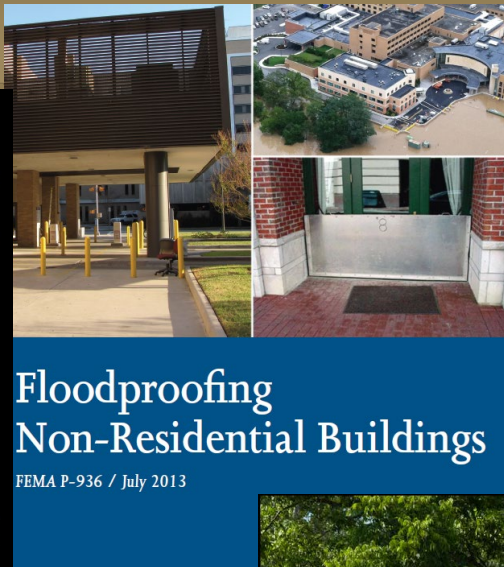
- **DOI Climate Action Plan 2021**
- **NPS Climate Change Response Strategies (2010 and 2016)**
- **2021 DOI Guidelines on Flood Adaptation for Rehabilitating Historic Buildings**

Resilient Rehabilitation



THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION & ILLUSTRATED GUIDELINES ON SUSTAINABILITY FOR REHABILITATING HISTORIC BUILDINGS

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
CULTURAL RESOURCES, PARTNERSHIP, AND SCIENCE
CLIMATE CHANGE RESPONSE PROGRAM

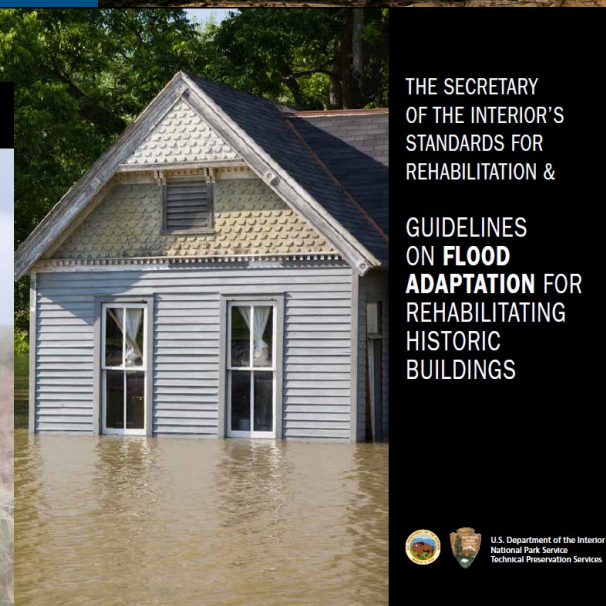
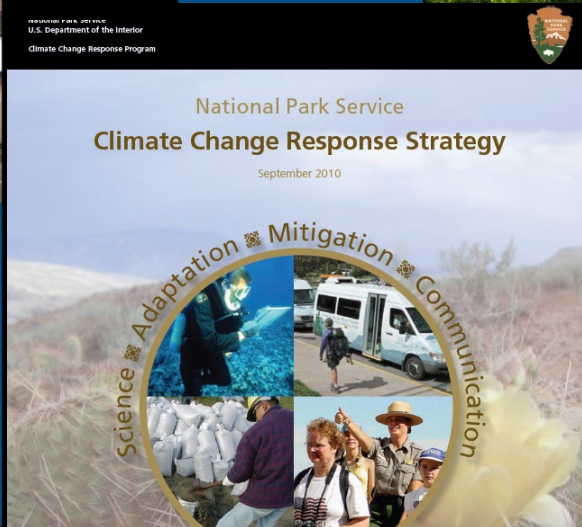


Reducing Flood Risk to Residential Buildings That Cannot Be Elevated

FEMA P-1037 / September 2015

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
CLIMATE CHANGE RESPONSE PROGRAM

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEMA



DOI Climate Action Plan 2021

The Department will integrate climate change risk, mitigation, adaptation, and resilience in its policies, planning, programs, and operations. The Department will prepare for the effects of climate change on its various responsibilities, which include the following themes:

- Promote Climate-Resilient Lands, Waters, and Cultural Resources
- Advance Climate Equity
- Transition to a Resilient Clean Energy Economy
- Support Tribal and Insular Community Resilience
- Empower the Next Generation of Conservation and Resilience Workers

Action #1. Promote Climate-Resilient Lands, Waters, and Cultural Resources Outcome: Lands, waters, and cultural resources threatened by climate change are managed, protected, and/or preserved for current and future generations

