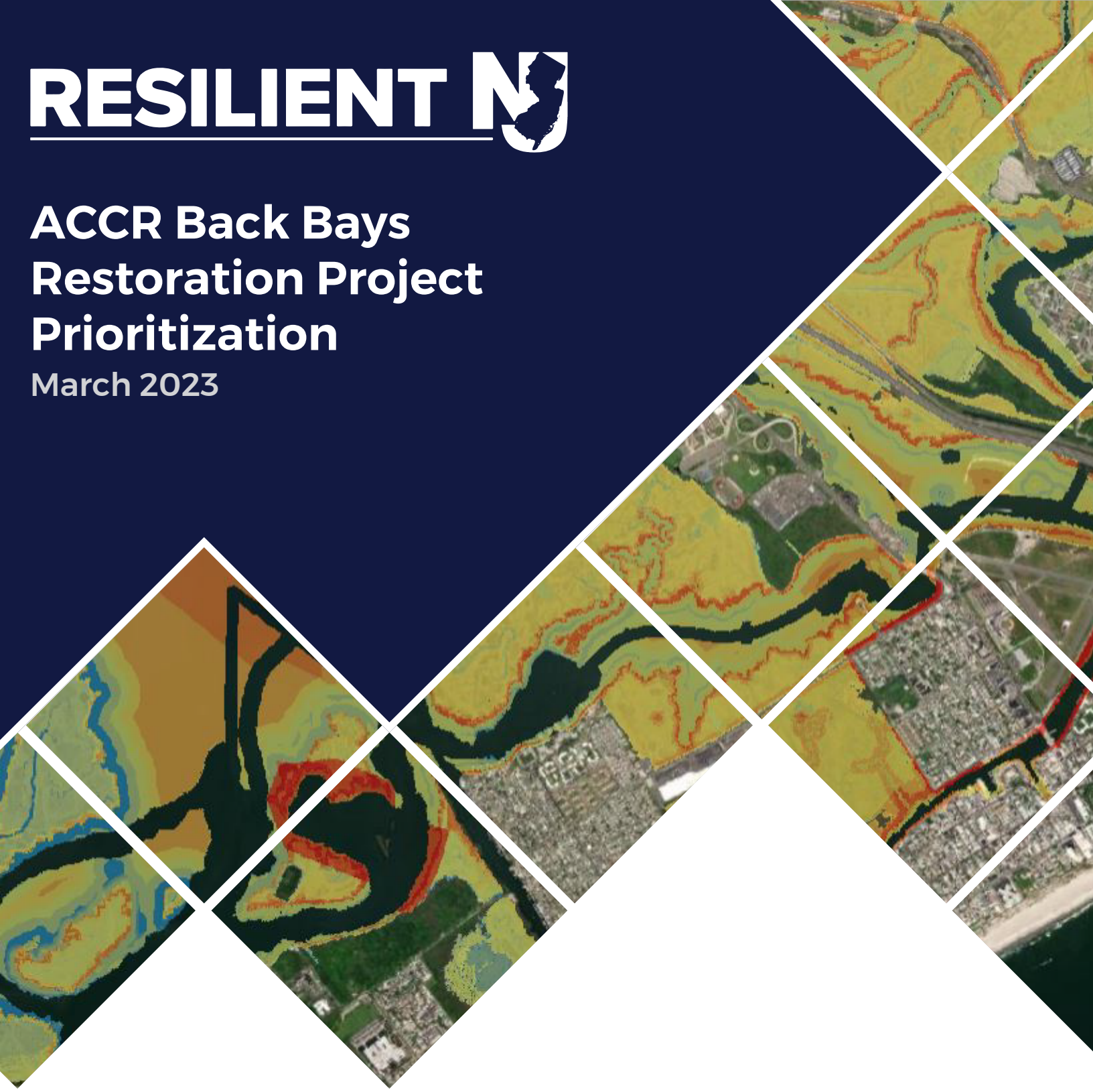
RESILIENT NJ

ACCR Back Bays Restoration Project Prioritization

March 2023



Atlantic County, Atlantic City, Brigantine, Pleasantville, Northfield, Ventnor City, Margate City, Longport, and the American Red Cross

Submitted by:

wsp

ENGENUITY INFRASTRUCTURE

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ACRONYMS AND ABBREVIATIONS

ACCR	Atlantic County Coastal Region
AOI	Area of Influence
DEM	Digital Elevation Model
ESI	Environmental Sensitivity Index
GIS	Geographic Information System
m	meter
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NOAA	National Oceanic and Atmospheric Administration
SVI	Social Vulnerability Index
USACE	United States Army Corps of Engineers

1 OVERVIEW

1.1 Background

New Jersey's Atlantic County Coastal Region (ACCR) back bay tidal marshes provide vital ecosystem services that buffer the surrounding communities and infrastructure from storm surge damage, reduce coastal erosion, help support the local ecotourism and the fishing industries, and contribute to the stability of the infrastructure and natural resources of the region.

With changing climate conditions, these back bay marshes will be subject to prolonged inundation, erosion, and loss from sea level rise, which in turn will diminish the benefits they can provide and result in the eventual loss of critical ecosystem services. The ACCR back bay tidal marshes are critical in mitigating the impacts of storm surges on the communities and properties located along the bay shoreline. As the frequency and severity of coastal storm events increase, the necessity of maintaining the ecological health of the bay will only grow in importance. As such, the long-term condition monitoring and maintenance of the back bay tidal marshes requires coordinated and securely funded intervention that will need public support bolstered through public outreach and education.

Protection of the ACCR back bay tidal marshes will require sustained, comprehensive, and coordinated planning to guide future development along shoreline properties and improve and monitor water quality, wetlands, and wildlife habitat in the ACCR back bays, as well as sustained and adequately resourced intervention.

1.2 Living Bay Master Plan

For the reasons described above, a Living Bay Master Plan is proposed as part of the ACCR Regional Resilience and Adaptation Action Plan (RRAAP). This short-term action would fulfill an environmental/ecological component of the ACCR RRAAP and would benefit the region because it would enhance ecosystem services of the Back Bay tidal wetlands and bring flood protection along the bayside—an area that the ACCR Steering Committee has identified as a key vulnerability.

This plan would provide a framework to establish condition monitoring for inundation, erosion, and loss; create a tool to help to streamline permit reviews for resilience projects; and prioritize future restoration projects in the ACCR back bay tidal wetland areas. The framework would establish frequent condition monitoring, prioritize actions to restore habitats through thin-layer sand deposition in targeted locations and living shoreline improvements, and coordinate uses of resources (dredge sand) and funding. This effort should be developed in partnership with local municipalities and other stakeholders and could be led by a number of different entities, such as The Nature Conservancy, Stockton University, or Rutgers University.

Previous planning efforts focusing on the New Jersey back bay tidal marshes are informative; however, they do not assess all local shoreline segments to clearly identify specific project boundaries where nature-based solutions might be constructed. As a result, this geospatial analysis was funded by a U.S. Department of Housing and Urban Development - Community Development Block Grant - National Disaster Resilience Competition grant administered by New Jersey Department of Environmental Protection (NJDEP) to identify restoration opportunities in the back bay area to complement the Living Bay Master Plan. This Back Bay Restoration Project Prioritization planning exercise (the topic of this report) provides a list of priority areas for future living shoreline projects within the ACCR and recommends areas for using dredged materials to restore dredge holes and eroding marshes. Information from environmental, social, and infrastructure data sets pertaining to coastal resilience

and ecosystem services have been combined and analyzed to determine the results of this analysis, which are described in further detail below.

1.3 Stakeholder Engagement

Stakeholder engagement was an important part of this task because it helped inform and refine the input datasets and the results of the analyses. **Table 1-1** lists the stakeholders who were invited to provide input and feedback during the course of this planning exercise. **Table 1-2** lists the stakeholder meetings, where the overall process, inputs, and results were discussed. Meeting minutes are provided in **Appendix A**.

Table 1-1. Invited Stakeholders

Category	Stakeholders
ACCR Steering Committee	Rutala Associates, Atlantic City, Brigantine, Margate, Atlantic County, Northfield, Longport, Pleasantville, American Red Cross
ACCR Community Advisory Committee	City or Township Engineers: Atlantic City, Pleasantville, Northfield, Linwood, Somers Point, Absecon, Brigantine, Egg Harbor Township
ACCR Technical Advisory Committee	• New Jersey Department of Transportation (NJDOT) Maritime Resources • Forsythe National Wildlife Refuge • New Jersey Coastal Resilience Collaborative • NJDEP Division of Coastal Engineering • NJDEP Bureau of Climate Resilience Planning • United States Army Corps of Engineers (USACE) Philadelphia District • Federal Emergency Management Agency Region II • Stockton College/Stockton Research Center • State Office of Emergency Management • Watershed Coordinator Jacques Cousteau National Estuary • The Nature Conservancy
ACCR Focus Groups	• Atlantic County Utilities Authority • Orsted • EDF/Shell Atlantic Shores Wind
Other Stakeholders Identified for ACCR	• New Jersey Economic Development Authority – Wind Institute / Brownfields and Sustainable Systems • Rutgers University • Stevens Institute of Technology • New Jersey State Police • U.S. Coast Guard

Table 1-2. Stakeholder Meetings

Meeting Date	Purpose
September 13, 2022	Introduce stakeholders to task purpose and process.
October 11, 2022	Review list of proposed data inputs.
October 19, 2022	Review preliminary analysis results.
November 7, 2022	Review revised analysis results.

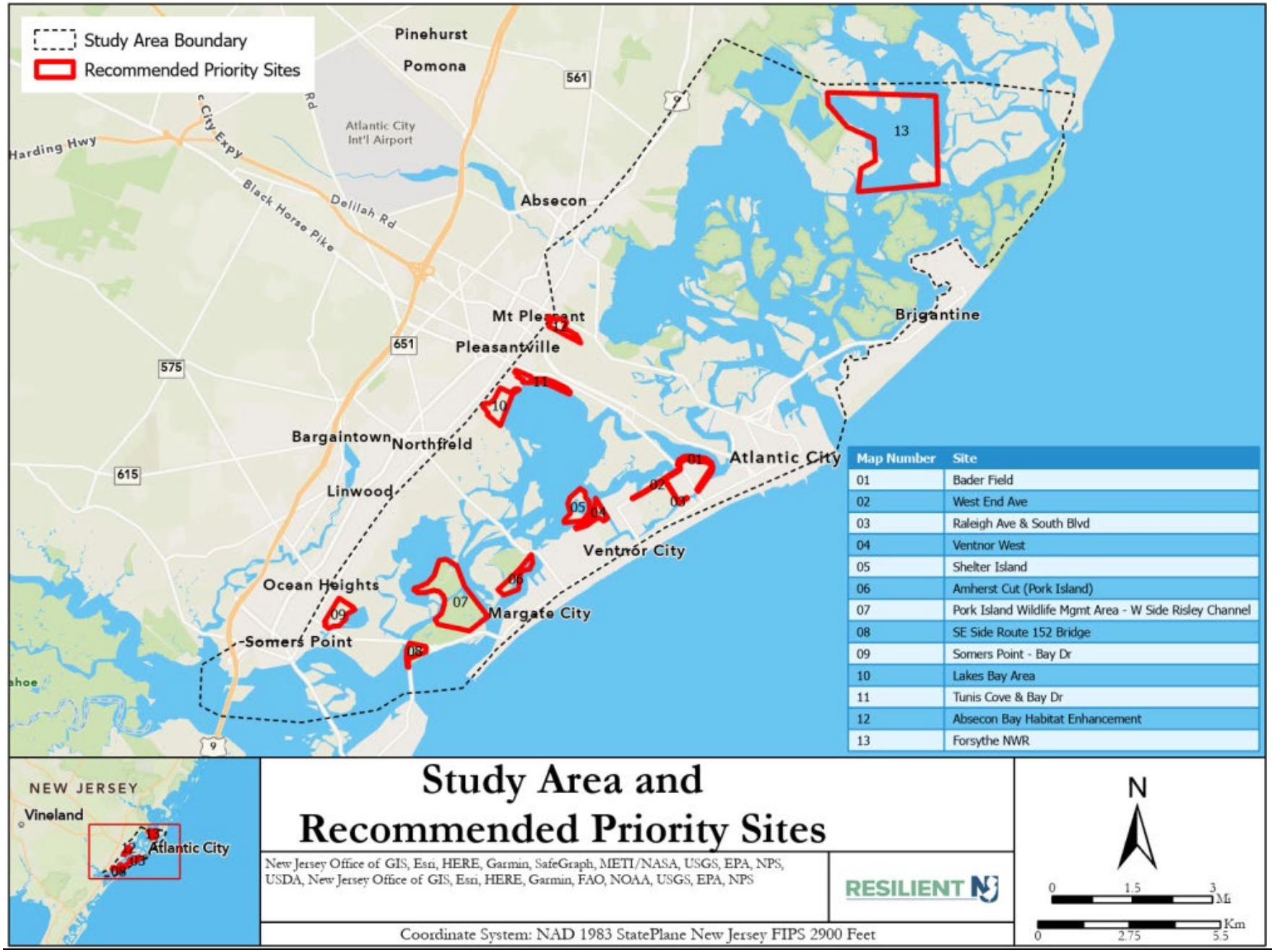
2 GENERAL PROJECT APPROACH

The Consultant Team used a multiple criteria geospatial analysis approach to identify and prioritize restoration opportunities in the ACCR back bays area (**Figure 2-1**). This geospatial analysis effort involved engaging with key stakeholders to maximize the inclusion of existing relevant data and to ensure that the assessment considers factors that are most important to the community.

Leveraging the many available datasets and tools available, the Consultant Team evaluated the estuarine shorelines of the ACCR back bay area and adjacent contiguous areas, using a customized, geographic information system (GIS) analysis to assess the need and prioritize future shoreline restoration/stabilization with living shoreline techniques (e.g., using reefs and/or coastal vegetation to help reduce erosion). The assessment also considered the proximity to dredge material sources, as well as marsh erosion potential, to facilitate future restoration planning and implementation. This planning exercise resulted in a list of priority areas for future living shoreline projects, with some consideration for use of dredged materials in restoring eroding marshes. Factors that determine the results of this analysis were a combination of environmental, social, and infrastructure datasets pertaining to coastal resiliency and ecosystem services.

To provide a comprehensive approach that captured the interests of various stakeholder groups, the Consultant Team conducted several rounds of analysis to allow for stakeholder input and feedback at key milestones to inform and refine the analysis. The first round of analysis emphasized protection of community infrastructure that is most vulnerable to coastal impacts. A second iteration of the analysis focused less on infrastructure and more on ecosystem services of the marshes, with an emphasis on future projects that might provide opportunities for beneficial reuse of dredged materials. Because stakeholder input was considered of such high importance, an additional iteration of the analysis was performed to ensure that community-supported sites were identified in the plan.

Figure 2-1. Back Bays Restoration Project Prioritization Study Area and Recommended Priority Sites



3 METHODS

3.1 Data Gathering

Data gathering efforts built upon the existing Resilient NJ data library and other geospatial data/tools such as The Nature Conservancy's Coastal Resilience tool. **Table 3-1** lists the various data inputs used in the analysis. A more detailed list of data used is provided in **Appendix B**, which includes source information. Only existing data from public sources were used, except for the "Community Identified Sites" dataset generated by the stakeholders.

3.2 Preliminary Data Analysis

This step began with the development of the GIS workflow for the data analysis process, which occurred concurrently with the data acquisition process. Upon completion of the data acquisition and GIS workflow planning, the Consultant Team performed the GIS analysis, with input from Resilient NJ partners and other stakeholders regarding the appropriate relative weighting factors and scoring for each data type. For the preliminary maps, the Consultant Team used input from stakeholders, combined with professional judgement to establish an appropriate weighting system.

Table 3-1. Data Inputs

GIS Layer Name	Description	Notes
Community Identified		
Project Boundaries	Community-supported projects identified by stakeholders	Confirmed by ACCR Regional Coordinator, Jim Rutala
Feasibility Considerations		
USACE Channel Quarter	Navigation channels maintained by USACE districts	
USACE Dredge Location	Dredging locations from the Navigation Data Center	
USACE Placement Areas (from Dredging)	Placement areas from dredging	
TopoBathymetry	High-resolution coastal elevation data	
Marsh		
Likelihood of Shoreline Erosion by 2050	Coastal Ecological Restoration and Adaption Plan Issues of Concern data developed by Rutgers	
Tidal Marsh Classification Digital Elevation Model (DEM)	A classification of tidal marsh vegetation communities of the northeastern United States	DEM Clipped to 1 kilometer of the area of influence (AOI)
Public Access		
Boat Ramp		
Public Access Locations to Tidal Waterways	Point data for public accessibility of the ocean, shore and tidal waterways of New Jersey	
Public Parcels 2022	Parcel poly dataset	Extracted parcels with appropriate property classification
Public Shoreline	Public shorelines derived from parcel data	Source Layers: esil_arc and parcels. Spatial join of public parcels and NOAA ESI shoreline data layer.

GIS Layer Name	Description	Notes
Critical Infrastructure		
Critical Infrastructure	Combined point data for childcare centers, fire stations, gas stations, health care facilities/hospitals, libraries, municipal buildings, nursing home/assisted care facilities, places of worship, police stations, schools, shelter facilities, and coast guard.	
ESI Built Structures 5-meter buffer	Environmental Sensitivity Index (ESI) for Delaware/New Jersey/Pennsylvania collected, mapped, and digitized to provide environmental data for oil spill planning and response	
Marina	NJDOT Office of Maritime Resources Marine Database	
Social Vulnerability		
Major Employer	Point data layer for major employers in proximity to AOI	
Overall Social Vulnerability Index (SVI)	https://svi.cdc.gov/Documents/Data/2018_SVI_Data/SVI2018Documentation.pdf	
Special Use Areas (to Avoid)		
ESI Built Structures 5-meter buffer	Environmental Sensitivity Index (ESI) for Delaware/New Jersey/Pennsylvania collected, mapped, and digitized to provide environmental data for oil spill planning and response	Some shoreline types were used as proxy for some areas to avoid
NJDEP Canals and Water Raceways	Artificial canals and raceways in New Jersey	
NJDOT Channel Boundaries	New Jersey Channel boundaries received as Google Earth file from NJDOT	
Orsted OM Facility	Digitized from pdf obtained from ENGenuity NJ	
Shellfish Leases	Shellfish leasing program within the Atlantic Coast and Delaware Bay regions of New Jersey	
USACE Waterway Network	Layers from the Navigation Data Center	

GIS Layer Name	Description	Notes
Transportation		
Bike Paths	Bike paths in Atlantic County	
Bus Route	Bus route line feature, NJ Transit	
Evacuation Routes – 10-meter buffer		Buffered road centerlines to 10 meters
Passenger Railroad Lines	Passenger railroad lines name, service	
Roads 3-meter	Derived from Atlantic County Roads centerline layer	3-meter buffer of Atlantic Co. roads centerline layer
Transportation Assets	Combined point data for airports/heliports, bridges, bus stops, ferry landings, and train stations	Utilized compiled data layer developed by Consultant Team
Hazardous Materials		
NJEMS Known Contaminated Site	The Known Contaminated Sites List for New Jersey are those sites and properties within the state where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards	
Underground Storage Tank Facility	NJDEP-maintained locations of underground storage tank facilities in New Jersey	
Other Areas to Protect		
Archaeological Site	Centerpoints of grid used	
Areas where Tourism Predominates	This dataset contains the boundaries of areas within Atlantic City where tourism predominates	
Building Footprints	Polygon layer extract of building footprints generated by Microsoft using deep learning	
Historic Properties	Converted parcel data to points	
Natural Heritage Priority Sites in New Jersey	Critically important areas identified to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities	Sites within 1 kilometer of the AOI were used

GIS Layer Name	Description	Notes
Utility Infrastructure	Combined point data for water well, recycling center, sewage pumping station, power plant, electric substation, sewer lift station, wastewater treatment facility	EPA and NJDEP data

3.3 GIS Workflow

Because the purpose of this planning exercise was to identify and score locations within the study area based on certain relevant criteria, the Consultant Team completed a GIS analysis using ArcGIS Pro and its geoprocessing tools. As a first step, the input layers were broken into categories. For each category, a majority of the layers had buffer distance and associated risk scores (0-5) assigned, or the score (0-5) was assigned using other fields in the layer. Buffers were used to generate scores based on the proximity to features of interest. Distances varied by category, with scores for a given location generally higher where features of interest are close to it. For example, higher scores were assigned to locations close to roads and buildings. Each category was converted into a raster (a set of cells arranged in rows and columns), which were added together to get a final risk score raster. In this way, locations that are close to numerous features of interest have the highest scores.

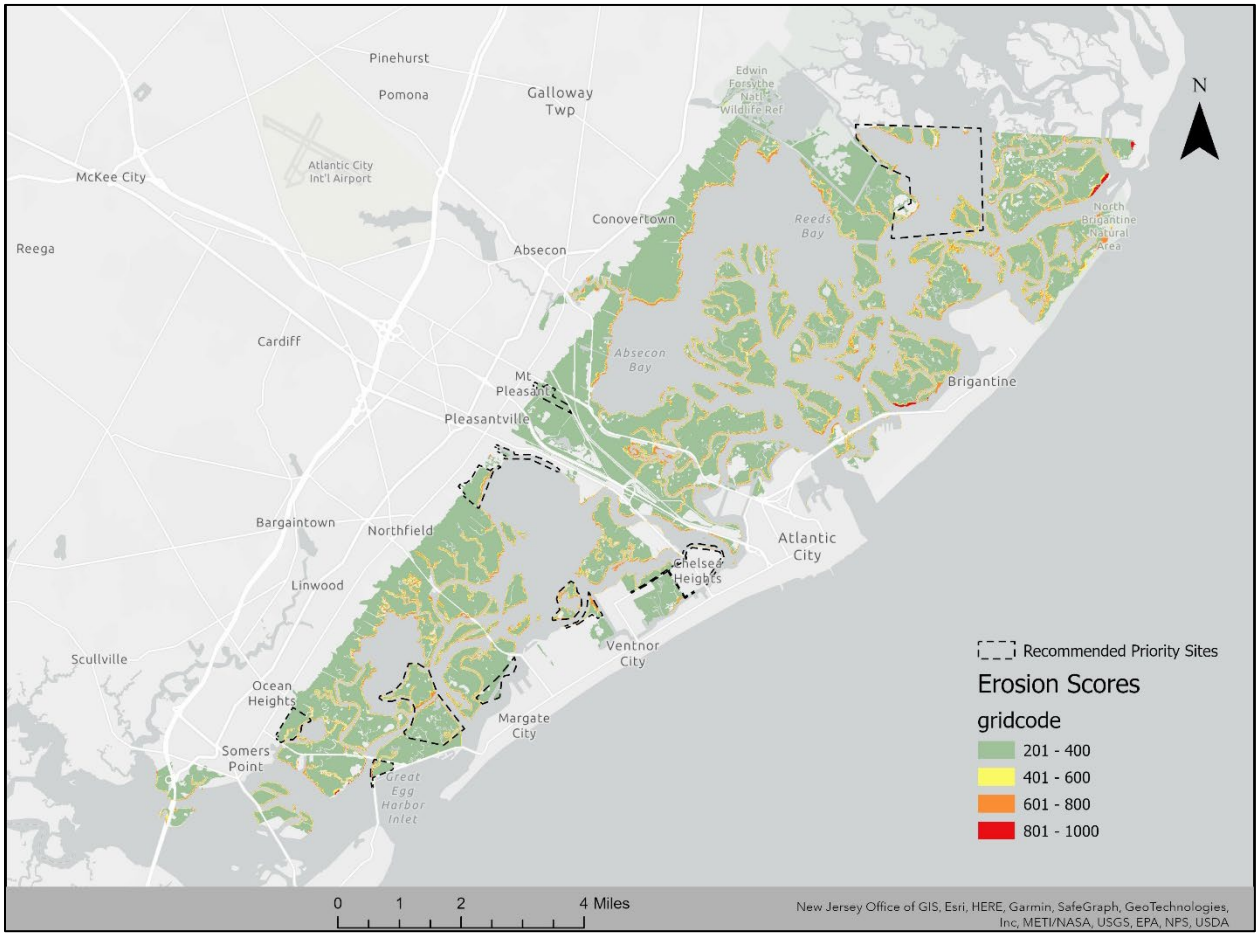
A final raster calculation step was completed to account for layers that received a weight other than 100 percent. The rasters calculated from the final category were multiplied by 10 to yield an integer score between 0 and 1000, rather than a decimal. This step was taken so the scores could be converted to polygons if necessary (which can only be done with integer values in a raster). All resultant category rasters above were added together. The sum raster was multiplied by the special use area raster to get the final scoring raster for the entire study area.

See each category below for details on GIS layers included in each category and accompanying scoring factors. The recommended priority sites are also included in the map series below for reference.

Shoreline Erosion

Shoreline erosion was calculated using the layer "Likelihood of Shoreline Erosion by 2050." The layer already included scoring in a field called gridcode, where a score of 1 was low, 2 was medium, 3 was high, 4 was highest, and no data was 0. For the second and third iterations of the analysis, these scores were used in the reclassified raster for this category, then multiplied by 25 to get scoring from 0 to 100. **Figure 3-1** illustrates the GIS scoring for shoreline erosion after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. Ultimately, this resulted in assigning higher scores to locations that are at a higher risk of erosion.

