

Hazard Mitigation Goals, Objectives & Action Items: City of Charlottesville

Introduction

This document presents detailed information regarding hazard mitigation goals, objectives, and mitigation action items developed for the 2023 update to the Regional Hazard Mitigation Plan. The “Mitigation Strategy” is five broad categories with corresponding goals and objectives. The mitigation strategy was developed through a cooperative effort of the Hazard Mitigation Working Group, consisting primarily of planners and emergency operations coordinators. The overarching goals of the hazard mitigation plan were reviewed and revised from the previous plan update. Those goals and objectives were then reviewed by the public in the Hazard Mitigation Public Workshop held by the TJPDC, which further modified the goals and objectives detailed in the Mitigation Strategy.

Based on the goals and objectives identified through the cooperative planning process of the mitigation strategy, each jurisdiction developed actionable directives or “mitigation action items” to further the Mitigation Strategy before the next Hazard Mitigation Plan update.

Mitigation actions are discrete projects, programs, or policies that are recommended for implementation in this plan. The action items differ from objectives in that they are measurable, have a party responsible for completion, and typically can be completed within a given timeframe. The action items presented in this plan represent the aspirations of the various localities in the region, with the understanding that they may be completed as resources are made available from a variety of sources. Mitigation actions are to be implemented by the lead party, as identified in the plan, often in partnership with other agencies and organizations.

TJPDC staff compiled input from the Working Group into a listing of potential actions organized under each goal and objective. The list was provided to each jurisdiction and used in discussions with Local Emergency Plan Committees (LEPCs) and at Working Group meetings. Each action item in the plan is prioritized as high, moderate, or low to reflect the mitigation value of the action or the urgency it requires. Priorities were determined based on several criteria. Items that were included in the 2018 plan generally maintain the same priority. The online survey asked respondents to prioritize goals and objectives, and this information has been used to prioritize the associated action items. Locality staff considered the severity and urgency of the issue to be addressed, the locality’s capacity to complete the action, and the benefit to be realized compared to the estimated cost of completion. TJPDC staff recommended use of FEMA’s cost-benefit analysis toolkit to ensure that localities were considering factors like number of people affected by hazards, area affected, property damage, loss of life, and injury, as well as economic impacts of inaction or partial action. A broad range of benefits were considered; some actions provide benefits beyond mitigating the impacts of hazards. Localities are acquainted with these types of tradeoffs, and instead of prescribing a specific process that each locality should use after creating mitigation action items, TJPDC staff instead prioritized locality-specific analysis when generating and prioritizing mitigation action items. Localities were encouraged to communicate cross-departmentally to accurately measure costs, timeline, and priority. TJPDC staff encouraged an iterative and collaborative process within each locality, as well as with other localities concerning shared hazards or facilities.

Most jurisdictions chose to roll over actions that were either incomplete, delayed, or modified from the 2018 plan. There were significant revisions of actions’ priorities, lead parties, and/or costs. These changes were primarily a result of localities experiencing significant staff turnover since 2018 and funding constraints. Many localities decided to revise older mitigation action items to supply a more realistic and

achievable set of action items for the next 5 years. Locality staff indicated that revising goals, as well as coordinated efforts to revitalize LEPC meetings and other community engagement opportunities, serves as a realistic and operational foundation for hazard mitigation efforts in the coming years. Some localities added new action items in order to address new goals.

The Mitigation Strategy, corresponding mitigation goals and objectives, and the detailed mitigation action items for the City of Charlottesville are found below.

Mitigation Strategy

Education and Outreach

- **GOAL:** Increase awareness of hazards and encourage action to mitigate the impacts
 - o **OBJECTIVE:** Educate families and individuals on disaster mitigation and preparedness
 - o **OBJECTIVE:** Train key agency staff and volunteer groups in disaster mitigation and preparedness
 - o **OBJECTIVE:** Train staff at schools and residential facilities in disaster mitigation and preparedness
 - o **OBJECTIVE:** Encourage and equip employers to develop emergency action plans

Infrastructure and Buildings

- **GOAL:** Reduce the short and long-term impact of hazard events on buildings and infrastructure
 - o **OBJECTIVE:** Diversify the energy system to provide multiple power source and fuel supply options and promote self-sufficient buildings with multiple energy options
 - o **OBJECTIVE:** Diversify the communications system to provide alternative lines for use during loss of capacity
 - o **OBJECTIVE:** Diversify the transportation system by increasing connectivity and providing modal options
 - o **OBJECTIVE:** Elevate, retrofit and relocate existing structures and facilities in vulnerable locations
 - o **OBJECTIVE:** Construct or upgrade drainage, retention, and diversion elements to lessen the impact of a hazard on an area
 - o **OBJECTIVE:** Protect sensitive areas through conservation practices
 - o **OBJECTIVE:** Ensure that each critical facility has a disaster plan in place

Whole Community

- GOAL: Prepare to meet the immediate functional and access needs of the population during natural hazards
 - o OBJECTIVE: Effectively communicate with and transport people regardless of their language proficiency and physical needs.
 - o OBJECTIVE: Make information available, accessible, and accurate to ensure the entire population can access emergency shelters in a timely manner and have functional needs met, in the event of a natural hazard
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- o OBJECTIVE: Updating necessary information consistently and through multiple different outlets through the development an emergency information communication plan

Mitigation Capacity

- GOAL: Increase mitigation and adaptation capacity through planning and project implementation
- o OBJECTIVE: Reduce property risks through planning, zoning, ordinances and regulations
- o OBJECTIVE: Incorporate mitigation planning concepts, climate resilience, and vulnerability planning into local plans and ordinances
- o OBJECTIVE: Pursue funding to implement identified mitigation and resilience strategies
- o OBJECTIVE: Encourage proactive management of hazard prone areas, environmental features, or infrastructure

