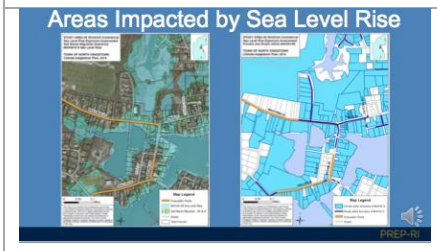
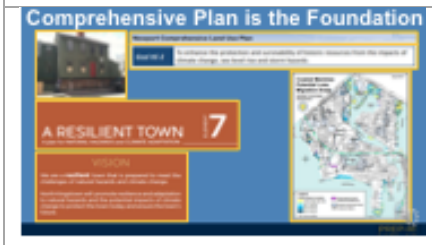
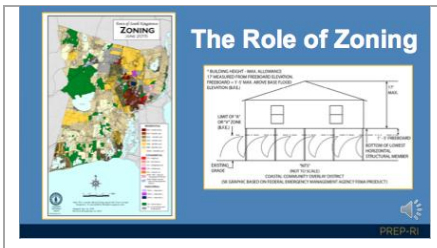
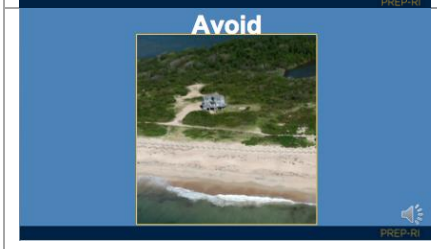
PREP-RI ADAPTATION

PRESENTATION NOTES

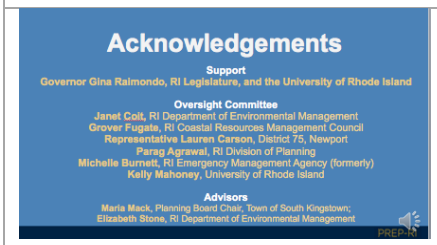
	1. Welcome to "Reduce Your Risk: Integrating Adaptation into Local Planning." This is part of the online module series "Providing Resilience Education for Planning in Rhode Island" (or PREP RI). *** **Image Source:** Meeting Photograph, RI Sea Grant
	2. I am Pam Rubinoff with URI's Coastal Resources Center and Rhode Island Sea Grant. I'm joined by Chelsea Siefert, Planning Director for the Town of South Kingstown.
	3. By the end of this module, you will be able to describe the process of incorporating adaptation into local planning and identify adaptation strategies to address flooding and other climate change-related impacts in coastal communities.
	4. So, why should we adapt to- or plan for- the impacts of a changing climate, impacts that are expected to worsen in the future?
	5. As you've learned in other PREP-RI modules, the impacts of climate change, such as increased flooding and erosion, are already being felt in Rhode Island. By taking proactive steps now to adapt, we can help protect people and places from these impacts today as well as reduce the burden on our children and generations into the future. Cities and towns are on the front line of reducing the vulnerability of people, infrastructure, and the environment to the impacts of climate change. *** **Image Sources: (clockwise from upper right):** Waterplace Park, Providence, J. Bancroft

	Arnolds Neck Road, Warwick, B. Haiken, MyCoast.org Ocean Drive, Newport, M. Davis, MyCoast.org Storm-damaged home, RI Sea Grant Galilee after Hurricane Irene, RI Sea Grant
	6. So what can we do?
	7. The process of incorporating adaptation into local planning may be boiled down to three main steps. The first step is to know your risk by defining your scope- including which hazards will be examined and over which time frames- and assessing impacts using the best available data. The second step is to make a plan by designing and adopting adaptation goals, policies and actions and incorporating them into local documents and procedures. The third step is to take action and evaluate the effectiveness of adaptation measures by monitoring them over time. It's important to reevaluate your risk as new information becomes available and to apply what you learned in previous efforts to modify future actions. It's also important to incorporate stakeholder engagement throughout to ensure that the concerns of the community are addressed. Outreach to residents and business owners, engaging with all municipal departments, and coordinating with state agencies will facilitate "buy in" for action.
	8. There are myriad tools to help you understand risk at both the community and site scales. STORMTOOLS maps show the extent and depth of flooding from different storm surge and sea level rise scenarios. The Rhode Island Floodplain Mapper provides shows flood hazard areas as delineated on FEMA's Flood Insurance Rate Maps. Shoreline Change Maps display erosion trends used to determine regulatory coastal setbacks. Sea Level Affecting Marshes Model (SLAMM) maps display how wetlands are projected to migrate inland under various sea level rise scenarios. Social Vulnerability and Sea Level Rise and Transportation Fact Sheets highlight related issues for each coastal community that are useful for planning. Flood Evacuation Maps show zones that are recommended to be evacuated during potential worst-case Hurricane Surge Inundation. Watch the mapping module for more information on the various tools available. ***

