REPORT OF THE SECRETARY OF
NATURAL AND HISTORIC RESOURCES

THE STATUS OF FLOOD RESILIENCE IN THE COMMONWEALTH

TO THE GOVERNOR AND THE GENERAL ASSEMBLY

COMMONWEALTH OF VIRGINIA
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1 Introduction

Flood resilience efforts are underway across Virginia to minimize loss of life, property damage, and negative social and environmental impacts of flooding. Flood resilience planning and implementation guides the direction of these efforts and includes understanding and addressing the ways in which the Commonwealth's critical infrastructure is vulnerable to the impacts of flooding. The Department of Conservation and Recreation (DCR), under the direction of the Commonwealth's Secretary of Natural and Historic Resources and Chief Resilience Officer (CRO), serves as the lead administrator of flood resilience and protection planning, coordination, outreach, and engagement for the Commonwealth of Virginia. Comprehensive planning efforts that DCR will lead to assess flood risk and identify and prioritize resilience-building actions include the *Virginia Flood Protection Master Plan* (VFPMP) and *Coastal Resilience Master Plan (CRMP),* which builds upon the existing *Coastal Resilience Master Planning Framework* and *Coastal Resilience Master Plan Phase I*. The Commonwealth's CRMP, Phase I was released in 2021, while the VFPMP was last updated in 2005. Both the CRMP and the VFPMP are scheduled to be updated on a five-year basis, and plan updates are scheduled for 2024 and 2025 (one year ahead of the statutory deadline), respectively.

1.1 Flood Risk in the Commonwealth

All regions of the Commonwealth of Virginia experience flooding, as illustrated in Figure 1. Virginia's communities experience varying levels of flood exposure and vulnerability to harm or damage, both of which are tied to each community's unique socioeconomic, historical, and physical context. These flood events range from extreme, episodic storm events to recurrent, sunny-day inundation and put people, infrastructure, and the environment at risk. While some communities are well-resourced to plan for the challenges ahead, others lack capacity or allocated funds to address their growing and changing flood risks.

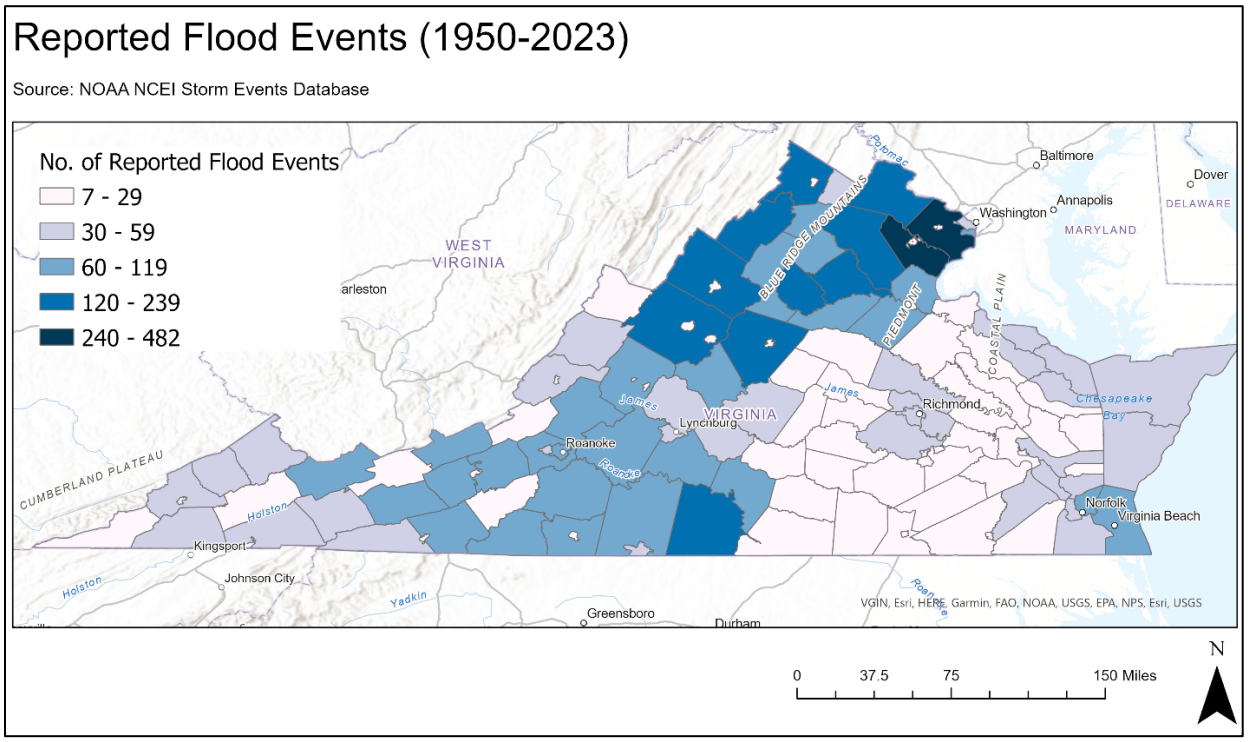

Figure 1. Reported Flood Events Across Virginia from 1950-2023 (NOAA/NCEI Storm Event Database)

