

Climate Resilience Training Module: Flooding

Flooding Speaker Notes & Information

Flood Video Script, Citations & Image Sources

1. Welcome to “Rising Waters: Planning for Flooding in Connecticut” part of the online series for Adapt CT.

Image: Sally Harold, Fairfield, CT

2. I am pleased to introduce the speakers for this module. I am Diane Ifkovic, the Connecticut State NFIP Coordinator. I am joined by Jeffery Callahan, Stonington Borough Warden, and Emmeline Harrigan, the Assistant Planning Director in Fairfield.
3. The Adapt CT series is designed to support local decision-making and community resilience.
 - By the end of this module you will be able to:
 - Recognize different flooding scenarios in Connecticut;
 - Describe the social and economic impacts of flooding; and
 - Identify flood mitigation examples, opportunities, and programs.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

4. So why should we care about flooding?
5. Hundreds of miles of Connecticut’s riverine and coastal shoreline have been historically used for business and pleasure. Many of these areas lie in floodplains and may be vulnerable to disruption and damage. In fact, flooding is the most prevalent and frequent natural hazards that impacts Connecticut. We can be proactive and take steps to reduce our risk.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: Road Flooding in Groton – Sarah Schechter

6. A portion of Connecticut's economy relies on coastal industry. A 2013 Maritime Industry Economic Report found that Connecticut's maritime industry, including seafood production and packaging, ship building and boating recreational uses, has an estimated total output impact of nearly \$7 billion dollars in 2010 with the maritime economy contributing nearly 40,000 jobs to the state, which could be at risk in part, due to flooding.

Source: [*Valuing the Coast: Economic Impacts of Connecticut's Maritime Industry*](#)

Image: *View from Mystic Seaport – Sarah Schechter*

7. According to the Connecticut Natural Hazards Mitigation Plan, Connecticut has 192 critical facilities, such as fire stations, EMS, and law enforcement, within the 1% annual floodplain area. This flood zone—historically referred to as the 100-year floodplain—has a 1% chance of a certain level flooding occurring in any given year. Another way to think about this is that over the course of a 30-year mortgage, there is a 26% chance of this type of storm. Flood maps depict the 100-year floodplain (1% annual flood) and the 500-year floodplain (.2% annual flood).

Source: [*Connecticut Natural Hazard Mitigation Plan; FEMA Glossary*](#)

Image: *Road Flooding in Groton – Sarah Schechter*

8. So, what exactly is happening? Over the past dozen years Connecticut has experienced significant flooding due to hurricanes, nor'easters, and other heavy rain events.

Source: *PREP-RI module* (<https://prep-ri.org/prep-ri/flooding/>)

9. During the Spring of 2010, flooding of Shunock Brook in North Stonington damaged a well-traveled bridge and a 150-year old historic building on Main Street. At this time, other rivers in New London County, such as the Yantic and Pachaug, also flooded, leading to ruined dams, broken bridges, neighborhood evacuations, and the need for a great deal of clean-up. In 2011, Tropical Storm Irene caused flooding, as well as severe wind damage, in many areas across the state as well as over \$10 million dollars in fiscal impacts. In 2012, Superstorm Sandy resulted in over \$360 million dollars in damage for Connecticut and over \$6 million dollars in fiscal impacts. On September 25-26, 2018, heavy rain statewide resulted in flash flooding that closed roads, damaged culverts and triggered water rescues. Subsequently a federal disaster declaration was declared for Middlesex and New London counties. In April 2019, a flood warning was issued by the National Weather Service for parts of Connecticut as heavy rains combined with snowmelt from Vermont and New Hampshire, inundating the Connecticut River and areas along its shores. This impacted Wethersfield, Cromwell, Rocky Hill, and Glastonbury.

Citations: [Connecticut Natural Hazard Mitigation Plan](#); “[Sandy Storm Damage Tops \\$360 million in State](#)” Ken Dixon, *CT Post* Nov 14, 2012; “[Historic North Stonington Devastated by Flood](#)” – Julianne Hanckel, *The Day* April 02, 2010; “[Climate suggests floods will probably happen again](#)” – Judy Benson, *The Day* March 27, 2011; “[Flood Warning Issues along Connecticut River as Heavy Rain Moves into the State](#)” – Kathleen McWilliams, *Hartford Courant* April 20, 2019; [Federal Register](#)

Images: a. North Stonington Town Hall Files, b. *Hartford Courant* c. *CT Post* d. *NBC Connecticut*

e. *Hartford Courant*

10. Flooding can occur with daily high tides or intermittently with storms. Along the coast, tidal flooding affects low-lying areas during extreme high tides. Flooding due to storm surge—which occurs when strong winds push waves landward—is less frequent, but can devastate coastal lowlands, especially when a storm hits at high tide. Inland, heavy rainfall may inundate areas more rapidly than our environment and infrastructure can absorb it, resulting in riverine and flash flooding.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: a. Tidal Flooding in Groton – Sarah Schechter; b. Wikimedia Commons; c. a *Hartford Courant*

11. Sea level rise will amplify both tidal flooding and storm surge, causing more widespread damage to coastal areas in the future. The Connecticut State Legislature recently adopted the projection of 20 inches of sea level rise by 2050 in Public Act 18-82. An additional two feet of flood protection will be added to any new state funded projects built in the floodplain.

