

Richmond – Crater Multi-Regional Hazard Mitigation Plan (2017 Update)

Executive Summary for County of Prince George



1. Introduction

Disasters have the potential to devastate a community’s economic, social, and environmental well-being. Hazard mitigation is the effort to reduce loss of life and property by lessening the potential impact of future disasters. Mitigation planning is a key process to break the cycle of disaster damage, reconstruction, and repeated damage.

The 26 localities of the Richmond and Crater regions of Virginia have worked together to update the *Richmond-Crater Multi-Regional Hazard Mitigation Plan* to identify vulnerabilities associated with natural disasters and develop long-term strategies to reduce or eliminate long-term risks. The effort was guided by the Hazard Mitigation Technical Advisory Committee (HMTAC) consisting of emergency management staff from each of the 26 localities (appointed by each locality’s chief administrative official).

While the full plan is an exhaustive review of hazard mitigation within the multi-regional planning area, this executive summary highlights key information specific to County of Prince George with emphasis on the results from the Hazard Identification and Risk Assessment (HIRA). Additional information on the region, analysis methodologies, and mitigation actions can be found in the full plan posted on the RRPDC website (www.richmondregional.org)

2. Hazard Mitigation Planning in County of Prince George

2.1 Demographic Characteristics

Population (2014):	36,792
Population projection (2040):	42,640
Land Area (2010):	265.16 sq. miles
Density (2014):	138.75 persons per sq. mile
Median household income (2014):	\$61,071
Percent below poverty level (2014):	10.1%
Housing units (2014):	12,136
% of housing units in multi-unit structures (2014):	12.5%
Homeownership rate (2014):	70.9%
Median value owner occupied housing unit (2014):	\$196,300
<small>Source: 2014 American Community Survey, 2010 Decennial Census, U.S. Census Bureau</small>	

2.2 About County of Prince George

During the past 50 years, Prince George County has seen growth despite annexations by the Cities of Petersburg and Hopewell. The county's residents are concentrated in the Prince George Planning District, which is the northwest portion of the county between the two cities.

Approximately 89% of the county is forested or in crop production. The Virginia Department of Forestry estimates that roughly 74% of the total land area is forested, some of which is commercially owned. The remaining 11% of land is dominated by residential development. Single-family homes comprise about 74% of the housing stock followed by manufactured homes that account for about 12%. Most of the single-family homes are found in subdivisions near the two cities. The remainder of the residential development is scattered throughout the county. Commercial development occurs primarily as strip development along major routes.

Prince George County's prosperity is intertwined with Fort Lee. In 2005, Fort Lee experienced the largest growth ever in Prince George County under the United States Congress Base Realignment and Closure (BRAC) Commission's directives to combine specific Army and Air Force training operations at Fort Lee. In the end, 1.5 billion federal tax dollars were spent to create approximately 6.5 million square feet of new space on post to include Army and Air Force headquarters, new classroom buildings, fitness and dining facilities, new military barracks, a new 1,000 room high-rise hotel and new single-family and multi-family housing units. BRAC transformed Fort Lee into a major military facility in Prince George County while other parts of the country lost both federal government revenue and jobs. The daily population on Fort Lee rose from about 32,000 to 48,000 between 2005, the start of BRAC, and the completion of the BRAC construction projects in 2011.

As in 1990, the 2005 BRAC expansion at Fort Lee provided a real boost to the Prince George economy and overall the entire region's economy. BRAC expansion in Prince George helped to sustain both the civilian contractors and the military suppliers during the recession that was brought on by the financial and residential mortgage crisis across the country. Prince George County received federal impact aid funding that assisted in the construction a new county library and assisted in the construction of a new elementary school to help educate the influx of the new military dependent students into the County school system. Federal funds were utilized to make the necessary traffic improvements in Prince George County surrounding Fort Lee such as new traffic lights, turn lanes and other road improvements, all necessary to our national defense and indirectly improving the quality of life for Prince George County residents.

