



Burlington County Multi-Jurisdictional Hazard Mitigation Plan 2024 Update

Planning Partnership Risk Assessment Meeting

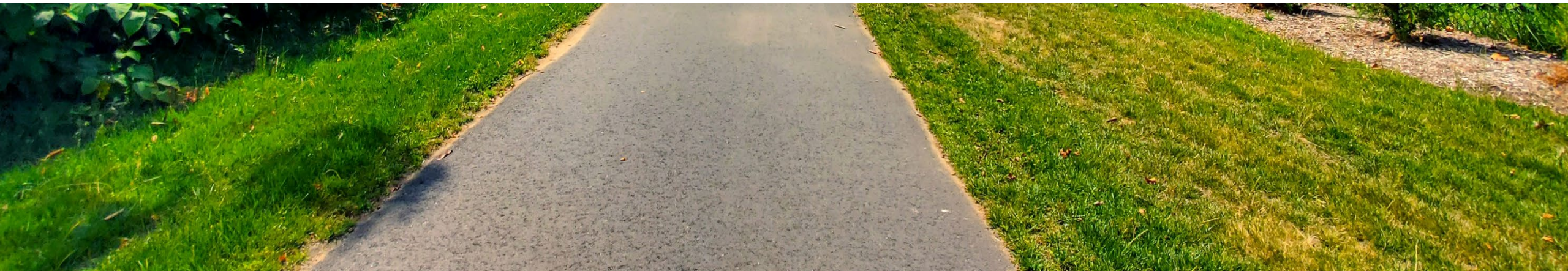
October 30, 2023

While waiting for the meeting to start, please enter your information on the Sign-In Sheet.



Today's Agenda

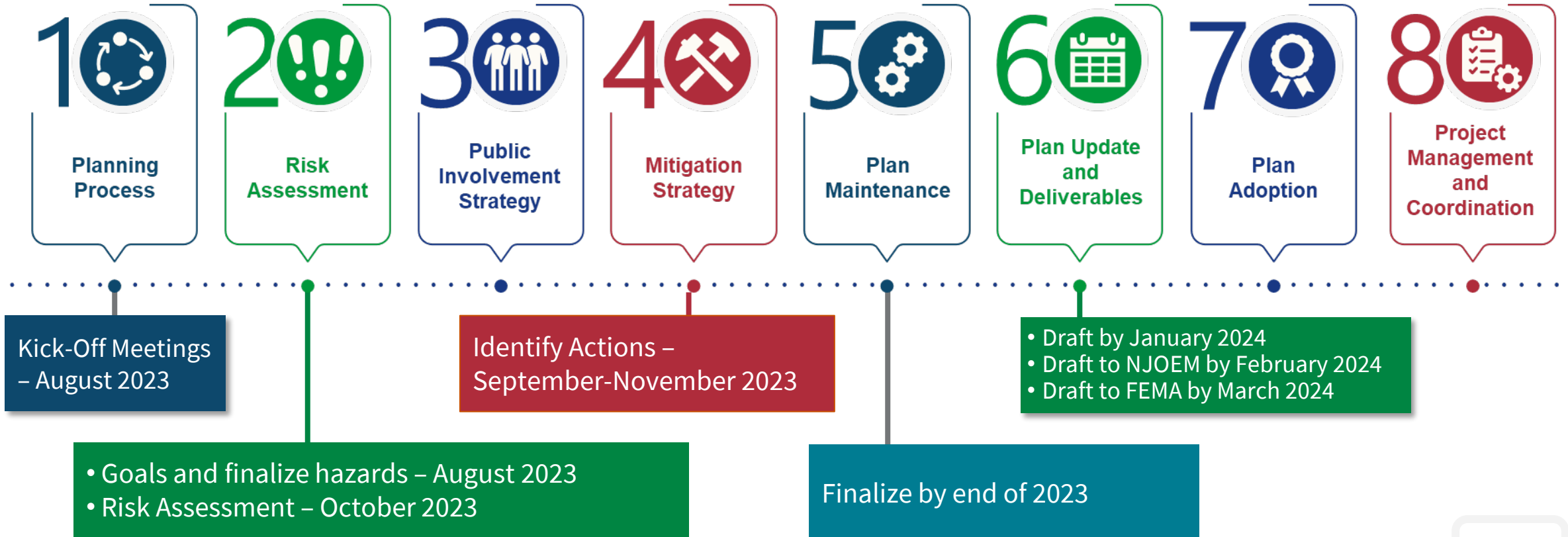
1. Welcome and Introductions
2. Project Status
3. Risk Assessment Overview
4. Hazard Ranking
5. SWOO
6. Questions/Wrap Up





Project Status

Schedule





Municipal Participation Status

- To date, we have received Letters of Intent to Participate (LOIP) from all but seven municipalities.

Status (10/20/2023)		Status (10/20/2023)		Status (10/20/2023)		Status (10/20/2023)	
Municipality	LOIP Received?	Municipality	LOIP Received?	Municipality	LOIP Received?	Municipality	LOIP Received?
Bass River (Twp)		Eastampton (Twp)	X	Medford Lakes (B)	X	Riverton (B)	X
Beverly (C)	X	Edgewater Park (Twp)	X	Moorestown (Twp)	X	Shamong (Twp)	X
Bordentown (C)	X	Evesham (Twp)	X	Mt. Holly (Twp)	X	Southampton (Twp)	X
Bordentown (Twp)	X	Fieldsboro (B)		Mt. Laurel (Twp)	X	Springfield (Twp)	X
Burlington (C)	X	Florence (Twp)	X	New Hanover (Twp)	X	Tabernacle (Twp)	X
Burlington (Twp)	X	Hainesport (Twp)	X	North Hanover (Twp)	X	Washington (Twp)	X
Chesterfield (Twp)	X	Lumberton (Twp)	X	Palmyra (B)	X	Westampton (Twp)	
Cinnaminson (Twp)	X	Mansfield (Twp)	X	Pemberton (B)	X	Willingboro (Twp)	
Delanco (Twp)	X	Maple Shade (Twp)		Pemberton (Twp)	X	Woodland (Twp)	
Delran (Twp)		Medford (Twp)	X	Riverside (Twp)	X	Wrightstown (B)	X



Public Outreach and Engagement

ACTION! Distribute the Public Survey!