DEPARTMENT OF THE INTERIOR
CLIMATE ACTION PLAN

2021



EXPERIENCE YOUR AMERICA



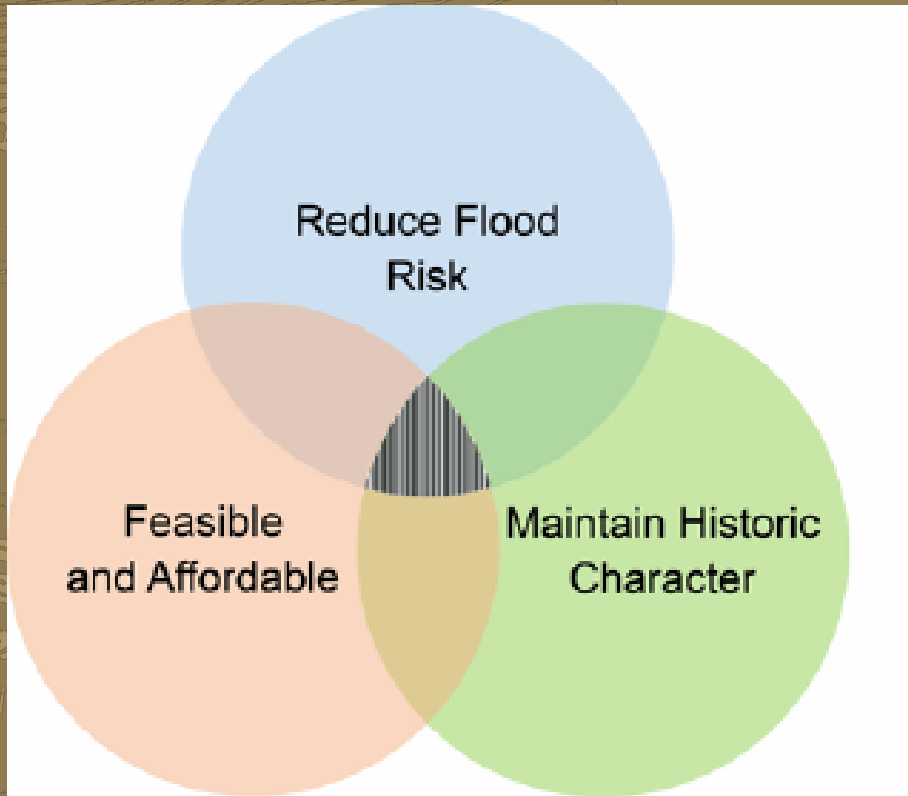
NPS Climate Change Response Strategy 2010

Climate Change Response Strategy - Climate
Change (U.S. National Park Service) (nps.gov)

NPS Cultural Resources Climate Change Strategy 2016

Cultural Resources Climate Change Strategy
(nps.gov)

Flood Adaptation



Technical and economic limitations must be considered when attempting to reduce flood risk and create greater resilience; changes must also respect the historic character of the property. This can be a challenging balance for a project to achieve.

From The Secretary of Interior's Standards for Rehabilitation & Guidelines on Flood Adaptation for Rehabilitating Historic Buildings, 2021

Flood Adaptation

- **Planning and Assessment for Flood Risk Reduction**
- **Temporary Protective Measures**
- **Site and Landscape Adaptations**
- **Protect Utilities**
- **Dry Floodproofing**
- **Wet Floodproofing**
- **Fill the Basement**
- **Elevate the Building on a New Foundation**
- **Elevate the Interior Structure**
- **Abandon the Lowest Floor**
- **Move the Historic Building**

From The Secretary of Interior's Standards for Rehabilitation & Guidelines on Flood Adaptation for Rehabilitating Historic Buildings, 2021

