



West Piedmont PDC Hazard Mitigation Plan 2021 Update

Mitigation Advisory Committee Workshop #2

April 20, 2021 / Virtual



AGENDA

Background

Project Schedule & Timeline

- Public Outreach Strategy

Hazard ID & Risk Assessment

Mitigation Goals, Objectives & Strategies

Next Steps



Danville, VA

Background

Purpose & Need for a Hazard Mitigation Plan

Franklin County, VA

Authority & Goals

- Disaster Mitigation Act of 2000 (amendments to Stafford Act of 1988)
- Encourage disaster preparedness
- Encourage hazard mitigation actions to reduce losses of life and property

HM Plans in Virginia

- Local plans updated every five years
- West Piedmont Multi-Jurisdictional Plan last updated in 2016
- Update needed to be eligible for FEMA HMA grants

HMGP



HMGP
Post Fire



FMA

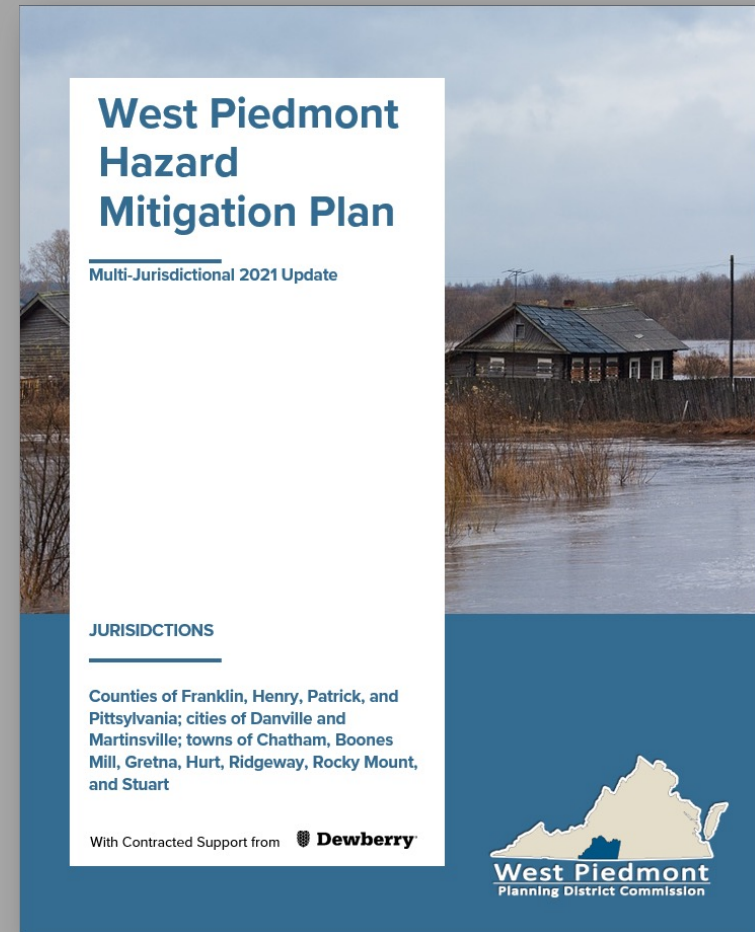


BRIC



Plan Components

- Planning Process Description
- Capability Assessment
- Hazard ID and Risk Assessment
- Vulnerability Analysis and Loss Estimations
- Hazard Mitigation Strategy
- Implementation Plan



Project Schedule & Timeline

Project Timeline

We are here



Pre-
Planning

Kickoff
Meeting

Workshop 2

LPT Meetings

Workshop 3

- Stakeholder lists
- Outreach website
- Capability assessment survey

- Data collection
- Mission statement

- Capability assessment
- Hazard ID & risk assessment (HIRA)
- Mitigation goals & objectives
- Public survey
- 1st public meeting

- Mitigation strategies
- Plan maintenance procedures

- Draft plan
- 2nd public meeting

	D '20	J '21	F	M	A	M	J	J	A	S	O	N	D
HM Plan Milestone	Kick-Off						Draft #1	Draft #2	Address Comments / Revise			Final	
Review 2020 HMP													
Data Collection													
HIRA									R E V I S E				
Capability Assessment													
Revise Goals + Objectives													
Mitigation Strategy Development													
MAC Review / Input	MAC #1				MAC #2			MAC #3					
LPT Review / Input			LPT #1			LPT #2							
Public Engagement						Mtg #1		Mtg #2					
HMP Writing / Revising													
VDEM Review / Approval													
FEMA Review / Approval													
Plan Adoption, Approval Letters, Plan Distribution													

Project Schedule

Public Outreach Strategy

Public Input



Stakeholder &
Community
Champion
Engagement



Project Website
(WPPDC)



Online Survey



Virtual Workshops
/ Public Meetings
5 / 4 / 21



Neighboring
Jurisdictions
Engagement



Video



Story Map

Hazard Mitigation Plan



Hazard Identification and Risk Assessment (HIRA)

Purpose: Provide a factual basis for prioritizing hazard mitigation activities

HIRA Components



Hazard Ranking



Hazard Profiles



**Climate Change
Impacts**



**Hazard History (Locations,
Extents, Occurrences)**



**Vulnerability, Exposure,
and Loss Estimations**



**Probability of Future
Events**



Potential Impacts



State HMP Integration

2021 Changes to the Hazard ID and Risk Assessment

- **Updated hazard ranking** incorporating regional feedback
- **New analyses**, including:
 - HAZUS used for flood risk assessment
 - Dam inundation and pluvial flooding
 - Severe Weather included as new hazard section
- **New maps** based on updated data
- **Climate change impacts** in each hazard profile

Hazard Identification

West Piedmont's Natural Hazards



Flooding



Winter Storm



Hurricane



Severe Weather



Wildfire



Drought



Tornado



Earthquake



Landslide

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	WF: 0.10	WF: 0.20
Unlikely No documented occurrence with annual probability <0.01	Negligible 1 to 10% of people or property	Isolated < 5% of community impacted	Extended More than 3 days	Low
Somewhat Unlikely Infrequent occurrence with at least one documented event and annual probability between 0.5 and 0.01	Slight 10% to 20% of people or property	Minor 5 to 15% of community impacted	Slight 3 days	Medium-Low
Somewhat Likely Moderate occurrence with at least two documented events and annual probability between 0.5 and 0.01	Limited 20 to 30% of people or property	Small 15 to 25% of community impacted	Limited 2 days	Medium
Likely Frequent occurrence with at least three documented events and annual probability between 1 and 0.5	Critical 25 to 50% of people or property	Medium 25 to 50% of community impacted	Minimal 1 day	Medium-High
Highly Likely Common events with annual probability >1	Catastrophic > 50% of people or property	Large > 50% of community impacted	No Notice < 24 hours	High

Hazard Ranking Priority Criteria

		Hazard Type	2016 Priority Level	2021 Priority Level
Natural		Flooding (with Shoreline Erosion)	High	High (Top)
		→ Pluvial Flooding	Not Addressed	High (Top)
		Winter Storms	High	High
		Wind (Hurricane, Thunderstorms – 2016 only)	Medium-High	Medium-High
		Severe Weather	Addressed in “Wind”	Medium-High
		Drought	Medium-Low	Medium-Low
		Wildfire	Medium	Medium
		Tornado	Medium	Medium-High
		Earthquake	Low	Medium-Low
		Landslide	Low	Low
Human-Caused		Dams (Impoundment Failure)	Medium-Low	Medium-Low
		High Voltage Transmission (HVT) Lines	Medium	Medium
		Organic/Inorganic Spills	Medium-High	Medium-High
		Pipeline Failure	Medium	Medium
		Agriterrorism	Medium-Low	Medium-Low

Hazard Ranking Priority Comparison

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Home Contact Us About NCEI Help

NCEI > Storm Events Database

Storm Events Database

Data Access
Search
Bulk Data Download (CSV)
Storm Data Publication

Documentation
Database Details
Version History
Storm Data FAQ
NOAA's NWS Documentation
Tornado EF Scale

External Resources
NOAA's SPC Reports
NOAA's SPC WCM Page
NOAA's NWS Damage Assessment Toolkit
NOAA's Tsunami Database
ESRI/FEMA Civil Air Patrol Images
SHELDUS
USDA Cause of Loss Data

Storm Events Database

The Storm Events Database contains the records used to create the official [NOAA Storm Data publication](#), documenting:

- The occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce;
- Rare, unusual, weather phenomena that generate media attention, such as snow flurries in South Florida or the San Diego coastal area; and
- Other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occur in connection with another event.

The database currently contains data from **January 1950 to November 2020**, as entered by NOAA's National Weather Service (NWS). Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. NCEI has performed data reformatting and standardization of event types but has not changed any data values for locations, fatalities, injuries, damage, narratives and any other event specific information. Please refer to the [Database Details](#) page for more information.

[Register your email address](#) with NCEI to receive future information regarding access system downtime, data issues, new features and general news about the Storm Events Database.

Select State or Area
-- All States and Areas --
Search

Narrative Text Search
Text Search [\[help and examples\]](#)

*** Find all events on this day *** [List all events from April 15](#) across all years. Choose 'Any' as the year to search all years of the database for a selected day and month range.

The Storm Events Database has changed greatly over time. Please refer to the [version information page](#) for detailed version information and release dates. If you have questions, please [Contact NCEI](#).

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USA.gov Ready



FEMA List of Federally Declared Disasters

- Nature of disaster
- Type(s) of assistance provided



NOAA / National Centers for Environmental Information (NCEI) Storm Events Database

- Area Impacted
- Damages
- Description of event

Historical Disaster Databases



Community	Severe Storm & Flooding	Hurricane/ Tropical Storm	Severe Winter Storm/Ice Storm	Wildfire	Severe Storm & Wind (inc. Tornado)	Total
City of Danville	4	7	2	0	2	15
Franklin County	7	6	2	0	4	19
Henry County	5	5	2	0	3	15
City of Martinsville	2	6	2	0	2	12
Patrick County	5	4	3	1	3	16
Pittsylvania County	8	7	6	0	1	22

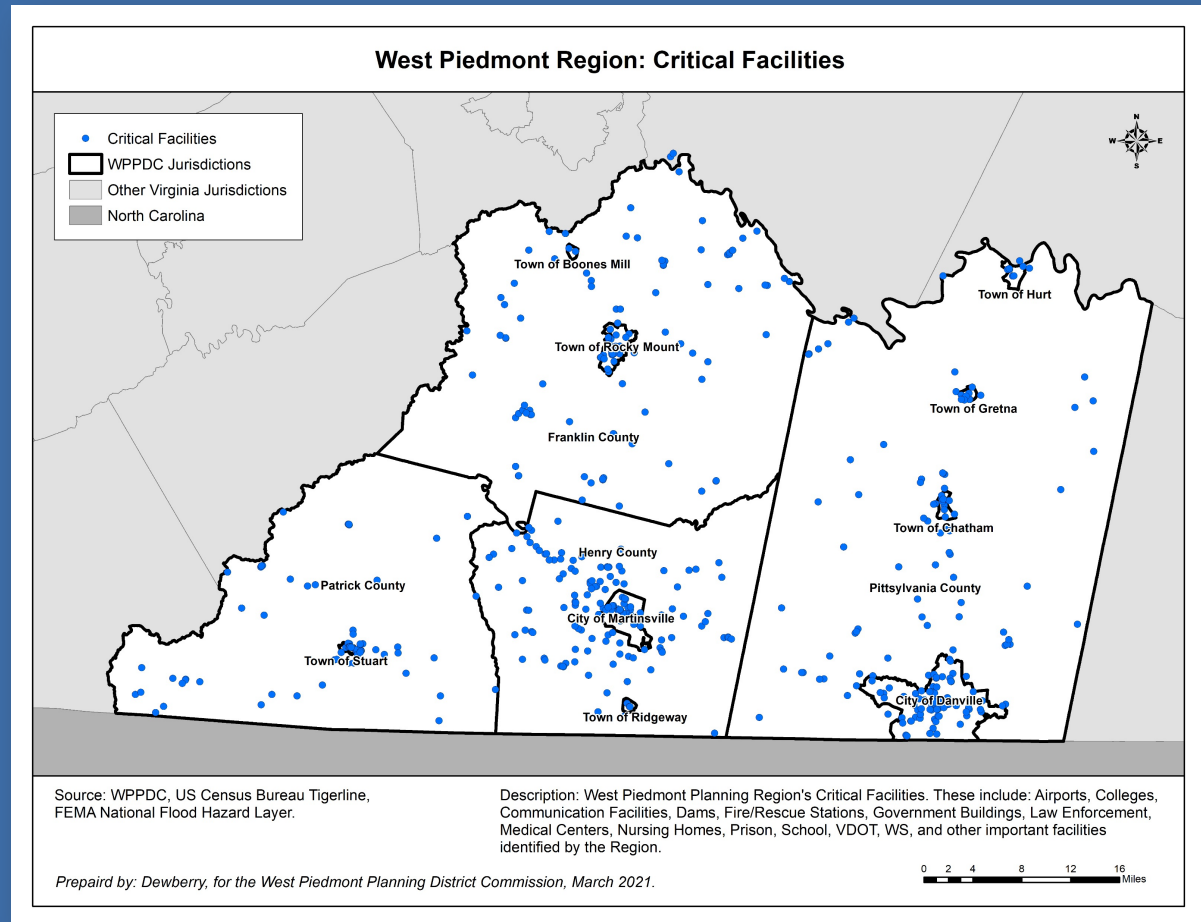
Major Disasters – Federal Declarations



Critical Facilities

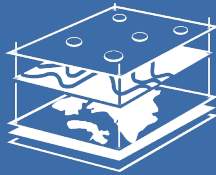
Changes reflected in the map:

- **Stuart:** Converted a building into a fire house that replaced older fire house
- **Patrick:** Food Lion building converted (fire dept/community college)
- **Danville:** New fire station replaced old one
- **Henry:** Added Meadow Elem. School and decommissioned John Redd Elem School; Collinsville Primary decommissioned



Loss Estimation Approaches

Hazus Analysis



Flood, Hurricane Wind, and
Earthquakes

(Improved methodology in most recent version)

Non-Hazus Analysis



All Other Hazards

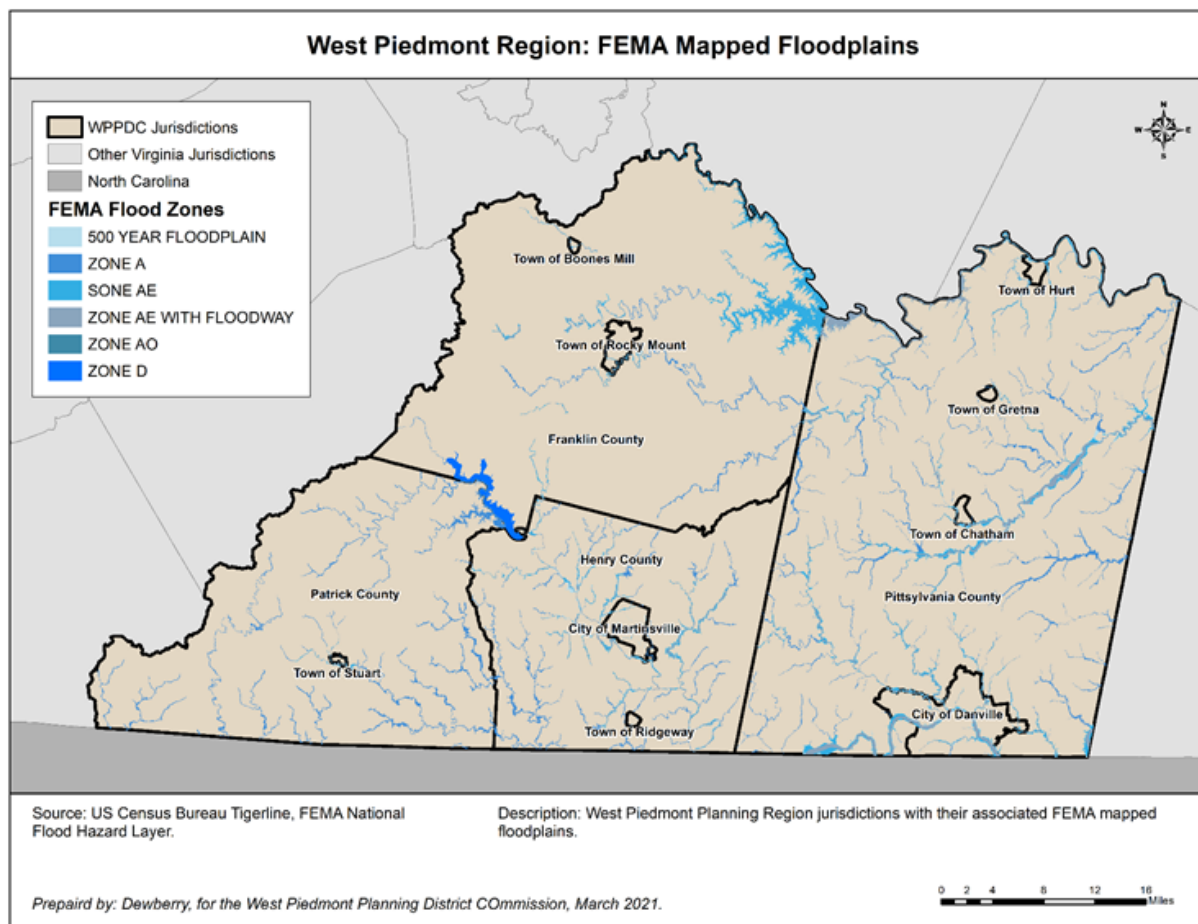
- NCEI, NFIP losses, and Public Assistance reimbursements
- Downscale loss estimates from VA HMP
- Typical losses for the most challenging hazards (i.e., wildfire losses)

Augmented with Exposure Analysis as Needed



Flooding

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Highly Likely Common events with annual probability >1	Critical 25 to 50% of people or property	Small 15 to 25% of community impacted	Limited 2 days	High	High (Top Priority)



Mapped Floodplains

Exposure Analysis: Parcels



County	Total Parcels	100 YR Parcels Exposed	100 YR Exposed Parcel Percent	500 YR Parcels Exposed	500 YR Exposed Parcel Percent
City of Danville	25,648	1,057	4.1%	1,262	4.9%
Franklin County	43,959	7,305	16.6%	7,375	16.8%
Henry County	54,456	4,469	8.2%	5,036	9.2%
City of Martinsville	11,177	384	3.4%	738	6.6%
Patrick County	23,616	2,474	10.5%	2,497	10.6%
Pittsylvania County	61,284	6,001	9.8%	6,216	10.1%
WPPDC	220,140	21,690	9.9%	23,124	10.5%

Exposure Analysis: Value



County	Total Value	100 YR Total Exposed Value (all parcels)	100 YR SFHA Exposed Value (weighted by %)	100 YR SFHA Exposed Value Percent	500 YR Total Exposed Value (all parcels)	500 YR SFHA Exposed Value (weighted by %)	500 YR SFHA Exposed Value Percent
City of Danville	\$2,820,000,000	\$409,000,000	\$108,000,000	3.8%	\$479,000,000	\$141,000,000	5.0%
Franklin County	\$8,130,000,000	\$3,120,000,000	\$412,000,000	5.1%	\$3,150,000,000	\$427,000,000	5.3%
Henry County	\$5,180,000,000	\$880,000,000	\$115,000,000	2.2%	\$962,000,000	\$136,000,000	2.6%
City of Martinsville	\$1,250,000,000	\$51,800,000	\$12,100,000	1.0%	\$91,700,000	\$20,500,000	1.6%
Patrick County	\$2,160,000,000	\$417,000,000	\$50,800,000	2.4%	\$418,000,000	\$51,400,000	2.4%
Pittsylvania County	\$6,590,000,000	\$918,000,000	\$115,000,000	1.7%	\$939,000,000	\$126,000,000	1.9%
WPPDC	\$26,130,000,000	\$5,795,800,000	\$812,900,000	3.1%	\$6,039,700,000	\$901,900,000	3.5%

Exposure Analysis: Acreage



County	Total Acreage	100 YR Total Exposed Acreage	100 YR SFHA Exposed Acreage	100 YR SFHA Exposed Acreage Percent	500 YR Total Exposed Acreage	500 YR SFHA Exposed Acreage	500 YR SFHA Exposed Acreage Percent
City of Danville	24,155	8,319	2,202	9.1%	8,686	2,551	10.6%
Franklin County	441,519	78,133	10,319	2.3%	78,595	10,652	2.4%
Henry County	236,269	89,625	11,688	4.9%	90,991	12,902	5.5%
City of Martinsville	6,375	1,171	273	4.3%	1,654	371	5.8%
Patrick County	310,587	97,610	11,900	3.8%	97,636	11,991	3.9%
Pittsylvania County	627,265	290,110	36,401	5.8%	293,098	39,316	6.3%
WPPDC	1,646,170	564,967	72,784	4.4%	570,660	77,783	4.7%

Additional Flood Analysis



Pluvial Flooding



Hazus



Dam Inundation

NFIP Statistics



Jurisdiction	Policies in Force	Repetitive Loss Properties	Severe Repetitive Loss Properties	Number of Claims	Net Payments
Danville	112	22	3	149	\$4,626,399
Patrick County	15	3	0	43	\$1,050,438
Henry County	86	15	1	145	\$2,391,196
Martinsville	7	5	0	49	\$817,367
Franklin County	113	5	0	44	\$642,343
Pittsylvania County	30	2	1	37	\$687,516
Total	363	52	5	467	\$10,215,260



Winter Storm

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	WF: 0.10	WF: 0.20	
Highly Likely Common events with annual probability >1	Critical 25 to 50% of people or property	Large > 50% of community impacted	Limited 2 days	High	High

Winter Storm Events in NCEI Storm Events Database (1996 – February 2019)

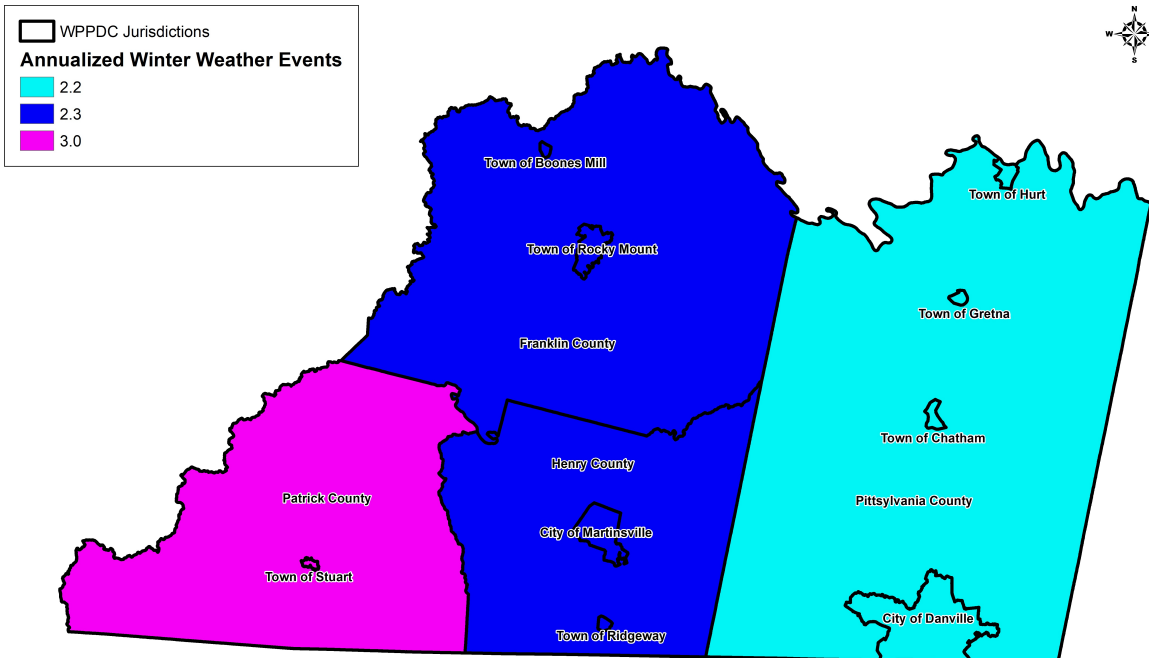


Jurisdiction	Annualized Property Damage	Annualized Crop Damage	Total Annualized Damages
Franklin County	\$6,543	\$19,870	\$26,413
Henry County	\$8,304	\$11,435	\$19,739
Patrick County	\$2,652	\$15,870	\$18,522
Pittsylvania County	\$36,739	\$13,000	\$49,739
Total	\$54,239	\$60,174	\$114,413

Annualized Damages



West Piedmont Region: Annualized Winter Weather Events from the NCEI Storm Events Database



Source: NOAA NCEI, US Census Bureau Tigerline, FEMA National Flood Hazard Layer.

