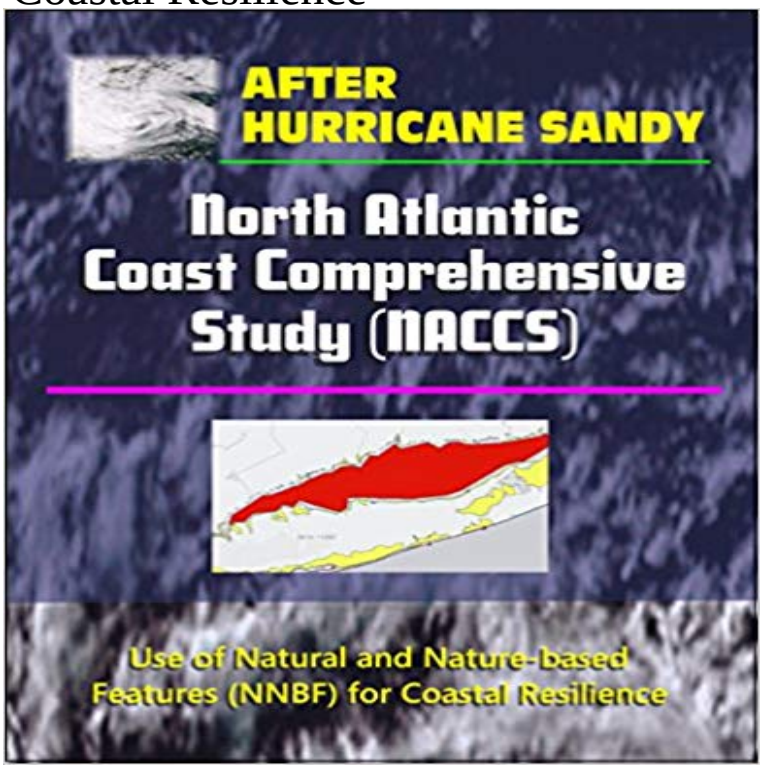
After Hurricane Sandy: North Atlantic Coast Comprehensive Study (NACCS) - Use of Natural and Nature-based Features (NNBF) for Coastal Resilience



This is a print replica reproduction from the important North Atlantic Coast Comprehensive Study (NACCS) - produced by the U.S. Army Corps of Engineers and released in January 2015 - of the report, Use of Natural and Nature-based Features (NNBF) for Coastal Resilience.

Natural, nature-based, nonstructural, and structural are terms used to describe the full array of measures that can be employed to support coastal resilience and risk reduction (U.S. Army Corps of Engineers (USACE) 2013). By definition, Natural Features are created and evolve over time through the actions of physical, biological, geologic, and chemical processes operating in nature. Natural coastal features take a variety of forms, including reefs (e.g., coral and oyster), barrier islands, dunes, beaches, wetlands, and maritime forests. The relationships and interactions among the natural and built features comprising the coastal system are important variables determining coastal vulnerability, reliability, risk, and resilience. Conversely, Nature-based Features are those that may mimic characteristics of natural features, but are created by human design, engineering, and construction to provide specific services such as coastal risk reduction. The built components of the system include nature-based and other structures that support a range of objectives, including erosion control and storm risk reduction (e.g., seawalls, levees), as well as infrastructure providing economic and social functions (e.g., navigation channels, ports, harbors, residential housing). An integrated approach to coastal resilience and risk reduction will employ the full array of measures, in combination, to support coastal systems and communities. In order to pursue an integrated approach to coastal resilience, the North Atlantic Coast Comprehensive Study (NACCS) formed a team to develop a framework for

identifying and evaluating opportunities for integrating natural and nature-based features (NNBF) (USACE 2015). NNBF can be used to enhance the resilience of coastal areas threatened by sea level rise and coastal storms. For example, beaches are natural features that can provide coastal storm risk reduction and resilience where their sloping nearshore bottom causes waves to breakdissipating wave energy over the surf zone. Dunes that back a beach can act as physical barriers that reduce inundation and wave attack to the coast landward of the dune. Coastal wetlands can attenuate waves and stabilize sediments, thereby providing coastal storm protection. Nature-based features are acted upon by processes operating in nature, and as a result, generally must be maintained by human intervention to provide the functions and services for which they were built. Coastal systems are naturally dynamic, and NNBF respond in many ways to stormswith some responses being temporary and others permanent. Storm effects on wetlands often include erosion, stripped vegetation, and salinity burnall of which can decrease long-term productivity. Storms, however, also introduce mineral sediments that contribute to long-term sustainability with respect to sea level rise.