Source: [Connecticut Public Act No. 18-82](#)

Image: *Union of Concerned Scientists*

12. Riverine flooding is becoming more common in Connecticut. Connecticut’s rain events have become more intense due to changing climate conditions and impervious surfaces.

Source: [Climate State Profiles Connecticut](#), Prof. Raymond Bradley, Dr. Ambarish Karmalkar, and Kathryn Woods Climate System Research Center (CSRC) University of Massachusetts Amherst

Image: *Cargill Falls – Sarah Schechter*

13. Increasingly intense precipitation events result in a greater flood risk, which is made worse by development with hard surfaces (like roads and parking lots) that prevent water from soaking into the soil. Before 1970, many local rivers experienced a significant flood event every 5 to 10 years, but today we are seeing flooding every 1 to 3 years. In many cases the severity of the flooding is worse as well.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: UConn Center for Land Use Education and Research

14. So, what can we do? Floodplain management cannot be an afterthought.
15. Cities and towns are working to be better prepared through their local planning efforts.

Some examples include:

- Municipal Plans of Conservation and Development, and Natural Hazard Mitigation Plans.
- Floodplain ordinances, the State building code, National Flood Insurance Program (NFIP); and the Community Rating System (CRS); and
- Standard operations around emergency response and recovery.

Sources: “[Conservation and Development Policies: The Plan for Connecticut 2018 - 2023](#)” The CT Office of Policy and Management; [Connecticut Natural Hazards Mitigation Plan](#); PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

16. Municipal Plans of Conservation and Development, and Natural Hazard Mitigation Plans do not exist in isolation—they build upon, and reinforce, each other. Information about recurring hazards and past impacts identified in the Natural Hazard Mitigation Plans help determine priority hazards to be included in the Plan of Conservation and Development. The Plan of Conservation and Development establishes goals, priorities, and actions which become the blueprint for the community and its decision-making.

Sources: “[Conservation and Development Policies: The Plan for Connecticut 2018 - 2023](#)” The CT Office of Policy and Management; [Connecticut Natural Hazards Mitigation Plan](#)

17. Under Connecticut Law, a Municipal Plan of Conservation and Development must be reviewed and adopted every 10 years, and must consider climate change, flooding, and hazard mitigation.

Sources: “[Conservation and Development Policies: The Plan for Connecticut 2018 - 2023](#)” The CT Office of Policy and Management; [Connecticut Natural Hazards Mitigation Plan](#); pers. comm. Bruce Hyde, UConn Center for Land Use Education and Research

Image: “[Conservation and Development Policies: The Plan for Connecticut 2018 - 2023](#)” The CT Office of Policy and Management

18. Municipalities must comply with their local floodplain maps and ordinances as well as the State Building Code, which includes minimum standards for building in floodplains. A community which fails to adhere to these regulations, or which grants variances in floodplains, risks its National Flood Insurance Program status.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Images: a. Milone and MacBroom; b. Construction – Sarah Schechter

19. Municipal emergency management administrators establish plans and procedures to ensure effective responses to an emergency. For example, Groton’s Office of Emergency Management alerts people to hazardous weather and flooding through their main webpage and urges them to follow the updates on Facebook, as well as having a community emergency notification system. Similarly, Stonington offers community members the option to sign up for emergency alerts, which increases preparedness and risk management for flooding and other hazards.

Source: [Groton Office of Emergency Management](#); [Stonington Emergency Management](#)

Images: a. Sarah Schechter; b. [FEMA Building a Supply Kit](#); c. Sarah Schechter

20. Everyone wants a safe community; however, challenges exist. At the heart of many decisions is weighing short and long-term costs and benefits and finding a balance that works for your community and your tax base.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: Flickr Photos

21. Municipalities have opportunities to do more to reduce the risk from flooding by protecting, accommodating, or avoiding impacts. Cities and towns can incentivize developers to build to higher standards, join the Community Rating System, retrofit municipal properties, acquire flood prone properties, and engage residents through outreach programs.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

22. By State Law, building permits can only be issued for new construction when the proposed work has been authorized by local zoning departments as consistent with their zoning regulations. Flood regulations are a key part of CT local zoning regulations and there are both requirements and incentives to help persuade property owners to elevate structures above the minimum flood requirements. FEMA requires adoption of substantial improvement and substantial damage regulations within local regulations to require that any construction that exceeds 50% of the value of the structure (whether for improvements or repair) triggers making the structure flood-compliant at the time. Presently a one-foot freeboard requirement for substantial improvement/substantial damage and new construction is also in place in the Connecticut Stat Building Code. As an incentive, adding freeboard during the initial construction of structures reduces flood insurance premiums and has a long-term benefit as it protects municipalities from more extreme flooding. According to research by the UConn Law School in a white paper titled, “Floodplain Building Elevation Standards”, adding freeboard up to four feet increases the original construction cost for elevation one-to-two percent more than the

initial cost of elevating to the Base Flood Elevation. This expense is then paid for in three-to-six years, due to significantly lower flood insurance rates.