- Post links on social media and department/agency websites
- Stakeholder and neighboring municipalities surveys have been distributed
- Make efforts to reach out to:
 - General Public
 - Stakeholders
 - Neighbors
 - Socially Vulnerable Populations

Burlington County Hazard Mitigation Plan Update - Public Survey

Natural Hazard Information

In this section, we are looking for your input on the types of natural hazards that impact Burlington County and its residents. Please answer the following questions to help us understand the concerns throughout the counties.

OK

1. In the last five years, have you experienced any of the following natural hazards?
 Dam Failure
 Disease/Pest

BURLINGTON COUNTY HAZARD MITIGATION PLAN SURVEY

Burlington County is seeking input for the 2024 Hazard Mitigation Plan. The plan will address the County's risks posed by hazards (e.g., flood, drought, winter storms) and identify specific strategies to help reduce or eliminate risks.

TAKE THE SURVEY
[HTTP://BIT.LY/45C7GOL](http://bit.ly/45c7gol)

Risk Assessment Overview





What is Risk?

Risk is defined as a function of :

- Hazard
 - Source of potential danger or adverse condition
- Exposure
 - Manmade or natural features that are exposed to the hazard
- Vulnerability
 - Damage susceptibility of the exposed features
- Adaptive Capacity (or capability)
 - Plans/policies
 - Response/recovery
 - Financial resources





Purpose of Risk Assessment

- To get a better understanding of the risks you face
- Initial results based on available data
- Quantitative data (population/structures exposed, structural damages within hazard zones) used when available
- Qualitative community input (such as unmapped flood areas) integrated to adjust results
- Local community input to adjust relative rankings





Preliminary Risk Assessment Results

Dam Failure

Dam failures in Burlington County are a low-probability and high-consequence event. A dam failure can have devastating impacts on the County. While most dams have storage volumes small enough that failures would have little or no consequences, dams with large storage amounts could cause significant flooding downstream.

Number of Dams

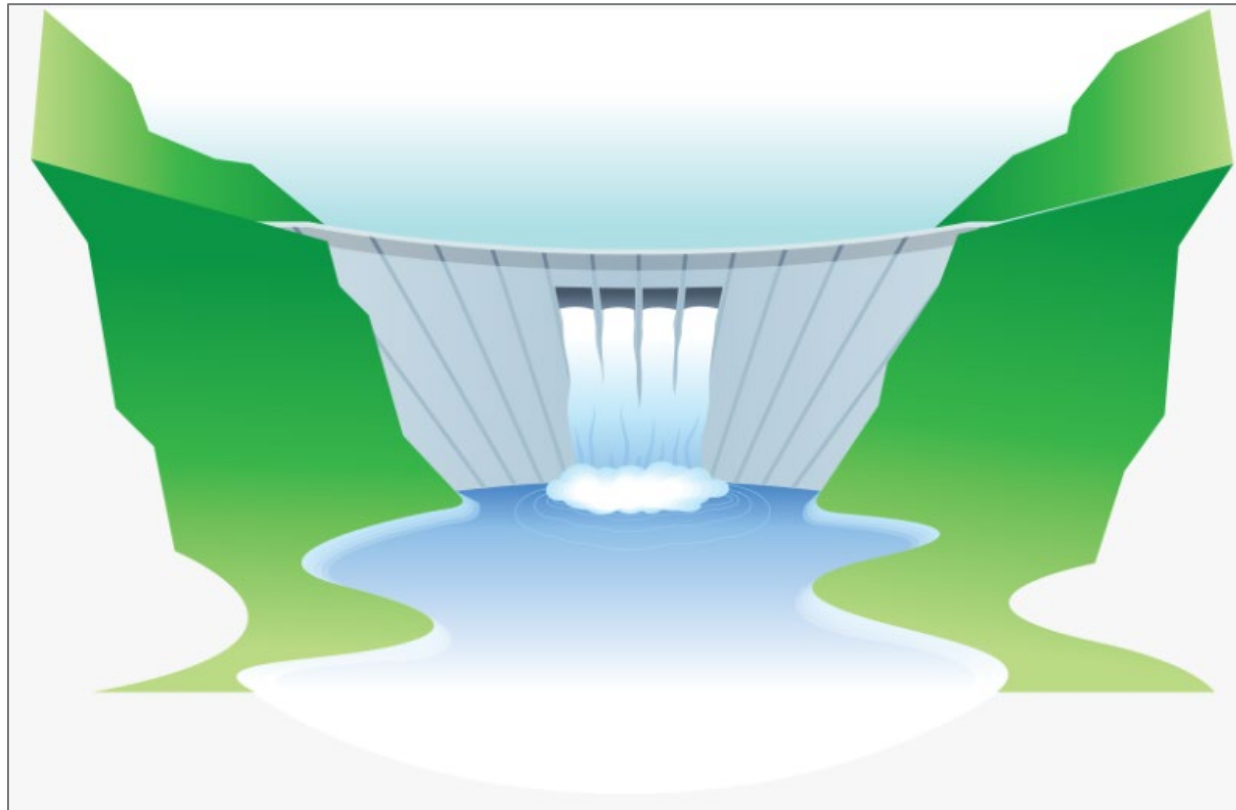
74

- 10 High Hazard
- 40 Significant Hazard
- 24 Low Hazard

Impacts

- Dam failure can cut evacuation routes, limit emergency access, and/or create isolation issues.
- Severe flooding that follows a dam failure can cause extensive structural damage and withhold essential services.
- The environmental impacts of a dam failure can include significant water-quality and debris-disposal issues or severe erosion that can impact local ecosystems.

Dam Graphic



Notable Occurrence



On July 12-13, 2004, the Townships of Lumberton and Medford experienced major flooding due to heavy rainfall. Property damage from the flood was estimated at \$50 million. The flooding led to the evacuation of about 760 residents, the complete destruction of seven homes, major flood damage to approximately 200 homes, flood damage to approximately 1,000 homes, the closing of 25 major roads.

Disease Outbreak

Disease outbreaks can impact the entirety of Burlington County. Emerging diseases are difficult to contain or treat and present significant challenges to risk communication since the mechanics of transmission, laboratory identification, and effective treatment protocols may be unknown.

