Climate Resilience Design Standards Tool Project Report

FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment

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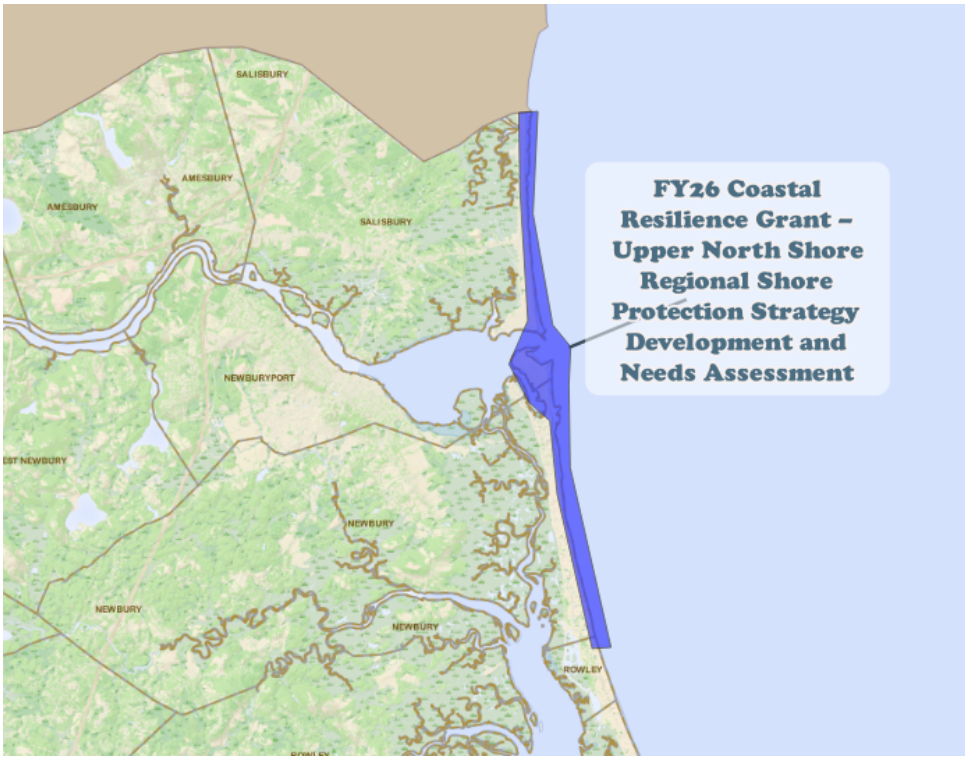
Project Summary

Link to Project

Estimated Capital Cost: $25739.55
End of Useful Life Year: 2026
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Moderate
Exposure	**Scores**
Sea Level Rise/Storm Surge	High Exposure
Extreme Precipitation - Stormwater Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	High Exposure
Extreme Heat	High Exposure



Asset Preliminary Climate Risk Rating Summary

Number of Assets: 6

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Stormwater Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Salisbury Beach	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			
Newburyport/ Plum Isalnd	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			
Newbury/ Plum Island	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			
Salisbury	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			
Newbury	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			
Newburyport	—— Natural Resource project assets do not receive a preliminary climate risk rating. ——			

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Salisbury Beach	2030				
Newburyport/ Plum Isalnd	2030				
Newbury/ Plum Island	2030				
Salisbury	2030				

Newbury	2030		
Newburyport	2030		
Extreme Precipitation			
Salisbury Beach	2030		Tier 1
Newburyport/ Plum Isalnd	2030		Tier 1
Newbury/ Plum Island	2030		Tier 1
Salisbury	2030		Tier 1
Newbury	2030		Tier 1
Newburyport	2030		Tier 1
Extreme Heat			
Salisbury Beach	2030	50th	Tier 1
Newburyport/ Plum Isalnd	2030	50th	Tier 1
Newbury/ Plum Island	2030	50th	Tier 1
Salisbury	2030	50th	Tier 1
Newbury	2030	50th	Tier 1
Newburyport	2030	50th	Tier 1

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "High Exposure" because of the following:

- Located within the predicted mean high water shoreline by 2030
- Exposed to the 1% annual coastal flood event as early as 2030
- Historic coastal flooding at project site

Extreme Precipitation - Stormwater Flooding

This project received a "High Exposure" because of the following:

- Historic flooding at the project site
- No increase to impervious area
- Maximum annual daily rainfall is within 6 to 10 inches within the overall project's useful life
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "High Exposure" because of the following:

- Project site has a history of riverine flooding
- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 200ft of a waterbody and less than 30ft above the waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- Less than 10% of the existing project site has canopy cover
- 10 to 30 day increase in days over 90 deg. F within project's useful life
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site
- No tree removal

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Salisbury Beach
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Asset - Newburyport/ Plum Isalnd
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Asset - Newbury/ Plum Island
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Asset - Salisbury
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Asset - Newbury
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Asset - Newburyport
Primary asset criticality factors influencing risk ratings for this asset:

No score available

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Salisbury Beach — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				
2030	6.1	5.8	1.4	-2.9	-3.1

This project is located in an area with uncertainty for future tidal datums. These uncertain zones are either dynamic in terms of geomorphology or are restricted by manmade features (i.e., culverts, tide gates, etc.) that should be evaluated in more detail at the site-scale.

Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Salisbury Beach	2030	5% (20-Year)	9.9	6.9	9.2

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Salisbury Beach	2030	5% (20-Year)	14.7	6.9	10.0

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
Salisbury Beach	2030	5% (20-Year)	28.0	0.0	12.4

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

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Applicable Design Criteria

Tiered Methodology: Tier 1

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Salisbury Beach	2030	25-Year (4%)	7.3	Downloadable Methodology PDF

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

ATTENTION: This is a Tier 1 project. It is advised to compare the extreme precipitation output values to the NOAA+ methodology to calculate total precipitation depth for 24-hr design storms.

This methodology can be found in the following PDF. (Link).