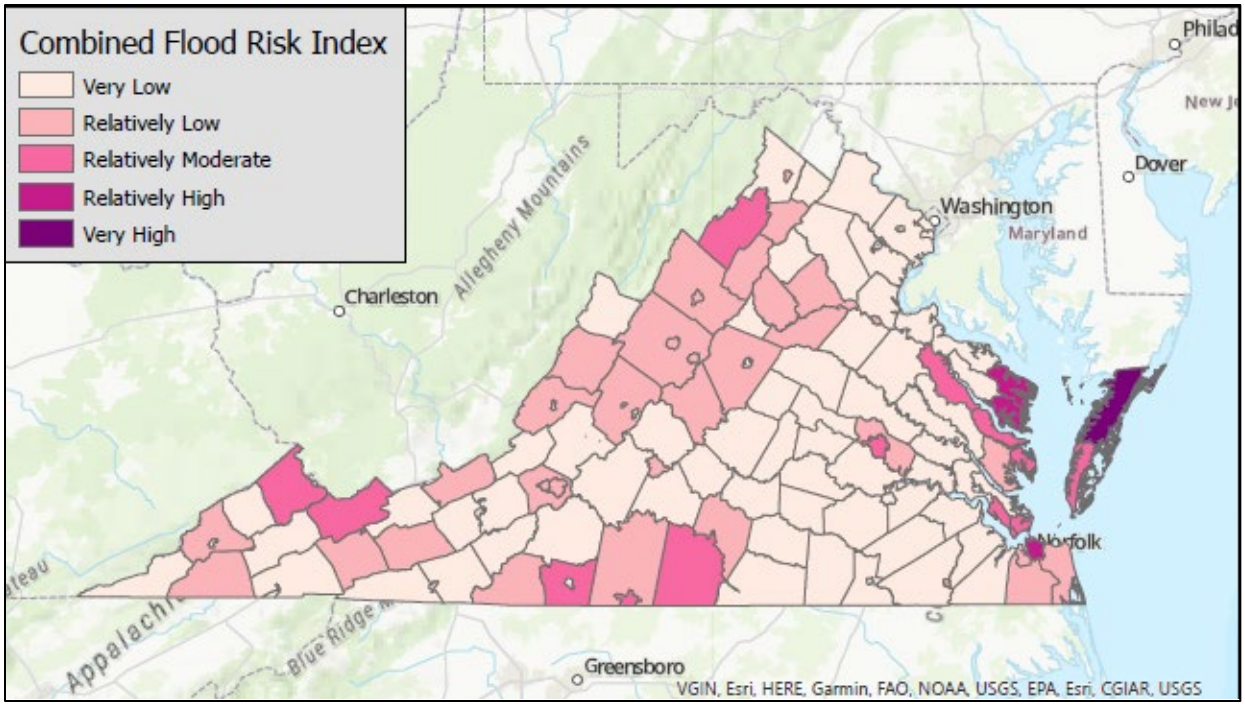

Figure 2. FEMA NRI Combined Flood Risk Index (FEMA Nov 2021 NRI data)

We know from recent events and other risk assessment tools and planning processes, including the CRMP, that substantial flood risk exists across Virginia. For example, an analysis conducted for the CRMP estimated that between 2020 and 2060, annualized damages resulting from coastal flooding could increase by 550% from $0.4 billion to $2.4 billion. Across the state, concentrated geographic areas of flood risk exist in the regions of Southside Virginia, Southwest Virginia, the Shenandoah Valley, and Coastal Virginia along the Chesapeake Bay and Atlantic Ocean. The FEMA National Risk Index, described below, is one tool currently available statewide to assess flood risk. Statewide flood risk is also summarized in the *Commonwealth of Virginia Hazard Mitigation Plan* (see pages 3-145 to 3-199).

FEMA's National Risk Index (NRI)

The FEMA NRI provides a useful overview of the present-day flood risks the commonwealth faces. The NRI's calculated expected annual losses to buildings, population, and agriculture from coastal and riverine flooding are added to create a combined flood impact. Then, the combined flood impact is multiplied by social vulnerability and divided by community resilience. The resulting relative combined flood risk index (Figure 2) is a relative rating of flood risk to people, buildings, and agriculture across the commonwealth, considering both physical and social vulnerabilities. However, this tool provides limited information on the expected changing nature of flood risk as a result of climate change.

To achieve functional resilience across the Commonwealth, we must understand the landscape of flood risk through the combined impacts of flood exposure and vulnerability, including socioeconomic vulnerability. Ultimately, we aim to build capacity to prepare, adapt, and respond to flooding events and ensure that communities across Virginia are equipped to address flood risks.

Virginia's Flood Hazard Exposure Data

While a state standard for projecting future flood hazard conditions for planning purposes does not exist, efforts are underway to gather and provide flood hazard exposure data for rainfall-driven flooding for the coastal regions of the state through the CRMP Phase II. Additionally, identifying and prioritizing needs in developing forward-looking data to model riverine and rainfall-driven flood hazard exposure will be a central topic addressed in the 2025 VFPMP.

- ***Coastal Flood Hazard*** – The Commonwealth provides maps of current and future coastal flood hazards ranging from daily tidal flooding to episodic storm event flooding based on the NOAA 2017 Intermediate-High Sea Level Rise Projections in the Coastal Resilience Web Explorer.
- ***Riverine Flood Hazard*** – FEMA provides Flood Insurance Rate Maps (FIRMs) across the Commonwealth. The Commonwealth provides the maps in the Virginia Flood Risk Information System (VFRIS).This data does not include future projections for changes river flows.
- ***Rainfall-Driven Flood Hazard*** – Rainfall-driven flood hazard data does not exist across the Commonwealth.

Recurrent updates to the VFPMP and CRMP will progressively increase our understanding of flood exposure statewide and assess critical infrastructure vulnerability to flooding. In future plans and Status Reports, we will continue to develop and analyze data on the anticipated impacts of climate change on both sea level rise and precipitation patterns, as well as state-specific watershed modeling and risk analysis, to evaluate our needs and prioritize our resilience efforts.

1.2 The Commonwealth's Approach to Flood Resilience

Flood resilience is the capability to anticipate, prepare for, respond to, and recover from flood hazards with minimal damage to social well-being, health, the economy, and the environment.[1] The Commonwealth's approach to flood resilience embraces the following five guiding principles, as established in the Coastal Resilience Master Planning Framework:

- Acknowledge climate change and its consequences and base decision-making on the best available science and data.
- Identify and address socioeconomic inequities and work to enhance equity through flood adaptation and protection efforts.
- Recognize the importance of protecting and enhancing green infrastructure by prioritizing nature-based solutions.
- Utilize community and regional scale planning to the maximum extent possible, seeking region-specific approaches tailored to the needs of individual communities.
- Understand fiscal realities and focus on the most cost-effective solutions for the protection and adaptation of our communities, businesses, and critical infrastructure.

[1] Definition adapted from Code of Virginia § 10.1-603.28.

Additionally, the Chief Resilience Officer has outlined the following additional guiding principles:

- We are committed to addressing challenges relating to flooding and resiliency.
- We must address these challenges with programs that work for all impacted parts of Virginia.
- The programs we implement must work together as parts of comprehensive, cohesive plans.
- These programs and plans must be developed and implemented with transparency and input from the public.

Building flood resilience requires planning for current conditions in the short-term, while anticipating long-term shifts in flood hazards that will be experienced across the Commonwealth. These short- and long-term efforts must be balanced as we seek to reduce risk. In the long term, a variety of interventions, including both flood protection and adaptation, will be required to achieve acceptable levels of flood risk. As outlined in CRMP Phase I, the Commonwealth's vision for a flood-resilient future is not one in which all risk is eliminated but rather where the burden of acceptable risk is distributed among communities and residents.

Finally, flood-related risks are felt across the whole community, and thus, a "Whole Community" approach is needed to address this risk head-on. Through this approach, broad representation from the community – including residents, non-governmental organizations, flood resilience practitioners, and government officials – collectively understand risk, build assets, and organize action.[2] While the CRO and DCR hold significant responsibilities related to flood resilience planning across the Commonwealth, coordinated and cohesive plans and implementation rely on the broad participation of many others. This includes the Virginia Department of Emergency Management (VDEM), Virginia Department of Transportation (VDOT), and other state agencies and stakeholders who own or are responsible for critical infrastructure as well as other governmental units that are responsible for the health, safety, or general welfare of the public within their jurisdiction.