Population Exposed

461,860

(100%)

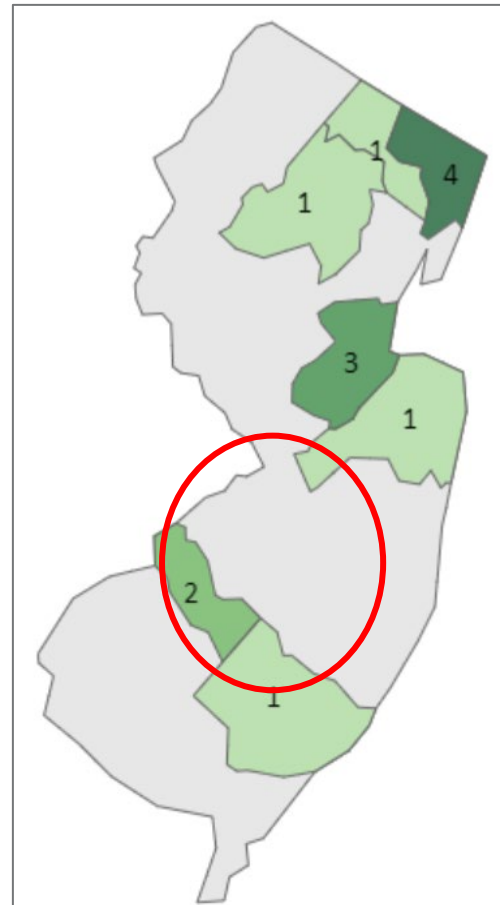
The entire County is susceptible

Notable Occurrences

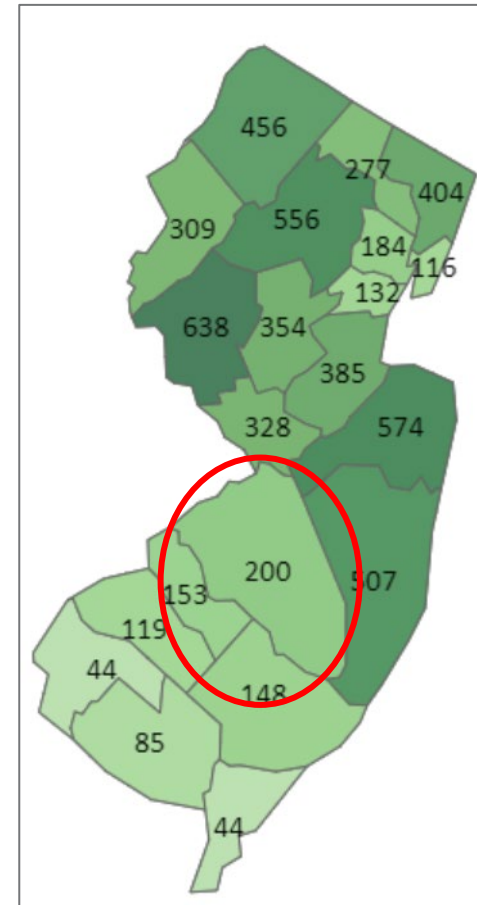


- In 2019, there were 236 confirmed cases of Lyme Disease.
- In 2020, there were 847 confirmed cases of Influenza.
- Since 2020, Burlington County reported 117,710 positive cases of COVID-19 and 681 deaths.

West Nile Virus Cases by County, 2023



Lyme Disease Cases by County, 2023



Hazard Types

- Influenza
- West Nile Virus
- Lyme Disease
- Coronavirus

Drought

Droughts can affect Burlington County's industries and make day to day tasks more difficult to complete when water usage must be monitored.

Population Exposed

461,860

(100%)

The entire County is susceptible

USDA Declarations

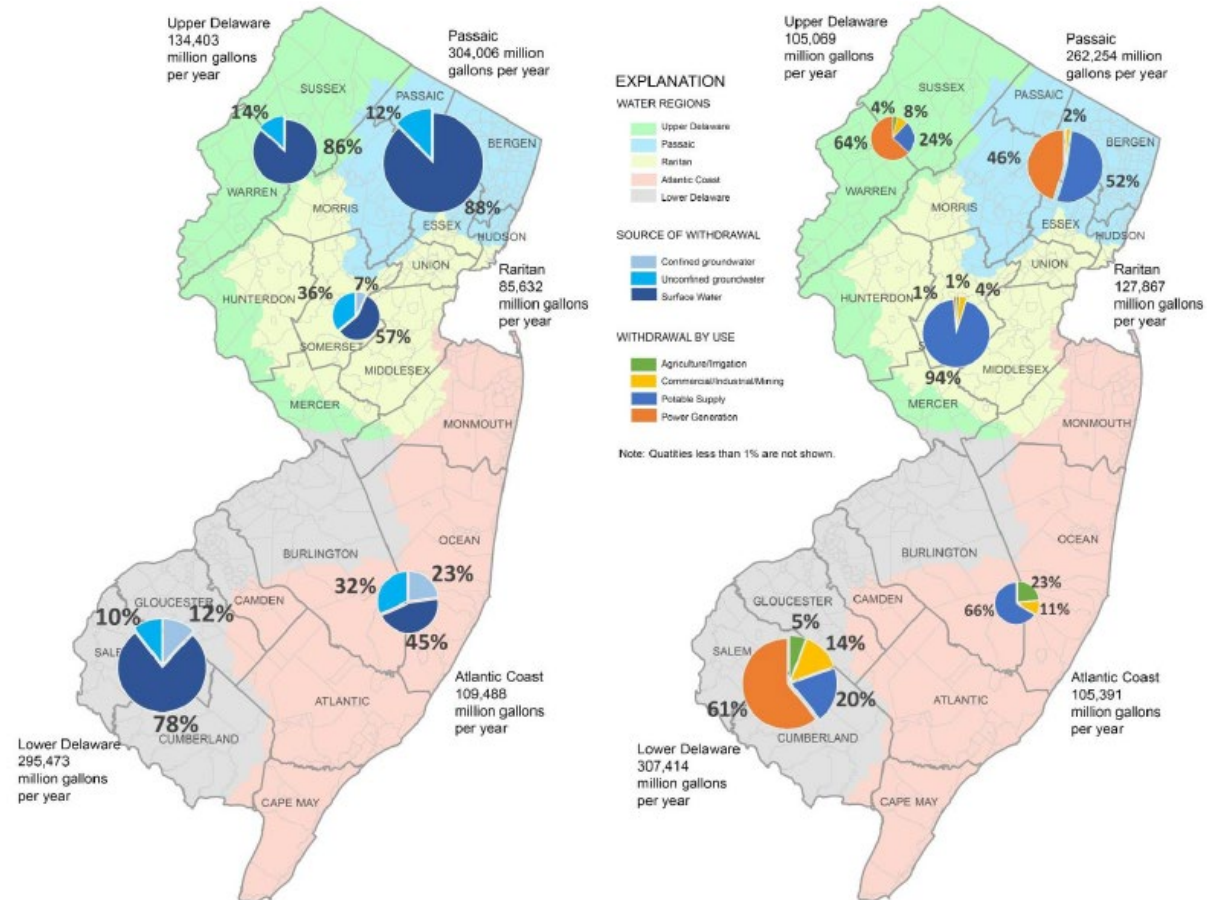
3

- 3 Drought declarations

Climate Change Impacts

It is anticipated that droughts lasting 3 to 6 months and longer may slightly increase in frequency under a low emissions scenario and will significantly increase under a high emissions scenario.

