

# Hazard Mitigation Goals, Objectives & Action Items: Albemarle County

## 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 Albemarle County are found below.

## ***Mitigation Strategy***

### **Education and Outreach**

- **GOAL:** Increase awareness of hazards and encourage action to mitigate the impacts
- **OBJECTIVE:** Educate families and individuals on disaster mitigation and preparedness
- **OBJECTIVE:** Train key agency staff and volunteer groups in disaster mitigation and preparedness
- **OBJECTIVE:** Train staff at schools and residential facilities in disaster mitigation and preparedness
- **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
- **OBJECTIVE:** Diversify the energy system to provide multiple power source and fuel supply options and promote self-sufficient buildings with multiple energy options
- **OBJECTIVE:** Diversify the communications system to provide alternative lines for use during loss of capacity
- **OBJECTIVE:** Diversify the transportation system by increasing connectivity and providing modal options
- **OBJECTIVE:** Elevate, retrofit and relocate existing structures and facilities in vulnerable locations
- **OBJECTIVE:** Construct or upgrade drainage, retention, and diversion elements to lessen the impact of a hazard on an area
- **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

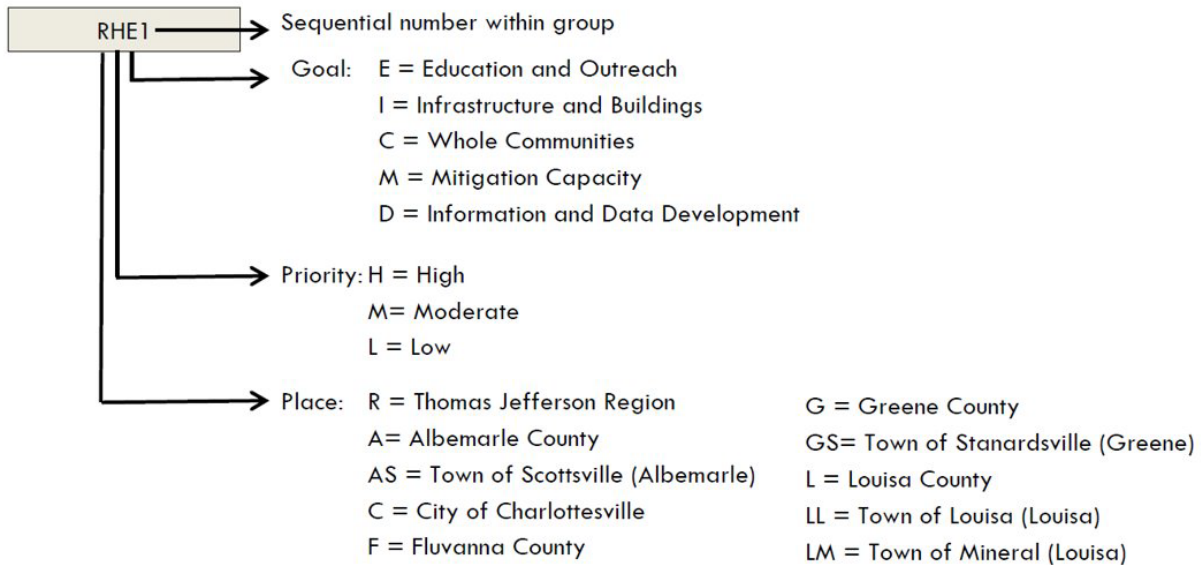
### **Information and Data Development**

- 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

<b>[Activity Code] Mitigation Action: [Jurisdiction]</b>	
<b>Goal:</b>	One of the goal categories listed above that is supported by the action
<b>Action Item Description:</b>	Brief description of action item
<b>Hazard (s):</b>	The hazard(s) the action is intended to mitigate
<b>Lead Party Responsible:</b>	Identify the local agency, department, or organization that is best suited to accomplish the action
<b>Estimated Cost:</b>	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
<b>Funding Method:</b>	Potential sources of funds to complete the action, when applicable

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

### *Albemarle County's Detailed Mitigation Action Items*

<b>AHE1 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Increase the number of trained emergency responders, both staff and volunteers. Establish a minimum ICS/emergency management training/certification requirement for essential County staff. Train/educate 70% of identified staff to minimum qualifications. Conduct disaster tabletop and/or full-scale scenarios on an annual basis to exercise skills/processes
Hazard (s):	Multiple
Lead Party Responsible:	Community Development Dept., Police Dept., Fire Rescue Dept., ACOEM
Estimated Cost:	unknown
Funding Method:	N/A
Implementation Schedule:	1-3 years
Priority:	High

<b>AHI1 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Implement recommendations from the urban Community Water Supply Plan and those for all other public water supplies within the County, including drought monitoring and management
Hazard (s):	Drought, adequate potable water
Lead Party Responsible:	RWSA, Dept. of Community Development, other County agencies
Estimated Cost:	Variable
Funding Method:	RWSA ratepayers, state and federal grants
Implementation Schedule:	3-5 years
Priority:	High

<b>AHI2 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings

Action Item Description:	Develop an integrated regional security and monitoring system, including access control and intrusion detection
Hazard (s):	Multiple (including outsider physical threat and terrorism)
Lead Party Responsible:	Albemarle County Service Authority, RWSA,
Estimated Cost:	\$4 Million
Funding Method:	Hazard Mitigation Grant Program, Utility Revenue, General Revenue
Implementation Schedule:	1-3 years
Priority:	High