1.3 Report Objective

Per the Code of Virginia, 2.2-220.5. Chief Resilience Officer, the objectives of this bi-annual *Status of Flood Resilience in the Commonwealth* report (Status Report) to the Governor and the General Assembly are to:

1. Monitor, evaluate, and report the status of the Commonwealth's flood resilience efforts outlined in key flood resilience and protection plans.

2. Evaluate flood risk and protection for critical infrastructure, including human and natural infrastructure.

To achieve the report's first objective, this document presents an update on the implementation progress of the CRMP and VFPMP, including information on the status of those plans' goals, strategies, activities, and outcomes. In this way, the Status Report serves a crucial role in the overall five-year cycle of flood resilience planning led by the CRO and DCR at the state level for the VFPMP and CRMP (see Figure 3). Monitoring and evaluating progress toward goals are important elements of successful plan implementation. This enables adaptive management approaches to adjust strategies and approaches where outcomes are not being achieved. This Status Report will facilitate the process of monitoring, evaluating, and adaptive management by providing bi-annual updates on the status of critical infrastructure flood risk and progress made toward the state's flood resilience goals.

[2] Derived from FEMA's Whole Community Approach, https://www.fema.gov/sites/default/files/2020-07/whole_community_dec2011__2.pdf

To advance the report's second objective and further the Commonwealth's overall flood resilience planning goals as required in the CRMP, this inaugural Status Report provides information on DCR's role, interest, and goals for critical infrastructure resilience. It also establishes a commitment and preliminary roadmap for coordinating with VDEM and the forthcoming Commonwealth of Virginia Critical Infrastructure Program (COV-CIP). The COV-CIP provides an important opportunity for inter-agency coordination, which can support DCR's flood resilience planning efforts.

Figure 3. Five-Year Cycle of Flood Resilience Planning

2 Commonwealth Flood Resilience Planning Status

DCR is the lead administrator for the *Coastal Resilience Master Plan* (CRMP) and the *Virginia Flood Protection Master Plan* (VFPMP), which – once complete – will serve as a foundation for the Commonwealth's flood resilience planning efforts. This bi-annual *Status Report* provides an update on the implementation of programs outlined in these two flood resilience plans. Implementation status tables summarizing progress toward each plan's goals, objectives, actions, and responsible parties can be found in Appendix C for the VFPMP and Appendix D for the CRMP.

In carrying out the CRMP and the VFPMP, the state has the potential to serve a critical role in coordinating and supporting flood resilience actions across communities, regions, and planning districts to incentivize collaborative action. When successfully coordinated, these planning efforts can inform state expenditures, provide communities with data and analysis to make informed decisions, guide the direction of federal resources and technical assistance for disaster-related planning and recovery, and recommend policy adoption to shape decisions at the state and local levels. Finally, the plans can inform decisions about the location and type of infrastructure investments, such as state agency decisions for state-owned infrastructure or appropriate criteria for state grant programs that direct funding resources to critical infrastructure owners.

Beyond DCR, many other state agencies, Planning District Commissions (PDCs), local governments, and non-governmental actors are developing plans, programs, policies, and projects to address the challenge of flood risk and build flood resilience. Although those efforts are not summarized in detail in this report, collaboration with other organizations advancing flood resilience in Virginia is an important piece of DCR's flood resilience coordination work. A brief, high-level summary of other critical, complementary flood resilience planning efforts ongoing at the state, regional, or local levels can be found in Appendix E.

Additional work is still needed to advance the Commonwealth's role as a leader in flood resilience. Specifically, there is a need for greater collaboration and cohesion between state agencies for overall resilience planning and coordination, as well as more proactive action to partner with localities, private sector partners, and non-governmental organizations in flood resilience planning matters, such as land use planning and funding coordination. At present, the Commonwealth does not have one specific assigned entity to plan for the financial impacts and costs associated with the overall resilience needs, including the increasing financial risks associated with flood hazards (VASEM 2021).

To address these challenges, at the direction of the Chief Resilience Officer, an interdisciplinary Resilience Coordination Working Group was convened and met throughout 2023. Included among the group's charges are (1) to consider and assess strategies and policies for the Commonwealth to improve intergovernmental and interagency coordination in planning for and implementing flood resilience throughout the Commonwealth and (2) to improve the flood resilience of both human and natural systems and infrastructures. The Resilience Coordination Working Group will report recommendations to the Governor and General Assembly by the end of 2023. These recommendations may impact the CRMP and VFPMP, and future bi-annual status reports.

2.1 Virginia Flood Protection Master Plan – Implementation and Revision Status

The requirements of the VFPMP are established in the Code of Virginia § 10.1-602. The VFPMP was last published in 2005 and was entitled *The Floodplain Management Plan for the Commonwealth of Virginia*. Strategies and actions identified in the 2005 plan are identified in Appendix C. Each of the strategies and actions identified in the 2005 plan are programmatic for DCR staff to complete; therefore, responsible parties are not identified for each action. In the 2025 VFPMP and future iterations of the plan, DCR will embrace a more collaborative approach to planning and implementation. Looking ahead, the VFPMP will assess and prioritize actions across the Commonwealth to increase flood resilience statewide and will include actions for not only DCR but also other state agencies supporting DCR to develop the plan.

DCR's Floodplain Management Program has made significant progress toward the strategies and actions identified in the 2005 VFPMP in recent years. Among the program's key accomplishments have been to provide National Flood Insurance Program (NFIP) training to floodplain management staff across the Commonwealth, including to support individuals to successfully become Certified Floodplain Managers (CFMs). In 2023, the program hosted 26 floodplain management training workshops, which were attended by 152 localities. Additionally, the DCR Floodplain Management program coordinates with professional associations like the Association of State Floodplain Managers to build statewide support structures for CFMs and floodplain managers across the Commonwealth.

In Virginia, there are currently 292 communities enrolled in the NFIP. Since the VFPMP was last published in 2005, 33 communities have joined the program. Of the NFIP communities, 28 participate in the Community Rating System (CRS) program, a voluntary incentive program that discounts flood insurance premium rates in communities that adopt certain floodplain management practices exceeding the minimum requirements of the NFIP. This is an increase of 12 communities since the VFPMP was last published. The 28 CRS communities represent over 80% of all flood insurance policies in Virginia, and approximately 65,000 policyholders benefit from the program across the state.

The Floodplain Management program also works with FEMA to provide oversight in the state and local implementation of the NFIP program through Planning, Technical Assistance and Compliance Audits in NFIP localities through the state. In 2023, the team conducted six compliance visits. The team also provides subject matter expertise to communities on an ongoing basis, including providing a state model ordinance for regulatory compliance and tailored support to communities adopting and updating their local ordinances. The model ordinance was last updated in 2018 and includes various recommendations for localities to adopt higher standards than the minimum federal requirements.