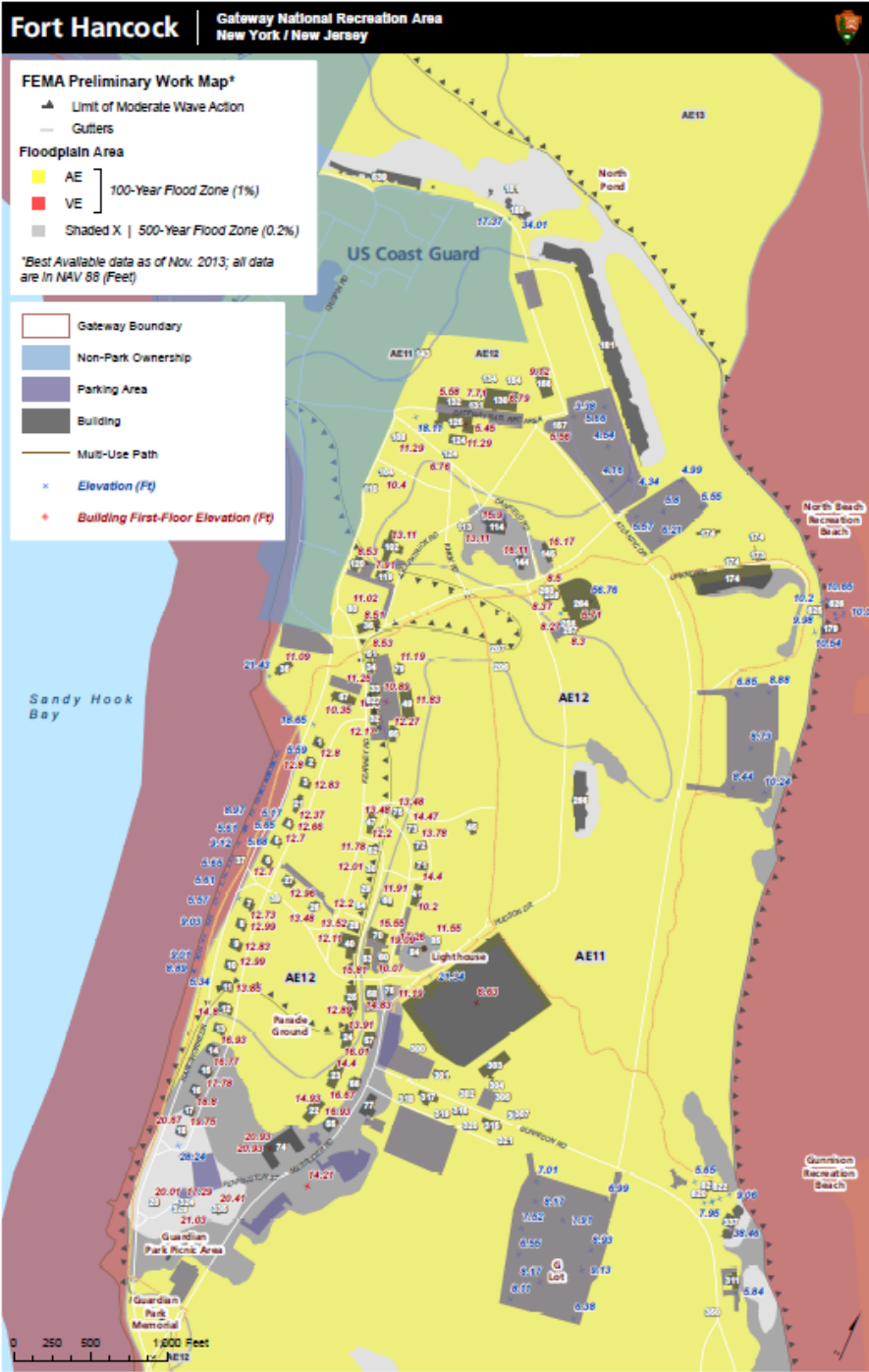


FEMA Preliminary Work Map*

- ▲ Limit of Moderate Wave Action
- Gutters
- Floodplain Area**
 - AE 100-Year Flood Zone (1%)
 - VE 500-Year Flood Zone (0.2%)
 - Shaded X | 500-Year Flood Zone (0.2%)

*Best Available data as of Nov. 2013; all data are in NAV 88 (Feet)

- Gateway Boundary
- Non-Park Ownership
- Parking Area
- Building
- Multi-Use Path
- x Elevation (Ft)
- + Building First-Floor Elevation (Ft)