<b>AHI3 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Establish a backup Emergency Operations Center (EOC)
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM, FES
Estimated Cost:	
Funding Method:	County Operational Budget
Implementation Schedule:	1-3 years
Priority:	High

<b>AHI4 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Establish an Albemarle County specific basic Emergency Operations Plan and annexes for the 3 highest risk natural disasters as defined in the HIRA.
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM, FES
Estimated Cost:	
Funding Method:	County Operational Budget
Implementation Schedule:	1-3 years
Priority:	High

<b>AHM1 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Incorporate this Regional Hazard Mitigation Plan into local comprehensive plans and Emergency Operations Plans

Hazard (s):	Multiple
Lead Party Responsible:	Community Development Dept., Thomas Jefferson Planning District Comm., ACEOM
Estimated Cost:	None (other than staff costs)
Funding Method:	County operational budget (for staff time)
Implementation Schedule:	3-5 years
Priority:	moderate

<b>AHM2 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Install fire mitigation measures, including dry hydrants, fire breaks, and fire rings.
Hazard (s):	Wildfire
Lead Party Responsible:	Fire Rescue Dept., Community Development Dept., Building Official, Dept. of Forestry
Estimated Cost:	Unknown; based on need
Funding Method:	Grant programs (Va. dry hydrant grant program)
Implementation Schedule:	Ongoing
Priority:	High

<b>AHM3 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Develop continuity-of-operations plan to ensure critical operations are maintained during power failure.
Hazard (s):	Multiple
Lead Party Responsible:	
Estimated Cost:	\$50,000
Funding Method:	County General fund, grant opportunities
Implementation Schedule:	1-3 years
Priority:	High

<b>AHD1 Mitigation Action: Albemarle County</b>	
Goal:	Information and Data Development
Action Item Description:	Continue to assess new and existing critical facilities for resilience to/preparedness for natural hazards
Hazard (s):	Multiple

Lead Party Responsible:	ACEOM, Dept. of Facilities and Environ. Services, Community Development Dept.
Estimated Cost:	Varies
Funding Method:	General Revenue; possible grant sources
Implementation Schedule:	Ongoing
Priority:	High

<b>AHD2 Mitigation Action: Albemarle County</b>	
Goal:	Information and Data Development
Action Item Description:	Mitigate Water and Wastewater System Failure or Contamination through community coordination and information/equipment sharing. Provide planning support for operational and integrated security management (including communications plan and continuity plan, emergency exercises, coordinated committee)
Hazard (s):	All
Lead Party Responsible:	Albemarle County Service Authority and RWSA
Estimated Cost:	\$500,000
Funding Method:	Hazard Mitigation Grant Program, Utility Revenue
Implementation Schedule:	1-2 years
Priority:	High

<b>AHC1 Mitigation Action: Albemarle County</b>	
Goal:	Information and Data Development
Action Item Description:	Develop a debris management plan (including emergency response access and cleanup) for removal of fallen trees, etc. following a storm, such as hurricane or tornado.
Hazard (s):	Multiple
Lead Party Responsible:	VDOT, ACOEM, Community Development, Park and Rec, RSWA, other landfills in region
Estimated Cost:	N/A
Funding Method:	N/A
Implementation Schedule:	1-2 years
Priority:	High

<b>AHC2 Mitigation Action: Albemarle County</b>
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Goal:	Information and Data Development
Action Item Description:	Engage in climate resilience and adaptation planning and implement initiatives to prepare for the anticipated hazards and impacts driven by climate change.
Hazard (s):	Multiple
Lead Party Responsible:	FES
Estimated Cost:	Variable
Funding Method:	County funds; grants, including VA DCR Community Flood Preparedness Fund
Implementation Schedule:	Ongoing
Priority:	High

<b>AHC3 Mitigation Action: Albemarle County</b>	
Goal:	Information and Data Development
Action Item Description:	Implement initiatives to reduce community greenhouse gas emissions as prescribed by the Climate Action Plan adopted in 2020 in order to mitigate climate change.
Hazard (s):	Multiple
Lead Party Responsible:	FES
Estimated Cost:	Variable
Funding Method:	County funds; grants
Implementation Schedule:	Ongoing
Priority:	High

<b>AME1 Mitigation Action: Albemarle County</b>	
Goal:	Education and Outreach
Action Item Description:	Ensure that all schools have regular disaster response drills
Hazard (s):	Multiple
Lead Party Responsible:	Dept. of Schools and Education; independent private school
Estimated Cost:	N/A
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AME2 Mitigation Action: Albemarle County</b>
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Goal:	Mitigation Capacity
Action Item Description:	Continue to pursue conservation practices in sensitive areas, including riparian buffers and flood-prone areas.
Hazard (s):	Multiple
Lead Party Responsible:	Virginia Outdoors Foundation, Nature Conservancy, Thomas Jefferson Soil and Water Conservation District, Albemarle Conservation Easement Authority, CDD, FES
Estimated Cost:	Based on individual property assessments and/or practices implemented
Funding Method:	Various
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AME3 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Conduct comprehensive residential and business disaster preparedness programs focusing on the ability of residents and businesses to sustain themselves for 72 hours post emergency.
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM, CAPE
Estimated Cost:	\$20,000
Funding Method:	County general fund
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AME4 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Define Neighborhoods/communities within the County and identify (using a contact management system) key residents and Non-Governmental organizations (NGOs) within each neighborhood who may connect the County and disaster services to the neighborhood during a crisis.
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM, CAPE, OEI
Estimated Cost:	Unknown
Funding Method:	Unknown
Implementation Schedule:	1-3 years

