Chapter 4: Flood

2024 Plan Updates

Chapter 4: visual and thematic updates were included throughout the chapter, including updates to fonts, colors, and the addition of this cover page detailing updates.

Page 4-2: Section 4.1.1 Flash Flood History & Risk has been updated. Included in this section is the definition for flash flood from the NCEI, historical occurrences of flash flood events (Tables 4-1 and 4-2), and future probability of this type of event.

Page 4-7: Section 4.1.2 Flood History & Risk has been updated. Included in this section is the definition for flood from the NCEI, historical occurrences of flood events (Tables 4-3 and 4-4), and future probability of this type of event.

Page 4-14: Section 4.1.2 text has been updated to include the most recent significant (i.e., with recorded property damage) flood event that have occurred in Allegany County; the event occurred September 1, 2021, and caused $200,000 in damages. Major impacts from this event are included.

Page 4-16: Section 4.2 Flood Risk and Mapping, Table 4-5 has been modified to include current definitions for FEMA flood zones.

Page 4-17: Map 4-1 has been updated to represent the most recent flood zones for Allegany County per the DFIRM effective April 3, 2020.

Page 4-18: Section 4.3 National Flood Insurance Program has been updated to include flood insurance policy information from the most recent food insurance report. This includes Tables 4-6 (number of policies) and 4-7 (number of claims).

Page 4-18: Section 4.3.1 Repetitive Loss Properties has been updated to include the latest definitions of repetitive loss and severe repetitive loss properties. The total amount, type, and general location of repetitive loss properties in Allegany County has been updated. It is suggested that any newly identified repetitive loss properties be added to the flood buyout property list, as described in the text and in Table 4-8.

Page 4-21: The Dam Failure hazard has been added as Section 4.4 to this chapter. The section describes dam failure history, risk, vulnerability assessment, identification of impacted resources, mitigation measures, and future conditions. Identified in the section are all dam/levee locations in Allegany County per the National Inventory of Dams. Information about high hazard potential dams, including the geographic extent of failure, is included in Tables 4-7 and 4-8. Dam locations are also mapped on page 4-27.

Page 4-28: Section 4.5 County Perspective was updated to include risk ranking information from Chapter 3, as well as public survey results regarding level of concern for the flood hazard. This section has been reviewed to ensure information is up to date.

Page 4-29: Section 4.6 Municipal Perspective has been reviewed and updated to include text related to recent flood events impacting municipalities.

Page 4-30: Section 4.7 Impacts to People, Systems, and Resources has been added to this chapter to highlight the impacts flood has on people, systems such as emergency services and utilities, transportation networks, and cultural resources such as historic structures. Vulnerable populations have also been identified in this section.

Page 4-31: Section 4.8 Mitigation Capabilities has been reviewed to ensure capabilities are up to date.

Page 4-33: Added Section 4.9 Future Conditions. This section examines the impacts that climate change is projected to have on frequency and intensity of flood events. The section also incorporates findings and projections from the 3rd National Risk Assessment to demonstrate how flooding impacts are expected to change in the next thirty years in Allegany County.

CHAPTER 4 FLOOD (RIVERINE & FLASH)

4.1 Flood Hazard Profile

Flooding is the result of heavy or continuous rains exceeding the absorptive capacity of soil and the flow capacity of rivers, streams, and coastal areas. These conditions cause water to overflow their banks. The lowland-adjacent lands most subject to flooding are known as floodplains.

Floods present a serious risk to people and property. Heavy rains can result in flash floods, dumping several inches of rain in such a brief period of time that areas not usually subjected to high waters are devastated. Flash floods occur rapidly, as floodwaters rush down with little warning. Riverine flooding is slower and may occur after several days of rain before waters overflow banks and inundate an area.

Tropical systems as a hazard are not identified separately, however remnants of these systems are captured within flood hazard risk data and vulnerability. Due to Allegany County's location in the western portion of the State, the County is not vulnerable to coastal hazards in terms of storm surge and high winds, as is the case with Maryland's coastal shoreline areas, which are most vulnerable to direct impacts from coastal hazards. In fact, according to the Maryland State Hazard Mitigation Plan, Section 3.9.9 Coastal Hazard Risk Map, Allegany County is rated as the County with the lowest risk to coastal hazards of all Maryland counties. As such, coastal hazards are not profiled separately within this plan. That being said, remnants of tropical storms that impact the State of Maryland, in the form of precipitation events, have resulted in riverine and urban flooding in Allegany County and are included herein. The intensity and severity of precipitation events, from the remnants of tropical storm systems, as well as other severe storm events, is expected to increase overtime due to climate change. Planning for both current and future flood events is crucial and is a priority for Allegany County.

As part of the update process, data was gathered for Allegany County from the National Centers for Environmental Information (NCEI) specific to "flash flood" and "flood." Data for flash flood and flood events within the database starts in January 1996 and continues through to April of 2023.

4.1.1 Flash Flood History & Risk

The NCEI defines flash flooding as "a life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to shorter-term flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Flash flooding, such as

dangerous small stream or urban flooding and dam or levee failures, requires immediate action to protect life and property. Conversely, flash flooding can transition into flooding as rapidly rising waters abate."

The NCEI includes records of 49 flash flood events occurring between January 1996 and April of 2023. Since the 2018 Plan, three additional flash flood events have been recorded. In some instances, multiple recorded flash flood events occurred on the same day. For example, in 2011, ten flash flood events were recorded in the month of May. Several of which occurred on the same day. These events were recorded as ten localized events resulting in flooded roadways and some basement flooding. Most recently, six flash flood events occurred on August 2, 2018.

Table 4-1. Flash Flood Events Overview
Allegany County from January 1996 – April 2023

49 Flash Flood events		
Number of Days with Event	29	
Number of Days with Event and Death:	0	
Number of Days with Event and Injury:	0	
Number of Days with Event and Property Damage:	8	$63,215,000
Number of Days with Event and Crop Damage:	1	$25,000
Number of Event Types reported:	1	**Flash Flood**

Source: National Centers for Environmental Information (NCEI), 2023.
Legend: There are three designators: C - County/Parish; Z - Zone; and M – Marine Zone.
Based on NCEI definitions/criteria: Flash Flood (C). A life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to shorter-term flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Flash flooding, such as dangerous small stream or urban flooding and dam or levee failures, requires immediate action to protect life and property. Conversely, flash flooding can transition into flooding as rapidly rising waters abate. The Storm Data preparer uses professional judgment in determining when the event is no longer characteristic of a Flash Flood and becomes a Flood.

Table 4-2. Flood Hazard – Flash Flood Events, January 1996 to April 2023

Date	Event Narrative	Property Damage ($)
January 19 to 22, 1996	Snowmelt combined with 1 to 3 inches of rain (some locations received 5 inches) to produce, in some cases, catastrophic river flooding. The flooding was the worst in the region since 1985. Record flooding occurred on Wills Creek near Cumberland (MDZ002), damaging all dwellings in the town of Locust Grove. The largest losses were sustained just outside of Cumberland. Water line breaks occurred in LaVale (MDZ002). Three counties in central Maryland were declared under a federal state of emergency: Washington, Allegany, and Frederick.	$60,000,000
June 11, 1996	One of these storms ravaged western Allegany Co, flooding roads in and near Frostburg and Cumberland. Substantial damage was reported in Mt. Savage, where mud slides closed roads and runoff from higher terrain flooded several homes.	$50,000

Table 4-2. Flood Hazard – Flash Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
September 6, 1996	No report.	$250,000
May 7, 1999	Lightning also struck the 1st Presbyterian Church, damaging electrical equipment. Between 1.25 and 2.00 inches of rain fell across the county in less than one hour, causing water levels to rise rapidly. A co-op observer in Cumberland reported 1.15 inches of rain fell in only 10 minutes around 8:00 PM EDT. This deluge of water flooded basements and led to high water closures on several roads in Cumberland and across the county. Greene Street and Henderson Avenue were also impassable after the storm. Roads in the western end of the county required maintenance after mud and debris settled on road margins after being washed onto the roadway.	$15,000
July 31, 2000	Roads and streams were flooded. Across the western portion of Allegany County, several roads were flooded, and streams overflowed their banks after heavy downpours. Near Lonaconing, trees were downed along Route 36 at the intersection of George's Creek. A total of 1.85 inches of rain was recorded in Cumberland and over 3 inches fell in Westernport.	Not Available
August 6, 2000	Flooding resulted after a total of 3.19 inches of rain fell in Frostburg and Pinto and 2.48 inches fell in Cumberland. In Westernport, Ross Street, Riordan Road, and Lincoln Drive were damaged by rapidly moving water and 46 basements were flooded. Main street became a makeshift river and after the water subsided piles of mud debris had to be removed. Rising water threatened Westernport Elementary School. In Barton, 2 streets were damaged, and 25 basements were flooded. In Lonaconing, 14 basements were flooded. Flooded basements were reported in Frostburg and a toll bridge and Bowery Street were submerged. Flooding was also reported near the junction of the Savage River Dam and the Potomac River. Across the County, Route 135 and old Route 36 were closed by high water.	$250,000
September 11, 2000	Numerous roads, creeks, and structures were flooded. A thunderstorm with torrential rainfall became stationary over the western portion of Allegany County during the evening of the 11th. Serious flash flooding developed in less than an hour. Nearly $2 million in flood damage was reported. Hardest hit communities included Cumberland's north and west side, LaVale, communities along Goose Creek, the Haystack Mountain area, Westernport, and Barton. Across the county, three businesses and a residence were destroyed by flood waters. A total of 27 homes and businesses received major damaged and 141 other structures reported minor damage.	$2,000,000
June 7, 2001	Several roads and creeks were flooded, and some structures were damaged. An area of showers and thunderstorms with very heavy rainfall moved across western and central Maryland during the early morning hours of the 7th. The heaviest rain fell across western Allegany County where flash flooding was reported. The hardest hit area included Westernport, McCoole, and Barton.	$150,000
June 22, 2001	Flooding was reported in Rawlings and on Route 220. During the afternoon of the 22nd, numerous showers and thunderstorms developed just east of the In Allegany County, the heaviest rain fell across the southwestern portion of the county. Several basements were flooded in Rawlings and parts of Route 220 were covered in water. Heavy rainfall downed a tree onto a power line in Frostburg.	Not Available