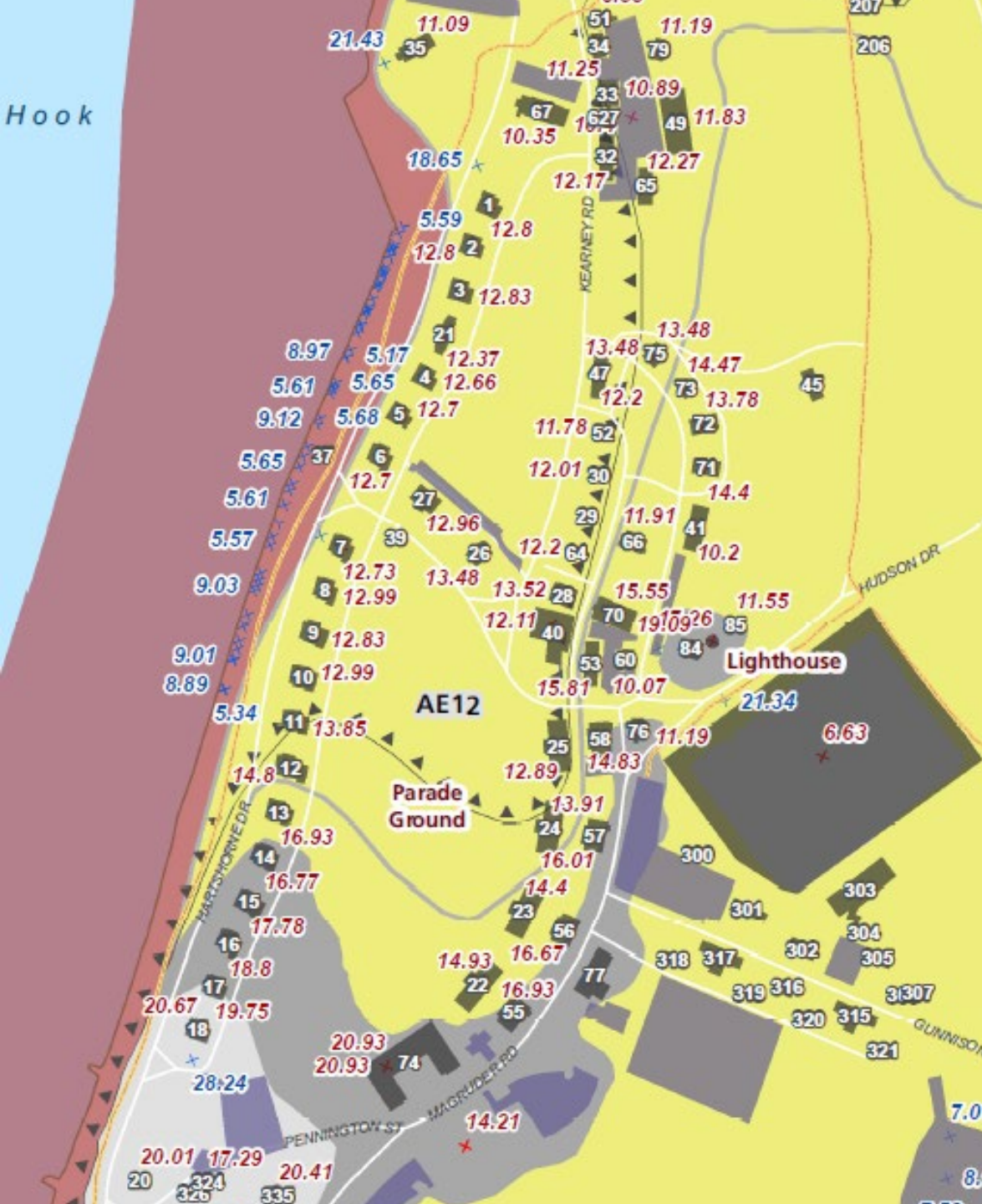


Flood Adaptation