Priority:	Moderate
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<b>AMI1 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Build or repair bridges and culverts so as not to minimize impacts to floodways
Hazard (s):	Flood
Lead Party Responsible:	Virginia Dept. of Transportation, CDD, P&R
Estimated Cost:	Unknown-based on individual projects
Funding Method:	VDOT State of Good Repair program, State transportation funding; federal bridge funds/highway funds, Hazard Mitigation Grant Program, 406 Public Assistance Program (after disaster), private foundation funding
Implementation Schedule:	Ongoing (as bridges and culverts are maintained, repaired, replaced or newly built)
Priority:	Moderate

<b>AMI2 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Upgrade bridges to support emergency vehicles
Hazard (s):	Multiple
Lead Party Responsible:	VDOT, Railroads
Estimated Cost:	Unknown-based on individual projects
Funding Method:	VDOT State of Good repair program; State transportation funding; federal bridge funds/highway funds, Hazard Mitigation Grant Program, 406 Public Assistance Program (after disaster)
Implementation Schedule:	Ongoing (as bridges are maintained, repaired, replaced or newly built)
Priority:	Moderate

<b>AMI3 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Carry out physical security improvements to water & wastewater systems, which may include fencing, door hardening, window hardening, locks, bollards, cameras, signage, lighting, access control and intrusion detection.
Hazard (s):	Multiple (including outsider physical threat)
Lead Party Responsible:	Albemarle County Service Authority & Rivanna Water and Sewer Authority
Estimated Cost:	\$2 Million

Funding Method:	Hazard Mitigation Grant Program, Utility Revenue
Implementation Schedule:	1-3 years
Priority:	Moderate

<b>AMI4 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Procure technology equipment for Water/Wastewater system component inspections.
Hazard (s):	Multiple (including natural disasters and contamination)
Lead Party Responsible:	Albemarle County Service Authority & Rivanna Water and Sewer Authority
Estimated Cost:	\$100,000
Funding Method:	Hazard Mitigation Grant Program, Utility Revenue
Implementation Schedule:	1-2 years
Priority:	Moderate

<b>AMI5 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Improve the maintenance and repair of stormwater conveyance systems – in part through better coordination and cooperation with local partners
Hazard (s):	Flood
Lead Party Responsible:	Facilities and Environmental Services Dept., VDOT
Estimated Cost:	Unknown
Funding Method:	406 Public Assistance (following a federal declared disaster), County funding (CIP), Hazard Mitigation Grant Program
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AMC1 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Improve the preparedness of public and private dams within the county to withstand extreme flood events
Hazard (s):	Flood
Lead Party Responsible:	Facilities and Environmental Services Dept, CDD, RWSA
Estimated Cost:	Unknown

Funding Method:	DCR dam safety grants and Community Flood Preparedness Fund
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AMC2 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Maintain and update, as needed, the regional and local sheltering plans
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM, DSS
Estimated Cost:	Unknown
Funding Method:	County general fund
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AMC3 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Continue to assess designated community shelters for compliance with minimum specifications and best practices
Hazard (s):	Multiple
Lead Party Responsible:	Facilities and Environmental Services Dept, CDD, ACOEM, DSS< Red Cross
Estimated Cost:	Unknown
Funding Method:	County general fund
Implementation Schedule:	1-3 years
Priority:	Moderate

<b>AMC4 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings

Action Item Description:	During Comprehensive Plan update, consider loosening restrictions on the types of County improvements in Rural areas to accommodate community support facilities
Hazard (s):	Multiple
Lead Party Responsible:	CDD, FES
Estimated Cost:	N/A
Funding Method:	N/A
Implementation Schedule:	1-3 years
Priority:	Moderate

<b>AMM1 Mitigation Action: Albemarle County</b>	
Goal:	Mitigation Capacity
Action Item Description:	Through the development process, discourage or prohibit development in flood-prone areas
Hazard (s):	Flood
Lead Party Responsible:	Community Development Dept.
Estimated Cost:	None
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>AMD1 Mitigation Action: Albemarle County</b>	
Goal:	Information and Data Development
Action Item Description:	Expand GIS data and capabilities and other technologies for the purposes of mitigation planning, preparedness planning, and response activities
Hazard (s):	Multiple
Lead Party Responsible:	Community Development Dept., TJPDC., FES, ECC
Estimated Cost:	Unknown
Funding Method:	General Revenue, Hazard Mitigation Grant Program, ESRI, Pre-Disaster Mitigation Grant, Dept. of Interior Geologic Mapping Program
Implementation Schedule:	Ongoing
Priority:	Moderate

<b>ALE1 Mitigation Action: Albemarle County</b>
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Goal:	Education and Outreach
Action Item Description:	Encourage property owners and residents to clear storm drain inlets, channels, creek beds, and other conveyances of fallen trees and debris to minimize the potential for flow restrictions and flooding.
Hazard (s):	Flood
Lead Party Responsible:	Facilities and Environmental Services Dept., ACOEM, CAPE
Estimated Cost:	Unknown, based on need
Funding Method:	General Revenue
Implementation Schedule:	Ongoing
Priority:	Low