2.3 Critical Facilities

A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the public; is otherwise necessary to preserve the health, welfare, and quality of life in the community; or fulfills important public safety, emergency response, and/or disaster recovery functions. In some instances, one or more critical facility

is located within the identified hazard area and is so noted. For this update, critical facilities are defined as follows:

- **Public Safety:** Police, Emergency Operations Centers, Sheriff, Fire, Correctional Facilities, and Emergency Management
- **Infrastructure:** Cell towers, fuel storage, pumping stations, water and wastewater treatment facilities, and transportation structures
- **Government Facilities:** Courthouses and judicial facilities, government offices and facilities
- **Medical Facilities:** Hospitals, nursing facilities, rehabilitation centers and outpatient centers
- **Education:** K – 12 public schools, colleges and universities, and technical schools

2.4 Identified Hazards

A solid fact base is a key component of any plan. The Hazard Identification and Risk Assessment (HIRA) serves as the fact base for the regional hazard mitigation plan and evaluates the region’s vulnerability to natural hazards so that mitigation strategies, activities, and projects can be developed to minimize hazard risks. It includes the identification of natural hazards and risks that are likely to impact the region based on historical experience, an estimate of the frequency and magnitude of potential disasters, and an assessment of potential loss to life and property. Emphasis is on hazards with a high likelihood of occurring, a significant level of impact, or both.

The information below summarizes the effects on County of Prince George of the hazards identified for the multi-regional plan area. The statistics come from a National Climatic Data Center (NCDC) database. For some hazards, no data was available.

(1) *Flooding (Moderate Threat)*

Repetitive Loss Structures:	1
Severe Repetitive Loss Structures:	1
RL/SRL Claims:	4
RL/SRL Building and Contents Payments:	\$72,822.55
Critical Facilities within Identified Floodplain Areas:	0
Annualized Flood Damages:	\$158,329
NFIP Policies:	94
NFIP Policy Coverage:	\$25,420,500
NFIP Claims Since 1978:	27
NFIP Payments Since 1978:	\$223,737

Significant Events:

- **8/27/2011:** Hurricane Irene impacted the area with heavy rainfall and gusty winds which knocked power out to millions of people in the area. It took electrical crews several days to fully restore power in the planning area. Irene originated east of the

Lesser Antilles and tracked north and northwest into the western Atlantic. The hurricane reached Category 3 intensity with maximum sustained winds of near 120 mph at its strongest point. The hurricane made an initial U.S. landfall in the eastern portions of the North Carolina Outer Banks on August 27, 2011 as a Category 1 hurricane. The storm then tracked north/northeast along the coast slowly weakening before making its final landfall in Brooklyn, New York on August 28 as a high-end tropical storm. Rainfall totals with the hurricane ranged from around two inches in western sections of the planning region to 5 to 9 inches in eastern sections closest to the coast. At its closest pass, Irene brought sustained winds of 30 to 45 mph with gusts of 60 to nearly 70 mph to the planning area. The winds downed power lines and trees throughout the area. A man was killed when a tree fell on his home near Colonial Heights.

- **9/4/2011:** Tropical Storm Lee moved inland along the Mississippi/Louisiana Gulf Coast on September 4, 2011. The remnants of the weakening storm tracked northeast, producing rainfall over a wide swath extending from the Gulf Coast to New England. Rainfall totals generally ranged from 4 to 8 inches in the planning area with the heaviest totals falling just east of Interstate 95. The rain fell on soils saturated only days earlier with Hurricane Irene's passage. The result was widespread flooding, particularly over the eastern sections of the planning region. Gusty winds in thunderstorms knocked down trees that had already been weakened from the hurricane resulting in thousands of power outages.

(2) *Wind (Limited Threat), including winds from Hurricanes and Thunderstorms*

- **Annualized wind damages including thunderstorm winds:** \$469
- **Annualized hurricane wind damages:** \$2,236,959

Significant Events:

- **8/27/2011:** Hurricane Irene – See full description in Flood section
- **9/4/2011:** Hurricane Lee – See full description in Flood section.
- **6/29/2012:** A devastating line of thunderstorms known as a derecho moved east-southeast at 60 miles per hour (mph) from Indiana in the early afternoon to the Mid-Atlantic region around midnight. Winds were commonly above 60 mph with numerous reports of winds exceeding 80 mph. Some areas reported isolated pockets of winds greater than 100 mph. Nearly every county impacted by this convective system suffered damages and power outages. To make matters worse, the area affected was in the midst of a prolonged heat wave. Unlike many major tornado outbreaks in the recent past, this event was not forecast well in advance. Warm-season derechos, in particular, are often difficult to forecast and frequently result from subtle, small-scale forcing mechanisms that are difficult to resolve more than 12-24 hours in advance.
- **10/26/2012:** Hurricane Sandy made landfall along the southern New Jersey shore on October 29, 2012, causing historic devastation and substantial loss of life. The National Hurricane Center (NHC) Tropical Cyclone Report estimated the death count from Sandy at 147 direct deaths. In the United States, the storm was associated with 72 direct deaths in eight states: 2 in Virginia. The storm also