	Image Sources: (clockwise from upper right): Shoreline Change Maps, J. Freedman Evacuation Routes, RI Sea Grant Social Vulnerability, SLR & Transportation Fact Sheets (King tide at Conimicut Point, Warwick), J. Freedman SLAMM maps (king tide at Block Island marsh), K. Hoyt STORMTOOLS, www.beachsamp.org RI Floodplain Mapper, RIEMA
	9. Such information may be compiled into assessments of exposure to coastal hazards that help local officials make informed decisions, leading to safer, more resilient communities. For example, the Town of North Kingstown worked with URI to examine the impacts of climate change on the community, resulting in a series of maps that identify the natural and physical assets most vulnerable to sea level rise and increasing storminess. Now I'll hand it over to Chelsea.
	10. After "Know Your Risk," comes "Make a Plan." Rhode Island cities and towns are now required to include natural hazards and climate change impacts in their community's comprehensive plan. The comp plan conveys broad goals and policies for adaptation, and the Hazard Mitigation Plan, which is required if seeking mitigation funding, addresses those goals with specific actions. Other community plans follow suit. Capital and Transportation Improvement Plans include things like building retrofits, road raising or rerouting, and stormwater system redesign. Subdivision and land development regulations and zoning ordinances may be amended to ensure that natural hazards and climate change impacts are appropriately considered early on in the review process. There are great resources available to assist you in these efforts that are listed in the resources document accompanying this video.
	11. Several Rhode Island communities have already incorporated natural hazards and climate change impacts into their planning. For example, North Kingstown developed a vision statement stressing the importance of resilience. In Newport, protecting historic resources in the face of climate change and sea level rise is included in the Historical and Cultural Resources section of their Comprehensive Plan in addition to other key priorities addressed in their "Natural Hazards and Climate Change" chapter. Barrington's plan included a section on "Planning for Impacts of Sea Level Rise on Coastal Wetlands," informed by the SLAMM project.

	12. Adaptation may also be incorporated into community zoning ordinances and subdivision and land development regulations. For instance, South Kingstown created a coastal community overlay district that allows, among other things, the elevation of buildings up to five feet above base flood elevation without triggering a height variance. This additional height above the FEMA-regulated base flood elevation, called freeboard, goes beyond the Rhode Island State Building Code minimum of one foot. South Kingstown is also revising their subdivision and land development regulations to provide guidance to the Planning Board when making decisions regarding development in high flood hazard areas. ** **Image Source:** South Kingstown, Zoning Map South Kingstown Coastal Community Overlay District.
	13. The next step is to use your plans to take action. There are three main categories of adaptation strategies: Avoid, Accommodate, and Protect. The approach taken In your community will likely be a combination of all three.
	14. “Avoid” ensures that development doesn’t occur in areas at moderate to high risk to coastal hazards, or where the risk is low at present but will likely increase over time. For instance, communities may enact overlay districts as mentioned earlier to limit or condition development or institute special design considerations in vulnerable areas. In cases where development already exists in risky areas, retrofitting may be in order or managed retreat considered. The strategic decision to relocate or abandon private or public assets at risk to flood hazards was implemented by the city of Cranston after the 2010 floods. Private homes at risk of flooding from the Pawtuxet River were demolished and the floodplain returned to open space. The final report claimed that the “project is not only the best alternative, it is also the most feasible and cost effective alternative.” *** **Image Source:** House on beach, RI Sea Grant

