Climate Adaptation: Flooding Risk

20 Points Priority for all certification levels

Action Updated July 2022

IMPORTANT ANNOUCEMENT: In February, 2021 a new law went into effect in New Jersey that now requires the development of a climate change-related hazard vulnerability assessment in municipal master plans. These assessments will need to include an analysis of current and future threats associated with climate change related natural hazards, including increased temperatures, drought, flooding, hurricanes, and sea-level rise.

Due to the change in the Municipal Land Use Law, this action will be retired on **December 31, 2022**. Municipalities are advised not to undertake this action at this time. Municipalities that have already completed the action can potentially earn points in the 2022 certification cycle only. If your municipality is currently working on this, please contact Anne Heasly, Program Manager for Policy and Planning at Sustainable Jersey at 609-771-7835 or email heaslya@tcnj.edu.

Sustainable Jersey is in the process of preparing new guidance to assist municipalities in complying with the municipal land use law changes and making their communities climate ready.

To be awarded 20 points for this action, towns must have:

1. Form a team capable of and dedicated to addressing this action. This team could be the town's Green Team, but more likely will include representatives from the various local agencies that deal with planning, zoning and emergency management. This team will be responsible for the following two steps.
2. Utilizing the *NJ Flood Mapper Tool* to visually assess your community's vulnerability;
3. Completing the on-line *Getting to Resilience: Community Planning Evaluation Tool* (hereafter referred to as the GTR Tool), which assesses a town's readiness to deal with flooding situations.

Points are earned when the town submits the documented output from the GTR Tool, along with proof of team formation and a detailed discussion of how the *NJ Flood Mapper Tool* was used.

For certified communities, this action can count toward a Gold Star in Health. See the Gold Star Standard section of this action for more information.

Why is it important?

Historically, communities developed near rivers and streams because they provided transportation and power, and because adjacent floodplains were flat and fertile. In the more recent past, development along the ocean coast has boomed because it offers enhanced living conditions and access to recreation. New Jersey has 1,792 linear miles of coastal shoreline subject to tidal influence, sea level rise and storm surge. The New Jersey coastline along the Atlantic Ocean supports a large coastal economy, and the four coastal counties along the Atlantic Ocean (Monmouth, Ocean, Atlantic and Cape May) make up approximately 15 percent of the state's total employment and approximately 18 percent of its total population.[3] In addition, a large percentage of New Jersey's housing, employment, and commercial activity lies adjacent to inland rivers, lakes and streams.

Living near water bodies has always had inherent risks for flooding hazards and the joint influence of global climate change and land development have increased these risks. Flooding can pose significant health hazards. Standing flood waters can spread infectious diseases, contain chemical hazards, and cause injuries.

Flooding is not only due to climate change [4], it can result from excessive rainfall, rapid snow melt, and severe coastal storms. Consequently, it is likely to increase due to climate change. More impervious surfaces resulting from development also increase the risk of flooding, particularly flash flooding.

New Jerseyeans experienced a series of precipitation and storm-related weather extremes in 2011 [5], setting the following statewide records (the comparison extends back to 1895):
- Wettest year for NJ (wettest weather station over a calendar year);
- Third wettest rainstorm, record flooding (Tropical Storm Irene: August 27-28)
- Wettest month on record for NJ: August (wettest two consecutive months: Aug-Sept.);
- Seventh snowiest snowstorm dating to 1893: January 26-27;
- Snowiest January on record for NJ (snow covering the ground all 31 days in North Jersey; and,
- Back-to-back rain storms March 6-7, 10-11 (major flooding).

While one year of extreme weather events like these does not indicate, in and of itself, a trend, these recent extreme weather events

do demonstrate the importance of planning for both short-term emergency responses and enhancing preparedness to account for what may become long-term trends.

Both the *NJ Flood Mapper Tool* and the *GTR Tool* were developed as non-regulatory tools to assist local decision-makers in identifying opportunities to reduce their vulnerability to an increase in the severity and frequency of heavy precipitation events, sea level rise and storm surge, and build capacity for community resilience. The *NJ Flood Mapper Tool* is an interactive GIS system designed to provide visual representations of FEMA's 100-year floodplain for both inland and coastal flooding and different sea level rise scenarios

The *GTR Tool* highlights the importance of local plan integration and consistency with municipal building codes and ordinances. It also helps to identify the importance of localized hazard assessments and their necessary link to planning, outreach, adaptation, response, and recovery. Combined, these two tools provide local decision-makers with a wealth of information about the current and future resiliency of their communities. By using these tools, local leaders can identify means and implement strategies to improve their resilience and protect public health through existing planning, programming and implementation mechanisms. Municipal responses will also inform government managers of the technical and educational needs of communities subject to recurrent flooding threats.