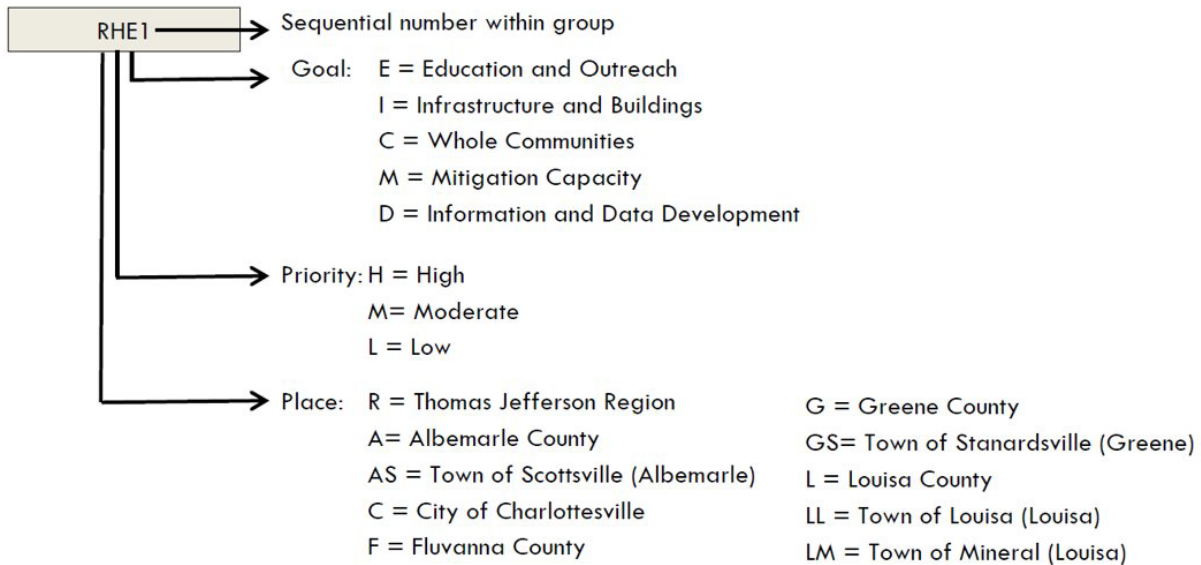
Information and Data Development

- GOAL: Build capacity with information and data development to refine hazard identification and assessment, mitigation targeting and funding identification
- o OBJECTIVE: Identify data and information needs and develop methods to meet these needs
- o OBJECTIVE: Utilize data to ensure proactive targeting of mitigation efforts

Mitigation Actions Key Code

Each mitigation action item is accompanied by an activity code key in the top left corner of the Mitigation Action Items Table. The place or jurisdiction responsible for completing the item, the Mitigation Strategy goal that the mitigation action addresses, and the priority of the mitigation action item are detailed through the activity code key found below.

Activity Code Key



Furthermore, the detailed list of action items includes the supporting goal, hazard to be mitigated, party responsible for implementation, timeframe of implementation, estimated cost, and potential funding sources. Furthermore, all action items are prioritized and listed in order from high, moderate, to low priority.

Mitigation Action Item Description Table

[Activity Code] Mitigation Action: [Jurisdiction]	
Goal:	One of the goal categories listed above that is supported by the action
Action Item Description:	Brief description of action item
Hazard (s):	The hazard(s) the action is intended to mitigate
Lead Party Responsible:	Identify the local agency, department, or organization that is best suited to accomplish the action
Estimated Cost:	An estimate of the costs required to complete the project or continue the project for the course of 5 years; this amount should be estimated until a final dollar amount can be determined
Funding Method:	Potential sources of funds to complete the action, when applicable

Implementation Schedule:	Timeframe for which the action is expected to be completed
Priority	Placement in the order of importance and urgency

Charlottesville's Detailed Mitigation Action Items

CHE1 Mitigation Action: City of Charlottesville	
Goal:	Education and Outreach
Action Item Description:	Provide training for building inspectors and code officials on mitigation techniques and hazard-resistant building.
Hazard (s):	Multiple
Lead Party Responsible:	Neighborhood Development Services, Public Works
Estimated Cost:	\$10,000
Funding Method:	Hazard Mitigation Grant Program, General Revenue
Implementation Schedule:	Ongoing
Priority:	High

CHE2 Mitigation Action: City of Charlottesville	
Goal:	Education and Outreach
Action Item Description:	Ensure that all city schools have an emergency and disaster plan and regularly conduct disaster response drills.
Hazard (s):	Multiple
Lead Party Responsible:	Public School System, independent private schools
Estimated Cost:	N/A
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	High

CHM1 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Complete Flood Resilience Plan
Hazard (s):	
Lead Party Responsible:	
Estimated Cost:	
Funding Method:	

Implementation Schedule:	
Priority:	

CHM2 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Complete Climate Adaptation plan
Hazard (s):	
Lead Party Responsible:	
Estimated Cost:	
Funding Method:	
Implementation Schedule:	
Priority:	

CHM3 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Update floodplain regulations
Hazard (s):	
Lead Party Responsible:	
Estimated Cost:	
Funding Method:	
Implementation Schedule:	
Priority:	

CHM4 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Incorporate hazard mitigation plan into community plans. Identify senior living/special needs residences in areas vulnerable for flooding.
Hazard (s):	Multiple
Lead Party Responsible:	Neighborhood Development Services
Estimated Cost:	None
Funding Method:	N/A
Implementation Schedule:	3-5 years
Priority:	High

CHM5 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity

Action Item Description:	Conduct Community Emergency Response Team (CERT) classes to equip individuals and groups to assist in the event of a disaster.
Hazard (s):	Multiple
Lead Party Responsible:	Emergency Services Coordinator
Estimated Cost:	\$10,000
Funding Method:	FEMA Community Emergency Response Teams, FEMA Emergency Management Performance Grant
Implementation Schedule:	Ongoing
Priority:	High

CHM6 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Provide incentives to institutions and homeowners for use of low-flow appliances.
Hazard (s):	Drought
Lead Party Responsible:	Neighborhood Development Services
Estimated Cost:	None
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	High

CHM7 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Continue to expand use of citizen alert system. (Code RED) Develop community promotion plan for Code RED.
Hazard(s):	Multiple
Lead Party Responsible:	Regional Emergency Management Coordinator, City OEM
Estimated Cost:	\$5,000
Funding Method:	General Revenue
Implementation Schedule:	6-12 months
Priority:	High

CHM8 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Inventory all shelters and public buildings to ensure emergency preparedness supplies and equipment are onsite.