Table 4-2. Flood Hazard – Flash Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
August 3, 2001	Several roads were closed by flooding after George's Creek and other waterways overflowed. Radar estimated that three inches of rain fell along Dans Mountain near the border of Grant County. This caused George's Creek to overflow its banks and flood Old Route 936 between Midland and Shaft.	Not Available
May 27, 2002	Interstate 68 was closed by flooding and an apartment building was evacuated after Elk Lick Run overflowed. In Allegany County, significant flooding occurred just east of Cumberland along the west slope of Martin Mountain after Elk Lick Run overflowed its banks. Flood waters damaged property in a 2.5 mile area along Baltimore Pike (Route 144) from Rocky Gap Road to Hinkle Road near Interstate 68. An apartment complex on Baltimore Pike was surrounded by flood water. Twenty people had to be evacuated and were eventually displaced after 12 rental units sustained major flood damage. Twenty homes nearby were significantly damaged by flooding, including one which was moved off its foundation by the rushing water. Up to 15 private driveway bridges across Elk Lick Run were damaged and a parking lot was washed away. Three feet of creek water spilled onto Interstate 68 which forced officials to shut down the road for over an hour. Four to five inches of rain was believed to have fallen in this area in only 2 hours.	$500,000
May 29, 2002	Roads and basements were flooded. A thunderstorm with very heavy rainfall moved through the northern portion of Allegany County between 6 and 8 AM. Flood waters closed Korrigum and Cash Valley roads and Route 35. Several other side streets were also flooded. Over 30 homes reported flooded basements.	Not Available
September 27, 2003	Route 220 was closed by flooding from near Cumberland to Bedford. Streams were out of their banks in LaVale, and 30 basements were flooded across the county. Rainfall totals included 2.50 inches in Mt. Savage, 2.10 inches in Frostburg, and an unofficial reading of up to 4 inches in LaVale.	Not Available
November 19, 2003	A few roads closed due to high water. Widespread power outages were reported due to downed trees and power lines. The heavy rainfall led to flash flooding across the Potomac Highlands and Northeast and Central Maryland.	Not Available
June 25, 2004	Water covering three roads in the county.	Not Available
September 8, 2004	Allegany and Washington Counties were especially hard hit according to emergency personnel. 7 inches of rain fell in the western Panhandle of Maryland. In Allegany County Georges Creek rose out of its bank between Frostburg and Westernport. Route 135 was closed for buckling due to high water. Several bridges were under water and around 20 basements were flooded.	Not Available
September 17 to 18, 2004	The remnants of Hurricane Ivan affected the Mid-Atlantic Region on the 17th and 18th. Washington and Allegany Counties once again bore the brunt of the flooding as small streams and creeks rose out of their banks.	Not Available
March 28 to 29, 2005	A fairly significant severe weather event occurred on March 28. This was due to a strong low pressure system that moved west of the area leaving Maryland with abundant moisture and an unstable air mass.	Not Available
May 28, 2010	Roads were closed due to flash flooding around Mount Savage and Frostburg	Not Available

Table 4-2. Flood Hazard – Flash Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
December 1, 2010	Several basements were flooded in Cumberland. A rain gauge nearby recorded 2.39 inches.	Not Available
May 17, 2011	Flash flooding was occurring over Dickerson Hollow Road and Murleys Branch Road. A nearby spotter measured 1.15 inches of rain. Baltimore Pike Fire Hall was experiencing flash flooding on its site. A nearby spotter measured 3.5 inches of rain.	$0
May 18, 2011	Numerous roads were closed, and basements and yards were flooded in LaVale and Mount Savage.	$0
May 27, 2011	• Lexington Avenue was closed due to flash flooding. • At least six inches of water was flowing down Louisiana Avenue in Cumberland. A rain gage near the event measured a total of 1.75 inches. • At least 4 flooded basements in the area. Spotter reported 1 inch of rain in about 10 minutes. • Car stranded in water on Virginia Avenue. A nearby spotter observed 1.18 inches of rain in 30 minutes leading up to the event. • Water was over the roadways of Industrial Blvd and Maryland Ave. • Water was deep and swift enough to wash the payment off Williams Street between the 100 and 700 blocks.	$0
September 11, 2013	There were water rescues ongoing on highway 40 near Shaw Street.	$0
June 12, 2014	There was street flooding on Winchester Road, Warrior Drive and Route 220. There was water as high as the wind shields of cars.	$0
June 12, 2014	There were multiple water rescues ongoing in the southern portion of Cresaptown near Route 220. Route 220 was closed at Potomac Park and between I-68 and Highway 636 due to high water.	$0
2023 Plan Update		
August 2, 2018	A southerly flow pumped in plenty of moisture from the Atlantic while a slow moving cold front approached from the west. Copious amounts of moisture ahead of the boundary led to showers and thunderstorms. Torrential downpours combined with convection training over the same areas led to some flooding and flash flooding. Some of the flooding lingered into August 3rd. • The stream gauge on Georges Creek near Westernport quickly rose above the flood stage of 8 feet, cresting at 8.65 feet. Water reached the underside of the railroad bridge at downtown Westernport. • Numerous roads were blocked by high water in Westernport. Some roads were washed out. • A mudslide was reported along MD-36 near Barton. • Buskirk Hollow Road Southwest was washed out near Elklick Road. • Water and debris were reported over the road in multiple spots in the Bowling Green and Potomac Park areas, with a rockslide reported in one location. • Ten inches of water was into a house on McKinley Street.	$0

Table 4-2. Flood Hazard – Flash Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
September 1, 2021	The remnants of Ida produced widespread flooding along with instances of flash flooding across the area. Tropical moisture infiltrated the area and there were moderate amounts of instability as well. This combined with the lift provided from the remnants of Ida led to heavy rainfall during this time. Rainfall amounts averaged around 1-3 near and east of Interstate 95, with amounts around 4 to 8 inches across portions of northern and central Maryland. Excess runoff from the heavy rainfall led to river flooding as well. • There were five reports of roads closed in western Allegany County, mainly near Georges Creek and Mount Savage. One swift water rescue occurred due to an individual stuck in flood waters.	$0
August 4, 2022	Numerous showers and thunderstorms developed during the afternoon and evening of the 4th. Slow storm movement led to some instances of flooding and flash flooding. • Bald Knob Road was reported near Blank Road. • Barrelville Road was reported to be flooded near Mount Savage Road.	$0
Source: National Centers for Environmental Information (NCEI), 2023.		

In terms of the number of occurrences, the NCEI listed a total of 49 flash flood events occurring in the County between 1996 and 2023. Therefore, Allegany County experiences 1.81 flash flood events per year.

4.1.2 Flood History & Risk

In addition to flash floods, the NCEI includes a "flood" category, which is defined as "any high flow, overflow, or inundation by water which causes damage. In general, this would mean the inundation of a normally dry area caused by an increased water level in an established watercourse, or ponding of water, that poses a threat to life or property."

As part of the update, data from the NCEI yielded a total of 36 "flood" events from January 1996 to April 2023. As is the case for flash flood events, there are instances where multiple flood events occurred on the same date. These are included in the event narratives in Table 4-4, but only one record (i.e., table row) is included for each date.

Table 4-3. Flood Events Overview Allegany County from January 1996 to April 2023		
36 Flood events		
Number of Days with Event and Death:	0	
Number of Days with Event and Injury:	0	
Number of Days with Event and Property Damage:	6	$536,000

Table 4-3. Flood Events Overview Allegany County from January 1996 to April 2023		
Number of Days with Event and Crop Damage:	0	$0
Number of Event Types reported:	1	**Flood**

Source: National Centers for Environmental Information (NCEI), 2023.
Legend: There are three designators: C - County/Parish; Z - Zone; and M – Marine Zone.
Based on NCEI definitions/criteria: Flood (C). Any high flow, overflow, or inundation by water which causes damage. In general, this would mean the inundation of a normally dry area caused by an increased water level in an established watercourse, or ponding of water, that poses a threat to life or property. If the event is considered significant, it should be entered into Storm Data, even if it only affected a small area. Refer to the Flash Flood event (Section 14) for guidelines for differentiating between Flood and Flash Flood events.

Table 4-4. Flood Events, January 1996 to April 2023

Date	Event Narrative	Property Damage ($)
November 7, 1997	Rainfall averaging 2 to 4 inches, with localized totals between 4 and 6 inches at higher elevations, caused minor flooding of creeks and small streams. Dozens of secondary roads were closed in the area, most due to swollen creeks but a few others from high standing water. Rain tapered off during the early evening in Allegany Co.	Not Available
May 4, 1998	1 1/2 and 2 inches of rain in less than 3 hours onto saturated ground. In Midland, Neff's Run flooded, causing damage to the flood wall and washing away several gabion baskets. Damage to the baskets was estimated at $100 thousand. A section of state route 936 was closed, and a few trees were knocked down by the swollen creek. Elsewhere, road and basement flooding was noted in Frostburg, McCoole, and Lonaconing.	$100,000
January 1, 2003	In Allegany County, high water caused basement flooding and a handful of mud slides and rock slides. In Cumberland, a total of 1.30 inches of rain was recorded.	Not Available
May 16 to 17, 2003	The system dropped between 2 and 4 inches of rain across western and central Maryland which caused several low lying areas to flood. In Allegany County, twenty sewage pumping stations overflowed after being inundated by water. Residents in 3 communities had to boil their water for a few days following the flood.	Not Available
September 19 to 23, 2003	On September 18, 2003, remnants of Hurricane Isabel caused wind gusts of 50 to 60 mph. Allegany County was on the fringe of the storm. Higher terrain saw the most wind. Two to four inches of rain fell across central and western Maryland. This was not enough to cause flash flooding but when added to previous rains; it was enough to bring the Potomac River out of its banks. Route 135 was closed due to river flooding in Luke. Officially, the river crested in Luke 1.7 feet below flood stage. Cumberland and Hancock crested just 4 feet below flood stage.	$130,000
April 13, 2004	Heavy rainfall on the 12th and 13th led to rises on area streams and rivers. The one to two inches of rain produced nuisance flooding in the Oldtown area. A privately owned low water bridge was affected.	Not Available
September 8, 2004	The remnants of Hurricane Frances produced damaging winds, tornadoes and flooding in the Mid-Atlantic Region on the 8th. Allegany and Washington Counties were especially hard hit according to emergency personnel. 7 inches of rain fell in the western Panhandle of Maryland. In Allegany County Georges	$100,000