Another key accomplishment of the program since 2005 is the development of the Virginia Flood Risk Information System (VFRIS). VFRIS is a digital mapping tool that helps communities, real estate agents, prospective buyers and property owners discern an area's flood risk. By pulling together information from a variety of federal and state resources, VFRIS allows users to quickly determine if property is located within the Special Flood Hazard Area (SFHA).

The Code of Virginia states the VFPMP should be reviewed and updated every five years. The 2022 General Assembly codified a requirement that the next plan be prepared no later than December 31, 2026, and every five years thereafter, and must be integrated with the *Coastal Resilience Master Plan*. The VFPMP is currently under development within DCR and is anticipated to be released by December 2025. This next VFPMP will take a collaborative approach to planning and result in a more holistic guiding framework for the entire Commonwealth. The plan will focus on state agency programs and policies and will aim to incorporate consideration of flood risk under both current and future flooding scenarios into agency decision-making.

2.2 Coastal Resilience Master Plan – Implementation and Update Status

In October 2020, the Commonwealth released its *Coastal Resilience Master Plan Framework*, which established guiding principles, goals, and a roadmap for future planning efforts to further resilience in coastal areas of the state. The CRMP Framework includes four goals with corresponding strategies, actions, and outcomes. Of the 12 strategies identified in the Framework, five have been completed, and the remainder are in progress. A summary of key accomplishments to date is included below, and a full report on the status of goals, actions and outcomes identified in the Framework are outlined in Appendix D.

2.2.1 Goal 1: Establishing Priority Flood Resilience Projects

Key accomplishments to implement these goals over the past three years include the development of the Phase I CRMP, which was released in December 2021. This plan developed flood hazard exposure mapping for coastal flood types and developed an impact assessment to analyze the intersection of present and future coastal flooding conditions with assets of importance across the coastal region. The plan also included a non-exhaustive inventory of coastal projects submitted to DCR by localities and PDCs, and an inventory of funding resources to support coastal resilience-building efforts. In addition to creating the plan document, this process developed an interactive web application, the Coastal Resilience Web Explorer, that will remain available to the public and practitioners as a tool for understanding coastal flood risk and building flood resilience. These accomplishments were completed during an 8-month window in 2021, and schedule constraints provided to be a significant limitation on the ability to capture all major flood hazards, include all public resilience projects, prioritize projects, and have a robust public outreach and engagement effort. Although the plan included a section on sustaining planning efforts, these items were not incorporated into an actionable implementation strategy shared amongst key stakeholders and tied to metrics for accountability. Future iterations of regional resilience master plans for the coastal region and beyond will provide an actionable framework for achieving progress in reducing flood risk.

The Code of Virginia states that Phase II of the CRMP must be prepared no later than December 31, 2024, and the full plan must be updated every five years thereafter. The Phase II plan is currently under development within DCR. In addition to this coastal-focused plan, DCR anticipates developing additional regional flood resilience master plans after the completion of the next VFPMP.

2.2.2 Goal 2: Creating a Financing Strategy for Flood Resilience

The General Assembly established the Community Flood Preparedness Fund (CFPF) to provide grant and loan financing for resilience planning efforts to local and regional government bodies across the Commonwealth. To date, DCR and the Virginia Resources Authority have administered three rounds of grant offerings, from which awards have totaled $97.74 million in funding provided by the Commonwealth. Of this amount, $65.9 million, or 67.5%, has gone to communities meeting the fund's definition of low-income communities.

The Resilient Virginia Revolving Fund (RVRF) is a second state fund for flood resilience, which was established in the Code of Virginia (Title 10.1, Chapter 6, Article 1.4) in 2022. The fund was established to hold sums from a variety of sources and distribute these sums as loans and grants to local governments for flood resilience projects. Loans, grants, and appropriations from the fund may be used by local governments for projects such as residential structural and non-structural flood mitigation and gap financing, as well as projects that have been identified in the VFPMP and CRMP.

Moving forward, it is DCR's intention to focus the CFPF on large, community-scale projects while leveraging the RVRF primarily for property-scale mitigation efforts. Following a public comment period, DCR issued grant manuals for Round 4 of the CFPF and Round 1 of the RVRF in September 2023. Applicants had until November 2023 and December 2023 to apply for CFPF and RVRF, respectively.

2.2.3 Goal 3: Incorporating climate change projections into state programs

Several different efforts have been completed to ensure projections for tangible risks and impacts posed by climate change and the CRMP Framework's guiding principles are incorporated into state programs. Following state legislation targeting updates passed in 2020, both the Virginia Marine Resources Commission (VRMC) and the State Water Control Board (SWCB) adopted amendments to their guidelines and regulations. In May of 2021, VMRC adopted amendments to its Tidal Wetlands Guidelines to reflect amendments to the Code of Virginia which requires that VMRC permit only living shorelines approaches to shoreline management unless the best available science shows that such approaches are not suitable. In June of 2021, the Virginia State Water Control Board adopted amendments to the Chesapeake Bay Preservation Act (CBPA) Designation and Management Regulations (9VAC25-830-155) which now require that local governments (1) assess the impacts of climate change and sea-level rise on any proposed land development Chesapeake Bay designated Resource Protection Areas (RPAs); and (2) ensure that any activity in these areas ensures the protection of shorelines and sensitive coastal habitat from sea level rise and coastal hazards.

2.2.4 Goal 4: Coordinating Coastal Efforts across Levels of Government in Virginia

Several important efforts have been completed or are underway to empower local governments to take action to build their flood resilience in support of this goal. As described in Section 2.1 of this report, the DCR Floodplain Management Team continues to provide technical assistance and support to local governments participating in the NFIP and CRS programs. Additionally, in November 2021, Governor Northam issued Executive Order 45, which established the Virginia Flood Freeboard Standard. The standard sought to ensure flood protection in coastal and riverine flood-prone environments, including sea level rise inundation areas as well as 100-year and 500-year floodplains as mapped by the Federal Emergency Management Agency (FEMA). The standard applies to all state-owned building projects that began initial design beginning on or after January 1, 2020. In 2023, the Youngkin Administration proposed, and the Virginia General Assembly passed HB 1807/SB1392, which codified the requirement for a state standard for floodplain development and directed DCR to develop such a standard by 2023. While only state agencies are mandated to comply with the standard, it provides an example for local governments to adopt should they choose to take further action to reduce flood risk.

