New Jersey Back Bays Coastal Storm Risk Management Study

Summary of Public Outreach

U.S. Army Corps of Engineers

Philadelphia District

Updated December 2016

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Summary

On June 17, 2016 and June 21, 2016 the United States Army Corps of Engineers (USACE) Philadelphia District (NAP) and New Jersey Department of Environmental Protection (NJDEP) conducted Stakeholder Planning Workshops for the New Jersey Back Bays (NJBB) Coastal Storm Risk Management (CSRM) Feasibility Study. The purpose of these workshops was to obtain feedback from stakeholders to assist NAP in developing problems, objectives, and potential measures throughout the NJBB study area. In recognition of the diversity of the existing conditions and CSRM issues throughout the study area, NAP sent out invitations to a wide range of stakeholders including representatives from Federal agencies, state agencies, counties, municipalities, non-governmental organizations (NGOs), elected officials, and academia.

A total of 39 and 52 stakeholders attended the June 17 and June 21 workshops, respectively. Feedback was gathered from discussion at the meetings as well as written responses submitted during and after the meetings. Analysis of stakeholder feedback on coastal flooding issues identified problems, opportunities, considerations and constraints in the NJBB study

On the evening of December 01, 2016 from 6:00 pm to 8:00 pm at the Campus Center of Richard Stockton University, the NAP conducted a Public Meeting for the NJBB CSRM Feasibility Study. The purpose of this meeting was to provide an introduction of the study to the general public and obtain feedback from the general public to assist NAP in identifying problems, opportunities, objectives, constraints and potential CSRM measures throughout the NJBB study area.

The public meeting consisted of a brief 15 minute introductory presentation to the NJBB study with welcomes from both USACE and NJDEP, a question and answer session of approximately 45 minutes, and an hour long “open house” session with tables related to the USACE study process and different management measures for more in-depth and personalized interactions between the public and USACE Project Delivery Team (PDT) members. At least 119 people attended the meeting, as counted using the sign in sheet at the “Welcome Table” at the meeting. Approximately a quarter of attendees were from the general public.

Several approaches were used to assess feedback from the public meeting. Meeting attendees were invited to fill out Coastal Flooding Problem Identification forms to be submitted either at the meeting or after the meeting via e-mail. PDT members also took notes during the Q&A and open house sessions of the meeting to collect public input.

NAP will use the problems, opportunities, considerations, constraints, and potential measures discussed at the stakeholder workshops and public meeting to inform the plan formulation process and develop different alternatives to address coastal flooding in the NJBB study area.

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NEW JERSEY BACK BAYS
COASTAL STORM RISK MANAGEMENT STUDY
SUMMARY OF PLANNING WORKSHOPS ON
JUNE 17, JUNE 21, AND DECEMBER 1 2016

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1 Stakeholder Workshops – June 17 and June 21, 2016

1.1 Introduction

Historical storms including Hurricane Sandy have impacted the New Jersey Back Bays Bay shoreline. In response to Hurricane Sandy, USACE initiated the North Atlantic Coastal Comprehensive Study (NACCS) after the Passage of Public Law 113-2, the Disaster relief Appropriations Act of 2013. This study investigated solutions that will reduce future flood risk in ways that support the long-term resilience and sustainability of the coastal ecosystem and surrounding communities, and reduce the economic costs and risks associated with large-scale flood and storm events. In support of this goal, the NACCS identified nine high risk areas on the Atlantic Coast for an in-depth analysis based on preliminary analyses.

The NJBB Focus Area is one such high risk area that warrants an in-depth investigation into potential CSRM solutions. The NJBB Focus Area study area is located behind the New Jersey barrier islands of Monmouth, Ocean, Atlantic and Cape May Counties and includes the set of interconnected water bodies that are joined to the Atlantic Ocean by inlets, estuaries and tidal lagoons. The inland extent of the study area was determined using the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Category 4 Maximum of Maximums Storm Surge inundation footprint (Fig. 1).

The NJBB CSRM Study will investigate coastal storm risk management problems and alternative solutions. The study will consider past, current, and future CSRM and resilience planning initiatives and projects underway by the USACE and other Federal, State, and local agencies. NJDEP has partnered with USACE as the non-Federal sponsor of the study.

On June 17, 2016 and June 21, 2016 the NAP conducted Stakeholder Planning Workshops for the NJBB CSRM Feasibility Study. For the purpose of the stakeholder workshops, the NJBB study area was divided into ten planning reaches (Fig. 1). The June 17 workshop was held for planning reaches 1,2,3,6,7, and 8 in Burlington, Ocean, and Monmouth Counties (herein referred to as “Northern Planning Reaches”). The June 21 workshop was held for planning reaches 4, 5, 9, and 10 in Atlantic and Cape May Counties (herein referred to as “Southern Planning Reaches”).

The purpose of these workshops was to obtain feedback from stakeholders to assist NAP in identifying problems, opportunities, objectives, constraints and potential CSRM measures throughout the NJBB study area. In recognition of the diversity of the existing conditions and CSRM issues throughout the study area, NAP sent out invitations to a wide range of stakeholders including representatives from Federal agencies, state agencies, counties, municipalities, non-governmental organizations (NGOs), elected officials, and academia.

The workshops were structured to familiarize the attendees with the NJBB study and the USACE feasibility study process. After this initial presentation by USACE and NJDEP, breakout groups were organized by study planning reaches to allow stakeholders a forum to discuss the specific coastal storm risk problems they experience and to discuss potential FRM measures and opportunities. The background information presentation delivered at the workshop can be found in Appendix A, and the agendas from the workshops are in Appendix B.