Table 4-4. Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
	Creek rose out of its bank between Frostburg and Westernport. Route 135 was closed for buckling due to high water. Several bridges were under water and around 20 basements were flooded. Students were held in schools for an extra 1 « hours due to inclement weather on the 8th and some schools were closed on the 9th.	
July 13, 2005	Several streets were closed, and basements were flooded in Cumberland, Maryland. Roads were closed at Greene Street and Virginia Avenue due to high water. The storm total rainfall was measured at 3.0 inches by a trained storm spotter.	Not Available
April 22, 2006	Flooding occurred along the banks of the C and O Canal. There were several reports of flooding and flash flooding due to the heavy rainfall across portions of the region.	Not Available
April 15, 2007	A Trained Spotter reported flooding of Town Creek in Flintstone, MD.	Not Available
June 13, 2007	Greene Street and Kelly Road were both closed for more than an hour when they flooded at the railroad trestles. A car was stuck in high water in the Virginia Ave. subway at Industrial Blvd. Numerous reports of flooded basements were also received by Emergency Officials.	$1,000
March 4, 2008	A trained spotter reported Route 144 (National Pike) covered with water. There were also 5 flooded basements.	$5,000
May 4, 2009	Observed rainfall amounts of 2 to 3 inches caused streams and tributaries to flow out of their banks. In Bowling Green, 12 basements were flooded.	Not Available
March 13, 2010	Route 36 was flooded in several locations by Jennings Run, particularly along Parkersburg Road. Rain gauge in the area observed 1.12 inches of precipitation.	Not Available
April 19, 2011	Basements were flooded due to heavy rain.	0
June 2, 2016	Many streets including Spruce Street, Walnut Street, Rock Street and Stony Run Road were all closed due to flooding.	0
June 3, 2016	Winchester Road was closed due to flooding between the town of LaVale and Cresaptown.	0
2023 Plan Update		
May 27, 2018	A cold front sagged into Maryland during the afternoon of May 27th. Heavy rain trained to the northeast of Baltimore early in the afternoon, causing flash flooding. Then, later in the afternoon, the line completely stalled just west of Baltimore, producing 6-12 inches of rain in a very short period of time. Catastrophic flash flooding occurred in the Ellicott City and Catonsville areas, with significant flooding also observed in other nearby areas. Stream flooding continued through the next morning. Flooding of unknown depth was reported on Bedford Street in Cumberland.	$0
July 24, 2018	Following the passage of a coastal low, bands of moisture continued to pull northward across the same areas that had already experienced heavy rain. Heavy rainfall fell in some areas, especially in Baltimore and Carroll Counties, with widespread flooding and flash flooding throughout the period. Over half a dozen roads reported flooded and closed in Cumberland.	$0

Table 4-4. Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
July 31, 2018	Isolated heavy rain occurred in Allegany County, Maryland during the evening of July 31st. Over three inches was reported, with a couple isolated instances of flooding. • Bear Hill Road flooded and closed due to heavy rain. • Portions of Town Creek Road were flooded and closed.	$0
August 1, 2018	A southerly flow pumped in plenty of moisture from the Atlantic while a slow moving cold front approached from the west. Copious amounts of moisture ahead of the boundary led to showers and thunderstorms. An isolated incident of flooding occurred due to locally heavy rainfall. The USGS stream gage on Sideling Hill Creek near Bellegrove exceeded the 7.5 foot flood stage during the indicated period. The peak level of 7.88 feet occurred at 1:45am EST. Agricultural flooding occurred, along with water approaching Allegany Line Road.	$0
August 2, 2018	A southerly flow pumped in plenty of moisture from the Atlantic while a slow moving cold front approached from the west. Copious amounts of moisture ahead of the boundary led to showers and thunderstorms. Torrential downpours combined with convection training over the same areas led to some flooding and flash flooding. Some of the flooding lingered into August 3rd. • MD-36 Mount Savage Road Northwest was closed due to flooding over Jennings Run near MD-638 Parkersburg Road Northwest. • Hardwood Drive Southwest was closed due to flooding over Preston Run.	$0
September 6, 2018	An isolated flooding incident occurred from locally heavy rainfall. US-220 McMullen Highway southwest was blocked by high water and debris.	$0
September 9, 2018	Low pressure tracked to the west while a nearly stationary boundary was to the south. Warm and moist tropical air overran the surface cooler air in place, resulting in a moderate to heavy rainfall. Excess runoff from the rainfall led to flooding. One and a half to three inches of rain fell across northern Maryland late on the 8th into the 9th, followed by another one to three inches on the 9th into the 10th. This combination produced fairly widespread flooding, including of the mainstem rivers, which continued through the 11th and into the 12th. • MD-36 Mount Savage Road northwest was closed due to flooding near MD-638. • The river level surpassed flood stage at Georges Creek at Westernport, cresting at 8.83 feet on September 9th at 3:45 PM EST. Water reached the underside of the railroad bridge at downtown Westernport. • The USGS stream gage on Wills Creek near Cumberland exceeded the 10 foot flood stage during the indicated period. This caused a flood of a car wash at Motor City, with water in parking lots in the same area. The peak level of 11.57 feet was observed at 4:45pm EST on the 9th. • The Oldtown Toll Bridge was closed due to high water.	$0
September 10, 2018	Country Club Road was closed near Christie Road due to flooding.	$0

Table 4-4. Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
September 27, 2018	Showers and thunderstorms associated with a cold front produced locally heavy rainfall in Frederick County on the 26th. Runoff from this heavy rain moved into larger rivers, causing flooding on a portion of the Potomac into the 27th. The river level surpassed flood stage at Georges Creek at Westernport, cresting at 8.09 feet on September 27th at 10:00 PM EST. Water reached the underside of the railroad bridge at downtown Westernport.	$0
September 28, 2018	A warm front moved through the area during the morning hours of the 28th. Warm and moist air associated with a tropical air mass overran the relatively cooler air in place, resulting in heavy rainfall. Also, the steering flow aloft was weak so showers and thunderstorms were slow to move. This enhanced the flooding threat. The resulting flooding moved into larger streams and rivers and continued through the 30th. The river level surpassed the flood stage of 25 feet at Paw Paw along the Potomac River. The river level crested at 25.90 feet at 6:15 PM EST September 28th. ||A parking area adjacent to the highway bridge was flooded. The roadway to the C&O Canal parking area flooded, as did the lowest end of the Purslane Run hiker/biker area.	$0
December 16, 2018	A potent upper-level low and associated area of surface low pressure approached the region from southwest on the 15th. Strong forcing for ascent and ample moisture transport in advance of the upper-level low led to a prolonged period of rain across the region. Eventually low pressure transferred to the coast before precipitation wound down on the 16th. Widespread rainfall totals of 2-4 inches were observed across the area. The river gage on the Potomac River at Paw Paw exceeded the 25 foot flood stage during the indicated period. The roadway to the C&O Canal parking area flooded, as did the lowest end of the Purslane Run hiker/biker area, and a parking area adjacent to the highway bridge. The peak level of 25.33 feet occurred at 1:00 PM.	$0
August 12, 2020	Showers and thunderstorms developed, and with little steering flow aloft this caused the storm motion to be slow. The slow storm motion resulted in instances of flooding and flash flooding. About a foot of flowing water over the intersection at E Oldtown Rd. and Blackston Ave.	$0
June 3, 2021	Showers and thunderstorms developed, and due to higher amounts of instability and moisture, heavy rain led to instances of flooding and flash flooding in northeastern Maryland. North Main Street was closed due to flooding in Port Deposit.	$0
August 28, 2021	Several rounds of showers and thunderstorms developed ahead of an approaching cold front on August 27th-28th, primarily during the afternoon/evening hours each day. Heavy rainfall occurred with these storms which lead to several instances of flooding across the area. • Calla Hill Rd. closed due to flooding.	$0

Table 4-4. Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
	• Several roads in and around Frostburg closed due to flooding.	
September 1, 2021	The remnants of Ida produced widespread flooding along with instances of flash flooding across the area. Tropical moisture infiltrated the area and there were moderate amounts of instability as well. This combined with the lift provided by the remnants of Ida led to heavy rainfall during this time. Rainfall amounts averaged around 1-3 near and east of Interstate 95, with amounts around 4 to 8 inches across portions of northern and central Maryland. Excess runoff from the heavy rainfall led to river flooding as well. • Several roads closed due to high water. • Several roads closed due to flooding. • Several roads closed in and near Mount Savage due to high water. • MD 36 closed at Jennings Run due to flooding. • The water level along Georges Creek at Westernport rose above flood stage, cresting 9.41 feet at 1:45 PM EST on the 1st of September. Water overflowed out of Georges Creek into low-lying areas in the town of Westernport. • The water level along the Wills Creek in Cumberland rose above major flood stage, cresting at 14.10 feet at 7:15 PM on the first of September. Several businesses at Motor City and outside the levee protection north of Cumberland were flooded along with at least a couple homes in Locust Grove. Water approached low spots on Route 36, possibly affecting one lane. • Wills Creek out of banks and flowing onto nearby roads between La Vale and Corriganville. • Part of the wall of the foundation of a home on Crocus Avenue collapsed due to flooding. • Lower portion of Ellerslie evacuated due to rising waters and numerous water rescues on Wills Creek. • The water level along the Sideling Hill Creek at Bellegrove rose above flood stage, cresting at 9.17 feet at 11:30 PM EST on the 1st of September. Lowlands near the creek were flooded and a low spot on Allegany Line Road was also flooded. • The water rose above flood stage along the North Branch Potomac River at Cumberland, cresting at 18.34 feet at 9:45 PM EST on the 1st of September. A low spot on Airport Road in Wiley Ford, West Virginia was flooded. A livestock field southeast of the Cumberland Regional Airport also flooded.	$200,000
September 2, 2021	The water level along the Town Creek in Oldtown rose above flood stage of 14 feet, cresting at 15.11 feet on the 2nd of September at 2:30 AM EST. Water overflowed thee banks just downstream of the Pack Horse Road bridge.	$0
September 23, 2021	A slow moving cold front approached the area on the 22nd before passing through on the 23rd. A deep southerly flow allowed tropical moisture to move into the area ahead of the boundary. This led to heavy rainfall as the cold front approached, and several instances of flooding along with isolated instances of flash flooding occurred.	$0

Table 4-4. Flood Events, January 1996 to April 2023		
Date	**Event Narrative**	**Property Damage ($)**
	New Bridge Road closed at Horseshoe Road due to Octoraro Creek flowing onto the intersection/bridge.	
May 6, 2022	A line of thunderstorms crossing a warm front caused several instances of flooding across MD from May 6th into May 7th. Residual river flooding continued through May 9th due to excessive runoff. Several roads were submerged in flood waters in the Jennings area, especially along Jennings Rd. and Millers Rd.	$0
May 7, 2022	The stream gage on Sideling Hill Creek near Bellegrove reached flood stage during the specified timeframe, reaching a peak crest of 8.02 ft at 3:45 PM EST on May 7th. At this level lowlands near the creek begin to flood. Also, a low spot on Allegany Line Road is likely also flooded.	$0
Source: National Centers for Environmental Information (NCEI), 2023.		