Hazard (s):	Multiple
Lead Party Responsible:	Emergency Services Coordinator
Estimated Cost:	\$40/location
Funding Method:	General Revenue
Implementation Schedule:	Ongoing
Priority:	High

CMI1 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Build or repair roadway and pedestrian crossings so as not to impede floodwaters
Hazard (s):	Flood
Lead Party Responsible:	VDOT
Estimated Cost:	Unknown
Funding Method:	Hazard Mitigation Grant Program, 406 Public Assistance Program
Implementation Schedule:	When bridges are repaired/replaced
Priority:	Moderate

CMI2 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Retrofit emergency service buildings for hazard resistance.
Hazard (s):	Structural
Lead Party Responsible:	Emergency Services Coordinator
Estimated Cost:	Unknown
Funding Method:	All hazards Emergency Operations Planning, Assistance to Local Firefighters Grant, Local Hurricane Grant Program, Pre-Disaster Mitigation Grant, Hazard Mitigation Grant Program
Implementation Schedule:	3-5 years
Priority:	Moderate

CMI3 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Retrofit emergency service buildings for hazard resistance.
Hazard(s):	Structural

Lead Party Responsible:	Regional Emergency Management Coordinator, City OEM
Estimated Cost:	Unknown
Funding Method:	All hazards Emergency Operations Planning, Assistance to Local Firefighters Grant, Local Hurricane Grant Program, Pre-Disaster Mitigation Grant, Hazard Mitigation Grant Program
Implementation Schedule:	3-5 years
Priority:	Moderate

CMM1 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Support volunteer groups and encourage collaboration on public outreach and education programs on hazard mitigation.
Hazard (s):	Multiple
Lead Party Responsible:	All City Departments, Emergency Services Coordinator
Estimated Cost:	None
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	Moderate

CMM2 Mitigation Action: City of Charlottesville	
Goal:	Mitigation Capacity
Action Item Description:	Create a strategy for using existing media outlets for communications during a hazard event.
Hazard (s):	Flood
Lead Party Responsible:	Office of Communications
Estimated Cost:	None
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	Moderate

CLE1 Mitigation Action: City of Charlottesville	
Goal:	Education and Outreach
Action Item Description:	Provide citizens with literature about flood and drought-smart landscaping.
Hazard (s):	Drought, Flooding
Lead Party Responsible:	Neighborhood Development Services, Public Works
Estimated Cost:	\$5,000

Funding Method:	Pre-Disaster Mitigation Grant, Hazard Mitigation Grant Program, Annual DCR Flood Awareness Week
Implementation Schedule:	3-5 years
Priority:	Low

CLE2 Mitigation Action: City of Charlottesville	
Goal:	Education and Outreach
Action Item Description:	Create educational campaign about floodplain locations, the benefits of open space and riparian corridors.
Hazard (s):	Multiple
Lead Party Responsible:	Public Works
Estimated Cost:	\$50,000
Funding Method:	Hazard Mitigation Grant Program, Community Flood Preparedness grant , Citywide Floodplain Management NFIP
Implementation Schedule:	Ongoing
Priority:	Low

CLI1 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Improve the maintenance of stormwater infrastructure.
Hazard(s):	Flood
Lead Party Responsible:	Public Works
Estimated Cost:	Unknown
Funding Method:	Environmental Protection Agency – Water Quality Cooperative Agreements, EPA-Nonpoint Source Grant Program, 406 Public Assistance (following a federally declared disaster), USDA-Watershed Protection and Flood Prevention Program, USDA-Environmental Quality Incentives Program, Stormwater Utility Fee, Community Flood Preparedness Grants
Implementation Schedule:	Ongoing
Priority:	Low

CLI2 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Reduce pollution discharge to and erosive conditions in receiving waters.
Hazard(s):	Flood
Lead Party Responsible:	Public Works

Estimated Cost:	Unknown, based on need
Funding Method:	Environmental Protection Agency – Water Quality Cooperative Agreements, EPA-Nonpoint Source Grant Program, 406 Public Assistance (following a federally declared disaster), USDA-Watershed Protection and Flood Prevention Program, USDA-Environmental Quality Incentives Program, Stormwater Utility Fee, Stormwater Local Assistance Fund
Implementation Schedule:	Ongoing
Priority:	Low

CLI3 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Retrofit stormwater management basins
Hazard(s):	Flood
Lead Party Responsible:	Public Works
Estimated Cost:	Unknown, based on individual projects
Funding Method:	EPA – Water Quality Cooperative Agreements, EPA-Nonpoint Source Grant Program, 406 Public Assistance (after a federally declared disaster), USDA-Watershed Protection and Flood Prevention Program, USDA-Environmental Quality Incentives Program, Stormwater Utility Fee
Implementation Schedule:	Ongoing
Priority:	Low

CLI4 Mitigation Action: City of Charlottesville	
Goal:	Infrastructure and Buildings
Action Item Description:	Retrofit stormwater management basins
Hazard(s):	Flood
Lead Party Responsible:	Public Works
Estimated Cost:	Unknown, based on individual projects
Funding Method:	EPA – Water Quality Cooperative Agreements, EPA-Nonpoint Source Grant Program, 406 Public Assistance (after a federally declared disaster), USDA-Watershed Protection and Flood Prevention Program, USDA-Environmental Quality Incentives Program, Stormwater Utility Fee
Implementation Schedule:	Ongoing

Natural Hazard Mitigation Plan: Introduction

Hazard Mitigation Planning

The purpose of the Regional Natural Hazard Mitigation Plan is to prepare for natural disasters before they occur, thus reducing loss of life, property damage, and disruption of commerce.

The Federal Emergency Management Agency (FEMA) requires such a plan as a condition for eligibility in certain mitigation grant programs. The plan applies to all jurisdictions in the Thomas Jefferson Planning District – Albemarle County, the City of Charlottesville, Greene County, Louisa County, Fluvanna County, Nelson County, and the Towns of Stanardsville, Louisa, Mineral & Scottsville. The original plan was adopted by all jurisdictions in 2006, and the plan was further updated in 2012 and 2018.

The Following sections are included in the plan:

- 1. Introduction** – an overview of hazard mitigation generally and an outline of the plan
- 2. Planning Process** – the process through which the plan was developed, including public input
- 3. Community Profile** – general information about communities in the planning district
- 4. Hazard Identification and Analysis** – general information about potential hazards in the planning district, the historic record of hazard events, and the probability of future events
- 5. Vulnerability Assessment** – analysis of the human impact hazards could cause, with estimated potential losses for various hazard scenarios
- 6. Capabilities Assessment** – a survey of current local capacity to mitigate natural hazards
- 7. Mitigation Strategy** – goals, objectives, and action items selected to mitigate hazards identified in the region



Planning Process

The lead agency in the preparation of this plan is the Thomas Jefferson Planning District Commission (PDC). The PDC provides resources that ensure the plan takes an efficient regional approach and is supported by a Hazard Mitigation Working Group, consisting of representatives from local planning departments, emergency managers, and local administrators to help guide updates to the plan. Once adopted the Working Group members will help monitor and implement the plan.