Description: West Piedmont Planning Region jurisdictions by annualized winter weather events from the NCEI Storm Events Database.

Prepared by: Dewberry, for the West Piedmont Planning District Commission, March 2021.

0 2 4 8 12 16 Miles



Annualized Events

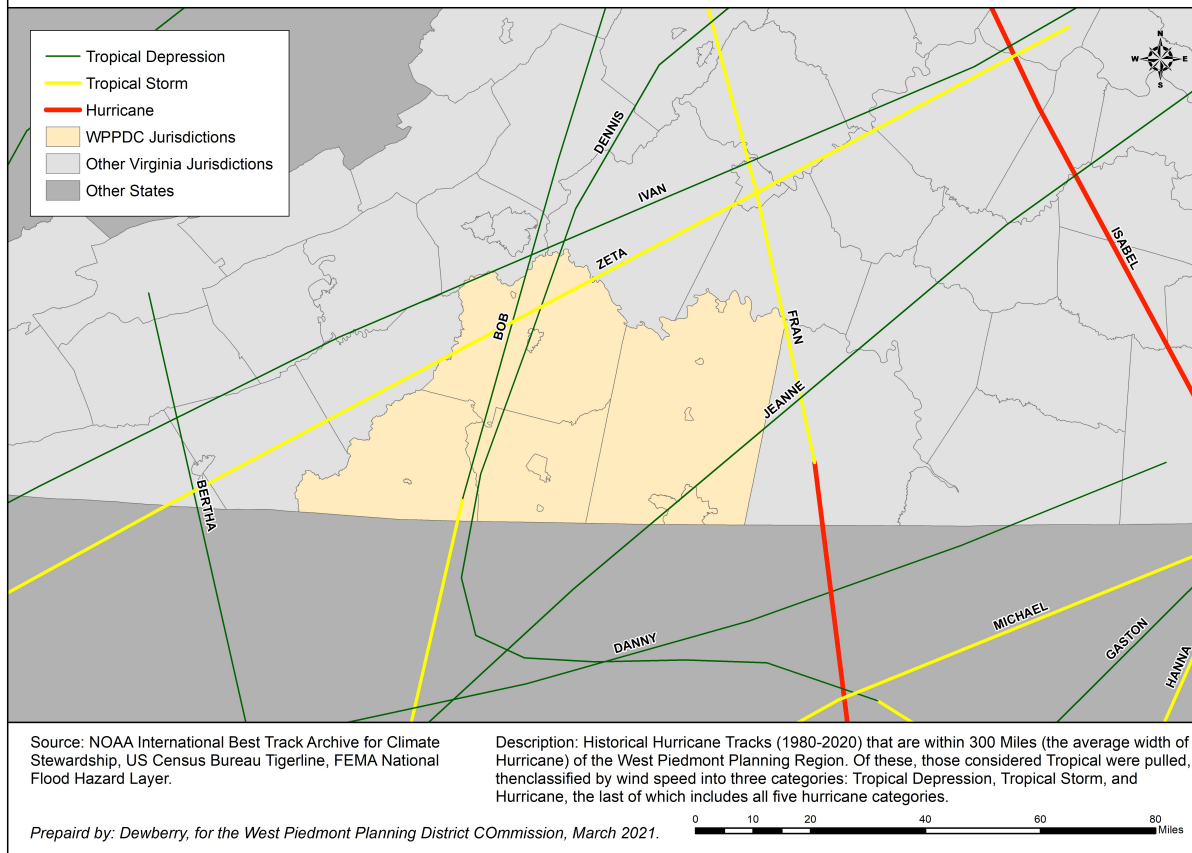
 **Dewberry**



Hurricane Wind

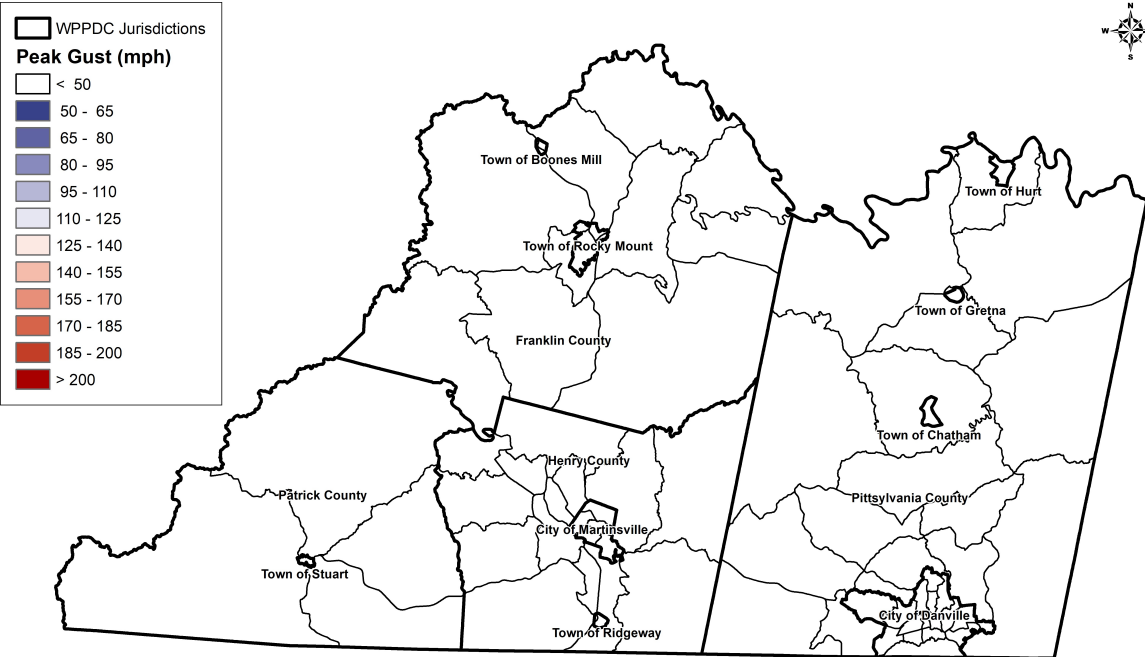
Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Highly Likely Common events with annual probability >1	Limited 20 to 30% of people or property	Small 15 to 25% of community impacted	Minimal 1 day	Medium-High	Medium-High

West Piedmont Region: 1980-2020 Tropical Depression, Tropical Storm, and Hurricane Tracks.



Historical Hurricane Tracks

West Piedmont Region: Probabilistic 10-Year Wind Event



Source: FEMA Hazus v4.2, US Census Bureau Tigerline, FEMA National Flood Hazard Layer.

Description: West Piedmont Planning Region jurisdiction Census Tracts by Wind Speed as measured by Peak Gust (mph).

Prepared by: Dewberry, for the West Piedmont Planning District Commission, March 2021.

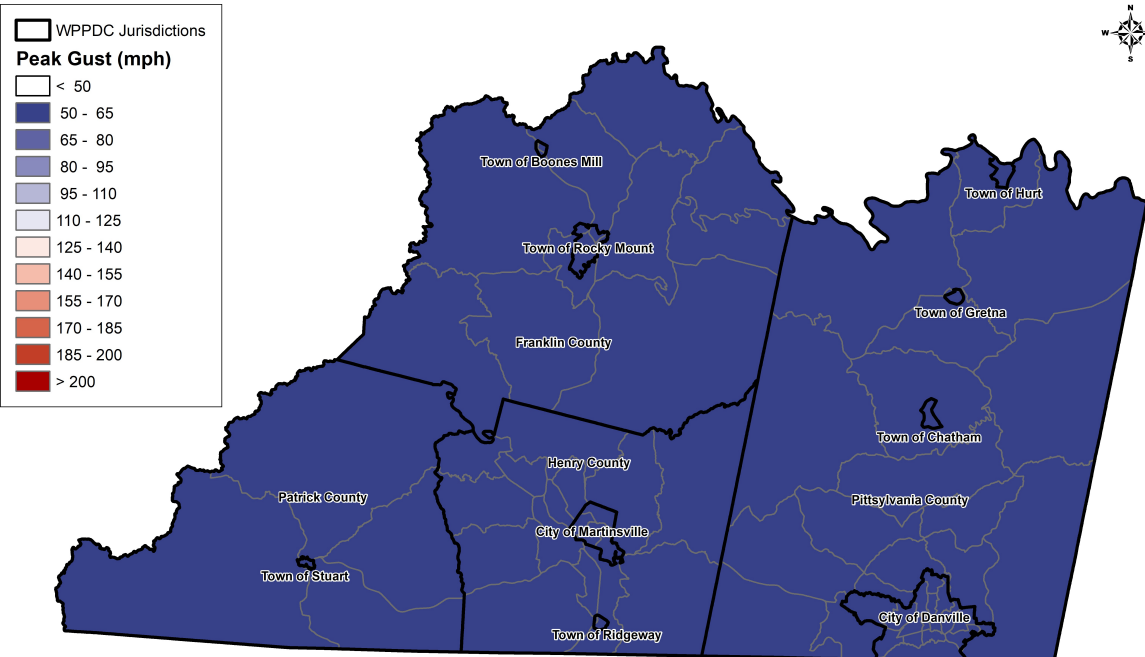
0 2 4 8 12 16 Miles



Probabilistic 10-Year Wind Event

 **Dewberry**

West Piedmont Region: Probabilistic 50-Year Wind Event



Source: FEMA Hazus v4.2, US Census Bureau Tigerline, FEMA National Flood Hazard Layer.

Description: West Piedmont Planning Region jurisdiction Census Tracts by Wind Speed as measured by Peak Gust (mph).

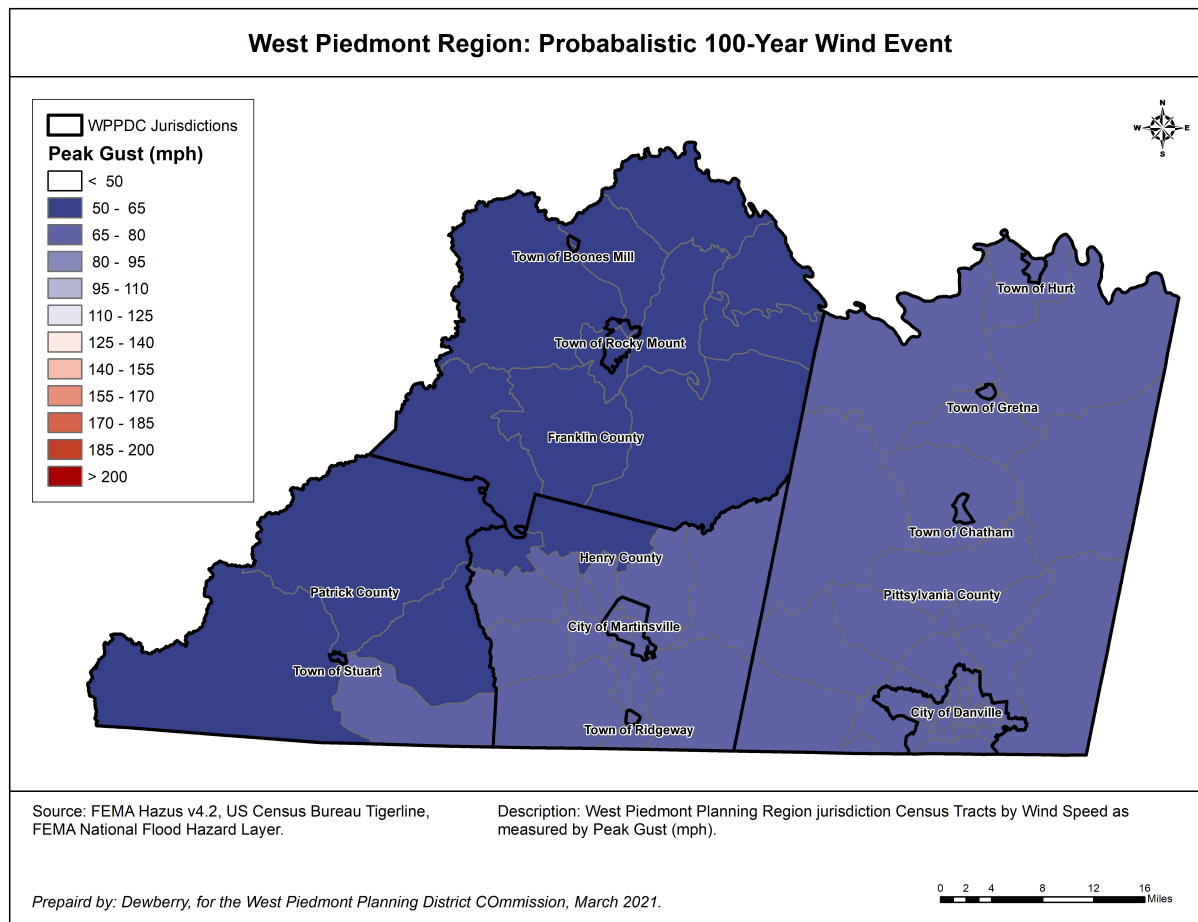
Prepared by: Dewberry, for the West Piedmont Planning District Commission, March 2021.

