

## Natural Hazard Mitigation and Climate Adaptation Plan



Town of Peru  
June 14, 2021

## What is Hazard Mitigation?

- Natural hazards pose a risk to people, property and the environment
- Examples: floods, hurricanes, tornadoes, drought, heat waves
- Identify activities that can be done to mitigate the hazards *before* they occur
- Mitigation: *pro-active*, rather than reactive; action taken to solve a problem on a *permanent, long-term basis*
- Mitigation Plan a requirement for eligibility for some FEMA funds



## What Risks Are We Evaluating?

<b>11 Main Hazards Evaluated</b>
<b>3 Top Hazards Identified</b>
Severe Winter Events (Ice Storm, Blizzard, Nor'easter)
Flooding (Dam Failure, Ice Jam, Beaver Activity)
Hurricane & Tropical Storm
High Wind & Thunderstorm
Drought
Invasive Species / Pests
Wildfire
Annual & Extreme Temperature Changes
Landslide, Tornado, Earthquake
Cyber Attacks

## Ice Storm Dec. 2008

- Loss of electricity for 1+ million customers; some for more than 2 weeks
- In Peru: 4 days of non-stop chainsaws; a week to clear all roads; weeks for full cleanup
- FEMA obligates >\$32 million in Mass.
  - State costs >\$7 million
  - Municipal costs >\$5 million
  - National Grid claims damages of >\$30 million
  - Small businesses without electricity "lose tens of millions of dollars"



## T.S. Irene 2011

- 3"-9" in 12-hour period + high winds
- 500,000+ MA residents w/out electricity
- In Peru: damages to Hickingbotham & Middlefield Roads; flooding of Smith, Beauman, Marlow
- Dubbed the "costliest Category 1 storm" (\$15.8 billion in damages in U.S.)
- \$35 million in damages in Berk. Co.; \$23 million alone for Mohawk Trail
- Permanent loss of The Spruces, Wmstn.



## Don't take Water for Granted

- Warmer temps. = drought cycles due to more evaporation rates
- Less groundwater recharge
- Downpours = more runoff = less base flow and groundwater recharge
- Berkshires got off lightly 2016-17




### Berkshire County Forest Fires

- Clarksburg, April 2015 – record for county – 272 acres
- Clarksburg, May 2021 – new record – 950+ acres
- Bad News: sites inaccessible to trucks, tankers; helicopters win the battles
- Good News: no buildings nearby
- Experience gained



### Observed Number of Extreme Precipitation Events

- 55% increase 1958-2016 in heavy rain/snow events – more downpours
- 55% increase in heavy precipitation includes 9-year drought
- 30% increase in precipitation events >2" in 1 day (see right)
- >2"/day = flooding, especially if rain on snow/frozen ground




<https://statesummaries.ncics.org/mo>

### Winter Weather Changes

Cycles of cold and warm will increase, alter risks

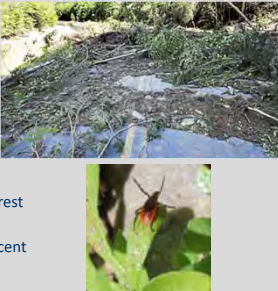
- **More rain-on-snow events** = Increased runoff, risk of winter floods and ice jams
- **More Ice Storms** = 2008: >1 million w/out power; several smaller ice events in recent years
- **Less snowpack** = less groundwater recharge
- **Loss of snow insulation** = risk of freeze/thaw = increased risk of frozen pipes, drains
- **Dryer spring soils** = more fire risk



### Will Climate Change Effect Hazards and Human Health?

Already we see altered weather patterns:

- More frequent and more intense precipitation; damages and repairs more costly
- Longer growing season, more airborne allergens
- More heat waves (>90°F); more in spring and fall
- Warmer winters with heavier snow and more ice
- Higher survival rates for pests (ticks, mosquitos, forest pests)
- Increased risk for algae blooms on lakes/ponds (recent ex. = Stockbridge, Pittsfield)




### Are you ready for power outages?

**Observed:** household summer peak demand up 3-fold from 1960-2000

**The energy sector's 3 major climate change concerns:**


- Flooding (increased downpours, flooding in low lying areas)
- Extreme events (hurricanes, snow, ice);
- Increased temperature (AC demand surge, heat damage to distribution system, controlled brownouts)

**Are you prepared to open warming or cooling shelters?**



### Public Survey Results

- 41 surveys completed – **and it's still open!**
- Respondents from across Town
- Hazard cited most often: Ice Storm 2008 (46% directly list it)
- Hurricane Irene 2011 second most listed event
- Road washouts
- Tree damages



## Public Survey Results

### Rankings: what natural hazards concern residents the most

1. Severe winter weather
2. Others (hurricanes, high winds, thunderstorms)
3. Flooding or washout of roads

### Rankings: why residents are concerned about hazards

1. Loss of electricity - #1 by a large margin
2. Injury or loss of life
3. Being isolated (washed out roads or communication)

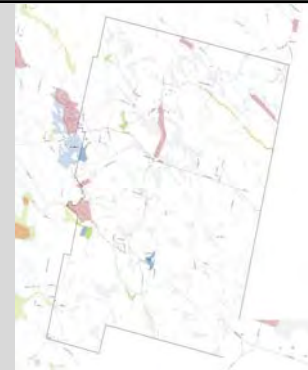
## Flooding

**Good News:** 0 homes in 100-year floodplain; few road miles in FP

**Bad News:** main connector roads at risk

### Flooding of key connectors

- Hickingbotham Road – rain, dam releases
- Middlefield Road – rain, beavers
- North Road – rain
- East Windsor Road – rain



## Natural Hazards Themes

### Flooding of roads

- Need to up-size some culverts, but high cost is barrier
- Timing and coordination: Lake Ashmere dam water releases in fall
- Resident concerns about washouts and isolation

**Widespread tree damage:** from storms, emerald ash borer

### Emergency Preparedness

- Concern for loss of electricity and communications

## Main Recommended Actions

### Pursue road improvements with flooding in mind:

- Advocate for upsizing of box culvert on Middlefield Rd.
- Continue culvert improvements along North Road; pursue grant options to cover costs
- Continue beaver control measures and funding options



### Mitigation Example: Dingle Rd., Worthington

Double box culvert washed out 2003  
New crossing survived T.S. Irene 2011



### Mitigation Example: Benton Hill Rd., Becket

3 culvert bridge  
replacements in 7  
years

New full span bridge  
reduces risk of  
repeated failures



Clockwise from top left: First replacement culvert (2006); culvert failure due to Tropical Storm Ivan (2011); temporary temporary replacement culvert (2011); replacement bridge (2016).

## Major Recommended Actions

- Continue tree trimming/removal of roadside trees
- Look for updates to FEMA floodplain maps
- Consider a town-wide emergency notification system
  - Towns with systems: Middlefield, Hinsdale, Dalton, Cummington, Clarksburg, Monterey, New Marlborough
- Remain active in the Central REPC to take advantage of regional preparedness trainings, exercises and services



## Now it's Your Turn!



**Help town officials,  
first responders and  
fellow residents  
prioritize the most  
important actions**

## Seeking Public Comments

- Fill out the survey if you haven't done so - through June 25<sup>th</sup> at <https://www.surveymonkey.com/r/PeruHM>
- Provide comments about tonight's presentation
- Review / comment on the Draft Hazard Mitigation and Climate Adaptation Plan when it's posted June 30 – July 20, 2021
- Send comments to: [lauren@berkshireplanning.org](mailto:lauren@berkshireplanning.org) or to any of your Selectmen