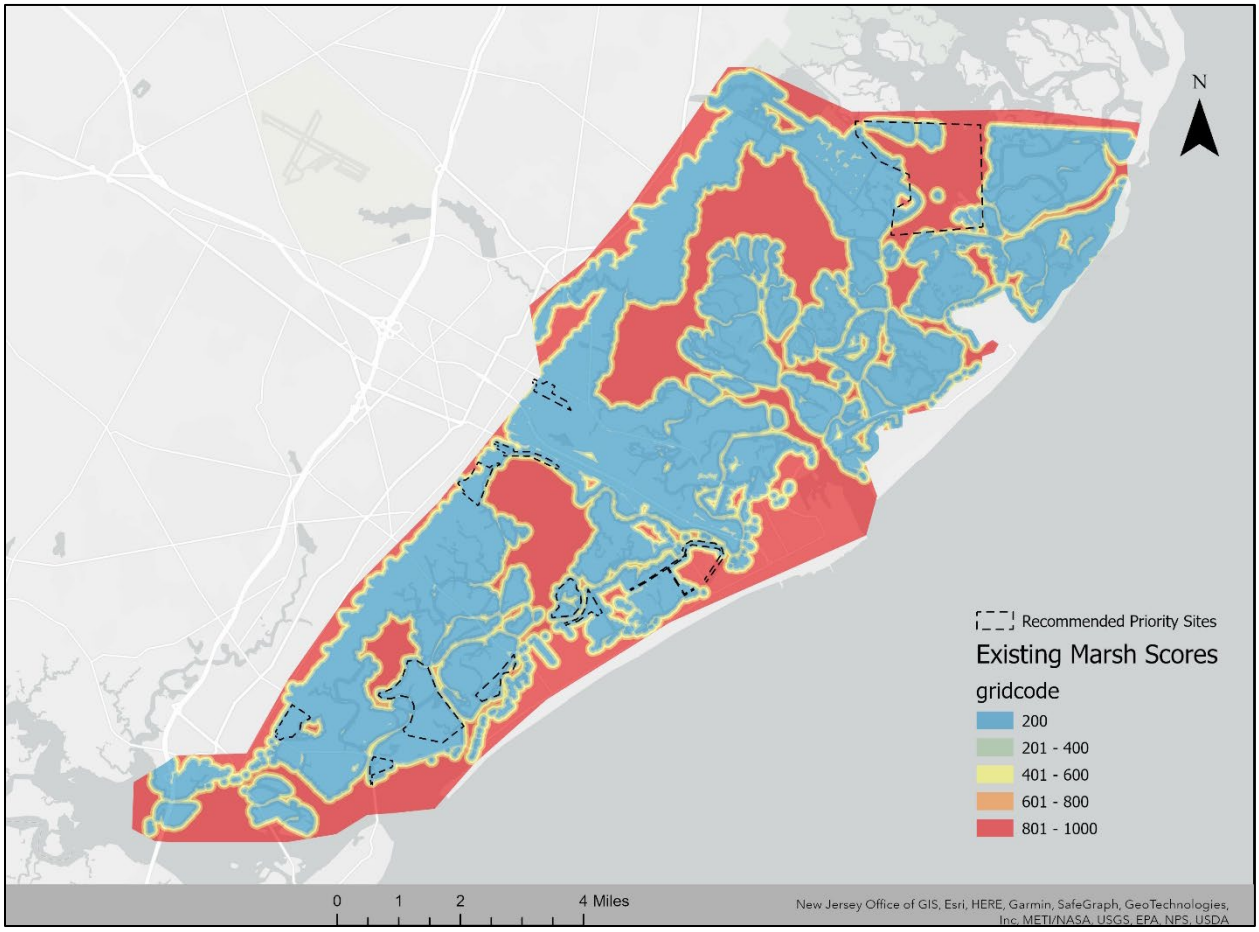
Figure 3-1. GIS Scoring for Shoreline Erosion



Existing Marsh

Existing marsh was calculated using the layer "SHARP Tidal Marsh," extracting the description of High Marsh and Low Marsh only (removing any areas of 200 square feet or less because they erroneously included some upland vegetated areas that were incorrectly categorized as marsh). The marshes were given the following buffers and scoring: 50 meters (m)=1, 100 m=2, 150 m=3, 200 m=4, and over 200 m=5. The buffer layer was converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. For the second and third iterations of the analysis, the raster was multiplied by 20 to get scoring from 0 to 100. **Figure 3-2** illustrates the GIS scoring for existing marsh after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are devoid of marsh (and do not have marsh nearby).

Figure 3-2. GIS Scoring for Existing Marsh



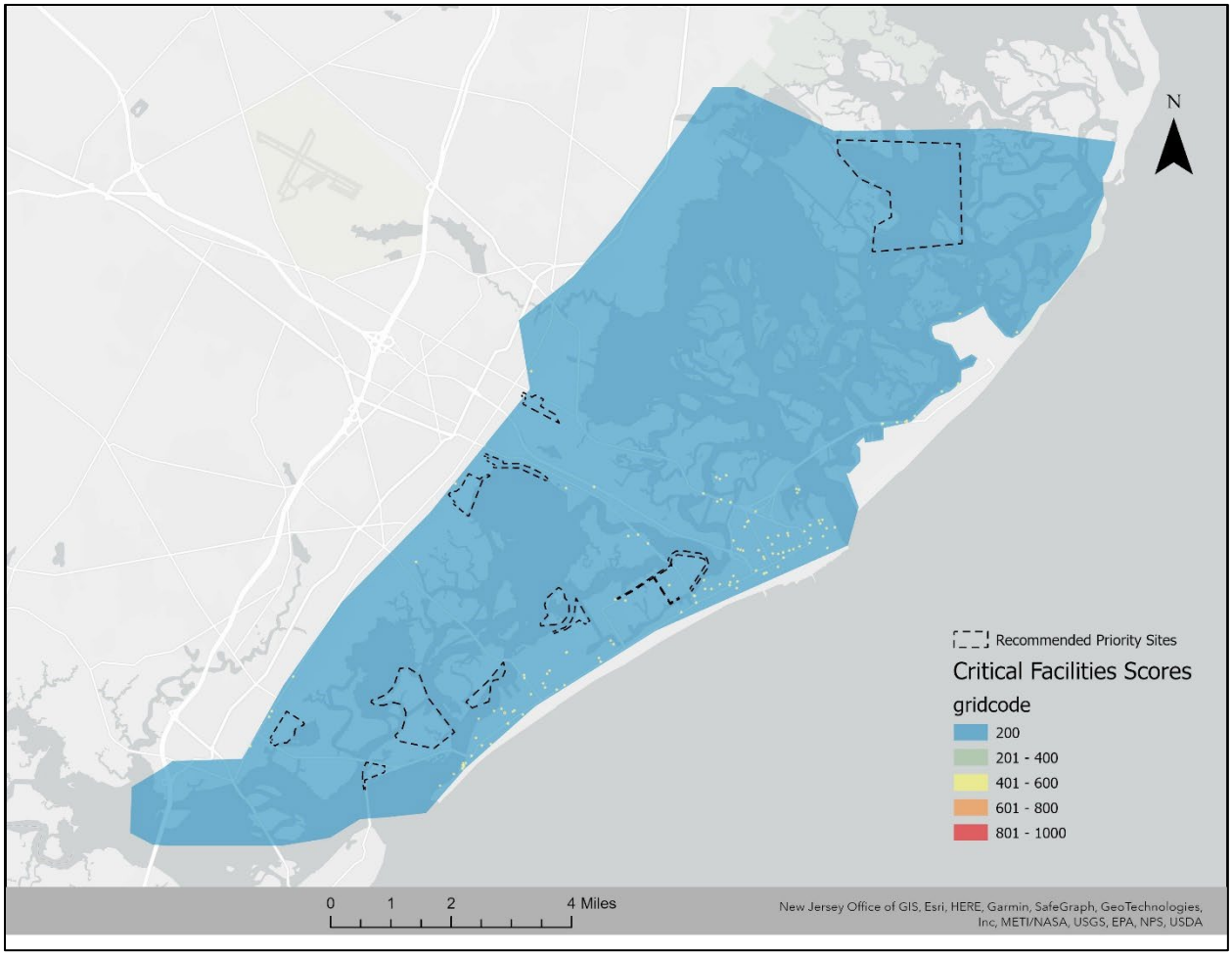
Critical Facilities

Critical facilities were calculated using the following layers:

- Critical Infrastructure
- Utility Infrastructure

Each facility was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because more than one layer is present in this category, these reclassified rasters were summed using a raster calculation (scores 1-10). For the second and third iterations of the analysis, the raster was multiplied by 10 to get scoring from 0 to 100. **Figure 3-3** illustrates the GIS scoring for critical facilities after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are close to critical infrastructure.

Figure 3-3. GIS Scoring for Critical Facilities



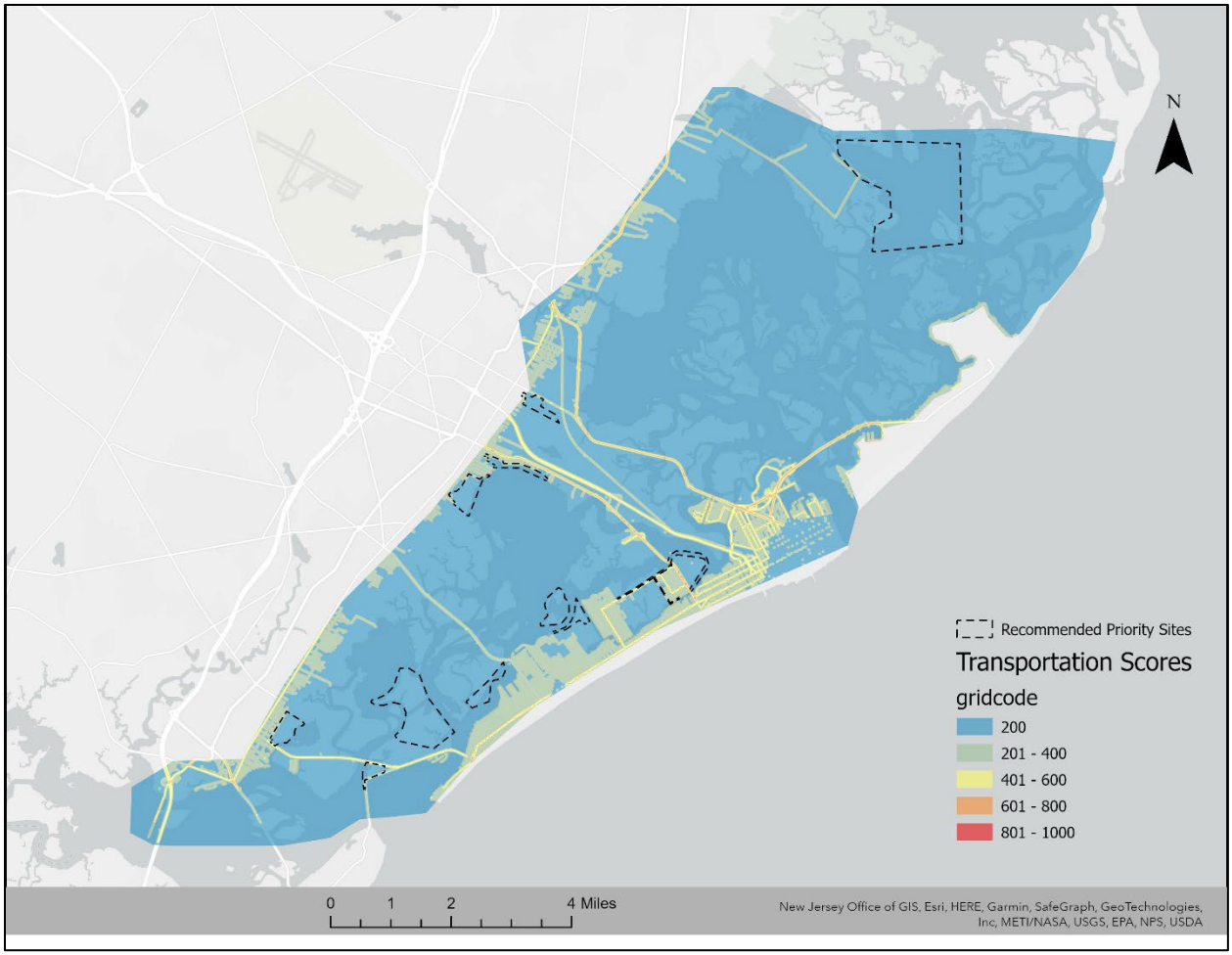
Transportation

Transportation was calculated using the following layers:

- Transportation assets
- Passenger railroad
- Bus routes
- Bike paths
- Roads polygon - Road centerlines with a 3m buffer dissolved with Evacuation routes polyline with a 10-m buffer

Each facility was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these reclassified rasters were summed using a raster calculation (scores 0-25). For the second and third iterations of the analysis, the raster was multiplied by 4 to get scoring from 0 to 100. **Figure 3-4** illustrates the GIS scoring for transportation after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are close to transportation infrastructure.

Figure 3-4. GIS Scoring for Transportation



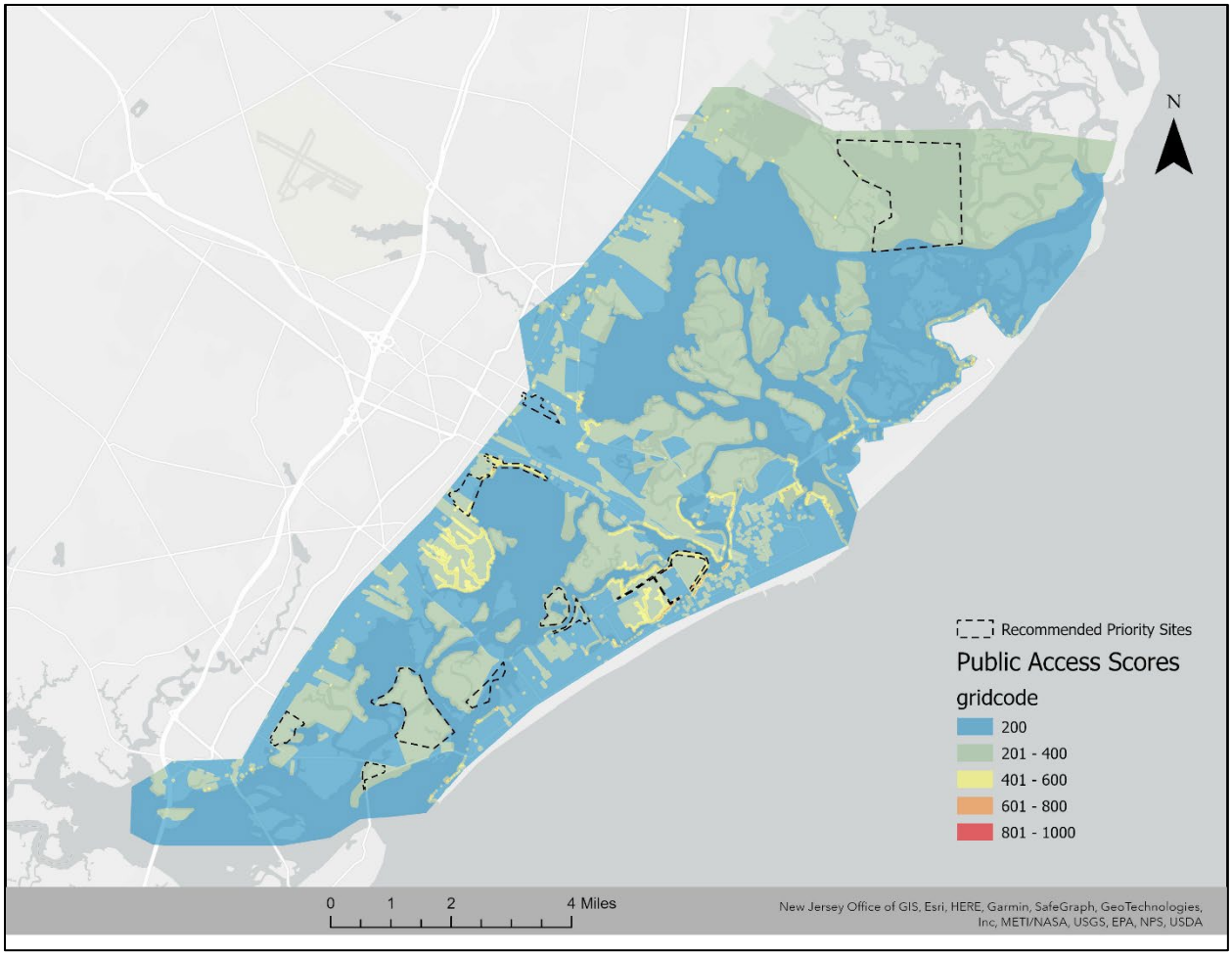
Public Parcels and Access Points

The public access category includes the following layers:

- Public parcels
- Boat Ramps
- Public Access to Waterways
- Public Shoreline

Each layer was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these reclassified rasters were summed using a raster calculation (scores 0-20). For the second and third iterations of the analysis, the raster was multiplied by 5 to get scoring from 0 to 100. **Figure 3-5** illustrates the GIS scoring for public parcels and access points after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are close to public access points.

Figure 3-5. GIS Scoring for Public Access



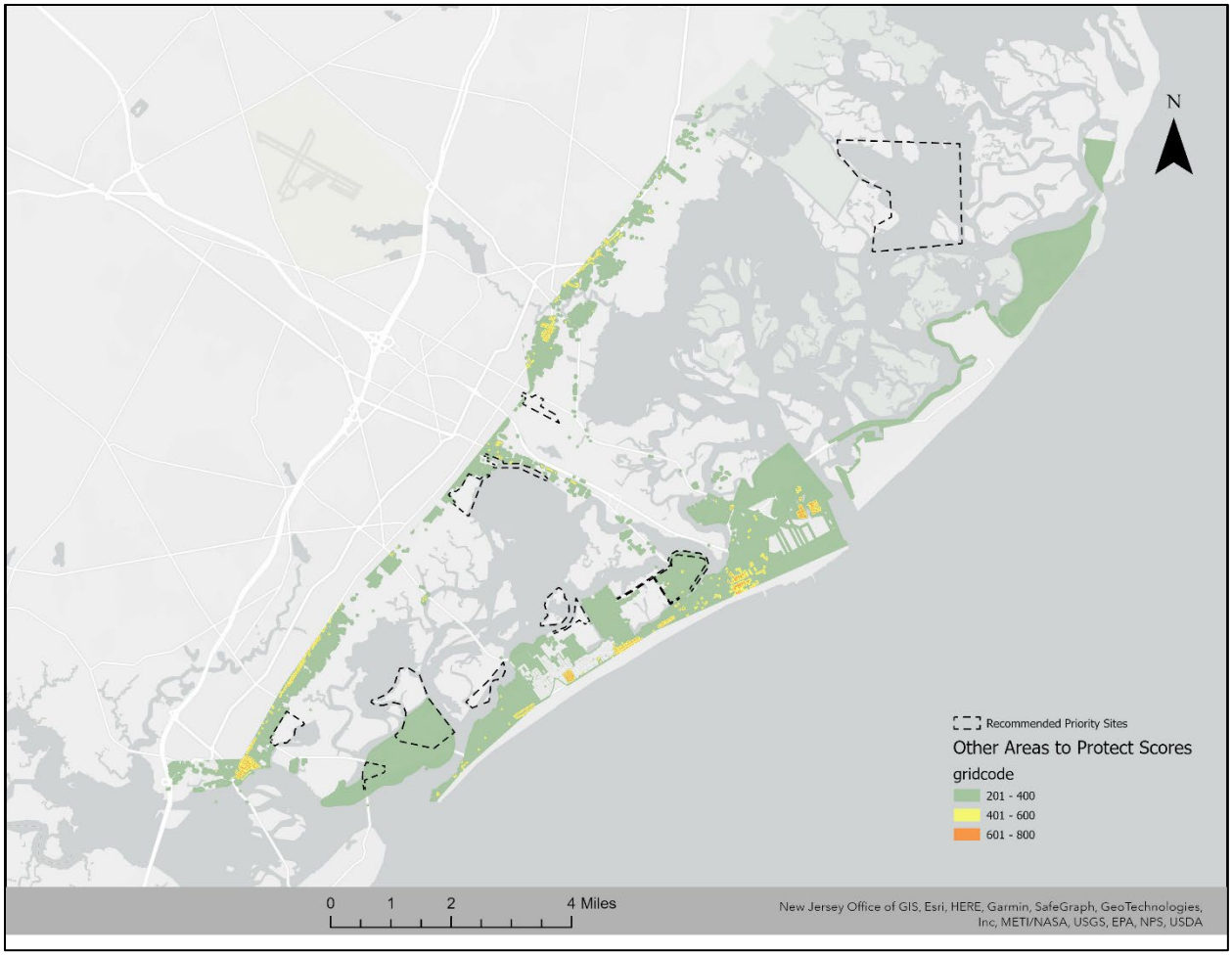
Other Areas to Protect

The other areas to protect category includes the following layers:

- Archaeological Sites
- Historic Properties
- Building Footprints (weighted 50 percent)
- National Historic Properties for New Jersey (weighted 10 percent)
- Tourism Trade Area (weighted 10 percent)

Each layer was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these reclassified rasters were summed using a raster calculation; however, the layers with a weight were multiplied by this factor before the addition process (resulting in scores from 0 to 13.5). For the second and third iterations of the analysis, the raster was multiplied by 7 to get scoring from 0 to 100. **Figure 3-6** illustrates the GIS scoring for other areas to protect after the final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are close to other features of importance.

Figure 3-6. GIS Scoring for Other Areas to Protect



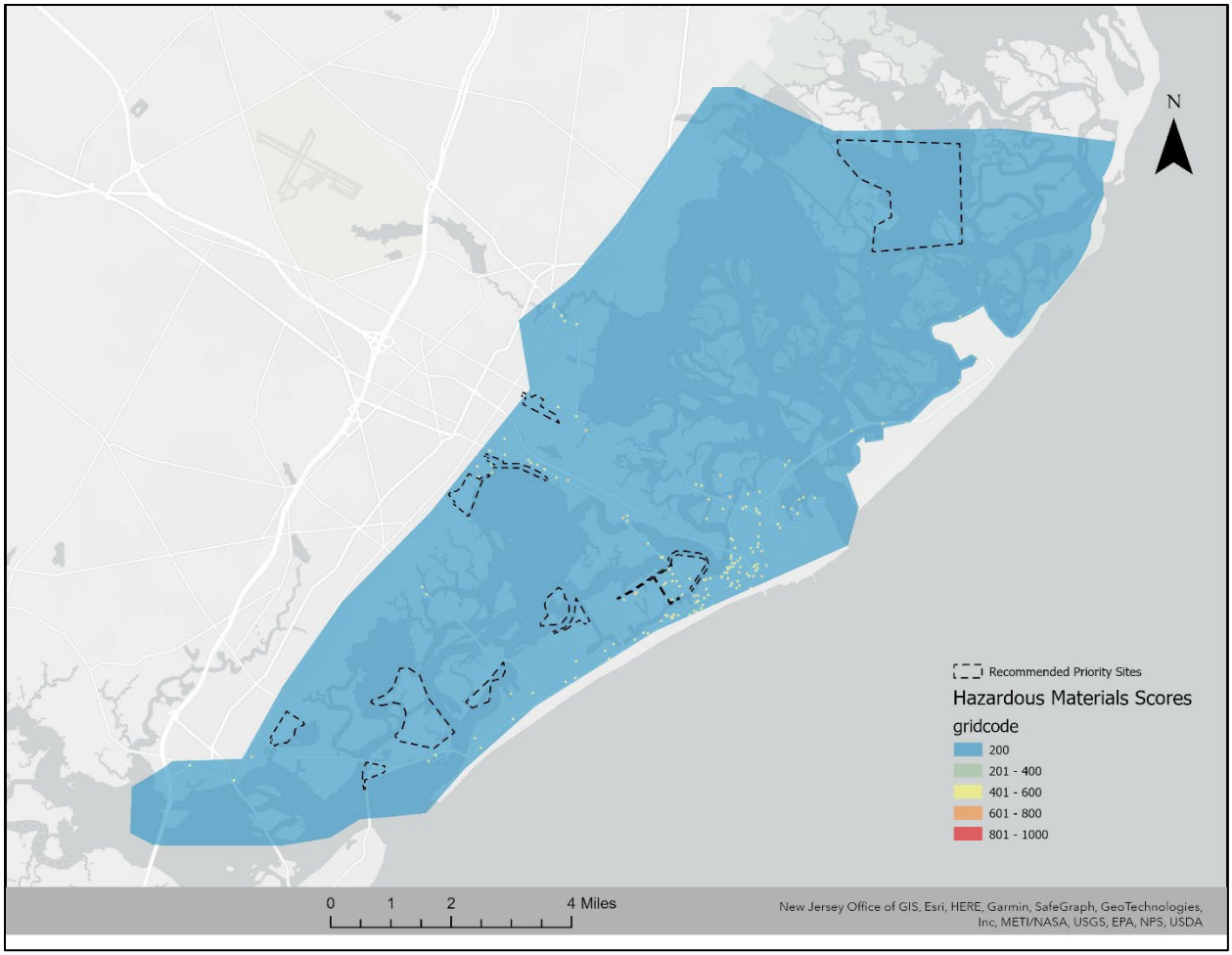
Hazardous Materials

The hazardous materials category includes the following layers:

- Contaminated Sites
- Underground Tanks

Each layer was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these reclassified rasters were summed using a raster calculation (scores 0-10). For the second and third iterations of the analysis, the raster was multiplied by 10 to get scoring from 0 to 100. **Figure 3-7** illustrates the GIS scoring for hazardous materials after the final raster calculation step was completed, resulting in a final possible scoring range of 0 to 1000. As a result, this process assigned higher scores to locations that are close to hazardous materials that could potentially find their way into surface waters.