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Salisbury Beach	2030	50th	50.73	70.79	30.33

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: NOT APPLICABLE

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: NOT APPLICABLE

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: NOT APPLICABLE

Asset: Newburyport/ Plum Isalnd — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

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Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				
2030	6.1	5.8	1.4	-2.9	-3.1

This project is located in an area with uncertainty for future tidal datums. These uncertain zones are either dynamic in terms of geomorphology or are restricted by manmade features (i.e., culverts, tide gates, etc.) that should be evaluated in more detail at the site-scale.

Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newburyport/ Plum Isalnd	2030	5% (20-Year)	9.9	6.9	9.2

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newburyport/ Plum Isalnd	2030	5% (20-Year)	14.7	6.9	10.0

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
Newburyport/ Plum Isalnd	2030	5% (20-Year)	28.0	0.0	12.4

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Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

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Applicable Design Criteria

Tiered Methodology: Tier 1

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Newburyport/ Plum Isalnd	2030	25-Year (4%)	7.3	Downloadable Methodology PDF

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Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Newburyport/ Plum Isalnd	2030	50th	50.73	70.79	30.33

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: NOT APPLICABLE

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: NOT APPLICABLE

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: NOT APPLICABLE

Asset: Newbury/ Plum Island — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

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Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
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2030	6.1	5.8	1.4	-2.9	-3.1

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Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newbury/ Plum Island	2030	5% (20-Year)	9.9	6.9	9.2

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average (ft - NAVD88)
Newbury/ Plum Island	2030	5% (20-Year)	14.7	6.9	10.0

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average (Feet)
Newbury/ Plum Island	2030	5% (20-Year)	28.0	0.0	12.4

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Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

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Tiered Methodology: Tier 1

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Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

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Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
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Projected Heat Index: NOT APPLICABLE

Asset: Salisbury — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

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Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				
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Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
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Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
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Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
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Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Tiered Methodology: Tier 1

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Salisbury	2030	25-Year (4%)	7.3	Downloadable Methodology PDF

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

ATTENTION: This is a Tier 1 project. It is advised to compare the extreme precipitation output values to the NOAA+ methodology to calculate total precipitation depth for 24-hr design storms.

This methodology can be found in the following PDF. (Link).

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Salisbury	2030	50th	50.73	70.79	30.33

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: NOT APPLICABLE

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: NOT APPLICABLE

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: NOT APPLICABLE

Asset: Newbury — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				

2030	6.1	5.8	1.4	-2.9	-3.1	

Planning Horizon	(ft - NAVD88)

This project is located in an area with uncertainty for future tidal datums. These uncertain zones are either dynamic in terms of geomorphology or are restricted by manmade features (i.e., culverts, tide gates, etc.) that should be evaluated in more detail at the site-scale.

Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newbury	2030	5% (20-Year)	9.9	6.9	9.2

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newbury	2030	5% (20-Year)	14.7	6.9	10.0

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
Newbury	2030	5% (20-Year)	28.0	0.0	12.4

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

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Applicable Design Criteria

Tiered Methodology: Tier 1

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Newbury	2030	25-Year (4%)	7.3	Downloadable Methodology PDF

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

ATTENTION: This is a Tier 1 project. It is advised to compare the extreme precipitation output values to the NOAA+ methodology to calculate total precipitation depth for 24-hr design storms.

This methodology can be found in the following PDF. (Link).

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Newbury	2030	50th	50.73	70.79	30.33

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: NOT APPLICABLE

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: NOT APPLICABLE

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: NOT APPLICABLE

Asset: Newburyport — Natural Resources

Sea Level Rise/Storm Surge

Target Planning Horizon: 2030
Intermediate Planning Horizon: Not Applicable

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

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Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				
2030	6.1	5.8	1.4	-2.9	-3.1

This project is located in an area with uncertainty for future tidal datums. These uncertain zones are either dynamic in terms of geomorphology or are restricted by manmade features (i.e., culverts, tide gates, etc.) that should be evaluated in more detail at the site-scale.

Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newburyport	2030	5% (20-Year)	9.9	6.9	9.2

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Newburyport	2030	5% (20-Year)	14.7	6.9	10.0

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
Newburyport	2030	5% (20-Year)	28.0	0.0	12.4

Return Period Recommendations for natural resource assets and subsequent projected values are provided as a consideration for users, not a formal standard. Users should follow industry best practices for designing natural resource assets in coordination with the appropriate regulatory agencies.

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation

Target Planning Horizon: 2030

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

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Applicable Design Criteria

Tiered Methodology: Tier 1

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Newburyport	2030	25-Year (4%)	7.3	Downloadable Methodology PDF

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This methodology can be found in the following PDF. (Link).

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Target Planning Horizon: 2030
Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Newburyport	2030	50th	50.73	70.79	30.33

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Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: NOT APPLICABLE

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: NOT APPLICABLE

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: NOT APPLICABLE

Sea Level Rise/Storm Surge Project Maps

The following three maps illustrate the Projected Water Surface Elevation for the 2030, 2050, and 2070 planning horizons corresponding to the lowest return period (largest design storm) recommended across the assets identified for this project in the Tool. For projects that only have Natural Resource assets, the maps will show the Projected Water Surface Elevations corresponding to the 5% (20-year) return period. Refer to the Climate Resilience Design Standards Output - Sea Level Rise/Storm Surge Section for additional values associated with other assets. The maps include the project area as drawn by the user with a 0.1 mile minimum buffer, but do not reflect the location of specific assets on the site.