Regional Natural Hazard Mitigation Plan



Prepared By the:
Thomas Jefferson Planning
District Commission
401 East Water Street
Charlottesville, VA 22902
www.tjpdcc.org | info@tjpdcc.org

2017 Update
DRAFT



extreme-heat/cold
Wildfire/
Flooding
Tornado
High-Wind
Earthquake
Winter-weather
Lightning
Dam

Hazard Identification and Analysis Process

The purpose of the hazard identification process is to describe all natural hazards that affect the Thomas Jefferson Planning District and provide an analysis on their location, extent, severity, and probability of occurrence. Each individual hazard was identified, including a description of the hazard in general written from a national perspective, followed by an in-depth analysis based on the particular impact the hazard has on the Thomas Jefferson Planning District. The Hazard Assessment Tool was used to evaluate each identified hazard according to the probability of occurrence and the severity in terms of impact to human life, property, and business operations. Results of the 2023 risk assessment are outlined in the hazard vulnerability assessment matrix below.

Hazard Vulnerability Assessment

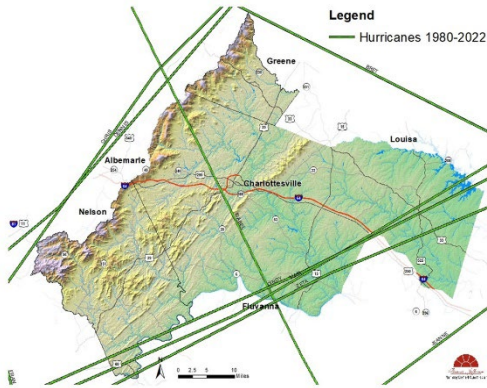
EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 - 100%
Hurricane/high wind/windstorms	3	2	2	2	74%
Flooding	3	1	2	2	65%
Winter storms/weather	3	1	1	2	56%
Communicable Disease/Pandemic	2	2	1	2	30%
Lightning	2	1	1	1	22%
Wildfire	2	1	1	1	22%
Drought / Extreme Heat	2	1	1	1	22%
Dam Failure	1	2	2	2	22%
Tornado	2	1	1	1	22%
Earthquake	1	1	2	2	19%
Landslide	1	1	1	1	11%
AVERAGE SCORE	1.88	1.37	1.5	1.58	33%

HIRA: Hurricanes, High Wind, Wind Storms & Lightning

Hurricanes, High Wind, Wind Storm

Wind associated with hurricanes, thunderstorms and other weather phenomena poses the most significant risk to area residents. Wind related weather has caused more than \$2 million in property and crop damage. These events have resulted in 85 injuries and 2 deaths since 1995. Significant past wind events include the 2012 Derecho, which caused significant regional damage and was a Federally declared disaster. Wind events caused by thunderstorms can be especially dangerous because they develop quickly. Hurricane related winds tend to have a greater impact in the eastern part of Virginia. Few hurricanes have made a direct hit on the region. Most are downgraded to tropical storms before they reach the planning district. Note: Tornadoes are addressed on a separate poster.

Historic Hurricane Tracks 1980-2008



Hurricane/Tropical Storms 2010-2020

Locality	#	Deaths	Injuries	Property Loss	Crop Damage
Albemarle/Cville (reported with Nelson)	2	0	0	\$ 5,000.00	\$ -
Fluvanna (reported with Louisa)	1	0	0	\$ 36,000.00	\$ -
Greene	1	0	0	\$ 1,000.00	\$ -
Louisa (reported with Fluvanna)	1	0	0	\$ -	\$ -
Nelson (reported with Albemarle)	2	0	0	\$ 1,000.00	\$ -

Source: National Climate Data Center

Notable Hurricanes in the Planning District

Hurricane	Specific Area	Damage	Year	Cat.
Zeta	All	Heavy rain, localized flooding	Oct. 20, 2020	3
Mathew	All	\$30+ million in private + public structure damage, 2 deaths, evacuations, flooding/power outages	De. 18, 2018	5
Florence	All TJPDC localities	\$200 million in damage, heavy rain/flooding/high winds/spawned tornadoes, 3 deaths	Oct. 15, 2018	4
Joaquin	All	Rain, localized flooding	Oct 2, 2015	2
Arthur	Fluvanna, Louisa, Albemarle	Power outages, rain, flooding	July 4, 2014	2
Sandy	Nelson, Greene	Power outages, rain, flooding	Oct 29, 2012	3
Cindy	Fluvanna and Louisa Counties	3 deaths in U.S.	July 7, 2005	1
Ivan	Fluvanna and Louisa Counties	Estimated \$18 billion in U.S. damages and 25 deaths	Sept. 18, 2004	5
Isabel	All	Preliminary estimate of over \$4 billion in damages/costs; at least 40 deaths	Sept 18, 2003	5
Floyd	All	Flooding rains and high winds. 4 deaths; over 280,000 customers without electricity, 5,000 homes damaged.	Sep-99	4
Fran	Northwest Greene Co. was hardest hit.	\$5.8 billion damage; 37 deaths, loss of electricity (state-wide)	August-September 1996	3
Agnes	Scottsville (34 feet), Howardsville and Columbia	More than 210,000 people were forced to flee for their lives and 122 were killed.	June 19-24, 1972	1
Camille	Massie Mill, Davis Creek, Scottsville, Howardsville, Schuyler, Columbia, Piney River	114 deaths in Nelson Co alone. Flooding & landslides. \$1.42 billion (unadjusted).	August 1969	5
Hazel	All	Flooding, barns leveled, roofs pulled off.	Oct 14-15, 1954	4

High/Strong Wind Events and Thunderstorms with Wind 2010-2020

Locality	#	Death	Injuries	Property Loss	Crop Damage
Albemarle	10	0	0	\$ -	\$ -
Charlottesville	5	0	0	\$ 1,000.00	\$ 50,000.00
Fluvanna	0	0	0	\$ -	\$ -
Greene	6	0	0	\$ -	\$ -
Louisa	2	0	0	\$ 50,000.00	\$ -
Nelson	19	0	0	\$ -	\$ 20,000.00
Region	42	0	0	\$51,000	\$70,000

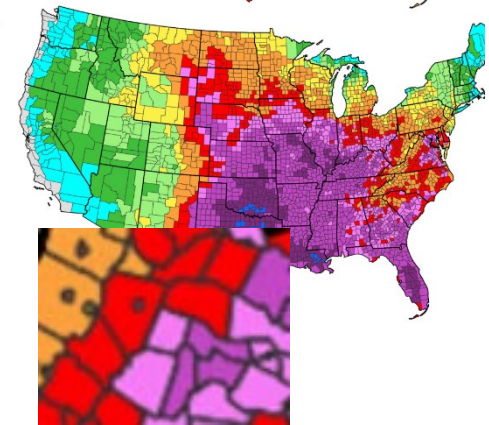
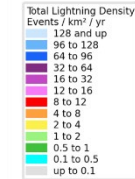
Source: National Climate Data Center (NOAA)

