

Enhancing Resiliency in the Wake of Hurricane Sandy

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October 29, 2012 – Hurricane Sandy

CLIMATE CHANGE RESPONSE PROGRAM



Estimated \$65B in damage, including many units of the US National Parks System



CLIMATE CHANGE RESPONSE PROGRAM



Hurricane Sandy Rebuilding Task Force

- National Park Service Director Jon Jarvis designated lead for U.S. Department of Interior (DOI)
- Use latest data (*Advisory Based Flood Elevation or Best Available Flood Hazard Data*) versus published FIRM (*Flood Insurance Rate Maps*)
- Build above 100-year (1%) floodplain by at least 1', 2' for critical
- Goal is resiliency – don't want to go back to Congress for money in the next storm



Hurricane Sandy National Park Service Response

While meeting public demand to rebuild facilities, open parks, and restore access, the NPS is committed to ensuring response to Sandy incorporates resiliency to climate change.

- *Sea level rise and increased storms are part of planning for the future.*
- *Habitat restoration promotes long term resiliency → protected natural areas are part of the solution.*

Major Components Include

- *Incident Response (e.g., tree cutting, cleanup, hazard evaluation, project scoping)*
- *Hurricane Sandy Rebuilding Task Force (Interagency)*
- *NPS Rapid Review Team:*

Phase I Projects: Parks reopened Memorial Day – 4th of July

Phase II Projects: Park fully functional - Ongoing





Example of Resilient Rebuild: Liberty Island, New York



How to protect primary electric and heating plants in park facilities?



Boilers & Electric Switchgear: Choices for Resiliency

- Elevate in each building – **not practical**
- Water proof equipment or basements – **not practical**
- Elevate in central location



Liberty Island Incinerator Building now with Mezzanine

Heating Plant & Electrical Switchgear previously in Basement



Protected Areas Provide Natural Resiliency

- Protected areas provide natural solutions.
- NPS and its partners adopt strategies to restore natural areas & enhance natural resiliency.
- Events like Sandy offer opportunities to demonstrate the benefits of protected areas to surrounding communities.



Jamaica Bay West Pond Breach

The ecosystem adapted by shifting its structure. This raises important questions about how to best manage for change.



Jamaica Bay Saltmarsh

The restored saltmarsh was resilient to the storm.