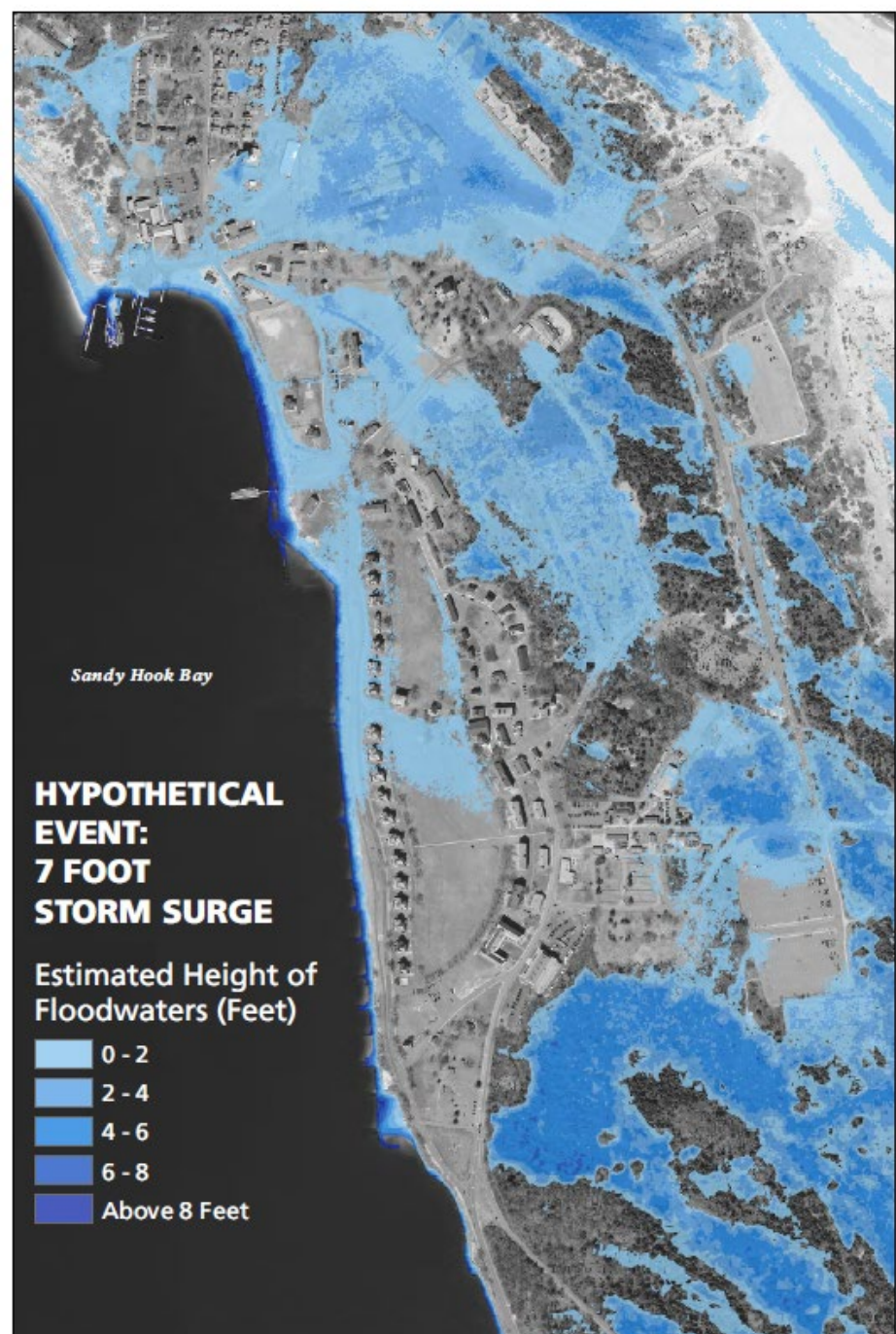
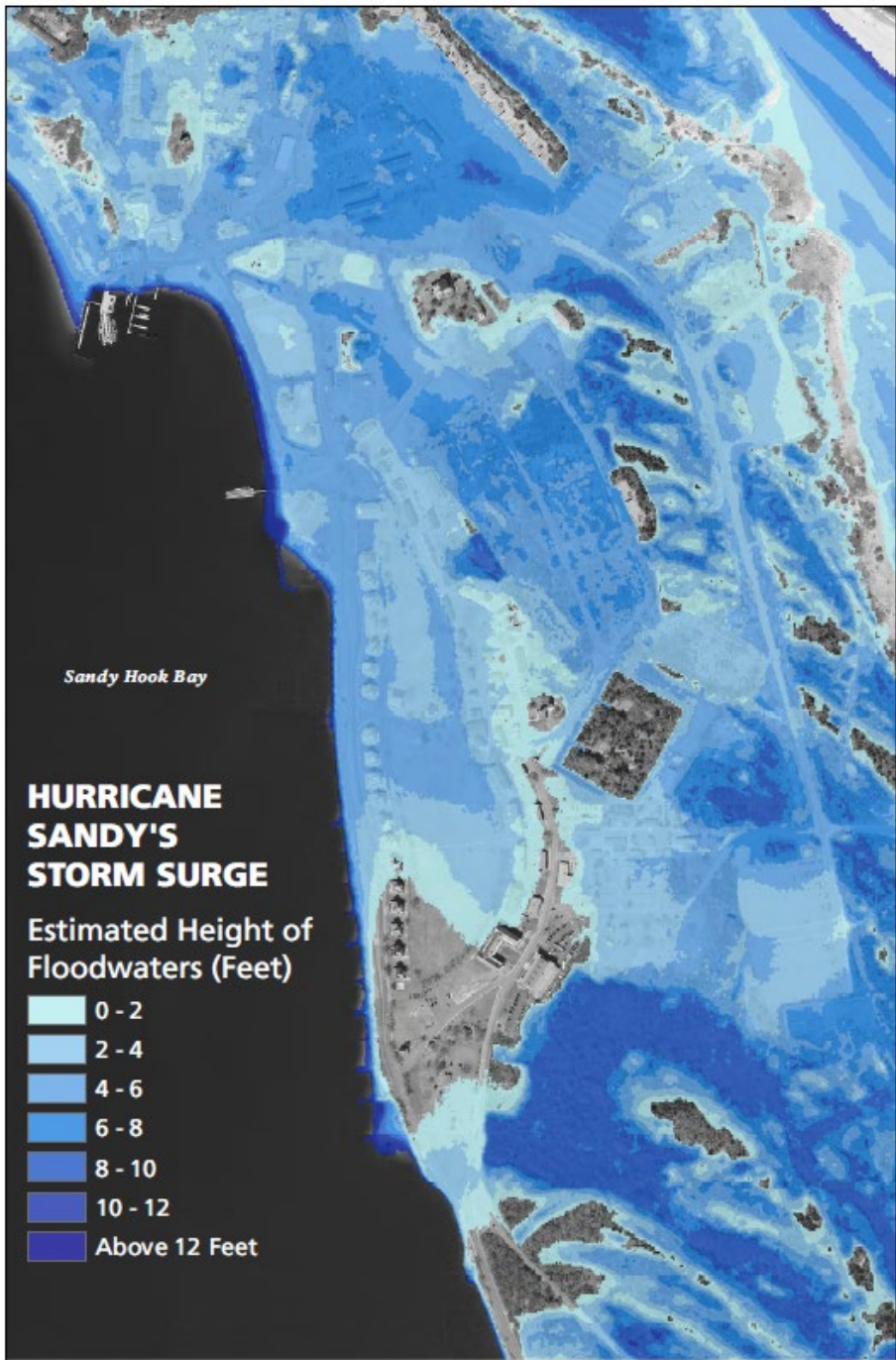
Flood zones