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values and maps provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

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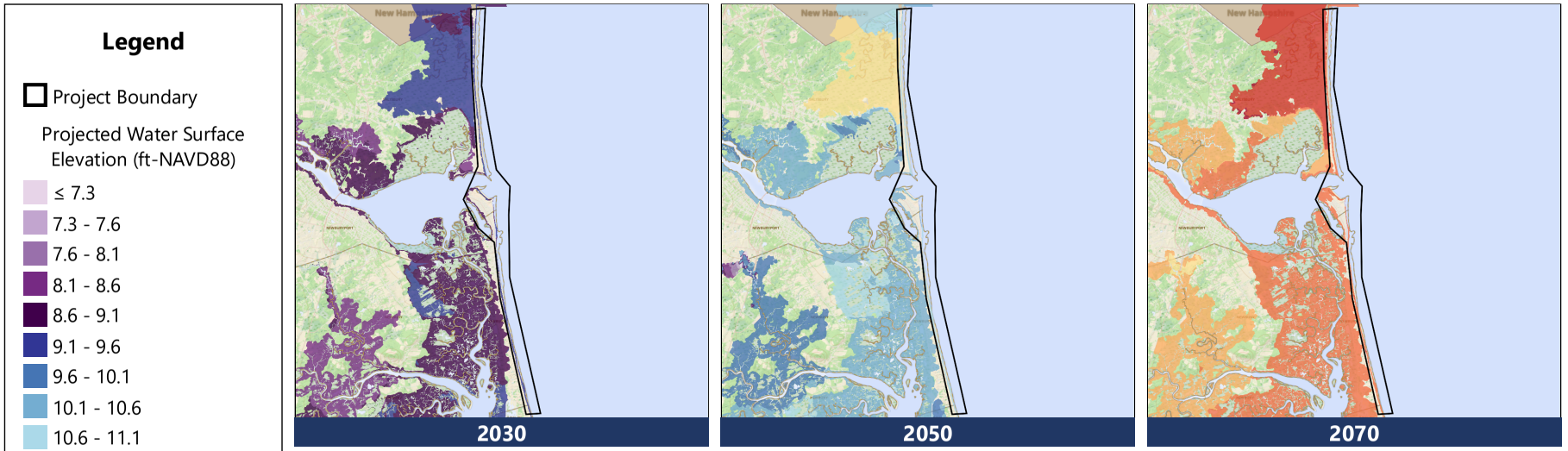


Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Water Surface Elevation Map: 5% (20-yr)

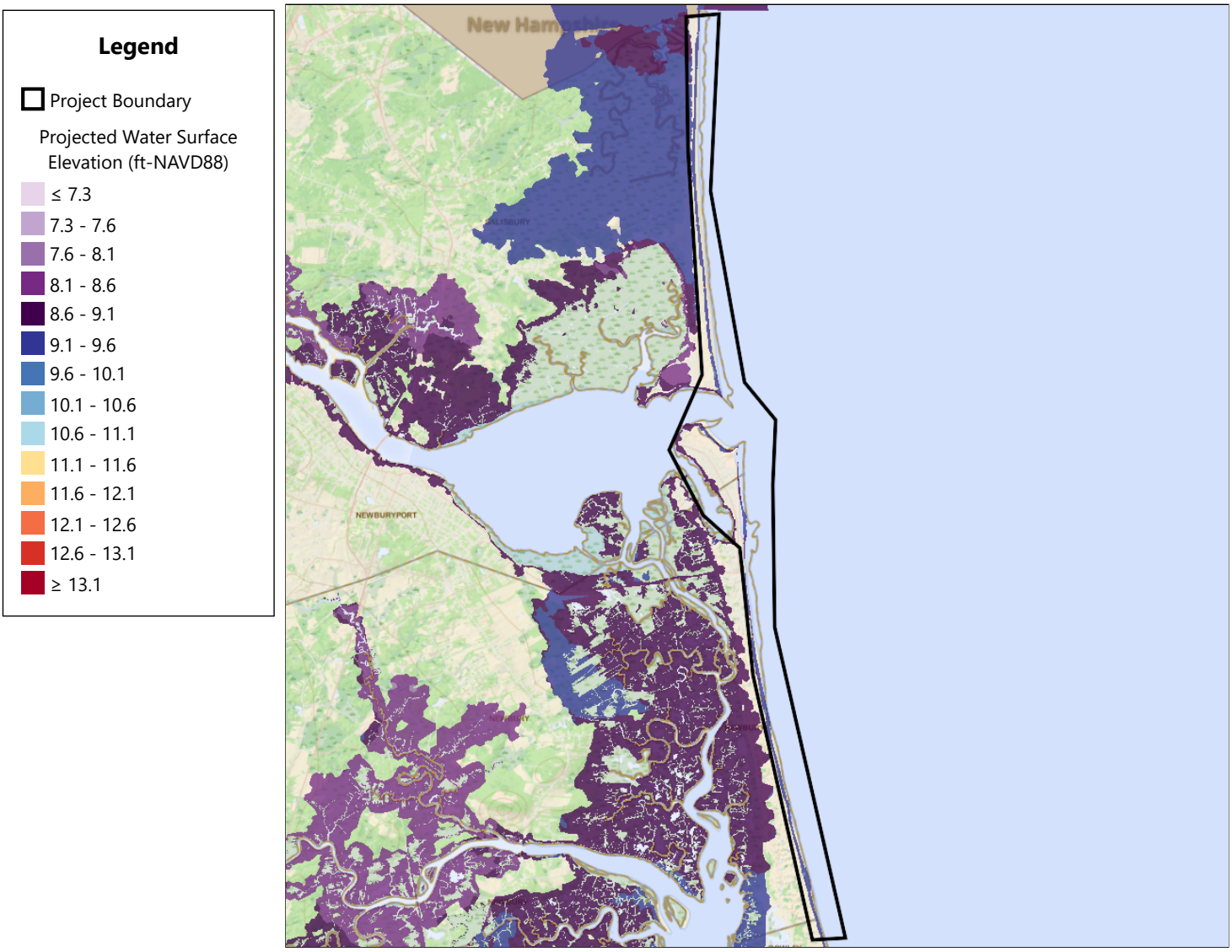
Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

1.0 2.0 5.0 Miles

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2030	5% (20-yr)	9.9	6.9	9.2
	2050	5% (20-yr)	11.4	10.0	10.7
	2070	5% (20-yr)	13.1	11.9	12.5

