

NEW JERSEY BACK BAYS
COASTAL STORM RISK MANAGEMENT
INTERIM FEASIBILITY STUDY AND
ENVIRONMENTAL SCOPING DOCUMENT

Executive Summary

1 March 2019

Document Overview

This U.S. Army Corps of Engineers (USACE) New Jersey Back Bays (NJBB) Coastal Storm Risk Management (CSRМ) Interim Feasibility Study and Environmental Scoping Document presents a preliminary focused array of alternative plans that reduces risk to human life and flooding risk from coastal storms in the NJBB Region. These findings and associated analyses are consistent with study planning objectives in addition to minimizing environmental, social and economic impacts. The reduction of flood-related damages to residential structures, commercial structures, critical infrastructure, and industries is critical to the national and regional economy.

The long term strategy for resilience in the NJBB region is a scalable solution that integrates CSRМ efforts included in this NJBB CSRМ Study Document as well as CSRМ efforts considered by the New Jersey Department of Environmental Protection (the NJBB Study non-Federal Sponsor), other Federal agencies, NGOs and municipal entities.

This Interim Feasibility Study and Environmental Scoping Document has been prepared in accordance with relevant laws and USACE guidance. This document does not inform Federal or USACE policy and is not considered a formal decision document, and is not a National Environmental Policy Act of 1970 (NEPA) compliant document.

The USACE will continue to coordinate with the NJDEP to implement the recommended project in accordance with current policy.

Study Area & Existing Conditions Overview

The study area has been subdivided into five regions based on problems and opportunities, geomorphology and hydraulic interconnectedness of water bodies. The preliminary focused array of alternative plans is presented by individual region in Chapter 10 of the Main Report. These alternative plans are compared to the No Action alternative (Future Without Project Condition) which includes no additional measures above the existing condition plus CSRМ actions either constructed or currently under construction to manage coastal storm risk. This preliminary focused array of alternative plans and continued study analyses are necessary to determine the

plan that reasonably maximizes National Economic Development (NED) benefits while not sacrificing environmental, regional, or social concerns, which will ultimately result in the selection of a recommended plan in subsequent phases of the feasibility study.

The study area includes the bays and river mouths located landward of the barrier islands and Atlantic Ocean-facing coastal areas in the State of New Jersey. The Atlantic Ocean Coast of New Jersey is fronted by an effective Federal CSRSM program. However, the NJBB region currently lacks a comprehensive CSRSM program. As a result, the NJBB region experienced major impacts and devastation during Hurricane Sandy and subsequent coastal storm events thus damaging property and disrupting millions of lives due to the combination of low-lying topography, sea level change, densely populated residential and commercial areas, extensive low-lying infrastructure, and degraded coastal ecosystems.

Further vulnerability to coastal storms and the potential for future, more devastating events due to changing sea level and climate change is significant. Rising sea levels represent an inexorable process causing numerous, significant water resource problems such as: increased widespread flooding along the coast; changes in salinity gradients in estuarine areas that impact ecosystems; increased inundation at high tide; decreased capacity for storm water drainage; and declining reliability of critical infrastructure services such as transportation, power, and communications. Addressing these problems requires a paradigm shift in how we work, live, travel, and play in a sustainable manner as a large extent of the area is at a very high risk of coastal storm damage as sea levels continue to rise.

Focused Array of Alternative Plans Overview

The preliminary focused array of alternative plans was developed through a detailed hydrodynamic modeling and multi-criteria based iterative screening analysis process. Through this process, CSRSM measures were combined into complete and implementable multi-measure alternative plans. Measures that would not contribute to the study's CSRSM objectives were screened out. The remaining four major measure types identified for this Document include: storm surge barrier (inlet closures) and interior bay closures; perimeter (levees and floodwalls); nonstructural (residential building retrofits); and Natural and Nature Based Feature (NNBF) measures.

Preliminary results of the modeling and screening analyses indicate that storm surge barriers are viable options at Manasquan Inlet, Barnegat Inlet, Absecon Inlet, and/or Great Egg Harbor Inlet. Storm surge barriers were evaluated at the Little Egg/Brigantine Inlet complex, and at Hereford Inlet as well as at other inlets but many of these storm surge barriers have limited benefits as compared to costs and may present environmental impact obstacles. Interior bay closures inclusive of navigable gates at the Intracoastal Waterway are viable both north of Absecon Island and south of Ocean City.