First floor building elevations

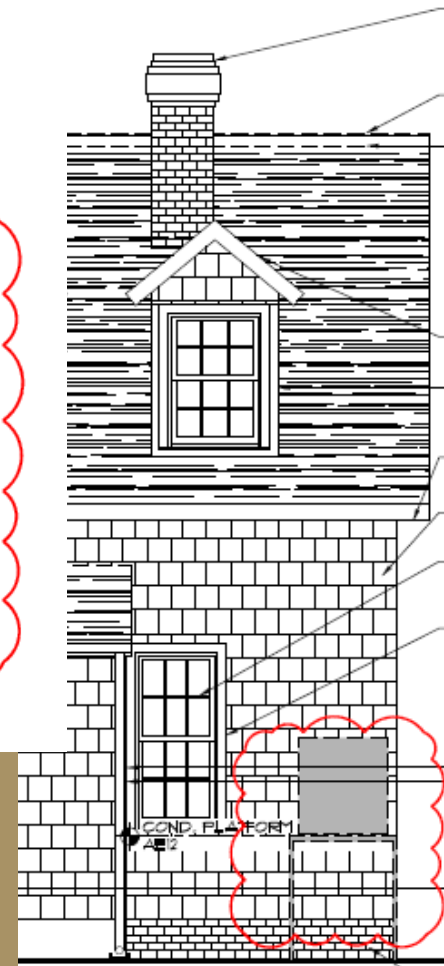
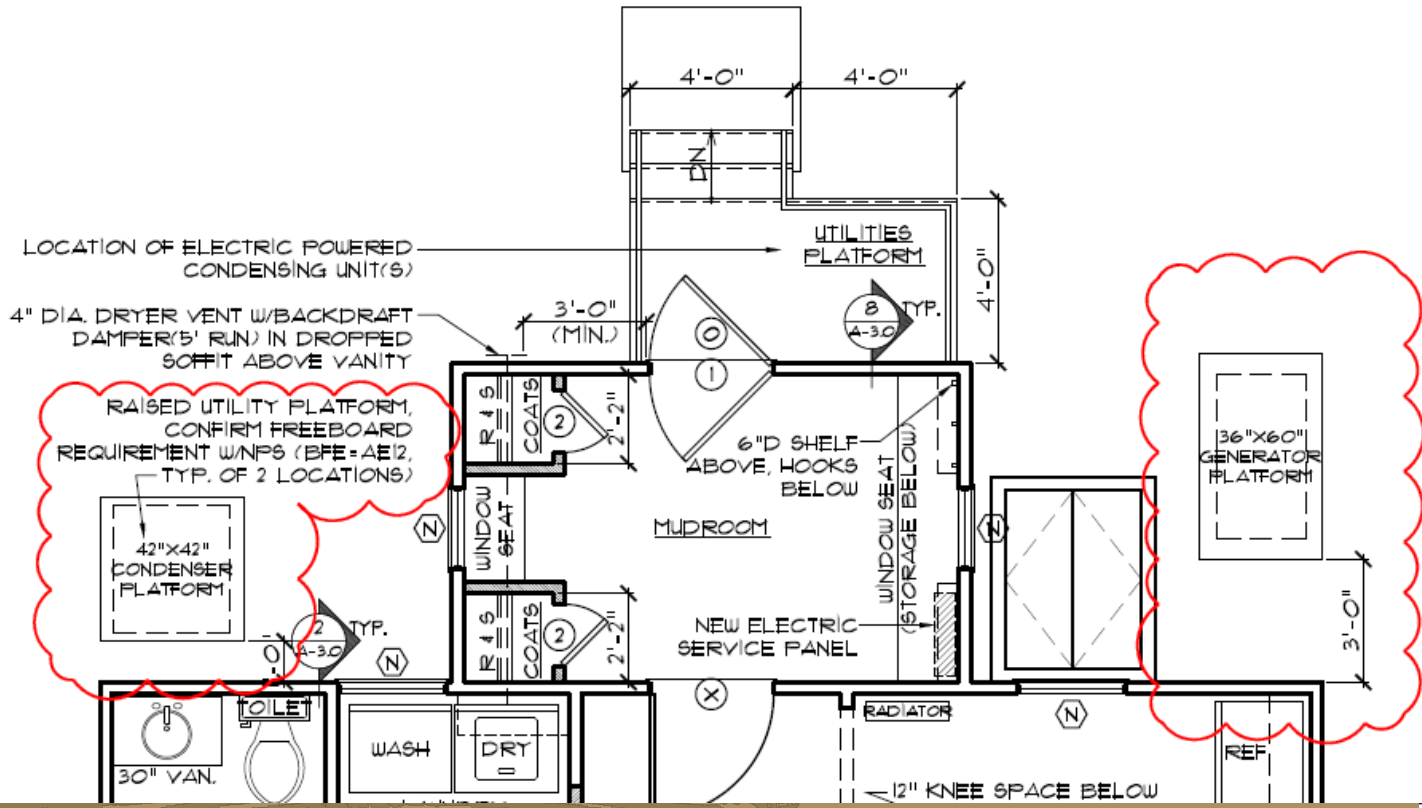
Hook



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Protect Utilities



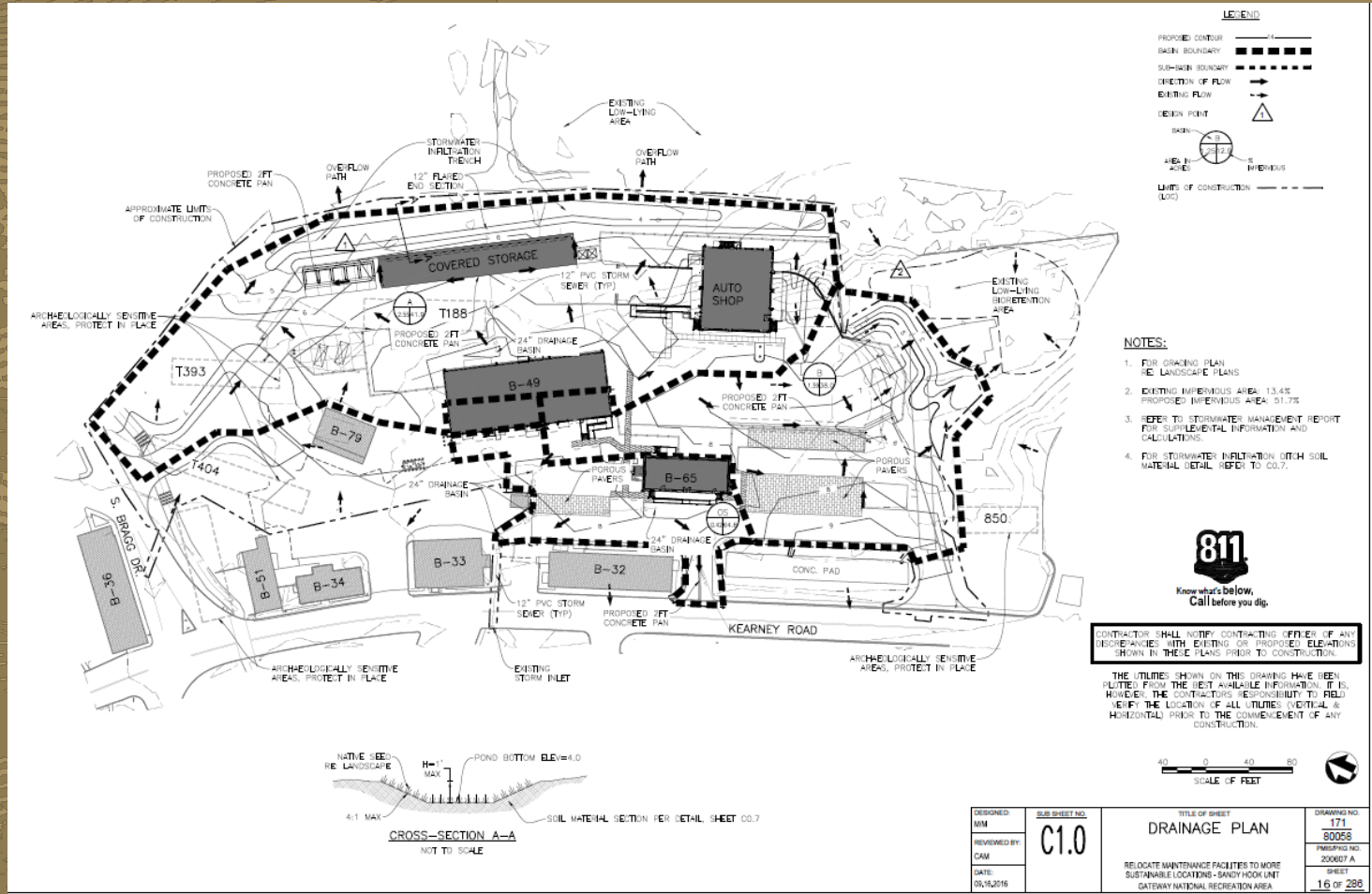
Building 104 – excerpts from plan set showing raised utility platforms for condenser and generator