	15. "Accommodate" involves solutions that essentially allow for impacts to occur, but minimizes them as much as possible. Accommodation strategies include elevating structures on pilings in flood prone areas and designing buildings to allow floodwaters to enter the lowest floor while relocating critical systems such as heating and electrical to upper floors to avoid damage. Temporary or mobile structures may also be encouraged. For example, after the devastating effects of Superstorm Sandy, Sam's Snack Bar and Little Mermaid's in Westerly reopened as mobile restaurants. The Andrea Hotel was rebuilt as just a restaurant that can be moved if needed. *** **Image Sources:(clockwise from upper right):** Andrea Hotel in Westerly 1930 – 1945, By Tichnor Quality Views - Boston Public Library Tichnor Brothers collection #62874, Public Domain Andrea Hotel reconfigured restaurant after Superstorm Sandy, RI Sea Grant Mobile restaurant in Westerly, RI Sea Grant Elevated home, Westerly, RI Sea Grant
	16. "Accommodate" can address both private development, as in the Westerly example, as well as public facilities and infrastructure. In South Kingstown, Hazard Mitigation Assistance funds were used to relocate and elevate the town beach pavilion to accommodate future flooding and erosion impacts. Parts of vulnerable roads may be removed and replaced by natural filtrations strip to control stormwater and protect against coastal flooding and erosion. *** **Image Sources:** **Top/Bottom Right:** Grove Avenue, Warwick pavement removal and filter strip installation, W. Ferguson **Bottom Left:** South Kingstown Beach Pavilion, Town of South Kingstown **Top Left:** South Kingstown Beach Pavilion, J. Freedman
	17. "Protect" is used to prevent impacts to the greatest extent possible through the use of natural and built systems. Protecting and restoring natural buffers like salt marshes and dune systems help slow down chronic erosion and reduce wave impacts during storms. Marshes also provide wildlife habitat, carbon storage capability, and infiltration. They may not however fully protect a large and expensive piece of critical infrastructure from a 16 foot storm surge, for instance.

	*** **Image Sources (clockwise from upper right):** Hazard's Beach, Newport dune restoration, W. Ferguson Salt Marsh, NBNERR
	18. While structural protection measures like hurricane barriers, seawalls, and riprap may be used in such cases, it's important to remember that these strategies are only effective, and permitted, in certain locations. They also may tend to amplify the force of the water that hits them, exacerbating erosion and putting them at risk of collapse. The initial construction costs, along with the required maintenance, make them expensive investments. Now I'm going to hand it back over to Pam to finish up. *** **Image Sources:** Left: Fox Point Hurricane Barrier, M. Belanger Right: Newport Cliff Walk, P. Rubinoff
	19. As you've seen, many communities are already preparing for the impacts of climate change. By using the tools available to understand their vulnerabilities, local communities can incorporate adaptation strategies in their plans and procedures to reduce flooding, erosion and other climate change-related impacts, which will ultimately protect the well-being of our residents and communities as a whole. It's important to note that the efforts presented- and many others- are successful in large part because of strong partnerships. For example, municipalities may partner with their local land trust to protect open space or with the local Historic Commission on design guidelines.
	20. Thank you for viewing this module. Go to the PREP-RI website to see the resources document and presentation notes, to fill out the survey, get your certificate, and view the other modules.
	21. The PREP-RI team acknowledges the support of statewide leaders, experts and practitioners who helped to make this module a reality. **Support** Governor Gina Raimondo, RI Legislature, and the University of Rhode Island **Oversight Committee** Janet Coit, RI Department of Environmental Management

	Grover Fugate, RI Coastal Resources Management Council Representative Lauren Carson, District 75, Newport Parag Agrawal, RI Division of Planning Michelle Burnett, RI Emergency Management Agency (formerly) Kelly Mahoney, University of Rhode Island **Advisors** Maria Mack, Planning Board Chair, Town of South Kingstown; Elizabeth Stone, RI Department of Environmental Management
	22. And thanks to the PREP-RI Team for pulling this module together! Pam Rubinoff, Jennifer West, Jennifer McCann, Teresa Crean, Dawn Kotowicz, Mary-Kate Kane, Kevin Proft, Sue Kennedy, Cathy Dwyer, Monica Allard Cox