Figure 3-7. GIS Scoring for Hazardous Materials



Feasibility Considerations

The feasibility considerations category includes the following layers:

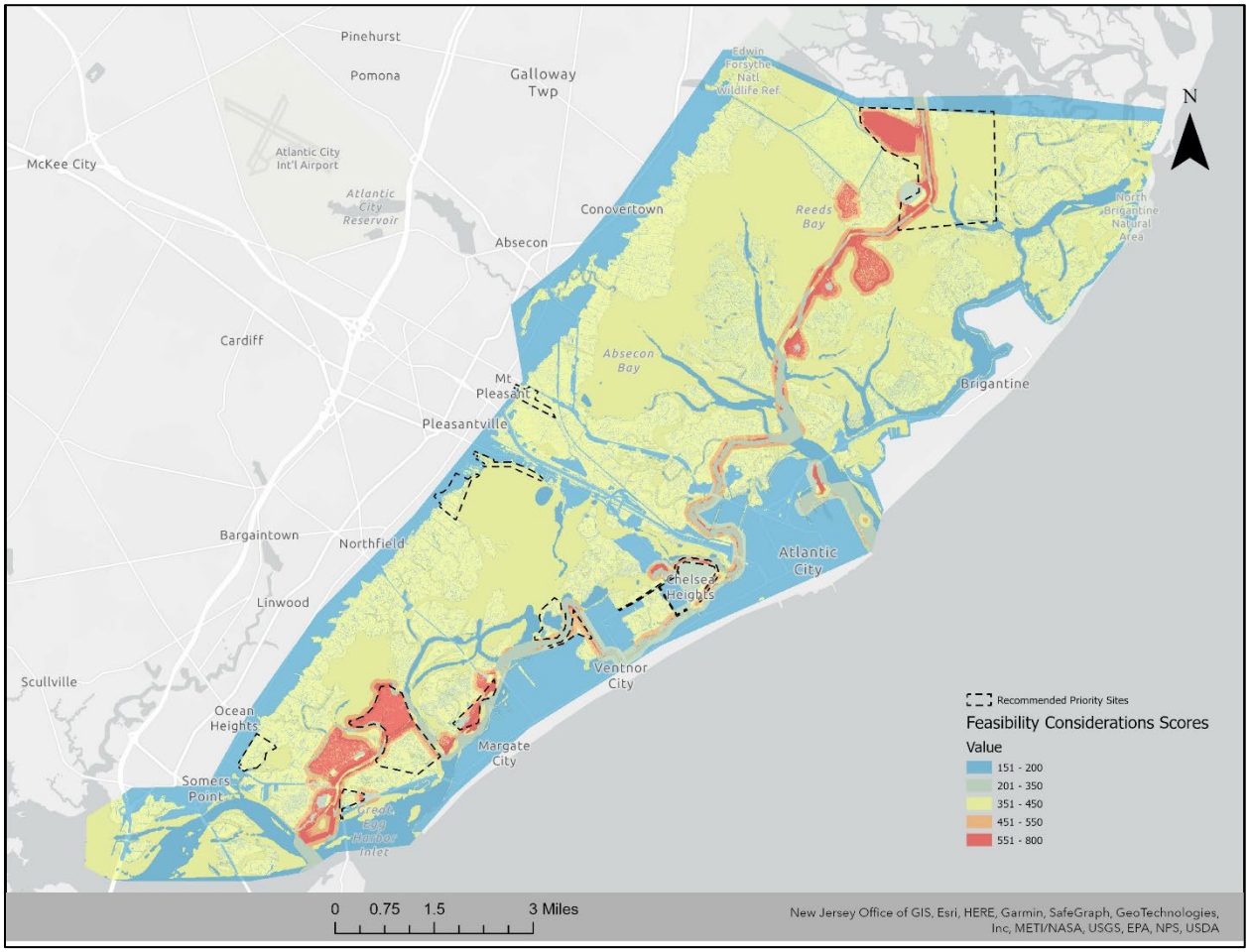
- Slope percentage from TopoBathymetry
- USACE Dredge Locations
- Channel Quarters
- Placement Areas from Dredging

From the bathymetry raster, elevations of 2 m and below were extracted, including negative values that show up for areas under water. The slope tool was used to get the percent slope for each cell of the raster. This percent slope raster was reclassified using the following scoring: 0–5 percent=5, 5–10 percent=4, 10–15 percent=3, 15–20 percent=2, and over 20 percent=1.

The dredging layers were given the following buffers and scoring: 50 m=5, 100 m=4, 150 m=3, 200 m=2, and over 200 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these reclassified dredged and slope rasters were summed using a raster calculation (scores 0-20). For the second and third iterations of the analysis, the raster was multiplied by 5 to get scoring from 0 to 100. **Figure 3-8** illustrates the GIS scoring for feasibility considerations after the final raster calculation step was

completed, resulting in a final possible scoring range of 0 to 1000. As a result, assigned higher scores to locations with a relatively less complicated physical path for construction.

Figure 3-8. GIS Scoring for Feasibility Considerations



Social Vulnerability

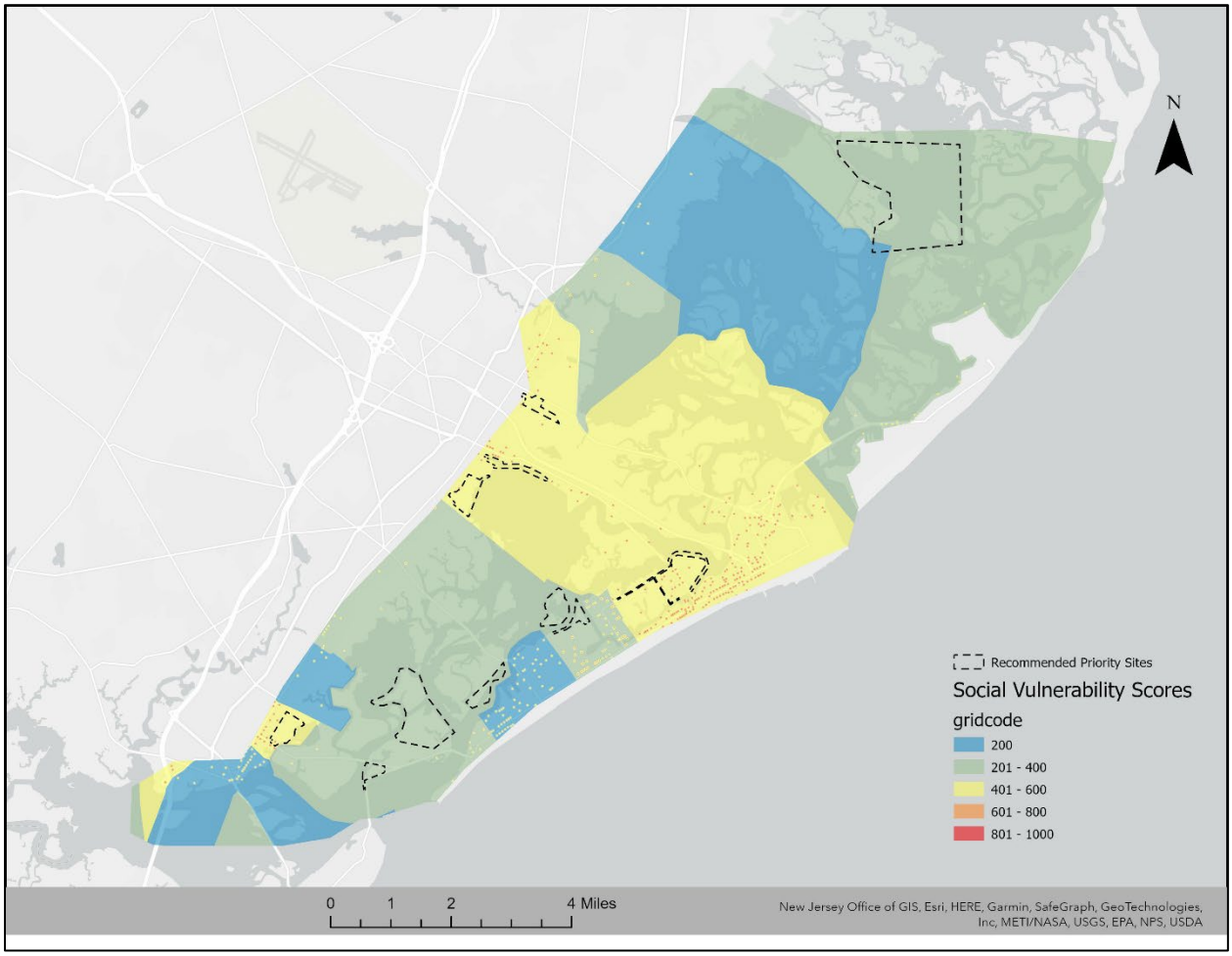
The social vulnerability category includes the following layers:

- Overall SVI by Tract
- Major Employer

From the SVI polygon layer, the "RPL_THEMES" field was used to score the top quarter with a 4, all the way to the bottom quarter with a 1. This data field was used because it is a compilation of numerous social vulnerability factors, including socioeconomic status, household composition and disability, minority status and language, and housing type and transportation. The major employer layer was given the following buffers and scoring: 10 m=5, 20 m=4, 30 m=3, 40 m=2, and over 40 m=1. The buffer layers were converted to raster and reclassified to the 1-5 scoring using the study area as its full extent. Because this category includes more than one layer, these rasters were summed using a raster calculation (scores 0-10). For the second and third iterations of the analysis, the raster was multiplied by 10 to get scoring from 0 to 100. **Figure 3-9** illustrates the GIS scoring for social vulnerability after the

final raster calculation step was completed, resulting in a final scoring range of 0 to 1000. As a result, this process assigned higher scores to areas with higher social vulnerability.

Figure 3-9. GIS Scoring for Social Vulnerability



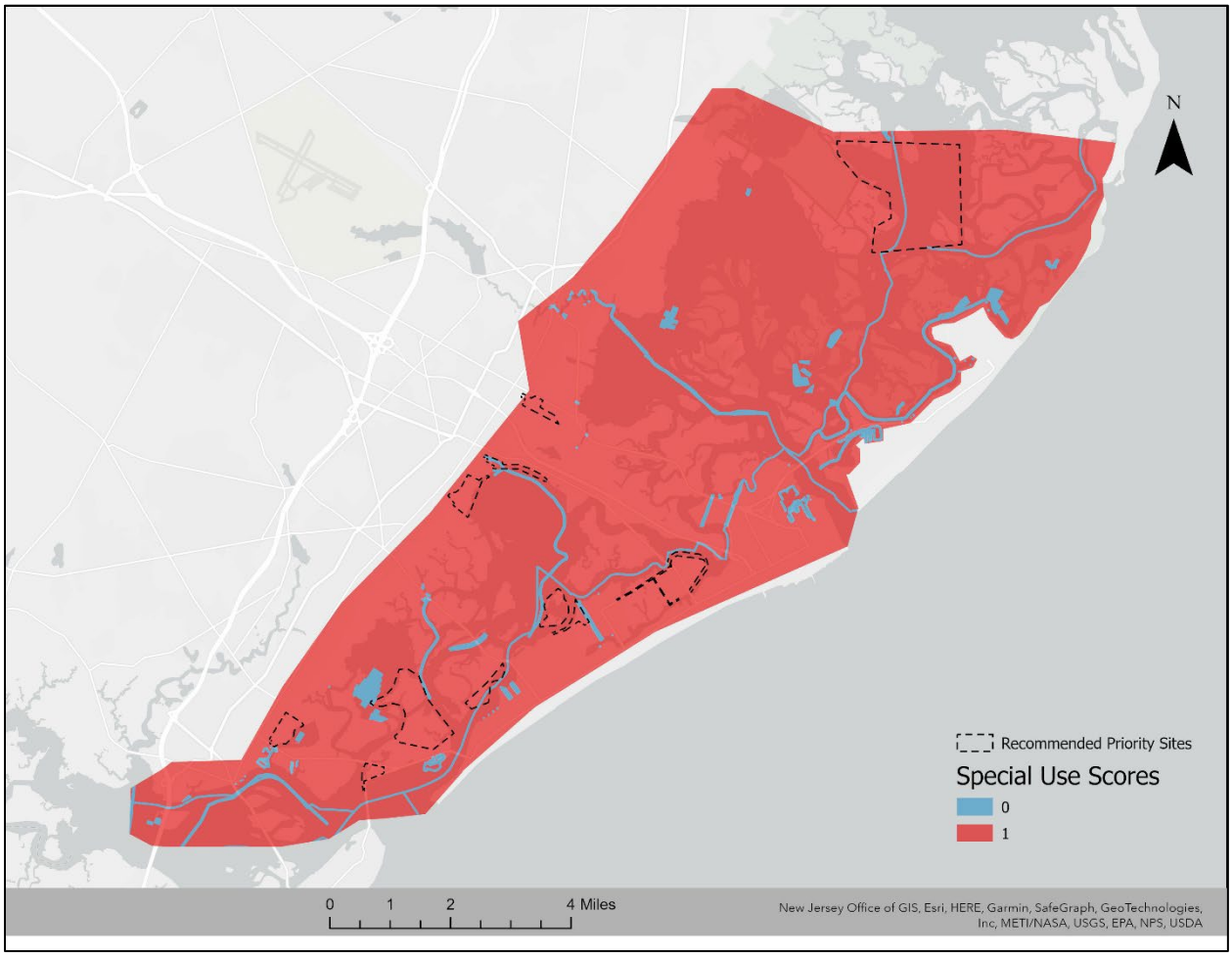
Special Use Area

The special use area category was different because it serves as an exclusionary category (i.e., areas to avoid), rather than a category that is included in the score addition. This category includes the following layers:

- NOAA ESI Lines with 5m buffer (8B category only)
- Marinas
- Canals and Raceways
- Waterway Network
- Orsted Operations and Maintenance Facility
- Shellfish Leases
- Channel Boundaries

Each layer was given the following buffer and scoring: 30 m=0 and over 30 m=1. The buffer layers were converted to raster and reclassified to the 0-1 scoring using the study area as its full extent. Because this category includes more than one layer, the minimum per cell of all rasters was found using raster statistics because those areas of the rasters with a 0 score are most important to keep, since this minimum raster will be multiplied by the final score raster, excluding the special use areas from the results (see **Figure 3-10**).

Figure 3-10. GIS Scores for Special Use Areas



Weighting System

For the three iterations of analysis, varying emphasis on different datasets was achieved by applying the weighting system detailed in **Table 3-2**.

Table 3-2. Back Bays Restoration Project Prioritization Weighting System

GIS Layer	Iteration 1 - Resilience-Focused Analysis	Iteration 2 – Habitat Restoration-Focused Analysis	Iteration 3 – Community Input Analysis
Shoreline Erosion	1	25	1
Existing Marsh	1	20	1
Critical Facilities	1	10	1
Transportation	1	4	1
Public Parcels and Access Points	1	5	1
Other Areas to Protect	1	7	1
Hazardous Materials	1	10	1
Feasibility Considerations	1	5	1
Social Vulnerability	1	10	1
Community Identified Sites	0	0	1

Only shoreline areas of this final raster needed to be clipped for the final analysis. To create a polygon shape of the "shoreline area," the bathymetry raster was used. The elevation range from -2 m to 1 m was extracted and converted to a polygon layer. Any small (less than 10, 000 m^2) and isolated area was removed from this polygon layer. In addition, any ocean beach area was removed. This resulted in a "shoreline polygon" to which the final scoring raster could be clipped.

Priority Sites Analysis

From the final shoreline rasters, area with the highest scores were identified by creating polygons surrounding groupings of high-scoring cells. The outputs for the three iterations of analysis are shown in **Figures 3-11 through 3-13**.

Figure 3-11. GIS Scores for Iteration 1 – Resilience-Focused Analysis

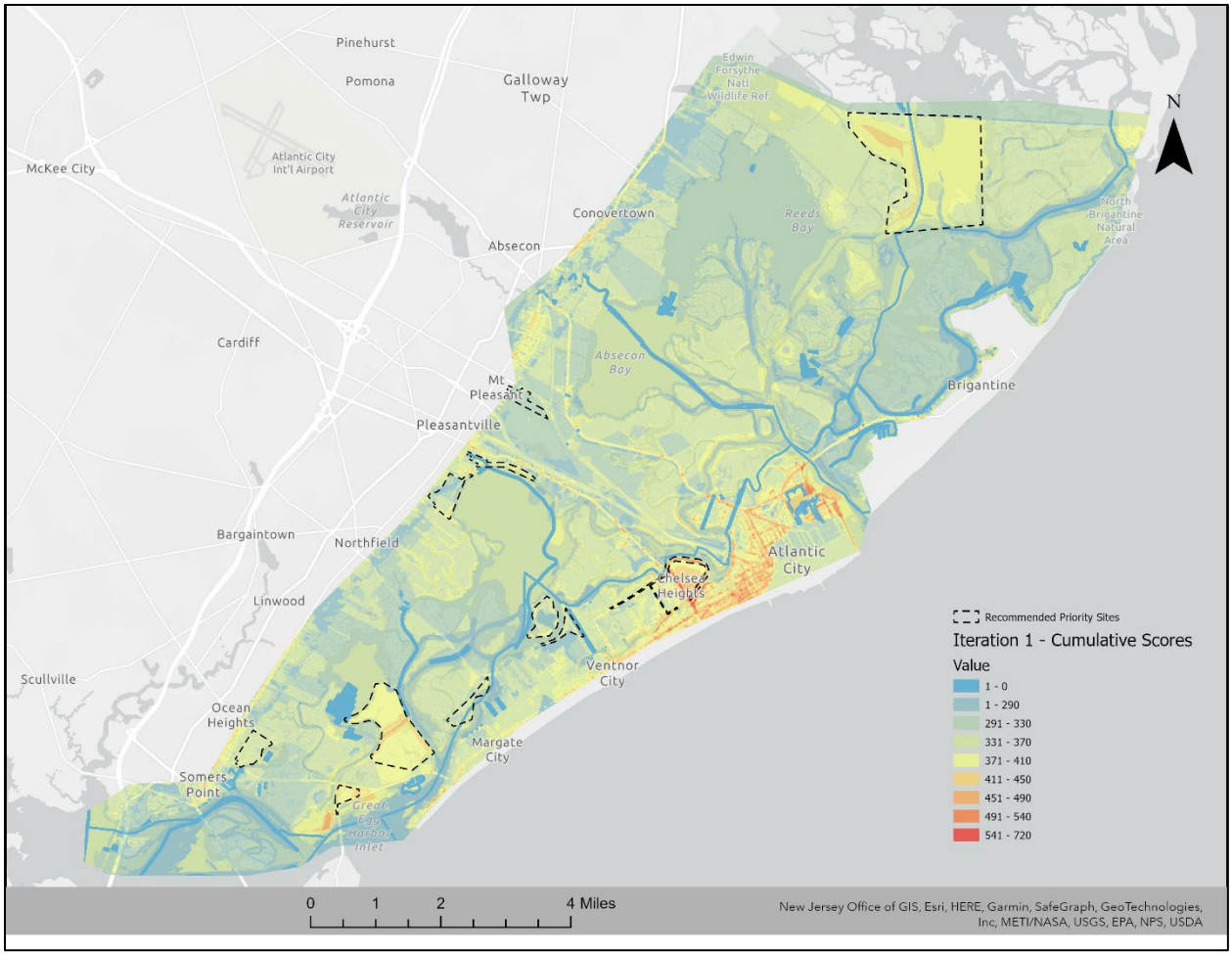


Figure 3-12. GIS Scores for Iteration 2 - Habitat Restoration-Focused Analysis

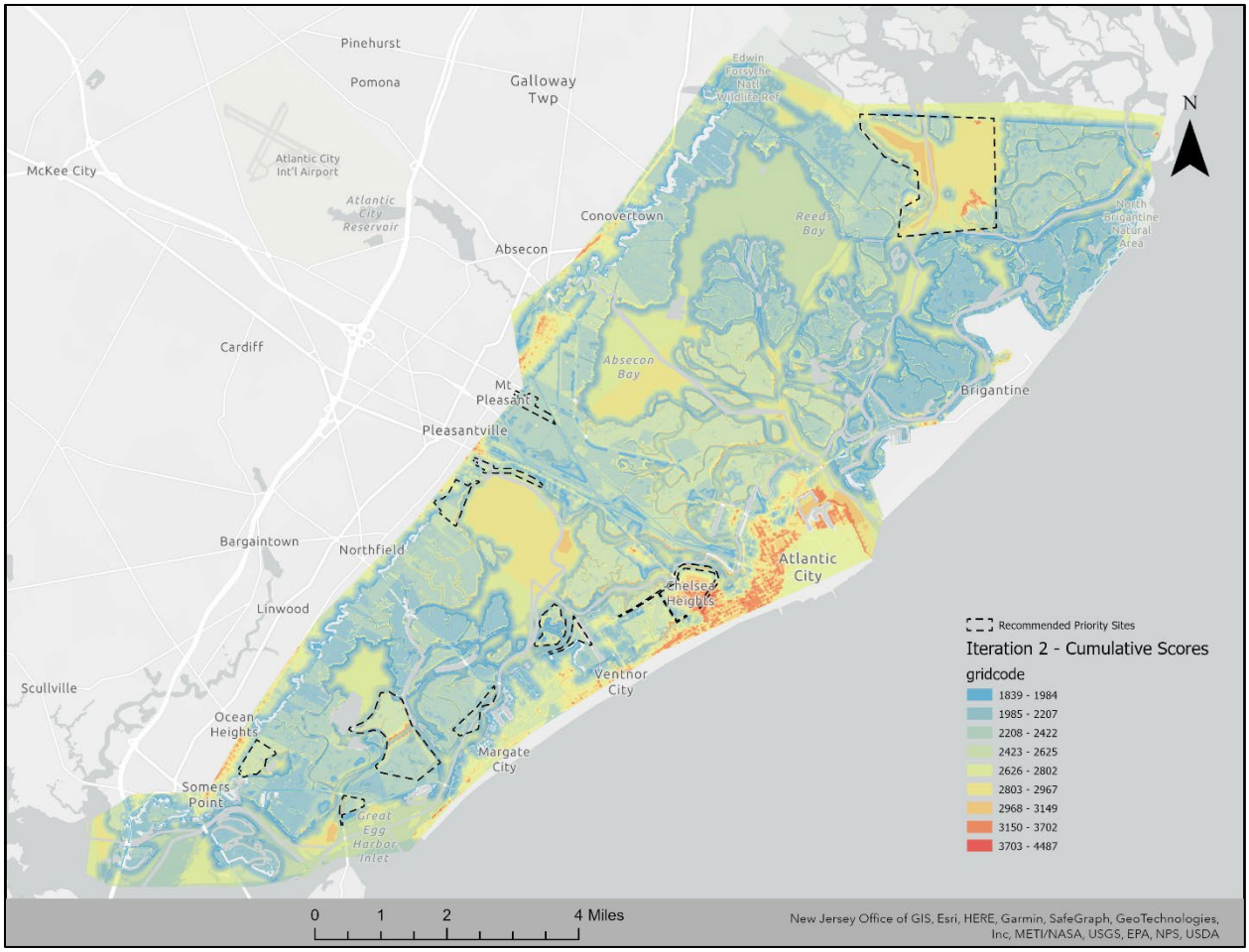
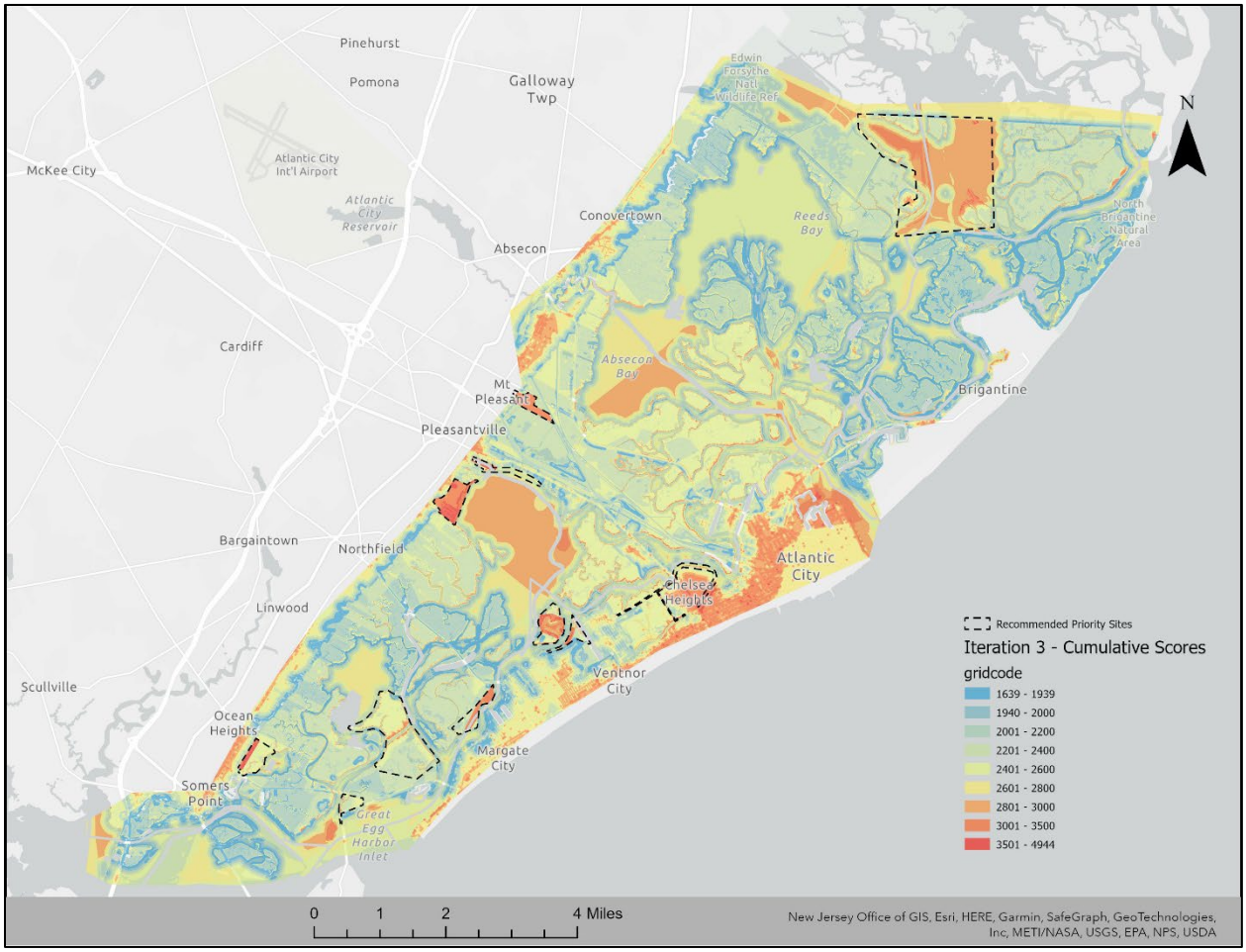


Figure 3-13. GIS Scores for Iteration 3 - Community Input Analysis



After additional manual review and analysis of all potential priority sites from the three iterations, 13 top priority sites were selected (see **Figure 2-1** for an overview map of these sites, as well as individual maps on the fact sheets in **Appendix C**). This last step in the analysis was more subjective than the previous steps and relied on the professional judgement of the Consultant Team to review the larger groups of high-scoring raster cells to select those areas with high potential for restoration activities and areas of superior community support.