0 2 4 8 12 16 Miles



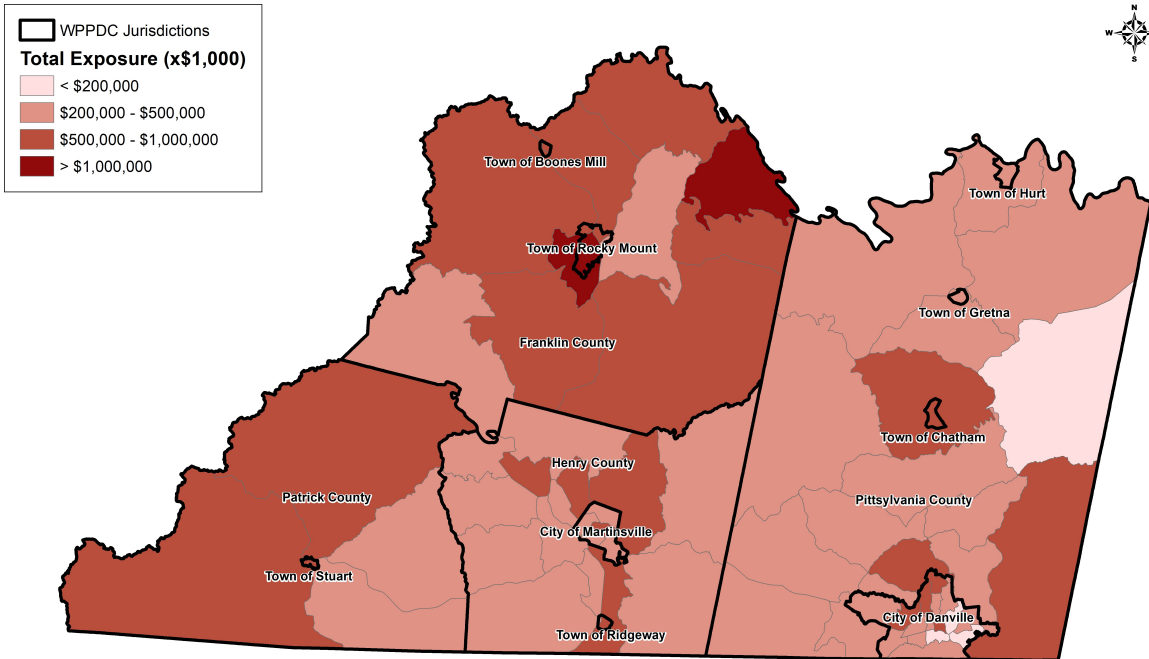
Probabilistic 50-Year Wind Event

 **Dewberry**



Probabilistic 100-Year Wind Event

West Piedmont Region: Total Exposure by Census Tract



Source: NOAA NCEI Storm Events Database, US Census Bureau Tigerline, FEMA National Flood Hazard Layer.

Description: West Piedmont Planning Region jurisdiction Census Tracts by total exposure.

Prepared by: Dewberry, for the West Piedmont Planning District Commission, March 2021.

0 2 4 8 12 16 Miles



Total Exposure

 **Dewberry**

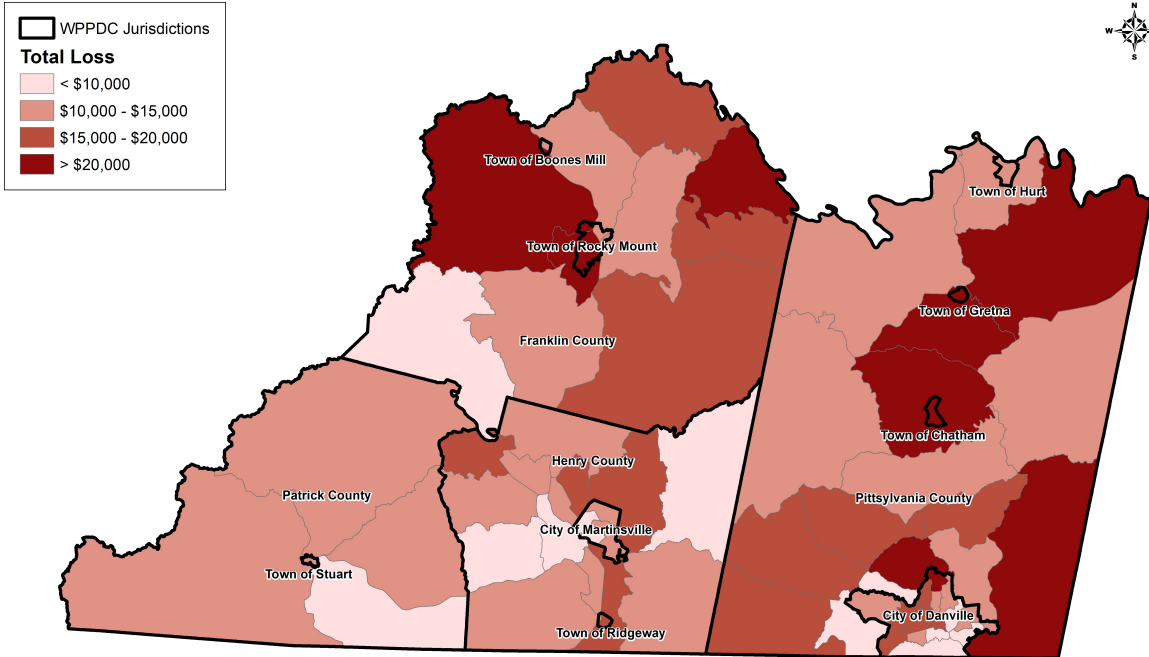
Total Annualized Hurricane Wind Loss

Hazus-MH v4.2



Jurisdiction	Buildings	Contents	Inventory	Relocation	Income	Rental	Wages	Total Loss	Total Exposure
City of Danville	\$164,589	\$24,219	\$368	\$11,155	\$793	\$4,667	\$1,374	\$207,166	\$5,667,085
Franklin County	\$155,949	\$27,789	\$421	\$7,467	\$269	\$2,426	\$494	\$194,815	\$7,095,280
Town of Boones Mill	\$140	\$16	\$0	\$8	\$0	\$2	\$1	\$166	\$8,035
Town of Rocky Mount	\$5,651	\$1,080	\$108	\$351	\$41	\$143	\$72	\$7,446	\$331,698
Henry County	\$145,635	\$24,893	\$454	\$9,213	\$582	\$3,006	\$1,094	\$184,875	\$6,046,498
Town of Ridgeway	\$683	\$111	\$5	\$44	\$7	\$15	\$7	\$871	\$31,593
City of Martinsville	\$43,943	\$6,656	\$252	\$2,792	\$300	\$1,166	\$484	\$55,594	\$2,158,182
Patrick County	\$41,654	\$4,374	\$76	\$2,391	\$110	\$748	\$271	\$49,624	\$1,964,965
Town of Stuart	\$53	\$6	\$0	\$3	\$0	\$1	\$0	\$63	\$2,783
Pittsylvania County	\$205,571	\$45,841	\$246	\$11,095	\$380	\$3,240	\$1,125	\$267,498	\$6,102,244
Town of Chatham	\$617	\$254	\$1	\$29	\$2	\$9	\$6	\$918	\$18,642
Town of Gretna	\$393	\$153	\$1	\$17	\$0	\$5	\$1	\$570	\$10,099
Town of Hurt	\$761	\$69	\$0	\$44	\$2	\$13	\$2	\$892	\$31,073
Total	\$765,640	\$135,458	\$1,932	\$44,610	\$2,485	\$15,442	\$4,931	\$970,498	\$29,468,177

West Piedmont Region: Total Annualized Hurricane Wind Loss



Source: NOAA NCEI Storm Events Database, US Census Bureau Tigerline, FEMA National Flood Hazard Layer.

Description: West Piedmont Planning Region jurisdictions by annualized total hurricane-wind losses from Hazus-MH v.4.2.

Prepared by: Dewberry, for the West Piedmont Planning District Commission, March 2021.

0 2 4 8 12 16 Miles



Annualized Total Loss

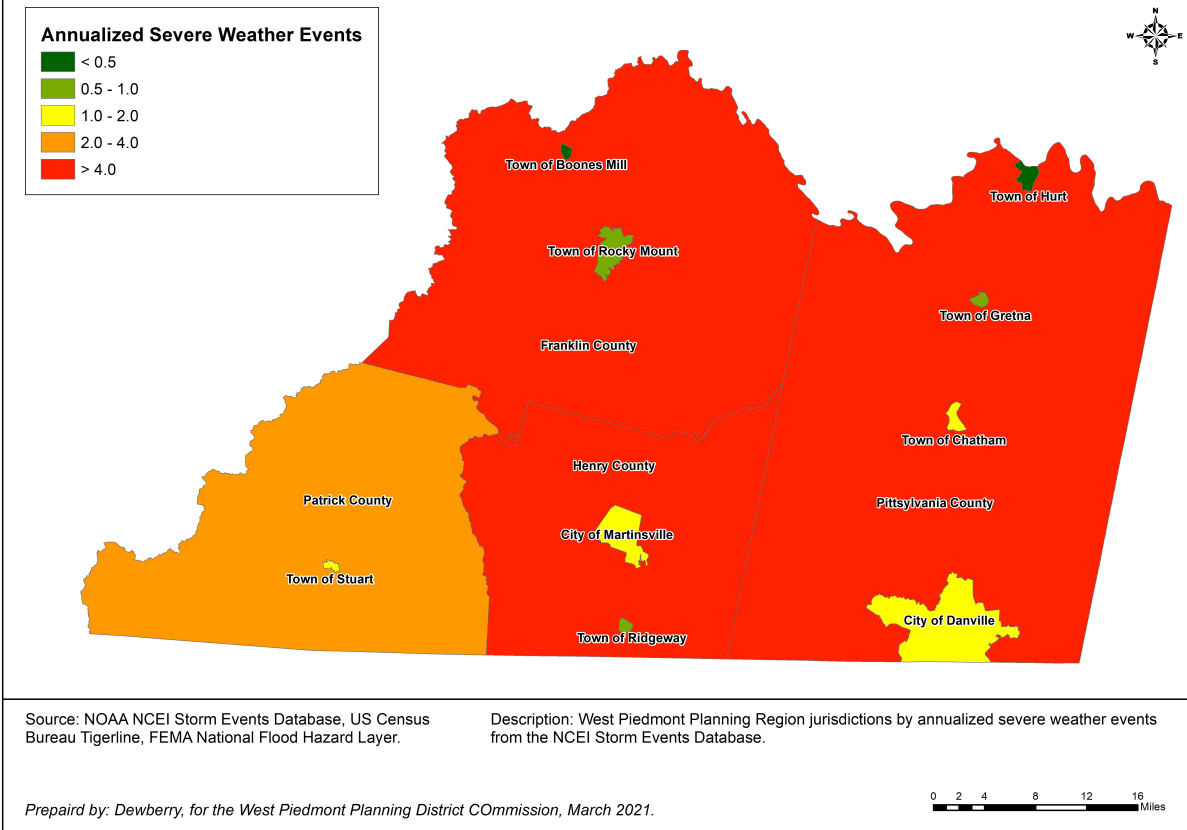
 **Dewberry**



Severe Weather

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Highly Likely Common events with annual probability >1	Limited 20 to 30% of people or property	Small 15 to 25% of community impacted	Minimal 1 day	Medium-High	Medium-High