Water Regions, Sources and Withdrawal by Sector in New Jersey



Hazard Types



Meteorological



Hydrological



Agricultural



Socioeconomic

Earthquake



Earthquakes in Burlington County are a low-probability and high-consequence event. An earthquake can have devastating impacts on the County. Ground shaking can lead to the collapse of buildings and bridges and disrupt gas lines, electricity, and phone service.

Population Exposed

461,860
(100%)

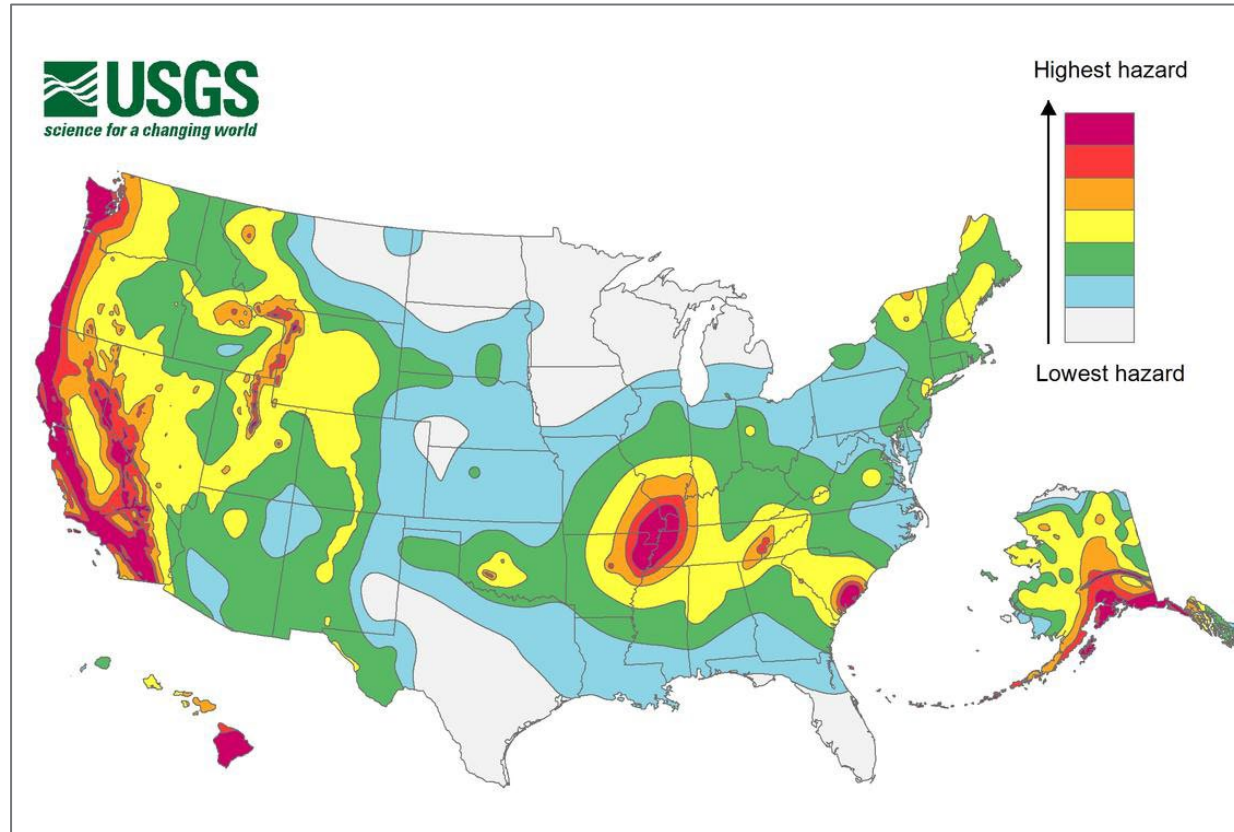
The entire County is susceptible

Notable Occurrences



Small earthquakes may occur several times a year and generally do not cause significant damage. The strongest earthquake with an epicenter in Burlington County was a 3.0 quake in Medford Lakes in 1980.

Location



Hazard Types

- Surface Faulting
- Ground Motion
- Liquefaction
- Tectonic Deformation
- Seiche

Extreme Temperatures

Extreme temperature includes both heat and cold events, which affects the entire County including, human health and commercial/agricultural businesses. Extreme temperature events can have primary and secondary effects on infrastructure.

Population Exposed

461,860

(100%)