2.3 Community Outreach and Engagement Plan – Development Status

A crucial component of the flood resilience planning process is the involvement of stakeholders who are affected by and vulnerable to flood risk, as well as those stakeholders with responsibilities for taking action to address flood hazards. The purpose of involving these stakeholders is to allow their experiences, priorities, actions, and ideas to shape and influence the information and decisions captured in government plans. Both the VFPMP and CRMP development processes rely on public outreach and engagement efforts. To establish a framework for this work, DCR is developing a Community Outreach and Engagement Plan (COEP) that will outline the ways in which DCR, together with its partners, will involve the "whole community" through outreach and engagement to capture critical public input in developing the VFPMP and CRMP. This COEP will fulfill DCR's requirements as established in Enactment Clause 3 of HB516/SB551, passed during the 2022 General Assembly Session.

DCR released a draft COEP for public comment in December 2022. DCR will post the final COEP that incorporates public comments and additional stakeholder input to DCR's Office of Resilience Planning's Outreach and Engagement website.

3 Evaluating Critical Infrastructure Flood Risk and Resilience

Critical infrastructure is defined as the assets, systems, and networks, whether physical or cyber, which are so vital to the United States, the Commonwealth of Virginia, or its local jurisdictions that their incapacitation or destruction would have a debilitating effect on physical security, economic vitality, public health or safety, or any combination of thereof at a national, state, or local level.[3]

For the purposes of assessing the risk flooding poses, DCR organizes critical infrastructure into three categories: built, natural, and human.

[3] Critical infrastructure is defined by 42 U.S. Code § 5195c - Critical infrastructures protection. This definition is used by VDEM.

- Built Infrastructure: The man-made or modified structures that provide people with living, working, and recreational spaces encompassing the buildings we live in, the distribution systems that provide us with water and electricity, and the roads, bridges, and transportation systems we use to get from place to place.[4]

- Human Infrastructure includes the facilities and systems of a place that provide critical services to people. These services are foundational to society and the economy and are necessary to support the well-being of all citizens. Unlike built infrastructure, these sectors typically center around service provision rather than physical assets. However, they are still highly dependent on physical facilities and assets to function, such as hospitals or police stations. Both the services and the direct facilities established to house those services are considered human infrastructure.

- Natural infrastructure is infrastructure that uses, restores, or emulates natural ecological processes and (A) is created through the action of natural physical, geological, biological, and chemical processes over time; (B) is created by human design, engineering, and construction to emulate or act in concert with natural processes; or (C) involves the use of plants, soils, and other natural features, including through the creation, restoration, or preservation of vegetated areas using materials appropriate to the region to manage stormwater and runoff, to attenuate flooding and storm surges, and for other related purposes.[5]

Building resilience to flooding is one of many critical infrastructure goals that exist to secure the assets, systems, and networks upon which all Virginians rely. Documenting the vulnerability of critical infrastructure is a topic already addressed by multiple state agencies, and by federal and local governments. Rather than create a new coordination and risk assessment structure for critical infrastructure and flooding, DCR is working together with VDEM, which has taken recent strides to establish a critical infrastructure coordination program for the Commonwealth.

3.1 Coordination to Evaluate Critical Infrastructure Flood Risk and Resilience

Historically, there has not been a centralized approach to managing critical infrastructure data in Virginia. Where data does exist, it does not include asset-level information to verify exposure and assess flooding impacts. The Commonwealth does not currently have a statewide critical facility dataset. Instead, regional hazard mitigation plans appear to use different datasets. The 2023 Hazard Identification and Risk Assessment (HIRA) uses the Homeland Infrastructure Foundation-Level Data (HIFLD) open dataset to identify critical facilities in the Commonwealth. The HIFLD dataset contains general location information for each facility, but it does not contain attribute information such as building valuation, age, or size, nor does it contain information on facility criticality or importance (VDEM Commonwealth Hazard Mitigation Plan 2023).

[4] Definition established by the Environmental Protection Agency, https://www.epa.gov/smm/basic-information-about-built-environment.
[5] H.R. 3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act. (2021, November 15). https://www.congress.gov/bill/117th-congress/house-bill/3684.

Table 1. Critical Infrastructure Sectors Draft List

	CISA Sector	Code Req.[6]	Sector
Built Infrastructure	X		Chemical Sector
	X		Commercial Facilities Sector
	X	X	Communications Sector
	X		Critical Manufacturing Sector
	X		Dams Sector
	X		Defense Industrial Base Sector
	X	X	Energy Sector
	X		Information Technology Sector
	X	X	Nuclear Reactors, Materials, and Waste Sectors
	X	X	Transportation Systems Sector
	X	X	Water and Wastewater Sector
Human Infrastructure	X		Emergency Services
	X	X	Financial Services Sector
	X	X	Food and Agriculture Sector
	X		Government Facilities Sector
	X	X	Healthcare and Public Health Sector
Natural Infrastructure		X	Natural Infrastructure Sectors [to be determined]

VDEM began building a more robust Critical Infrastructure Program in 2023, including developing a Commonwealth of Virginia Critical Infrastructure Program (COV-CIP) Charter. VDEM anticipates finalizing the COV-CIP Charter in December 2023. It outlines a proposed structure for applying and promoting collaborative and innovative programs and activities that cost-effectively manage risk and enhance the resilience of the state's critical infrastructure. Efforts are underway to establish a critical infrastructure working group and advisory group comprised of key state agencies as well as private sector critical infrastructure owners, which are representative of critical infrastructure sectors (see Table 1 for a draft critical infrastructure sector list).[7] Among the functions of the program and associated groups are to identify, prioritize, and assess the vulnerability of critical infrastructure, including building out geospatial data for critical infrastructure.

[6] This column identifies sectors which are identified in § 2.2-220.5. Chief Resilience Officer for inclusion in the bi-annual status reports by CRO/DCR. The Code does specify that the report must consider risks to natural infrastructure but does not identify critical natural infrastructure sectors.

[7] VDEM's base list of sectors align with the federal Cybersecurity & Infrastructure Security Agency (CISA) critical infrastructure approach.

3.2 Roles in Critical Infrastructure Flood Risk and Resilience

Critical infrastructure serves a fundamental role in preparing for, responding to, and recovering from flood events. Effective flood risk plans identify critical infrastructure vulnerabilities and prioritize identified activities and projects based on those vulnerabilities to bolster critical infrastructure resilience. DCR is responsible for identifying, evaluating, and reporting on critical infrastructure flood vulnerability. The VFPMP, CRMP, future regional resilience master plans, and Status Reports will incorporate critical infrastructure flood vulnerability assessments. Priority critical infrastructure assets and their level of vulnerability to flooding will be an important guiding tool to inform not only project identification but also policy actions and projects. However, DCR cannot determine which infrastructure is critical nor develop critical infrastructure datasets.