West Piedmont Region: Annualized Events Severe Weather Events in NCEI Storm Events Database



Annualized Severe Weather Events

Events in NCEI Database

(1955- November 2020)



Jurisdiction	Hail	High Wind	Lightning	Strong Wind	Thunderstorm Wind	Total
City of Danville	18	17	2	6	72	115
City of Martinsville	19	14	3	9	43	88
Franklin County	147	39	10	8	296	500
Town of Boones Mill	12	0	2	0	16	30
Town of Rocky Mount	28	0	5	0	30	63
Henry County	104	14	15	9	226	368
Town of Ridgeway	15	0	0	0	36	51
Patrick County	90	39	2	6	118	255
Town of Stuart	30	0	1	0	41	72
Pittsylvania County	138	17	7	6	330	498
Town of Chatham	21	0	3	0	46	70
Town of Gretna	13	0	2	0	37	52
Town of Hurt	10	0	1	0	19	30
Total	645	140	53	44	1,310	2,192

Annualized Events from NCEI

(1955 – November 2020)



Jurisdiction	Annualized Events	Annualized Property Damage	Annualized Crops Damage	Annualized Total Damage	Total Deaths	Total Injuries
City of Danville	1.8	\$32,126	\$615	\$32,742	0	1
City of Martinsville	1.4	\$44,597	\$308	\$44,905	0	4
Franklin County	7.7	\$56,089	\$462	\$56,551	1	0
Town of Boones Mill	0.5	\$2,266	\$0	\$2,266	0	0
Town of Rocky Mount	1.0	\$13,649	\$0	\$13,649	0	1
Henry County	5.7	\$82,928	\$9,538	\$92,466	1	3
Town of Ridgeway	0.8	\$2,932	\$0	\$2,932	0	0
Patrick County	3.9	\$17,137	\$15	\$17,152	0	1
Town of Stuart	1.1	\$4,694	\$0	\$4,694	0	0
Pittsylvania County	7.7	\$62,662	\$14,185	\$76,846	0	0
Town of Chatham	1.1	\$3,288	\$77	\$3,365	0	1
Town of Gretna	0.8	\$4,374	\$0	\$4,374	0	1
Town of Hurt	0.5	\$8,897	\$0	\$8,897	0	0
Total	33.0	\$335,639	\$25,200	\$360,839	2	12



Tornado

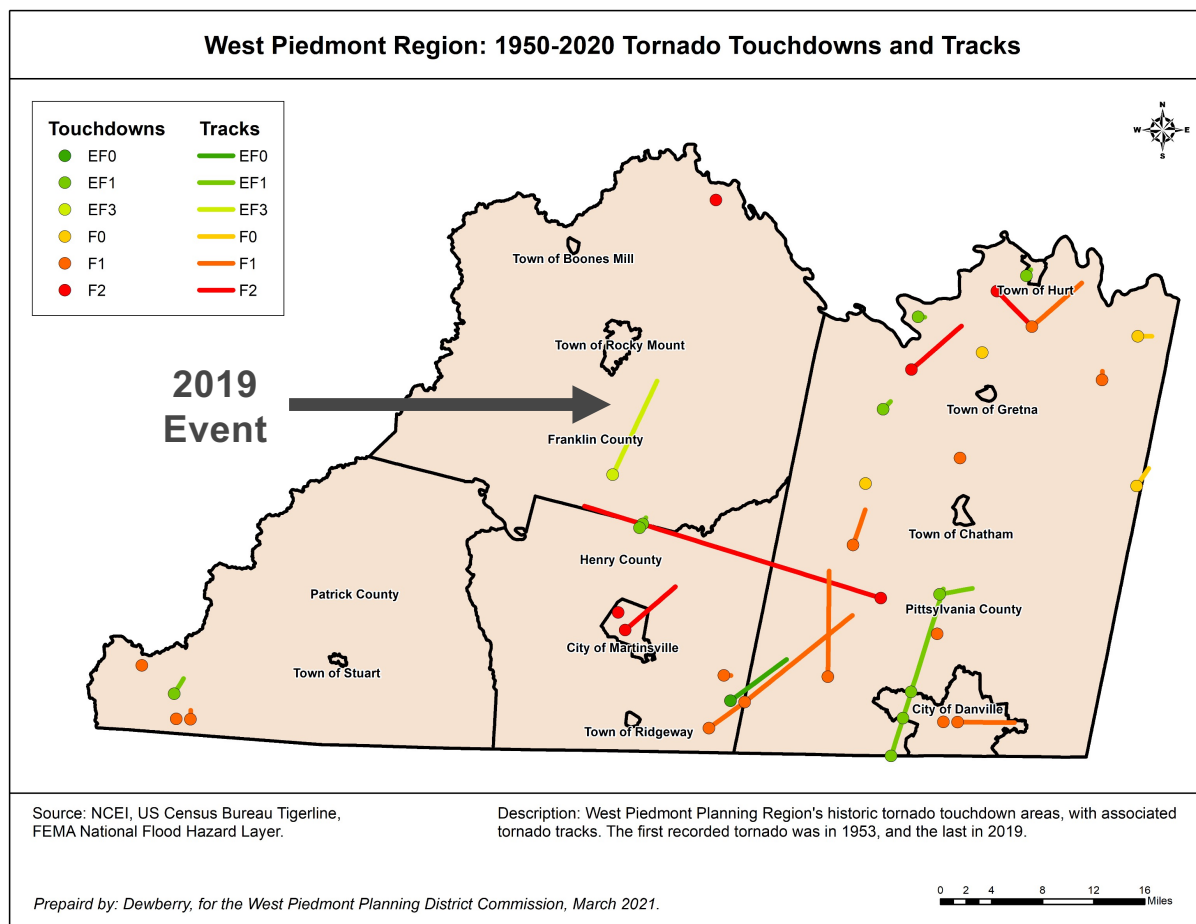
Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Likely Frequent occurrence with at least three documented events and annual probability between 1 and 0.5	Negligible 1 to 10% of people or property	Small 15 to 25% of community impacted	No Notice < 24 hours	Medium	Medium

Tornado Touchdowns



Tornado Statistics by Fujita Intensity Scale (1953-2019)
West Piedmont Region Tornado Touchdowns

Jurisdiction	Unknown	F0	F1	F2	≥ F3	Total
City of Danville	1	0	2	0	0	3
City of Martinsville	0	0	0	1	0	1
Franklin County	1	1	1	1	1	5
Henry County	0	1	3	2	0	6
Patrick County	0	0	4	0	0	4
Pittsylvania County	1	5	14	2	0	22
Total	3	7	24	6	1	41



Tornado Touchdowns and Tracks

Probability and Annualized Loss



Tornado Events in NCEI Storm Events Database (2021)

Jurisdiction	Number of events annually	Annualized Loss
Franklin County	0.08	\$10,015
Henry County	0.11	\$1,583,205
City of Martinsville		
Patrick County	0.06	\$8,258
Pittsylvania	0.33	\$53,489
City of Danville	0.05	\$51,515
Total	0.62	\$1,706,481



Wildfire

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Highly Likely Common events with annual probability >1	Negligible 1 to 10% of people or property	Small 15 to 25% of community impacted	No Notice < 24 hours	Medium	Medium

Historical Wildfire Statistics

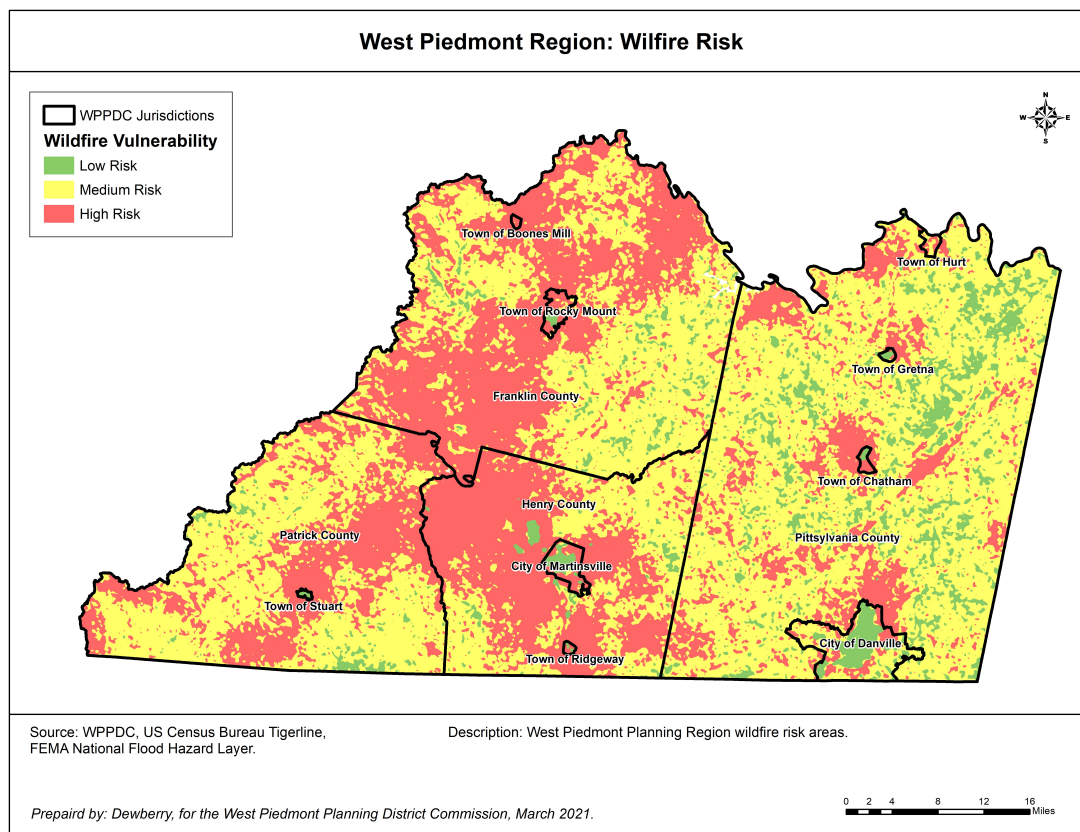


Number of Wildfires by Fire Year (2009 - 2015)

Jurisdiction	2009	2010	2011	2012	2013	2014	2015	Sub-Total
Franklin County	12	5	8	11	5	4	8	355
Henry County	8	7	16	11	3	9	9	293
Patrick County	6	6	6	7	4	7	5	175
Pittsylvania County	8	17	20	16	12	7	21	460
Total	34	35	50	45	24	27	43	1,283

Number of Wildfires by Fire Year (2016 - 2019)

Jurisdiction	2016	2017	2018	2019		Total All Years
Franklin County	7	11	11	2		386
Henry County	7	5	6	3		314
Patrick County	9	6	3	2		195
Pittsylvania County	12	16	12	4		504
Total	35	38	32	11		1,399



Wildfire Risk

Exposure Analysis: Acreage



County	Total Acres	Low Risk Acres	Medium Risk Acres	High Risk Acres
City of Danville	24,200	8,660	9,830	5,600
Franklin County	442,000	14,200	211,000	216,000
Henry County	236,000	6,240	92,000	138,000
City of Martinsville	6,380	2,230	542	4,490
Patrick County	311,000	7,700	184,000	116,000
Pittsylvania County	627,000	75,800	438,000	112,000
WPPDC	1,650,000	115,000	935,000	591,000