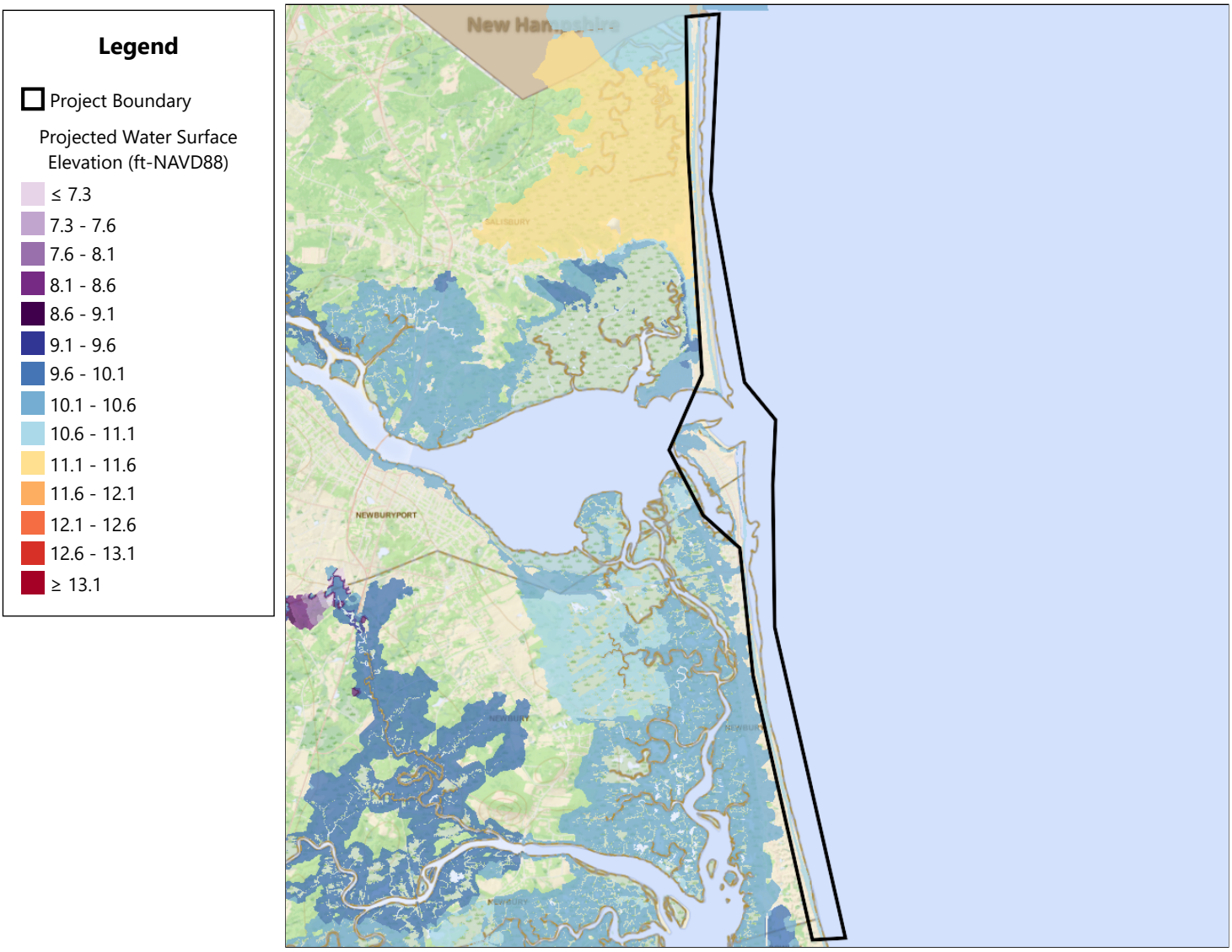


Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Water Surface Elevation Map: 2030, 5% (20-yr)

Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2030	5% (20-yr)	9.9	6.9	9.2

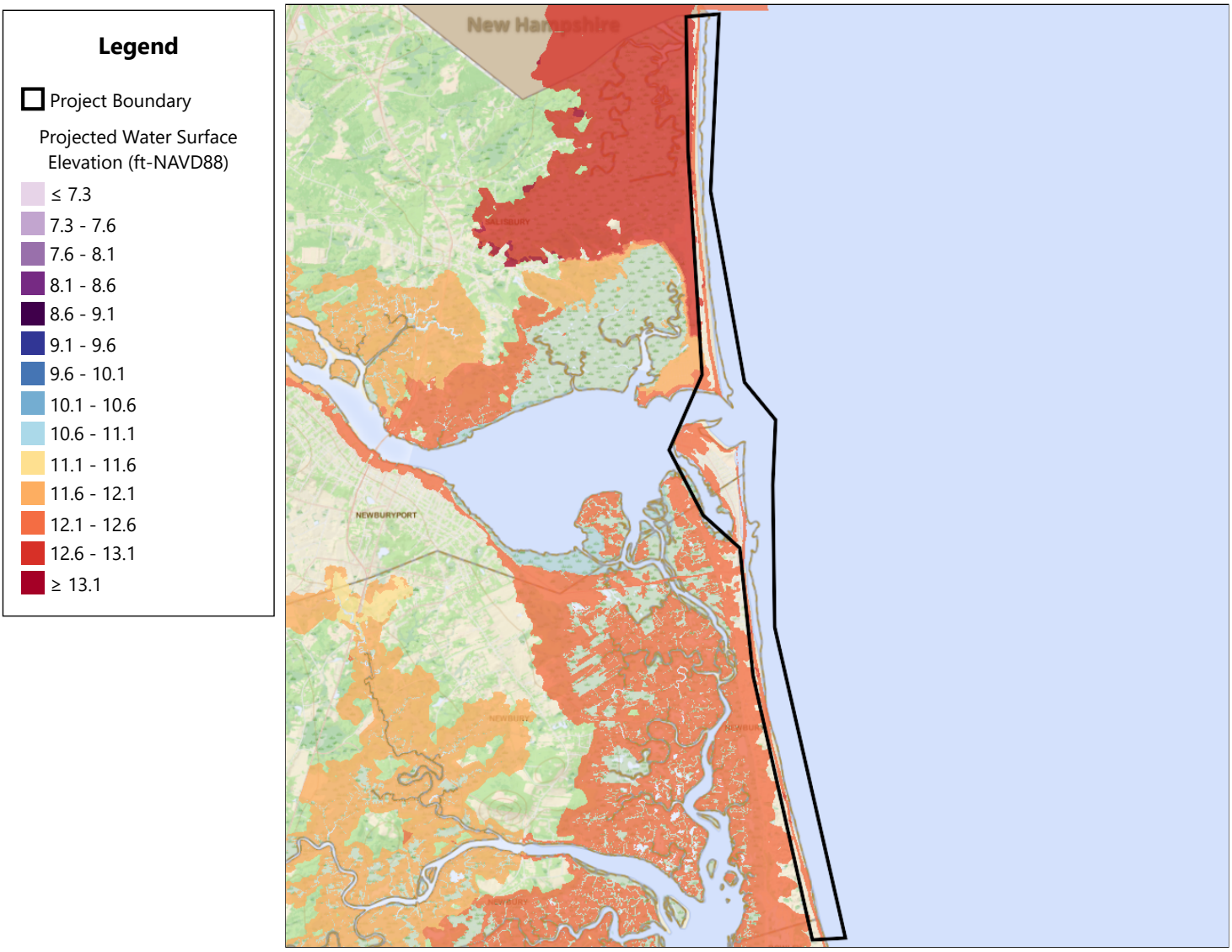


Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Water Surface Elevation Map: 2050, 5% (20-yr)

Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2050	5% (20-yr)	11.4	10.0	10.7



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Water Surface Elevation Map: 2070, 5% (20-yr)

Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

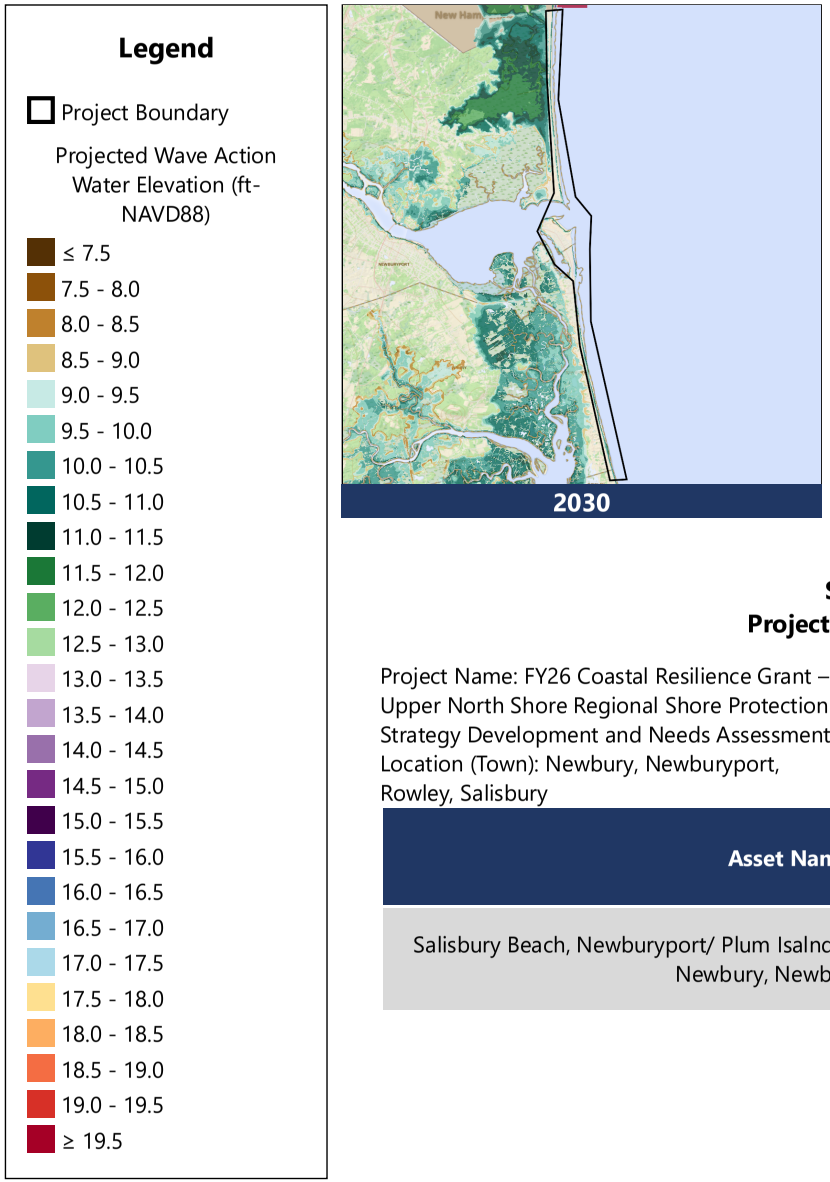
Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2070	5% (20-yr)	13.1	11.9	12.5