resulted in at least 75 indirect deaths (i.e., related to unsafe or unhealthy conditions that existed during the evacuation phase, occurrence of the hurricane, or during the post-hurricane/clean-up phase). These numbers make Sandy the deadliest hurricane to hit the U.S. mainland since Hurricane Katrina in 2005, as well as the deadliest hurricane/post-tropical cyclone to hit the U.S. East Coast since Hurricane Agnes in 1972.

(3) Tornado (Significant Threat)

- **Total tornado touchdowns since 1950:** 1
- **Annualized tornado damages:** \$20,546

Significant Events:

- **5/22/2014:** The tornado was confirmed near Prince George. The storm intensified northwest of Richmond, then produced wind damage in the City of Richmond, with trained storm spotters periodically reporting a funnel cloud in the Metro as it raced southeast. At 5:45 p.m., a tornado touched down on Kurnas Lane, destroying a shed, snapping trees and causing minor damage to a home. The tornado was rated an EF-0, with winds of 70 mph. It was 25 yards wide, and was on the ground for 75 yards. No injuries were reported.

(4) Thunderstorm, including Hail and Lightning (Moderate Threat)

- **Annualized Thunderstorm Events, 1956 – 2016:** 2.74
- **Annualized Thunderstorm damages:** \$6,247

Significant Events:

- **6/29/2012:** The June 2012 Mid-Atlantic and Midwest derecho was one of the most destructive and deadly fast-moving severe thunderstorm complexes in North American history. The progressive derecho tracked across a large section of the Midwestern United States and across the central Appalachians into the mid-Atlantic states on the afternoon and evening of June 29, 2012, and into the early morning of June 30, 2012. It resulted in 20 deaths, widespread damage and millions of power outages across the study region.
- **6/13/2013:** On the morning of the 13, another linear complex of severe storms developed along a line near the southern border of Ohio. The storms eventually strengthened into a powerful derecho and raced to the south and east. Fatalities and injuries occurred as a result of falling trees and power lines as the storms ripped through Virginia, along with numerous reports of damaging winds and power outages. The derecho downed numerous trees and damaged structures winds up to 80 mph (130 km/h) in some areas.
- **5/22/2014:** A large Hail and Thunderstorm event came through the region. Some hail was reported to be as large as ping pong balls. Several areas were affected from fallen electric lines. The NCDC data reports that 12 direct deaths in the study region resulted from this event.

- **2/24/2016:** This storm started in the north eastern states and traveled down through Virginia and south. During the thunderstorm, hail in some parts of the region were as large as 3 inches in diameter.

(5) Winter Weather (Moderate Threat)

- **National Weather Service Alerts (1986-2016):** 119
- **Annualized winter weather damages:** \$9,089

Significant Events:

- **12/25/2010:** A 4- to 10-inch snowfall blanketed the region with the heaviest amounts falling over the south and eastern sections. Amounts ranged from 4 inches northwest of the City of Richmond, 6 to 7 inches in the Cities of Petersburg and Emporia, and around a foot near the Town of Wakefield.
- **2/10/2014:** This was a major ice and snow storm that affected the entire region and elsewhere in the Eastern United States. This event produced devastating amounts of freezing rain and snow along and east of Interstate 95 all the way down to the coast. Overall temperatures throughout the winter were much colder in 2014. This was rated as 3 (Major) on the NESIS scale. A Presidential Disaster event was declared in Chesterfield.
- **1/22/2016:** What transpired was reasonably close to what was forecast, with a major snowstorm for our entire region, which also included a mix of some sleet across portions of the area as well as small amounts of freezing rain. NOAA ranks Northeast U.S. storms according to overall impact, part of which is dependent on societal and economic factors, thus population density is a key component. This particular storm was ranked as a 4 (crippling) on the NESIS scale of 1-5. It is now 4th on the list of historic storms that have been ranked on the NESIS scale, with only two storms ever ranked as a 5 (extreme). Presidential Disasters for this study region were declared for Sussex and Henrico Counties.