Engagement and Communication Strategy - North Atlantic Division This reality has given rise to efforts to make greater use of ecosystem-based approaches to reduce risks from the use of natural and nature-based features (NNBF) to improve coastal resilience and was designed to support post-Hurricane Sandy recovery efforts under the North Atlantic Coast Comprehensive Study (NACCS). **North Atlantic Coast Comprehensive Study - North Atlantic Division** s@usace.army.mil. USACE-NOAA NNBF Meeting Coastal Resilience is Serious Business: Lives are at Stake Nature-Based Features Perform During. Hurricane Sandy (2012) D.C are in the NACCS study area). ?650,000 houses The North Atlantic Coast Comprehensive Study. **The North Atlantic Coast Comprehensive Study and the US Army** NACCS: Resilient Adaptation to Increasing Risk. 1 CHAPTER . the study area as areas affected by Hurricane Sandy,

following Hurricane Sandy, provide the foundation . technical report, Use of Natural and Nature-Based Features for Coastal opportunities for the strategic placement of dredged material for NNBF. **Institutional & Other Barriers - North Atlantic Division - Army** the North Atlantic. Coast Comprehensive Study: Resilient Adaptation to . landscapes nature-based features and natural processes in the context of coastal **Nature-Based Features in a Systems Approach to Coastal Storm USACE Resilience Assessment Methodologies - International Risk** Coastal Storm Risk Management National Planning Center of Expertise Coastal Resilience. ? NACCS: Through the Lens of Planning Modernization. 2 A USACE-only application. 7 Sandy Task Force Hurricane Sandy Rebuilding Strategy NNBF NATURAL AND NATURE-BASED FEATURES. **North Atlantic Coast Comprehensive Study: Resilient - Amazon S3** North Atlantic Coast Comprehensive Study (NACCS). United States Army . pools and analyses of natural and nature-based features (NNBF). **North Atlantic Coast Comprehensive Study: New Jersey Back Bays** comprehensive study to address the flood risks of vulnerable coastal populations in areas that were affected by Hurricane Sandy within the boundaries of the North Atlantic. Division of the Corps What data gaps exist/can be closed through the NACCS? Natural and nature-based features (e.g. living shorelines, wetlands **North Atlantic Coast Comprehensive Study: Resilient - asbpa** Hurricane/Post-Tropical Cyclone Sandy moved to the North Atlantic Coast Comprehensive Study infrastructure. $19M study submitted to Congress in. January 2015. NACCS Use of Natural Develops a quantified measure of resilience based on speed and magnitude of restoring functionality or service following. **Natural and Nature-Based Features in the USACE North Atlantic** comprehensive study to address the flood risks of vulnerable by Hurricane Sandy within the boundaries of the North Atlantic Develop creative incentives to promote use of resilience measures Integrate natural-based features in coastal risk management systems . Integrate NNBF coastal storm risk. **North Atlantic Coast Comprehensive Study Through the Lens of** coastal resilience, and was designed to support post-Hurricane Sandy recovery efforts under the. North Atlantic Coast Comprehensive Study (NACCS). **Use of Natural and Nature-based Features (NNBF) - North Atlantic** Army Corps of Engineers releases NACCS NACCS advances into Phase 3 The Comprehensive U.S. Army Corps of Engineers collaborates on study of North Atlantic coast after Hurricane Sandy Abstract: Use of Natural & Nature-Based Features for Coastal Resilience . NNBF Policy & Technical mtgs., Nov. 20-22 **Slideshow presentation - US Fish and Wildlife Service** NACCS: Resilient Adaptation to Increasing Risk. 1 CHAPTER . following Hurricane Sandy, provide the foundation . technical report, Use of Natural and Nature-Based Features for Coastal .. guidance for NNBF for use in coastal storm. **After Hurricane Sandy: North Atlantic Coast Comprehensive Study** Use of Natural and Nature-?Based Features for vulnerable coastal populations in areas that were affected by Hurricane Sandy within. **Application to Natural and Nature-Based Features - Engineering** USACE North Atlantic Coast Comprehensive. Study. Dr. Todd S. Bridges, ST. Senior Research Hurricane Sandy. Storm Impacts and D.C are in the NACCS study area). ?650,000 In the Context of Coastal Resilience Define NNBF Performance Metrics. Evaluate NNBF case study. Use extreme event to improve. **North Atlantic Coast Comprehensive Study** Resilient Adaptation to Increasing Risk Natural and Nature-Based Features (NNBF) Team, NACCS. ? Jason Engle. Chief, Coastal Engineering Design Section, Jacksonville District Hurricane Sandy within the boundaries of the North Atlantic Division of the Floodplain management, land use planning. **After Hurricane Sandy: North Atlantic Coast Comprehensive Study** Natural and Nature-Based Approaches to Support Coastal Resilience and Risk Reduction of the North Atlantic Coast Comprehensive Study (NACCS) Coastal Risk and Natural and Nature-Based Features (NNBF) The NACCS NNBF Policy were affected by Hurricane Sandy within the boundaries of the North Atlantic **North Atlantic Coast Comprehensive Study - North Atlantic Division** USACE North Atlantic Coast Comprehensive. Study. Dr. Todd S. Bridges, ST. Senior Research Hurricane Sandy In the Context of Coastal Resilience NACCS Natural and Nature-Based Features: Define NNBF Performance Metrics. **North Atlantic Coast Comprehensive - USACE NAD** After Hurricane Sandy: North Atlantic Coast Comprehensive Study (NACCS) - Use of Natural and Nature-based Features (NNBF) for Coastal Resilience eBook: **Use of Natural and Nature-Based Features (NNBF) for Coastal** North Atlantic Coast Comprehensive Study: Coastal Storm Risk Management Framework areas that were affected by Hurricane Sandy within the boundaries of the North Atlantic 8. NNBF Natural and Nature-Based Features Develop creative incentives to promote use of resilience measures. Resilient Adaptation to Increasing Risk Natural and Nature-Based Features (NNBF) Team, NACCS study to address the flood risks of vulnerable coastal populations in areas that Hurricane Sandy within the boundaries of the North Atlantic Division . D2M2 uses computer optimization to balance all. **After Hurricane Sandy: North Atlantic Coast Comprehensive Study** North Atlantic Coast Comprehensive Study (NACCS) . NACCS goals of community resilience and coastal storm risk management must be understood. Resilience is defined by the Hurricane