Locality	#	Death	Injuries	Property Loss	Crop Damage
Albemarle	298	0	0	\$ 528,300.00	\$ 24,250.00
Charlottesville	14	0	0	\$ 75,500.00	\$ -
Fluvanna	40	0	0	\$ 390,000.00	\$ -
Greene	59	0	0	\$ 49,500.00	\$ 7,000.00
Louisa	79	0	0	\$ 597,000.00	\$ -
Nelson	103	0	0	\$ 133,500.00	\$ 18,250.00
Region	593	0	0	\$1,773,800	\$49,500

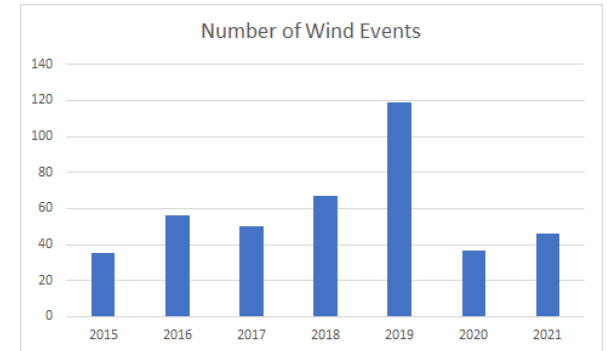
Source: NCDC, Albemarle Historical Society archived newspapers, HMP working Group

VAISLA Lightning Flash Density/Mile 2015-2019

NLDN average total lightning density April-June 2015-2019



Number of Wind Events by Year 2015-2021



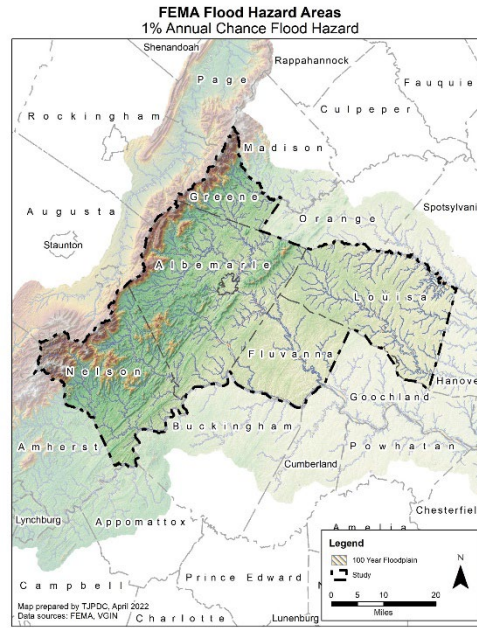
HIRA: Flooding and Dam Failure

Flooding and Dams

Flooding is considered one of the most significant risks to people and property statewide. Flooding is associated with heavy or extended rain events and may be locally constrained or occur far downstream from a weather event. Riverine flooding occurs along the regions larger river systems like the James or Rivanna Rivers. In the case of riverine flooding the storm event takes place upstream and causes floodwaters to travel downstream. Examples of this kind of flooding can be found in the towns of Scottsville and Columbia. All of which have suffered devastating floods.

Dam failure risk is evaluated based on a dam's hazard potential in terms of its threats to flooding people and property downstream. Dams are categorized into three risk classes low, significant and high. These categories factor in the dam size and the number of people in the floodway. It does not focus on the quality of the structure.

100 Year Floodplain (1% Chance of Flood)



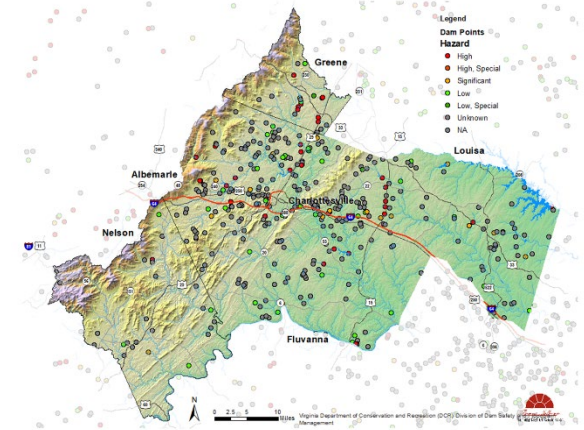
Floods 2010-2021

Summary of Floods, Flood Record 2010-2021

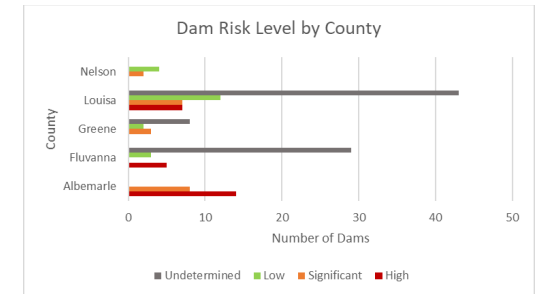
Locality	#	Death	Injuries	Property Loss	Crop Damage
Albemarle	136	1	0	\$50,000.00	\$
Charlottesville	5	0	0	\$	\$
Fluvanna	6	0	0	\$	\$
Greene	79	0	0	\$4,777,000.00	\$312,000.00
Louisa	9	0	0	\$	\$
Nelson	65	0	0	\$30,000.00	\$
Region	300	1	0	\$4,857,000.00	\$312,000.00

Source: National Climate Data Center (NOAA)

Dam Points Across Region



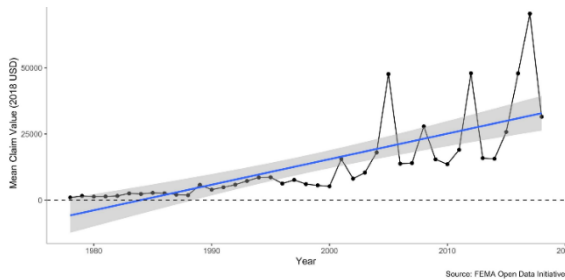
Dam Risk Level by County



HIRA Assessment

EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Flooding	3	1	2	2	65%
Dam Failure	1	2	2	2	22%

National Annual Flood Loss (mean claim value of flood insurance)



HIRA: Winter Weather

Winter Weather

Winter weather and storms are frequent occurrences in the region. Winter storms frequently cause power outages and disrupt travel in the region. Storms like nor'easter can cause significant snow accumulations, especially in areas at higher elevations. Winter storms frequently cause school closings and interruptions to transit services such as CAT and JAUNT.