Who should lead and be involved with this action?

This action is designed to inform local decision-makers about the current and future flooding concerns for your community, and assist them in identifying opportunities to improve your community's resilience to flooding-related hazards through existing planning mechanisms, public engagement, and disaster preparedness. Therefore, communities should consider involving the following individuals in the completion of this action:

- Municipal Officials
- Zoning Officers
- Municipal Engineers
- Land Use Planners
- Environmental Planners
- Transportation Planners
- Floodplain Managers
- Emergency Managers
- Storm water Managers
- Public Works Personnel
- Building Code Officials
- Conservation Organizations
- Environmental Commission Members

All participants should be well-informed about their local plans, ordinances, and hazard outreach efforts.

Timeframe

This action breaks down into three sub-actions. These actions must be completed **from within 3.5 years of the June submission deadline.**

Step 1: Form a team capable of and dedicated to addressing this action, which requires that a community identify the key individuals in your town who are able to effectively plan for and address flooding situations. These people will form the core team needed to complete the rest of this action. Formation of such a team (i.e., identifying, contacting, and coordinating team members) may take between 2-20 hours depending on whether the community has a pre-established body or network that is familiar with addressing flooding.

Step 2: Utilize the NJ Flood Mapper Tool to visually assess your community's vulnerability, including current and future flooding threats.[2] This exercise will give the team a sense of where they are most vulnerable, and the information gathered from this exercise will help inform their responses to the final sub-action; use of the Getting To Resilience Tool. Using the NJ Flood Mapper Tool to view existing FEMA floodplain maps, future sea level rise scenarios, and the extent of storm surge from Superstorm Sandy should take approximately 2 – 4 hours. Note: for coastal areas, the NJ Flood Mapper does not model storm surges from a full range of possible hurricanes. Communities that have additional local data to model or approximate future flooding risks beyond the current 1 in 100 year event should use that data in this exercise.

Step 3: Armed with the knowledge gained from the NJ Flood Mapper Tool, use the Getting To Resilience (GTR) Tool to determine your community's resiliency to flooding concerns. This should be completed as a collective action by the entire team. Ideally, municipalities will do the questionnaire during one or more interactive team meetings during which team members comprehensively address the questions posed in the tool, to provoke thought and cooperation on future actions. If needed, the GTR Tool has a built in feature that allows for virtual collaboration, although in-person meetings work best. Proof of collaboration requires either completed sign-in sheet(s) from the meeting session(s) including names, organizations and contact information from the participants; and/or a printout of the on-line collaboration team through the GTR Tool. It is anticipated that completion of the questionnaire should take approximately two to three meetings lasting 2 - 4 hours, plus additional research outside of the meeting time frame. Assuming a team of six, up to 40 person-hours may be required to complete the GTR.

Project costs and resource needs

The NJ Flood Mapper Tool is a free online tool available at www.njfloodmapper.org.. Similarly, the GTR Tool is a free on-line tool available at *http://www.prepareyourcommunitynj.org*. Resource needs, in terms of staff time dedicated to the project, will vary by town, but are not expected to be significant.

What to do and how to do it ("How to")

From within 3.5 years of the June submission deadline, complete the following 3 steps:

Step 1: Identify key community representatives and form a team to complete the action.

• Using the list in "Who should lead and be involved in this action," identify those individuals with critical knowledge about how to prepare for and/or respond to various flooding situations.
• Coordinate those individuals into a team designed to complete the remaining tasks in this action.
• The team should meet in person at least once to gather appropriate materials, discuss the task and task outcomes, e.g., what plans and information are needed; what mapping scenarios would be most beneficial to develop; etc. and establish a schedule for completion.

Step 2: Use the *NJ Flood Mapper Tool* to visually assess your community's current vulnerability to flooding and future sea level rise scenarios.

• Get familiar with the various tabs of the NJ Flood Mapper Tool, including layers that allow visualization of various critical infrastructure, e.g., schools, hospitals, evacuation routes, input of sea level rise in increasing increments; visualization of the storm surge from Hurricane Sandy, and the latest flood area maps (Advisory Base Flood Elevations (ABFEs) or Preliminary Work Map) for riverine flooding and storm surge.
• Go to the flood button and zoom into your municipality. Examine the map under the FEMA Q3 tab. Find the areas that are colored dark orange, indicating that they are in danger (have a 1% chance of flooding in any given year). Also look at the light orange areas, which have a 0.2% chance of flooding in any given year. For communities along tidal waterways also check the SFHA tab. This tab shows FEMA's ABFEs and Preliminary Work Maps. As the team conducts this exercise the following questions should be discussed.