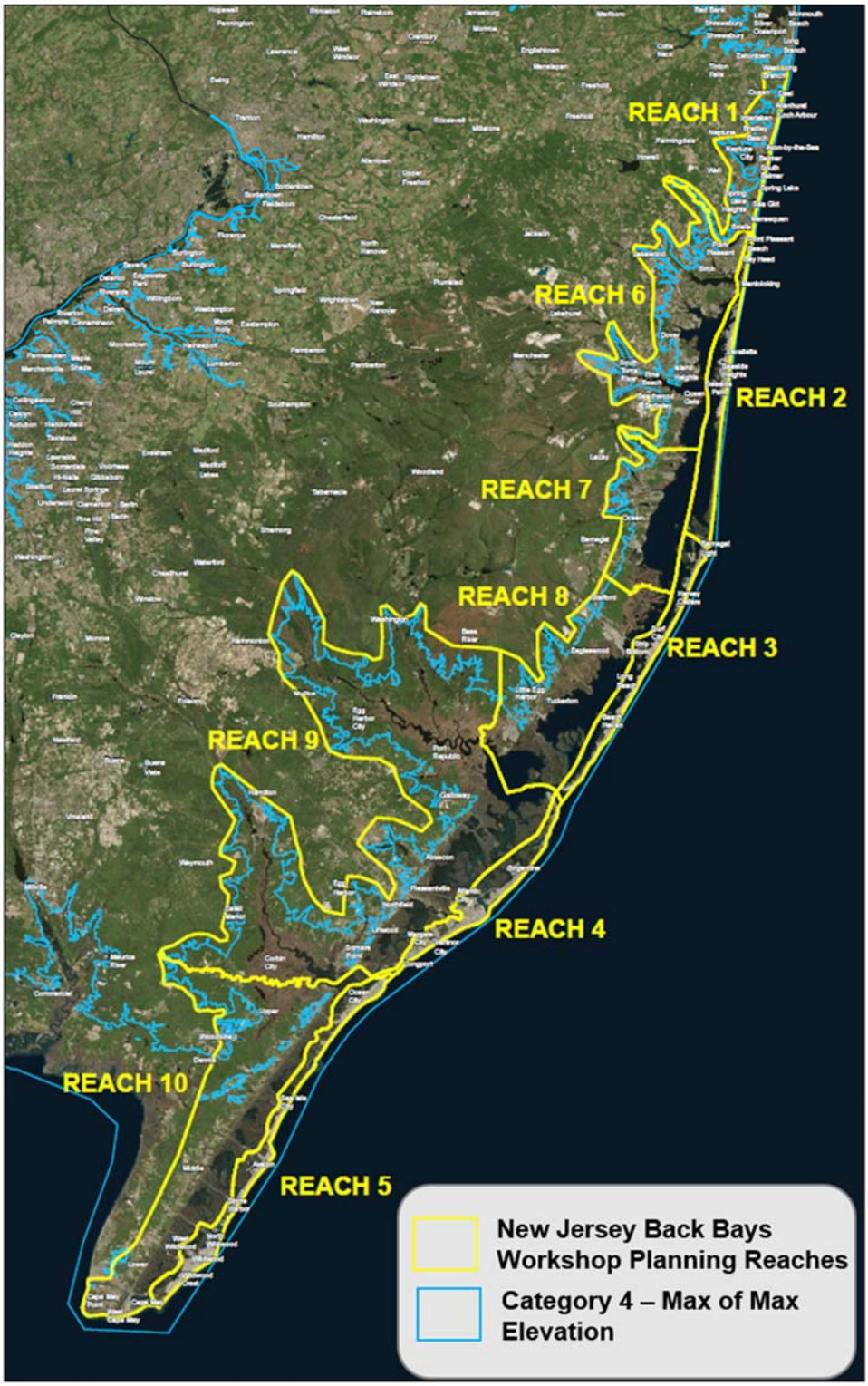

Figure 1: Map of planning reaches developed for the NJBB CSRM Feasibility Study Stakeholder Planning Workshops

1.2 Workshop Attendance

A total of 39 and 52 stakeholders attended the June 17 and June 21 workshops, respectively

(Fig. 2). Attendance counts do not include members of the Project Delivery Team (PDT) from NAP and NJDEP that were in attendance. Due to the lower turn-out in the June 17 workshop, problems, opportunities, objectives, constraints and measures were discussed in a single group discussion rather than having breakout discussion groups by planning reach.

Federal agency attendance at the workshops included representatives from the United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and National Park Service (NPS). USACE was represented by individuals from NAP, New York District (NAN), Norfolk District (NAO), and North Atlantic Division (NAD). State agency participation included representation by NJDEP. Several offices and bureaus within the NJDEP were represented including the Bureau of Coastal Engineering, Office of Coastal and Land Use Planning, Office of Science, and Bureau of Marine Fisheries. A total of 14 and 13 municipalities were represented by municipal administrators, mayors, planners, and engineers at the June 17 and June 21 workshops, respectively (Fig. 3). Several of the municipal engineers present at the workshops represented multiple municipalities, and some municipalities were represented by more than 1 individual. Representatives from Monmouth, Ocean, and Cape May Counties also attended the workshops.

NGO participation in the workshops included representatives from the American Littoral Society, Barnegat Bay Partnership, Nature Conservancy, Wetlands Institute, Atlantic Cape Coastal Coalition, NJ Sea Grant Consortium, and Sustainable NJ. The academic community was represented at the meeting by the Jacques Cousteau National Estuarine Reserve, Rutgers University, Monmouth University, Stevens Institute of Technology, Stockton University, and Rowan University.

The offices of New Jersey State Senator Jim Whelan, New Jersey State Assemblyman Vince Mazzeo, United States Congressmen Tom MacArthur (3rd district) and Chris Smith (4th district), and United States Senator Robert Menendez sent representatives to attend the workshops.