4 RESULTS

4.1 Resilience Focused Analysis

The initial analysis used a weighting system (Iteration 1 as described above) that emphasized protection of community assets and infrastructure. This approach combined all scores within each category, such that areas with more nearshore assets would get higher scores. However, because there are more datasets pertaining to community resilience than habitat restoration need/feasibility, the effect of the scoring for habitat restoration factors had a very low impact on the final score.

4.2 Habitat Restoration Focused Analysis

Another iteration of analysis used a weighting system (Iteration 2 as described above) that more equally balanced protection of community infrastructure with habitat restoration. The results of this analysis identified several other potential priority locations.

4.3 Community Input Analysis

During the stakeholder meetings and interviews, it became clear that local communities had already identified some project locations as priority sites in the back bays area. At these sites (listed below), preliminary efforts have already been made toward project development and solicitation of funding. Iteration 3 of the analysis incorporated these community-identified project locations.

- Amherst Cut
- Absecon Bay (west side) South of Delilah Road
- Bay Avenue in Somers Point
- Lakes Bay Area
- Shelter Island
- Ventnor West
- Raleigh Avenue and South Boulevard – Chelsea Heights
- Tunis Cove

Other notable areas mentioned, but not specifically shown as priority project sites in this analysis are:

- Black Horse Pike Elevation and Adjacent Shoreline: Elevation and protection of Route 40 going into Atlantic City
    - Bulkheads will be built around the intersection of West Avenue and Albany Avenue.
    - There are sections of Egg Harbor Township and Pleasantville, where the bulkheads do not exist and there is no protection.
    - A gabion wall is along the bay area that ended in Egg Harbor Township. Going into Pleasantville, bulkheads need to be repaired or raised.
- Brigantine:
    - Brigantine has completed a lot of home elevation projects, but the island is still exposed on the back bay area. There are many opportunities for shoreline enhancement with living shoreline techniques, but these will likely need to be implemented as small-scale projects because the shoreline is composed primarily of private residences on small lots.

5 RECOMMENDATIONS TO FACILITATE IMPLEMENTATION

Based on the scorings of the GIS analysis, the identified priority sites should be further defined and described to facilitate advancement and implementation of project ideas. **Table 5-1** lists the priority sites and characterizes the relative focus and likely project type for each site. This information can be helpful in determining which funding sources might be most appropriate for project development and implementation of a restoration activities at each site. **Appendix C** provides a brief summary of each of the top tier selected priority sites. These narratives are intended to convey basic information about each site and can be used to aid in development of future grant applications.

Table 5-1. Priority Project Sites for Living Shorelines and Marsh Restoration in the ACCR Back Bays Area

Site Name	Project Type	Infrastructure Protection	Social Vulnerability	Habitat Benefits	Community Identified	High Beneficial Reuse Potential	Construction Feasibility
Tunis Cove & Bay Drive, Pleasantville and Egg Harbor Township	Living shoreline	High	High	Medium	**X**		High
Shelter Island, Ventnor City	Dredge hole/marsh replacement	Medium	Low	High	**X**	**X**	High
Ventnor West, Ventnor City	Marsh enhancement	Medium	Low	High	**X**		High
Amherst Cut, Egg Harbor Township	Dredge hole/marsh replacement	Low	Low	High	**X**	**X**	High
West End Avenue, Ventnor City and Atlantic City	Living shoreline below bulkhead	High	High	Low	**X**		Medium
South Boulevard and Raleigh Avenue, Atlantic City	Living shoreline below bulkhead (South Boulevard) and vegetated berm (Raleigh Avenue)	High	High	Low	**X**		Low
Southeast side of Route 152 Bridge, Egg Harbor Township	Marsh enhancement	Medium	Low	Medium		**X**	High
Pork Island Wildlife Management Area - West side of Risley Channel, Egg Harbor Township	Marsh enhancement	Low	Low	Medium		**X**	High

Site Name	Project Type	Infrastructure Protection	Social Vulnerability	Habitat Benefits	Community Identified	High Beneficial Reuse Potential	Construction Feasibility
East Delilah Road (Absecon Bay Habitat Restoration Project), Pleasantville	Marsh enhancement	Medium	High	Medium	**X**	**X**	High
Forsythe National Wildlife Refuge Wetlands, Galloway Township	Marsh enhancement	Low	Low	High		**X**	Medium
Bader Field, Atlantic City	Living shoreline	High	High	Medium			High
Bay Avenue at Somers Point, Somers Point and Egg Harbor Township	Vegetated berm and marsh enhancement	High	High	Low	**X**		Medium
Lakes Bay Area, Pleasantville	Marsh enhancement	Medium	High	Medium	**X**	**X**	High

Source: GIS analysis conducted by WSP combined with stakeholder input.

Appendix A – Meeting Minutes

Resilient NJ – September 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: October 3, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – September 2022 – Back Bay Project Prioritization Meeting

A meeting was held September 13, 2022 at 11:00 AM with the ACCR stakeholders and members of the Consultant Team. The meeting was held via Zoom. The following were in attendance:

Name	Organization	Email
Kathleen Evans	WSP	katie.evans@wsp.com
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net
Ranae Fehr	Atlantic County	fehr_renae@aclink.org
Frances Brown	Atlantic County	Brown_frances@aclink.org
Jacques Howard	Atlantic City	jhoward@acnj.gov
Bruce Funk	Longport	zoning@longport-nj.us
Jordan Rizzo	CME	jrizzo@cmeusa1.com
Greg Schneider	Somers Point City Engineer	greg@ksecivil.com
Ed Dennis	Absecon City Engineer	Edward.dennis@rve.com
Alex Renaud	USACE	Alexander.D.Renaud@usace.army.mil
JB Smith	USACE	J.B.Smith@usace.army.mil
Steve Haffner	Stockton University	steven.hafner@stockton.edu
Chris Testa	State Office of Emergency Management	Christopher.Testa@njsp.org
Liz Semple	The Nature Conversancy	elizabeth.semple@TNC.ORG
Vincent Maione	Orsted	XVMAI@orsted.com
Lowell Dickerson	Atlantic Shores Wind	Lowell.Dickerson@atlanticshoreswind.com
Isabel Peck	Atlantic Shored Wind	Isabel.Peck@atlanticshoreswind.com
Mike Garrity	EDF/Shell Atlantic Shores Wind	mike.garrity@atlanticshorewind.com

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. Jaclyn Flor, ENGenuity, went through introductions, and reiterated that many of the stakeholders that were included have been involved throughout Phase I of Resilient NJ which

commenced in October of 2020, and that this Back Bay Project Task is one of the Actions that came out of 1.5 years of planning work and stakeholder feedback.

2. Amy DiCarlantonio, WSP, then went through the meeting agenda and objectives, which included:
    a. Resilient NJ project update
    b. Introduction of Back Bay Project Prioritization Task
        i. Background
        ii. Purpose
        iii. Process
    c. Review/discuss desired output
    d. Review/discuss existing datasets recommended for analysis
    e. Coordination with the Army Corps on the Back Bay Study
    f. Next steps

3. Jim Rutala, Regional Coordinator, added that we are wrapping up Phase I of the Regional Resilience and Adaptation Action Plans and this Phase II is the start of the implementation of actions. This Tasks will include living shorelines, island restoration, FEMA grants, and dredging of back bay area. This step is working in conjunction with the USACE Back Bay Study.

II. GENERAL UPDATE:

4. Amy DiCarlantonio, reviewed the project schedule and the project scope area which includes Brigantine, Atlantic City, Ventnor, Margate, Longport, Pleasantville, and Northfield, and Atlantic County and therefore includes the abutting communities including Somers Point, Absecon, Egg Harbor, and Linwood. She thanked everyone for involvement in the community and stakeholder engagement that led up to this Phase.

5. She then reviewed the timeline. This project has been worked on since the Fall of 2020 starting with the community & stakeholder engagement and the asset collection & risk assessment. The resilience and adaption scenarios finished in the Winter of 2022. The draft Regional Resilience and Adaption Action Plan has been sent to NJDEP and comments were received in August. The plans and ideas resulting from the plan will be used in the implementation phase.

III. IMPLEMENTATION PHASE:

1. Amy DiCarlantonio discussed that the implementation phase includes concept development of actions. She provided some examples of concept development to include data gathering, studies, analysis, plan preparation, grant applications, ordinance development, long range plans, conceptual design, feasibility studies, and cost-benefit analysis. No engineering or architectural drawings for construction are included in the implementation phase.

2. Amy DiCarlantonio highlighted that the Atlantic County Coastal Region (ACCR) won the $250,000 Resilient NJ - Innovation Competition award. The current projects underway include Back Bay Restoration Project Prioritization for the Living Bay Master Plan, the Atlantic City Harbor Strategic Resilience Plan / Blue Economy Sites working in conjunction with the offshore wind industry, and Evacuation Communication Plan.

3. Rick Harter, WSP, discussed the analysis of the Back Bay areas with goal of identifying top tier projects for funding. The steps to complete this goal are to analyze existing data, prioritize nature-based solutions and the use of dredge material.

4. Rick Harter, WSP, explained that there are range of options that can be used for shoreline stabilization, which include vegetation, sills, breakwaters, revetments and bulkheads. The greener techniques (involving vegetation) are called "living shorelines".

5. He explained that there is a list of criteria being developed to decide where to put the living shorelines. The criteria include stabilization needed, suitable for habitat enhancement, ownership, best value, and construction.

6. He also reviewed the multiple tools and resources which the team is considering, which consist of the USACE Back Bay Study, the Rutgers Coastal Ecological and Restoration Adaption Plan (CERAP), the Nature Conservancy (TNC) Coastal Resilience Webmap, the TNC NJ Bay Islands Restoration Planner, and Stevens Institute Living Shoreline Guide, to name a few. He asked stakeholders if any additional datasets exist.

7. Rick Harter then reviewed each of the tools and resources in more detail:

    a. CERAP shows large areas of interests and locations need to be minimized to be utilized. Data going into this includes coastline erosion, open space, ownership, etc.
    b. TNC Bay Islands Restoration Planner current focus area is in Barnegat Bay however, some of the input data also covers part of the Atlantic County study area.
    c. TNC Coastal Resilience Tool, Marsh explorer is mi^2 resolution. Living shoreline module has very good resolution across the shorelines. The risk explorer is 250m resolution, which includes vulnerable population looking at sea level rise and inundation. The Resilience tool, also includes conservation areas. Datasets that go into the coastal resilience tool are shoreline change rate (compares 1977 aerials and 2012 aerials), marsh edge erosion, marsh retreat (sea level rise component), vulnerable populations, etc.

8. Datasets that will be used for WSP's analysis will likely include critical infrastructure, navigation channels, special use areas (working waterfront), access points, underground storage tank (contaminated areas), archeological features, and cultural buildings. Rick requested the data set of existing habitat coverage for marsh in project area.

9. Rick Harter then went into detail about how the datasets would be used to include a shoreline cut into smaller segments to score each segment of shoreline based on all the criteria. Each segment of the shoreline's score will be combined and weighted to get high importance areas. The highest importance areas will be aggregated into potential project sites and will a one-page project description will be developed.

10. Rick Harter paused the meeting to ask stakeholders for suggestions on datasets.

11. Liz Semple, The Nature Conservancy, explained that some of the datasets are being updated right now in the Coastal Resilience WebMap. Bill Shadel and Adrianna Zito-Livingston are working on updating the datasets for TNC.

12. Jay Bailey Smith, USACE, is working on a marsh degradation model (including water levels and wave analysis), looking at how the marsh degrades over time, with expected results in the next month. The Datasets will be shared with the group.

13. Rick Harter then went into detail about criteria that will be analyzed including the best return on investment and where sediment is located and where sediment is needed (beneficial reuse).

14. Jay Bailey Smith, USACE explained that at times, large scale features can cost too much and small and medium size projects can at times be better for cost effectiveness.

15. Rick Harter then went into detail about the aggressive timeline for Phase II. The goal is to finish the final report around the end of October.

16. Jaclyn Flor, ENGenuity Infrastructure, discussed that there will be coordination and alignment with USACE, as well as collaboration with everyone on call and the importance of utilizing past research. She then turned it over to Jay Bailey Smith, USACE, to talk about the Back Bay Study.

17. Jay Bailey Smith, USACE, explained the scope of the USACE Back Bay Study, and that in addition to soft shorelines it includes many grey structures such as storm surge barriers and a cross bay closure. Utilizing the CERAP tool the USACE has looked into living shorelines in Barnegat Bay. The living shorelines will be added to the chief's report in 2025. Draft and final feasibility studies will be released in 2023 and 2024, respectively.

18. The Team then spoke about next steps. Jaclyn Flor, ENGenuity stated that given the feedback heard in this meeting, that smaller meetings with TNC and USACE will be conducted in next few weeks in addition to the larger stakeholder meetings.

IV. QUESTIONS AND COMMENTS:

1. Rick Harter then opened the discussion for questions and comments.

2. Vince Maione, Orsted, wanted the Team to know that Orsted received final approval for reconstructing the bulkhead in AC on Gardners Basin and Delta Basin at the end of Delaware Ave and New Jersey Ave. It has been approved by USACE and NJDEP. Final permits for the new building on the property for the O & M Facility to be approved at next planning board meeting.

3. Jaclyn Flor asked Vince Maione is he could share the location of bulkhead, so that we could be aware in the study. Also, if there are any navigation constraints we would want to include those as well. Vince Maione agreed to share same.

4. Chris Testa, State Office of Emergency Management, stated that FEMA BRIC applications are due in mid-November. However, given the timing it is his guess that most of the projects resulting from this study will be in 2023 applications.

5. Amy DiCarlantonio emphasized that the data sets developed during the Resilient NJ planning process, including the vulnerability analysis and lists of critical assets, will inform this Phase. She thanked everyone and ended the meeting.

ACTION ITEMS:

1. Rick Harter, WSP, will reach out to USACE and TNC for information on updated datasets.

2. The Team will send out potential meeting dates to stakeholders, meeting attendees to send feedback if dates conflict with availability. 10/27 and 10/20 to be avoided based on feedback in meeting. (It was decided post meeting, that the final meeting dates are as follows: October 11, 2022 for the Preliminary Analysis Meeting, October 19, 2022 for the Final Analysis Meeting, and October 26, 2022 for the Final Report Meeting.)

3. The Team will set up smaller meetings with TNC, USACE, or other organizations as requested.

4. Vince Maione, Orsted, to provide data of location of reconstructed bulkhead for Orsted O & M Facility.

Resilient NJ – October 2022 – Coordination with Forsythe National Wildlife Refuge

MEETING MINUTES

DATE: October 6, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – October 2022 – Coordination with Forsythe National Wildlife Refuge

A meeting was held October 6, 2022 at 2:00 PM with the Forsythe national Wildlife Refuge Manager and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeffrey King	ENGenuity Infrastructure	jking@engenuitynj.com
Virginia Rettig	Forsythe National Wildlife Refuge	virginia_rettig@fws.gov

The following was discussed at the meeting:

I. INTRODUCTIONS:

1. Jaclyn Flor, ENGenuity, went through introductions of project team including WSP and ENGenuity.

2. Amy DiCarlantonio, WSP, then went through the overview of the Back Bay Project Prioritization Tasks. She discussed that the planning phase was completed in the summer for the four regions and the implementation phase is being worked on now which includes concept development of actions. No construction plans are included in the implementation phase.

3. Rick Harter, WSP, discussed the analysis of the Back Bay areas with goal of identifying top tier projects for funding. The steps to complete this goal are to analyze existing data, prioritize nature-based solutions and the reuse of dredge material.

4. Datasets that are being used for the analysis include critical infrastructure, navigation channels, special use areas (working waterfront), access points, underground storage tank (contaminated areas), archeological features, and cultural buildings.

5. He explained that there is a list of criteria being developed to decide where to put the living shorelines. The criteria include stabilization needed, suitable for habitat enhancement, ownership, best value, and construction. These areas are being produced from data that is currently available right now.

6. Rick Harter then went into detail about how the datasets would be used to include a shoreline cut into smaller segments to score each segment of shoreline based on all the criteria. The highest importance areas will be aggregated into potential project sites and a one-page project description will be developed.

II. Forsythe national Wildlife Refuge Info:

1. Jaclyn Flor, discussed that NJDEP had asked if we had set up meetings with Forsythe, specifically when we were reviewing an action related to the erosion occurring to the north of Brigantine where there is a possibility of the island breaching.

2. Virginia Rettig, Forsythe National Wildlife Refuge, discussed the NJ Bay Islands Initiative is surveying and getting data on the islands to the west of Brigantine and Absecon. Contact Kim Mckenna (Stockton) for the data. Most of the islands are owned by Brigantine or the state. The goal is to raise the elevation of these islands as they are in very bad shape.

3. Virginia Rettig went into detail about DOT dredging in Atlantic City over the last few years that placed materials in a CDF south of Big Fish Thorofare.

4. Virginia Rettig, discussed the Regional Sediment Management Planning Team that has started over the last few months. There goal is to capture all the sediment locations in the region in one database. She recommended that we contact Kim Mckenna (Stockton), Bill Shadel (TNC), or Scott Douglass (DOT). The data collection is being contracted out by the DOT. The state has lots of data but it may not all be made public currently.

5. She discussed her top priority goal is to level Shad Island which is a CDF used by the USACE for the channel. The permit was accepted by previous manager in 2013 and will not get renewed. She wants the material from Shad Island to be placed in the Impoundment to the West of Shad Island and for the USACE to fund it.

6. Virginia also discussed that the back bays of Stafford have 800,000 CY of material that can be used for restoration. All of the data she has used is in the NJ Bay Islands Restoration Planner. Fish data she has used is in the NJDEP NJ Commercial Shellfish Aquaculture NJDEP| Aquaculture | Home.

7. Rick Harter, discussed the aggressive timeline, and that the preliminary data analysis will be done by the end the week of October 10th. Project summaries that can help support grant applications will be done around the end of October.

III. Action Items:

1. Contact DOT to get a meeting to discuss their projects.

Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: October 11, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

A meeting was held October 11, 2022 at 1:00 PM with the ACCR stakeholders and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Kathleen Evans	WSP	katie.evans@wsp.com
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net
Ranae Fehr	Atlantic County	fehr_renae@aclink.org
Frances Brown	Atlantic County	Brown_frances@aclink.org
Jacques Howard	Atlantic City	jhoward@acnj.gov
Bruce Funk	Longport	zoning@longport-nj.us
Jordan Rizzo	CME	jrizzo@cmeusa1.com
Greg Schneider	Somers Point City Engineer	greg@ksecivil.com
Ed Dennis	Absecon City Engineer	Edward.dennis@rve.com
Steve Haffner	Stockton University	steven.hafner@stockton.edu
Liz Semple	The Nature Conversancy	elizabeth.semple@tnc.org
Robert Von Briel	NJDEP	Robert.vonbriel@dep.nj.gov
Kim Mckenna	Stockton University	kimberly.mckenna@stockton.edu
Bill Shadel	The Nature Conversancy	william.shadel@tnc.org
Stewart Farrell	Stockton University	Stewart.farrell@stockton.edu
Amanda Archer	Rutgers	aa2769@marine.rutgers.edu
Uzoma Ahiarakwe	Atlantic City	uahiarakwe@cityofatlanticcity.org
Mike Garrity	EDF/Shell Atlantic Shores Wind	mike.garrity@atlanticshorewind.com
Matthew Baumgardner	NJDEP	Matthew.baumgardner@dep.nj.gov
Adriana Zito-Livingston	The Nature Conversancy	azito-livingston@tnc.org

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. Jaclyn Flor, ENGenuity, facilitated introductions of the attendants in the meeting.

2. Amy DiCarlantonio, WSP, discussed the meeting agenda and objectives, which included:
    a. Background/Purpose of Back Bay Project Prioritization Task
    b. Review of input data and preliminary outputs
    c. Discussion of "Exclusion Zones" (aka. "Special Use Areas")
    d. Next Steps

3. Amy DiCarlantonio, also discussed the Atlantic County Coastal region which includes the Atlantic County, the American Red Cross, Brigantine, Atlantic City, Ventnor, Margate, Longport, Northfield, and Pleasantville. She discussed the consulting teams working on this project and the representation from the steering committee. She then reviewed the timeline. The project is almost at its conclusion and the Regional Resilience & Adaptation Plan will be wrapping up this week (10/10). She discussed the action plan will be sent out later this week to NJDEP and the steering committee.

4. Amy DiCarlantonio discussed that the implementation phase includes concept development of the actions developed from the action plan. Amy DiCarlantonio highlighted that the Atlantic County Coastal Region (ACCR) won the $250,000 Resilient NJ - Innovation Competition Award. The current projects underway include Back Bay Restoration Project Prioritization for the Living Bay Master Plan, the Atlantic City Harbor Strategic Resilience Plan / Blue Economy Sites working in conjunction with the offshore wind industry, and Evacuation Communication Plan.

5. Rick Harter, WSP, explained the area of focus is within the back bays and the project has looked at shoreline management using living shorelines. These are techniques that incorporate habitat value above what is typically seen in a bulkhead or revetment. The end goal for the task is a project list of shoreline segments where it makes most sense for shoreline restoration. WSP's analysis considers at numerous factors including erosion, shoreline slope, public access points, best value, and constructability.

6. Rick Harter explained that the data sets used are critical facilities, transportation, public ownership, access points, social vulnerability, existing marsh, special use areas, shoreline erosion/retreat, other areas to protect (buildings, underground storage tanks, contaminated areas, archeological features, etc.), and elevation/bathymetry.

7. Rick Harter discussed the web map that WSP created. He started with critical facilities that are close to the shoreline. These included Utility Infrastructure and Critical infrastructure. Each of these facilities have a buffer at increasing distances. Locations that are closer to the critical facility were given a higher number then further away for preliminary scoring.

8. Rick Harter discussed the next input called "Transportation". This included bridges, bus stops, bike paths, evacuation routes, and roads. The transportation also has a buffer at increasing distances used for scoring. It is intended to increase the distances of the buffers to better capture the shorelines that need attention.

9. Rick Harter discussed the next input called "Ownership". This included public ownership and access points. The access points are at the end of public right of ways and boat ramps. These are important to take under consideration because vulnerable people may need to utilize these

areas for food and recreation. He explained the data scoring while showing the preliminary scoring combining these inputs.