The entire County is susceptible

USDA Declarations

2

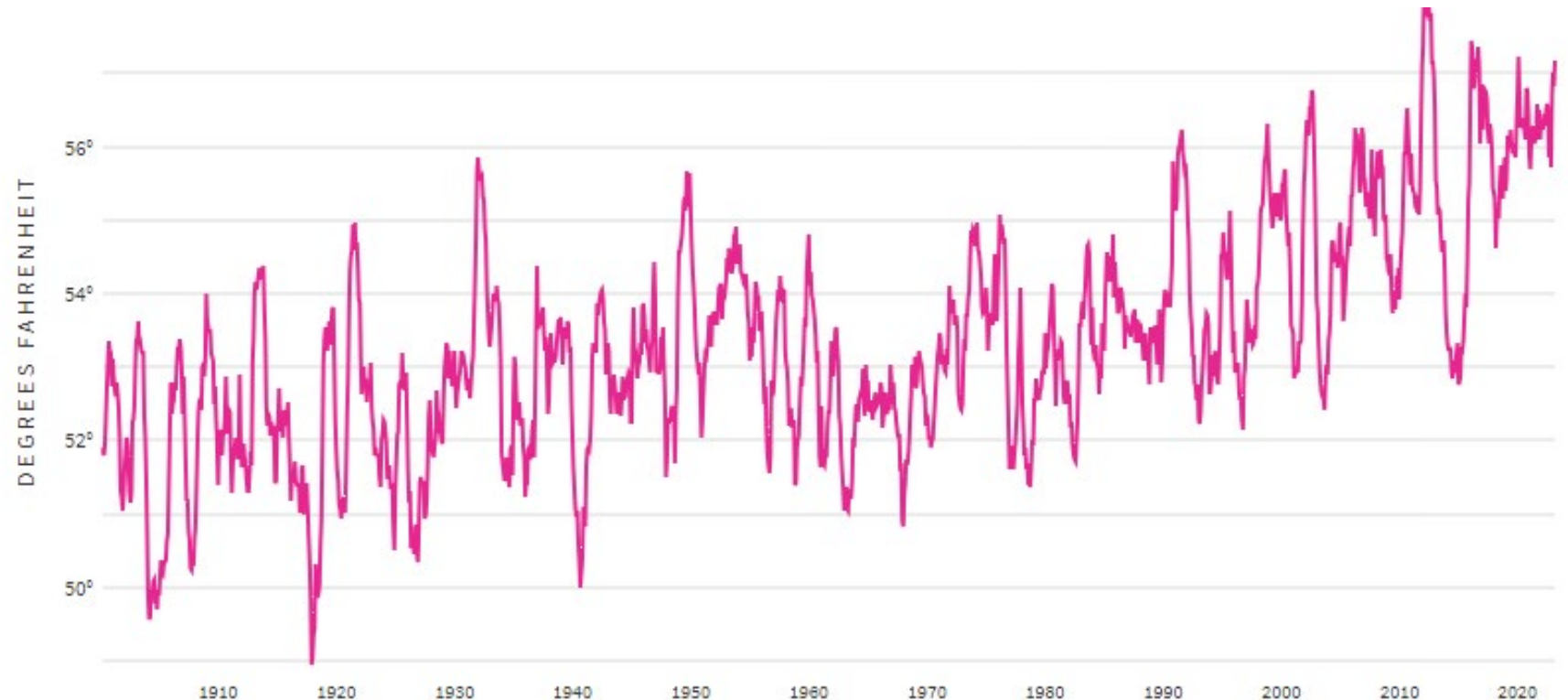
- 2 Excessive Heat declarations

Climate Change Impacts

New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F.



12-Month Temperature Averages in Burlington County



Flood

Floods are one of the most frequent and costly natural hazards in Burlington County in terms of human hardship and economic loss, particularly to communities that lie within flood prone areas or floodplains.

Population Exposed

14,583
(3.2%)

In 1% Annual Chance Flood Area

25,026
(5.4%)

In 0.2% Annual Chance Flood Area

Number of Buildings Exposed

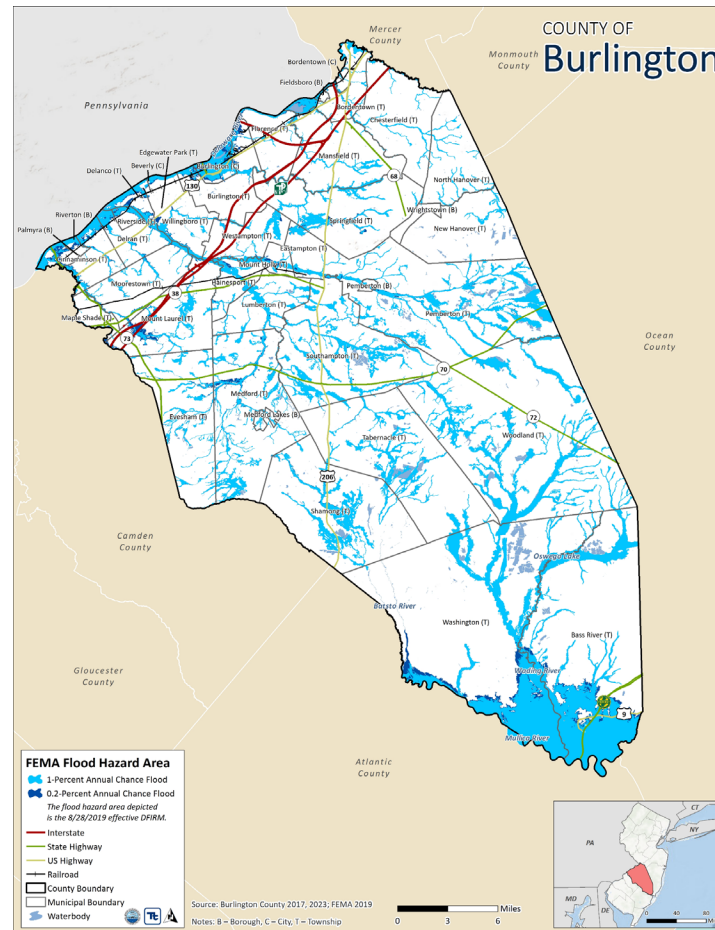
5,163

In 1% Annual Chance Flood Area

8,739

In 0.2% Annual Chance Flood Area

Location



Flood Building Replacement Cost Value

\$9,333,016,825

In 1% Annual Chance Flood Area

\$14,060,945,896

In 0.2% Annual Chance Flood Area



Land Exposed to Flood Hazard

72,903

(14.6%)

Sea Level Rise Impacts

1-Foot Hazard Area

- 225 Persons Located in Hazard Area
- 90 Buildings Located in Hazard Area

3-Foot Hazard Area

- 677 Persons Located in Hazard Area
- 272 Buildings Located in Hazard Area

Hazard Types



Riverine / Inland



Flash Flood



Urban / Stormwater



Coastal



Ice Jam



Erosion



Sea Level Rise

Severe Weather

Severe weather can occur anywhere in the County at any time and have the potential to be life-threatening. It is critical for the community to prepare and be aware of forecasts in their local jurisdictions.