In terms of the number of occurrences, the NCEI listed a total of 36 flood events occurring in the County between January 1996 and April 2023. Therefore, Allegany County experiences 1.33 flood events per year. Combining flash flood and flood, the County and its municipalities can expect to experience about three flood events per year.

Significant flood (including flash flood) events occurring in Allegany County include the following:

In 1996, Allegany County was drastically affected by two disastrous flood events that occurred in the months of January and September. These two events, one in January from snow melt accompanied by heavy rain and the other in September from rainfall associated with the passage of Hurricane Fran. The two basins hit hardest by the 1996 floods were the Georges Creek and Wills Creek basins, both of which had numerous stretches where urban development encroached not only on the floodplain but also in the stream channel. In the Georges Creek Basin, much of the floodplain and floodway area was occupied by homes dating from the late 1800's to the early 1900's. In the Jennings Run/Wills Creek Basin, a combination of older residential and modern commercial development was scattered along the floodplain of both streams.

Flood depths recorded in the Wills Creek Basin and along Georges Creek were in excess of the percent-annual-chance flood level. Stream velocity recorded on both Wills Creek and Georges Creek at the U.S.G.S. gauging stations were in excess of 10 ft/second, indicative of the steep slopes of the stream channels. Excessive flood depths and stream velocities pose an even greater threat to life, property and utility systems than water levels alone would dictate.

Figure 4-1: January 1996 Flood Event. Swift waters caused substantial amounts of damage to structures within the Town of Midland (photo).

Photo Source: Allegany County Department of Emergency Services

In the aftermath of the two flood events, damage assessment teams noted that several hundred homes had been affected to some extent and dozens of businesses had suffered flood damage. Public facilities, including roads, water and sewer lines, pump stations and public buildings had suffered damage resulting in more than $19 million in public expenditures just to restore these facilities to a pre-flood condition.

Another significant flood event occurred when Hurricane Frances swept through Allegany County in mid-September 2004. A week later Hurricane Ivan followed causing an already swollen Jennings Run to breach its stream banks. Flowing water coursed around houses, into basements and through backyards along Mount Savage Road. As a result, Allegany County identified six homes as part of the potential acquisition projects. Several additional flash and riverine flood events have occurred within Allegany County including a riverine flood event on May 4, 2009, which caused flooding in the Potomac Park community. Twelve residential structures experienced basement flooding. In March 2010, Jennings Run overflowed its banks causing several sections of Route 36 to flood as well as Parkersburg Road. Also, a flash flood event in May 2010, caused road closures in the Mount Savage area.

On June 12, 2014, a flash flood event occurred, causing significant damage to several areas throughout the County. According to the Cumberland Times-News, some areas in the county reported up to five inches of rain and the worst flood damage occurring in Cresaptown and at Cumberland's Greene Street underpass. Several schools, churches, Rocky Gap State Park, a volunteer fire department, along with many roads and bridges required repair. Among the most serious damages in the County were those to the Cresaptown Volunteer Fire Department and Calvary Baptist Church and Calvary Christian Academy. Additionally,

approximately 175 residents were impacted, and several homes were deemed uninhabitable. Allegany County reported $1.7 million dollars in flood damage.

Figure 4-2: June 12, 2014, Flood Event

Route 220 in Cresaptown. Calvary Baptist Church can be seen on right side of picture. Calvary Christian Academy is located behind the church.

Photo Source: Washington Post

A total of 19 flood events occurred during the most recent five-year planning cycle (2018 to present). The event with the most recorded property damage during this timeframe occurred on September 1, 2021. The flooding was caused by remnants of Hurricane Ida and damage was estimated to be $200,000 in Allegany County. Impacts included the following:

- Several roads closed due to flooding/high water near Mount Savage and MD 36 near Jennings Run.
- Water overflowed out of Georges Creek into low-lying areas in the Town of Westernport.
- The water level along the Wills Creek in Cumberland rose above major flood stage. Several businesses at Motor City and outside the levee protection north of Cumberland were flooded along with a couple homes in Locust Grove.
- Wills Creek overflowed its banks onto nearby roads between LaVale and Corriganville.
- Part of a residential foundation on Crocus Avenue collapsed due to flooding.
- Lower portion of Ellerslie evacuated due to rising waters and numerous water rescues occurred on Wills Creek.
- The water level along the Sideling Hill Creek at Bellegrove rose above flood stage. Lowlands near the creek were flooded and a low spot on Allegany Line Road was also flooded.
- The water rose above flood stage along the North Branch Potomac River at Cumberland. A low spot on Airport Road in Wiley Ford, West Virginia was flooded. A livestock field southeast of the Cumberland Regional Airport also flooded.

4.2 Flood Risk and Mapping

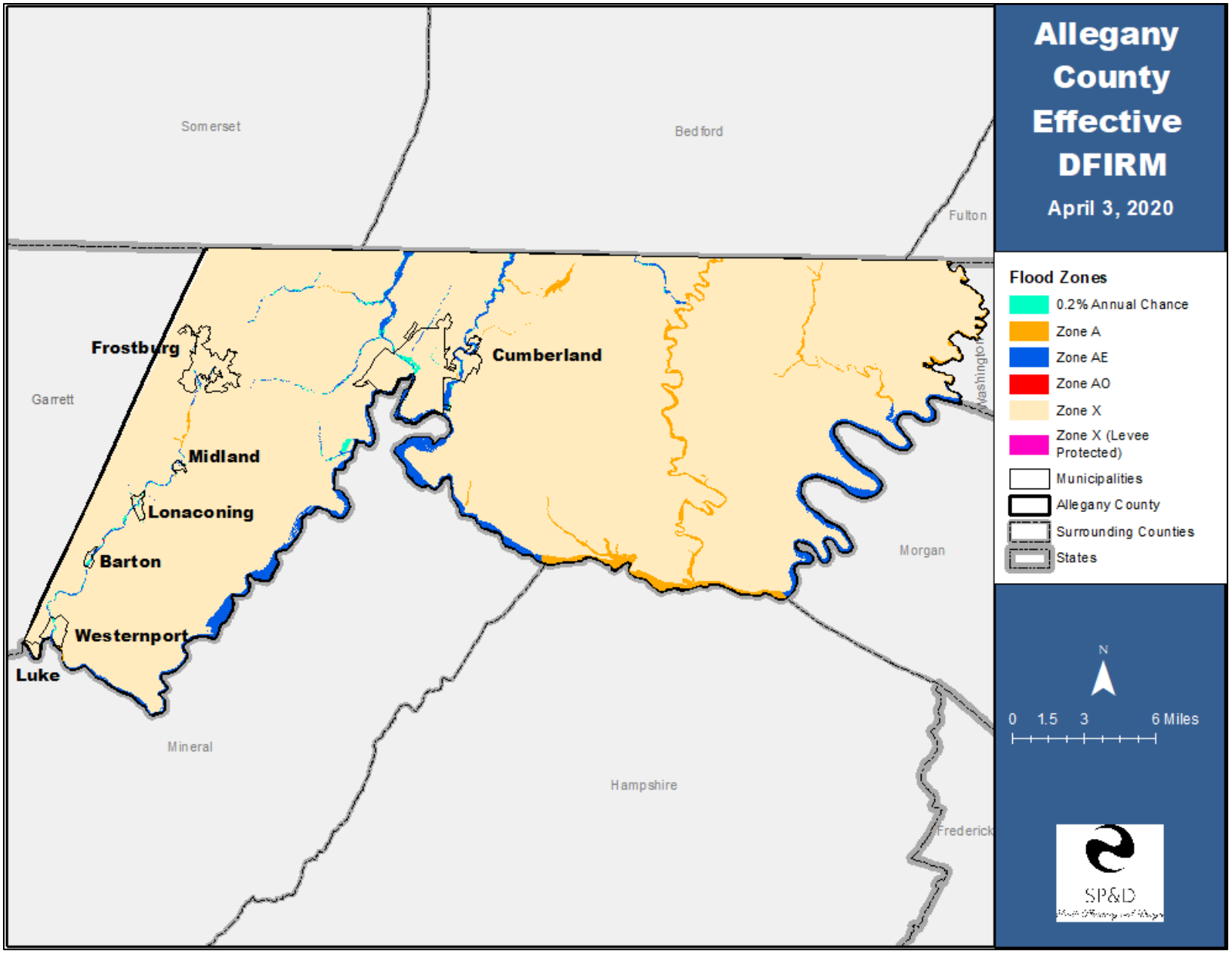
Allegany County is highly susceptible to riverine and flash flooding – a Digital Flood Insurance Rate Map (DFIRM) is utilized to help depict this flood risk. The DFIRM is the basis for floodplain management, mitigation, and flood insurance activities conducted by the National Flood Insurance Program (NFIP). The DFIRM categorizes floodplains into Flood Zones (A, AE, VE, X and X500), which are geographic areas that FEMA has defined according to the various levels of flood risk. These flood zones are described on table 4-5 below.

Table 4-5. FEMA Flood Zones

Flood Zone		Description
High Risk Areas		
1 Percent-Annual-Chance Flood Hazard Area	A	Areas with a 1 percent-annual-chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
	AE	The base floodplain where base flood elevations are provided for a 1 percent-annual-chance flood event. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
	AO	Areas subject to inundation by 1 percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.
Moderate Risk Area		
X (Shaded) 0.2% or 500-yr.		Moderate flood area(s), shaded area(s) shown on FIRM, are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.
Low Risk Area		
X (Un-shaded)		The areas of minimal flood hazard, which are areas outside the SFHA and higher than the elevation of the 0.2 percent-annual-chance flood, are labeled Zone X (un-shaded).