To maximize the impact of state programs and reduce conflict between efforts with mutual goals, DCR will work with VDEM to leverage the COV-CIP working group to obtain data and information on critical infrastructure assets, including prioritization of these assets. As the data is being compiled and developed by the working group, DCR will continue to rely on existing best available datasets, to complete plan requirements. Identification of best available datasets will be carried out in collaboration with VDEM and the working group. DCR will contribute flood hazard expertise to the working group, including improved and forward-looking flood hazard exposure data to incorporate into critical infrastructure assessments. Importantly, to meet DCR's needs, this data will identify areas of varying flood exposure probability under current climate conditions, as well as anticipated future climate conditions. DCR will work with VDEM and the COV-CIP to develop a critical infrastructure analysis procedure to conduct critical infrastructure flood vulnerability assessments to inform the Commonwealth's flood resilience plans while also aligning with and supporting the COV-CIP's broader goals.

During resilience planning efforts, DCR will coordinate with working group members to compile information on flood resilience initiatives and projects that sustain the function of critical infrastructure. The CRO is charged with recommending actions that private and public sector actors should consider when identifying resilience initiatives and projects. According to the Coastal Resilience Master Planning Framework, the private and public sectors should pursue adaptation strategies to sustain critical infrastructure benefits wherever practical. Where impractical, structural solutions to reduce infrastructure risk should be used. Where both adaptation and structural solutions are impractical, the Framework recommends that relocation strategies should be used.

4 Next Steps

This *Status of Flood Resilience Report* summarizes the progress of flood resilience planning and implementation in the Commonwealth of Virginia, led by the CRO and DCR. In addition to providing a picture of current flood risk and resilience efforts undertaken by these entities, it introduces a charge and approach for the CRO and DCR to work with VDEM's emerging COV-CIP to engage actors responsible for building the Commonwealth's collective flood resilience through critical infrastructure vulnerability assessments. These critical infrastructure assessments will feed into an existing codified structure and timeline for resilience coordination, planning, and reporting led by the CRO and DCR. They will provide key data needed to develop not only these bi-annual Status Reports, but also to develop the Commonwealth's flood resilience and protection master plans. Table 2 contextualizes these critical infrastructure vulnerability assessments within the landscape of flood resilience deliverables over the next four years to advance resilience coordination and planning and adhere to statutory requirements.

VDEM anticipates sharing the final COV-CIP Charter with state agencies in December 2023 and launching the working and advisory groups in January 2024. DCR and VDEM will continue to work together as the group is launched to clarify specific roles, responsibilities, and scopes of work for critical infrastructure risk and resilience evaluation. Future Status Reports will provide an update on the progress of the COV-CIP and summarize flood risk for critical infrastructure assessed by sector.

Table 2. Resilience Planning Milestone Schedule

Date	Lead	Deliverable & Description
December 2023	**CRO/DCR**	**Status Report** Release the First Bi-Annual *Status of Flood Resilience Report*
December 2023	**CRO**	**Resilience Coordination** Present RCWG Final Report with Recommendations
January 2024	**VDEM and DCR**	**Initiate Critical Infrastructure Flood Vulnerability Assessment** Launch COV-CIP Charter Work Begin coordination with key stakeholders for critical infrastructure flood vulnerability assessments
June 2024	**DCR**	**Resilience Coordination** Host Annual Flood Preparedness Coordination Meeting
July 2024	**DCR and COV-CIP Working Group**	**Critical Infrastructure Flood Vulnerability Assessment** Pilot assessments for coastal region complete
December 2024	**DCR**	**Master Plan** Release *Coastal Resilience Master Plan*, Phase II Incorporates critical infrastructure flood vulnerability assessments

Date	Lead	Deliverable & Description
May 2025	**DCR and COV-CIP Working Group**	**Critical Infrastructure Flood Vulnerability Assessment** Initial statewide assessments complete
June 2025	**DCR**	**Resilience Coordination** Host Annual Flood Preparedness Coordination Meeting
July 2025	**CRO/DCR**	**Status Report** Release Bi-Annual *Status of Flood Resilience Report*
December 2025	**DCR**	**Master Plan** Release *Virginia Flood Protection Master Plan*
June 2026	**DCR**	**Resilience Coordination** Host Annual Flood Preparedness Coordination Meeting
2027-2029	**DCR and COV-CIP Working Group**	**Critical Infrastructure Flood Vulnerability Assessment** Updated assessments complete by region alongside potential regional flood resilience master plans
June 2027	**DCR**	**Resilience Coordination** Host Annual Flood Preparedness Coordination Meeting
July 2027	**CRO/DCR**	**Status Report** Release Bi-Annual *Status of Flood Resilience Report*

APPENDICES

Appendix A. Definitions

Infrastructure

The framework of interdependent networks and systems comprising identifiable industries, institutions (including people and procedures), and distribution capabilities that provide a reliable flow of products and services essential to the defense and economic security of the United States, the smooth functioning of government at all levels, and society as a whole. – FEMA

Built Infrastructure

The man-made or modified structures that provide people with living, working, and recreational spaces encompassing the buildings we live in, the distribution systems that provide us with water and electricity, and the roads, bridges, and transportation systems we use to get from place to place. – EPA

Human Infrastructure

Human infrastructure includes the facilities and systems of a place that provide critical services to people. These services are foundational to society and the economy and are necessary to support the well-being of all citizens. Unlike built infrastructure, these sectors typically center around service provision rather than physical assets. However, they are still highly dependent on physical facilities and assets to function, such as hospitals or police stations. Both the services and the direct facilities established to house those services are considered human infrastructure.

Natural Infrastructure

Natural infrastructure is infrastructure that uses, restores, or emulates natural ecological processes and (A) is created through the action of natural physical, geological, biological, and chemical processes over time; (B) is created by human design, engineering, and construction to emulate or act in concert with natural processes; or (C) involves the use of plants, soils, and other natural features, including through the creation, restoration, or preservation of vegetated areas using materials appropriate to the region to manage stormwater and runoff, to attenuate flooding and storm surges, and for other related purposes. – United States Congress, H.R.3684, Infrastructure Investment and Jobs Act

Critical Infrastructure

Critical infrastructure is defined as the assets, systems, and networks, whether physical or cyber, which are so vital to the United States, the Commonwealth of Virginia, or its local jurisdictions that their incapacitation or destruction would have a debilitating effect on physical security, economic vitality, public health or safety, or any combination of thereof at a national, state, or local level. – VDEM COV-CIP Charter

Flood Resilience

The capability to anticipate, prepare for, respond to, and recover from flood hazards with minimum damage to social well-being, health, the economy, and the environment. – Coastal Resilience Master Plan Framework

Flood Protection

Flood protection means those physical structural works which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a special flood hazard and the extent of the depths of associated flooding. Such a system typically includes hurricane tidal barriers, dams, reservoirs, levees, or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards. – Modified from 44 CFR § 59.1

Adaptation

Adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects. – Coastal Resilience Master Plan Framework

Appendix B.Statutory Requirements

Developing the *Status of Flood Resilience Report*

Code of Virginia *§ **2.2-220.5**. Chief Resilience Officer* states that the CRO's duties shall include:

"Beginning July 1, 2023, and every two years thereafter, report to the Governor and the General Assembly on the status of flood resilience in the Commonwealth.