Population Exposed

461,860
(100%)

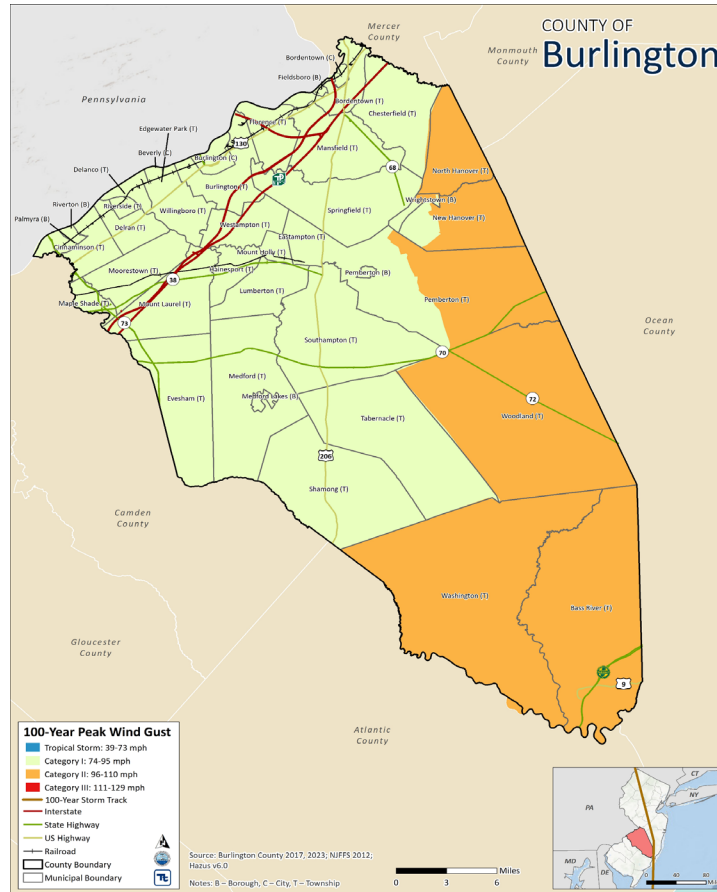
The entire County is susceptible

Notable Occurrences



The remnants of Hurricane Ida resulted in widespread thunderstorms. An EF-1 tornado formed in Burlington Township, near Edgewater Park. Extensive tree damage was reported. Power outages occurred due to damages to powerlines.

Location



Potential Impacts

- Essential Services Interruptions Power Outages
- Traffic Accidents
- Downed Trees
- Property Damage
- Personal Injury / Loss of Life

Hazard Types



Climate Change Impacts

New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F. Increases will be more conducive to increased frequency and intensity of severe storms (e.g., thunderstorms, tornadoes).



Severe Winter Weather



Severe winter weather can occur anywhere in the County and have the potential to be life-threatening. It is critical for the community to prepare and be aware of forecasts in their local jurisdictions.

Population Exposed

461,860

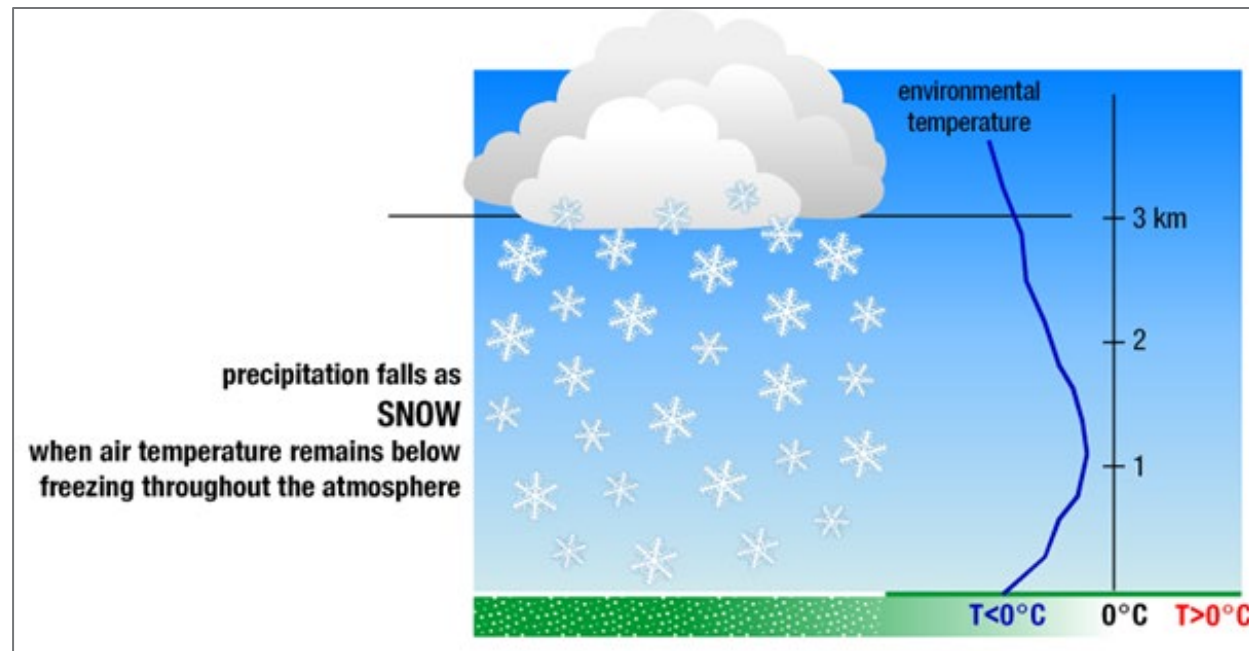
(100%)

The entire County is susceptible

Hazard Types

- Heavy Snow
- Blizzard
- Sleet
- Ice Storm
- Nor'easter

Formation of Snow



Notable Occurrences



The Blizzard of 1996 dropped roughly 30 inches of snow in parts of Burlington County on January 7, 1996. Property damage was in the millions and the storm resulted in one death.

Wildfire events in Burlington County typically occur toward the forested southeastern portions of the County in the Pinelands. Wildfires can have impacts on critical services, utilities, and properties, and may cause injury.