Source: FEMA - https://snmapmod.snco.us/fmm/document/fema-flood-zone-definitions.pdf

New FEMA flood maps became effective on April 3, 2020, for Allegany County. Residents are encouraged to examine the maps online at https://msc.fema.gov/portal/home, to determine if their property is in a low to moderate, or high-risk flood zone. Major changes to the new maps include updated photographic base maps that improve the accuracy of floodplain determinations compared to the prior vector street map, and compatibility with GIS. The improvements in spatial accuracy provided by the new base map, and the availability of electronic floodplain information greatly enhance the ability to use the maps for planning, permitting, and insurance applications.



Map 4-1. Effective DFIRM, Allegany County, MD. Source: FEMA.

4.3 National Flood Insurance Program

The National Flood Insurance Program (NFIP) is managed by FEMA and is delivered to the public by a network of more than fifty insurance companies and NFIP Direct. The NFIP provides flood insurance to property owners, renters and businesses – having this coverage helps them recover faster after a flood event. Flood insurance is available to anyone living in one of the almost 23,000 participating NFIP communities. Homes and businesses in high-risk flood areas with mortgages from government-backed lenders are required to have flood insurance.

A total of 104 flood insurance policies are active within Allegany County as of August 2023. These active policies have a total annual premium value of $123,039. On average, property owners with a flood insurance policy pay $1,183 per year, or $98 a month. The County's participation in the program is voluntary, however compliance is mandatory. More information regarding Allegany County's strategies for complying with the NFIP and current capabilities can be found in *Appendix C*.

The NFIP report also shows that as of August 2023, a total of 226 claims have been paid since 1979. Of the 226 total claims, 151 resulted in payments totaling $2,248,176.28. This represents an average of $14,888.58 per claim. The remaining 75 claims were closed without payment.

4.3.1 Repetitive Loss Properties

Considering the number of flood insurance policies and the amount of claims that have been reported, identifying areas of repetitive loss within a community is a good indicator in determining areas of high flood damage vulnerability. While flood damage is not necessarily limited to these areas, repetitive loss data provides location indicators for areas where structures are experiencing recurring and costly flooding damage.

The FEMA NFIP defines a **repetitive loss property** as:

- Properties are those for which two or more losses of at least $1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978."

The FEMA NFIP defines **severe repetitive loss properties** as:

- A property that has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or,
- A property for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims

exceeding the market value of the building.

The 2023 Hazard Mitigation Assistance Program and Policy Guide (page 304) defines repetitive loss and severe repetitive loss properties differently, and these definitions are as follows:

A **repetitive loss property** is a structure covered by a contract for flood insurance made available under the NFIP that:

a) Has incurred flood-related damage on 2 occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event and
b) At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

A **severe repetitive loss property** is a structure that:

a) Is covered under a contract for flood insurance made available under the NFIP
b) Has incurred flood related damage –
    i. For which 4 or more separate claims payments (includes building and contents) have been made under flood insurance coverage with the amount of each such claim exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000 or
    ii. For which at least 2 separate claims payments (includes only building) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

As part of Allegany County's Flood Insurance program, FEMA maintains a record of properties having repetitive flood insurance claims. During the previous planning cycle, twenty-one repetitive loss properties were identified in the County.

Based on the FEMA NFIP and FMA definitions for repetitive loss properties and severe repetitive loss properties, as of August 2023, there are a total of twenty one (21) repetitive loss properties, two (2) of which are severe repetitive loss properties. Of these properties, seventeen (17) are single family residential, one (1) is business nonresidential, one (1) is other residential, one (1) are other nonresidential, and one (1) is 2-4 family residential. Four (4) structures are identified as "mitigated" and four (4) are NFIP insured.

The County actively seeks to mitigate flood risk via the acquisition of repetitive flood prone properties. According to the Mitigation Action Progress Report completed for this plan update, the County is still on schedule for including the 21 repetitive loss properties (identified in the 2018 plan) on the buyout list but has been delayed in prioritization and

purchase of properties on the list. As of this plan update, the listing includes 82 total properties, including the 21 repetitive loss properties added to the list in 2018.

In the last five year planning period, the County has worked on a grant funded project entitled Garden City Mobile Home Park located on Winchester Road in LaVale. The goal of this project is to buyout and relocate a total of 25 mobile homes from the floodplain. This will relocate individuals into another area where they will not be impacted by flood water. Other properties that are a part of the flood buyout list have been placed on hold while the County focuses on the Garden City project described above. Additional repetitive loss properties will be considered for relocation once the current project has been closed out.

During this plan update, the 21 identified repetitive loss properties were reviewed to determine if any of these properties were part of the flood buyout listing. Those repetitive loss properties not on the flood buyout waiting listing will be recommended for inclusion on the flood buyout waiting list as part of a continuous mitigation strategy that has been included in both past and present updates to the hazard mitigation plan. Table 4-6 provides a general location of the properties currently on the flood buyout waiting list.

Table 4-6. 2023 Flood Buyout Listing

Watershed	Community	Number of Structures
Warrior Run	Cresaptown-Winchester Road	1
Georges Creek	Midland/Gilmore	2
Georges Creek/Jackson Run	Lonaconing	11
Georges Creek	Barton	14
Georges Creek	Westernport	6
Jennings Run	Mt. Savage	3
Georges Creek	Frostburg	2
Town Creek	Flintstone	1
Potomac River Lower North Branch	Rawlings	3
Wills Creek	LaVale	6
Potomac River Lower North Branch/Evitts Creek	Cumberland	6
Fifteen Mile Creek	Little Orleans	1
Potomac River Lower North Branch	Oldtown	2
	Total	**58**

Source: Allegany County Land Development Services.

The Towns of Barton and Lonaconing located along Georges Creek contain 25 of the 58 properties on the flood buyout waiting list. Westernport, LaVale, and Cumberland contain 6 properties each on the flood buyout waiting list.

4.4 Dam Failure

Dams present risks but they also provide benefits including irrigation, flood control, and recreation. Dams have been identified as a key resource of our national infrastructure that is vulnerable to terrorist attack. States have the primary responsibility for protecting their populations from dam failure. Of the approximately 94,400 dams in the United States, State governments regulate about 70 percent. About 27,000 dams throughout the U.S. could incur damage or fail, resulting in significant property damage, lifeline disruption (utilities), business disruption, displacement of families from their homes, and environmental damage. Flooding as a result of dam failure is the primary concern of this risk profile.

4.4.1 Risk and History

According to damsafety.org, hundreds of dam failures have occurred throughout U.S. history. These failures have caused immense property and environmental damage and have taken thousands of lives. As the nation's dams age and population increases, the potential for deadly dam failures grows. Allegany County does not have a significant history of dam failures, but the risk of a dam failure is not non-existent. According to the National Performance of Dams Program, which maintains a database of failures for all dams listed in the National Inventory of Dams, 34 dam-related incidents have occurred in the entire state of Maryland since 1929; none of which have occurred in Allegany County.

According to FEMA, dams can fail for several reasons, including: overtopping caused by floods, acts of sabotage, upstream dam failure (i.e., the failure of another nearby dam), structural failure of materials used in dam construction, or earthquakes.[i] FEMA acknowledges three primary types of risk associated with high hazard potential dams, which include the following:

Incremental Risk: The risk (likelihood and consequences) to the pool area and downstream floodplain occupants that can be attributed to the presence of the dam should the dam breach prior or after overtopping, or undergo component malfunction or misoperation, where the consequences considered are over and above those that would occur without dam breach. The consequences typically are due to downstream inundation, but loss of the pool can result in significant consequences in the pool area upstream of the dam.

Non-Breach Risk: The risk in the reservoir pool area and affected downstream floodplain due to 'normal' dam operation of the dam (e.g., large spillway flows within the design capacity that exceed channel capacity) or 'overtopping of the dam without breaching' scenarios.

Residual Risk: The risk that remains after all mitigation actions and risk reduction actions have been completed. With respect to dams, FEMA defines residual risk as "risk remaining at any time" (FEMA, 2015, p A-2). It is the risk that remains after decisions related to a specific dam safety issue are made and prudent actions have been taken to address the risk. It is the remote risk associated with a condition that was judged to not be a credible dam safety issue.

According to a 2019 study by the Global Risk Institute nearly a third of dam failure is due to overtopping, an event whose likelihood increases as the potential for severe storms increases. The shear strength of a dam decreases with age, and as more of the reservoir fills with sediment, the capacity for flood storage is reduced. A dam failure can damage downstream assets such as thermoelectric plants, water and wastewater treatment plants, airports, bridges, highways, as well as other dams. The failure of such critical infrastructure can lead to a cascading failure of other critical services such as hospitals, emergency response, and supply chains. Immediate losses can include damage to life and property, but a dam failure can also lead to longer term losses related to access to water, flood control, electricity and transportation services, that go beyond remediation and reconstruction costs.

4.4.2 Vulnerability Assessment

Allegany County could be affected by the failure of ten dams or levees within the county. Of these dams, six (6) have a hazard potential classification of "high," one is "significant" and three are "low" hazard potential classification. These dams are identified in Table 4-7. In Maryland, the MDE Dam Safety Division/Program* is responsible for improving dam safety throughout the state and works with local officials and dam owners. According to the Division, hazard potential classifications are based on the negative impacts should the dam fail, and are described as follows:

- **High Hazard** (85 dams in the State*): Probable loss of life; major increases in existing flood levels at houses, buildings, major interstates and state roads .
- **Significant Hazard** (125 dams in the State*): Possible loss of life, significant increased flood risks to roads and buildings with no more than two houses.
- **Low Hazard** (330 dams in the State*): Unlikely loss of life; minor increases to existing flood levels at road and buildings.