(6) Drought (Limited Threat)

- **Annualized drought damages:** \$223,161

Significant Events:

- **November 1976 – September 1977:** The region experienced ten months of below average precipitation. The drought began in November 1976 when rainfall totaled only 50% to 75% of normal. During the rest of the winter, storms tracked across the Gulf. During the spring and summer storms tracked across the Great Lakes. These weather patterns created significant droughts throughout most of Virginia.
- **June – November 1998:** A heat wave over the Southeast produced warm and dry conditions over much of Virginia. Unusually dry conditions persisted through much

of the fall. The drought produced approximately \$38.8 million in crop damages over portions of central and south-central Virginia.

- **December 2001 – November 2004:** Beginning in the winter of 2001, the Mid-Atlantic began to show long-term drought conditions. The NWS issued reports of moisture-starved cold fronts that would continue throughout the winter. Stream levels were below normal with record lows observed at gauges for the York, James, and Roanoke River basins. By November 2002, the U.S. Secretary of Agriculture had approved 45 counties for primary disaster designation, while 36 requests remained pending.
- **2007:** Unusually dry conditions persisted through a significant portion of the year through much of southern and central Virginia. Virginia as a whole experienced its tenth driest year on record.
- **7/21/2011:** This was one of the hottest July’s in the last 75 years, breaking records for multiple. According to the NCDC data, all counties were recorded as having excessive heat waves and drought throughout the entire month.
- **7/5/2012:** Another year of record setting highs and ties throughout the states. These high were accompanied with droughts and heat waves.

(7) Mass Evacuation (Limited Threat)

- Mass evacuations from urban areas can strain a community’s resources and cause gridlock on major transportation routes, overcrowding of hospitals and shelters, and increased load on local utility infrastructures leading to potential failure.

(8) Wildfire (Limited Threat)

Annualized wildfire damages:	\$1,768
Total acres burned (1995-2008):	533.6
Total dollar damage (1995-2008):	\$22,990
Annualized number of wildfire events:	9.62
High fire risk woodland communities:	24
Number of homes in high fire risk woodland communities:	1,397
Critical facilities within high risk wildfire areas:	19

(9) Landslide/Shoreline Erosion (Limited Threat)

- The greatest landslide hazards are found in the higher elevations of western and southwestern Virginia. Analysis of the hazard here is limited by the availability of data. There is no comprehensive database documenting all landslide occurrences within the Commonwealth.

(10) Land Subsidence/Karst/Sinkholes (Limited Threat)

- According to the Virginia State Hazard Mitigation Plan, there have been no Federal Declared Disasters or NCDC recorded events for karst related events in the Commonwealth. Land subsidence is very site-specific. There is no comprehensive long-term record of past events in Virginia.

(11) Earthquake (Limited Threat)

- **Annualized earthquake losses:** \$42,008

Significant Events:

- Significant earthquakes were first recorded in Virginia in 1774. Virginia has had more than 160 earthquakes since 1977, of which 16% were felt. This averages to approximately one earthquake every month, with two felt each year. There have been four significant earthquakes centered in the region. There is quaternary faulting in the Central Virginia Seismic Zone, running through Powhatan, Goochland, Fluvanna, and Cumberland Counties. Quaternary faults and folds are believed to be sources of earthquakes greater than magnitude 6 in the past 1,600,000 years; however, the USGS reports that only liquefaction features are evidence of strong shaking and that individual faults in the Central Virginia Seismic Zone remain unidentified.
- **8/23/2011:** A 5.8 magnitude quake centered near Mineral, VA occurred at 1:51 pm EDT on August 23, 2011. The earthquake was reportedly felt as far north as Boston, as far south as Georgia and as far west as Chicago. Effects of the earthquake were reported to the USGS through its online survey from over 8,434 zip codes, and ranged from weak intensity to very strong. In terms of damage, particularly hard-hit were brick and unreinforced structures and infrastructure near the quake's epicenter. In addition to cracks and buckling, some buildings were knocked off of their foundations. Minor injuries were reported as a result of the damage and debris. The earthquake forced the North Anna Power Station nuclear power plant offline pending an all-clear from a Nuclear Regulatory Commission review. Aftershocks of a lesser magnitude continued to plague the area for several weeks after the event. The strongest aftershock measured 4.5 and occurred on August 25 at 1:08 am EDT.