- Is there critical infrastructure or other assets in that area, e.g., roads (especially evacuation routes), schools, wastewater treatment facilities, hospitals, public works – (Use the FACILITIES TAB)
- Are there vulnerable populations in this area? (Use the VULNERABILITY TAB)
- Are there natural resources, e.g. freshwater wetlands, forests, beaches (Use the WETLANDS tab)

Print this map. It will inform Step 3 of this Action. *(The simplest way to print the maps is to do a "print screen." If the computer you are using lacks this capacity, you will want to keep the Flood Mapper available to do the Getting to Resilience step of this Action.)*

• Click on the Sea Level Rise button and zoom in to your municipality. Set the Sea Level Rise slider to 1 foot of sea level rise, which is a reasonable projection for the year 2050. *Recent projections show that sea level rise along the New Jersey coast may be higher by 2050. Communities should consider looking at a 2 foot rise for the year 2050 to err on the side of caution.* Scroll around the municipality to see what areas are inundated. As the team conducts this exercise, the following questions should be discussed.

- Is there critical infrastructure or other assets in that area, e.g. roads (especially evacuation routes), schools, wastewater treatment facilities, hospitals, public works? (Use the FACILITIES TAB)
- Are there vulnerable populations in this area? (use the VULNERABILITY TAB)
- Are there natural resources, e.g. freshwater wetlands, forests, beaches? (Use the WETLANDS tab)

Print this map. It will inform Step 3 of this Action.

• Repeat this step for a sea level rise of 3 feet, which is generally considered a moderate projection for the year 2100. *Recent projections show that sea level rise along the New Jersey coast may be higher by 2100. Communities should consider looking at a 4 foot rise for the year 2050 to err on the side of caution.*
• Repeat step above for a sea level rise of 6 feet, which is the maximum level this tool allows at this time.
• For communities that were impacted by surge from Superstorm Sandy, go to the Flooding tab and select 2050 SFHA. This layer shows the Advisory Base Flood Elevations and the Preliminary Maps plus a range of sea level rise from an additional 0.3 feet to an additional 2.0 feet. As the team conducts this exercise, the following questions should be discussed.

- Is there critical infrastructure or other assets in that area, e.g. roads (especially evacuation routes), schools, wastewater treatment facilities, hospitals, public works? (Use the FACILITIES TAB)
- Are there vulnerable populations in this area? (use the VULNERABILITY TAB)
- Are there natural resources, e.g. freshwater wetlands, forests, beaches? (Use the WETLANDS tab)
- Are any major facilities being planned for the areas highlighted by this tab? If so, are those areas being designed to accommodate storm surge?

Print this map. It will inform Step 3 of this Action.

Additional discussion questions:
• Identify which areas of your community are in the V or A zones.
• Are floodways and other frequently flooded areas zoned for open space or recreation?
• Does the community have a Continuity of Operations Plan? - Is machinery for debris removal located outside of flood hazard areas? (Look at the Sea Level Rise and Flooding layers.)
• Does the community have a Continuity of Operations Plan? Are routes to waste disposal facilities passable in the event of flood? (Look at the Sea Level Rise and Flooding layers.)
• Does the community have a Post-Disaster Redevelopment Plan? Does the Plan utilize risk and vulnerability mapping to determine the location of future development? (Use the different Sea Level Rise scenarios and the SFHA 2050 layer to inform this step.)
• Choose two or more additional scenario questions to discuss. (Appendix A has examples.) Describe any additional scenarios that were chosen and why. Describe how the flooding maps were used to assess vulnerability.

Print out your floodplain and sea level rise maps to inform Step 3 below. Submit these, along with your descriptions, as part of your Sustainable Jersey application submission.

Step 3: Utilizing the GTR Tool, answer a series of questions targeted at determining your community's overall resiliency as part of one or more interactive meeting sessions (either in person or virtually).

• Review the components of the GTR Tool.
• Based on the review, identify all the information and data resources needed to adequately address questions regarding flooding and your community's preparedness for and resilience to flooding concerns, including:

- All existing plans and documents that address flooding concerns (both coastal and inland)
- Your community's FEMA-approved Hazard Mitigation Plan to review existing flood mitigation strategies and assess the success and level of implementation of these strategies.
- Outputs from the NJ Flood Mapper Tool.