Population Exposed

6,406
(1.4%)

Of the County is susceptible

Building Replacement Cost Value

\$4,963,331,009

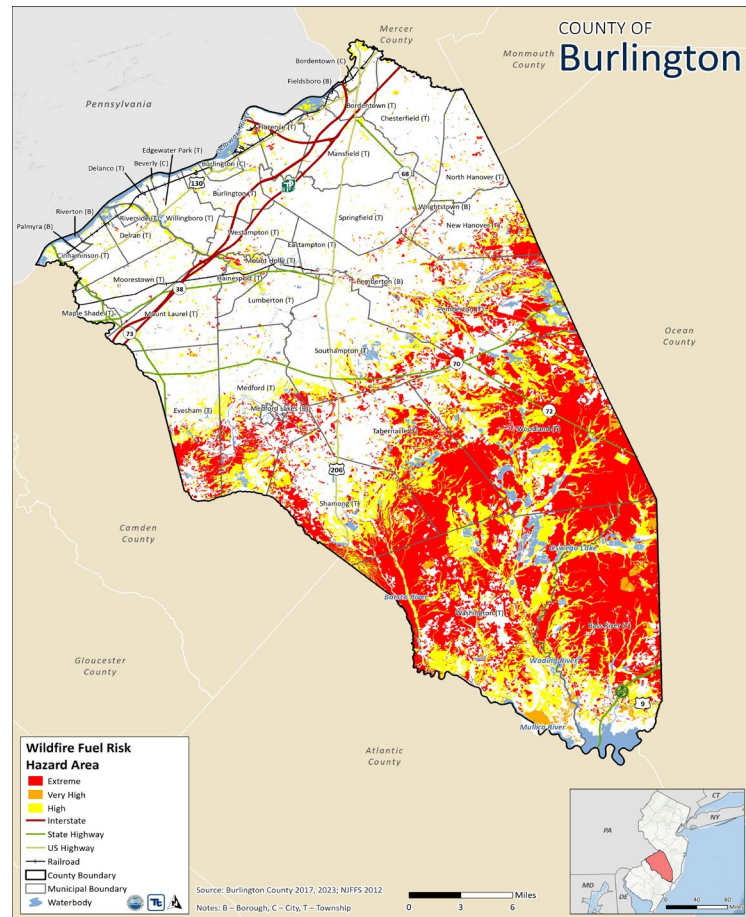
In Extreme, Very High, or High Wildfire Fuel Risk Hazard Area

Number of Buildings Exposed

2,140
(1.4%)

In Extreme, Very High, or High Wildfire Fuel Risk Hazard Area

Location



Notable Occurrences



On June 19-21, 2022 a wildfire was detected in a remote section of the Wharton State Forest in Mullica Twp. Unseasonably dry, windy conditions, combined with difficulty in accessing the initial fire location, led to rapid fire spread. When the fire was fully contained an estimated 14,983 acres had burned. This made it the largest wildfire in New Jersey since 2007.

Climate Change Impacts

Burlington County can expect warmer and drier conditions which may increase the frequency and intensity of wildfires. Higher temperatures are expected to increase the amount of moisture that evaporates from land and water. These changes have the potential to lead to more frequent and severe droughts, which, in turn, increases the likelihood of wildfires.



Hazard Rankings

Review the calculated hazard rankings and provide your feedback.

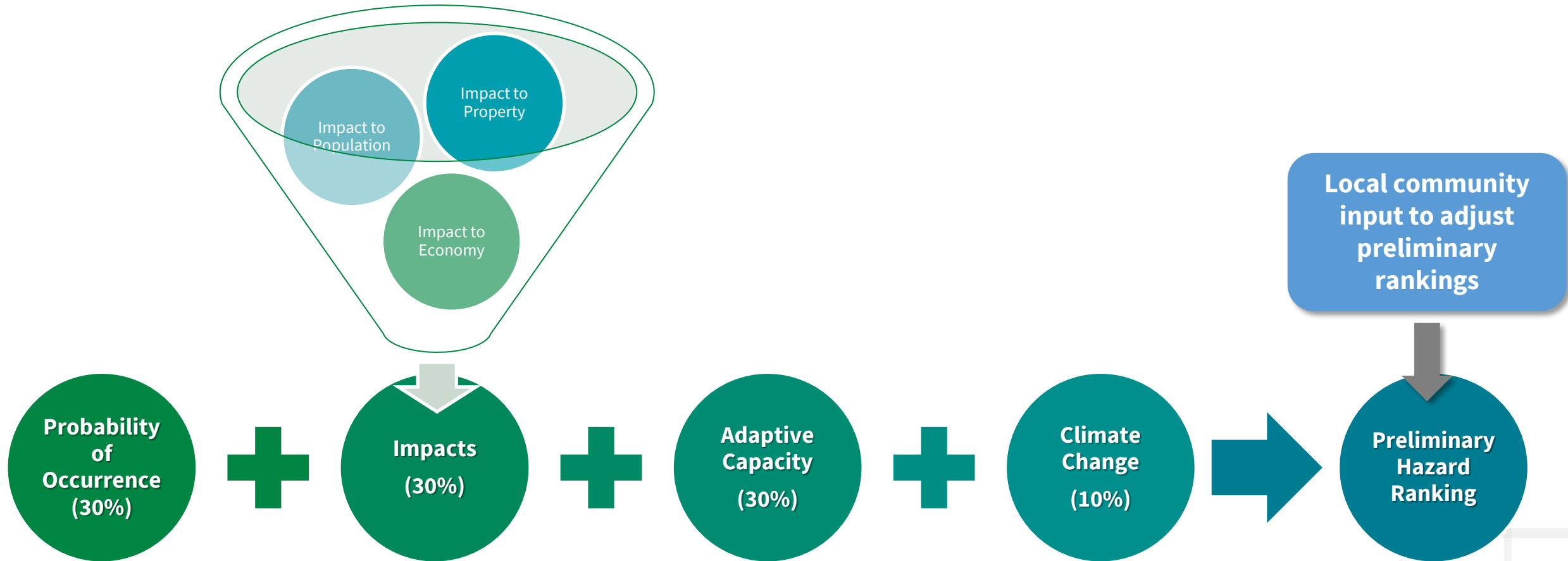
Preliminary Hazard Ranking Methodology



- The calculated probability of a hazard occurring based on historical data
- *Impacts to people, property, and the economy* based on GIS data and analysis of exposure.
- The degree to which climate change will affect future occurrences based on best available data.
- The degree to which existing capabilities (the ability of your community to respond to the hazard based on ordinances, mitigation strategies and procedures, and readiness) decrease overall risk.