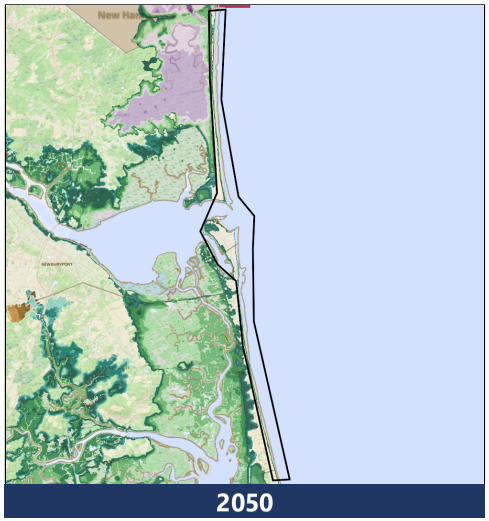
Sea Level Rise/Storm Surge Project Maps

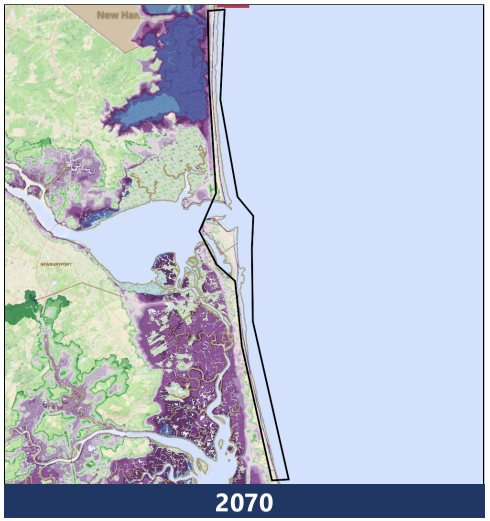
The following three maps illustrate the Projected Wave Action Water Elevation for the 2030, 2050, and 2070 planning horizons corresponding to the lowest return period (largest design storm) recommended across the assets identified for this project in the Tool. For projects that only have Natural Resource assets, the maps will show the Projected Wave Action Water Elevations corresponding to the 5% (20-year) return period. Refer to the Climate Resilience Design Standards Output - Sea Level Rise/Storm Surge Section for additional values associated with other assets. The maps include the project area as drawn by the user with a 0.1 mile minimum buffer, but do not reflect the location of specific assets on the site.

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values and maps provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, maps, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.







Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Wave Action Water Elevation Map: 5% (20-yr)

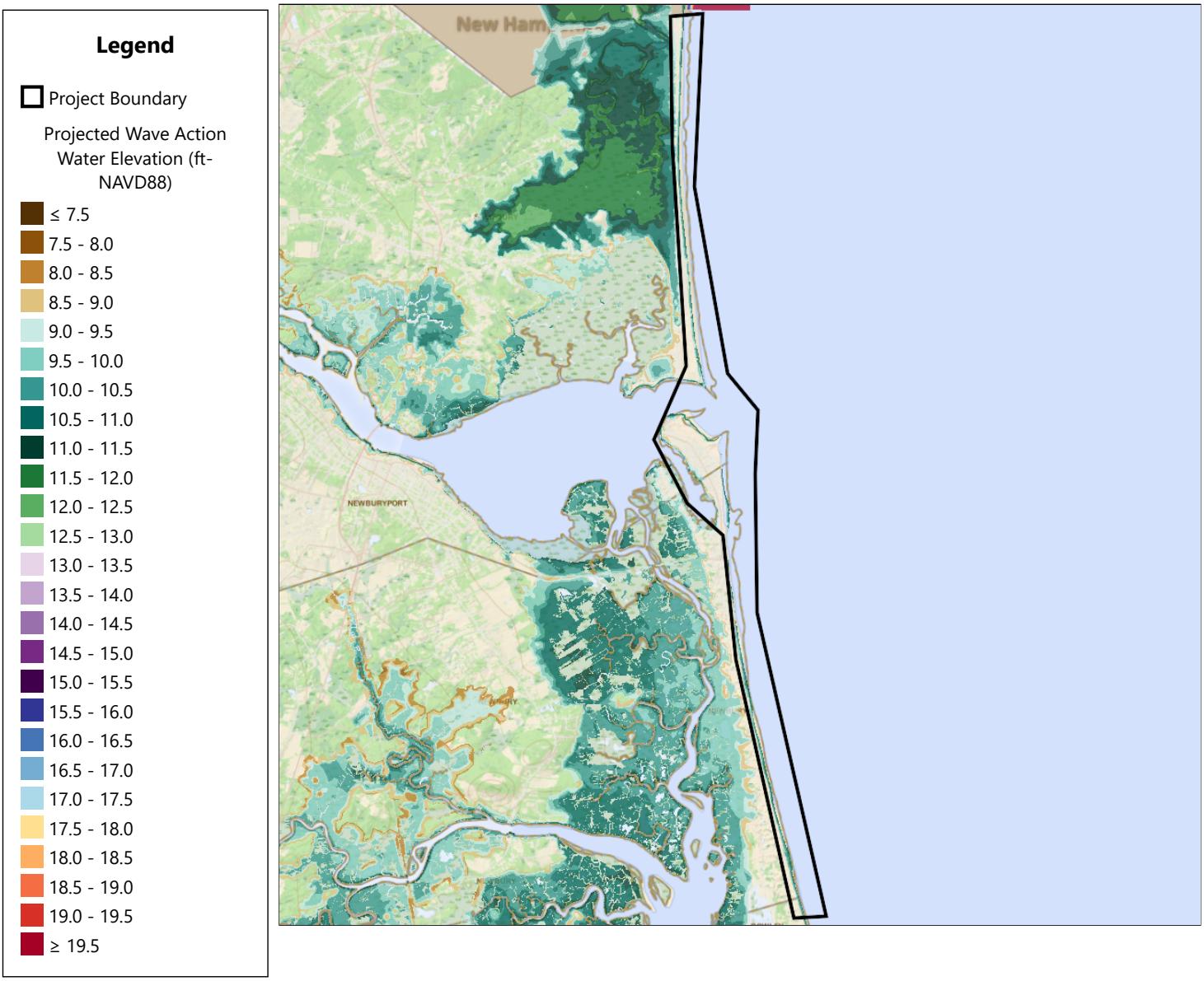
Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

1.0 2.0 5.0 Miles

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2030	5% (20-yr)	14.7	6.9	10.0
	2050	5% (20-yr)	17.0	10.0	11.8
	2070	5% (20-yr)	19.9	11.9	13.8



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Wave Action Water Elevation Map: 2030, 5% (20-yr)