• Decide ahead of time if you'll want a coordinator/facilitator who will be assigned to move your team through the process. A facilitator with general knowledge of the local community's character and governmental structure could be helpful in leading group discussions and working through conflicts during the interactive meeting(s), but is not necessary. You should consider what would work best for your community.

- The process is much easier to organize if there is an assigned single point of contact coordinating the information. This will ensure consistency and comprehensiveness. However, this person should not be filling out the questionnaire based on his/her knowledge alone.
- The coordinator/facilitator should describe to all participants the purpose of the questionnaire: to facilitate a dialogue among community leaders and identify options to improve local resilience to flooding hazards. He/she should identify how each section contributes to building local community resilience.

• Complete the questions in the GTR Tool.

• Each question can be answered with a "yes" or "no" response. An "other" option may also be used, for example, to indicate that the assembled team does not know the answer or is presently pursuing the action identified in the question. It is important not to just answer the question, but also to build on the issue at hand and determine if and how improvements can be made.

• Print the summary results of responses – positives, negatives, unknowns, and next steps (potential prioritization)

- The summary will not only give information on recommended strategies where improved community resilience is warranted, but will also provide information on where these recommendations overlap with other community planning tools (e.g., Community Ratings System).

Step 4: Submit the results of the Flood Mapper exercise and Getting to Resilience to the municipal Planning Board and Environmental Commission, if one exists.

- These products must be provided to all members of the Planning Board and the Environmental Commission (if one exists).

What to submit to earn points for this action

To be awarded 20 points for this action, towns must complete the following three steps **from within 3.5 years of the June submission deadline:**

1. Form a team capable of and dedicated to addressing this action. This team could be the town's Green Team, but more likely will include representatives from the various local agencies that deal with planning, zoning and emergency management. This team will be responsible for:
2. Utilizing the NJ Flood Mapper Tool to visually assess your community's vulnerability;
3. Completing the on-line Getting to Resilience: Community Planning Evaluation Tool (hereafter referred to as the GTR Tool), which assesses a town's readiness to deal with flooding situations.

Points are earned when the town submits the documented output from the GTR Tool, along with proof of team formation and a detailed discussion of how the NJ Flood Mapper Tool was used.

Submit the following documentation to verify the action was completed to the above standards. (Log in to the password protected webpage where you submit your online application for certification to write in the text box and upload documents).

In the text box, please provide a short narrative (300 word max) to summarize what was accomplished and the general steps taken to accomplish it. Then upload documentation as specified in the submission requirements.

In order to earn all 20 points, your submission must meet the following standards:
• Upload: Sign-in sheet(s) from the interactive meeting(s) hosted to get comprehensive answers to the questions in the GTR Tool and/or a printout of the on-line collaboration team through the GTR Tool.
• Upload: Description of how the NJ Flood Mapper Tool was used in the town's analysis as specified above. Output maps from the NJ Flood Mapper Tool must be submitted as part of this description.
• Upload: Summary results from the GTR Tool.

IMPORTANT NOTES: You can upload up to six separate documents for each action. Please excerpt relevant information from large documents. Please remember that your submissions will be viewable by the public as part of your certified report.

Resubmission Requirements

To resubmit for points under this action, please provide a progress report discussing how the results of the GTR tool have and continue to impact municipal decision making. The report should be **from within 2.5 years of the June certification application submission deadline**, and signed my a municipal elected, appointed official, or professional staff member.

Approved Action Expiration Date

Approved actions will be set to expire 3.5 years from the date of the summary results of the GTR Tool, OR if resubmitting for this action, 2.5 years from the date of the report.

Gold Star Standard

Successful completion of this action will meet the requirement of an Additional action for earning a Gold Star in Health. For more information on earning a Gold Star in Health see the Gold Star Standards section of the website.