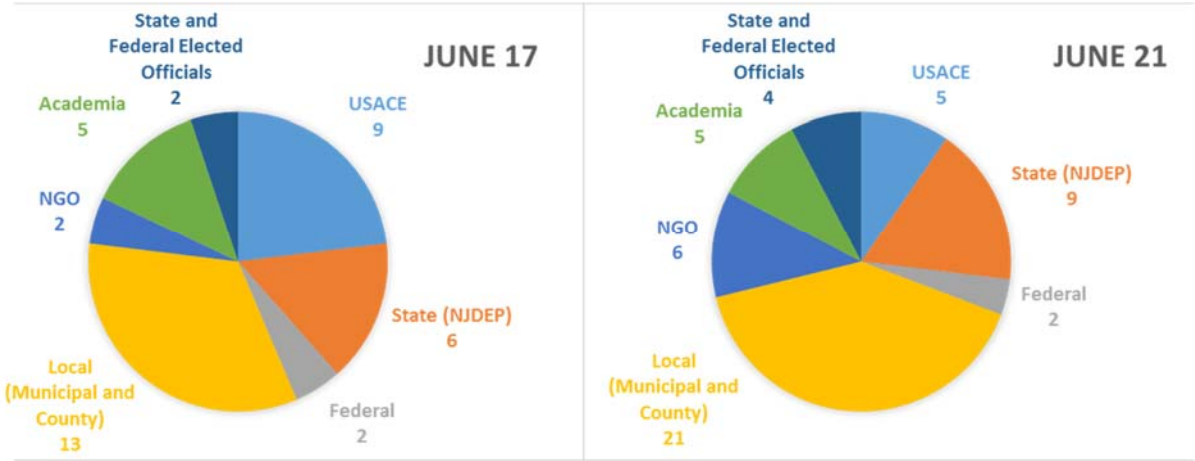

Figure 2: Attendees at June 17 and June 21 Workshops. Numbers under category indicate number of attendees.

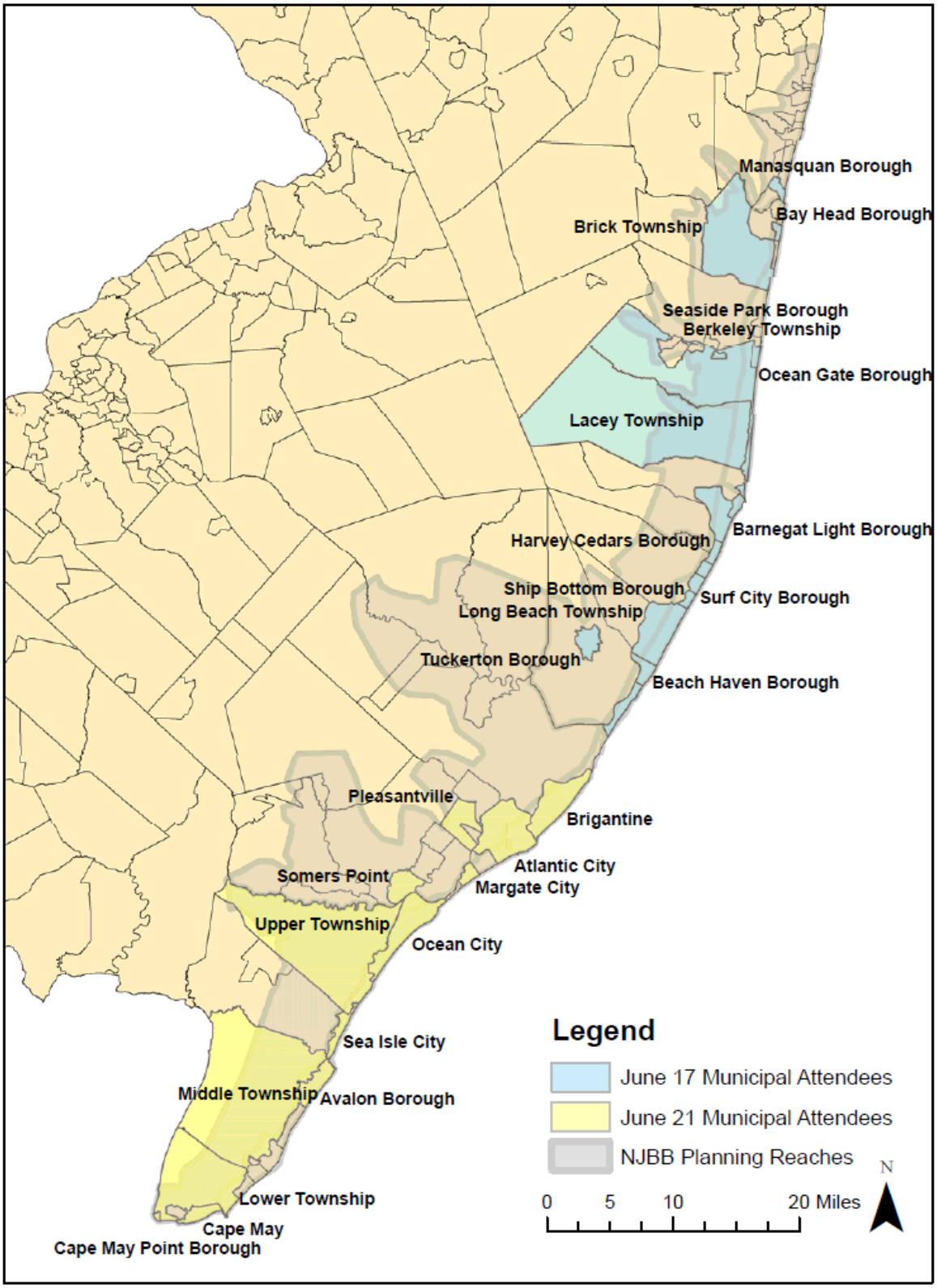

Figure 3: Map indicating municipalities with representatives in attendance during the June 17 and June 21 Workshops

1.3 Stakeholder Feedback: Problems

Stakeholders submitted feedback at the workshop either through informal comments during discussion sessions at the meetings or through submitting a Coastal Risk Management Strategy (CRMS) Profile. CRMS Profiles provided space for stakeholders to elaborate on coastal flood risk problems, opportunities, and potential management measures. The template for the CRMS Profile can be found in Appendix C. Following the June 17 and June 21 workshops, a follow up e-mail soliciting CRMS Profiles was sent to stakeholders to encourage further feedback.