> The report shall serve as an evaluation of flood protection for critical infrastructure, including human and natural infrastructure.
>
> The report shall identify risks to critical transportation, energy, communication, water and food supply, waste management, health, and emergency services infrastructure.
>
> The report shall also include the status of flood resilience planning.

In preparing the report, the Chief Resilience Officer shall also coordinate with the Director of Diversity, Opportunity, and Inclusion and shall be assisted by all relevant Secretariats and agencies."

Coordinating Resilience Initiatives

According to the Code of Virginia, § 2.2-220.5. Chief Resilience Officer, the Chief Resilience Officer "shall serve as the primary coordinator of resilience and adaptation initiatives in Virginia and as the primary point of contact regarding issues related to resilience, recurrent flooding, all flooding-related pre-disaster hazard mitigation, and adaptation."

DCR as the Lead Administrator of the CRMP and VFPMP

Under the CRO's direction, as outlined in § 10.1-602, DCR is responsible for powers and duties related to flood resilience plan administration, implementation, and integration for the Commonwealth. Specifically, DCR is the lead administrator for the CRMP and the VFPMP, which – once complete – will serve as a comprehensive foundation of the Commonwealth's flood resilience planning efforts.

Appendix C.2005 Virginia Flood Protection Master Plan Implementation Status

Strategies	Activities	Status
1 Enhance the Floodplain Management Program's Effectiveness in Coordinating NFIP Activities and Achieving the Program's Goals and Objectives.	1. Improve the effectiveness of Community Assistance Visits (CAVs), Contacts (CACs), and Planning/Technical Assistance Visits (PTAVS) with NFIP communities within the Commonwealth.	***Completed.*** In 2023, DCR conducted six compliance audits. In 2023, FEMA updated the Community Assistance Visit and Contact process. The new compliance audit process requires a significantly higher amount of detail, coordination, field tours, and administrative review, which reduces the feasibility of the 2005 targets. In 2022, DCR modernized the CAV/CAC process with the development of the Floodplain Management Database System, which serves as a repository for documents and a tool for interfacing with the locality. Field operations were modernized with the use of electronic tablets and applications to collect data during compliance visits and disaster assistance visits. The Floodplain Management Database System is a COVA tool and does not replace the reporting requirements in the FEMA Community Information System. CAV/CAC data is entered into CIS at various touchpoints throughout the process. CAV reports are updated in CIS and submitted to the locality within 45 days of the completed field tour. DCR utilized the FEMA CEPT tool to prioritize community assistance.
	1.b Maintain/Improve the percentage of communities adopting New/Revised FIRMs and Floodplain Management Ordinances and Increase the Percentage of Communities that Adopt Prior to FEMA Issuing the 30-Day Notification Letter.	***Completed.*** DCR maintained the percentage of communities adopting New/Revised FIRMs and Ordinances at 100%. DCR tracks the status of FEMA map study projects on a monthly basis. After the release of preliminary FIRMs and FIS reports, FEMA and DCR hold a formal meeting to present the new flood hazard data to community officials (Consultation Coordination Officer or CCO Meeting). Changes in flood risk and notification requirements are explained, and the locality has an opportunity to provide feedback on the products. Upon the issuance of the FEMA Letter of Final Determination (LFD), DCR conducts an LFD coordination meeting with the locality. The LFD coordination meeting explains the map adoption process, including the model ordinance, resources, and guidelines for statutory compliance. DCR does not track the percentage of communities that adopt prior to FEMA issuing the 30-Day notification letter. No communities were suspended from the NFIP due not non-compliant map adoption in 2023.

Strategies	Activities	Status
	1.c Implement Utilization of the Virginia Flood Prevention and Protection Assistance Fund (VFPPAF) for Flood Hazard Identification and Reduction Projects.	***Completed***. The VFPPAF is now the Dam Safety, Flood Prevention and Protection Assistance Fund Grant Program. This grant program is well utilized by communities throughout the Commonwealth. In 2022, more than $1.6 million in competitive projects were approved by the Soil and Water Conservation Board. However, these projects are exclusively used for dam safety projects. Two new grant funding sources, the Community Flood Preparedness Fund (CFPF) and the Resilient Virginia Revolving Fund, have been established to support flood hazard identification and reduction projects. Since October 2021, 3 grant submission rounds of the CFPF have awarded more than $97 million to nearly 100 flood resilience efforts throughout the Commonwealth. DCR released the manuals for the CFPF Round 4 and the Resilient Virginia Revolving Fund in September 2023 and accepted applications for CFPF and RVRF in November 2023 and December 2023, respectively. DCR is currently evaluating the applications. Round 4 of the CFPF included 68 application submissions, with nearly $78 million in requests.
2 Expand the Role of the Program in Floodplain Mapping Activities	2.a Increase Cooperating Technical Partner (CTP) Participation	***Completed.*** DCR has increased CTP participation by supporting the outreach and engagement activities within the RiskMAP process, including Discovery, Flood Risk Review, and CCO meetings. DCR conducts the annual Risk Reduction Consultation meeting. On March 17, 2023, DCR, VDEM, and FEMA Region 3 hosted the Virginia 2023 Risk Reduction Consultation. The annual meeting brings together federal, state, and local partners to share progress on risk reduction efforts, identify areas of collaboration, and discuss ways to advance mitigation solutions. In 2024, DCR will host the inaugural FEMA Region 3 CTP Summit. This event will convene CTP partners to collaborate on programmatic initiatives and implementation of new requirements. CTP Combined Course is a DCR-facilitated training that includes floodplain management topics with a technical focus. The 2023 course was delivered in-person and virtually and consisted of elevation certificates, flood risk products, Community Rating System, VA Flood Risk Information System, and floodplain ordinances.