**ALE2 Mitigation Action: Albemarle County**

Goal:	Education and Outreach
Action Item Description:	Ensure all houses and businesses have clear address signs that are visible during snowstorms and other emergencies
Hazard (s):	Multiple
Lead Party Responsible:	Community Development Dept, Fire-Rescue Dept., County Executive's Office, IT, ECC, ACPD, CAPE
Estimated Cost:	\$4,000
Funding Method:	General Revenues
Implementation Schedule:	Ongoing
Priority:	Low

**ALE3 Mitigation Action: Albemarle County**

Goal:	Education and Outreach
Action Item Description:	Continue educational campaign about the benefits of open space and sensitive area protection.
Hazard (s):	Multiple
Lead Party Responsible:	Virginia Outdoors Foundation, Nature Conservancy, Thomas Jefferson Soil and Water Conservation District, Albemarle Conservation Easement, Community Development Dept., CAPE
Estimated Cost:	Variable
Funding Method:	County funding, State funds for farmland and open space preservation (VDACS Farmland Preservation)
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALE4 Mitigation Action: Albemarle County</b>	
Goal:	Education and Outreach
Action Item Description:	Outdoor warning sirens for public use facilities
Hazard (s):	Multiple
Lead Party Responsible:	AC Parks and Rec, ACOEM, RWSA
Estimated Cost:	Unknown
Funding Method:	County general fund, CIP, Grants
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALC1 Mitigation Action: Albemarle County</b>	
Goal:	Whole Community
Action Item Description:	Increase the capacity to shelter in place in public buildings
Hazard (s):	Multiple
Lead Party Responsible:	ACOEM
Estimated Cost:	Unknown
Funding Method:	General Revenue, FEMA funds/grants
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALC2 Mitigation Action: Albemarle County</b>	
Goal:	Whole Community
Action Item Description:	Promote biodiversity and native plant communities and control invasive species to improve the resilience of native ecosystems
Hazard (s):	Flood, drought, extreme heat
Lead Party Responsible:	CDD, FES
Estimated Cost:	Unknown
Funding Method:	County funding and grants
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALC3 Mitigation Action: Albemarle County</b>	
Goal:	Whole Community



Action Item Description:	Develop communications strategy and protocols (both preparedness and response) using traditional and emerging outlets (local media, social media, etc.); consider languages besides English
Hazard (s):	Multiple
Lead Party Responsible:	CDD, ACOEM
Estimated Cost:	N/A
Funding Method:	N/A
Implementation Schedule:	1 year
Priority:	Low

<b>ALC4 Mitigation Action: Albemarle County</b>	
Goal:	Whole Community
Action Item Description:	Improve ability to notify public in the event of extreme storms and/or dam failure, possibly through utilizing river level sensors and a downstream notification system
Hazard (s):	Flood
Lead Party Responsible:	RWSA FES
Estimated Cost:	Unknown
Funding Method:	Various
Implementation Schedule:	3-5 years
Priority:	Low

<b>ALC5 Mitigation Action: Albemarle County</b>	
Goal:	Whole Community
Action Item Description:	Continue and expand the use of citizen alert systems. Explore use of Social Media platform emergency alert systems. Establish backup procedures/plans for emergency notification/alert when methods relying on power & technology are inoperable
Hazard (s):	Multiple
Lead Party Responsible:	ACEOM, CAPE, ECC
Estimated Cost:	\$5,000
Funding Method:	General Revenue
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALI1 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings

Action Item Description:	Implement Stormwater Management programs and initiatives to reduce flood risk throughout the community
Hazard (s):	Flood
Lead Party Responsible:	Facilities and Environmental Services Dept.
Estimated Cost:	Unknown, based on need
Funding Method:	County funding (CIP)
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALI2 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Improve the maintenance, repair, and upgrades to public and private stormwater management facilities and impoundments to withstand extreme storms and enhance flood control.
Hazard (s):	Flood
Lead Party Responsible:	Facilities and Environmental Services Dept.
Estimated Cost:	Unknown, based on individual projects
Funding Method:	County funding (CIP)
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALI3 Mitigation Action: Albemarle County</b>	
Goal:	Infrastructure and Buildings
Action Item Description:	Partner with utility companies to keep power lines and other utilities free of vegetation
Hazard (s):	Multiple
Lead Party Responsible:	County Executive's Office, ACOEM
Estimated Cost:	Unknown
Funding Method:	N/A
Implementation Schedule:	Ongoing
Priority:	Low

<b>ALI4 Mitigation Action: Albemarle County</b>	
Goal:	Education and Outreach

Action Item Description:	Implement programs and initiatives to reduce pollution discharge via stormwater systems
Hazard (s):	Flood
Lead Party Responsible:	Community Development Dept., Facilities and Environmental Services
Estimated Cost:	Unknown, based on need
Funding Method:	EPA – 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
Implementation Schedule:	Ongoing
Priority:	Low