The following stakeholders submitted CRMS Profiles:

- NJDEP, Borough of Marine Fisheries - Shellfisheries
- Cape May County, Engineering Division
- Brick Township
- Manasquan Borough
- Ocean Gates Borough
- Seaside Park Borough
- Surf City Borough
- Middle Township
- Ocean City
- Brigantine City
- Somers Point City
- Cape May Point Borough
- Neptune Township
- Rutala Associates, LLC (addressing issues on Absecon Island)
- Atlantic Cape Coastal Coalition
- The Wetlands Institute
- Members of the general public (from December 2016 meeting)

Notes taken during group discussions and breakout sessions and submitted CRMS Profiles were analyzed to identify problems, opportunities, objectives, constraints and potential management measures within the NJBB study area to aid in the plan formulation process. The analysis of stakeholder feedback yielded 11 general problems within the study area.

1.3.1 Tidal Flooding

Flooding during tidal events, often referred to as “nuisance flooding”, was identified as an issue by several stakeholders including Manasquan, Seaside Park, Beach Haven, Belmar, Brigantine, Longport, Brick Township, Neptune Township, Ocean Gate, Somers Point, Middle Township, Cape May County Engineering, and the Atlantic Cape Coastal Coalition. Wind driven wave action was cited as an exacerbating factor in tidal flooding. Tidal flooding from tidal water surcharging the storm water system occurs in many communities, which can make differentiating between flood issues from rain water and flood waters from the bays difficult. Flooding from tidal events can cause property damage and inundate roadways increasing public safety risks and preventing egress during coastal flooding emergencies. Stakeholders also expressed concern that present nuisance flooding will become more severe with climate change, and were interested in how nuisance flooding can fit into the USACE Benefit Cost Ratio (BCR) paradigm.

1.3.1.1 Potential and Implemented Measures

- Manasquan is currently responding by installing tide valves, elevating roadways, conducting a flood study, and considering a floodgate at Manasquan Inlet.
- Belmar has applied for a grant for flood valves in Silver Lake and new ocean outfalls with

tide valve controls in Lake Como. Grant funding is currently being sought through HMP-Federal Emergency Management Agency (FEMA) for a tide surge gate to prevent flooding on Shark River.

- Seaside Park has developed a plan to address flooding from both tidal and high frequency storm events, which includes a bay side wave dissipating wall, reducing outfall numbers and installing tide flux valves at outfalls. Existing infrastructure has been elevated in advance of the project and funding is currently being sought through a pending grant application with FEMA's Hazard Mitigation Grant Program (HMGP.)
- Local interest exists for green bulkheads and Natural and Nature-Based Features (NNBF) such as dunes. Specifically, Seaside Park is interested in creating vegetated dunes on the bayside of the municipality for flood risk management.
- Brigantine has constructed several storm water pump stations to address flooding during elevated tides.
- Brick Township has initiated capital improvements to elevate roadways and neighborhoods and install check valves at outfalls. However, check valves are difficult to procure using the public bidding process, and would be easier to purchase as part of a state contract or a co-op agreement.
- Neptune Township has installed tideflex valves on outfalls
- Replacement of Cape Island Creek Tidegate in Cape May
- Citizens in Margate City have identified Minnie Creek as an waterbody that causes tidal flood damages and suggested a tide gate as a solution

1.3.1.2 Identified Considerations

- Local resistance to wall structures that block water views is likely.
- Local resistance to tide gate structures can stop implementation of these measures.

1.3.2 High Frequency Event Flooding

Flooding from high frequency events was specifically cited as a problem by the following stakeholders: Belmar, Seaside Park, Cape May Point, Sea Isle City, Ocean City, Ocean Gate, Brick Township, Somers Point, Middle Township, Upper Township, Lower Township, Cape May County Engineering, and the Atlantic Cape Coastal Coalition. In Cape May County high groundwater during the fall and winter fills storm drains making it difficult to inspect and clean them. Several barrier island communities including Beach Haven, Sea Isle, and Ocean City cited land subsidence in the center of the island creating a "bath tub" effect that exacerbates flooding from all sources

1.3.2.1 Potential Measures

- Use marsh levee/dikes as storm water retention
- In Cape May Point, Lake Lily is used to successfully manage storm water by lowering the lake's water levels prior to storm events.
- New ordinances established in Somers Point to reduce impervious drive surface and to stop sump pumps from discharging into storm water systems.
- Storm drain clean outs
- Stormwater pumps and check valve installation

- Pressurized pump systems
- Install backup power to storm water pumps
- Develop or update local Stormwater Management Plans
- Green Stormwater Infrastructure including rain gardens, rain barrels, green roofs to better handle run-off.

1.3.2.2 Identified Considerations

- While municipalities may be successful in obtaining state and Federal grant funds for municipal storm water improvements, it is sometimes difficult for municipalities to manage maintenance costs for these projects.
- Multiple utility conflicts can constrain updating storm water systems
- Constructing and maintaining levees to protect against the 1% annual chance flood can be prohibitively expensive, but projects that protect against higher frequency events could protect against significant damages, but these projects would not get credit for flood protection in flood insurance premiums.

1.3.2.3 Identified Constraints

- Flooding issues that stem from inadequate storm water infrastructure likely will not fall under the authority of the NJBB CSRM Feasibility Study, but can be examined by USACE because solutions could be implementable by other agencies.