Sandy Rebuilding Strategy report as the Nature-Based Features for Risk Reduction and Resiliency on November 20, 2013. **Appendix C - Planning Analyses - North Atlantic Division - Army** After Hurricane Sandy: North Atlantic Coast Comprehensive Study (NACCS) - Use of Natural and Nature-based Features (NNBF) for Coastal Resilience eBook: **North Atlantic Coast Comprehensive Study Visioning Meetings** infrastructure or USACE project being studied but the community and expert elicitation in the early tiers, a comprehensive but simple analysis can be Following Hurricane Sandy in 2012, the USACEs North Atlantic Coast Comprehensive. Study Use of Natural and Nature-Based Features (NNBF) for coastal resilience. **Executive Summary: Natural & Nature-Based Features** Buy After Hurricane Sandy: North Atlantic Coast Comprehensive Study (NACCS) - Use of Natural and Nature-based Features (NNBF) for Coastal Resilience: **NACCS Main Report - North Atlantic Division - Army** stakeholders to develop a shared vision for resilience in response to risk and exposure, building upon Methods of coastal storm risk management strategies must be redundant, robust, and . 4.1 Hurricane Sandy Impacts and Stakeholder Feedback . Encourage Natural and Nature-Based Features (NNBF). 1. 4. 0. 1. 3. **NACCS Stakeholder Webinar - North Atlantic Division - U.S. Army** Coastal Storm Risk Management comprehensive study to address the flood risks of vulnerable areas that were affected by Hurricane Sandy within the boundaries of the North Atlantic NACCS Conceptual Regional Use of Natural and Nature-Based on critical infrastructure will promote resilience. **North Atlantic Coast Comprehensive Study - North Atlantic Division** Comprehensive Study Project Manager, NACCS Natural and Nature-Based Features (NNBF) comprehensive study to address the flood risks of vulnerable coastal populations in Hurricane Sandy within the boundaries of the North Atlantic Division . resilience applied to Jamaica Bay as pilot study. **Use of Natural and Nature-Based Features in the USACE North** Comprehensive Study. Draft Analyses Webinar: Coastal Flood Risk Plan Formulation Lead, NACCS Natural and Nature-Based Features (NNBF) by Hurricane Sandy within the boundaries of the North Atlantic Division of the Support Resilient Coastal Floodplain management, land use planning. **North Atlantic Coast Comprehensive Study - North Atlantic Division** Use of Natural and Nature-based Features. (NNBF) for Coastal In order to pursue an integrated approach to coastal resilience, the North Atlantic Coast.