Table 4-7. Dams Located in Allegany County, Maryland

Dam Name	Dam Type	Primary Purpose	Emergency Action Plan	Owner Name	Hazard Potential Classification
Rocky Gap Dam	Earth	Recreation	Yes	MD DNR	High
Koontz Run Reservoir Tanks	Earth	Water Supply	Yes	Lonaconing Water Co.	High

Table 4-7. Dams Located in Allegany County, Maryland					
Dam Name	**Dam Type**	**Primary Purpose**	**Emergency Action Plan**	**Owner Name**	**Hazard Potential Classification**
Lonaconing Reservoir	Earth	Water Supply	Yes	Lonaconing Water Co	High
Midland-Gilmore Reservoir	Earth	Water Supply	Yes	Lonaconing Water Co	High
Dry Run Detention Dam and Culvert	Earth	Flood Risk Reduction	Yes	City of Cumberland	High
Upper Potomac Industrial Park Levee	Earth	Flood Risk Reduction	Yes	Allegany County	High
Don Pleasants Dam	Earth	Recreation	Yes	Pleasants Excavating Co, Inc.	Significant
Industrial Dam (Blue Bridge)	Gravity, Earth	Flood Risk Reduction, Water Supply	Not Required	City of Cumberland	Low
Roeder Farm Pond	Earth	-	Not Required	Charles and Mary Lennox	Low
Newpage Westvaco Dam	Earth	Water Supply	Not Required	Verso Corporation	Low
Source: MDE Dam Safety Program Database & National Inventory of Dams, https://nid.sec.usace.army.mil/#/					

All of the 7 high hazard potential and significant hazard potential dams located in Allegany County have an Emergency Action Plan (EAP). EAPs are required to establish procedures that warn the population at risk to reduce the potential for loss of life and property damage in the event that a dam failure is imminent. The locations of these dams are mapped on page 4-27 and high hazard dams are denoted in red. More information about the high hazard potential dams listed above is included on Table 4-8 below, including current condition and the likely geographic extent of impact should the dam fail. The City of Cumberland and the Town of Lonaconing are the only municipalities likely to be directly impacted from a dam failure event due to the presence of the Dry Run Detention Dam and Culvert and Industrial Dam located within the City, and the Lonaconing Reservoir located near the Town.

Table 4-8. High Hazard Potential Dams – Condition and Potential Impact Area		
Dam Name	**Condition***	**Nearest City/Town (in miles)**
Rocky Gap Dam	Satisfactory	Dickens
Koontz Run Reservoir Tanks	Satisfactory	Lonaconing (population of 989)
Lonaconing Reservoir	Poor	Lonaconing (population of 989)
Midland-Gilmore Reservoir	Poor	Charlestown (located in Lonaconing, pop. 989)
Dry Run Detention Dam and Culvert	Poor	Cumberland (population of 18,736)
Upper Potomac Industrial Park Levee	Fair	Bowling Green (population of 1,289)
Source: MDE Dam Safety Program Database & National Inventory of Dams, https://nid.sec.usace.army.mil/#/		

Table 4-8. High Hazard Potential Dams – Condition and Potential Impact Area		
Dam Name	**Condition***	**Nearest City/Town (in miles)**
** Satisfactory - No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.* *Fair - No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme event is defined by the regulatory agency based on their minimum* *Poor - A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.*		

4.4.3 Impacts to People, Systems, and Resources

Dam failure and associated flooding has the potential to impact people, structures, and critical resources in Allegany County. Table 4-9 highlights the most likely impacts the County and its communities will face based on previously observed impacts (i.e., none) combined with forecasting for future conditions.

Table 4-9: People, Systems, and Resources Vulnerable to Dam Failure Hazards	

People (including underserved communities and socially vulnerable populations)	• Residents and businesses within the dam inundation areas, as identified in individual dam EAPs, would be directly impacted by flooding caused by dam failures.
	• Availability of clean water could be a major issue in the event of the failure of a high hazard potential dam with the primary purpose of water supply, including:
	  ○ Koontz Run Reservoir Tanks
	  ○ Lonaconing Reservoir
	  ○ Midland-Gilmore Reservoir
	  ○ Residents of the Town of Lonaconing are most likely to be negatively impacted from the failure of one of their water supply dams, listed above.
	• The City of Cumberland and the Town of Lonaconing are the only municipalities likely to be directly impacted from a dam failure event. The Dry Run Detention Dam and Culvert and the Industrial Dam are located within or near the City of Cumberland, and the Lonaconing Reservoir is located just outside the Town.

Systems (including networks and capabilities)	• Several high hazard dams in the County serve the purpose of flood risk reduction. Failure of these dam types would be worsened in conjunction with a severe storm event bringing heavy rain.
	• High hazard potential dams with the primary purpose of flood risk reduction include the following:
	  ○ Dry Run Detention Dam and Culvert
	  ○ Upper Potomac Industrial Park Levee
	• Structures located within dam inundation areas may experience damage due to flooding.

Table 4-9: People, Systems, and Resources Vulnerable to Dam Failure Hazards	
	○ It should be emphasized that almost all dams in the County, with the exception of the Upper Potomac Industrial Park Levee and the Dry Run Detention Dam and Culvert are located in rural areas, with minimal population, or existing floodplains
Natural, Historic, and Cultural Resources	• Per Maryland's Historical Trust National Register of Properties, the following historical/cultural structure could be impacted by dam failure: ○ The Bluebridge, located on Johnson Street sits atop the Potomac River and atop the Industrial Dam. This dam is for recreation and is classified as low hazard potential. The likelihood of impact to this historic structure is minimal. ○ Note: The City of Cumberland would remove the dam as part of its river park project. • Activities that have value to the community could potentially be impacted by dam failures, however the identified dams are located in isolated areas and floodplains. Therefore, community activities would be unlikely to occur in these areas.

4.4.4 Mitigation Strategies

According to the Association of State Dam Safety Officials (ASDSO), the following actions can be taken to address high hazard potential dams, or dams in poor condition, and increase overall dam safety:

- Support the improvement of state dam safety programs.
- Increase collaboration.
- Advance and expand the technical expertise of dam and levee safety practitioners through training and education programs.
- Reduce the potential for dam failure by promoting innovative approaches to fund dam rehabilitation.
- Reduce the consequences of dam failure by increasing public awareness, planning and preparedness.
- Advocate for laws, policies and government programs that serve to improve the safety of dams and reduce the risk to the public.
- Support and strengthen a coordinated effort to improve the safety of levees.

The ASDSO's Strategic Plan 2022-2027 is available online, here.

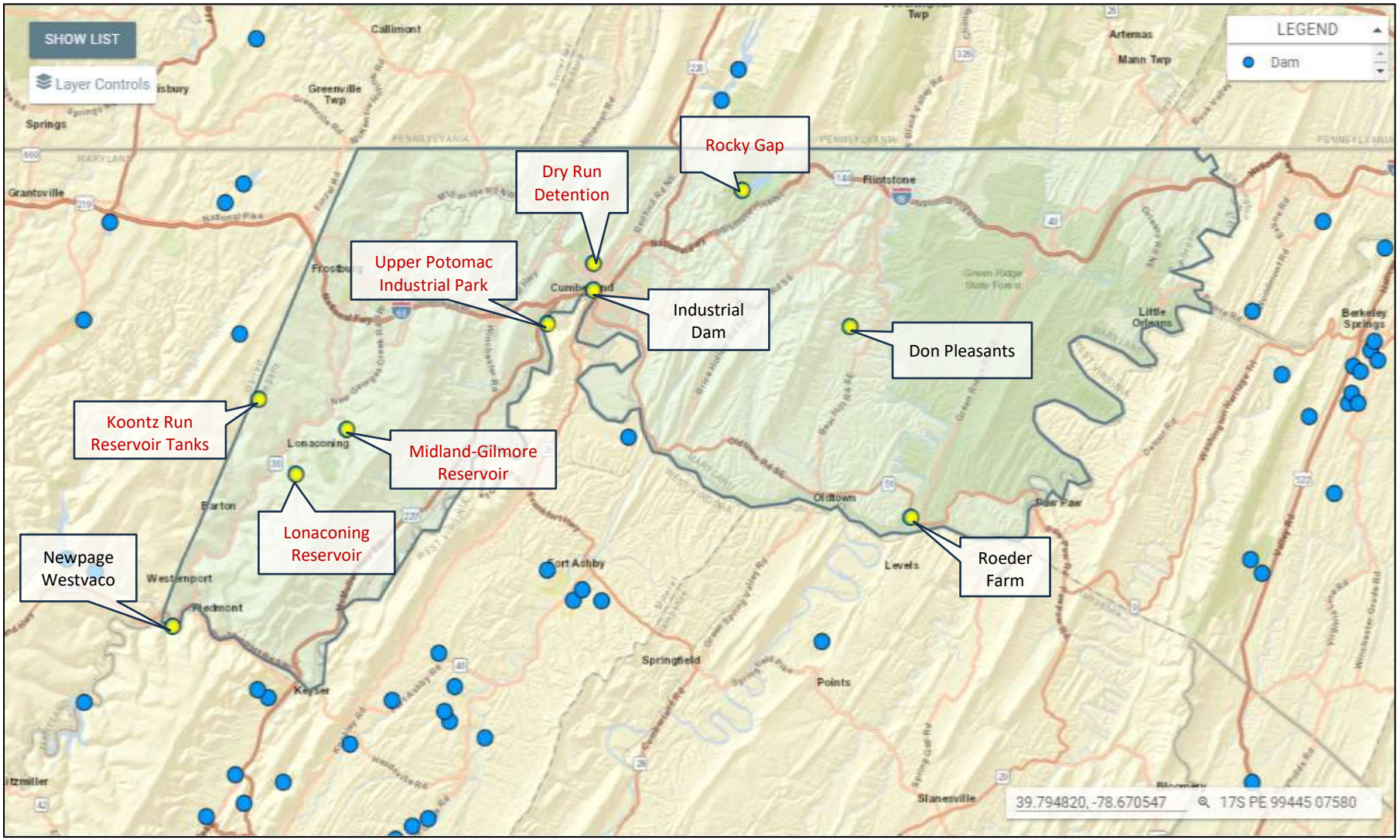
** Maryland Dam Safety Division Contact Information is available here, or residents can contact the local Department of Emergency Services, here.*

4.4.5 Future Conditions

Provided that adequate engineering and maintenance measures are in place, high hazard dam failures are very unlikely in Allegany County based on the lack of past incidents. The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur, but significantly older dams (as identified in Tables 4-7 and 4-8) are more likely to experience problems.

The construction, operation, maintenance, modification, and abandonment of dams should be regulated and monitored by the Maryland Department of Environment Dam Safety. Dams are evaluated based on categories such as slope stability, undermining seepage, and spillway adequacy. The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur. Minor dam failures are more common since low-hazard structures are minimally regulated, but the impact of these events would be minimal.