10. Amy DiCarlantonio asked if the red and orange areas of shoreline are of high importance and as more inputs get combined then will the project sites be developed.

11. Rick Harter answered that is correct and when looking at one dataset or one topic, there is a value judgement that some inputs are of higher importance than others. An example he explained, is it is better to do a project on public land then on private land and where the public can access them. Each of the inputs are weighted equally at the moment but will be weighted differently in the future.

12. Rick Harter discussed the next input called "Social Vulnerability". This input included vulnerable populations from the CDC and major employers. The other data set available is the environmental justice index, which is based on census-based data and includes contaminated sites.

13. Rick Harter discussed the next input called "Existing Marsh". This data comes from the NOAA Environmental Sensitivity Index polygons. He suggested there could be better data to encompass the marshes.

14. Kim Mckenna, Stockton University, asked why are the marshes included in your Social Vulnerability Justice datasets? She explained she is asking if the marshes are considered contaminated.

15. Rick Harter answered that the polygons that can be seen are primarily the boundaries for the census tract data. The high rated areas in the polygons are the highest socially vulnerable people based on age, demographic, income, etc. The Environmental Justice index also included contamination areas. Rick Harter explained the contamination areas do not impact the higher priority areas and this dataset could be taken out due to redundancy with the Social Vulnerability.

16. Kim Mckenna explained the dataset for the marsh used for the NJ Bay Islands Initiative – Bay Islands Restoration Planner was from the USFW SHARP dataset. It breaks the marsh into high, low, and mud flats.

17. Rick Harter explained that he does not have access to the dataset and requests for the data to be sent to him if possible.

18. Rick Harter explained the existing marsh can be prioritized in two different ways. If additional habitat is wanted, then it should be prioritized where they are absent. The other way to look at it is to look at suitability, which describes that the closer the project is to marsh the better suitable it is. This project is intended to prioritize the project sites. Areas should not be eliminated because they are not at the perfect site for a specific type of technique.

19. Rick Harter discussed the next input called "Special Use Areas". This input included marinas, dredge locations, canals, USACE channels, USACE waterways, and Orsted O&M Facility. Rick requested boundaries or better dataset of the marinas and waterways due to them being points

and lines respectively. The marinas could have a submerged land easement or perhaps the regulators have a polygon for them to better understand the special use areas.

20. Rick Harter discussed the next input called “Shoreline Erosion”. This input included the likelihood of shoreline erosion by 2050 created by Rutgers. This input has not been scored yet. Rick explained the process being used for this analysis is a raster analysis. A raster is a series of rows and columns and each of these cells has a value. There will be a different raster for each input, which will be compiled into a composite. Weighting factors will be added in the future for each input that has a higher impact.

21. Rick Harter discussed the sediment sources dataset including the USACE borrow areas or placement areas. These have not been scored yet. He explained they will be based on proximity to the areas to show cost effectiveness for construction.

22. Rick Harter discussed the next input called “Other Areas to Protect”. This input included underground storage tank facility, known contaminated site, historic properties, archeological site, and building footprints. There are two large polygons called natural heritage priority sites and areas where tourism trade predominates. Rick suggested these two could be removed and opened the discussion to the call.

23. Bill Shadel, The Nature Conservancy, suggested the natural heritage could be used as a bonus area. He also explained that he sees the analysis as a tiered approach showing the important areas that need to be protected and going down by less important areas. An example he explained is if there is tourism in an area then that section is more important than if there is an area where tourism is not located.

24. Rick Harter suggested to weight the two sections less than an underground storage tank, or archeological site due to their importance. The weights of the different inputs will be refined in the future.

25. Adrianna Zito-Livingston, The Nature Conservancy, explained there is a mix of areas that will be higher priority and some that will come with challenges, it is important to not only look at weighting but also if there are other considerations. Some projects might be less feasible because of these other considerations but are not deal breakers.

26. Rick Harter discussed that his team is still in the process of running the data. The input elevation (slope) is next to be analyzed. The slope of the shoreline is needed and can be found from depth contours and upland contours. The greater the slope the higher the risk. The slope will impact the feasibility. The shallower slope will allow for better projects.

27. Rick Harter discussed the preliminary composite scores. All the scores are stacked on top of each other, then a shoreline line was added with a 3-meter buffer on either side. The area was clipped and resulted in a composite score at the shoreline. This line will be the final result once all inputs are finalized. From the line, different areas of shoreline can be compared to other areas of shoreline.

28. Rick Harter explained WSP is currently in the middle of the preliminary analysis. The next steps are to refine the inputs and weights. The next meeting to go over these changes will be October

19. The next step is to summarize the findings and identify the top sites. The final meeting will take place on November 7th. The call was then opened to questions.

29. Stewart Farrell, Stockton University, suggested the USACE Philadelphia District have surveyed regularly and NJDOT have surveys of the channels every five years. The channels range from 50-150 feet wide and have about 50 feet past the channels. The most recent survey is from Absecon Inlet to the town of Absecon. The point of contact is Scott Douglas, Keith Watson (Project Manager for Absecon and Brigantine), and Monica Chasten (PM for Intercoastal Channel at USACE Philadelphia District).

30. Rick Harter requested a point of contact to get the data and emphasized the difficulty of getting the data on short notice.

31. Bill Shadel, suggested the dataset from the state data layer called overburdened communities.

32. Adrianna Zito-Livingston, suggested Scott Douglas, and Dan Barone from Rutgers for access to NJDOT data. She also explained to sift through the data that is prioritized vs. feasibility might give you the tier one, tier two approach and reduce the noise from the data.

Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: October 25, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

A meeting was held October 19, 2022 at 11:00 AM with the ACCR stakeholders and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Kathleen Evans	WSP	katie.evans@wsp.com
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net
Chris Testa	State Office of Emergency Management	Christopher.Testa@njsp.org
JB Smith	USACE	J.B.Smith@usace.army.mil
Alex Renaud	USACE	Alexander.D.Renaud@usace.army.mil
Ranae Fehr	Atlantic County	fehr_renae@aclink.org
Frances Brown	Atlantic County	Brown_frances@aclink.org
Jacques Howard	Atlantic City	jhoward@acnj.gov
Bruce Funk	Longport	zoning@longport-nj.us
Jordan Rizzo	CME	jrizzo@cmeusa1.com
Laura Kerr	Stevens Institute of Technology	LKerr@stevens.edu
Keely Lucientes	WSP	Keely.lucientes@wsp.com
Steve Hafner	Stockton University	steven.hafner@stockton.edu
Kim Mckenna	Stockton University	kimberly.mckenna@stockton.edu
Adriana Zito-Livingston	The Nature Conversancy	azito-livingston@tnc.org
Emily Covalt	WSP	Emily.covalt@wsp.com
Melissa Duliniski	NJ EDA	MDulinski@njeda.com
Rami Nassar	Schaeffer Nassar Scheidegg Consulting Engineers	rami@snsce.com
Amanda Archer	Rutgers	aa2769@marine.rutgers.edu
Uzoma Ahiarakwe	Atlantic City	uahiarakwe@cityofatlanticcity.org
Mike Garrity	EDF/Shell Atlantic Shores Wind	mike.garrity@atlanticshorewind.com
Isabel Peck	EDF/Shell Atlantic Shores Wind	Isabel.peck@atlanticshoreswind.com
Matthew Baumgardner	NJDEP	Matthew.baumgardner@dep.nj.gov
Vincent Maione	Orsted	XVMAI@orsted.com

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. Jaclyn Flor, ENGenuity, facilitated introductions of the attendants in the meeting.

2. Amy DiCarlantonio, WSP, discussed the meeting agenda and objectives, which included:
    a. Background/Purpose of Back Bay Project Prioritization Task
    b. Review of updated input data
    c. Review and discuss output data
    d. Discuss preliminary priority sites
    e. Next Steps

3. Amy DiCarlantonio also discussed the Atlantic County Coastal region which includes the Atlantic County, the American Red Cross, Brigantine, Atlantic City, Ventnor, Margate, Longport, Northfield, and Pleasantville. She discussed the consulting teams working on this project and the representation from the steering committee. She then reviewed the timeline. The project is almost at its conclusion and the Regional Resilience & Adaptation Plan will be published and uploaded to the website this week (10/17).

4. Amy DiCarlantonio discussed that the implementation phase includes concept development of the actions developed from the action plan. Amy DiCarlantonio highlighted that the Atlantic County Coastal Region (ACCR) won the $250,000 Resilient NJ - Innovation Competition Award. The current projects underway include Back Bay Restoration Project Prioritization for the Living Bay Master Plan, the Atlantic City Harbor Strategic Resilience Plan / Blue Economy Sites working in conjunction with the offshore wind industry, and Evacuation Communication Plan.

5. Amy DiCarlantonio explained the purpose of the Back Bay Restoration Project prioritization is to prioritize areas where living shorelines, dredge material, and other restoration projects can be developed and identified. These projects once identified from all the data sets will be able to get organized in order to get funding for the region.

6. Rick Harter, WSP, explained living shorelines, which is the idea of bringing as much habitat value back to any shoreline management technique. These techniques include sills, breakwaters, revetments, and bulkheads. The end goal for the task is a project list of shoreline segment where it makes most sense for shoreline stabilization. He has looked at numerous factors including erosion, shoreline slope, public access points, best value, and constructability.

7. Rick Harter discussed the data sets used are critical facilities, transportation, public ownership, access points, social vulnerability, existing marsh, special use area, shoreline erosion/retreat, other areas to protect (buildings, underground storage tanks, contaminated areas, archeological features, etc.), and elevation/bathymetry.

8. Rick Harter discussed the analysis WSP is conducting. He started with critical facilities. Some of the distances for the scoring for critical infrastructure data sets has been updated. This included both the scoring and weighting. The search distance for critical facilities areas have been expanded. The scoring distance for transportation area has doubled. Ownership and public access data have not changed.

9. Rick Harter discussed the input options for Social Vulnerability Index (SVI). This input included vulnerable populations from the CDC and major employers. The other data set available is the environmental justice index, which is based on census-based data from EPA and includes contaminated sites. The last dataset discussed is the "overburdened community" data. It is based on the NJDEP definition of overburdened communities which includes income, language, and minority data.

10. Jacques Howard, Atlantic City, asked about the inputs that go into the overburdened communities. He has an issue with the data because language barrier doesn't necessarily mean that it is overburdened. There are publications translated and about 54 or 55 languages spoken in Atlantic City. He proposed there should be more empirical data that makes an impact.

11. Chris Testa, State Office of Emergency Management, explained overburdened communities is 35% households qualify as low income, 40% of residents qualify as minority, 40% of the households have limited English proficiency. There are additional layers that include environmental conditions such as contamination.

12. Jacques Howard, discussed how those criteria make the area overburdened. He questioned if there are appropriate services to address some of those needs, what are the economics in the area, which should include the opportunities as well.

13. Rick Harter, explained that the data is intended to prioritize areas where communities can benefit from enhanced ecological habitats. He asked which of the three data sets is best suited.

14. Chris Testa, asked who would the primary funding source would be for these projects? He explained FEMA has $3.2 billion in BRIC this year and is specifically calling out the SVI index. He suggested to use the dataset with the best opportunity to score high for funding.

15. Jacques Howard, explained if the goal of the project is broader then don't make decision based on the funding source but make it on a sustainable investment.

16. Rick Harter, explained the goal of this project is to find the first projects to start with, the most fundable project, and most implementable.

17. Chris Testa, added the SVI will pick up aging population and disabled population in addition to race and income.

18. Based on the feedback we will be using the Social Vulnerability Index data in the project.

19. Rick Harter discussed the next input called "existing marsh". This data comes from the NOAA Environmental Sensitivity Index polygons. The NOAA data will be replaced with Salt Marsh Habitat and Avian Research Program (SHARP) data.

20. Rick Harter discussed the next input called "Special Use Areas". The purpose of identifying these areas is to not put a project in the middle of a navigation channel or marina. He said that the project team requested NJDOT channel data. The NOAA environmental sensitivity index line data has shoreline characterization, which is helpful for identifying hard armored shorelines

associated with these types of areas. Rick requested if any of the stakeholders have boundaries or a better dataset of the marinas and working waterfronts.

21. Rick Harter discussed the next input called “shoreline erosion”. This data includes consideration of sea level rise and elevation.

22. Rick Harter discussed the sediment sources dataset including the USACE borrow areas or placement areas. He explained the score will be based on proximity to the areas.

23. Rick Harter discussed the next input called “other areas to protect”. This input included underground storage tank facility, known contaminated site, historic properties, archeological sites, and building footprints. The building footprints weighting was reduced to 50% because they are typically private buildings. “Natural heritage priority sites” and “areas where tourism trade predominates” weighting were both reduced to 10%.

24. Rick Harter discussed the revised composite scores. The scores were trimmed to between a range of elevations to capture the shoreline and nearshore areas. He showed examples of areas that scored highly. The areas of red or dark orange will be captured in a polygon and those will be the potential project areas. The areas are thicker because it shows the slope of the areas. The thicker the area the gentler the slope is.

25. Chris Testa added in the chat, “I would suggest aligning / expand your critical facilities with FEMA lifelines. Perhaps consideration of natural systems that protect other natural systems with a bias toward areas that provide anthropogenic supporting systems. (salt marsh that protects against surge in areas vulnerable to salt water intrusion into the Kirkwood / Cohancy). Any consideration of Sea Level rise projections on the proposed project areas?”

26. Rick Harter, answered the sea level rise is in the likelihood of shoreline erosion data set. The critical infrastructure is closely aligned with the BRIC community lifelines.

27. Adrianna Zito-Livingston, The Nature Conservancy, added in the chat, “Chris, your second point (in your first comment) raises a concern I have about reducing the weight of natural heritage areas wholesale, opportunities might be missed for enhancing natural areas that provide valuable buffer for communities.” She discussed these areas are not the focal point, but may be protecting focal points in the project.

28. Rick Harter, discussed capturing the data by the public parcel data which scores more highly and existing marsh data scores more highly. He explained natural heritage areas are not scored as highly, but is still considered and it created large polygons.

29. Rick Harter explained that projects in an area with docks can be done between the dock and bulkhead. He also discussed the areas further from infrastructure, specifically mosquito ditches.

30. Chris Testa added to the chat, “Is there an overall storm event/ level of protection that the project seeks to get too? Is there a way to map the energy environment? A living shoreline in the wrong location is unfortunately just more debris….”

31. Rick Harter responded there is not a level protection for the project, each of the projects will be site specific. There will be a custom approach based on elevation, need, etc. In some cases, this could be more grey than green, if needed. This analysis is not meant to identify the ideal locations for a specific technique. He agreed on the living shoreline being in the wrong location is more debris. He expanded some techniques will not work at a certain location. It will need to be designed for the wave conditions.

32. Chris Testa, asked if there is any consideration for removing the hydraulic efficiency out of the mosquito protected marshland.

33. Rick Harter, asked to the audience their thoughts. He expanded on how it could be beneficial to restore the marsh mosquito ditches, however the sediment might not be available to do so.

34. Adrianna Zito-Livingston, suggested these large types of projects are the ones that standout to the conservation community. She added the identification of these types of projects would help facilitate partnerships and funding for the conservation side of coastal resiliency. She suggested to find a way to include the conservation projects with the protection of infrastructure. It will help check the box for the NFWF applications.

35. Chris Testa emphasized, from a funder's standpoint, it's important to find places where we can hybridize the approaches. This includes using the infrastructure protection and find as many secondary benefits as possible. When projects are scoped, we would define a benefit up to a certain amount of money and spread the extra money out to other elements and benefits across the project. The co-benefits would include the enhancement, corrective action that gets a larger net benefit than spinning of those projects individually.

36. Rick Harter, explained the analysis isn't meant to find the potential conservation areas, however it can be mined and extracted by getting the high priority areas on non-public land or vacant lots.

37. Chris Testa, expanded that he wouldn't limit it to vacant lots, since even if there is a building there now doesn't mean it is going to stay there. There are numerous buyout programs right now.

38. Rick Harter explained, in the short writeups, relative opportunity for conservation could possibly be added for each high priority site.

39. Chris Testa, explained there is conservation money in the buyout programs. There is also opportunity for credit offsets for other adaptive opportunities.

40. Adrianna Zito-Livingston added to the chat, "I'm definitely supportive of a hybrid approach where we can find overlap between conservation priorities and community priorities. It's helpful to hear what is driving prioritization of community projects."

41. Jaclyn Flor, then added that the next meeting is November 7th.

42. Rick Harter closed the meeting.

Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: October 25, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

A meeting was held October 21, 2022 at 10:00 AM with State Office of Emergency Management and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net
Chris Testa	State Office of Emergency Management	Christopher.Testa@njsp.org

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. The meeting began with a discussion of the FEMA BRIC funding and types of projects that have been funded in the past few years. Also included in the discussion was the benefits of finding a good projects, and if the project is strong enough there will be multiple options to fund it.

2. Chris Testa, State Office of Emergency Management, explained the Northwest Resilience Park in Hoboken was brought through his office and funded through PDM. $10 million was given for this project. FEMA used it as one of its poster child projects. Last year New York received a majority of the money from BRIC for our region.

3. Chris Testa, explained an approach for funding projects should be by looking for a problem, laying out the solutions, find the most cost-effective option, explore the collateral effects, and then find where green infrastructure can be put into the project. This option will help with getting grants. He emphasized the hybrid approach of adding a green element on to another project will help. Using this approach, a BCA can be developed by explaining how the green elements can be used as softeners for the typical harder, grey structures. The green elements will have to show its effectiveness, to what level of storm protection it has, and how many years it will last.

4. Christ Testa discussed another funding location can be NRD settlements from the EPA.

5. Chris Testa explained FEMA still has bias towards structures such as gabion walls than living shorelines because of their known effectiveness. The approach should be to look at the larger critical infrastructure and layer the green infrastructure into the project. He reminded to not forget about the possibility to remove the fixed structures from project areas. Anything but the casinos, critical infrastructure, and parkway can be removed for different projects. Since the coastal area has $50-60 billion from tourism the funding of these projects is very important.

6. Jaclyn Flor, ENGenuity, asked about the letter for matching funds, and how it would be handled for projects in multiple jurisdictions.

7. Chris Testa answered the funding letters can be open ended. “To be decided” is acceptable. Lots of the bigger projects have many different funders so the letters become very vague. Scopes inside of scopes can be created to not cutoff different funders from the project if BRIC accepts the project. In that way, multiple federal entities can fund the same project.

8. Jaclyn Flor asked how the applicant is handled when it is multi-jurisdictional, since if the back bay areas were treated as one large project then it could potentially span multiple jurisdictions.

9. Chris Testa discussed the applicant can be done on a project-by-project basis. The project area can also be very big encompassing multiple township and cities. There should be one main applicant with other sub-applicants. However, not every township needs to be a sub-applicant, the political lines should not be worried about. FEMA looks for creative partnerships as well. An example is public-private partnerships and across County, State, and Federal partnerships. The partnerships can be through a MOU or a handshake.

10. Christ Testa explained there will be $50 million available this year with $2.3 Billion available this year nationally. Once the project goes to his office in November, they go through a RFI process. Then the application will go to the attorney general office and be sent to FEMA at the end of December or early January.

11. Chris Testa suggested that if there is BCA support needed, he has a contractor. His name is Adam Ferguson.

12. Jim Rutala, Regional Coordinator, asked if the project can be phased.

13. Chris Testa, explained phasing is allowed however it is not encouraged.

14. Rick Harter, WSP, proposed the data could be put into an algorithm for each type of funder depending on the basic needs for each application. The examples of funding could be NRDA, BRIC, NOAA, NFWF, etc.

15. Chris Testa, emphasized for BRIC applications the primary importance will be critical infrastructure. He also explained a Post Fire Award, California received. The project included protecting streams, mudslides, forests, etc. A natural hazard framework can be created for this

project. The project could include coastal marshland, critical infrastructure, saltwater intrusion, beneficial reuse of dredge material, and the BMPs for solving these issues.

16. Rick Harter, suggested another approach could be to look at known projects and cross reference them with the datasets/scoring to see if there are any additional potential projects in the area of the known projects. This will have to be done at the Jim Rutala level before getting to Chris Testa. The results from the Resilient NJ efforts should also be cross referenced with the county HMGP plan and linked to proposed actions.

17. Chris Testa explained the results will have to be in the County Hazard Mitigation Plan.

18. The meeting was concluded.

Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: October 25, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – October 2022 – Back Bay Project Prioritization Meeting

A meeting was held October 21, 2022 at 1:00 PM with Jim Rutala and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. The meeting was in follow-up to the FEMA BRIC discussion with State OEM.

2. Rick Harter, WSP, started the meeting by suggesting using the known needs to calibrate the settings in the model.

3. Jim Rutala, Regional Coordinator, discussed that the region has many great projects already with BCAs, and some in the works that could be considered in the model. The first resiliency project is the elevation and protection of Route 40 going into Atlantic City. The NJDOT is funding at least $40 million dollars. Bulkheads will be built around the intersection of West Avenue and Albany Avenue.

4. Jaclyn Flor ENGenuity, asked Rick Harter if WSP is working on the Route 40 project and to check with Amy DiCarlantonio.

5. Jim Rutala expanded that this project is not a complete project. There are sections of Egg Harbor Township and Pleasantville, where the bulkheads don't exist and there is no protection. This portion of the project is about $10 million and could be more. This project was submitted to the state for funding after Hurricane Sandy. It was not selected, but a BCA was done. A gabion wall is along the bay area that ended in Egg Harbor Township. Going into Pleasantville there are bulkheads that need to be repaired or raised. There is probably a BRIC project available and

won't need a match because of the DOT funds. Black Forest Pike is an emergency evacuation route and has critical infrastructure located on it. He has the initial application and BCA.

6. Jim Rutala explained another project being worked on is in Ventnor and Margate. It is the restoration of shelter island, which was harvested to build the barrier island. The local sewer plant used to exist there and the city would like to restore it using dredge material. It can be restored and used to help protect the two cities.

7. Jim Rutala explained another project adjacent to this area. There is a 150-acre open space area owned by Ventnor called Ventnor West and is wanted to be an environmental refuge. It is an area that was used as a landfill with a majority of the area wetlands that is eroding quickly. Recently, a DEP grant was applied for to build a living shoreline along the edge of the area. However, a more significant project could be developed to restore the wetlands and reduce wave action. There are areas locally that need bulkheading and public access.

8. Jim Rutala expanded the entire bayfront of Atlantic City is being rebuilt and is very protected. Brigantine is not protected at all. The USACE plan is to protect Absecon with flood walls along Route 30 and flood walls along the Great Egg Harbor River Bay area. Brigantine has done a lot of raising home elevations, but is still exposed on the back bay area. There will be significant need for material for the USACE plan which could be dredge material. Most of the areas have not been dredged since Hurricane Sandy. The biggest concern for the USACE project is what happens in the meantime before the construction.

9. Jim Rutala explained another project in the Lakes Bay area of Pleasantville. This area is the only area in Atlantic County that is being bought up by Blue Acres. Lots of these areas will be parks and recreational. They have proposed to have living shorelines, however there is no funding available.

10. Jim Rutala discussed the next location at Somers Point. Somers Point is a marine town with water on three sides. The Bay Avenue area is very low. They have been awarded a FEMA grant to do planting along the bay front. They would like to replace the bulkhead and dredge the waterfront. They would like to replace it with a living shoreline along Bay Avenue. A berm design is proposed that does not interfere with the property views.

11. Rick Harter explained that the ditching in the wetlands is big part of the problem of eroding marshes, and asked what the public sentiment of putting material there is.

12. Jim Rutala explained the ditches were done a long time ago to get rid of the mosquitos. They are not maintained and there is probably no issue with the public. He also suggested if there is any way to use his information in the model to get an application. If there is a project that has merit then we can try to get the project in this year.

13. Jim Rutala added his team is doing about a dozen applications throughout Atlantic County and Cape May County.

14. Rick Harter explained the challenge for getting an application in for this year is that the project team is still early in the process to getting to the final output. The project team has to refine the results into project areas and shapefiles to delineate the potential project sites. The results still

need to summarized onto paper as well. He suggested that the project team can give information to the potential projects to expand the current projects.

15. Jim Rutala, expanded on the work done by the project team is looking at the areas in a much broader way than the way a municipality looks at the project. They are looking at the complaints of the residents and sea level rise because they are required to. A completed project we did was a seawall project in Atlantic City using USACE money and FEMA money and didn't cost the city anything.

16. Jaclyn Flor, suggested there is potentially more money being put into Resilient NJ. Perhaps it is possible that this money could be used for FEMA BRIC applications.