1.3.3 Coastal Storm Flooding

Specific mentions of coastal storm flooding were made by the following stakeholders: Manasquan, Surf City, Brigantine, Somers Point, Lower Township, Middle Township, Upper Township, Neptune Township, Cape May Engineering, and the Atlantic Cape Coastal Coalition. In addition to hurricanes, stakeholders stressed the impacts of Nor'easter storms on the NJBB study area. Cape May County Engineering stated the likelihood of Nor'easters spanning multiple tide cycles as contributing to increased coastal flood risk.

1.3.3.1 Potential Measures

- Flood gates could be possible at bridges and abutments (Ocean City Bridge discussed)
- Surge barriers at inlets
- Hybrid boardwalk/seawall barrier
- Improve or implement advanced flood warning systems to improve evacuation.

1.3.3.2 Identified Considerations

- Residents along the Metedeconk River are concerned about salt water intrusion upstream, and there would be local desire to address this with any kind of gate structure.
- Concerns about tide surge gates causing problems with storm water drainage and estuary eutrophication.
- Some areas in the NJBB might have too many inlets for storm surge barrier to be a viable measure.

1.3.3.3 Submitted Supporting Data/Information

- Manasquan submitted an online Hazard viewer which shows areas within the municipality that are impacted by coastal flooding and hurricane inundation.
- Map of ground elevation (NAVD88) in Somers Point
- NJDEP Office of Coastal Planning is performing a community vulnerability analysis.

1.3.4 Low Road and Infrastructure Elevations

Inundation of roads from tidal flooding, high frequency events, and coastal storms was cited by many stakeholders as a problem in the NJBB study area, including Manasquan, Seaside Park, Ocean Gate, Berkeley, Surf City, Brigantine, Atlantic City, Sea Isle City, Cape May Point, Brick Township, Somers Point, Middle Township, Neptune Township, Lower Township, Upper Township, and Cape May County Engineering. After Hurricane Sandy, many homes were reconstructed at higher elevations, creating potential for opportunities to elevate roadways. Emergency evacuation routes were mentioned as roads that should receive first consideration. A need to take a regional view of emergency access and evacuation routes was also discussed.

Specifically, the following roads were cited as areas of concern:

- N. Bayview Ave, Seaside Park
- Albany Ave/Route 322, Atlantic City
- State Highway 35, Belmar
- Snake Road (aka Knoll Crest/Holly Ave), Brick Township
- South Drive, Brick Township
- Bay Ave, Somers Point
- Jordan Road, Somers Point (access to hospital is compromised by flooding)
- Benny's Land Road, Middle Township
- Stone Harbor Blvd, Middle Township
- Leonard's Lane and Old Avalon Blvd, Middle Township
- On South and West Concourse between Route 35 to Albany Road, Neptune Township
- S. Riverside Drive between Beverly Way and Dykman Place, Neptune Township
- Sea Isle Blvd (currently being elevated)
- No evacuation routes above base flood elevation in Reach 5

1.3.4.1 Potential Measures

- The Garden State Parkway (GSP) currently functions similar to a berm in some areas. However, there is concern that with Sea Level Rise (SLR), the GSP could be at risk for inundation. Raising the elevation of the GSP could be a potential measure.
- Old abandoned railroad right of ways could be elevated further for flood risk protection.
- Cape May Route 9 could be elevated.
- Neptune Township is revisiting elevations of bulkheads along S. Riverside Drive after Hurricane Sandy and has obtained FEMA grants for additional bulk heading along S. Riverside Drive and upgrading outfalls, installing new bulkheads, installing tideflex valves, and elevating portions of S. Concourse.

1.3.4.2 Identified Considerations

- Raising roads might not be feasible when houses are immediately adjacent to roads and are not raised when the road is elevated.
- Raised roads, GSP and railroad ROWs may act as drainage barriers and exacerbate the problem.

1.3.4.3 Submitted Supporting Data/Information

- Project affidavit for Snake Road and South Drive road elevation projects in Brick Township

1.3.5 Low Structure Elevations and Development in Coastal Areas

Elevating structures is a non-structural measure for decreasing coastal storm flood risk. Brick Township, Brigantine, Middle Township, Somers Point, NJDEP Office of Coastal Planning, the Atlantic Cape Coastal Coalition, and Cape May County Engineering all discussed building elevation. Stakeholders indicated that past development in the NJBB has increased impervious surface area, decreased infiltration capacity of the ground and has exacerbated flooding in the area (Somers Point, Wetlands Institute) and puts property at increased risk for flood damages (Cape May County Engineering)

- Brick Township has thousands of housing units fronted on roads that are at or below 2.0 feet NAVD88, and several hundred could potentially be under 1.0 foot NADV88.
- 15 repetitive loss properties in Somers Point
- While newer homes are elevated, many older homes are not (Middle Township cited Stone Harbor Manor as an example).

1.3.5.1 Potential Measures

- Brigantine has adopted an ordinance to require additional freeboard (2-3 feet depending on AE zone)
- There is a goal in Brigantine to protect the island to 9 feet elevation (with potential to evaluate the need to increase to 10 feet)
- Move towards amphibious community design to deal with rising water (See Structures of Coastal Resilience Study funded by Rockefeller Foundation)
- Buy-outs of repetitive loss properties (Blue Acres Program)
- Local ordinances to prevent further development in high risk areas

1.3.5.2 Identified Considerations

- To date, Blue Acres participation has mostly occurred outside of the NJBB area. Blue Acres is not funded in Ocean County, and relocation is unlikely to obtain the support of local residents in most of the NJBB study area.
- It can be difficult and expensive to remain ADA Act compliant when elevating structures

1.3.5.3 Submitted Supporting Data/Information

- List of repetitive loss properties from Middle Township

1.3.6 Variations in Bulkhead Elevation and Condition

Generally, the elevation and condition of bulkheads vary widely across the NJBB study area. When bulkheads are not continuous across a shoreline, the flood risk management to the land behind the bulkheads is compromised. Bulkhead elevations were discussed by communities on Long Beach Island, Brigantine, the Wetlands Institute, Sea Isle, Ocean City, Cape May Point, Somers Point, Middle Township, Lower Township, Upper Township, and Cape May County Engineering.