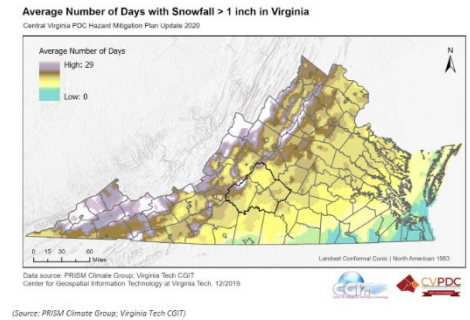
Winter Weather Events by Type 2000-2020

Locality	Blizzard	Cold/Wind Chill	Freezing Fog	Heavy Snow	Ice Storm	Winter Storm	Winter Weather	Frost/ Freeze
Albemarle	2	1	1	5	6	37	83	33
Fluvanna				1	3	48	40	3
Greene	2	4		7	7	39	79	34
Louisa				1	3	55	46	3
Nelson	2	2		5	7	34	65	33
Region	6	7	1	19	26	213	313	106

Winter Storm Events 2010-2020

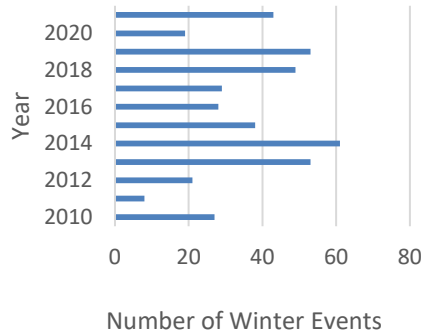
Locality	#	Death	Injuries	Property Damage
Albemarle	10	0	0	\$5,000.00
Charlottesville	17	0	0	\$ -
Fluvanna	15	0	0	\$110,000.00
Greene	32	0	0	\$-
Louisa	21	0	0	\$160,000.00
Nelson	25	0	0	\$5,000.00
Region	120	0	0	\$280,000.00

Frequency of Snowfall Events



Total Number of Winter Events by Year

Winter Events in TJPDC Region by Year (2010-2021)



HIRA Assessment

EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Winter Weather	3	1	1	2	56%

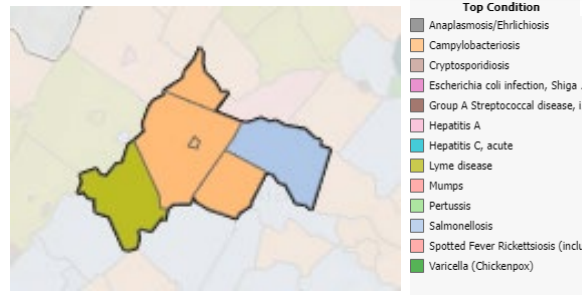
HIRA: Communicable Disease/Pandemic

Communicable Disease/Pandemic

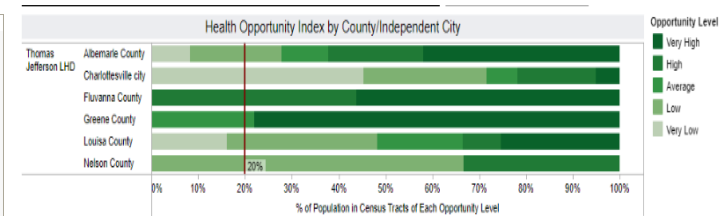
The most common infectious diseases impacting the region prior to Coronavirus were Campylobacteriosis and Salmonella. Both live in the intensities of birds and are spread to humans through consumption of contaminated foods, contact with infected animals, or by drinking contaminated water. Lyme disease is commonly spread through vectors such as ticks.

The Covid-19 pandemic is the leading infectious disease in each locality, surpassing historical data from 2018 on the top reported cases of other contagious diseases. Rather than case rates ranging from 20-60 per 100,000 people, Coronavirus cases have reached 9,000-14,000 cases per 100,000 people in the Thomas Jefferson Planning District Region.

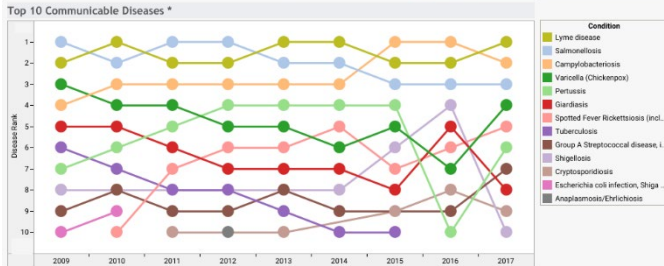
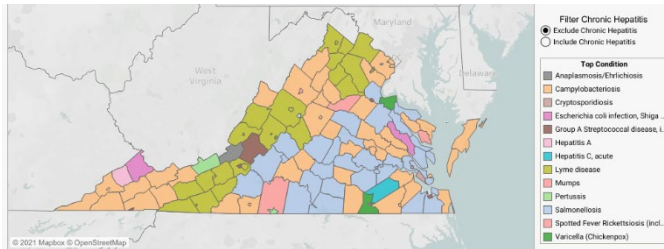
Top Communicable Diseases in TJPDC (Excluding Chronic Hepatitis)



TJPDC Health Opportunity Index



Top Communicable Diseases in Virginia (Excluding Chronic Hepatitis)



County	Top Condition
Albemarle	Campylobacteriosis was the most frequently reported disease with 25 cases. This equates to a rate of 23.2 cases per 100,000 population.
Fluvanna	Campylobacteriosis was the most frequently reported disease with 11 cases. This equates to a rate of 41.6 cases per 100,000 population
Louisa	Salmonellosis was the most frequently reported disease with 9 cases. This equates to a rate of 25.1 cases per 100,000 population.
Greene	Campylobacteriosis was the most frequently reported disease with 10 cases. This equates to a rate of 51.0 cases per 100,000 population.
Nelson	Lyme disease was the most frequently reported disease with 8 cases. This equates to a rate of 53.5 cases per 100,000 population.
Charlottesville (city)	Campylobacteriosis was the most frequently reported disease with 15 cases. This equates to a rate of 31.2 cases per 100,000 population.