17. Meeting concluded.

Resilient NJ – November 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: December 1, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – November 2022 – Back Bay Project Prioritization Meeting

A meeting was held November 7, 2022 at 11:00 AM with the ACCR stakeholders and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Kathleen Evans	WSP	katie.evans@wsp.com
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Rick Harter	WSP	rick.harter@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net
Jordan Rizzo	CME	jrizzo@cmeusa1.com
Melissa Duliniski	NJ EDA	MDulinski@njeda.com
Elizabeth Limbrick	NJ EDA	ELimbrick@njeda.com
Peter Blum	USACE	Peter.r.blum@usace.army.mil
Virginia Rettig	Forsythe National Wildlife Refuge	virginia_rettig@fws.gov
Robert Von Briel	NJDEP	Robert.vonbriel@dep.nj.gov
Edward Dennis	Absecon City Engineer	Edward.dennis@rve.com
Edward Blanchard	Red Cross	Edward.Blanchard@redcross.org
Roger Mclarnon	Margate Building Department	mclarnon_roger@margate-nj.com
Steve Hafner	Stockton University	steven.hafner@stockton.edu
Stewart Farrell	Stockton University	Stewart.farrell@stockton.edu
Jacques Howard	Atlantic City	jhoward@acnj.gov
Rami Nassar	Schaeffer Nassar Scheidegg Consulting Engineers	rami@snsce.com
Amanda Archer	Rutgers	aa2769@marine.rutgers.edu
Uzoma Ahiarakwe	Atlantic City	uahiarakwe@cityofatlanticcity.org
Mike Garrity	EDF/Shell Atlantic Shores Wind	mike.garrity@atlanticshorewind.com

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. Jaclyn Flor, ENGenuity, facilitated introductions of the attendants in the meeting.

2. Rick Harter, WSP, discussed the meeting agenda and objectives, which included:
    a. Background/Purpose of Back Bay Project Prioritization Task
    b. Review of Process
    c. Review and Discuss Potential Priority Sites
    d. Discuss Next Steps

3. Rick Harter, also discussed the Atlantic County Coastal region which includes the Atlantic County, the American Red Cross, Brigantine, Atlantic City, Ventnor, Margate, Longport, Northfield, and Pleasantville. He, explained enhancing the use of living shorelines, which is the idea of bringing as much habitat value back to any shoreline management technique. These techniques include intertidal marsh, possibly with sills or breakwaters to absorb wave energy.

4. Rick Harter, explained the end goal for the task is to look at all the shorelines within the back bays and figure out where shoreline restoration will have the greatest benefit. The shorelines were analyzed with numerous factors including erosion, shoreline slope, public access points, best value, and constructability. The task will conclude with a project list that can later be packaged for grant funding. This task only compiled and used existing data available. No data was obtained from the field. The data was used to score each section of shoreline. 20 potential sites have been identified for discussion today.

5. Rick Harter discussed the datasets used are critical facilities, transportation, public ownership, access points, social vulnerability, existing marsh, special use area, shoreline erosion/retreat, other areas to protect (buildings, underground storage tanks, contaminated areas, archeological features, etc.), and elevation/bathymetry.

6. Rick Harter discussed further the datasets. He started with critical facilities, transportation, ownership, public access. Each of these data sets has a scoring based on the distance from the data point or area.

7. Jacques Howard, Atlantic City, asked although ranking the shoreline based on proximity of the datasets to the shore makes a lot of sense, what is the impact to those individuals, neighborhoods, and roadways in the opposite direction (further away)?

8. Rick Harter, responded the purpose is to identify locations for creating intertidal marsh along the shoreline to have a protective value, where is that protective value going to be felt the most? If there is a road that is a mile away from the shore, it will not be affected by the creation of living shoreline.

9. Rick Harter, expanded on the datasets. The “Social Vulnerability Index” was used from the CDC and included the major employers. The “Special Use Areas” are areas that need to be avoided. Shoreline Erosion was included. He explained the composite scores, which are clipped between +1m to -2m elevations. Rick added the scoring analysis guide will be given in the final report for everyone to access. This guide covers the scoring, the weighting of the datasets, and a table of the datasets with their source. The guide can be used to replicate the analysis.

10. Rick Harter, discussed the output was refined by removing isolated areas, removing ocean and beach areas, and using the bathymetry between -2 and 1 meters. To create the shoreline

priority sites, WSP selected the areas with high scores, large areas, and logical start and stop points.

Site A

1. Rick Harter, explained the intent is to create a project sheet with an overview of why these project sites are important, the project benefits, recommended restoration approach, potential project partners, and potential funding sources. He then identified the potential priority sites starting with “Site A”.

2. Jim Rutala, Regional Coordinator, explained Site A is under construction with a bulkhead replacement.

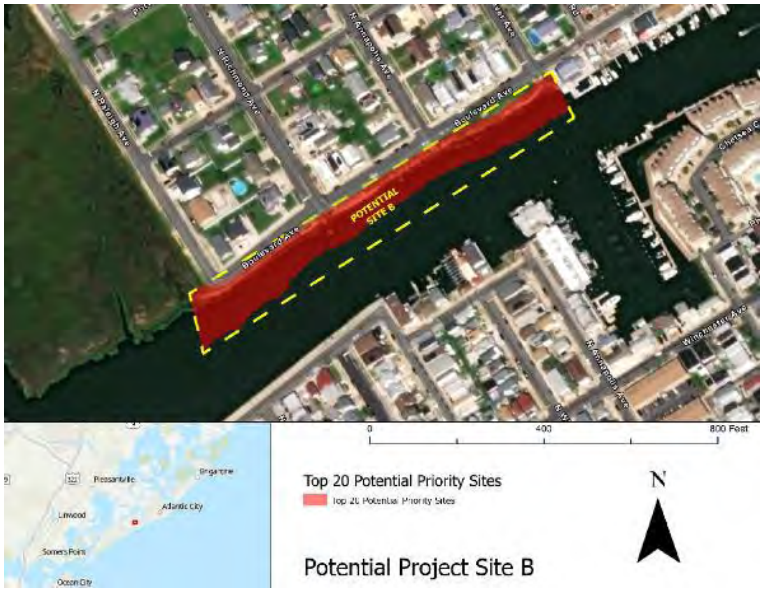
3. Rick Harter, expanded there are areas where living shorelines will not be possible. He asked if the bulkhead is going to be used for docking boats or could some type of additional habitat be constructed along the waterward edge of the bulkhead. Even if a bulkhead is being constructed, a living shoreline on the seaward side of the bulkhead can still provide added benefits.

4. Jim Rutala, the new bulkhead construction has water coming right up to the bulkhead, the top of the bulkhead will be at elevation 8.5’ with existing bulkhead elevation of 4’. He explained there are other bulkheads such as at South Boulevard, where habitat improvement can be done.

5. Jacques Howard, expanded there is a kayak launch being built with the bulkhead. He asked if a natural buffer could be added to this site?

6. Rick Harter, answered a natural buffer will be looked into in more detail at this site.

Site B



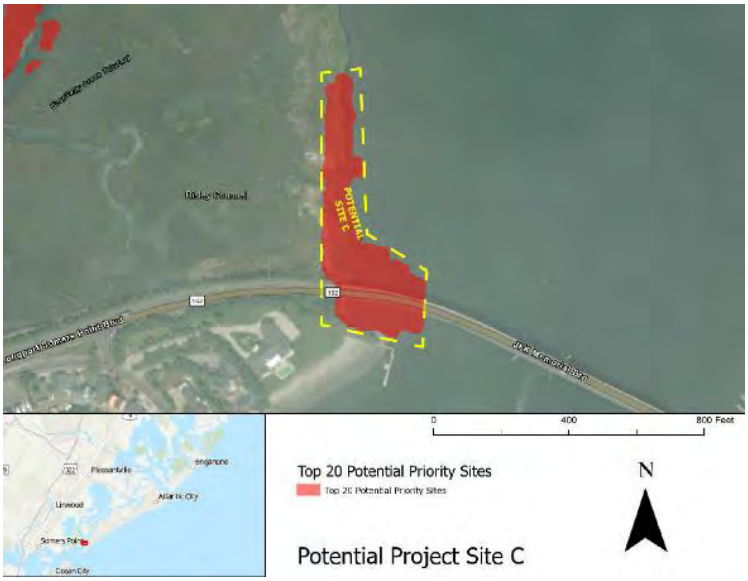
1. Jim Rutala, explained there was never a bulkhead at this location, and a new bulkhead at el. 8.5' was constructed. There is a ridge of sand in front of the bulkhead where there is some vegetation. There is an opportunity for vegetation at this location.

2. Roger Mclarnon, Margate Building Dept, (Chat) "Adding a natural buffer at that location may promote silt build up at the adjacent private slips."

3. Rick Harter, answered this issue should be considered and depending on the design it could be done where the marsh picks up the suspended sediment rather than the boat slip.

4. Ed Dennis, Absecon City Engineer, explained his project team designed this project and there is a need for additional vegetated berm along Raleigh Ave that is not at high enough elevation. The city has expressed interest in a vegetated berm along Raleigh Ave as opposed to continuing the bulkhead around Boulevard Ave.

Site C

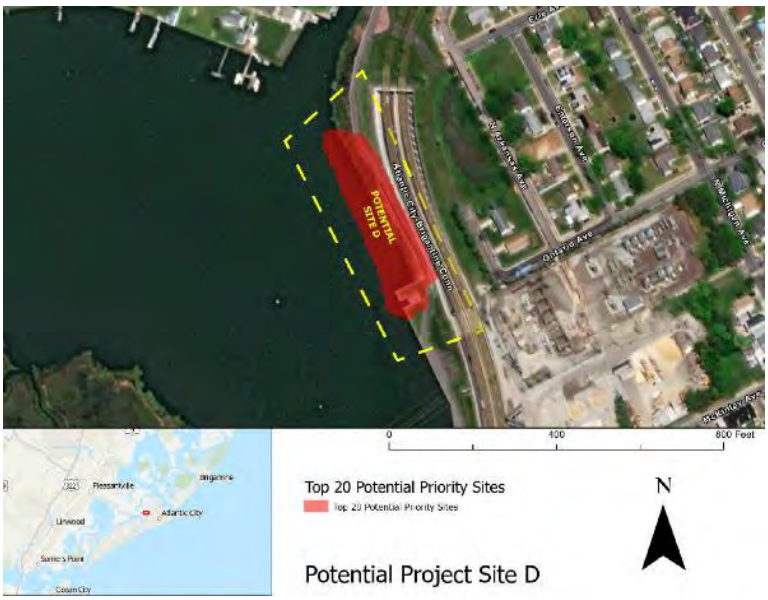


1. Rick Harter, Explained Site C as a location where expansion of the existing marsh and additional protection of the JFK Memorial Bridge can be done.

2. Jim Rutala, explained he thinks this site used to be a dredge disposal site. He asked what would the marsh protect?

3. Rick Harter, responded it would protect the base of the JFK memorial bridge.

Site D



1. Rick Harter, explained Site D, as being near the tunnel in Atlantic City, where there is the potential for a living shoreline.

2. Jim Rutala, discussed there is a pathway along the bay that goes under the bridge. Ed Dennis was the designer for this project as well. If this area was improved there could be a way to expand the path.

3. Rick Harter, asked if this path is constructed or designed already?

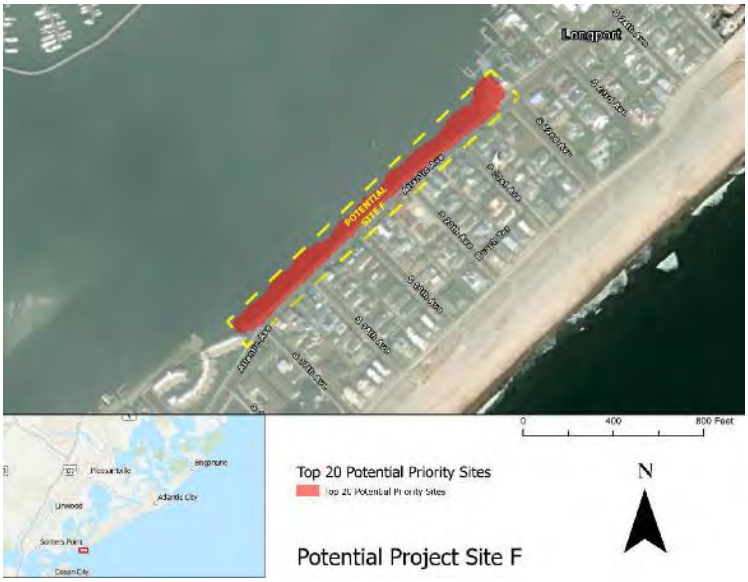
4. Jim Rutala, answered that parts of it are already built. There is a portion of the path under the Atlantic City Expressway, and parts of the path are being reconstructed as part of the new bulkheads being installed.

Site E

1. Rick Harter explained this site is along West End Ave and Albany Blvd. There is existing marsh that can be expanded out to create a larger buffer to the roads adjacent.

2. Jim Rutala, the NJDOT is doing bulkhead improvements at the intersection of Albany Blvd and West End Ave but does not expand as shown in the graphic. The NJDOT is raising portions of Route 40 as part of this project. This area was also studied as part of a FEMA Evaluation of the Chelsea Heights neighborhood and this area was identified as vulnerable to flooding.

Site F



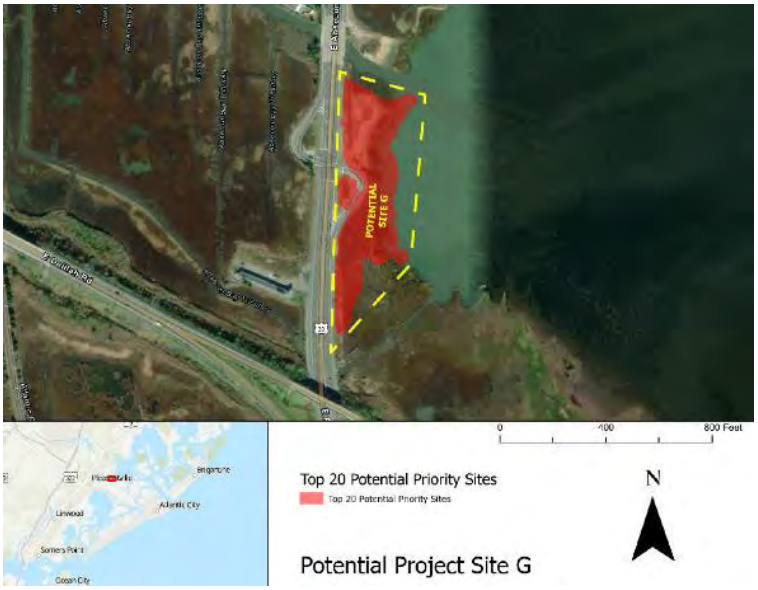
1. Rick Harter, explained this site is along Atlantic Ave and scored highly because it is adjacent to the road. A natural buffer along this road will help protect the area from a storm coming from the North or West.

2. Roger Mclarnon, asked if this area floods often or if the seawall gets overtopped?

3. Ed Dennis, answered that he is unsure if this area is part of the typical nuisance flooding. That can be found in the nuisance flooding report and will be checked.

4. Rick Harter, explained a living shoreline is not going to hold back a storm surge, it can absorb wave energy. The waves hitting a living shoreline will have less energy and reduced runup so the waves wont crash over it as much.

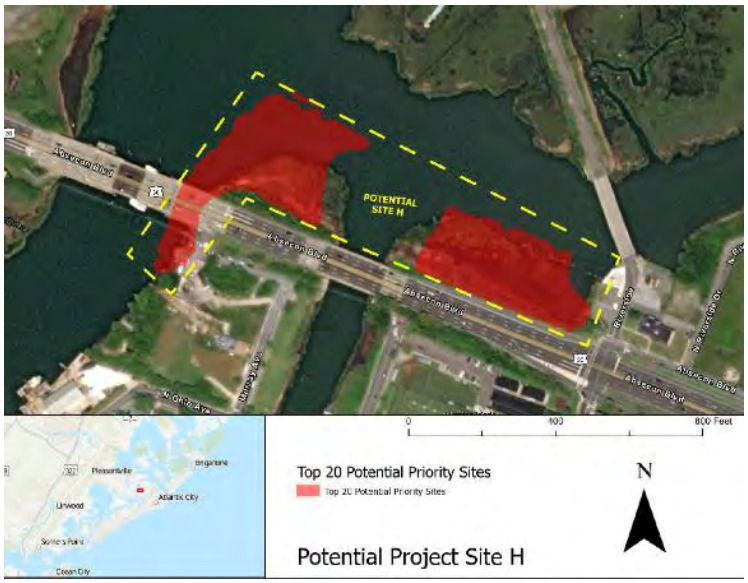
Site G



1. Rick Harter, explained this site is along Route 30 at a on/off ramp which is very close to the water. The existing marsh can be expanded and there looks to be dredge material in the vicinity.

2. Ed Dennis, explained this site is located in Absecon.

Site H

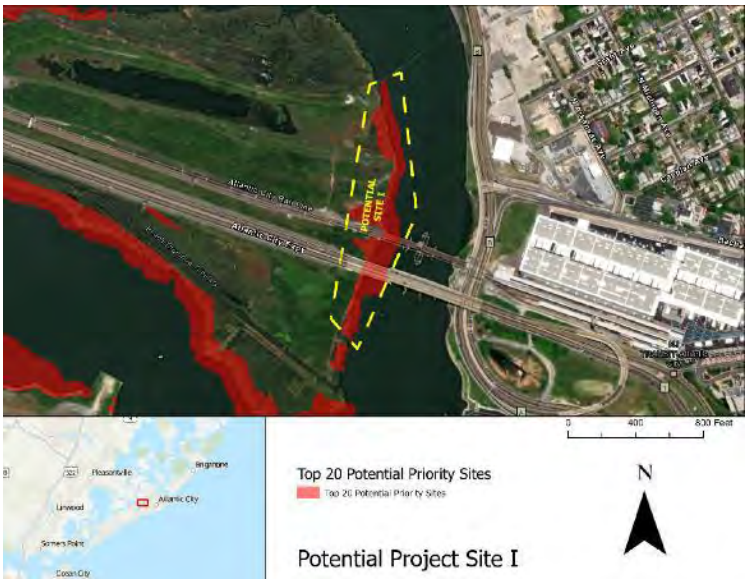


1. Rick Harter, explained this site is along Absecon Blvd.

2. Jim Rutala, explained he is unsure if this area has any flooding.

3. Rick Harter, explained this site could have scored highly because of proximity to channel, sediment source, soil properties, and the roadway. The reasons for the high score will still need to be analyzed further.

Site I



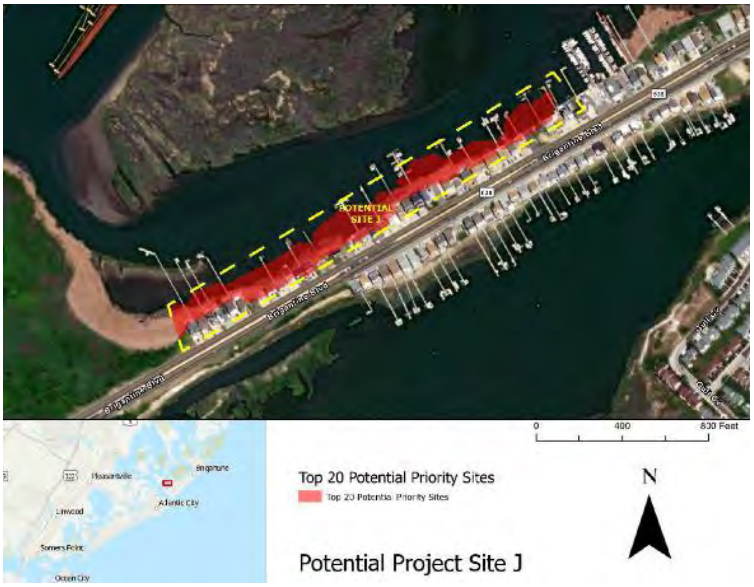
1. Rick Harter, discussed the site is underneath the Atlantic City Expressway and Atlantic City Rail Line. This area corresponds to evacuation routes, high use areas, and is in close proximity to the channel. He expanded that there are numerous living shoreline projects under bridges because it is typically public property.

2. Jim Rutala asked, if the property ownership is something that was identified and if some of the projects are on private property?

3. Rick Harter, answered the property ownership has been identified and there are a few projects located on private property. The project could also be in state tidelands and therefore be in public land.

4. Jaclyn Flor, explained that State OEM said in a recent call that private property shouldn't be ruled out because if something is currently private doesn't mean it can't be in a buyout program.

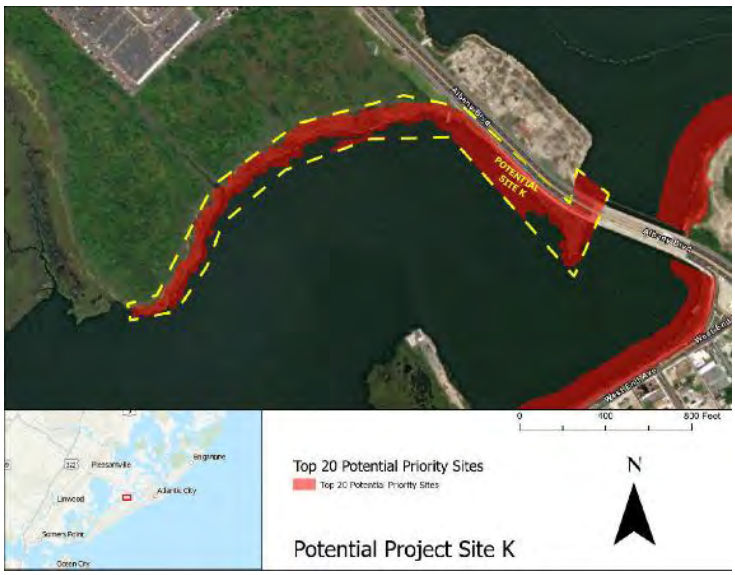
Site J



1. Rick Harter, discussed this site is along private property between boat dock and piers. There is an opportunity to create a fringing marsh without interfering with the navigability of the boats. He also explained from his experience it is hard to get the cooperation of a large number of property owners, but it is not impossible. These projects could also be totally privately funded or be used to get a matching grant.

2. Ed Dennis, explained near this area the city did street end living shorelines about 5 years ago along Brigantine Blvd.

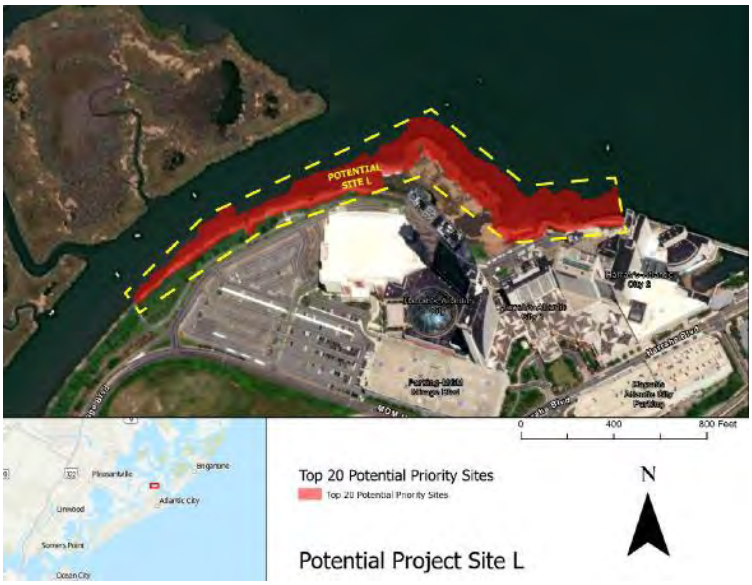
Site K



3. Rick Harter, explained this site can protect under the bridge at Albany Blvd and extends around the marsh area.

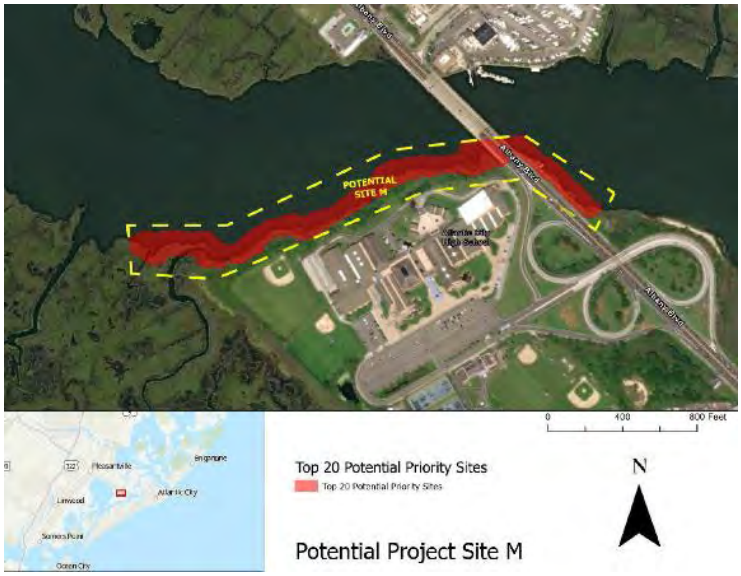
4. Jim Rutala, expanded that the area just North of the site is being purchased by the county for open space. It used to be a car dealership and everyone agrees retreat is the best option.

Site L



1. Rick Harter, explained this area has a deep-water bulkhead, but there is a large portion that is unprotected. There is an opportunity for living shoreline because of the gentle slope and the potential aesthetics.

Site M



1. Rick Harter, explained this site is to the north of Atlantic City High School. The existing shoreline is natural looking already and the site could be expanded near the cloverleaf/onramp. This site scored highly because of the roadway, school, and the elevations.