1.3.6.1 Potential/Implemented Measures

- Existing ordinances in Brigantine require Bayfront properties to construct bulkheads, and bulkheads are required to be elevation 9 feet NGVD29
- Potential for 7.0 feet NAVD88 bulkhead ordinance
- Construct bulkheads to connect bulkheaded shorelines along the back bays

1.3.6.2 Identified Considerations

- Some homeowners delay replacing deteriorated bulkheads to avoid compliance with new ordinances
- Many bulkheads, docks, and buildings were built without the required state, Federal, and local permits.
- Many bulkheads have created filled lands subject to tidelands claims, which complicates permitting. Stakeholders expressed interest in bringing Tidelands Management into discussion earlier in the project planning process to ease permitting difficulties and also questioned if it would be possible use maps other than the 1977 maps for Tidelands claims.

1.3.7 Need for Dredging and Suitable Placement Sites

Stakeholders outlined the need for dredging in different parts of the NJBB study area to restore navigation channels and water depths (Ocean City, Somers Point, Absecon Island), clean out sand blocked outlets into bays (Beach Haven, Brigantine, Atlantic City), and proposed dredging the Barnegat Bay as a flood risk management measure (Surf City). The scope of the NJBB CSRM Feasibility Study would not focus on dredging channels for navigation; however, dredged materials could be beneficially used to meet CSRM goals and objectives. While there is clear desire to dredge waterways in the NJBB area, stakeholders (Somers Point, Brick Township, Littoral Society, Ocean City) also highlighted the problem of a lack of suitable placement sites for dredged material. Stakeholders expressed an interest in using dredged materials for wetland restoration through thin layer placement and beach restoration (Ocean City, Sea Isle City, Cape May Point, Middle Township, Lower Township, Upper Township, Somers Point, Atlantic City, Margate).

1.3.7.1 Potential Measures

- Use of dredged materials (both from ongoing dredging efforts and existing CDFs) for wetland and beach restoration.
- Streamlined permitting process for wetlands restoration
- Extended timeframes for dredging
- Removal of sand from blocked outlets

- Use of dredged holes for placement of future dredged materials
- Relocation of New Jersey Intracoastal Waterway (NJIWW) near Atlantic City

1.3.7.2 Identified Considerations

- Logistical difficulties in getting pipeline/dredge and other construction equipment into marsh areas.
- Difficulty in permitting wetland restoration projects using dredged materials
- Permitting issues related to open water placement of dredged materials
- Geotechnical constraints of materials restricts possible placement areas
- CDFs along NJIWW are low in capacity.

1.3.7.3 Supporting Data/Information

- Monmouth Coastal Lakes Report addresses dredging in Coastal Lakes area
- Website with information related to Ocean City's Dredging Program
- Atlantic City Intracoastal Waterway Relocation Feasibility Technical Memorandum

1.3.8 Degraded Existing Wetlands and Historical Loss of Wetlands and Beaches

As referenced in the prior section, stakeholder interest exists in using dredged materials to restore wetland areas through thin layer placement. Stakeholders also indicated that loss of wetlands through encroachment from development (Wetlands Institute, Brick Township, Somers Point, and SLR (Brick Township) is a problem in the NJBB study area that contributes to coastal flooding. In addition to wetland restoration, interest existed among stakeholders (Seaside Park, Ocean Gate, Berkeley Township, Brigantine, Atlantic City, Margate, Cape May Point, Nature Conservancy) to create and restore beach and dune habitats and living shorelines along the back bay environment when possible.

1.3.8.1 Potential Measures

- Wetland restoration project at Poplar Island (MD) was referenced as a good case study for ecosystem restoration/dredged materials solutions for NJ.
- Extend beach nourishment from ocean side of Island Beach State Park to the bayside.
- Bringing permitting and resource agencies (state and federal) into the process early was discussed as a way to help decrease challenges that arise in the permitting process.

1.3.8.2 Identified Considerations

- Difficulty in permitting wetland restoration projects using dredged materials
- Logistical difficulties in getting pipeline/dredge into marsh areas.

1.3.9 Study Area Boundaries

During the June 21 meeting, stakeholders commented that the study area boundaries as they currently exist do not include the Delaware Bayshore area of Cape May County, and asked USACE to consider including the Delaware Bayshore of Cape May County in the NJBB study area. Middle Township provided a list of communities that experience flooding from the tidal creeks that drain to Delaware Bay and Delaware Bay itself including North Reeds Beach, South Reeds Beach, Cook's Beach, Kimble's Beach, High's Beach, and Del Haven. Flooding from the Delaware Bay in Middle Township is usually caused by wind driven waves moving inland and

creating pools which are unable to fully drain as the waters recede. Over the past few years, breaches have occurred along the Delaware Bayshore, which has increased flooding.

1.4 Stakeholder Feedback: Considerations, Data and Information, and Focus Areas

1.4.1 Considerations

In addition to the problem specific considerations outlined in the previous section, stakeholders also discussed constraints that were more general in nature or related to several different problems. The additional considerations that were discussed include:

- Coordination
- Funding
- Permitting
- Impacts on soil/erosion
- Public Education
- Flood impacts to adjacent communities
- Political will
- Grandfathered Structures
- Impacts to Aquaculture, Recreation, and Threatened and Endangered Species
- Fluctuating/seasonal population
- Lack of appropriate Tidal Hydrology/Ecology analysis software

Coordination, funding and permitting were the most frequently cited considerations. Stakeholders discussed the need for coordination in sharing information and filling data gaps and the importance of local, state, and Federal collaboration when studying and implementing measures that are comprehensive and tie into each other. Another priority for stakeholders was insuring that projects were financially feasible; stakeholders discussed the financial challenges that occur with cost sharing projects and the financial difficulty municipalities face when maintaining flood risk management structures after they have been built. Stakeholders also communicated difficulties they have encountered obtaining state and Federal permits for building flood risk management structures, restoring wetland areas, and dredging. Changes to the National Flood Insurance Program following the Biggert-Waters Flood Insurance Reform Act of 2012 was cited as creating issues related to flood risk management in the NJBB study area.