COVID-19 Case Information from 2019-January 2022

Locality	Total Cases	Cases per 100,000	Hospitalizations	Deaths
Albemarle	10,219	9,400	376	118
Charlottesville	6,518	13,546	162	64
Fluvanna	3,415	12,751	133	32
Greene	2,758	13,994	162	47
Louisa	4,410	11,991	175	54
Nelson	1,836	12,375	64	24

HIRA Assessment

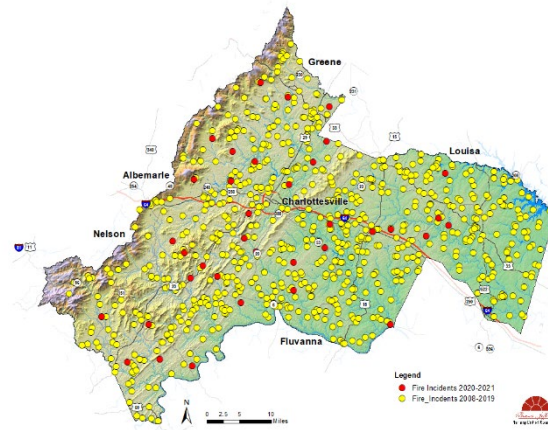
EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Communicable Disease/Pandemic	2	2	1	2	30%

HIRA: Wildfire

Wildfire

Wildfires are a relatively common occurrence in the rural portions of the PDC. Since 2017 there have been 466 fires that have burned a total of 3,276 acres of land. Most wildfires are small and are quickly brought under control by local firefighters and state Department of Forestry. Frequent causes of blazes are discarded cigarette butts and out-of-control brush pile burning. There have been a number of large notable fires but these have been mostly constrained to Federal Lands. For example, the Rocky Mountain Fire burned portions of Shenandoah National Park in Greene County. People and property are at increased fire risk as more people move into rural areas and extend the urban wildland fringe.

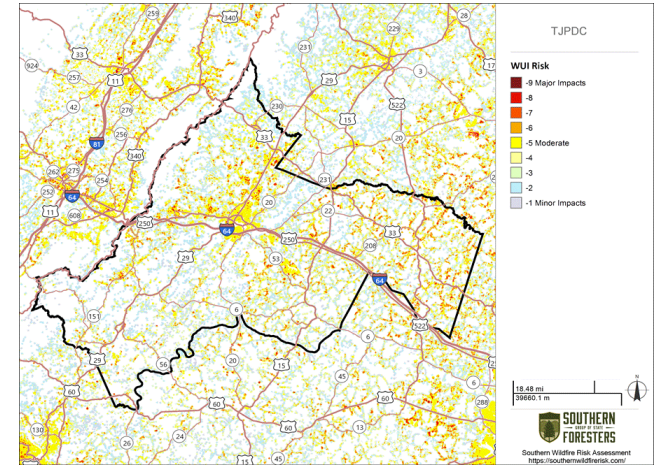
Wildfire Location and Acreage Burned



Wildfire Events 2017-2021

Locality	# Of Fires	Acres
Albemarle	136	1215.9
Fluvanna	98	319.1
Greene	29	31.1
Louisa	130	1298.4
Nelson	63	412.1
TJPCD	466	3276.6

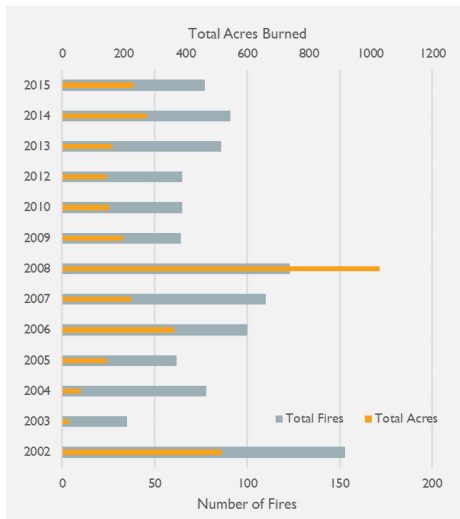
Wildfire Risk Index



Causes of Wildfires 2017-2021



Wildfire Acreage and Number of Events



HIRA Assessment

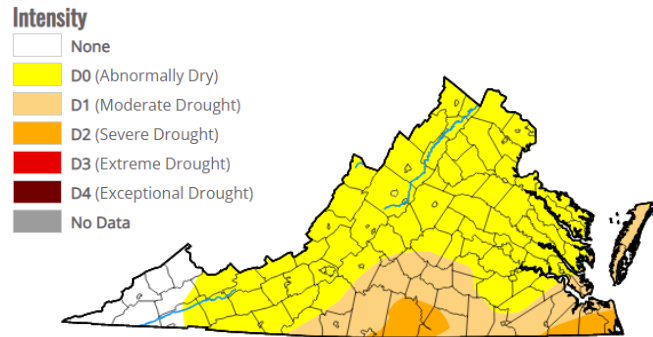
EVENT	PROBABILIT Y	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Wildfire	2	1	1	2	22%

HIRA: Temperature Extremes, Drought & Landslides

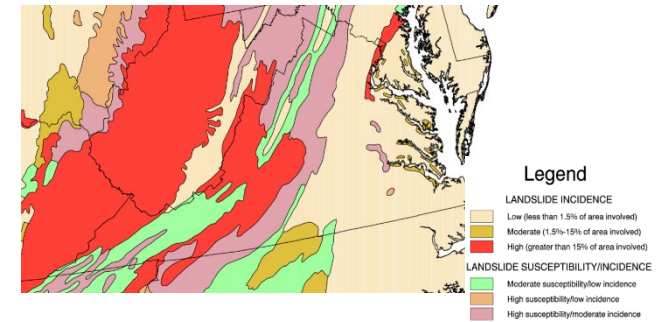
Temperature Extremes and Drought

Temperature extremes are considered to be those temperatures which are 10° above or below a baseline normal temperature. Both extreme cold and heat present hazards to vulnerable populations. The regions lowest recorded temperature was -1° (February, 2015) and the highest was 105° (July 2012). Drought is a natural climatic condition caused by extended periods of limited precipitation. Factors that influence drought severity include a prolonged lack of rainfall, human demands (water withdraws), high winds and low relative humidity (which increases evaporation). Prolonged droughts pose risks to people, agriculture and natural resources. Drought forecasts are produced by the U.S Drought Monitor. According to the USGS the eastern slopes of the Blue Ridge are characterized as having high susceptibility and a low incidence of landslide. Deforestation and the removal of vegetation greatly increase the chance of landslides.