Preliminary results indicate that floodwalls and levees are potentially viable at several locations including Cape May City, West Cape May, Wildwood Island, West Wildwood Island, Stone Harbor/Avalon, Sea Isle City, Ocean City, Absecon Island, Brigantine Island, Long Beach Island and the area just north of Manasquan Inlet.

Conceptual design of floodwalls, levees, and interior bay closures are based on a crest elevation of 13 ft. NAVD88. Conceptual design of storm surge barriers at inlets are based on a crest

elevation of 20 ft. NAVD88. Additional refinement will be included in design crest elevations in subsequent phases of the feasibility study.

Nonstructural elements include only building retrofits (structure elevation) to residential structures at this point of the study due to availability of existing data such as structure inventory and cost information. Future analysis will address flood proofing and ring levees for commercial, public, and industrial structures, as well as managed coastal retreat including acquisition/relocation. Building acquisition and relocation could provide significant environmental benefit by increasing open space by converting existing privately owned and buildable properties into natural habitat. Future recommendations will also be made regarding land use management and early flood warning elements.

The primary focus of the NJBB study is managing risk associated with storm surge events rather than flooding associated with inadequate storm sewer systems and/or high frequency (i.e. nuisance) flooding. USACE policy (ER 1165-2-21) states that storm water systems are a non-Federal responsibility. While inundation from high frequency flooding events and inadequate storm water systems is not the focus of the NJBB study, it is acknowledged that nonstructural and storm surge barrier measures may not provide flood risk management from high frequency flooding events. Therefore, complementary measures to address these problems will likely be investigated as part of the NJBB Study, and may be recommended as part of a comprehensive Federal project that could be implemented at the non-Federal level.

Natural and Nature Based Features (NNBFs) assist in the incorporation of natural approaches to develop regional climate change and sea level rise adaptation planning strategies and solutions in the NJBB study area. NNBFs help to meet the project objectives and provide coastal storm risk management attributes through the consideration of stand-alone measures including living shorelines, reefs, wetland restoration and submerged aquatic vegetation.

At this point in the NJBB Study, the preliminary focused array of alternative plans does not consider specific locations for NNBF implementation. Continuing evaluation for potential NNBF implementation includes locations in the study area with undeveloped shorelines showing shoreline erosion adjacent to infrastructure as well as adjacent to storm surge barriers or floodwalls/levees to pre-emptively address erosion near these structures. Specific modifications to structural measures include habitat benches to restore more natural slopes along shorelines and textured concrete to support colonization of algae and invertebrates. Additional analysis regarding NNBF implementation and consideration of the ancillary benefit of NNBFs to meet mitigation requirements will be performed in subsequent phases of the feasibility study as the recommended plan is developed.

Environmental Impacts Overview

Only general impacts and/or a range of impacts have been identified at this stage of the feasibility study and associated NEPA analysis. There is difficulty in accurately quantifying direct impacts to essential fish habitat, federally-listed threatened and endangered species, marine mammals, recreation, wetlands, cultural resources, navigation and visual resources based on analyses performed to date. Furthermore, quantification of indirect impacts is limited at this phase of the feasibility study owing to ongoing detailed environmental analyses including hydrodynamic and water quality modeling to determine the effects on flushing, salinity, dissolved oxygen and

nutrients, and conceptual environmental impact decision modeling to guide the impact analyses for ultimate integration into the future phases of the study and the recommended plan.

Findings to date suggest that structural measures in the preliminary focused array of alternative plans may have some direct impacts such as habitat loss at wetlands and submerged aquatic vegetation, and aesthetics/views impairment. Floodwalls and levees are expected to have significant direct impacts particularly on wetlands and shallow aquatic habitats within the footprint of floodwalls and levees over long linear distances, which would have regional effects. Inlet storm surge barriers and interior bay closures would have moderate to significant direct impacts on aquatic habitats, but comparatively less than that of floodwalls and levees.

Storm surge barriers and interior bay closures may pose significant indirect impacts on hydrodynamics such as tidal flow, and tidal range, water quality, and shifts in flora and fauna abundance, distributions and migrations. These potential effects have a high level of uncertainty particularly with the unknown frequency of gate closures coupled with changes in tidal flooding events related to sea level rise. This would require further modeling efforts to inform the impact assessment associated with these measures.