# 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

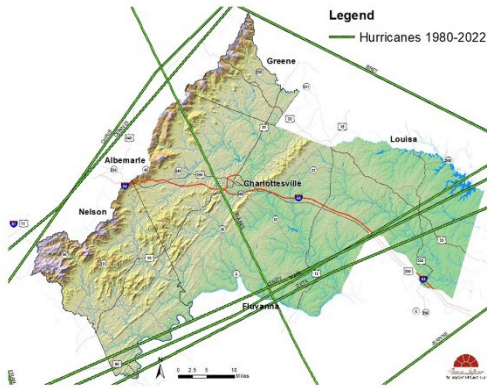
EVENT	PROBABILITY	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 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%
<b>AVERAGE SCORE</b>	<b>1.88</b>	<b>1.37</b>	<b>1.5</b>	<b>1.58</b>	<b>33%</b>

# 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

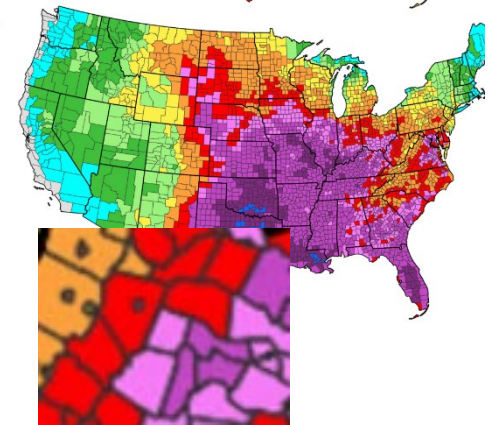
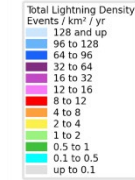
Source: National Climate Data Center (NOAA)

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

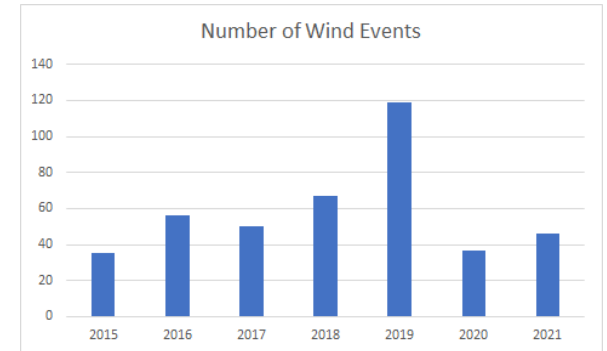
Source: NCDC, Albemarle Historical Society archived newspapers, HMP working Group

## VAISLA Lightning Flash Density/Mile 2015-2019

NLDN average total lightning density April-June 2015-2019



## Number of Wind Events by Year 2015-2021



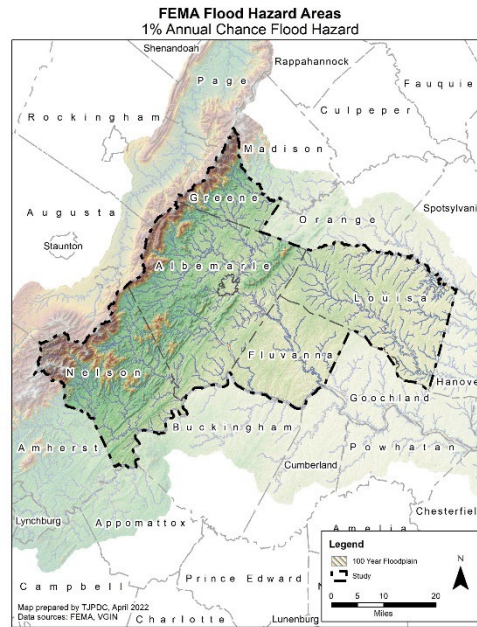
# HIRA: Flooding and Dam Failure

## 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)



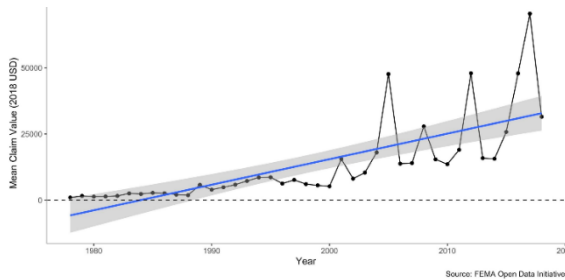
## Floods 2010-2021

### Summary of Floods, Flood Record 2010-2021

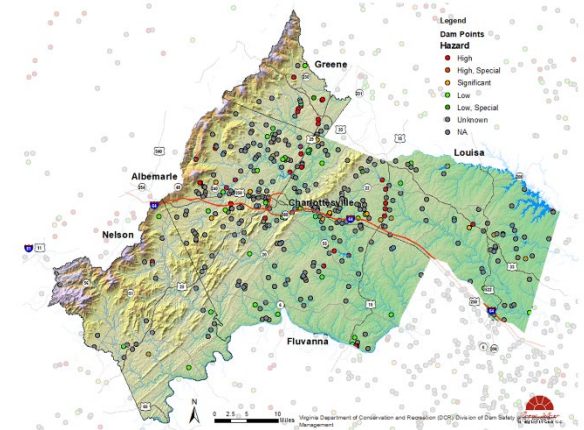
Locality	#	Death	Injuries	Property Loss	Crop Damage
Albemarle	136	1	0	\$50,000.00	\$
Charlottesville	5	0	0	\$	\$
Fluvanna	6	0	0	\$	\$
Greene	79	0	0	\$4,777,000.00	\$312,000.00
Louisa	9	0	0	\$	\$
Nelson	65	0	0	\$30,000.00	\$
Region	300	1	0	\$4,857,000.00	\$312,000.00