Dam Emergency Action Plans drafted in accordance with the Federal Guidelines for Dam Safety identify the risk related information include the inundation area and the time lapse between failure and flooding reaching specific destinations downstream. These plans are also reviewed and approved by MDEM. While the County and its municipalities have minimal potential to be affected by dam failure, the possibility exists and therefore it is essential to have emergency planning procedures.



Map 4-2. Dam/Levee Locations in Allegany County, Maryland. Source: National Inventory of Dams.

4.5 County Perspective

The *2021 State Hazard Mitigation Plan* identifies Allegany County's risk ranking for flood as "medium." Allegany County HMPC members ranked the flood hazard as "high."

During the 2024 plan update, members of the public were able to complete the Allegany County Hazard Mitigation Plan Update Public Survey. Question 4 asked respondents to "indicate your level of concern for each hazard" for each of the eleven (11) hazards identified within the plan. Options for each hazard included: "not concerned," "somewhat concerned," "concerned," and "very concerned."

Results indicate respondents combined "level of concern" for each of the hazards identified within the plan. On a scale of 1 to 11 – with 1 representing the hazard of most concern and 11 representing the hazard of least concern – the public ranks the flood hazard as eighth.

Additionally, the public ranked the dam failure hazard during this plan update. Dam failure was ranked as eleventh (the hazard of least concern) by the public. The 2021 State Hazard Mitigation Plan ranks dam failure as "medium-low" risk for Allegany County.

Most of Allegany County is located in the Ridge and Valley province of the Appalachian Mountains, with the exception of a small area west of Dans Mountain located in the Allegheny Plateau. Therefore, the County is drained by streams generally having their headwaters on steep, sandstone ridges. For the most part, major streams flow through narrow shale and limestone valleys, which are generally parallel to the ridge tops with smaller tributaries draining the ridges. These streams, all of which drain into the Potomac River, are subject to rapid runoff from rainfall and snow melt. With periodic tropical storms/hurricane related rains and persistent frontal systems, rainfall events of 3"-4" of rain or 24" of snow are not uncommon and the runoff from these events can result in severe flooding in major streams and small tributaries alike.

Allegany County experiences both flash and riverine flooding. Flash floods occur suddenly with tremendous force, usually as a result of torrential rainfall or thunderstorm event over a short period of time. Riverine flooding in Allegany County is typically associated with snow melt or persistent rain from a strong frontal system, tropical storm, or remnants of hurricanes that have made their way in-land.

4.5.1 Mitigation History

Following the creation of the Governor's Flood Mitigation Task Force for Western Maryland, FEMA selected Allegany County as one of seven communities nationwide to begin a pilot project to work towards the goal of becoming a disaster resistant community. In 1998, as part

of the initiative entitled "PROJECT IMPACT," Allegany County set up a number of workgroups to develop a program to meet its goal of disaster resistance. The workgroups developed objectives, projects and partnerships to aid them in meeting their ultimate goal – acquisition projects.

While the PROJECT IMPACT initiative is no longer funded by FEMA, Allegany County has continued to carry-out flood mitigation projects within its jurisdiction. One of the original workgroups developed under the PROJECT IMPACT initiative meets on a biannual basis to provide a forum for discussion and a framework for project development and prioritization. The Deputy Director of Public Works chairs this workgroup. Projects and issues considered by this workgroup include acquisition projects, infrastructure improvements, watershed studies and community concerns.

4.6 Municipal Perspective

Figure 4-3: September 1996 Flood Event. Railroad trestles located along Georges Creek interfered with water flows causing the water to divert in alternate directions. (Photo: Town of Midland)

Photo Source: Allegany County Department of Emergency Services

The residents in the Towns of Midland, Lonaconing, Barton and Westernport were greatly impacted by the two major 1996 flood events as well. Georges Creek overtopped its stream banks, flooding all the homes located along the stream. Portions of Route 36 were closed due to the flooding and schools were closed until the stream receded. The City of Cumberland was affected by the same events when Wills Creek caused flooding in several areas. Additionally, numerous residential structures were destroyed in the small community of Locust Grove and several businesses in Motor City area were affected by the flooding.

In September 2000, flooding occurred primarily in the City of Cumberland and the suburb of LaVale as a result of a localized cloud burst. In some places as much as five inches of rain fell within one hour. Storm water systems simply could not handle such a large volume of water in so short a time span. Residences were subsequently flooded with damage primarily in the minor damage category. Following the event, the City of Cumberland made some upgrades to their storm water system, however storm systems are still limited in the amount of water that they can be designed to convey.

In 2007, the City of Cumberland was affected by flooding again, which caused several basements to flood and roadways to be closed. Greene Street and Kelly Road were closed due to flooding caused by railroad trestles. Additionally, a vehicle was trapped under the subway located along Virginia Avenue.

In June 2016, the Town of Westernport experienced flooding due to heavy rainfall. The flooding caused roads to buckle and sinkholes to form. Numerous homes experienced basement flooding and stormwater drain backup due to excessive amounts of rainfall in a short timeframe. Most recently, in the 2021 flood event described in section 4.1, the City of Cumberland, Town of Lonaconing, and communities of LaVale, Corriganville, and Ellerslie were impacted.

4.7 Impacts to People, Systems, and Resources

Flood impacts people, structures, and critical resources in many ways, and has been described in this chapter primarily through the historical event narratives of flooding throughout the County. Table 4-10 highlights the most likely impacts the County and its communities will face based on previously observed impacts combined with forecasting for future conditions.

Table 4-10: People, Systems, and Resources Vulnerable to Flood Hazards

People (including underserved communities and socially vulnerable populations)	• Residents and businesses in and around floodplain and/or steep slopes are at increased risk of impacts. In the past this included, but is not limited to, Georges Creek, Wills Creek, and the Potomac River. • Floods cause minor to significant property damage or loss. This is exacerbated if flooding occurs to a property without flood insurance. • Property owners face the dilemma of costly structural mitigation or displacement or buyout in severe repetitive cases. • Socially vulnerable groups, particularly those without means to move (whether physically, financially, or medical) are prone to repetitive flooding. ○ Allegany County has many socially vulnerable groups, including aged populations, isolated rural communities, communities with limited access to broadband, those with medical needs, and people with limited means of transportation. • Business disruption and loss of revenue. This is described in estimates included in Allegany County's Flood Risk Report. • As was the case with flooding in 2021, residents of impacted communities may need to be evacuated due to flooding and/or water rescues by emergency responders may be necessary.
Systems (including networks and capabilities)	• Temporarily submerged roads or blown out bridges create an evacuation issue. • Frequently submerged infrastructure experiences damage over time, which can create closures in the long term.

Table 4-10: People, Systems, and Resources Vulnerable to Flood Hazards	
	• Communication breakdowns, emergency or otherwise, are possible. • Impervious surfaces combined with steep slopes common throughout the County exacerbate flooding. • Emergency responders may be cut off from communities and people due to roadway inundation. • Public perception and faith in first responders could be questioned due to slow responses caused by flooding. • Repetitive Flooded Roadways have been inventoried by the County since 2012. **These roadways are included in Table 4-11 and 4-12.**
Natural, Historic, and Cultural Resources	• Damage to beneficial protective habitats caused by frequent flooding. • Flooding from heavy rainfall can lead to a type of soil movement known as a landslide, which often occurs on steep slopes. This has occurred throughout the County on both private property and along road and railways. • Pollutants can enter waterways after a flood event, leading to a decline in overall water quality. Regular water quality reports for the County's water supplies are available on Allegany County's website. • Historic structures within or adjacent to the Special Flood Hazard Area are vulnerable to flood damage. • In some circumstances, structures and neighborhoods may be deemed as not having any historical value if flooding is frequent or destructive enough. Such is the case when the Maryland Historical Trust ruled that flooding which occurred in 1984 eliminated any historical value that the community of Locust Grove possessed.

Table 4-11: Repetitive Roadway Flooding Issues – County	
LOCATIONS	
Mason Road, Cumberland	Iron Rail Street, Mt Savage
Bear Hill Road @ Pumpkin Center, Oldtown	Waterside Street, Mt Savage
Forest Grove Road, Cumberland	Foundry Row Road, Mt Savage
Oldtown/Orleans Road @ Low Water Bridge, Little Orleans	Greenspring Road, Oldtown
Wallizer Road, Flintstone	Hazen Road, Cumberland
*Bowling Green Area between Milnor Avenue and Moss Avenue	Cresap Mill Road, Oldtown
Source: Allegany County Department of Public Works	

Table 4-12: Repetitive Roadway Flooding Issues – Municipal	
Location	**Issue: SWM &/or Elevation**
Washington Street, Westernport	Elevation
Main Street, Westernport	Elevation & SWM
Church Street, Westernport	Elevation & SWM
Franklin Street, Westernport	Elevation & SWM
Maryland Avenue, Westernport	Elevation & SWM
McKinley Street, Westernport	SWM
Green Street, Westernport	SWM
Sperry Street, Cumberland	SWM

Table 4-12: Repetitive Roadway Flooding Issues – Municipal	
Location	**Issue: SWM &/or Elevation**
Kelly Road, Cumberland	SWM
*Corner of Maryland Avenue at Williams Street, Cumberland	SWM
*Fayette Street, Cumberland	SWM
*Green Street at the Dingle Area and at the Underpass, Cumberland	SWM
*Virginia Avenue at the "Subway," Cumberland	SWM
Jackson Mountain Rd, Lonaconing	SWM
Intersection of Island and Union Street, Lonaconing	Elevation
Railroad Street, Lonaconing	Elevation
RT 135 (State Road)	Elevation & SWM
Source: Allegany County Municipalities	

4.8 Mitigation Capabilities

The two major 1996 flooding events brought home the realization that Allegany County could no longer continue the cycle of "flood-rebuild-contain" which had been prevalent since large scale stream channeling projects began in the 1930's. To that end, Allegany County utilizes Floodplain Management Regulations, Subdivision Regulations, and Stormwater Management Ordinances in an effort to mitigate potential flooding.

Chapter 325: Floodplain Management regulations, effective April 3, 2020, were adopted to establish measures to minimize flood damage to public and private property and to establish procedures by which these measures are to be administered and enforced. According to the floodplain management regulations, a land use permit is required for all proposed development in the 1 percent-annual chance floodplain. The regulatory floodplains are those areas of Allegany County which are subject to the 1 percent-annual-chance flood and are delineated on the DFIRMs prepared by FEMA (refer to section 4.2 Flood Risk and Mapping).