There will likely be both temporary and permanent visual adverse effects associated with the construction of structural measures in the recommended plan. Construction equipment will be visible at locations included in the recommended plan during the construction phase. The storm surge barriers, interior bay closures, floodwalls and levees will be permanent and visible both on land and from the water.

Nonstructural structure elevation may have some temporary adverse direct and indirect effects related to earth disturbance. Building acquisition and relocation could provide significant environmental benefit by increasing open space by converting existing privately owned and buildable properties into natural habitat although there is a potential for significant adverse impacts to cultural resources.

NNBFs are expected to have temporary and minor impacts on aquatic resources and water quality during their construction, but would have a long-term beneficial effect on aquatic and some terrestrial habitats and the flora and fauna that inhabit these areas.

Cultural resource impacts may include impacts to historic districts and properties that are eligible in the National Register of Historic Properties as well as to sunken historical vessel sites. Further study is needed, and these potential impacts will likely be addressed through a Programmatic Agreement with the New Jersey State Historic Preservation Office.

The preliminary focused array of alternative plans identified in this Document will undergo a rigorous evaluation of compliance with environmental protection statutes and Executive Orders at subsequent phases of the feasibility study. A detailed examination of impact avoidance and minimization to better quantify both direct and indirect environmental impacts will also be performed in the future. Based on the scale of the preliminary focused array of alternative plans, it is possible that substantial compensatory mitigation will be required.

Environmental concerns will be evaluated in the EIS during subsequent phases of the feasibility study and through coordination and review by the resource agencies including the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the U.S. Department of

Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service and other agencies as part of the feasibility process.

Next Steps for the NJBB Study

Following this Interim Feasibility Study and Environmental Scoping Document, the continued feasibility phase of the study will develop: a Draft Integrated Feasibility Report and Environmental Impact Statement (EIS) with tentatively selected plan (TSP) in 2020; a Final Feasibility Report and EIS with recommended plan in 2021; and a Chief's Report in 2022 which concludes the feasibility phase of the Study. The completion of the Chief's Report is the first step toward implementing the design and construction of the NJBB Study. Following this feasibility phase, the pre-construction engineering and design (PED) phase of the project initiates the implementation process of the recommended plan including the development of plans and specifications. Funding by the Federal Government to support these activities would have to meet traditional civil works budgeting criteria. In order for the PED phase to be initiated, USACE must sign a Project Partnership Agreement (PPA) with the non-Federal sponsor to cost share the PED and construction phases. This project would require congressional authorization for both the PED and construction phases. PED and construction phases are cost shared 75%/25% and 65%/35% Federal/non-Federal, respectively. Implementation would then occur provided that sufficient funds are appropriated to design and construct the project. Sequencing of project construction is dependent upon final study findings, congressional project authorization and appropriation of funds. The non-Federal cost share as discussed above would also be necessary to commence project design and construction.

The construction of scaled, incrementally implementable integrated USACE construction opportunities associated with the NJBB recommended plan to manage flooding risk in the region may be massive in scale and cost several billion dollars. A strategy for implementation and sequencing of the recommended plan will need to be prepared amongst team partners in order to identify and make available construction funds and to communicate the construction priority to stakeholders. It is anticipated that Federal/non-Federal sponsor project partnership agreements could be executed for individual construction opportunities rather than for one large project addressing the entire current study area. Project construction would start no earlier than 2030 and is dependent upon Federal congressional authorization and Federal and non-Federal partner appropriations.

Analyses have been conducted to address the specific requirements necessary to demonstrate that the preliminary focused array of alternative plans will form a recommended plan in a subsequent phase of the feasibility study that is technically feasible, economically justified, and environmentally compliant. Additional analyses will ultimately develop costs and cost-sharing to support a Project Partnership Agreement (PPA) between the non-Federal sponsor and the Federal government.

This document has considered and incorporated comments from the public, stakeholders, agencies, and NGOs through a series of workshops and meetings since the study commencement in 2016. Throughout the study, coordination was maintained with the State of New Jersey as well as counties and municipalities throughout the study area as well as academic institutions, environmental/resource agencies, and other key stakeholders. Continued NJBB analyses will incorporate Federal, State, local, NGOs and academic datasets and tools as applicable and will

consider ways to coordinate with and leverage other Federal and state resilience projects. The development of relationships with cooperating agencies was and will continue to be critical in conducting future analyses.