Spotlight: What NJ municipalities are doing

Lower Alloways Creek Township (Salem County)

The small community of Lower Alloways Creek Township assembled a diverse group of local officials, emergency managers, residents and business owners to participate in the Getting to Resilience questionnaire and flood risk mapping. The Township reported that prior to completing the questionnaire and flood risk mapping in 2016, sea level rise considerations had been a minor part of the community's preparedness planning. But after having completed the process, they intend to look at every aspect of its current plan to ensure the necessary steps are taken for the future. Supporting documentation includes:

- Linkages Report
- Maps
- Committee Members

Middletown Township (Monmouth County)

Middletown Township completed the "Getting to Resilience" questionnaire in 2014 with support from the Jacques Cousteau National Estuarine Research Reserve (JC NERR). The questionnaire prompted an in-depth discussion with local officials about the Township's strengths and challenges and identified specific strategies to increase the community's resilience to current and future flood risks. Middletown is now revisiting the 2014 recommendations to assess its progress and identify next steps in increasing the community's flood resilience. Supporting documentation includes:

- Recommendations Report
- Meeting Attendees
- Linkages Report

Moorestown Township (Burlington County)

In 2017, Moorestown Township teamed up with the Delaware Valley Regional Planning Commission (DVRPC) to produce the Moorestown Coastal Vulnerability Assessment Report (CVA). Given the similarities between this report and the Getting to Resilience questionnaire, the town decided to combine the two efforts. The local team was pulled from all areas of Moorestown's government as well as from various committees. The data and recommended strategies in the final CVA report – including results from the questionnaire – will be used to update the Township's Master Plan and Stormwater Management Plan, and will be an important resource for Sustainable Moorestown in all of its efforts. Supporting documentation includes:

- Coastal Vulnerability Assessment Report
- CVA Assessment Matrix
- Maps
- Linkages Report
- Meeting Attendance Sheet

Other Examples

The GTR online tool and the NJ Flood Mapper are both based on work completed by the NJ Department of Environmental Protection's Coastal Management Office (CMO). Specifically, the CMO developed the *Coastal Community Vulnerability Assessment Protocol (CCVAP),* including the *Coastal Community Vulnerability Mapping Index (CCVMI),* and the *Getting to Resilience* questionnaire as part of its 2006-2011 Section 309 Strategy. As part of their development, the CMO partnered with communities, including Greenwich, NJ, to pilot test their tools and provide feedback. The report of Greenwich's effort can be found at http://www.nj.gov/dep/cmp/docs/ccvap-greenwich.pdf.) Greenwich found the effort very informative, and used the information during their preparatory and recovery efforts for Hurricane Irene and Superstorm Sandy. Taking the CMO's work, and providing it to all municipalities in an online environment will help other communities prepare and recover from future storms and flooding events.

Resources

AVAILABLE RESOURCES TO SUPPORT THIS ACTION

The NJ Department of Environmental Protection's Office of Coastal and Land Use Planning is administering a Municipal Public Access Planning grant program to provide an incentive to eligible municipalities to develop Municipal Public Access Plans. The grant program includes the option, as well as funding, to perform a coastal vulnerability assessment and utilizes this action as one method to perform the analysis. Additional information on the grant program can be found at http://www.nj.gov/dep/grantandloanprograms/lu_mpapg.htm.

TOOLS AND BEST MANAGEMENT PRACTICES

The GTR tool refers to numerous ways to improve coastal community resilience by completing a risk and vulnerability assessment, providing public outreach, integrating existing planning efforts, preparing and responding to coastal storms, and mitigating vulnerabilities within your community. The following are a handful of the tools and Best Management Practices being utilized throughout the country. Take this opportunity to explore these tools and identify how to incorporate them into your municipal efforts

Risk and Vulnerability Assessments

- **HAZUS-MH:**
  - **Software:** http://www.fema.gov/plan/prevent/hazus/
  - **Training:** http://www.fema.gov/hazus-training
- **SLOSH**
  - **Website:** http://www.nhc.noaa.gov/HAW2/english/surge/slosh.shtml
  - **Obtain Access to GIS Data:** http://slosh.nws.noaa.gov/sloshPub/disclaim.php
- **NOAA Coastal Inundation Training:**
  - **Coastal Inundation Mapping:** http://www.csc.noaa.gov/digitalcoast/training/inundationmap
- **Coastal GIS Training:** http://csc.noaa.gov/digitalcoast/training/list/

Public Outreach and Engagement

- **Public Participatory Mapping:** http://www.csc.noaa.gov/cms/human_dimensions/participatory_mapping.pdf
- **Flood Signage:**
  - **High Water Mark Signs:** http://www.weather.gov/os/water/high_water/
  - **Storm Surge Height Signs:** http://fl-hillsboroughcounty.civicplus.com/index.aspx?NID=374
- **Register Ready:** https://www13.state.nj.us/SpecialNeeds/
- **Storm Ready:**
  - **National Weather Service:** http://www.stormready.noaa.gov/

