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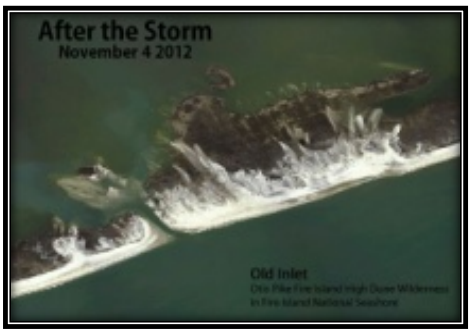
CLIMATE CHANGE WORKING GROUP

CASE STUDY OF CLIMATE CHANGE IMPACTS AND SOLUTIONS

ENHANCING NATURAL RESILIENCY AND THE CREATION OF THE U.S. NATIONAL PARK SERVICE (NPS) RAPID REVIEW TEAM IN THE AFTERMATH HURRICANE SANDY



KEY MESSAGE

Hurricane Sandy inflicted damage to infrastructure and historic structures and made significant changes to natural resources within NPS parks along the Atlantic seaboard. NPS is currently developing capacity to respond to future storm events, especially in light of climate change. As part of NPS response to the storm, adaptation to climate change will be integrated into future management approaches, in both facility design and habitat restoration. Protected areas will play a key role in NPS response to the storm and will provide an opportunity to highlight their importance in addressing the impacts of climate change.

BACKGROUND – OCTOBER 29TH, 2012, HURRICANE SANDY HITS THE ATLANTIC SEABOARD…

As Hurricane Sandy left a wake of destruction across the Atlantic seaboard, the U.S. Department of the Interior (DOI) mobilized resources to speed storm recovery on Federal and tribal lands in the impacted region. Hurricane Sandy was the largest hurricane ever recorded in the Atlantic but made landfall as a post-tropical cyclone with hurricane force winds in Atlantic City, New Jersey. In the wake of Hurricane Sandy, NPS has been designated the lead recovery bureau for the Department of the Interior, an acknowledgement of our leadership in adaptation planning at DOI.

Decisions and actions are happening quickly in response to Sandy. The public is demanding parks and facilities are reopened and restored to their previous condition, but NPS is also looking at long-term management strategies to mitigate against future storm events. Also, important lessons can be learned from Sandy, as scientific information generated from the Sandy response can be transferred to other coastal areas and used as part of larger coastal management strategy. Impacts from Sandy also provide scientists an opportunity to monitor and evaluate coastal change processes to inform management strategies.

The role of protected areas will be tested in the ongoing response to Sandy. NPS and its partners will adopt strategies that will help restore these areas and help enhance resiliency in the parks and surrounding communities. Although a tragic event, Hurricane Sandy offers an excellent opportunity for NPS to prepare for climate change and any future extreme storm events by enhancing the resiliency of the landscape.

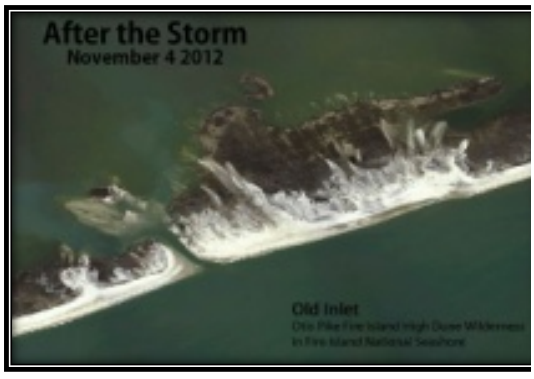
CASE STUDY 1: NATURAL RESILIENCY

National parks and the protected areas they maintain are excellent locations to use cutting edge adaptation techniques as approaches for building "natural resiliency" into the post-Sandy landscape. National parks in New York and New Jersey impacted by Hurricane Sandy are collaborating with adjacent and internal private communities to jointly develop long-term planning and management approaches to establish beach dune systems that provide community protection and are resilient to storms. Parks are reducing shoreline erosion by using revetments, bunkers, bulkheads and other shoreline stabilizing features, which emphasize using alternative beach nourishments techniques, e.g., "feeder beaches" (see Box 1), "sand motors."

The parks are also assessing and monitoring the impacts of Sandy to park's natural and cultural resources by sharing methodologies with federal, state and local agencies and non-governmental agencies. NPS is also supporting regional scale planning efforts (for example, Landscape Conservation Cooperatives) by coordinating and communicating science actions and outcomes. Gateway National Recreation Area, one of the park units heavily impacted by Sandy, will remove rip rap/sea wall around Floyd Bennett Field (other structures are being rebuilt) to establish a more natural shoreline.

Restoration of the natural shoreline lost to Sandy will use habitat restoration techniques such as feeder beaches (See Box 1). This will make this shoreline more resilient to storm impacts negating the need to restore miles of sea wall in the future. At Fire Island National Seashore (FIIS), NPS is restoring the beach/dune system eroded by the maintenance of the navigation channel at the east end of the island. These restoration efforts will require partners, and NPS is recruiting non-governmental organizations (for example, The Nature Conservancy) that are actively looking at habitat restoration that emphasizes "natural resiliency" approaches.

BOX 1
EMPHASIZING *NATURAL RESILIENCY* - FEEDER BEACHES



Responding to extreme events like Hurricane Sandy will require cost-effective yet innovative approaches. One such approach is the use of "feeder beaches," where a large volume of sediment is placed and redistributed by local waves and currents. Originating in Denmark – although used frequently in the United States – feeder beaches provide a more natural way of renourishing the sand along coastal areas. They are less popular in developed areas, since those areas are looking for a quicker fix, but in more natural systems, these feeder beaches offer an approach that focuses on 'natural resiliency' through sand renourishment. This approach highlights the value of protected areas – the purpose of NAWPA – as an alternative response to extreme storm events.

CASE STUDY 2: RECRUITING THE RESILIENCY DREAM TEAM

In response to Hurricane Sandy, NPS created an internal Rapid Review Team with core responsibilities to ensure future facility designs incorporate resiliency to climate change. The Rapid Review Team evaluates projects that will quickly restore access to parks impacted by Sandy, but the team is also empowered to take the

long view, incorporating actions that factor in resiliency to a changing climate. The team was established to evaluate projects at the pre-design phase and for the often conflicting interests of cost, preservation, long term storm resilience, and visitor enjoyment. The multidisciplinary team is responsible for asking hard questions. The approach the Rapid Review Team is taking highlights three priorities. Projects funded through this process must be:

(1) *Smart and Fast* - Projects must rebuild as quickly as possible to support the communities impacted by this disaster, and they must rebuild in a smart and sustainable way;
(2) *Adapted to expected risks* - The impacts of sea level rise and storm flooding must now be factored into any restoration project.
(3) *Wise Investments* - Hurricane Sandy projects must make good business sense. It clearly makes no business sense to spend $1 million dollars to protect a non-critical asset worth $20,000.

There is no simple formula to guide the recommendations for all Hurricane Sandy projects, but every project evaluated by the team should explore "out of the box" alternatives to rebuilding in place. Some assets provide essential functions or are fundamental to the park mission and may have few options other than to be restored to their pre-Sandy condition. At the other extreme, the best choice for some assets may be relocation or abandonment, or an asset may be judged now as a low priority and not warrant restoration and the costs associated with that restoration. It is the role of the Rapid Review Team to explore all of these issues for each project.