Source: National Climate Data Center (NOAA)

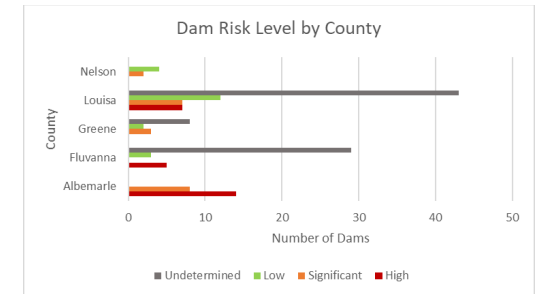
## National Annual Flood Loss (mean claim value of flood insurance)



## 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%
<b>Flooding</b>	3	1	2	2	<b>65%</b>
<b>Dam Failure</b>	1	2	2	2	<b>22%</b>

# 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.



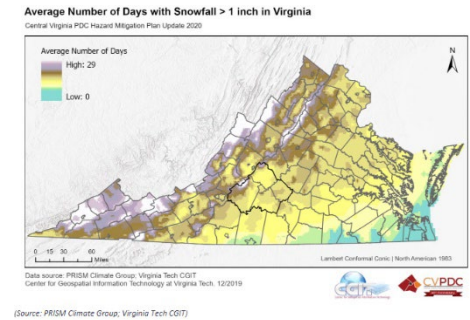
### Winter Weather Events by Type 2000-2020

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

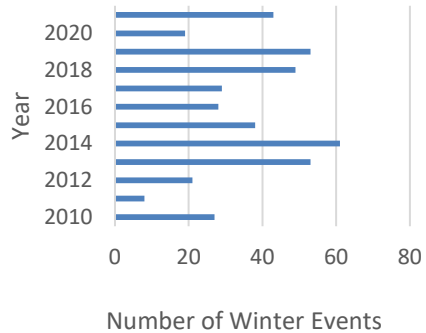
Locality	#	Death	Injuries	Property Damage
Albemarle	10	0	0	\$5,000.00
Charlottesville	17	0	0	\$ -
Fluvanna	15	0	0	\$110,000.00
Greene	32	0	0	\$-
Louisa	21	0	0	\$160,000.00
Nelson	25	0	0	\$5,000.00
Region	120	0	0	\$280,000.00

### 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%

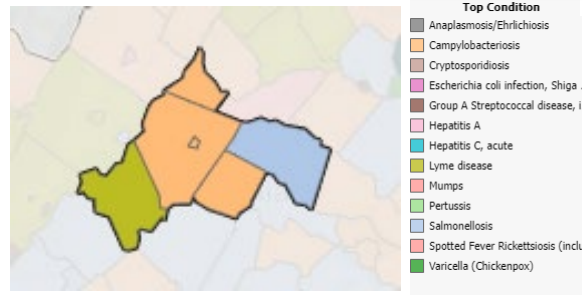
# HIRA: Communicable Disease/Pandemic

## Communicable Disease/Pandemic

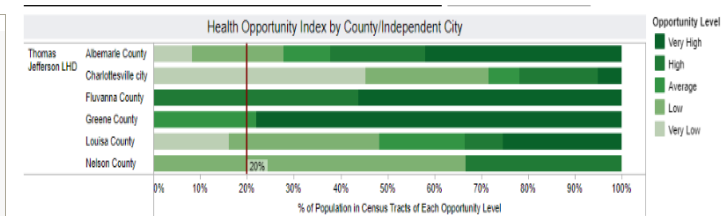
The most common infectious diseases impacting the region prior to Coronavirus were Campylobacteriosis and Salmonella. Both live in the intensities of birds and are spread to humans through consumption of contaminated foods, contact with infected animals, or by drinking contaminated water. Lyme disease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

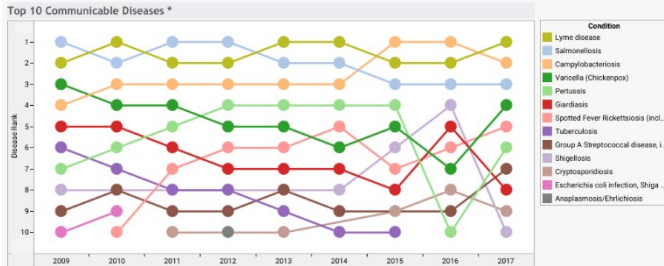
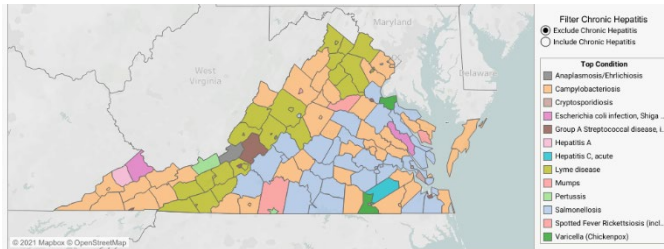
## Top Communicable Diseases in TJPDC (Excluding Chronic Hepatitis)