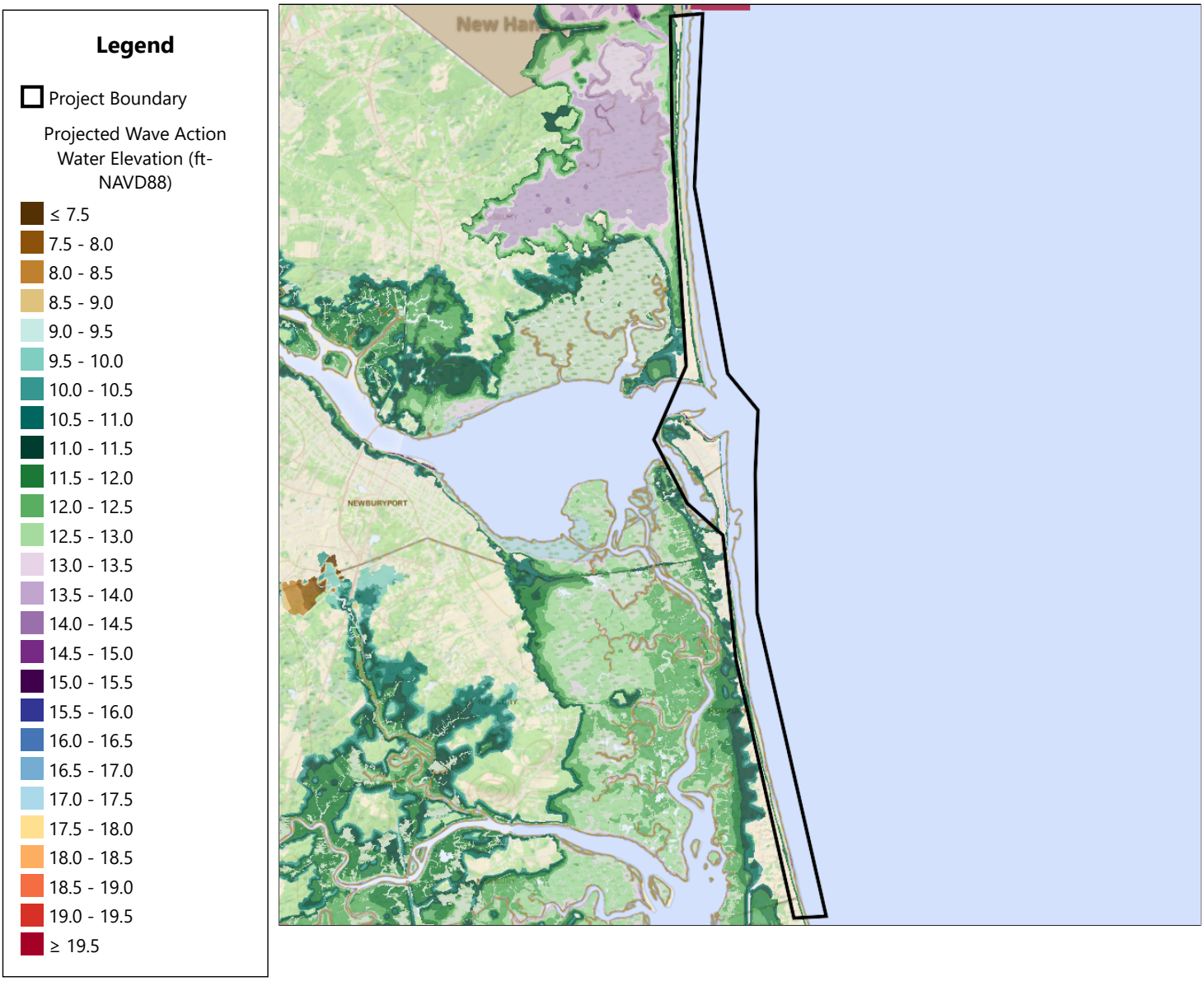
Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

0.5 1.0 2.0 Miles

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2030	5% (20-yr)	14.7	6.9	10.0



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Wave Action Water Elevation Map: 2050, 5% (20-yr)

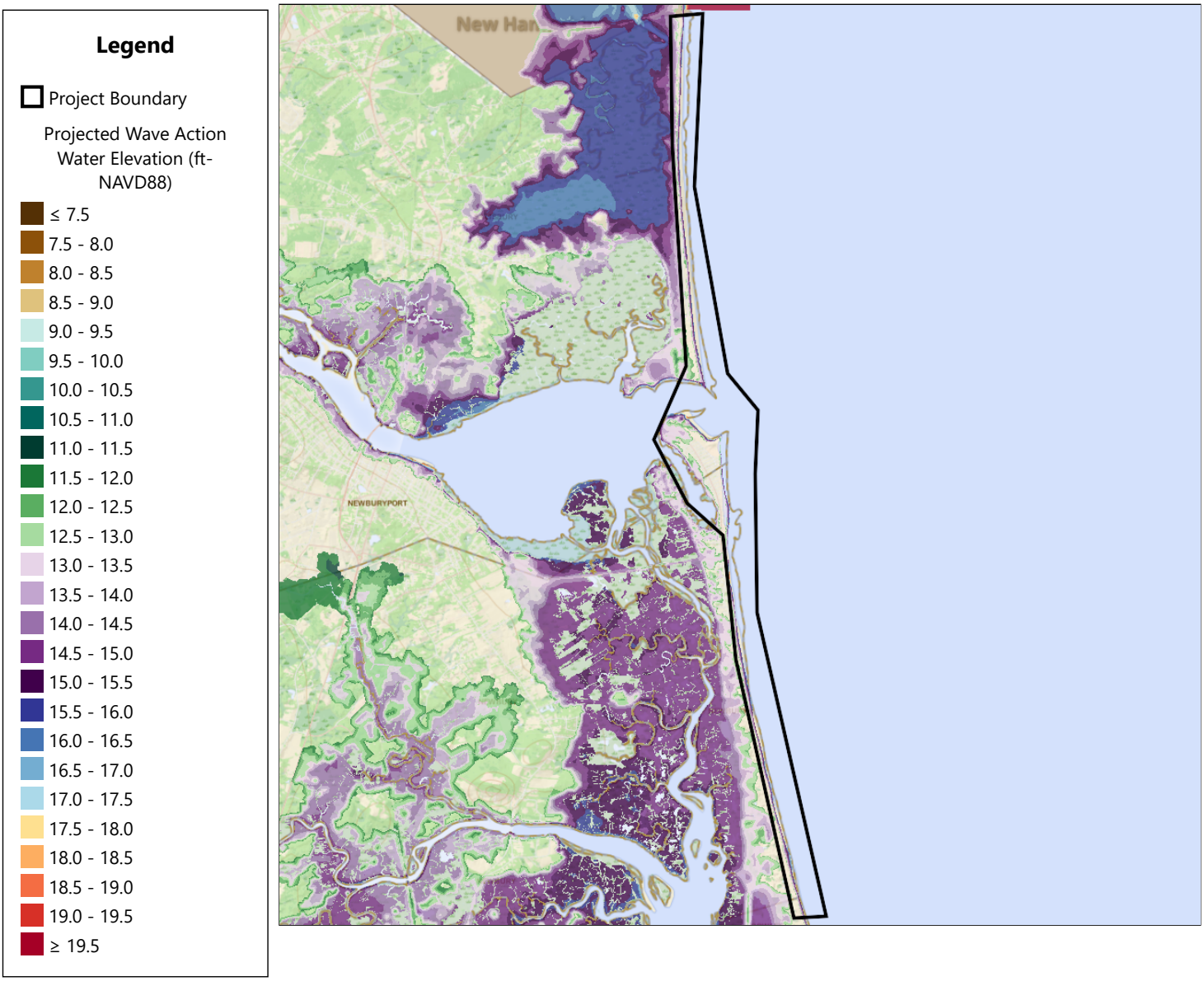
Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