In general, development may not occur in the floodplain where alternative locations exist. If the structure cannot be constructed outside of the 1 percent-annual-chance floodplain, the applicant must demonstrate that new structures cannot be located out of the floodplain and that encroachments onto the floodplain are minimized before a permit can be issued.

Elevation requirements defined in the Floodplain Management regulations state that all new and substantially improved residential and non-residential, including manufactured homes, shall have the lowest floor elevated to or above the Flood Protection Elevation (the elevation of the base flood plus one-foot freeboard). Basements are not permitted. Additions which increase the first floor size and are less than substantial improvements (less than 50% of the present market value) shall also have the lowest floor elevated to or above the Flood Protection Elevation (FPE). The elevation of the lowest floor shall be certified by a registered surveyor or professional engineer licensed to practice in Maryland, on the elevation

certificate, after the lowest floor is in place. Enclosures below the FPE must be constructed with water-equalizing vents. Improvements which are less than substantial shall be constructed to minimize damage during flooding or shall be elevated to the greatest extent possible.

In regard to flood protection setbacks, the Floodplain Management regulations state:

> *"A minimum one-hundred-foot flood protection setback shall be maintained from the edge of the banks of any watercourse delineated as having a floodplain on the Floodway Map or FIRM, except where the setback may extend beyond the floodplain. To prevent erosion, natural vegetation shall be maintained in this area. Where natural vegetation does not exist along the watercourse and conditions for replanting are suitable, high priority shall be given to planting trees in the setback area to stabilize banks and to enhance aquatic resources. Also, a minimum fifty-foot flood protection setback shall be maintained from the top of the bank of any stream which has no designated floodplain and has a basin larger than four hundred (400) acres. A twenty-five-foot setback shall be maintained from the centerline of all other streams and drain ways, including intermittent streams. Natural vegetation shall be maintained and, if needed, trees planted."*

According to Chapter 360: Part 1 Subdivision Regulations, the purpose for the regulations is to establish measures and requirements for the subdivision of parcels of land and to establish procedures by which these requirements and measures are to be administered and enforced. The Subdivision Regulations states that "subdivisions must be created in conformance with the provisions of the County Chapter 360, Part 4, Zoning; Chapter 360, Part 2, Sediment and Erosion Control; Chapter 360, Part 3, Stormwater Management; Chapter 325, Floodplain Management; and any other local or state laws."

Furthermore, the regulations establish design standards for subdivisions, which must depict areas within the mapped 1 percent-annual-chance flood zone within 25 feet of streams, drainways or designated wetlands or within designated habitat areas of threatened and endangered species. These areas are to be cross hatched on the map and may be included in lots but not building sites. Where stream basins are larger than 400 acres above the site being subdivided, the stream setback is 50 feet from stream banks.

Additionally, when required by the County Engineer, subdivisions are to have a planned development for stormwater management and drainage that shall provide storm drains, culverts, drainageways, ponds or other stormwater management works adequate to collect, store and dispose of all water originating on or flowing across the property, without inundating or damaging roads, lots, buildings or other properties. Such drainage works shall

meet the standards and requirements of Part 3, Stormwater Management. A stabilized drainageway shall be provided outside road shoulders, conforming to the standards of cross-section and construction adopted by the county.

According to the Stormwater Management Regulations, "the purpose of this regulation is to protect, maintain, and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures that control the adverse impacts associated with increased stormwater runoff. The goal is to manage stormwater by using environmental site design (ESD) to the maximum extent practicable (MEP) to maintain after development as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding, and use appropriate structural best management practices (BMPs) only when necessary. This will restore, enhance, and maintain the chemical, physical, and biological integrity of streams, minimize damage to public and private property, and reduce the impacts of land development."

More flood related community capabilities can be found in the updated NFIP Community Questionnaire worksheets as part of *Appendix C*. These worksheets include the County's capabilities related to floodplain identification and mapping, floodplain management, and flood insurance.

4.9 Future Conditions

The frequency of flooding, flash flooding, and heavy rain events are likely to increase due to climate change. Areas that currently experience regular flooding due to proximity to rivers and/or steep slopes are likely to see conditions change or worsen, and some areas that historically flood very little or not at all are likely to start flooding with greater frequency due to the increased amount and intensity of storm events.

According to a 2021 study published in Nature "when it comes to riverine flooding, climate change is likely exacerbating the frequency and intensity of extreme flood events but decreasing the number of moderate floods."[ii] Flash flooding will continue to increase as there are more extreme precipitation events. Warmer temperatures increase evaporation, putting more moisture into the atmosphere that then gets released as rain or snowfall.
The 3rd National Risk Assessment: Infrastructure on the Brink quantifies risk as "the unique level of flooding for each infrastructure type relative to operational thresholds, as established by the federal government and other authoritative bodies."[iii] Operational flood risk at the local level denotes when a facility is flooded to the point where it can no longer function as intended or becomes unsafe. At a high level, the assessment finds the following true today and likely in the coming decades:

- Risk to residential properties is expected to increase by 10% over the next 30 years, with 12.4 million properties at risk today (14%) and 13.6 million at risk of flooding in 2051 (16%).
- Additionally, 2.0 million miles of road (25%) are at risk today and that is expected to increase to 2.2 million miles of road (26%) over the next 30 years (a 3% increase over the next 30 years).
- Commercial properties are expected to see a 7% increase in risk of flooding from 2021 to 2051, with 918,540 at risk today (20%) and 984,591 at risk of flooding in 30 years (21%).
- Currently, 35,776 critical infrastructure facilities are at risk today (25%), increasing to 37,786 facilities by 2051 (26% and a 6% increase in risk).
- Compounding that risk, 71,717 pieces of social infrastructure facilities are at risk today (17%), increasing to 77,843 by 2051 (19% and an increase of 9% over that time).

In Maryland, there are 112,187 residential properties, 11,990 miles of roads, 8,445 commercial properties, 379 infrastructure facilities, and 826 social facilities with operational flood risk today. According to riskfactor.com, in Allegany County, there are 9,086 properties that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 26% of all properties in the County.

In addition to damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, Allegany County has a "severe" risk of flooding over the next 30 years, which means flooding is likely to impact day-to-day life within the community. This is based on the level of risk the properties face rather than the proportion of properties with risk. This risk is depicted in Figure 4-4, following.

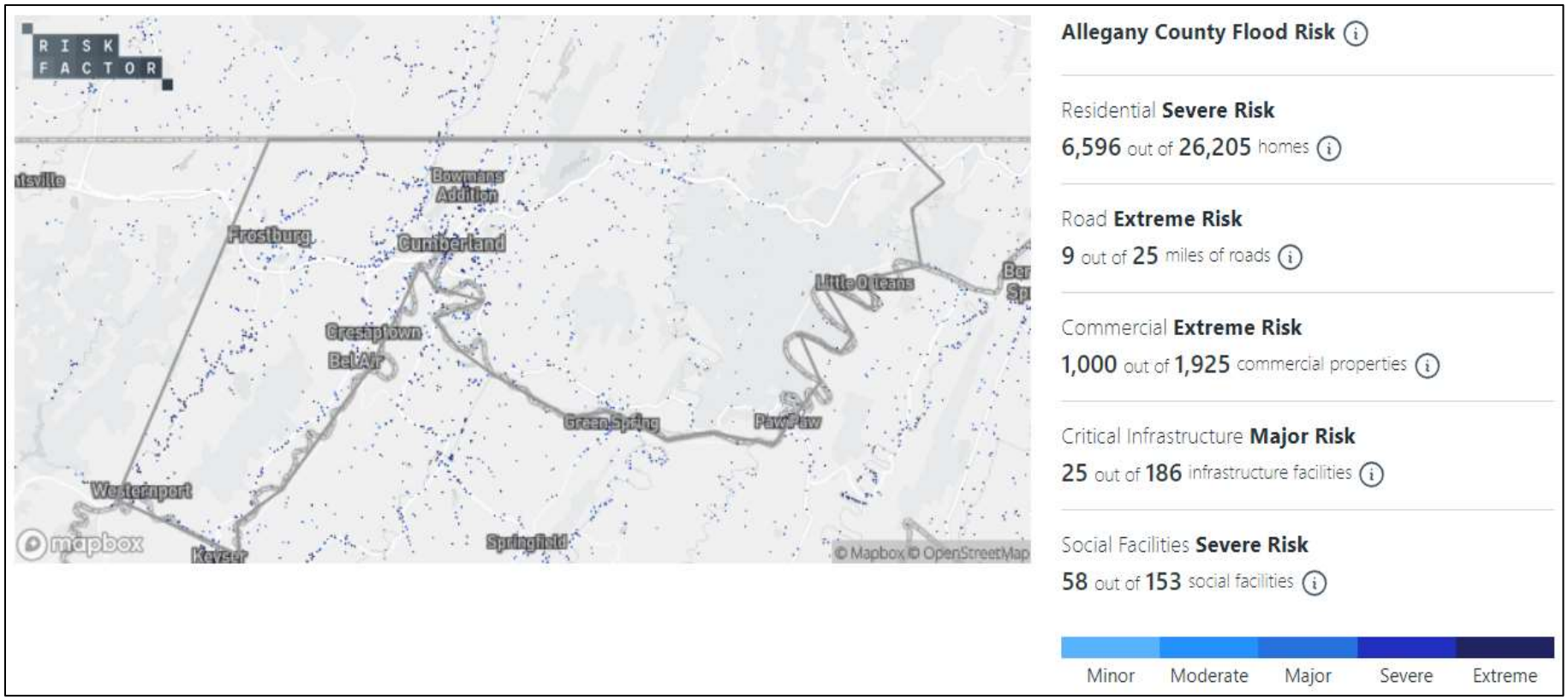


Figure 4-4. Allegany County Flood Risk. Source: www.riskfactor.com

[i] www.fema.gov/sites/default/files/2020-08/fema_dam-safety_aware-community_fact-sheet_2016.pdf
[ii] Brunner, M.I., Swain, D.L., Wood, R.R. et al. An extremeness threshold determines the regional response of floods to changes in rainfall extremes. Commun Earth Environ 2, 173 (2021). https://doi.org/10.1038/s43247-021-00248-x
[iii] The 3rd National Risk Assessment: Infrastructure on the Brink, 2021