Source: [Floodplain Building Elevation Standards fact sheet](#)

Images: a. FEMA library; b. Sarah Schechter

23. Many communities are going above and beyond by participating in FEMA’s Community Rating System or “CRS.” This voluntary program recognizes and encourages community floodplain management activities that exceed the NFIP minimum requirements and saves policy holders money on their annual flood insurance premiums.
- Benefits to the community include enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering and/or loss of life, and protection of the environment. In addition, policy holders in participating communities can receive discounts ranging from 5% to 45% on flood insurance premiums. Typical discounts for Connecticut range from 5% to 15%.
 - In Fairfield, town staff and officials have committed to maintaining their CRS participation at an 8 rating, which provides a 10% annual premium discount to Fairfield’s NFIP flood policy holders. This kind of savings can catalyze community interest and action around hazard mitigation.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: CT DEEP CRS records – Diane Ifkovic

24. In lieu of whole house elevations, municipalities and property owners can initially reduce risk by elevating critical elements such as utilities and information technology infrastructure above flood level. Stonington’s newsletter, for example, discusses the option to elevate appliances above the flood level and relocate both electrical panels and utilities out of harm’s way. Stonington also has used grant funding to create a coastal resilience plan, which explains the need for road and railway elevation in certain areas. Additionally, Stonington’s Hazard Mitigation Plan discusses programs and policies that restrict and control activities within the floodplain in order to mitigate coastal flood damage and flood hazards. Some of these measures include encouraging elevating and maintaining structures as well as providing both signage and warning systems for the community.

Source: [Stonington Coastal Resilience Plan 2017](#); [Stonington Hazard Mitigation Plan](#)

Images: a. Sarah Schechter; b. S. Schechter; c. S. Schechter; d. S. Schechter

25. West Haven used grant funds to obtain and demolish 13 flood-prone homes. The US Department of Agriculture’s Natural Resources Conservation Service has also provided a grant that acquired another 19 properties with the land retained for conservation, allowing it to return to floodplain functions.

Source: [“Thirteen flood-prone homes in West Haven to be Demolished”](#) *New Haven Register*, May 30, 2016

Images: a. NRCS; b. NRCS

26. Outreach is key to overcoming the challenges presented by flooding. Decide what works best for your community. Stonington sends out an annual newsletter to residents who have structures in the Special Flood Hazard Area. This proactively advises property owners of information regarding flood management and mitigation. Milford has taken a community-wide approach, preparing education programs to teach the public about flood hazard potential and how to recognize natural disaster warnings.

Source: [Stonington Flood Awareness Newsletters](#)

Images: a. [Stonington Flood Awareness Newsletters](#); b. Sarah Schechter

27. The Connecticut Division of Emergency Management and Homeland Security, DEMHS administers FEMA’s three Hazard Mitigation Assistance (HMA) grant programs. (1) The Flood Mitigation Assistance (FMA) program, funds projects that reduce flood risk to buildings insured under the NFIP (2) The Pre-Disaster Mitigation (PDM) program, funds hazard mitigation planning such as local or regional Hazard Mitigation Plans. (3) The Hazard Mitigation Grant Program (HMGP), assists in implementing long-term measures FOLLOWING Presidential disaster declarations. Fairfield was awarded several HMGP grants for home elevations as well as for the long-term protection of its wastewater treatment plant. Remember, a FEMA approved hazard mitigation plan is required for any of these funding opportunities.

Source: [CT Division of Emergency Management and Homeland Security](#)

Image: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

28. There are other funding options that municipalities have used such as the U.S. Department of Housing and Urban Development (HUD), and the Natural Resource Conservation Service (NRCS).

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Image: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

29. In summary, floods have and will continue to impact Connecticut communities, but there are many tools, strategies, and funding opportunities available to help mitigate and lessen the impacts of flooding.

Source: PREP-RI module (<https://prep-ri.org/prep-ri/flooding/>)

Images: a. “*Conservation and Development Policies: The Plan for Connecticut 2018 - 2023*” The CT Office of Policy and Management; b. Sarah Schechter; c. S. Schechter; d. S. Schechter; e. NRCS

30. Thank you for viewing this module. Go to Adapt CT: <https://climate.uconn.edu> or UConn EDEN*: <https://eden.uconn.edu> to see the resources document and presentation notes. The Adapt CT and UConn EDEN teams acknowledge the support of statewide leaders, experts and practitioners who helped to make this a reality.
- *UConn’s Extension Disaster Education Network
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