The length of the USACE planning process was cited as a consideration because generally the study process can last longer than the elected tenures of the public officials who initially supported the project concepts, which can make it difficult to secure non-Federal funding when a project moves towards implementation and needs a cost sharing non-Federal sponsor. Cape May County Engineering expressed concern that the seasonal fluctuations in population are not adequately captured in census data, and thus, do not allow for a full understanding of the size and scope of coastal flooding problems and costs in Cape May County.

Various resource impacts were described by stakeholders as considerations including soil stability, threatened and endangered species, recreation spaces, and aquaculture. Specifically, the NJDEP Marine Fisheries Administration expressed concern regarding the potential impacts of flood risk management projects on fisheries, fish and shellfish habitat, and fishing access and advised consideration of potential impacts to these resources during plan formulation and any potential project implementation.

1.4.2 Data and Information

Information and data received in addition to CRSM Profiles and comments at stakeholder workshops are listed below:

- Manasquan Hazard Viewer website
- Ocean City Dredging Program website
- Cape May County draft Hazard Mitigation Plan
- Project Affidavits for Snake Road and South Drive elevation projects, Brick Township
- Map of Ground Elevations, Somers Point
- Cost estimates for dredging and bulkhead construction, Somers Point
- Photos of Coastal Flooding, Middle Township
- Maps showing problem areas identified and maps showing sea level rise planning, Middle Township
- Repetitive Loss properties in Middle Township
- Cape May County Strategy Recovery Report
- Cape May County FHWA Emergency Relief Locations
- Cape May County Multi-Hazard Mitigation Plan
- Images outlining road flooding in Neptune Township

1.4.3 Focus Areas

The following areas were specifically referenced by stakeholders as being vulnerable to coastal storm risk:

Reach	Areas
Reach 1	• Borough of Manasquan: see provided Hazard Mapper • Belmar: Silver Lake and Lake Como, Tide Surge Gate on Shark River, State Highway 35 • Pumping identified as major issue in Deal Lake • Neptune Township: S. and West Concourse and S. Riverside Drive
Reach 2	• Seaside Park: N. Bayview Ave (1st St to Island Ave); pump stations along Central Ave • Bayside shore beach nourishment along Barnegat Peninsula
Reach 3	• Beach Haven: Inlet dredging proposed, storm outlets are blocked by sand • Surf City: Increased street flooding post-Sandy • South side of Long Beach Island is at lower elevation
Reach 4	• Atlantic City: Sunset Ave/Gardners Basin, Albany Ave/Route 322 • Wellington Ave Dredge Hole • Minnie Creek, Margate City
Reach 5	• Need for dunes at Alexander Ave and Cape May State Park, Cape May Point • Ocean City - See website for dredging activities and needs • Stone Harbor and Avalon bayside shores and business districts • Low marsh elevations throughout reach • Sea Isle City, back bay coastline – current causeway project underway
Reach 6	• Brick Township: Seaview Village Senior Community (Seaview Meadows), Snake Road, South Drive • Ocean Gate: Ocean Gate Ave to Narragansette Ave (shoreline erosion)
Reach 7	No Feedback Received
Reach 8	No Feedback Received
Reach 9	• Somers Point: Bay Ave, Jordan Road, Potential Tide Gate at Ocean City Bridge, 2 evacuation routes to GSP compromised by flooding see submitted map for other low lying areas
Reach 10	• Upper, Middle, and Lower Townships: Delaware Bayshore Area • Middle Township: Grassy Sounds, Avalon Manor, Stone Harbor Manor, Benny's Landing, Sea Isle Blvd • High ground water exacerbates flooding from rainfall during winter through late spring in Cape May County upland areas

2 Public Meeting – December 1, 2016

2.1 Introduction and Meeting Attendance

On December 01, 2016 from 6:00 pm to 8:00 pm at the Campus Center of Richard Stockton University, the US Army Corps of Engineers Philadelphia District (NAP) conducted a Public Meeting for the NJBB CSRM Feasibility Study. The purpose of this meeting was to provide an introduction of the study to the general public and obtain feedback from the general public with the goal of assisting NAP in identifying problems, opportunities, objectives, constraints and potential CSRM measures throughout the NJBB study area. NAP distributed notification of the meeting by using the NAP website and subscribers list, the e-mail listserv used for the stakeholder workshops in June 2016, and a news release to local news outlets. Several news outlets carried stories informing the public of the meeting, which helped to increase distribution of the meeting notice.

The public meeting consisted of a brief 15 minute introductory presentation to the NJBB study with welcomes from both USACE and NJDEP, a question and answer session of approximately 45 minutes, and an hour long "open house" session with tables related to the USACE study process and different management measures for more in-depth and personalized interactions between the public and USACE PDT members. Meeting attendees were provided with a handout that gave further context and detail for the materials presented at the meeting (Appendix D). At least 119 people attended the meeting, as counted using the sign in sheet at the "Welcome Table" at the meeting. Figure 4 demonstrates the diversity of backgrounds and level of technical knowledge of attendees at the meeting. Approximately a quarter of attendees were from the general public.