Planning Integration

- **American Planning Association's Model Hazard Element "Integrating Hazard Mitigation into Local Planning:** http://www.fema.gov/media-library-data/20130726-1908-25045-0016/integrating_hazmit.pdf
- **Florida's Land Use Planning Strategies and Best Management Practices for Minimizing Vulnerability to Flooding and Coastal Storms- DRAFT:** http://www.floridajobs.org/fdcp/dcp/hazardmitigation/files/Protecting_FL_Comm.pdf
- **New Jersey Model Floodplain Ordinances:** http://www.nj.gov/dep/floodcontrol/modelord.htm

Disaster Preparedness and Recovery

- **Storm-Ready Communities:** http://www.stormready.noaa.gov/resources/toolkit.pdf
- **Community Emergency Response Team (CERT):** http://www.citizencorps.gov/cert/
- **Community Rating System:** http://www.fema.gov/business/nfip/crs.shtm
- **Hurricane Planning and Impact Assessment Reports** http://www.csc.noaa.gov/hes/about.html
- **Post-Disaster Redevelopment Plan** http://www.floridadisaster.org/recovery/documents/Post%20Disaster%20Redevelopment%20Planning%20Guidebook%20Lo.pdf

Hazard Mitigation Implementation

- **Hazard Mitigation Planning Tools**
  - **Community Rating System:** http://www.fema.gov/business/nfip/crs.shtm
- **Hazard Mitigation Grant Programs:** http://www.fema.gov/library/viewRecord.do?id=4225
- **Land Acquisition**
  - **New Jersey Green Acres/Blue Acres:** http://www.nj.gov/dep/greenacres/
  - **Coastal and Estuarine Land Conservation Program (CELCP):** http://coastalmanagement.noaa.gov/land/welcome.html
  - **Property Acquisition Handbook for Communities:** http://www.fema.gov/media-library/assets/documents/3117
- **Structural Mitigation Guidance**
  - **Homeowner's Guide to Retrofitting:** http://www.fema.gov/library/viewRecord.do?id=1420
  - **Against the Wind: Protecting Your Home From Hurricane and Wind Damage:** http://www.fema.gov/library/viewRecord.do?id=1641
  - **Catalog of FEMA Flood and Wind Publications, Training Courses, and Workshops:** http://www.fema.gov/library/viewRecord.do?id=3184

END NOTES:

[1] While the NJ Flood Mapper looks only at sea level rise, and does not yet show storm surge other than what occurred during Sandy, the GTR online tool does consider storm surge impacts.

[2] The team doesn't have to collectively generate maps from the NJ Flood Mapper Tool, but they do have to generate the scenarios they would like to visualize and these maps must be used as a resource when using the GTR Tool.

[3] Joe Seneca, Rutgers University.

[4] Flooding and drought, together, are referred to in the more technical literature as "Hydro-Climate" factors.

[5] The Office of the State Climatologist at Rutgers University provides monthly updates on climate events in New Jersey. For more information, visit http://njclimate.org.

Appendix A: Example Scenarios for the NJ Flood Mapper

• You are planning for sea level rise in your municipality and want to know if your evacuation routes will be inundated. Use the website to view sea level rise (SLR) at 1–6ft increments and determine if there is a point at which your evacuation routes will be compromised.

• You would like to know how “safe” your municipal structures (schools, hospitals, police, fire, etc.) are in the face of different sea level rise scenarios. Use the website to view sea level rise at 1–6ft increments and determine if there is a point at which your municipal structures will be compromised. If so, which ones, and at what rise in sea level?

• You have municipal residents who have been asking how they can compare flood maps to the sea level rise predictions. Use the website to compare floodplain information to the sea level rise scenarios. Make sure you have enough information to share with the residents over different sea level rise scenarios.

• You are concerned for the residents of your town that are most socially vulnerable. These are residents that may be low income, rely on public transportation and may not have access to the internet to learn more about their risk due to inundation. You want to map your residents’ social vulnerability against a variety of scenarios so that you can make better evacuation decisions. Use your website to view sea level rise at 1-6ft increments to determine where and when you have to be most concerned about residents that are socially vulnerable.

• You are prioritizing open space acquisition of lands and want to ensure long term sustainability of coastal salt marshes. Marshes that are bordered with forest or other natural land covers are classified as an "unimpeded marsh migration zone". These "unimpeded" zones provide greater flexibility for marshes to adapt and migrate horizontally as sea levels rise. Locations with roads and development serve as barriers to future marsh migration and are classified as "impeded." Use the website to compare the potential for future marsh migration in a location of your choosing. What location has a good amount of flexibility in terms of unimpeded marsh migration area?