0.5 1.0 2.0 Miles

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2050	5% (20-yr)	17.0	10.0	11.8



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Wave Action Water Elevation Map: 2070, 5% (20-yr)

Project Name: FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Location (Town): Newbury, Newburyport, Rowley, Salisbury

0.5 1.0 2.0 Miles

Created by: LPearson
Date Created: 6/17/2025
Tool Version: 1.4

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average
			(ft-NAVD88)		
Salisbury Beach, Newburyport/ Plum Isalnd, Newbury/ Plum Island, Salisbury, Newbury, Newburyport	2070	5% (20-yr)	19.9	11.9	13.8

Project Inputs

Core Project Information

Name:	FY26 Coastal Resilience Grant – Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2026
Location of Project:	Newbury, Newburyport, Rowley, Salisbury
Estimated Capital Cost:	$25,740
Who is the Submitting Entity?	City/Town Salisbury Lisa Pearson (lpearson@salisburyma.gov)
Is this project identified as a priority project in the Municipal Vulnerability Preparedness (MVP) plan or the local or regional Hazard Mitigation Plan (HMP)?	Yes
Is this project being submitted as part of a state grant application?	Yes
What stage are you in your project lifecycle?	Planning
Is climate resiliency a core objective of this project?	Yes
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	No
Brief Project Description:	This project advances goals in the draft ResilientCoasts plan, particularly Strategy 1.6, which supports regional sediment management to protect resources, public safety, and coastal habitats. The updated coastal processes assessment will guide shoreline protection strategies to improve resiliency for infrastructure and public beaches in the three communities. It includes reviewing past studies, updating coastal and historical shoreline analyses, modeling, and evaluating beach nourishment needs and sediment sources, such as Merrimack River dredge material, offshore sand, and upland sources. The project also considers current protections and long-term resilience measures, like bylaws and managed retreat, to assist in planning for future goals and resiliency projects.

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project provides flood protection through nature-based solutions
- ✓ Project reduces storm damage
- ✓ Project promotes decarbonization
- ✓ Project improves water quality
- ✓ Project enables carbon sequestration
- ✓ Project protects fisheries, wildlife, and plant habitat
- ✓ Project remediates existing sources of pollution
- ✓ Project prevents pollution

Factors to Improve Output

- ✓ Preserve, enhance, and/or restore coastal shellfish habitats
- ✓ Increase plants, trees, and/or other vegetation to provide oxygen production
- ✓ Mitigate atmospheric greenhouse gas concentrations and other toxic air pollutants through nature-based solutions

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	Yes
Reduces storm damage	Yes
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	No
Improves water quality	Yes
Promotes decarbonization	Yes
Enables carbon sequestration	Yes
Provides oxygen production	Maybe
Improves air quality	Maybe
Prevents pollution	Yes
Remediates existing sources of pollution	Yes
Protects fisheries, wildlife, and plant habitat	Yes

Protects land containing shellfish	Maybe
Provides pollinator habitat	No
Provides recreation	No
Provides cultural resources/education	No

Project Climate Hazard Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	Yes
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Yes
Does the project site have a history of riverine flooding?	Yes
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	No

Project Assets

Asset: Salisbury Beach
Asset Type: Coastal Resource Area
Asset Sub-Type: Barrier beach
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1
Asset: Newburyport/ Plum Isalnd
Asset Type: Coastal Resource Area
Asset Sub-Type: Barrier beach
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1
Asset: Newbury/ Plum Island
Asset Type: Coastal Resource Area
Asset Sub-Type: Barrier beach
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1
Asset: Salisbury
Asset Type: Coastal Resource Area
Asset Sub-Type: Salt marsh
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1
Asset: Newbury
Asset Type: Coastal Resource Area
Asset Sub-Type: Salt marsh
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1
Asset: Newburyport
Asset Type: Coastal Resource Area
Asset Sub-Type: Salt marsh
Construction Type: Maintenance (environmental)
Construction Year: 2025
Monitoring Frequency: 1

Report Comments

This project directly supports adaptation to climate impacts such as sea level rise, storm surge, and coastal erosion. It includes updated coastal modeling, shoreline change analysis, and evaluation of beach and dune nourishment strategies designed to buffer public infrastructure and natural resources. Alternatives will be assessed against sea level rise projections at 10-, 20-, and 50-year intervals. The project also identifies sustainable sediment sources, including beneficial reuse of dredged material. Through public engagement, it will build support for science-based resiliency solutions. While extreme heat and freshwater flooding are outside the scope of this coastal-focused study, the results will inform broader climate resilience planning across the region.