Yellow Bar Hassock, GATE, November 11, 2012



Assessing Impacts & Long-term Monitoring of Wildlife

American Oystercatcher



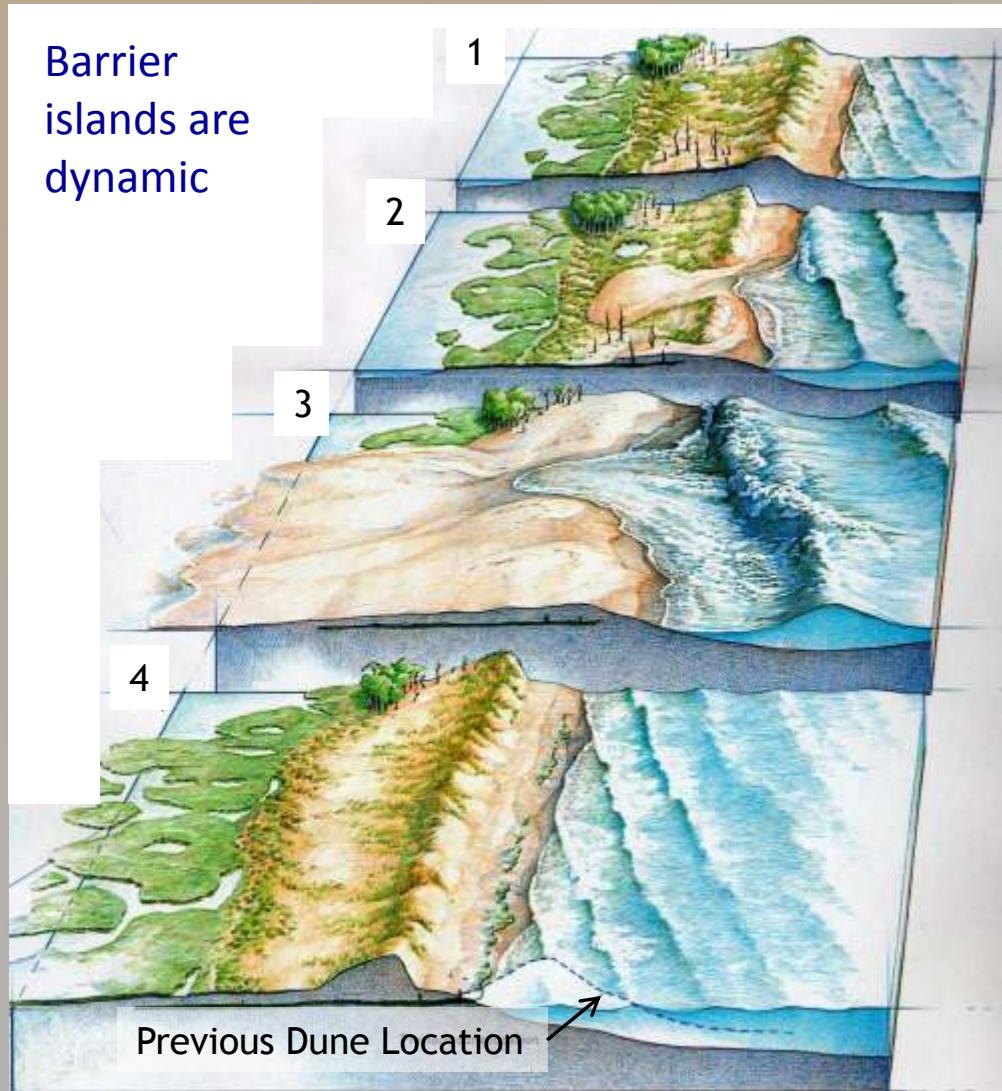
Piping Plover

Little evidence of serious direct impact on breeding or wintering birds.



Fire Island National Seashore is a Barrier Island

Barrier islands are dynamic



1. Sediment transported onshore and along the shore builds up island beaches and dunes
2. Island overwashed by storm waves
3. Sediment transported through overwash buries vegetation providing sediment for marsh development
4. Saltmarsh habitat forms reducing flooding, serves as a nursery ground for fish and shellfish. Island migrates landward



Fire Island Wilderness Breach



May 21, 2009



November 5, 2012



Otis Pike Fire Island High Dune Wilderness

The island is behaving as it should.

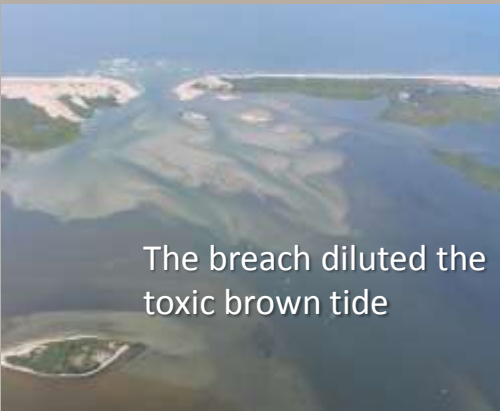
Legend – breach position

- March 27-28, 2013
- April 3-4, 2013
- April 10-11, 2013



before Sandy

Edge of Fire Island Pines and NPS lands



The breach diluted the toxic brown tide



after Sandy



Regional Scale Efforts for Risk Assessment & Resiliency Planning

NPS Facilities Risk Management Planning Steps

High Level Risk Screen

Park Level Risk Screen

Park Level Risk

Park Level Risk Management



Adaptation options handbook for coastal parks – 2013/14

Dr. Robert Young – Director of WCU/Duke University Program for the Study of Developed Shorelines.





Conclusions

- Protected areas provide natural resilience to storms such as Sandy.
- Resilient systems are dynamic.
- These events are opportunities to demonstrate and communicate the role natural areas play to enhance the resiliency of the landscape and surrounding communities.
- It is important that parks reduce the risks from natural disasters by planning ahead for future change.



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- It is important that parks reduce the risks from natural disasters by planning ahead for future change.

INVITATION:

Best Practices for Responding to Climate Change:
Natural Solutions for Parks, People, the Planet

November 14, 18:30-19:30, Meeting Room 2

Thank You!

ありがとうございます！

Questions?

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