Exposure Analysis: Value



County	Total Value	Low Risk Exposure	Medium Risk Exposure	High Risk Exposure
City of Danville	\$2,820,000,000	\$1,440,000,000	\$576,000,000	\$249,000,000
Franklin County	\$8,130,000,000	\$151,000,000	\$2,870,000,000	\$3,380,000,000
Henry County	\$5,180,000,000	\$220,000,000	\$1,270,000,000	\$2,590,000,000
City of Martinsville	\$1,250,000,000	\$225,000,000	\$129,000,000	\$618,000,000
Patrick County	\$2,160,000,000	\$44,300,000	\$1,090,000,000	\$622,000,000
Pittsylvania County	\$6,590,000,000	\$517,000,000	\$3,560,000,000	\$865,000,000
WPPDC	\$26,100,000,000	\$1,740,000,000	\$9,720,000,000	\$7,550,000,000

Historical Wildfire Damages

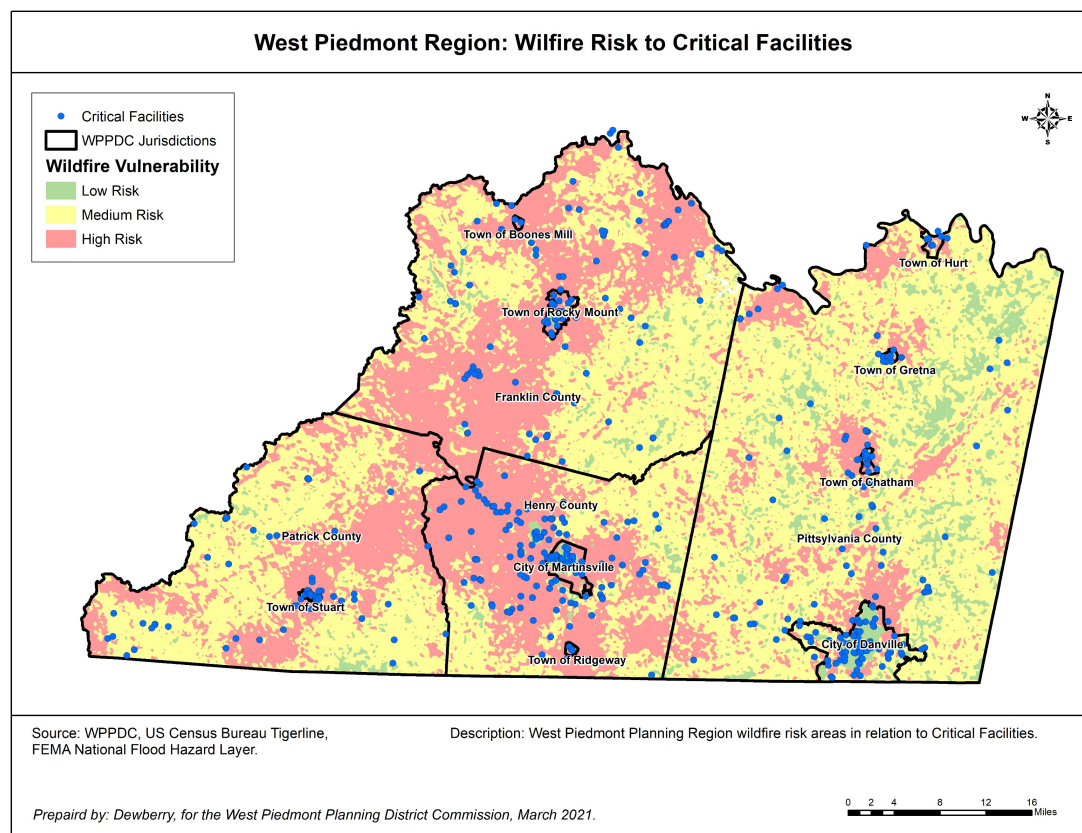


Fire Year	2007		2008		2009 - 2013		Acres Total	Damages Total
Jurisdiction	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage		
Franklin County	249	\$150	38	\$0	30.4	*Not Provided	1,190.3	\$281,006**
Henry County	22.1	\$0	75.5	\$0	35.2		848.3	\$158,700**
Patrick County	186	\$1,000	24.5	\$0	6.7		4,385.9	\$3,875,255**
Pittsylvania County	138	\$53,550	167.4	\$16,050	36.7		2,255.1	\$575,213**
Total	595.1	\$54,700	305.4	\$16,050	510**		9,080.6	\$4,890,174**

Critical Facilities in Fire Risk Zones



Jurisdiction	Low Potential	Medium Potential	High Potential	Grand Total	% High Risk
City of Danville	46	19	8	73	11%
Franklin County	15	43	58	116	50%
Henry County	13	33	69	115	60%
City of Martinsville	15	1	11	27	41%
Patrick County	6	35	25	66	38%
Pittsylvania County	29	50	23	102	23%
Total	124	181	194	499	39%



Wildfire Risk to Critical Facilities

Annualized Events and Damage (VDOF) (1995 – 2013)



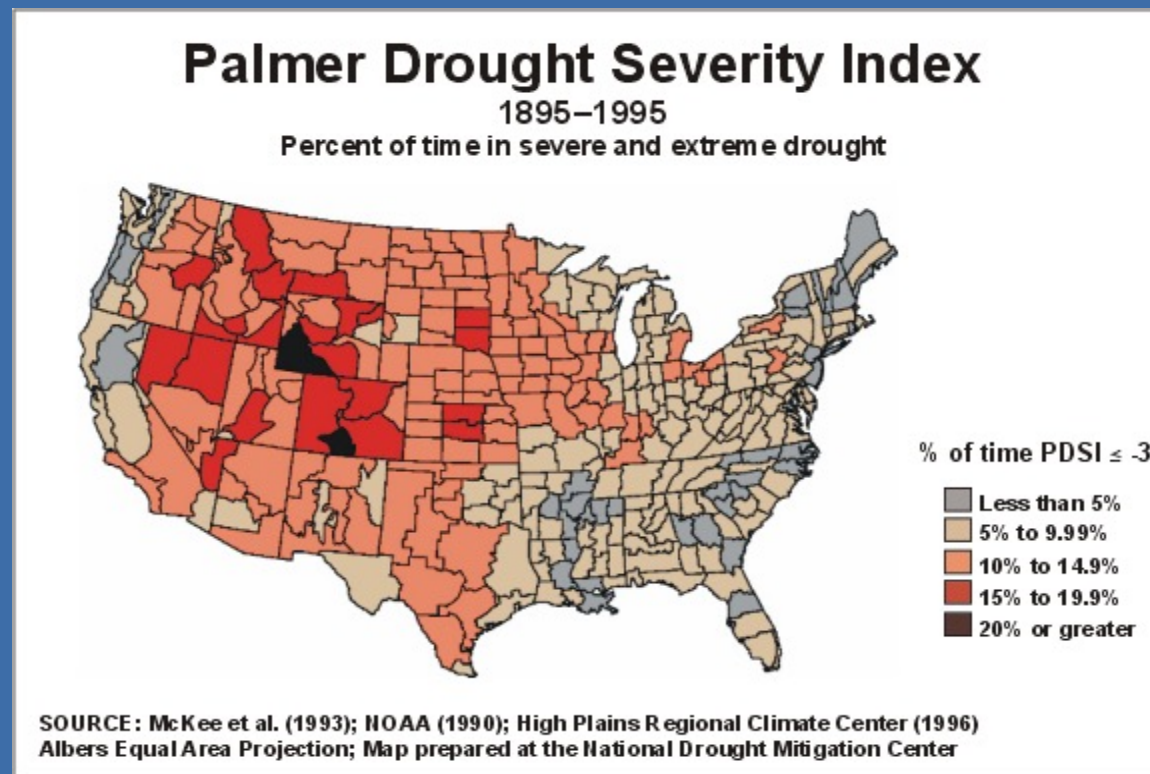
Jurisdiction	Annualized Property Damage (thru 2008)	Annualized Number of Events (thru 2013)
Franklin County	\$28,266	22.4
Henry County	\$15,147	17
Patrick County	\$305,330	10
Pittsylvania County	\$51,609	26.2
Total	\$400,352	79.9



Drought

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Likely Frequent occurrence with at least three documented events and annual probability between 1 and 0.5	Limited 20 to 30% of people or property	Medium 25 to 50% of community impacted	Extended More than 3 days	Medium-Low	Medium-Low

Drought Severity

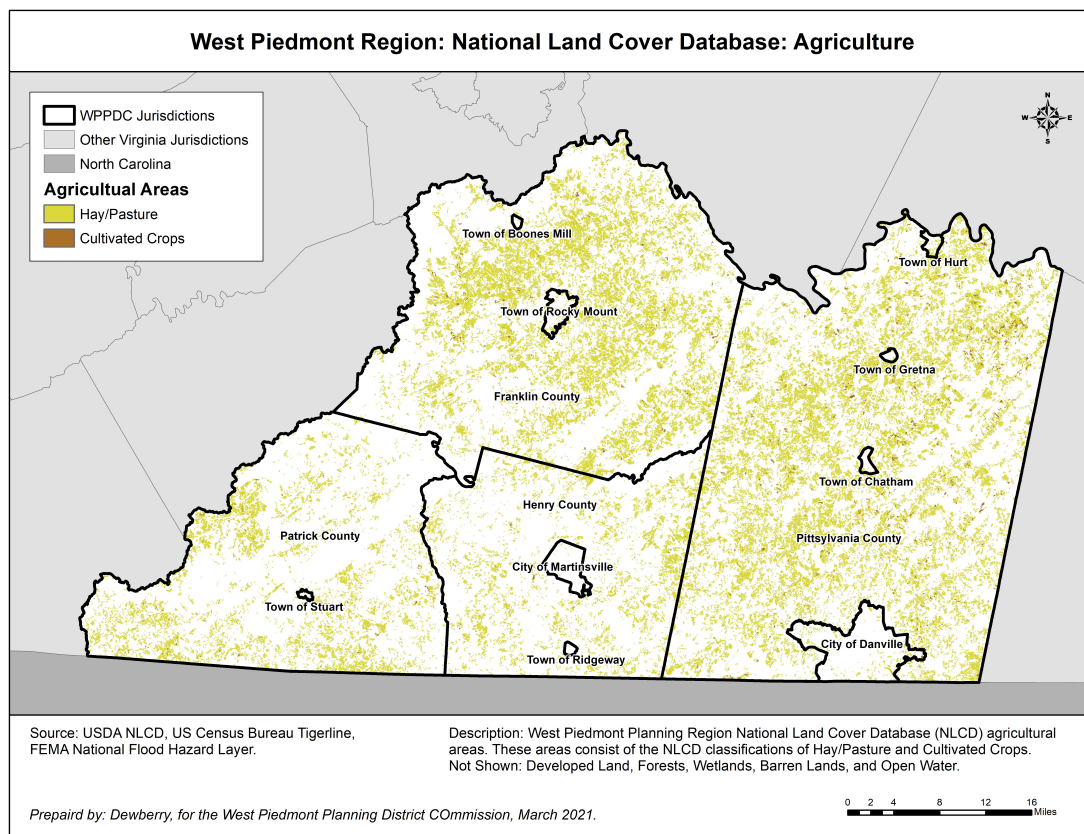


Annualized Drought Events



Drought Events in NCEI Storm Events Database (1998 – 2019)

Jurisdiction	Number of drought events annually
Franklin County	0.619
Henry County	0.810
Patrick County	0.810
Pittsylvania County	0.810