## TJPDC Health Opportunity Index



## Top Communicable Diseases in Virginia (Excluding Chronic Hepatitis)



County	Top Condition
<b>Albemarle</b>	Campylobacteriosis was the most frequently reported disease with 25 cases. This equates to a rate of 23.2 cases per 100,000 population.
<b>Fluvanna</b>	Campylobacteriosis was the most frequently reported disease with 11 cases. This equates to a rate of 41.6 cases per 100,000 population
<b>Louisa</b>	Salmonellosis was the most frequently reported disease with 9 cases. This equates to a rate of 25.1 cases per 100,000 population.
<b>Greene</b>	Campylobacteriosis was the most frequently reported disease with 10 cases. This equates to a rate of 51.0 cases per 100,000 population.
<b>Nelson</b>	Lyme disease was the most frequently reported disease with 8 cases. This equates to a rate of 53.5 cases per 100,000 population.
<b>Charlottesville (city)</b>	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
<b>Albemarle</b>	10,219	9,400	376	118
<b>Charlottesville</b>	6,518	13,546	162	64
<b>Fluvanna</b>	3,415	12,751	133	32
<b>Greene</b>	2,758	13,994	162	47
<b>Louisa</b>	4,410	11,991	175	54
<b>Nelson</b>	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%
<b>Communicable Disease/Pandemic</b>	2	2	1	2	<b>30%</b>

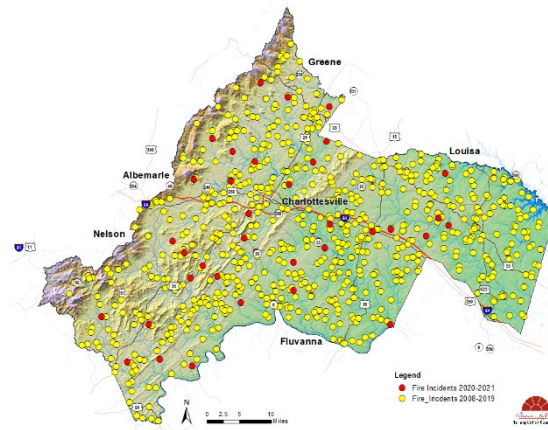


# HIRA: Wildfire

## 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.

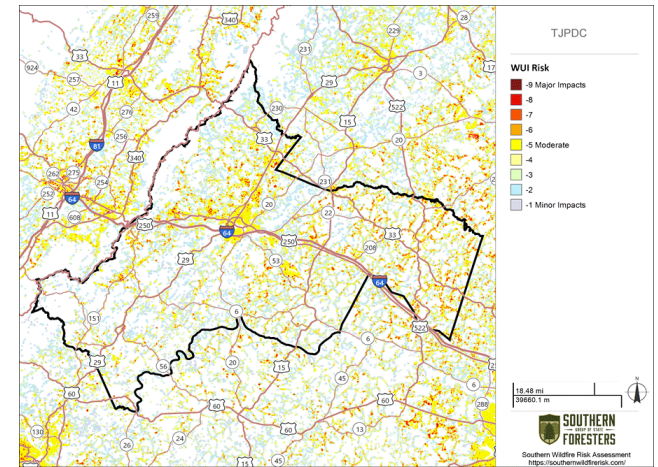
## Wildfire Location and Acreage Burned



## 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
TJPCDC	466	3276.6

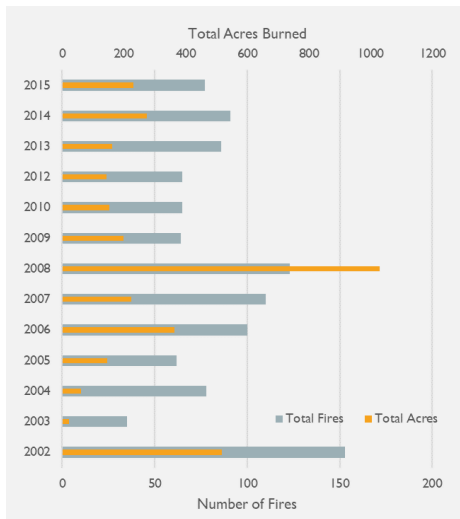
## Wildfire Risk Index



## Causes of Wildfires 2017-2021



## Wildfire Acreage and Number of Events



## HIRA Assessment

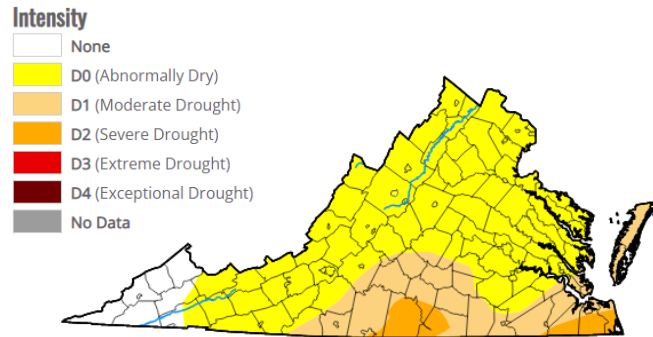
EVENT	PROBABILIT Y	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	RISK
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages	Interruption of services	Relative threat*
SCORE	0-3 NA-High	0-3 NA-High	0-3 NA-High	0-3 NA-High	0 - 100%
Wildfire	2	1	1	2	22%

# HIRA: Temperature Extremes, Drought & Landslides

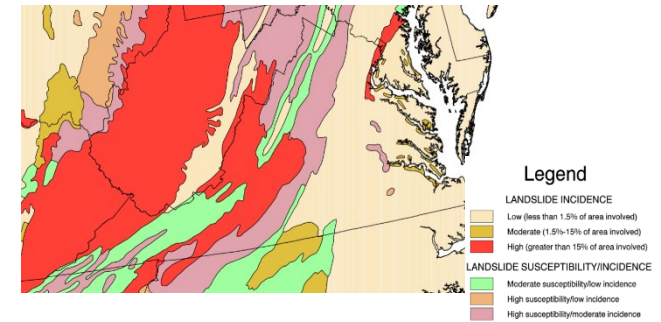
## Temperature Extremes and Drought

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.