2.5 2017 – 2022 Mitigation Actions identified by County of Prince George

Prince George County 2017 - 2022 Mitigation Actions							
Number	Strategy	Responsible Department	Priority	Goals Supported	Hazards Addressed	Timeframe	Resources
Prince George - 1	Continue to enforce zoning and building codes, with emphasis on floodplain management.	Building Department	High	1, 2	Flooding	Ongoing	Staff
Prince George - 2	Include an assessment and associated mapping of the municipality's vulnerability to location-specific hazards and make appropriate recommendations for the use of these hazard areas in a future comprehensive plan.	Planning Department	Medium	1, 2, 3	All	Ongoing	Staff
Prince George - 3	Support mitigation projects that will result in protection of public or private property from natural hazards. Eligible projects include but are not limited to: 1. acquisition of flood prone property 2. elevation of flood prone structures 3. minor structural flood control projects 4. relocation of structures from hazard prone areas 5. retrofitting of existing buildings, facilities and infrastructure 6. retrofitting of existing buildings and facilities for shelters 7. critical infrastructure protection measures 8. stormwater management improvements 9. advanced warning systems and hazard gauging systems (weather radios, reverse-911, stream gauges, I-flows) 10. targeted hazard education 11. wastewater and water supply system hardening and mitigation	??	??	1, 2, 4, 5, 7	All	Ongoing	FEMA grants
Prince George - 4	Evaluate existing stormwater system to determine if it is adequate for existing (or future) flood hazard.	Public Works	Medium	1, 2, 7	Flooding	Ongoing	Staff

Prince George County 2017 - 2022 Mitigation Actions							
Number	Strategy	Responsible Department	Priority	Goals Supported	Hazards Addressed	Timeframe	Resources
Prince George - 5	Target FEMA's RL properties for specialized outreach and mitigation activities.	Emergency Management	Medium	1, 2	Flooding	Ongoing	Staff
Prince George - 6	Identify means to coordinate, collect, and store damage assessment data in GIS format for each natural hazard event which causes death, injury, and/or property damage.	Emergency Management	Low	1, 5	All	Ongoing	Staff
Prince George - 7	Coordinate drought contingency plans with County Extension Office.	Emergency Management	Low	2, 3, 4	Drought	Ongoing	Staff, VEC
Prince George - 8	Distribute brochures and use other means to educate the public regarding preparedness and mitigation.	Emergency Management	Medium	1, 2,	All	Ongoing	Staff
Prince George - 9	Staff Emergency Management Office, Building Inspections Office, and/or Zoning Office at adequate levels.	County Administrator/ agency heads	Low	1, 2, 3, 5, 6, 7	All	Ongoing	County budget and Staffing plan
Prince George - 10	Request list from VDEM or VA DCR and conduct annual review of RL and SRL property list to ensure accuracy. Review will include verification of the geographic location of each RL property and determination if mitigated and by what means. Provide corrections if needed by filing form FEMA AW-501.	Emergency Management	Low	1, 2	Flooding	Ongoing	Staff
Prince George - 11	Review locality's compliance with the NFIP with an annual review of the floodplain ordinances and any	Emergency Management	Medium	1, 2	Flooding	Ongoing	Staff

Prince George County 2017 - 2022 Mitigation Actions							
Number	Strategy	Responsible Department	Priority	Goals Supported	Hazards Addressed	Timeframe	Resources
	newly permitted activities in the 100-year floodplain.						
Prince George - 12	Complete design for Fire Department burn building	Emergency Management	High	1, 2, 7	All hazards (response and recovery)	Ongoing	Capital Improvement Plan
Prince George - 13	Pursue construction of new fire station at Route 10 and Moody Road	Emergency Management	High	1, 2, 7	All hazards (response and recovery)	Ongoing	Capital Improvement Plan
Prince George - 14	Continue implementation of automatic aid agreement with Hopewell	Emergency Management	High	1, 2	All	Ongoing	County and Hopewell
Prince George - 15	Integrate mitigation plan requirements and actions into other appropriate planning mechanisms such as comprehensive plans and capital improvement plans.	Planning Department; Emergency Management	Medium	1, 2, 7	All	Ongoing	Staff

The Richmond-Crater Multi-Regional Hazard Mitigation Plan 2017 was developed by the Richmond Regional and Crater Planning District Commissions with the assistance and support of local planning, emergency management, and other local staff from the participating localities, as well as from Dewberry Consultants, LLC.

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