Flood Adaptation – Fill Basement



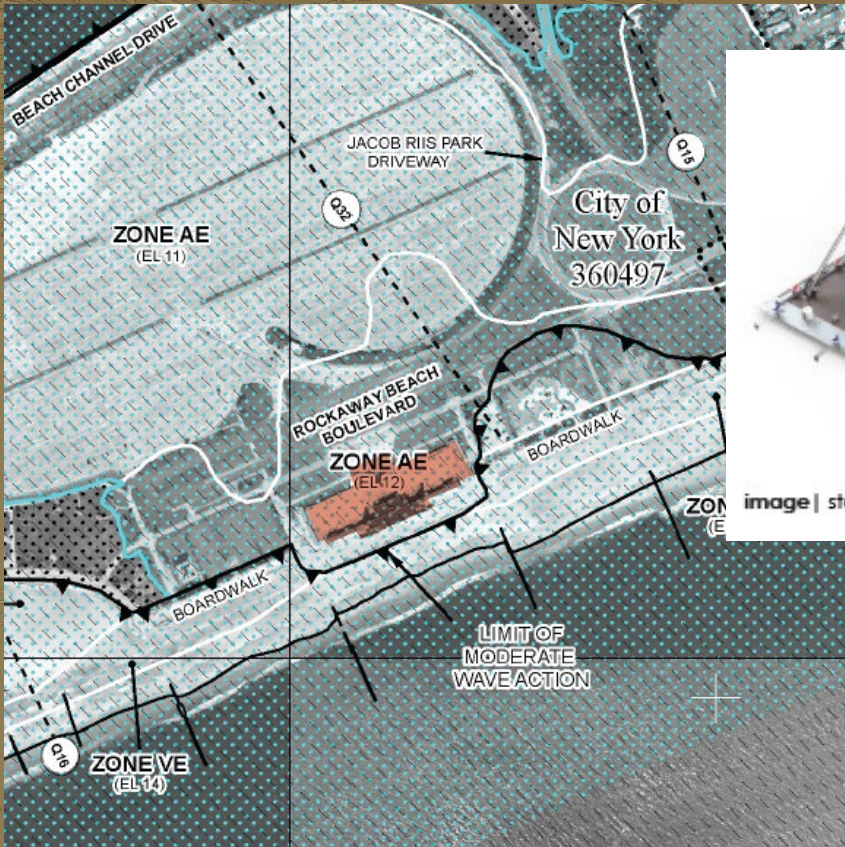
Building 56 – currently under construction

Flood Adaptation Site and Landscape Adaptations




Drainage plan for NPS Sandy Hook Maintenance Facility

Temporary Protective Measures



GATE Jamaica Bay Unit Jacob Riis Park Bathhouse – LOI holder has proposed and NPS has agreed to use of temporary deployed flood wall for temporary flood mitigation

AquaFen



Climate Related Stressors Identified and Discussed in 2016 NPS Cultural Resources Climate Change Strategy

- Temperature Change
- Precipitation Change
- Sea Level Rise
- Combined Stressors
- Increased Greenhouse Gas Emissions

Climate Related Impacts

Temperature Change

- Increased Global Temperature
- Increase Freeze/Thaw Cycles
- Permafrost Melt
- Higher Relative Humidity
- Increased Wind
- Increased Wildfire
- Changes in Seasonality and Phenology
- Species Shift
- Invasive Species/Pests



Climate Related Impacts Precipitation Change

- Less Precipitation/Drought
- More Precipitation and/or Heavier Precipitation
- Increase of Flooding Events



Climate Related Impacts

Sea Level Rise

- Inundation and Increased Flooding Events
- Increased Frequency and/or Severity of Storm Surge
- Increased Coastal Erosion
- Higher Water Table



Climate Related Impacts Combined Stressors

- Salt Water Intrusion
- Extreme Weather Events
- Pollution
- Development



Climate Related Impacts Increased GHG Emissions

- Ocean Acidification



Climate Change

How does GATE evaluate management alternatives and investments when it is clear that it is not “forever”?