Agricultural Land Use

Crop Losses



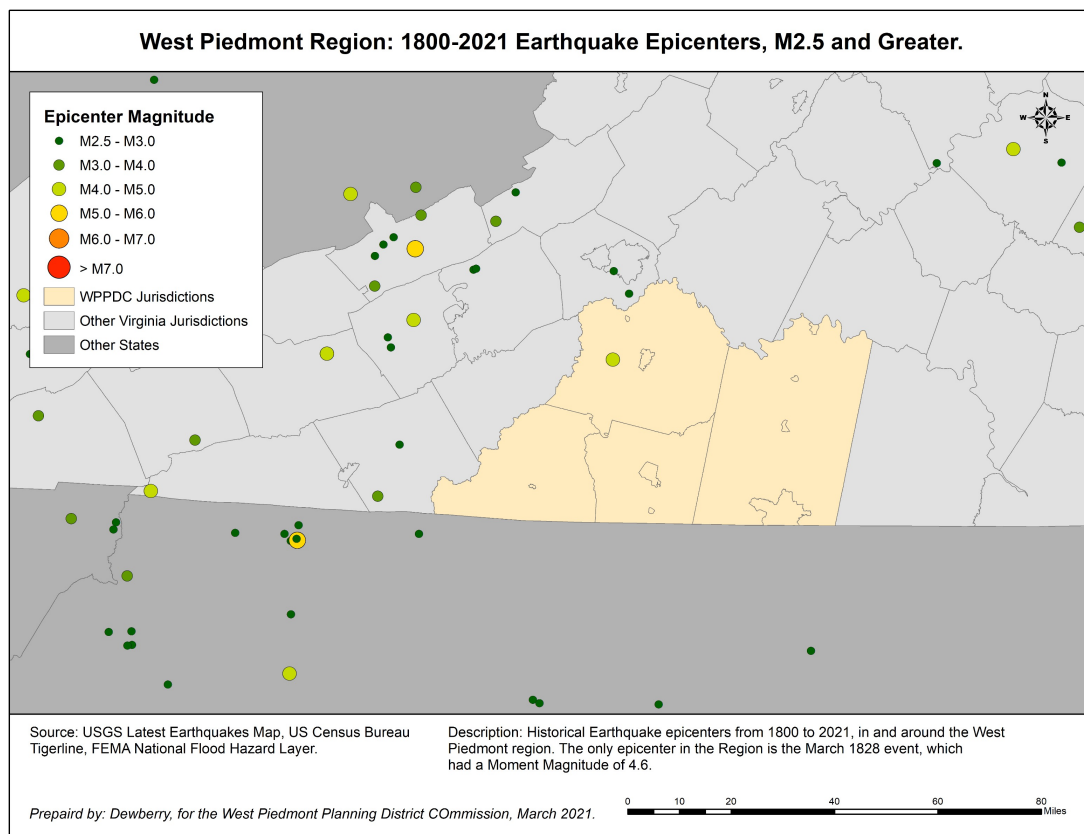
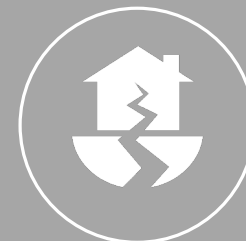
Crop Losses due to Drought Events in NCEI Storm Events Database

Jurisdiction	Total Crop Damage Over 21-year Period (1998-2019)	Total Annualized Crop Damage
Franklin County	\$10,425,000	\$496,429
Henry County	\$10,320,000	\$491,429
Patrick County	\$10,320,000	\$491,429
Pittsylvania County	\$7,660,000	\$364,762
Total	\$38,725,000	\$1,844,048



Earthquake

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Unlikely No documented occurrence with annual probability <0.01	Limited 20 to 30% of people or property	Small 15 to 25% of community impacted	No Notice < 24 hours	Medium-Low	Medium-Low



Earthquake Epicenters

Total Annualized Earthquake Loss (from Hazus-MH v4.2)

Jurisdiction	Buildings	Contents	Inventory	Relocation	Income	Rental	Wages	Total Loss	Total Exposure
City of Danville	\$31,575	\$6,105	\$217	\$7,177	\$2,144	\$3,347	\$3,375	\$53,940	\$5,667,085
Franklin County	\$57,924	\$12,470	\$633	\$11,080	\$1,763	\$4,009	\$2,459	\$90,339	\$7,435,013
Town of Boones Mill	\$61	\$13	\$1	\$12	\$2	\$4	\$3	\$95	\$7,816
Town of Rocky Mount	\$558	\$120	\$6	\$107	\$17	\$39	\$24	\$871	\$71,646
Henry County	\$54,037	\$12,235	\$582	\$11,940	\$2,560	\$4,388	\$3,401	\$89,143	\$6,078,091
Town of Ridgeway	\$131	\$30	\$1	\$29	\$6	\$11	\$8	\$216	\$14,736
City of Martinsville	\$28,811	\$7,650	\$401	\$6,518	\$2,875	\$3,079	\$4,557	\$53,892	\$2,158,182
Patrick County	\$18,547	\$3,906	\$134	\$4,116	\$832	\$1,429	\$1,102	\$30,066	\$1,967,748
Town of Stuart	\$28	\$6	\$0	\$6	\$1	\$2	\$2	\$46	\$3,020
Pittsylvania County	\$43,768	\$7,675	\$200	\$10,035	\$1,597	\$3,026	\$2,155	\$68,455	\$6,162,058
Town of Chatham	\$91	\$16	\$0	\$21	\$3	\$6	\$4	\$143	\$12,859
Town of Gretna	\$50	\$9	\$0	\$12	\$2	\$3	\$2	\$79	\$7,092
Town of Hurt	\$117	\$20	\$1	\$27	\$4	\$8	\$6	\$183	\$16,435
Total	\$234,663	\$50,041	\$2,168	\$50,864	\$11,773	\$19,277	\$17,047	\$385,835	\$29,468,177

Annualized Loss

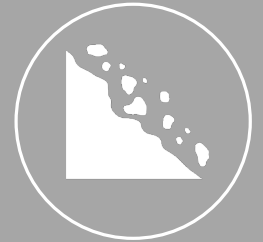
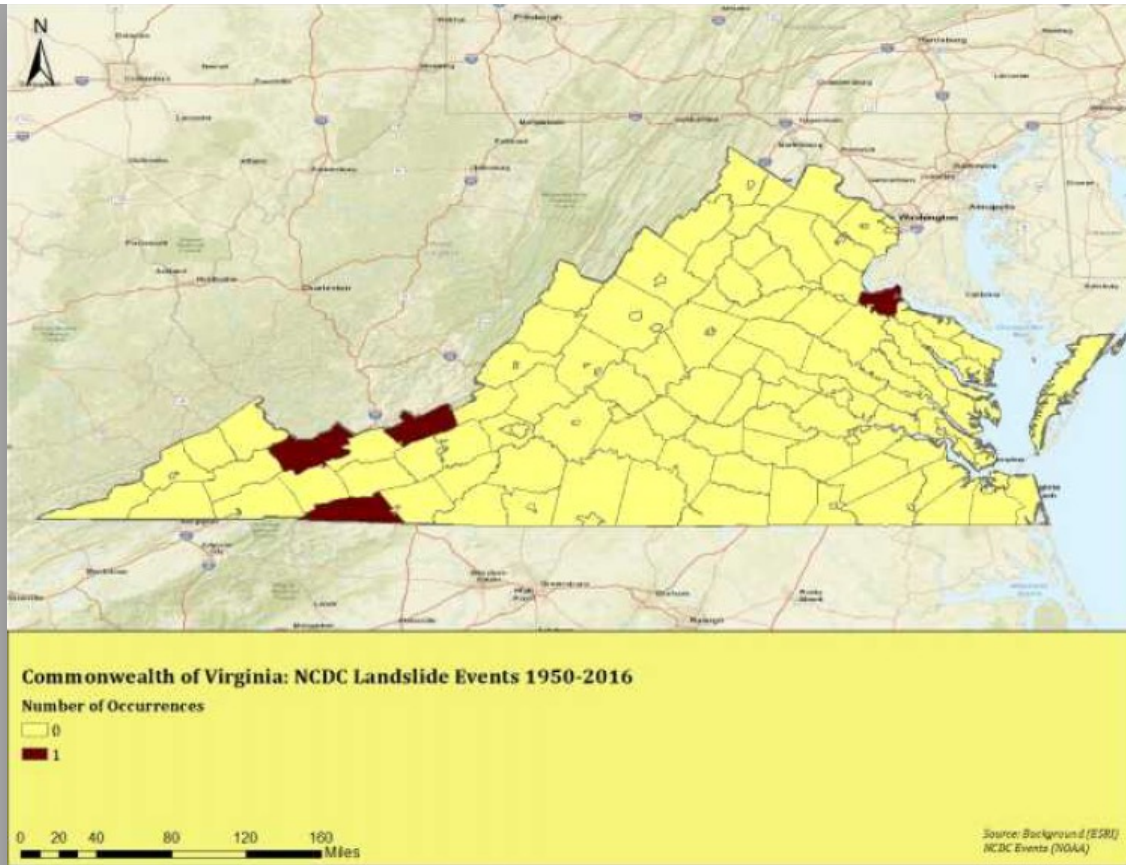


 **Dewberry**

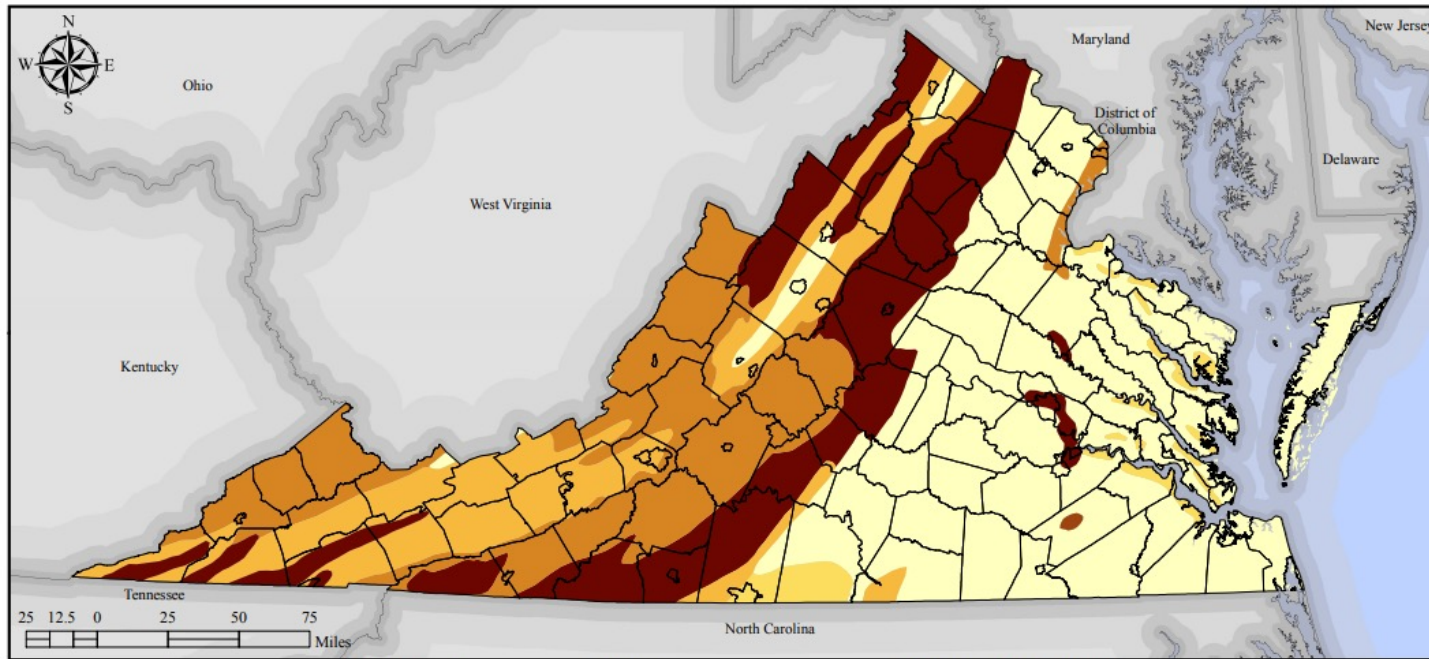


Landslide

Probability / History	Vulnerability	Maximum Threat (Geographic Area Affected)	Warning Time	2016 Ranking	2021 Ranking
Weighting Factor: 0.35	Weighting Factor: 0.25	Weighting Factor: 0.10	0.10	0.20	
Unlikely No documented occurrence with annual probability <0.01	Limited 20 to 30% of people or property	Small 15 to 25% of community impacted	No Notice < 24 hours	Low	Low



NCEI Significant Landslide Events



DATA SOURCES:

USGS NLHP
 VGIN Jurisdictional Boundaries
 ESRI State Boundaries

LEGEND:

Landslide Categories

- High Susceptibility & Moderate Incidence
- High Susceptibility & Low Incidence
- High Incidence
- Moderate Susceptibility & Low Incidence
- Moderate Incidence
- Low Incidence

HAZARD IDENTIFICATION:

The Landslide Incidence and Susceptibility map layer shows areas of landslides and areas susceptible to future landsliding. Areas where large numbers of landslides have occurred and areas which are susceptible to landsliding have been delineated in this layer.