Site N

1. No comments on this site

Site O

1. Jim Rutala, explained this site is in Egg Harbor Township and Atlantic City. This site was initially proposed as a NJDEP resiliency project but was not funded. A portion of the project area has been protected with gabions.

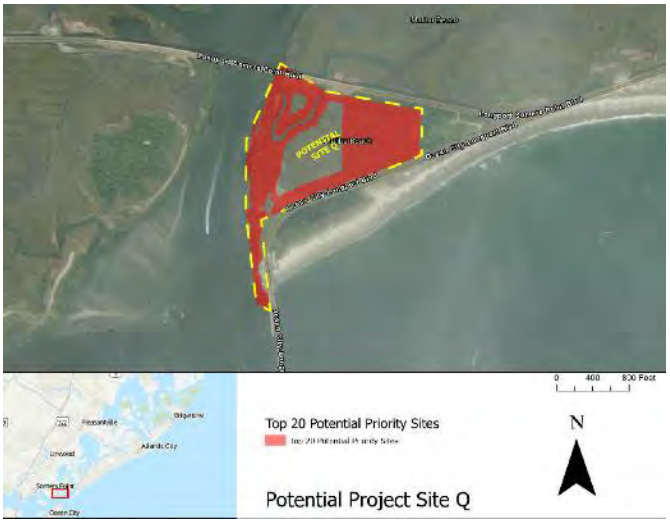
2. Rick Harter, this site is good because of the gentle slope, low elevation, and there is a large fetch to pick up the waves. He also explained that even if there is a gabion wall, revetment, seawall, or bulkhead then a living shoreline can still be incorporated. The benefits can come from the ecology, aesthetics, and recreational opportunity. Where can more information be found about the gabion wall?

3. Jim Rutala, the township engineer will have that information.

Site P

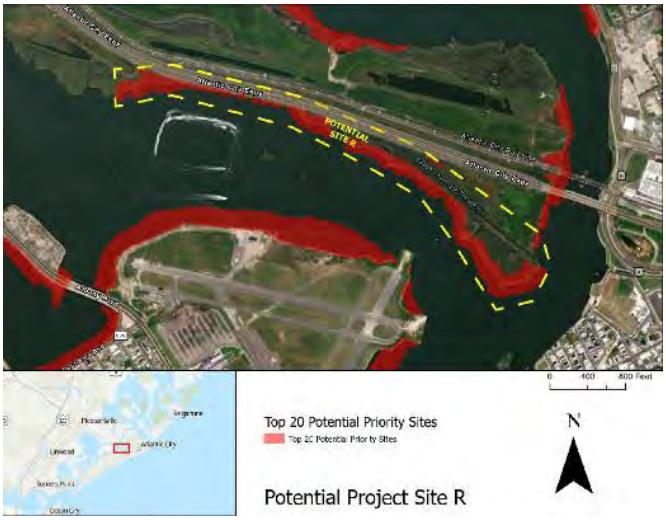
1. Rick Harter, discussed this site is around Bader Field and there is a lot of talk about changing this location so there is an opportunity to incorporate living shorelines.

Site Q



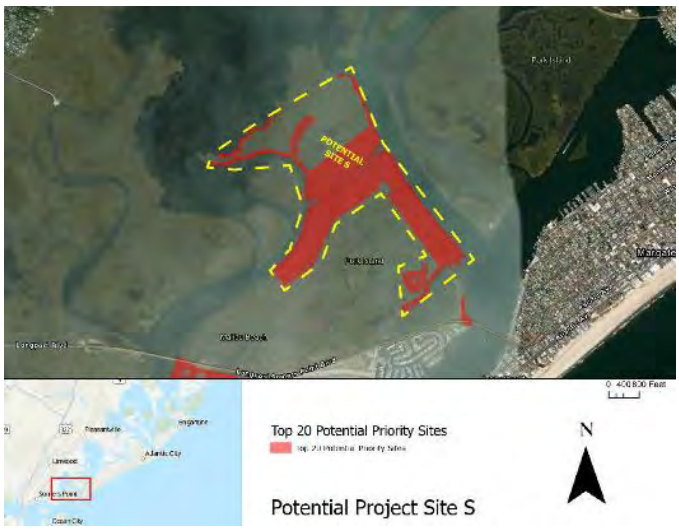
1. Rick Harter, explained the last few sites are generally marsh enhancement and beneficially reuse of dredge material sites. Site Q has a component of protecting the base of the bridge, but there is large low-lying marsh area that can be used as a beneficially reuse site.

Site R



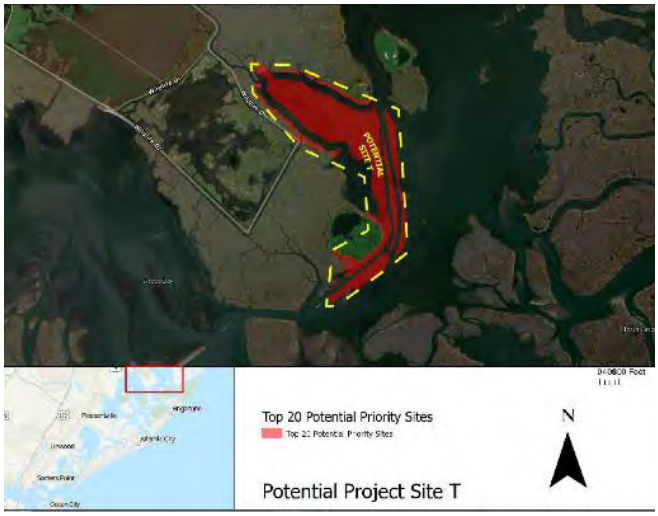
1. Rick Harter, discussed this site is along the southern edge of the Atlantic City expressway. The Expressway is located right on the waters edge and an added natural buffer will be beneficial.

Site S



1. Rick Harter, this site is largely a possibility for a beneficial reuse area because of the proximity to dredging areas, channels, marsh erosion.

Site T



1. Rick Harter, pointed out this site is at the Forsythe National Wildlife Refuge. He asked Virginia if this site will be of any help to include.

2. Virginia Rettig, Forsythe National Wildlife Refuge, said she is looking at placing material inside of the impoundments and she has not considered this site.

Closing

1. Rick Harter, explained WSP will summarize the methodology, consider the stakeholders information from the meeting, create the one-page summaries next.

2. Jim Rutala, explained there are several wetlands enhancement and protection projects that are not part of your summary. There is one at Shelter Island being worked on by Ed Dennis, a living shoreline along Ventnor West, a Lakes Bay project of Pleasantville, and there is significant

investment at Waterfront Park. There is no living shoreline proposed at Waterfront Park but there could an opportunity there to protect that investment. Additionally, there is a living shoreline to protect Bay Avenue in Somers Point in conjunction with a dredging project. Also, USACE has a floodgate system proposed along Route 30 as part of the back bay study that should include nature-based solutions.

3. Rick Harter, explained that although these projects did not score highly with the current scoring doesn't mean it is not a great project. These projects will be explored further and will be integrated into the report.

4. Peter Blum, USACE, explained they are focusing on natural and nature-based features (NNBF). The analysis done here needs to be weaved into the USACE studies and efforts so they can potentially be put together and get credits for New Jersey.

5. Robert Von Briel, NJDEP, explained he would like to utilize these nature-based features to be incorporated towards the structural projects such as the barriers and roadway raisings.

6. Rick Harter, discussed the final report will be completed soon and will be sent out to the stakeholders.

7. Amy DiCarlantonio, WSP, explained this task will be wrapped up in the next two weeks and the final report will be distributed to everyone, NJDEP, and the steering committee.

8. Jaclyn Flor, asked if the consultant team will look for comments after the final report?

9. Amy DiCarlantonio, said the comments should come in before the final report because after the submission to NJDEP this task will be wrapped up. Please send comments to Jaclyn Flor.

10. Amy DiCarlantonio closed the meeting.

Resilient NJ – November 2022 – Back Bay Project Prioritization Meeting

MEETING MINUTES

DATE: December 1, 2022

TO: All Meeting Attendees

FROM: Consultant Team

SUBJECT: Resilient NJ – November 2022 – Back Bay Project Prioritization Meeting

A meeting was held November 9, 2022 at 1:00 PM with Jim Rutala and members of the Consultant Team. The meeting was held via Microsoft Teams. The following were in attendance:

Name	Organization	Email
Rick Harter	WSP	rick.harter@wsp.com
Amy DiCarlantonio	WSP	amy.dicarlantonio@wsp.com
Jaclyn Flor	ENGenuity Infrastructure	jflor@engenuitynj.com
Jeff King	ENGenuity Infrastructure	jking@engenuitynj.com
Jim Rutala	Regional Coordinator	jmrutala@comcast.net

The following was discussed at the meeting:

I. MEETING OBJECTIVES:

1. The meeting was in follow-up to stakeholder meeting on 11/7/22.

2. Amy DiCarlantonio, WSP, started the meeting addressing how best to present the final results, top priority projects, and community projects.

3. Rick Harter, WSP, explained there has been limited opportunity to do iterations of the results to better identify other project sites. The analysis can be tweaked to incorporate specific areas based on the community input and Jim Rutala's list of projects. This can be done by adding a new dataset called "community support", or "projects in progress", etc. These would be the projects identified by the key stakeholders and by project descriptions.

4. Jim Rutala, Regional Coordinator, explained all the projects he has listed are vetted, have a conceptual design, are part of the hazard mitigation plan, and have community support or consensus from community. This final report and analysis will have high standing since it is partnered with the NJDEP and has the opportunity to elevate the current projects to potentially get funding.

5. Rick Harter, suggested WSP can also do a separate run of the analysis to prioritize restoration of public areas, with less emphasis on protecting infrastructure.

6. Amy DiCarlantonio, suggested the results can be broken up into protecting infrastructure, conservation, ecological, by funding source, and restoration.

7. Jim Rutala, explained that for some of the projects in the past, the funders all had a consensus on the projects and pooled together the money for the project. There was no applying for the grants during these projects. An example was in Atlantic City, a month after Hurricane Sandy, a report with all the needs in the area was made. The stakeholders met with the Federal and State agencies and received the funding for all the projects in the report. However, it did take a full 10 years for all the projects to be built and funded. Another similar project was the USACE engineered beaches where many people did not think it would work. However, the engineered beaches were executed and ended up working.

8. Rick Harter, explained the high scored sites based on the current scoring don't have to be higher priority. The lower scored projects are still good projects and can be elevated in priority, based on the "community support" dataset, which will be added. One benefit of this overall effort is that it can identify projects that are not obvious or known, but are high value due to some of the important needs.

9. Jim Rutala, suggested the priority sites should be the projects that have support from the communities.

10. Rick Harter, agreed to add a new dataset called "Community Support". The next steps are to create a shapefile of the boundaries of all the identified community projects. He questioned if there should be another stakeholder meeting to discuss this new development.

11. Jim Rutala, suggested send email to stakeholders with the updated information resulting from this meeting and ask the stakeholders if there are any additional projects missing.

12. Amy DiCarlantonio, suggested this group meets one more time before writing all the project sheets to go over the final results. The group can go over all the projects and make sure there is no additional work, or projects to be added to the results.

13. Meeting concluded.

Appendix B – Data Sources

Appendix B - Data Sources

Layer Name	Description	Source	Source's Layer Name	Download/Access Link	Download/ Access Date	Notes
Community Identified/Supported						
Project Boundaries	Community-supported projects identified by stakeholders	WSP, based on stakeholder input		-		Confirmed by ACCR Regional Coordinator, Jim Rutala
Elevation						
TopoBathymetry	high-resolution coastal elevation data	USGS CoNED	CoNED Bathymetry	https://topotools.cr.usgs.gov/topobathy_viewer/	10/5/2022	
Marsh						
Likelihood of Shoreline Erosion by 2050	Coastal Ecological Restoration and Adaption Plan (CERAP) Issues of Concern (IOC) data developed by Rutgers	Rutgers University CRSSA	Likelihood of Shoreline Erosion by 2050	https://njmaps1.rad.rutgers.edu/arcgis/rest/services/CERAP/CERAP_IOC_Data/MapServer/9	10/20/2022	
Tidal Marsh Classification (DEM)	A classification of tidal marsh vegetation communities of the northeastern US.	Saltmarsh Habitat and Avian Research Program (SHARP)	Tidal Marsh Vegetation Classification (no DEM), 3m, Northeast U.S.	https://databasin.org/datasets/3548be20563047bfba747b0d02f98833/	10/18/2022	DEM Clipped to 1km of the AOI
Public Access						
Boat Ramp		WSP	All Assets Merged		10/4/2022	
COE Dredge Location	Dredging locations from the Navigation Data Center	USACE	COE Dredge Location	https://geospatial-usace.opendata.arcgis.com/datasets/349ce90ebfcd47f49401ac4d817b0d58/explore?layer=4&location=7.222070%2C0.000000%2C2.88	10/18/2022	
Public Access Locations to Tidal Waterways	Point data for public accessibility of the ocean, shore and tidal waterways of NJ.	NJDEP	NJ Public Access Locations To Tidal Waterways	https://gisdata-njdep.opendata.arcgis.com/datasets/nj-public-access-locations-to-tidal-waterways	10/4/2022	
Public Parcels 2022	parcel poly dataset	NJGIN	Parcels	https://njgin.nj.gov/njgin/edata/parcels/index.html#!/	10/5/2022	Extracted parcels with appropriate property classification
Public Shoreline	public shorelines derived from parcel data	WSP		-	10/4/2022	Source Layers: esil_arc and parcels. Spatial join of public parcels and NOAA ESI shoreline data layer.
Critical Infrastructure						
Critical Infrastructure	Combined point data for child care centers, fire stations, gas stations, health care facilities/hospitals, libraries, municipal buildings, nursing home/assisted care facilities, places of worship, police stations, schools, shelter facilities, and coast guard.	WSP	new_jersey_poi		10/4/2022	
ESI Built Structures 5-meter buffer	Environmental Sensitivity Index (ESI) for Delaware/New Jersey/Pennsylvania collected, mapped, and digitized to provide environmental data for oil spill planning and response	NOAA's Ocean Service, Office of Response and Restoration (OR&R)	esil_arc	https://response.restoration.noaa.gov/esi_download#NewJersey	10/5/2022	
Marina	NJDOT Office of Maritime Resources Marine Database	NJDOT	Marina	Received as KMZ from NJDOT		
Socially Vulnerability						
Major Employer	Point data layer for major employers in proximity to AOI	WSP	Major Employer		10/3/2022	

Layer Name	Description	Source	Source's Layer Name	Download/Access Link	Download/ Access Date	Notes
Overall Social Vulnerability Index (SVI)	https://svi.cdc.gov/Documents/Data/2018_SVI_Data/SVI2018Documentation.pdf	CDC/ATSDR	CDC/ATSDR Social Vulnerability Index (SVI)	https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html	10/26/2022	
Special Use Areas (to Avoid)						
ESI Built Structures 5-meter buffer	Environmental Sensitivity Index (ESI) for Delaware/New Jersey/Pennsylvania collected, mapped, and digitized to provide environmental data for oil spill planning and response	NOAA's Ocean Service, Office of Response and Restoration (OR&R)	esil_arc	https://response.restoration.noaa.gov/esi_download#NewJersey	10/5/2022	used as proxy for some areas to avoid?
NJDEP Canals and Water Raceways	Artificial canals and raceways in New Jersey.	NJDEP	Canals and Water Raceways in New Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/canals-and-water-raceways-in-new-jersey	10/18/2022	
NJDOT Channel Boundaries	NJ Channel boundaries received as KMZ from NJDOT	NJDOT	NJDOT Channel Prioritization V2.kmz		10/11/2022	
Orsted OM Facility	digitized from pdf obtained from EngenuityNJ	Engenuity Infrastructure NJ			10/10/2022	
Shellfish Leases	shellfish leasing program within the Atlantic Coast and Delaware Bay regions of New Jersey	NJDEP	Shellfish Leases in New Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/shellfish-leases-in-new-jersey	10/5/2022	
USACE Channel Quarter	Navigation channels maintained by USACE districts	USACE	ChannelQuarter	https://geospatial-usace.opendata.arcgis.com/datasets/9227967a2748410983352b501c0c7b39_3/explore?location=13.628634%2C81.963280%2C2.64	10/5/2022	
USACE Waterway Network	Layers from the Navigation Data Center	USACE	Waterway Network	https://geospatial-usace.opendata.arcgis.com/datasets/349ce90ebfcd47f49401ac4d817b0d58_7/explore?location=5.293961%2C0.000000%2C2.64	10/18/2022	
Transportation						
Bike Paths	Bike paths in Atlantic County	Atlantic County	AtlCoBikePathsExistProp	https://www.atlantic-county.org/gis/data-downloads.asp	10/3/2022	
Bus Route	Bus route line feature, NJ Transit	NJOIT, OGIS	NJ Transit GIS Department	https://services6.arcgis.com/M0t0HPE53pFK525U/ArcGIS/rest/services/Bus_Lines_of_NJ_Transit/FeatureServer/1	10/5/2022	
Evacuation Routes – 10-meter buffer		HIFLD	Hurricane Evacuation Routes	https://hifld-geoplatform.opendata.arcgis.com/datasets/hurricane-evacuation-routes-1/about	10/6/2022	Buffered road centerlines to 10 meters
Passenger Railroad Lines	Passenger railroad lines name, service	FRA	Passenger_Railroad_Lines_in_New_Jersey		10/4/2022	
Roads 3-meter	Derived from Atlantic County Roads centerline layer	Atlantic County	Transportation17.gdb 'Roads_LineFeature'	https://www.atlantic-county.org/gis/data-downloads.asp	10/4/2022	3-meter buffer of Atlantic Co. roads centerline layer
Transportation Assets	Combined point data for Airports/Heliports, Bridges, Bus stops, Ferry Landings, and Train Stations	WSP	TransportationAssets		10/3/2022	Utilized compiled data layer developed by WSP
Other Areas to Protect						
Archaeological Site	Centerpoints of grid used	NJDEP	Archaeological_Site_Grid_of_New_Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/archaeological-site-grid-of-new-jersey/explore?location=39.392119%2C-74.471009%2C12.78	10/3/2022	
Areas where Tourism Predominates	This dataset contains the boundaries of areas within Atlantic City where tourism predominates	NJDEP	Atlantic City Tourist District Boundaries		10/4/2022	
Building Footprints	polygon layer extract of building footprints generated by Microsoft using deep learning	Microsoft	Microsoft Building Footprints - Features	ArcGIS Online data layer	10/4/2022	

Layer Name	Description	Source	Source's Layer Name	Download/Access Link	Download/ Access Date	Notes
Historic Properties	converted parcel data to points	NJDEP	Historic Properties of New Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::historic-properties-of-new-jersey/about	10/6/2022	
Natural Heritage Priority Sites in New Jersey	Critically important areas identified to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities.	NJDEP	Natural Heritage Priority Sites in New Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/natural-heritage-priority-sites-in-new-jersey/explore?location=40.128428%2C-74.753600%2C9.03	10/5/2022	Sites within 1km of AOI used
NJEMS Known Contaminated Site	The Known Contaminated Sites List (KCSNJ) for New Jersey are those sites and properties within the state where contamination of soil or ground water has been confirmed at levels equal to or greater than applicable standards.	NJDEP	Envr_NJEMS_KCSL	https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::known-contaminated-site-list-for-new-jersey/about	10/5/2022	
Underground Storage Tank Facility	Locations of underground storage tank facilities in New Jersey maintained by NJDEP.	NJDEP	Underground Storage Tank Facilities in New Jersey	https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::underground-storage-tank-facilities-in-new-jersey/explore?location=40.134330%2C-74.744100%2C9.02	10/5/2022	
USACE Placement Areas (from Dredging)	placement areas from dredging	USACE	USACE Placement Areas	https://geospatial-usace.opendata.arcgis.com/maps/aed16678ea814ddc8fdb5d96f723d90b/about	10/18/2022	
Utility Infrastructure	Combined point data for water well, recycling center, sewage pumping station, power plant, electric substation, sewer lift station, waste water treatment facility.	WSP		https://gisdata-njdep.opendata.arcgis.com/	10/4/2022	EPA and NJDEP data

Appendix C – Priority Site Summary Sheets

Absecon Bay Habitat Enhancement

Pleasantville, NJ

RESILIENT NJ

Project Overview

This community-identified project is located south of E. Delilah Road within Absecon Bay. The site is characterized by high tidal marsh that extends to the north, south, and east of the site. The site has been identified for marsh enhancement, which would improve the habitat quality of the marsh while providing coastal flood attenuation benefits for residential areas of Pleasantville to the west and road infrastructure to the north. As identified on the enclosed concept plan, intertidal wetland enhancement would be accomplished through hydrologic and hydraulic improvement or invasive species eradication and replanting with native plants.

Project Benefits

- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality and aquatic habitat for fish and shorebirds

Recommended Restoration Approach

Marsh enhancement and hydrologic and hydraulic improvements to restore a more natural tidal flow through the existing marsh system. Invasive species eradication and replanting in other areas.

Potential Project Partners

PLEASANTVILLE

The Nature Conservancy New Jersey

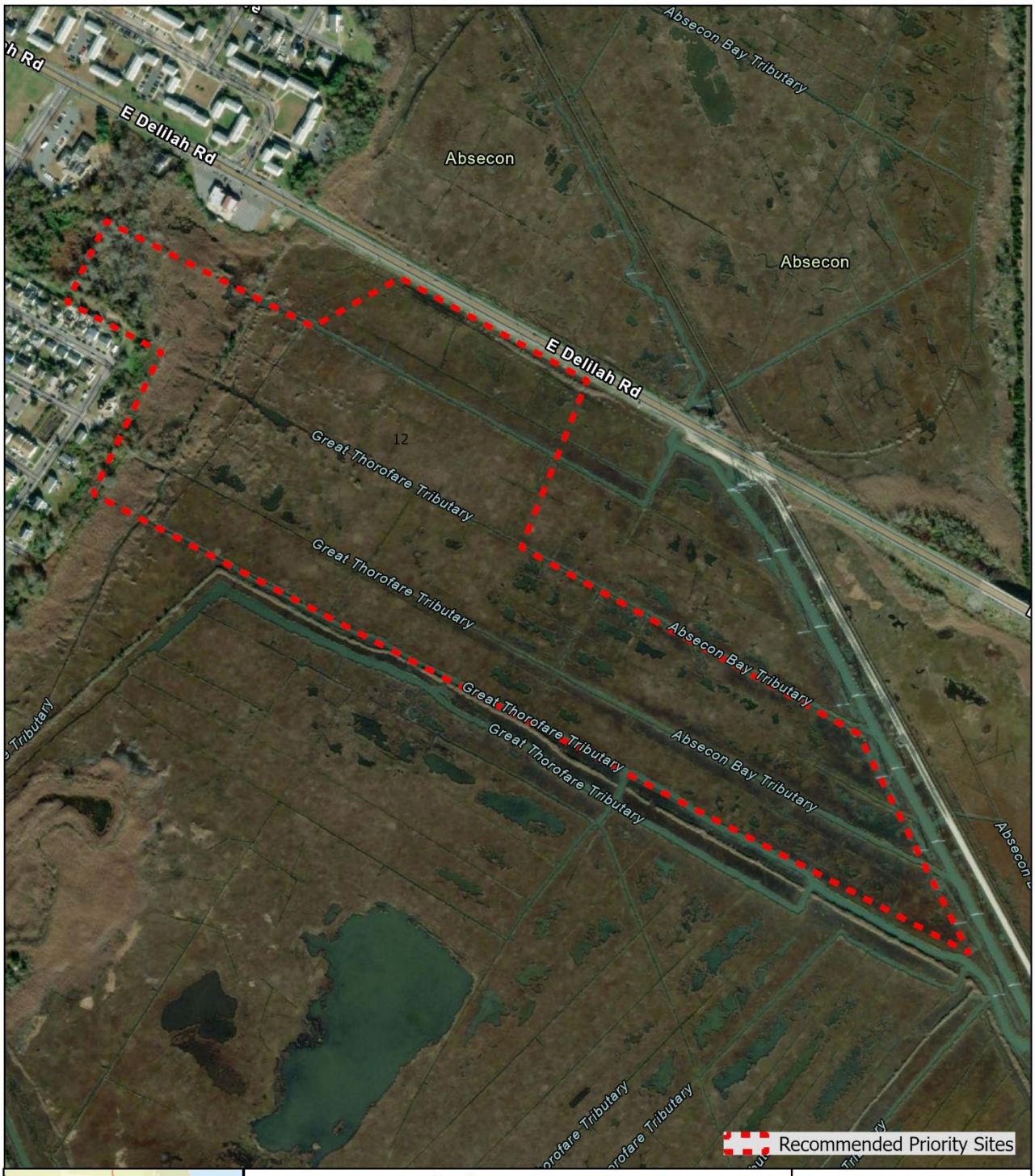
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOAA

U.S. FISH & WILDLIFE SERVICE

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration (NOAA): Community-Based Restoration
- NOAA: Coastal Resilience Grants for Coastal Communities
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters program; on-the-ground wetland, riparian, in-stream, and/or coastal habitat restoration
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore, and enhance coastal wetland ecosystems and associated uplands
- New Jersey Department of Environmental Protection: Shore Protection Program; protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues



Recommended Priority Site:
Absecon Bay Habitat Enhancement

New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar

RESILIENT NJ

Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

N

0 265 530 Feet

0 90 180 Meters


E Dalilah Rd
Chatham Ave
Glenview Ave
New Jersey
Absecon Bay Ecosystem & Community Resilience Project Map
Concept Plan
LEGEND
PROJECT BOUNDARY
PROPOSED TIDAL CREEK
MITIGATION AREAS
FRESHWATER WETLAND ENHANCEMENT (INVASIVE SPECIES ERADICATION & REPLANTING) 1.68 ACRES
INTERTIDAL WETLAND ENHANCEMENT (INVASIVE SPECIES ERADICATION) 14.95 ACRES
INTERTIDAL WETLAND ENHANCEMENT (HYDROLOGIC & HYDRAULIC ENHANCEMENT) 37.62 ACRES
UPLAND ENHANCEMENT (INVASIVE SPECIES ERADICATION & REPLANTING) 0.62 ACRES
N
1 inch = 300 feet
Feet
0 150 300
GreenVest
4201 Northview Drive, Suite 202
Bowie, MD 20716
410-987-5500
Date Figure Created: 1/25/2022

Amherst Cut (Pork Island)

Egg Harbor Township, NJ

RESILIENT NJ

Project Overview

Located on the eastern end of Pork Island within the larger Pork Island Wildlife Management Area and south of Margate-Northfield Boulevard in Egg Harbor Township, this project would restore previously dredged areas to reestablish the historic footprint of the tidal marsh using dredged material. While this project did not rank high for public access, critical facilities, or social vulnerability, it is a community-identified project with high habitat benefits. Extensive low tidal marsh exists to the west of the project area, and this project represents an opportunity to increase the abundance and interconnection of marsh habitats within and adjacent to the wildlife management area.