West Pond GATE Jamaica Bay Unit

Jamaica Bay Wildlife Refuge West Pond

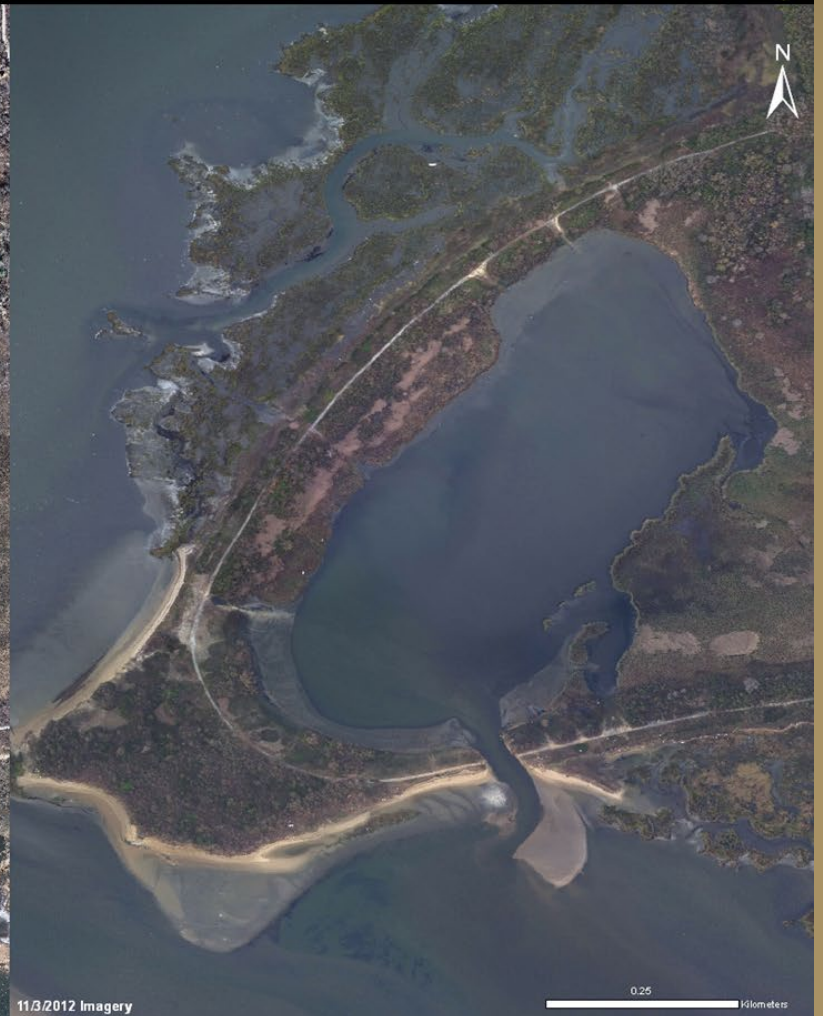
New York - New Jersey
Hurricane Sandy NPS IMT

West Pond Pre/Post-Sandy

National Park Service
U.S. Department of the Interior



2008 Imagery



11/3/2012 Imagery

0.25 Kilometers

Pre-Sandy Conditions

- Despite a long history of intense development, Jamaica Bay is rich in fish and wildlife communities, with large and diverse populations of resident and migratory species.
- Jamaica Bay is recognized by the U.S. Fish and Wildlife Service as valuable habitat for migrating birds along the Atlantic. Some of these species have special regulatory protections under the Endangered Species Act, Migratory Bird Treaty Act, and state-level protections.
- The U.S. Fish and Wildlife Service estimates that nearly 20% of North America's bird species migrate through or breed in the Jamaica Bay area.
- The West Pond freshwater wetland habitat of pre-Sandy conditions, unique and rare within Jamaica Bay, was a significant factor in the diversity of species.
- Average yearly visitation over 575,000 pre-Sandy. Over 5,400 school groups from 2010-2015.

Post-Sandy Conditions

- **Currently, due to the loss of the freshwater wetlands, the West Pond does not provide habitat that supports the diversity of species that existed pre-Sandy.**
- **Loss of the loop-trail affected the visitor use and experience.**
- **Although the West Pond area continues to provide excellent habitat for shorebirds, waterbirds with freshwater associations have declined.**
- **National Audubon Society and Cornell Lab of Ornithology data from 2011-2014 show a decline in species since the breach to West Pond.**
- **Visitation numbers for the Jamaica Bay Wildlife Refuge have dropped significantly since Hurricane Sandy.**
- **A 37% reduction in visitation occurred between 2011 and 2014.**

Sandy Recovery – Breach Closure