Preliminary Hazard Ranking Formula



Risk Ranking



High

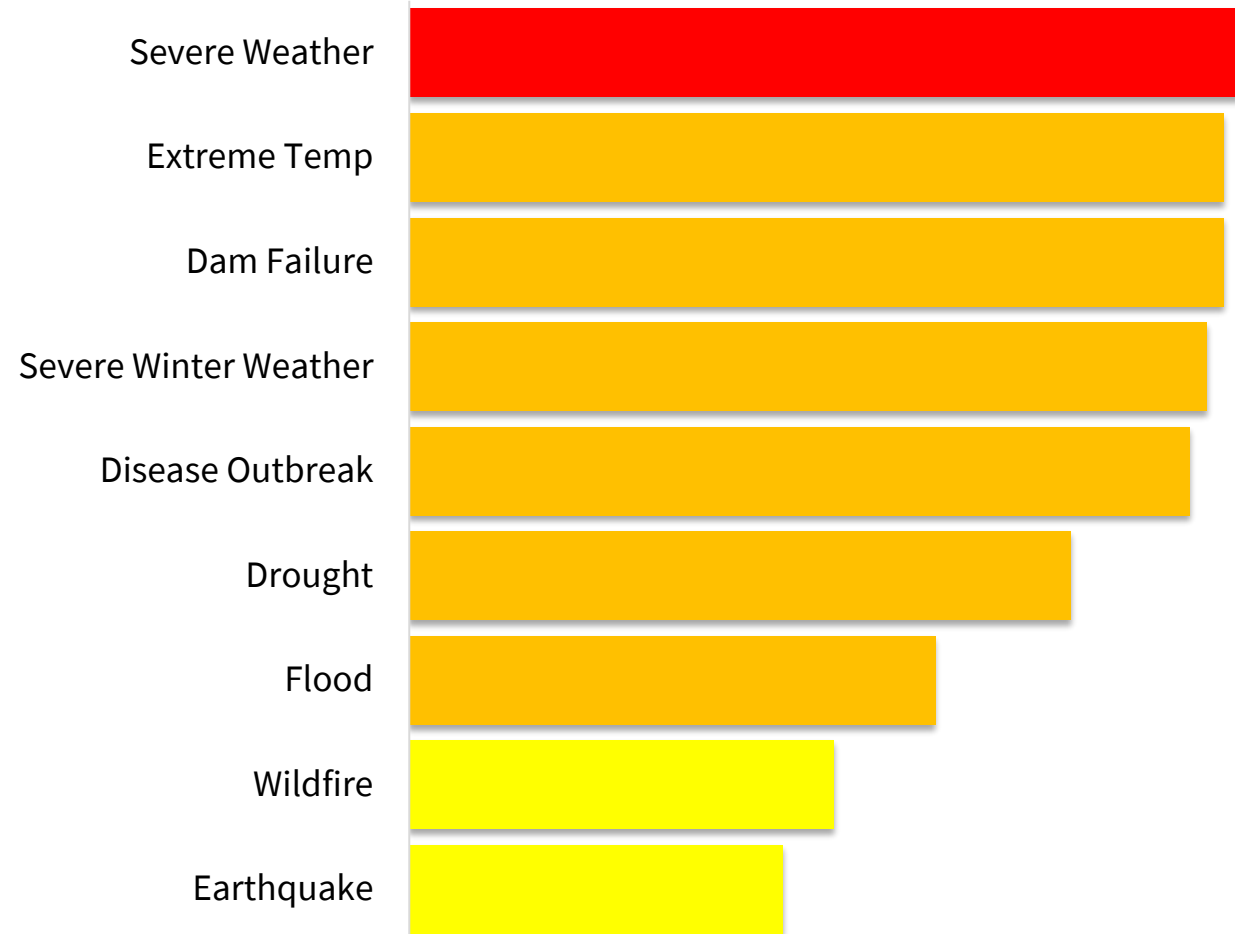
- Severe Weather

Medium

- Extreme Temperature
- Dam Failure
- Severe Winter Weather
- Disease Outbreak
- Drought
- Flood

Low

- Wildfire
- Earthquake





STRENGTHS, WEAKNESSES, OBSTACLES, AND OPPORTUNITIES (SWOO)

Fill out your SWOO worksheet to provide more information on capabilities, risks, and potential new actions

Strengths, Weaknesses, Obstacles, and Opportunities (SWOO)



- The purpose of the SWOO is to identify mitigation strategies and capabilities that will meet the goals and objectives for the Burlington County HMP. Look at the following for each hazard of concern:
 - Strengths – what the County and communities do well; things upon which we can capitalize;
 - Weaknesses – what can be done better; what can be strengthened;
 - Obstacles – what stands in the way to implementation to prevent mitigation or response (for example regulatory, geographical, environmental, financial issues); and
 - Opportunities - actions or projects to mitigate issues or improve resilience.



STRENGTHS, WEAKNESSES, OBSTACLES, AND OPPORTUNITIES (SWOO)

The purpose of the SWOO is to identify mitigation strategies and capabilities that will meet the goals and objectives for the Burlington County Hazard Mitigation Plan. The results will be used to develop a catalog of potential mitigation actions for use by the County and all jurisdictions. The opportunities developed from this process will serve as the basis for our catalog of potential mitigation alternatives. The alternatives will address our risks, meet our planning goals, and fall within our capabilities. We need to look at the following for each hazard of concern:

- **Strengths** – what the County and communities do well; things upon which we can capitalize;
- **Weaknesses** – what can be done better; what can be strengthened;
- **Obstacles** – what stands in the way to implementation to prevent mitigation or response (for example regulatory, geographical, environmental, financial issues); and
- **Opportunities** - actions or projects to mitigate issues or improve resilience.

Dam Failure
Strengths
Weaknesses
Obstacles
Opportunities

Use the results of this worksheet to assist with the development of your updated mitigation strategy.

Return this worksheet to Tetra Tech staff at the end of the Mitigation Strategy Workshop.



Questions?



Next Steps

- Complete your risk assessment worksheet including hazard rankings and SWOO
- Take a break and we will reconvene shortly.



Burlington County Project Contact

Kristen Carr, Office of Emergency Management
(609) 738-5139 | KrCarr@co.burlington.nj.us

Tetra Tech Project Manager

Chris Huch, CFM
(973) 630-8357 | chris.huch@tetrattech.com

Tetra Tech Lead Planner

Jessica Stokes, MSEM, NJCEM
(973) 630-8017 | jessica.stokes@tetrattech.com



Thank
You!