Landslides are defined to include most types of gravitational mass movement such as rockfalls, debris flows, and the failure of engineered soil materials.

Commonwealth of Virginia Hazard Mitigation Plan 2013

PROJECTION: VA Lambert Conformal Conic
 North American Datum 1983

DISCLAIMER: Majority of available hazard data is intended to be used at national or regional scales. The purpose of the data sets are to give general indication of areas that may be susceptible to hazards. In order to identify potential risk in the Commonwealth available data has been used beyond the original intent.



Landslide Incidence and Susceptibility



Risk Analysis: Next Steps

Hazus Analysis



- Riverine flooding
- 10, 25, 50, 100 and 500-year events
- Annualized run
- Buildings (by type), contents, inventory, relocation, income, rental and wage losses
- Debris

Pluvial Flooding



- Story Map anecdotal
- Topographic based only
- Topographic with 10, or 20-year depth grids
- Approximate Ras 2D Stormwater models

Dam Inundation



- Beaver Creek Reservoir Dam – Martinsville
- Other inundation/breach layers available in GIS?
- Exposure analysis only

Human-Caused Hazards – Resource Discussion

West Piedmont's Human-Caused Hazards



**Organic /
Inorganic Spills**



**Dam
Inundation**



**Pipeline
Failure**



HVT Lines



Agriterrorism



Mitigation Goals, Objectives & Strategies

Purpose: Reduce societal, economic, and environmental exposure to hazard impacts

HIRA → Mitigation Strategies



Definitions



Goal: general guidelines that describes what planning region would like to achieve



Objective: specific and measurable actions that must be implemented to achieve the identified goals



Strategy: methods and capabilities to achieve an objective with identified responsible parties, timeframes, and potential funding sources



Goal Development



2016 Goals

- Goal 1:** To protect persons and property, and reduce future damage and losses to the community
- Goal 2:** Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards.
- Goal 3:** Protect new and existing public and private infrastructure and facilities from the effects of hazards.
- Goal 4:** Ensure continued functionality of critical services
- Goal 5:** Enhance the capabilities and capacity of local government to lessen the impacts of future disasters
- Goal 6:** Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- Goal 7:** Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population.
- Goal 8:** Increase use of existing and new technology to enhance disaster mitigation, preparedness, response and recovery
- Goal 9:** Promote regional approaches to emergency management

Categorize

Strategic Categories



Physical projects

Goal 1, Goal 2, Goal 3



Capability- and Capacity Building

Goal 1, Goal 4, Goal 5, Goal 8, Goal 9



Public Awareness and Education

Goal 6, Goal 7

Goal 1: Physical Projects



Reduce future damages, losses, and risks to the community by **protecting new and existing built infrastructure** (homes, businesses, utility infrastructure, critical facilities, and other property) from the effects of hazards.

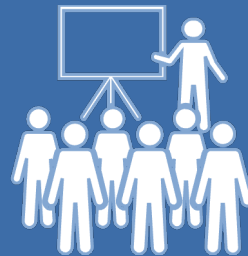
Goal 2: Capability- and Capacity-Building

Future Development



Ensure local ability to mitigate, prepare for, respond to, and recover from hazard impacts by **enhancing the capabilities and capacities of local governments** through regional partnership; the efficient use of new and existing technology; and the implementation of hazard mitigation policies, regulation and planning.

Goal 3: Public Awareness and Education



Implement **education and outreach programs and campaigns** to increase public awareness of hazard risks; promote hazard mitigation's importance to health, safety, and welfare; and enhance public engagement.

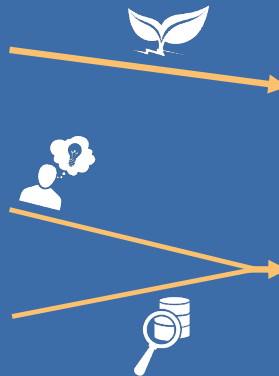
Objective Development



2016 Goal 5 + Objectives

Goal 5: Enhance the capabilities and capacity of local government to lessen the impacts of future disasters

- **Objective 5.1.** Enhance or develop plans that improve the community's ability to respond to and recover from disaster.
- **Objective 5.2.** Address training and staffing needs.
- **Objective 5.3.** Improve data used for emergency management purposes.



2021 Goal 2 + Objectives

Goal: Ensure local ability to mitigate, prepare for, respond to, and recover from hazard impacts by enhancing the capabilities and capacities of local governments through regional partnership; the efficient use of new and existing technology; and the implementation of hazard mitigation policies and planning.

- **Objective 1:** Integrate hazard mitigation principles into new and existing government planning and actions to increase the resilience of public infrastructure and services.
- **Objective 2:** Utilize mapping, drones, trainings, data, and other technological tools to improve the capability and capacity of local governments before, during, and after a hazard occurrence.

Goal 1 Objectives



Reduce future damages, losses, and risks to the community by **protecting new and existing built infrastructure** (homes, businesses, utility infrastructure, critical facilities, and other property) from the effects of hazards.

Objective 1



Implement cost-effective, **physical hazard mitigation projects** at the regional and local level to reduce the exposure and vulnerability of people and property.

Goal 2 Objectives



Ensure local ability to mitigate, prepare for, respond to, and recover from hazard impacts by **enhancing the capabilities and capacities of local governments** through regional partnership; the efficient use of new and existing technology; and the implementation of hazard mitigation policies, regulation and planning.

Objective 1



Integrate hazard mitigation principles into new and existing government **planning, policy, regulation** and **actions** to increase the resilience of public infrastructure and services and protect future development.

Objective 2



Utilize **mapping, drones, trainings, data**, and other **technological tools** to improve the capability and capacity of local governments before, during, and after a hazard occurrence.

Goal 3 Objectives



Implement **education and outreach programs and campaigns** to increase public awareness of hazard risks; promote hazard mitigation's importance to health, safety, and welfare; and enhance public engagement.

Objective 1



Develop programs that help the **public carry out actionable activities** they can implement in the near- and long-term to mitigate and prepare for hazards.

Objective 2



Implement **education and awareness campaigns** through **social media and partnerships** with local media and businesses that educate the public on what risks hazards pose to them and how they (and their community) can increase resiliency better respond to those hazards.

Mitigation Strategies



2016 Mitigation Strategy Disposition

Mitigation Strategy	2021 Status	Comments
City of Danville		
Strategy 2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).	In Progress – Keep with modifications Dewberry recommends removing	Add metrics to track progress and move past "investigating" to providing technical assistance
Strategy 5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.	In Progress – Keep / Complete?	DISCUSSION ITEM FOR MEETING #2
Strategy 5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.	Complete – Keep with modifications	IT and engineering departments have most of the capabilities. Danville is looking to increase the GIS capabilities of other departments, such as those that work on damage assessments. Training opportunities have been identified, so will modify to providing training.
Strategy 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.	In Progress – Keep with modifications	
Strategy 5.3.3. Coordinate with the state to update and digitize community Flood Insurance Rate Maps (FIRMs).	In Progress – Keep	The FIRM update process is in the discovery phase as of March 2021.
Strategy 6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and provide disaster preparedness information.	In Progress – Keep with modifications	Social media outreach, cable television channel advertisements, and informational pages on the city's website may be substituted for physical "information packets."

2016 Strategy Disposition

2021 Mitigation Strategies & Recommendations

- * Modifications were made to the 2016 strategy for the 2021 plan update
- New recommended strategy for 2021 plan update
- Added by jurisdictions during 2019 status update
- 2016 strategy that will be removed for 2021 plan update
- C Strategy completed and can be removed for jurisdiction
- Y Include this strategy for jurisdiction
- N Do not include this strategy for jurisdiction

2016 ID	Mitigation Strategy	Danville	Franklin	Henry	Martinsville	Patrick	Pittsylvania	Boones Mill	Chatham	Gretna	Hurt	Ridgeway	Stuart
1.1.1	Increase flood warning capabilities, particularly as they relate to dam failure.				Y								
1.1.1 6.1.7	Increase flood warning capabilities, particularly as they relate to dam failure. Improve signage and warning systems near dams.		Y			C							
1.1.2	Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.				C					Y	C		
1.1.3	Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.							Y			Y		
1.1.4	Investigate public warning systems for hazard occurrences.											Y	
1.1.5	Extend and improve the tornado siren warning system.				C								
1.2.1	Investigate need for regional stormwater management plan.												

- * Modifications were made to the 2016 strategy for the 2021 plan update
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2021 Strategy Recommendations

Mitigation Strategies



2016 Mitigation Strategy Disposition

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City of Danville		
Strategy 2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).	In Progress – Keep with modifications Dewberry recommends removing	Add metrics to track progress and move past "investigating" to providing technical assistance
Strategy 5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.	In Progress – Keep / Complete?	DISCUSSION ITEM FOR MEETING #2
Strategy 5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.	Complete – Keep with modifications	IT and engineering departments have most of the capabilities. Danville is looking to increase the GIS capabilities of other departments, such as those that work on damage assessments. Training opportunities have been identified, so will modify to providing training.
Strategy 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.	In Progress – Keep with modifications	
Strategy 5.3.3. Coordinate with the state to update and digitize community Flood Insurance Rate Maps (FIRMs).	In Progress – Keep	The FIRM update process is in the discovery phase as of March 2021.
Strategy 6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and provide disaster preparedness information.	In Progress – Keep with modifications	Social media outreach, cable television channel advertisements, and informational pages on the city's website may be substituted for physical "information packets."

2016 Strategy Summary

Strategies Completed	51
Strategies In Progress	102
Strategies Not Started	59
Removing for 2021 HM Plan	53
Keeping for 2021 HM Plan	159
Keeping with Modifications for 2021 HM Plan	89
Total Strategies Undertaken	212

2016 Strategy Disposition

New Strategy Discussion



- Initial feedback / input gathering
- Dewberry will make revisions after the workshop, then send it out for your review.
- We will follow up during the next workshop.

2021 Mitigation Strategies & Recommendations

* Modifications were made to the 2016 strategy for the 2021 plan update
 New recommended strategy for 2021 plan update
 Added by jurisdictions during 2019 status update
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1.11	Increase flood warning capabilities, particularly as they relate to dam failure.				Y								
1.11 6.17	Increase flood warning capabilities, particularly as they relate to dam failure. Improve signage and warning systems near dams.		Y			C							
1.12	Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.				C					Y	C		
1.13	Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.							Y			Y		
1.14	Investigate public warning systems for hazard occurrences.											Y	
1.15	Extend and improve the tornado siren warning system.				C								
1.2.1	Investigate need for regional stormwater management plan.												

* Modifications were made to the 2016 strategy for the 2021 plan update
 New recommended strategy for 2021 plan update
 Added by jurisdictions during 2019 status update
 2016 strategy that will be removed for 2021 plan update

C Strategy completed and can be removed for jurisdiction
 Y Include this strategy for jurisdiction
 N Do not include this strategy for jurisdiction

2021 Strategy Recommendations

Next Steps

- MAC to review a draft 2016 mitigation strategy disposition table – **April 2021**
- Public Engagement Meeting – **5 / 4 / 2021**
- MAC to review mitigation goals and objectives – **April 2021**
- Dewberry to deliver draft HIRA for review – **May 2021**
- Public Outreach (Online Survey) – **May 2021**
- Public Outreach (Story Map) - **May 2021**
- Dewberry will deliver draft mitigation strategies for jurisdictions to comment on and choose from – **May 2021**
- Draft complete hazard mitigation plan – **June 2021**
- Stakeholder engagement – **May – June 2021**

Questions?