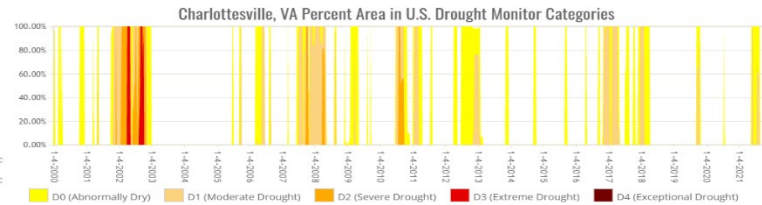
US Drought Monitor (USGS) Snapshot (Dec 20, 2021)



USGS Landslide Overview Map



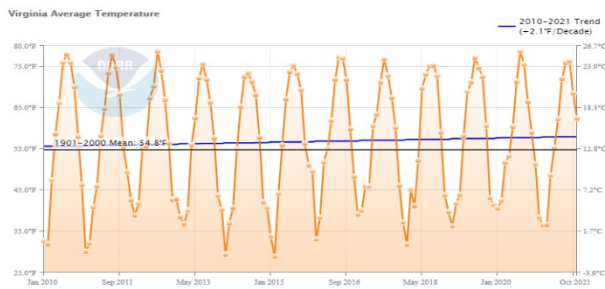
Region Historic Drought based on Percent Area



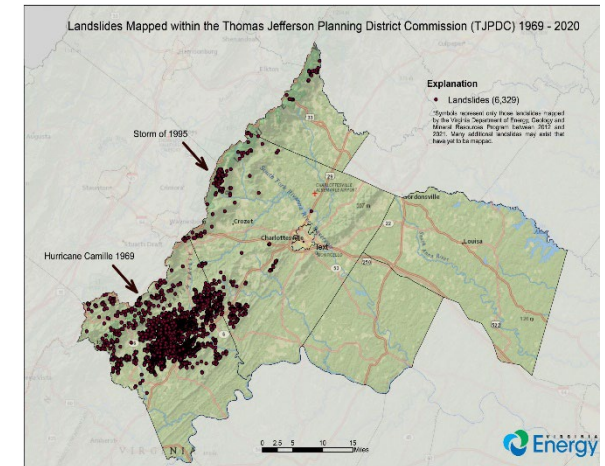
HIRA Assessment

EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Drought/Extreme Heat	2	1	1	2	22%
Landslide	1	1	1	1	11%

Virginia Monthly High, Low and Average Temperatures



Landslides in Region from 1969-2020



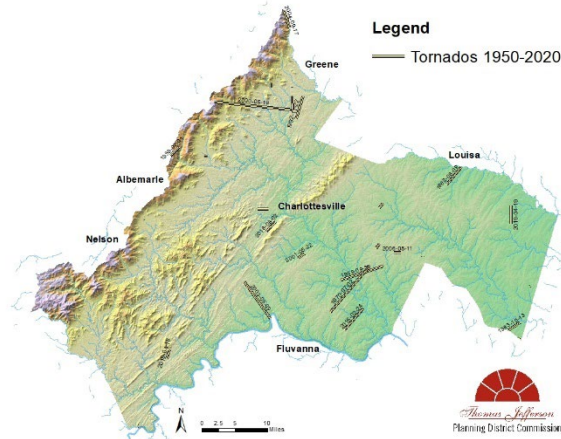
HIRA: Tornado and Earthquake

Tornado and Earthquake

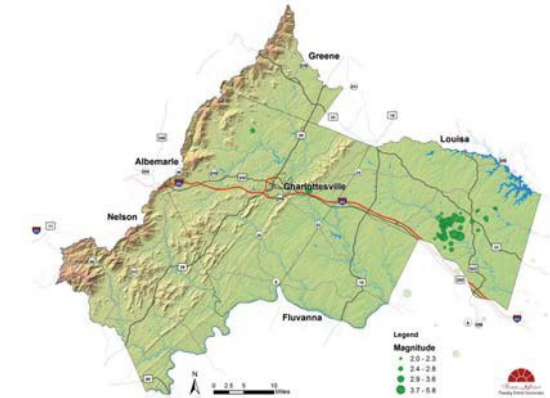
The Region averages about 1 tornado a year. Most tornados experienced in the region are EF0 or EF1 events. However, the exception was a major tornado produced by Tropical Storm Ivy (EF2) which touched down in Fluvanna County. July is the most active month for tornados as it has the most number of thunderstorms. Most storms spawned by these afternoon thunderstorms tend to be weak events (EF0-EF1)

Earthquakes are a relatively rare event in the region with most quakes that do occur being a magnitude 2.5 or less. These quakes are rarely detectable to people and pose little risk to life and property. However, the region has experienced a few major quakes like the August 28, 2011 Mineral earthquake which reached 5.8 magnitude and caused damage to structures throughout the region. Most tremors since the August quake have been small aftershocks which have continued into 2016.

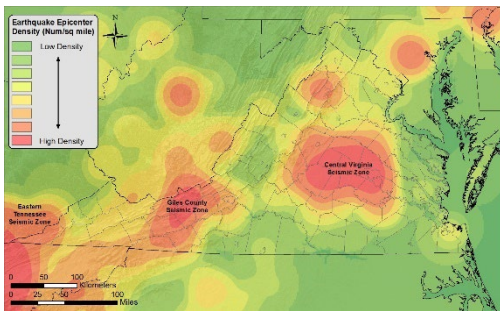
Regional Tornado Tracks



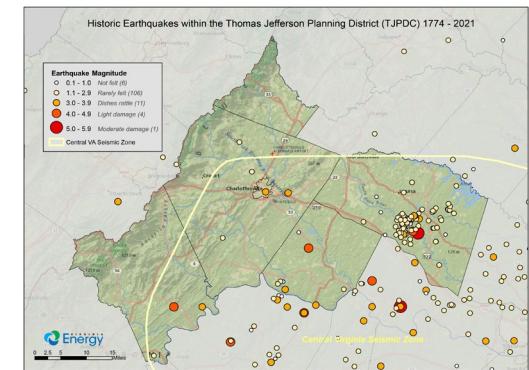
2011 Mineral Earthquake Epicenters and Magnitudes



Virginia Earthquake Epicenter Density Tornadoes 1950-2020



Historic Earthquakes in the TJPDC



Tornado Record 1920-2020

Class	Property Damage	Date
EF2	\$200,000	4/19/2019
EF0	\$325,000	2/24/2016
EF1	Historic homes damaged in Louisa County	10/9/2011
F1	\$500,000	8/30/2005
F2	\$3,000,000	9/17/2004
F1	\$500,000	5/13/2000
F1	\$250,000	5/5/1989
F3	\$250,000	7/25/1985
F1	\$250,000	10/13/1983
F2	\$250,000	8/9/1962
N/A	11 people died and 4 were injured in Ivy/Mechum's River	1959
N/A	Leveled trees, tore off roofs, smashed buildings in Ivy	1922

HIRA Assessment

EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Tornado	2	1	1	2	22%
Earthquake	1	1	2	2	19%