A desktop study was completed for the site that provides additional background on the site to inform project implementation (*Amherst Cut Ecological Project Review – Desktop Analysis*, November 2017). For example, mapping of erosion and accretion areas over time offers insight into the historic extent of tidal marsh in the project area.

Project Benefits

- Enhanced ecosystem services, including improved water quality and shellfish habitat
- Increased marsh footprint for flood attenuation

Recommended Restoration Approach

The restoration design should replace sediment in previously dredged areas to restore elevations to allow marsh growth and reestablish the historic footprint of marsh. An assessment of site conditions—including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others—should be used to determine dredge material placement location and methodology as part of the design process.

Potential Project Partners

NOAA

Township of Egg Harbor — Founded 1710

The Nature Conservancy New Jersey

U.S. Fish & Wildlife Service

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters program; includes coastal habitat restoration
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore, and enhance coastal wetland ecosystems and associated uplands
- New Jersey Corporate Wetlands Restoration Project


Pork Island
Fare Tributary
06
Fremont Ave
N Union
N Wilson Ave
N Harding Ave
Recommended Priority Sites
322
Atlantic
9
Recommended Priority Site:
Amherst Cut (Pork Island)
New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet
N
0 265 530 Feet
0 90 180 Meters

Bader Field

Atlantic City, NJ

RESILIENT NJ

Project Overview

The redevelopment of Bader Field in Atlantic City is of regional importance. The entire shoreline surrounding Bader Field has been identified for the potential implementation of a living shoreline project. Areas along the northern shoreline have a high likelihood of future shoreline erosion, and the site is located within an area rated medium for social vulnerability, as defined by the Centers for Disease Control under their Social Vulnerability Index. Additionally, the airfield is a historic property, and Albany Boulevard is located along the southern boundary of the site.

The 1930 aerial image to the right shows the historic marsh footprint prior to the dredging of Amherst Cut.

Project Benefits

- Erosion risk reduction to disadvantaged communities
- Community resilience benefit through coastal erosion reduction

Recommended Restoration Approach

The living shoreline design should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach. Options for the living shoreline may include marsh sills, breakwaters, joint planted revetments, living reefs, and reef balls.

Potential Project Partners

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

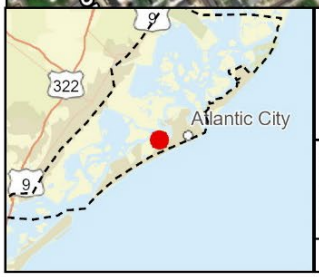
NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

ATLANTIC CITY

NOAA

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- New Jersey Department of Environmental Protection: Shore Protection Program; protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues



Recommended Priority Site: Bader Field

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RESILIENT NJ

Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

N

0 265 530 Feet

0 90 180 Meters

Somers Point – Bay Avenue

Somers Point, NJ

RESILIENT NJ

Project Overview

This community-identified project is located east of Bay Avenue, between E. Ocean Avenue and Groveland Avenue. The project site is located on a series of public parcels within mapped tidal marsh primarily composed of invasive Phragmites. Additional mapped areas of low and high marsh exist adjacent to the site to the north. There are areas of moderate and high likelihood of shoreline erosion along the entire edge of marsh on the eastern boundary of the project site. Additionally, eight individual outfalls along the shoreline adjacent to the project site drain over 125 acres into the bay. The proposed project focuses on reducing runoff and improving stormwater quality by creating a living shoreline in the form of a vegetated berm along Bay Avenue and eliminating the outfalls so that stormwater would run into a bioretention swale. The berm would protect the shoreline and various low-lying infrastructure located within Somers Point.

Project Benefits

- Community resilience benefit and infrastructure protection through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality

Recommended Restoration Approach

The restoration design for a vegetated berm and marsh enhancement should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach to the vegetated berm.

Potential Project Partners

New Jersey Department of Environmental Protection

NOAA

The Nature Conservancy New Jersey

Somers Point

U.S. Fish & Wildlife Service

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- Federal Emergency Management Agency: Building Resilient Infrastructure and Communities
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency – The Five Star and Urban Waters program: On-the-ground wetland, riparian, in-stream and/or coastal habitat restoration
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program – Protect, restore and enhance coastal wetland ecosystems and associated uplands
- New Jersey Department of Environmental Protection Shore Protection Program: Protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise


E Wilmont Ave
Sunny Ave
Bay Ave
09
152
152
Recommended Priority Sites
322
9
Recommended Priority Site:
Somers Point - Bay Ave
New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet
N
0 220 440 Feet
0 75 150 Meters

Forsythe National Wildlife Refuge

Galloway Township, NJ

RESILIENT NJ

Project Overview

This site, located within the Edwin B. Forsythe National Wildlife Refuge east of the Refuge Headquarters, includes Perch Cove and Little Bay and the southern half of Shad Island. The site comprises existing marsh habitat, ranging from high marsh along the shorelines, southern half of Shad Island, and inland areas beyond the site, to open water. Medium to high likelihood of shoreline erosion occurs along the shoreline throughout the site. The proposed project would use dredge material to elevate and expand the marsh community and protect it from shoreline erosion.

Although refuge staff have identified opportunities to use dredge sediments to enhance the impoundments, this site could provide additional habitat and enhance protection of the wildlife refuge to future storms.

Project Benefits

- Enhanced ecosystem services, including coastal erosion reduction, improved water quality and fish habitat

Recommended Restoration Approach

The restoration design for beneficial use of dredged material to elevate and expand the marsh should be based on an assessment of site conditions—including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others. This will determine dredge material placement location and process.

Potential Project Partners

RESTORE AMERICA'S ESTUARIES

The Nature Conservancy New Jersey

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands.
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters program; on-the-ground wetland, riparian, in-stream and/or coastal habitat restoration
- New Jersey Corporate Wetlands Restoration Project

Recommended Priority Site: Forsythe NWR

New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, Maxar, New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

RESILIENT NJ

Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

N

0 500 1,000 Feet

0 295 590 Meters

Lakes Bay Area

Pleasantville, NJ

RESILIENT NJ

Project Overview

The Lakes Bay Area project site is located north of Stillwater County Park in Pleasantville, east of Clematis Avenue along the shore of Lakes Bay. Approximately half of the site (eastern half) is composed of tidal marsh, and several small tributaries transect the site. In the northeastern portion of the site, two public access points to Lakes Bay are available, and a public parcel occupies the southernmost portion of the site. The entire shoreline is rated as moderate and high with respect to likelihood of erosion. This community-identified marsh enhancement project would increase protection of the existing marsh area, decrease coastal erosion, and provide enhanced recreational opportunities.

The New Jersey Department of Environmental Protection purchased four parcels within the northernmost portion of the site—between East Park Avenue and just south of Frambes Avenue—through Blue Acres funding.

Project Benefits

- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality, fishing habitat, and recreation opportunities

Recommended Restoration Approach

The marsh enhancement with dredged sediments design should be based on an assessment of site conditions, including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others to determine dredge material placement location and process.

Potential Project Partners

PLEASANTVILLE

U.S. FISH & WILDLIFE SERVICE

NOAA

NATIONAL FISH AND WILDLIFE FOUNDATION

NFWF

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; on-the-ground wetland, riparian, in-stream and/or coastal habitat restoration
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands.


Ryon Ave
E Park Ave
Frambes Ave
Clematis Ave
Lakes Bay Tributary
Lakes Bay Tributary
Lakes Bay Tributary
Recommended Priority Sites
Recommended Priority Site:
Lakes Bay Area
322
9
N
0 265 530 Feet
0 90 180 Meters
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

SE Side Route 152 Bridge

Longport, NJ

RESILIENT NJ

Project Overview

The Malibu Beach marsh site is located on the southeast side of the Longport Somers Point Boulevard (Route 152) bridge, between Ocean City-Longport Boulevard. The site is largely made up of a mixture of high and low marsh and has a medium and high likelihood of erosion along the extent of its shoreline. The proposed project would enhance the existing high and low marsh using dredged sediments, possibly by thin-layer placement. In addition to enhancing the existing marsh habitat, the project would add protection for the existing roadways adjacent to the site.

The site is located close to a navigation channel, and the U.S. Corps of Army Engineers has already identified the eastern portion of the site as a potential dredged material placement area, but this area could be expanded to the west for greater benefits.

Project Benefits

- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality and aquatic habitat

Recommended Restoration Approach

The marsh enhancement with dredged sediments design should be based on an assessment of site conditions, including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others to determine dredge material placement location and process.

Potential Project Partners

The Nature Conservancy New Jersey

RESTORE AMERICA'S ESTUARIES

NOAA

Longport

U.S. FISH & WILDLIFE SERVICE

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters program; on-the-ground wetland, riparian, in-stream and/or coastal habitat restoration
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands.
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues


Longport Somers Point Blvd
Malibu Beach
Ocean City-Lo
Ocean Ci
PrioritySitesDec4
322
9
Living Bay Master Plan Priority Site:
SE Side Route 152 Bridge
New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet
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Km
0
0.07
0.15

Shelter Island

Ventnor and Margate, NJ

RESILIENT NJ

Project Overview

Shelter Island is located north of Ventnor City, within Shelter Island Bay west of Turtle Gut. Its marsh area was excavated between 1925 and 1930 to provide sediment to fill marsh areas on Absecon Island. This resulting approximately 44-acre "dredge hole" is a deep open water area with degraded habitat. The remaining shoreline on Shelter Island has experienced significant erosion and loss of the marsh.

Stockton University, in partnership with the City of Margate, proposed a project to address these issues. The project, which is close to an existing navigation channel, would consist of the beneficial use of dredged material to fill the dredge hole, reestablish the historic salt marsh, and provide better storm protection for the barrier island. The resultant high salt marsh would provide habitat for a variety of shorebirds. Additionally, the restored marsh would reduce storm wave propagation and subsequent impacts on the developed properties along the bay in the vicinity of Shelter Island.

Project Benefits

- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality, shorebird habitat, and shoreline flooding

Recommended Restoration Approach

The restoration design incorporating beneficial use of dredged material to elevate and expand marsh should be based on an assessment of site conditions, including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others to determine dredge material placement location and process.

Potential Project Partners

NOAA

NFWF

Margate City New Jersey

The Nature Conservancy New Jersey

U.S. Fish & Wildlife Service

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; on-the-ground wetland, riparian, in-stream and/or coastal habitat
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues


Recommended Priority Sites
322
9
Atlantic Ci
Recommended Priority Site:
Shelter Island
New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet
N
0 220 440 Feet
0 75 150 Meters

Raleigh Avenue & South Boulevard

Atlantic City, NJ

Project Overview

This L-shaped, linear community identified project is located in Atlantic City, along South Boulevard on the southern end and Raleigh Avenue on the western end. While the site as a whole does not score highly for erosion likelihood, the southernmost corner of the project site, near the intersection of South Boulevard and North Raleigh Avenue, does have a small area rated high for erosion likelihood. Additionally, the site is rated medium for social vulnerability, as defined by the Centers for Disease Control under the Social Vulnerability Index. Previously completed projects illustrate challenges associated with erosion and/or coastal flooding. These include a previously funded Hurricane Sandy project that consisted of a bulkhead along South Boulevard. This proposed project would augment that bulkhead with a living shoreline. Additionally, over 3,100 linear feet of sand berm were installed previously along Raleigh Avenue, and this proposed project would create a vegetated berm in the same footprint. Due to the site's proximity to a navigation channel and areas identified for potential placement of dredged material, construction feasibility is considered high.

Project Benefits

- Erosion risk reduction to disadvantaged communities
- Community resilience benefit through coastal erosion reduction

Recommended Restoration Approach

The design of a living shoreline below the existing bulkhead (South Boulevard) and new vegetated berm (Raleigh Avenue) should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach.

Potential Project Partners

NOAA

NFWF

U.S. Fish & Wildlife Service

New Jersey Department of Environmental Protection

ATLANTIC CITY

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; on-the-ground wetland, riparian, in-stream and/or coastal habitat
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands.
- New Jersey Department of Environmental Protection: Shore Protection Program, protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise


West End Ave
N Annapolis Ave
N Dover Ave
Crossan Ave
Wisteria Rd
Harbor Rd
Filbert Ave
Chelsea Heights
Rec Complex
Warrena Rd
Inside Thorofare Tributary
Ridgeway Rd
Windsor Rd
N Elberon Ave
Porter Ave
N Richmond Ave
Stewart Ave
N Raleigh Ave
Boulevard Ave
Sunset Ave
Recommended Priority Sites
322
Atlantic City
Recommended Priority Site:
Raleigh Ave & South Blvd
New Jersey Office of GIS, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS, Esri Community Maps Contributors, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar, Microsoft
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet
N
0 175 350 Feet
0 63 125 Meters

Tunis Cove & Bay Drive

Pleasantville and Egg Harbor Township, NJ

RESILIENT NJ

Project Overview

This 4,500-linear-foot section of publicly owned shoreline in Pleasantville has significant wave exposure and flooding from tides and storm events, which threatens a nearshore roadway (Black Horse Pike). Other infrastructure at risk includes numerous buildings, including three historic properties. Extensive tidal marsh exists to the southwest of the shoreline section, and this project represents an opportunity to increase the abundance and interconnection of marsh habitats within this part of the bay. The entire length of shoreline is public, and one marina with boat ramp is located to the southwest, providing easy access for the public to enjoy the benefits of the project. This site is located within an area rated high for social vulnerability, as defined by the Centers for Disease Control under their Social Vulnerability Index. Feasibility for design and construction are high due to the proximity of a nearby boat ramp and associated channels, the gently sloping elevations, and easy access from the nearby roadway across public land.

Project Benefits

- Erosion and flood risk reduction to disadvantaged communities
- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services, including improved water quality, fishing habitat, and recreation opportunities

Recommended Restoration Approach

A restoration design consisting of intertidal marsh planting, possibly with a stone sill, should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach.

Potential Project Partners

Pleasantville

Restore America's Estuaries

U.S. Fish & Wildlife Service

NOAA

New Jersey Department of Environmental Protection

The Nature Conservancy New Jersey

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- NOAA: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; on-the-ground wetland, riparian, in-stream and/or coastal habitat
- USFWS: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands
- New Jersey Department of Environmental Protection: Shore Protection Program, protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues


Old Tpke
Milan Ave
Black Horse Pike
Bay Dr
Bay Dr
Bay Dr
E Bayview Ave
Atlantic City Expy
Great Thorofare Tributary
322
11
Recommended Priority Sites
Recommended Priority Site:
Tunis Cove & Bay Dr
N
0 445 890 Feet
0 155 310 Meters
RESILIENT NJ
Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

Ventnor West

Ventnor, NJ

Project Overview

The community-identified project site is a 150-acre open space area owned by Ventnor called Ventnor West, located between Ventnor West and Shelter Island. It is being considered for a living shoreline to stabilize the coastline, coupled with open space preservation and protection as a wildlife sanctuary. It is an area that was previously used as a landfill, and most of the site is composed of wetlands that are eroding quickly; erosion rates are between 1 foot to 3 feet per year along the shoreline.

Recently, the City of Ventnor applied for a New Jersey Department of Environmental Protection (NJDEP) grant to build a living shoreline along the edge of the area to stabilize the coastline and maintain upland and aquatic habitat. The project description and grant proposal developed for the NJDEP grant includes a nature-based living shoreline comprising biodegradable fiber logs, coir mats, bagged oyster shells, and plantings with an optional bulkhead. However, a more significant project could be developed to restore the wetlands and reduce wave action. Construction feasibility is considered high due to the site's proximity to an existing navigation channel.

Project Benefits

- Community resilience benefit through coastal erosion reduction and wave attenuation
- Enhanced ecosystem services, including improved water quality, increased biodiversity in the tidal marsh, promotes shellfish ecology and ecotourism opportunities

Recommended Restoration Approach

The design of the living shoreline with tidal marsh enhancement should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach.

Potential Project Partners

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- NJDEP Shore Protection Program: Protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise
- New Jersey Corporate Wetlands Restoration Project
- Wells Fargo and NFWF Environmental Solutions for Communities Initiative
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; includes coastal habitat
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues

Recommended Priority Site:
Ventnor West

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RESILIENT NJ

Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

N

0 265 530 Feet

0 90 180 Meters

West End Avenue

Ventnor City, NJ

Project Overview

The West End Avenue project site is located between North Little Rock Avenue and Albany Boulevard in Ventnor City, New Jersey, and focuses on the shoreline north of the roadway. The shoreline within the project site has a medium/high rating for likelihood of erosion and experiences coastal wave action. The site has a medium/high ranking for public access and a medium rating for transportation. Additionally, portions of the site rank medium for social vulnerability, as defined by the Centers for Disease Control under the Social Vulnerability Index. This community-identified project would create a living shoreline below the existing bulkhead along West End Avenue/Wellington Avenue. It is considered to have high construction feasibility due its proximity to proposed dredged material placement areas, a navigation channel, and nearby road access.

Project Benefits

- Erosion risk reduction to disadvantaged communities
- Community resilience benefit through coastal erosion reduction
- Enhanced ecosystem services including coastal wave attenuation

Recommended Restoration Approach

The design of the living shoreline should be based on an assessment of site conditions and consideration of the Stevens Institute of Technology's *Living Shorelines Engineering Guidelines* to determine a customized approach. Options may include marsh sills, breakwaters, joint planted revetments, living reefs, and reef balls as outlined in the *Guidelines*.

Potential Project Partners

Potential Funding Sources

- National Fish and Wildlife Foundation: National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Community-Based Restoration
- New Jersey Department of Environmental Protection: Shore Protection Program; protect public and private property and infrastructure from coastal storm damage and erosion and sea level rise
- Ocean Wind Pro-NJ Grantor Trust: Coastal infrastructure and resiliency projects to combat tidal flooding and erosion issues

Recommended Priority Site: West End Ave

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RESILIENT NJ

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Pork Island Wildlife Management Area - West Side of Risley Channel

Egg Harbor Township, NJ

RESILIENT NJ

Project Overview

This project site is located in Egg Harbor Township, New Jersey, within the Pork Island Wildlife Management Area. It is predominantly high marsh, with areas of low marsh, open water, mudflats, and Phragmites interspersed. The shorelines of the marsh within the project area are rated as medium/high for erosion potential. The proposed project would elevate and expand the tidal marsh using dredged material. Construction feasibility for the project is considered high because of the proximity to a navigation channel and identified dredged material placement areas.

Project Benefits

- Enhanced ecosystem services, including improved water quality, fish and aquatic habitat

Recommended Restoration Approach

The restoration design for beneficial use of dredged material to elevate and expand marsh should be based on an assessment of site conditions, including tidal range, shoreline characteristics, hydrology, current, existing soil chemical properties, and others to determine dredge material placement location and process.

Potential Project Partners

RESTORE AMERICA'S ESTUARIES

The Nature Conservancy New Jersey

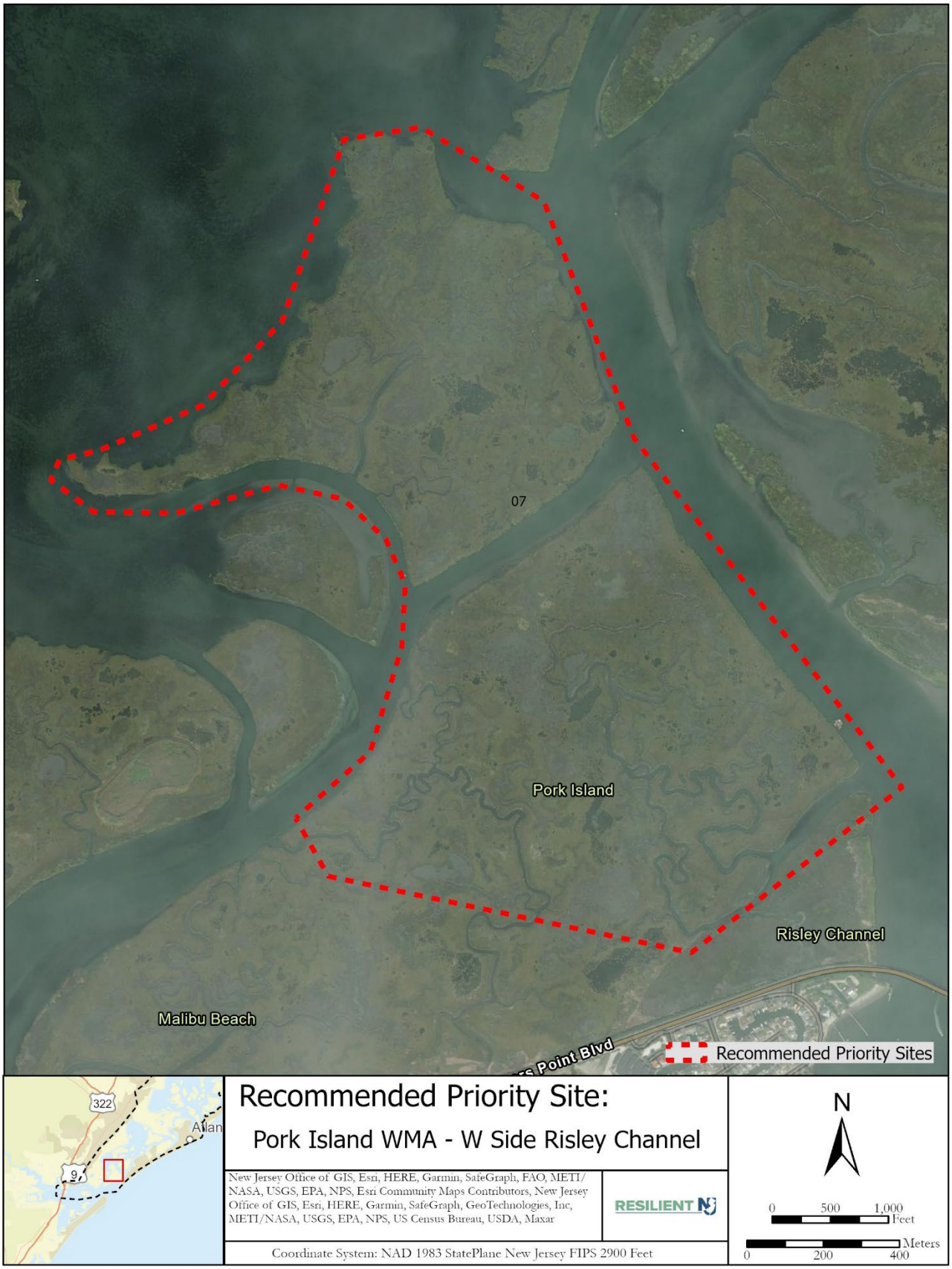
U.S. Fish & Wildlife Service

New Jersey Department of Environmental Protection

NOAA

Potential Funding Sources

- National Fish and Wildlife Foundation (NFWF): National Coastal Resilience Fund
- National Oceanic and Atmospheric Administration: Coastal Resilience Grants for Coastal Communities
- NFWF, Wildlife Habitat Council, U.S. Environmental Protection Agency: The Five Star and Urban Waters Program; on-the-ground wetland, riparian, in-stream and/or coastal habitat
- U.S. Fish and Wildlife Service: National Coastal Wetlands Conservation Grants Program; protect, restore and enhance coastal wetland ecosystems and associated uplands
- New Jersey Corporate Wetlands Restoration Project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Pork Island
Risley Channel
Malibu Beach
Point Blvd
Recommended Priority Sites
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Recommended Priority Site:
Pork Island WMA - W Side Risley Channel
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