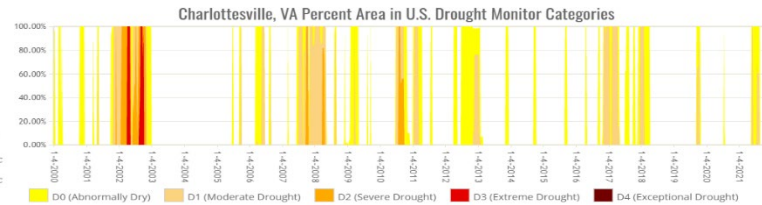
US Drought Monitor (USGS) Snapshot (Dec 20, 2021)



USGS Landslide Overview Map



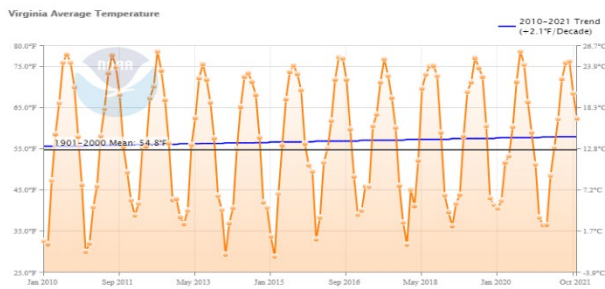
Region Historic Drought based on Percent Area



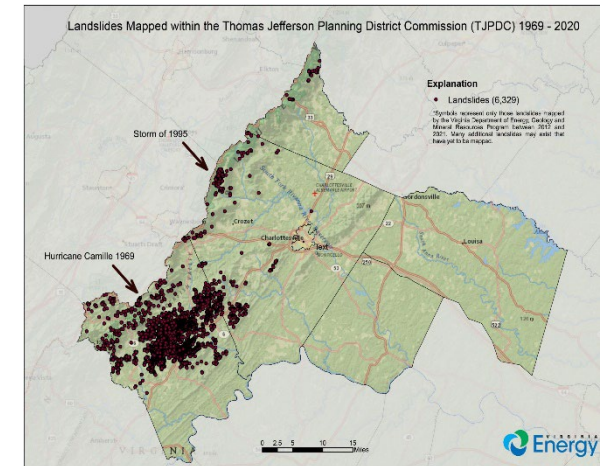
HIRA Assessment

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



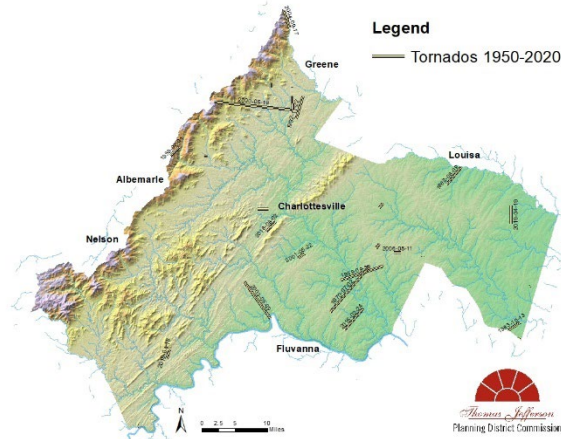
# HIRA: Tornado and Earthquake

## 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.

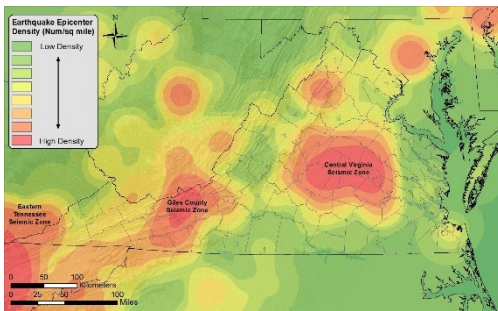
### Regional Tornado Tracks



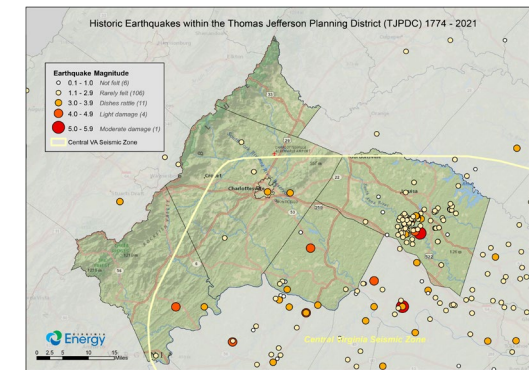
### 2011 Mineral Earthquake Epicenters and Magnitudes



### 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%