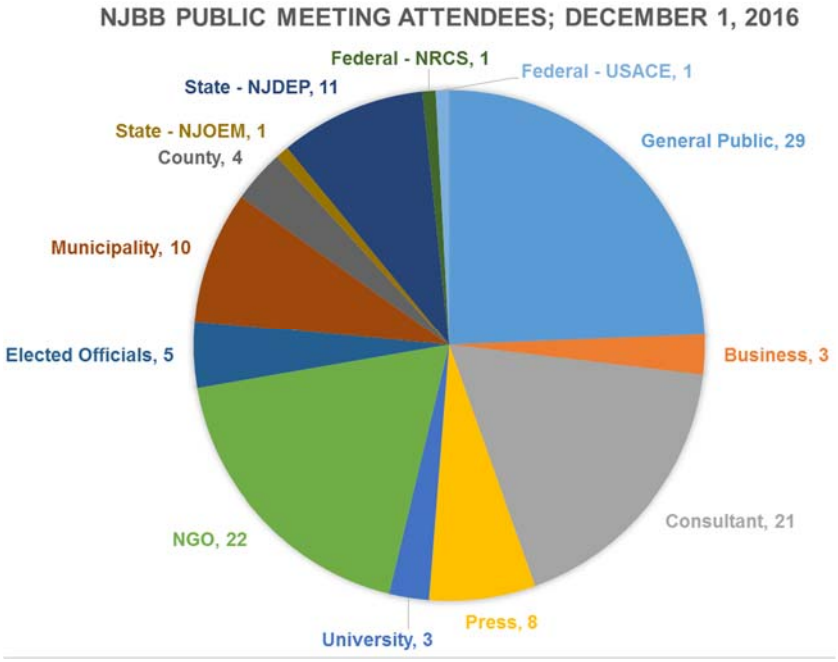

Figure 4: Attendees at December 1, 2016 Public Meeting. Numbers under category indicate number of attendees.

2.2 Public Meeting Attendee Feedback

Several approaches were used to assess public feedback from the meeting. Meeting attendees were invited to fill out Coastal Flooding Problem Identification forms to be submitted either at the meeting or after the meeting via e-mail. Fourteen Coastal Flooding Problem Identification forms were received. Half of the profiles came from members of the public who live adjacent to Minnie Creek in Margate City and identified Minnie Creek as a source of tidal flooding. Other areas and topics that were discussed in the profiles include flooding Grassy Sounds in Wildwood, flood water infiltration from salt water marshes, flooding along Sea Isle City's back bay coast, flooding along Route 35 in Belmar, damage to salt marsh in Great Bay Wildlife Management Area from speed boating, dredging in the back bay channel of Ocean City, and storm surge barriers at Point Pleasant, Barnegat Inlet, and Little Egg Inlet. PDT members also took notes during the Q&A and open house sessions of the meeting to collect public input.

2.2.1 Structural Solutions

Flooding of roads and properties from overtopping of bulkheads and inundation of salt marsh areas was highlighted as an issue in several parts of the study area including Sea Isle City and Belmar. Backflow of water through storm water management systems was also discussed as an issue in Long Beach Island. Structural solutions to coastal flooding that were discussed by the public included bulkheads along shorelines, check valves at storm water outfalls, storm water improvements, movable flood gates, and storm surge barriers at Point Pleasant Beach, Barnegat Inlet, and Little Egg Inlet.

2.2.2 Regional Sediment Management and Salt Marsh Restoration

Several meeting attendees were concerned with the health of salt marshes within the study area. Thin layer placement of dredged materials as a method of salt marsh elevation and restoration was discussed by several meeting participants. The establishment of invasive *Phragmites*, chemical and physical quality of the materials being used, and the appropriateness of the technique in general were all concerns that were raised during the public meeting. Meeting participants suggested incorporating lessons learned from ongoing National Fish and Wildlife Foundation marsh restoration efforts into study considerations. Additionally, another issue impacting salt marshes in the study area is the practice of speed boating in environmentally sensitive areas, such as Great Bay Wildlife Management Area and Tuckerton Creek, which is leading to salt marsh degradation.

Regional sediment management was also discussed at the meeting; Barnegat Bay was provided as an example of a sediment starved system, and the back bay area adjacent to Ocean City was identified as an area of sediment deposition. Meeting participants asked if in addition to marsh and beach restoration, if dredged materials could be used to construct vegetated berms in the study area. .

2.2.3 Study Conduct, Interagency Communication, and Public Coordination and Outreach

The study timeline was discussed at the meeting; the current study timeline estimate of three years was considered to be too long. There was also interest on how sea level rise will be considered in the study process.

Meeting participants expressed a need for USACE to coordinate with other Federal agencies, NGO's, the Governor's office, state agencies, and municipalities to ensure that the NJBB study is in alignment with existing efforts and to best leverage study resources. After Hurricane Sandy, some meeting participants stated there was a need that went unmet for state and Federal agencies to distribute best management practices for storm recovery and future flood risk reduction.

There was interest at the meeting for wider policy centered solutions in addition to the largely engineering based solutions discussed at the meeting. Specifically, meeting participants expressed the difficulty in implementing system wide changes when different municipalities have different levels of engagement and participation in coastal storm risk management policies and activities. Meeting participants also wanted to learn more about how ordinances are enforced at the local level. Additionally, at the meeting questions were raised on how FEMA determines flooding risk. There was concern expressed that in estuaries, the focus is on tidal flooding, and riverine flooding is not considered

Participants had several suggestions for how to conduct future public meetings. Suggestions for future public meetings included giving at least 30 days' notice for future meetings, holding meetings in municipal buildings rather than academic institutions, holding meetings in multiple areas or in a more centralized location to allow individuals from across the study area easier access. Some participants expressed that the meeting was too technical and others felt that not enough technical information related to the project was shared. This feedback reflects the diversity of backgrounds in the audience and suggests that in the future there will be a need for public engagement that is targeted to the information needs of different communities.

Appendix A: Background Information Distributed to Workshop Attendees (June 2016)

Appendix B: Workshop Agendas (June 2016)

Appendix C: Coastal Risk Management Strategy (CRMS) Profile Template

Appendix D: Information Package for Meeting Attendees