Strategies	Activities	Status
		DCR contributed to the development of the State Hazard Mitigation Plan, including data acquisition and subject matter expertise support. Regional Hazard Mitigation Plan support was provided to the Northern Neck PDC, PlanRVA PDC, Crater PDC, and NVRC PDC. Hazard Mitigation Plan Integration training is a new DCR training course and was virtually facilitated in 2022 and 2023. In 2022, DCR and FEMA Region 3 co-presented at the VA Building Code Officials Association mid-year conference. Topics presented include building codes and the NFIP, crisis track software, and substantial damage. Participated as a voting member in the Department of Housing and Community Development Resiliency Sub-Workgroup. The workgroup evaluated the current Uniformed Statewide Building Code (USBC) and provided suggestions for increased resiliency. Various higher standards, as well as alignments of the USBC and the requirements of the NFIP, were proposed and submitted for Board approval. Active participation in the post-disaster recovery efforts for Buchanan County, Federal declared disasters (DR-4628 and DR 4674).
	2.b Approaching Mapping Projects with a "Clustering" Strategy	***Completed.*** DCR coordinates with FEMA to execute map studies on a watershed basis. The current FEMA Region 3 Multi-Year Flood Hazard Mapping Plan outlines the areas of interest for the next three federal fiscal years. The 47 active projects are geographically clustered by watershed and at various stages of development in the RiskMAP process.
	2.c Development of Mutually Beneficial Partnerships with State, Regional, and Local Government and Private Entities	***Completed***. DCR participates in many inter-governmental and inter-agency partnerships. These include the Virginia Silver Jackets, GIS Flood Data Collaborative, Coastal Zone Management Policy Team, DHCD Sub-Resilience Workgroup, Buchanan County Flood Recovery Task Force, FEMA R3 Equity-in-Mitigation Workgroup, State Hazard Mitigation Planning Workgroup, and EO45 Workgroup. The RCWG report will provide recommendations for additional inter-governmental and inter-agency coordination to increase flood resilience in the Commonwealth.
	2.d Development of a Web-Based System for Public Access to FIRMs and Mapping Information	***Completed***. The Virginia Flood Risk Information System (VFRIS) was acquired by DCR from VIMS in 2017 and has since been upgraded to the ESRI platform. VFRIS is currently undergoing redevelopment.

Strategies	Activities	Status
	2.e Providing Technical Mapping and Flood Study Support to Local Officials for LOMCs and Approximate A-Zones	***Completed.*** DCR provides technical assistance and guidance to localities for LOMCs and Zone A floodplain management. DCR provides LOMC training through the facilitation of the Emergency Management Institute course: *Managing Floodplain Development through the NFIP*.
	2.f Meeting FEMA's "Sub-Program" Performance Measures"	***Completed***. In 2023, FEMA assigned DCR as Proficient within the Tiered State Framework Assessment Process. The next 3-year assessment is scheduled for 2026.
3 Broaden and Deepen Floodplain Management Education and Training	3.a Revise and Update Virginia's Floodplain Management Plan and Accompanying Guides for Citizens and Local Officials.	***In Progress.*** The Virginia Floodplain Management Plan and Accompanying Guides for Citizens and Local Officials have not been revised or updated since 2005. A revised and updated Virginia Flood Protection Master Plan is scheduled to be released prior to Dec 2026. In 2022, DCR, DHR, and the VA Silver Jackets won an award from the USACE to create a VA-specific mitigating historic structures from flooding guidebook. The project is currently active.
	3.b Increase the Number of Attendees at Floodplain Management Training Workshops and Expand the Audience to Include Non-Traditional Attendees.	***In progress.*** In 2022, 152 localities attended 26 Floodplain Management Training Workshops. Non-traditional attendees included private sector firms, academic professionals, and NFIP-participating communities outside of Virginia. DCR conducted a series on plan integration and grant development workshops for state and federal grants. The first series of trainings were deployed in southwest Virginia and included the DCR CFPF grant manual and application, VDEM flood mitigation grants, and DHCD flood mitigation grants. The second trainings were coordinated by FEMA Region and included a review of local plans, project prioritization, and application development.
	3.c Increase the Number of Certified Floodplain Managers that are Local Officials in the Commonwealth.	***Completed.*** DCR has certified senior instructor staff, which enables the agency to conduct the field-deployed Emergency Management Institute L273: Managing Floodplain Development Through the NFIP training course (4 days). This course provides a foundational level of knowledge and preparation to become a CFM. In 2022, DCR facilitated 2 L273 courses, and 3 in 2023. DCR also coordinated and proctored the ASFPM CFM exam until the paper exam ended in December 2022. 4 CFM exam sessions were proctored by DCR in 2022.

Strategies	Activities	Status
4 Expand the Enrollment of Virginia Communities in the NFIP and the Number of NFIP Communities in the Community Rating System.	4.a Increase the Number of Flood-Prone Communities in Virginia That Are Enrolled in the NFIP.	***Completed***. 292 of Virginia's communities are enrolled in the NFIP today. This represents an increase of 21 communities since the 2005 report was published. The DCR Floodplain Management team actively engages with all communities to reinforce the importance of participating in the NFIP.
	4.b Increase the Number of Community Rating System (CRS) Communities in Virginia and Improve CRS Classification of Existing Communities.	***Completed.*** 28 of Virginia's communities participate in the CRS program, representing 80% of all flood insurance policies in Virginia. Approximately 65,000 policyholders benefit from insurance rate discounts obtained through the program, resulting in a total statewide savings of nearly $5 million each year. The DCR team regularly shares information with communities regarding CRS, including receiving requests for training and technical assistance to communities interested in joining the program or obtaining a better class rating. Additionally, DCR hosts a webpage with information and links to additional resources on the program. DCR has leveraged resources from Wetlands Watch, a non-profit organization, to provide detailed training and resources to communities on participation in the program.
5 Expand Upon Existing Partnerships of Floodplain Management Stakeholders and Develop Additional Partnerships.	5.a Establish two stakeholder groups to further develop and refine the resources that will be used to annually update the information and strategies needed to develop a more effective, statewide floodplain management program.	***Completed***. Partnerships with floodplain management stakeholders have been expanded through outreach and engagement with the arts community, K-12 public schools, local non-profits/non-governmental organizations, and community organizers.
6 Develop Regulations at the State and Local Level to Encourage Development Away from Flood Hazard Areas and to Provide a Better System of Checks and Balances for Local Floodplain Management Programs.	6.a Coordinate with Local Officials Administering the Floodplain Management Ordinances to Encourage Adoption of State Recommended Higher Standards as Additional Flood Damage Preventive Measures.	***Completed.*** DCR most recently revised the State Model Floodplain Management Ordinance in 2018. The model includes various recommendations for localities to adopt higher standards than the minimum CFR requirements. During L273 and other training activities, information about these higher standards and their benefits is shared with participating communities. The State Model Floodplain Ordinance is currently being revised based on the Virginia Flood Risk Management Standards and NFIP transformation updates. The updated State Model Floodplain Ordinance will be published in 2024.
	6.b Develop Higher Standards of Flood Hazard Protection in State Statutes and Regulations that Enable DCR to Provide Better Oversight of Local Programs.	***Completed.*** State Code of Virginia § 10.1-602 enables DCR to make periodic inspections to determine the effectiveness of local flood plain management programs, including an evaluation of the enforcement of and compliance with local flood plain management ordinances, rules, and regulations. These activities are carried out through the CAV/CAC process.

Strategies	Activities	Status
		The 2023 General Assembly passed HB1807/SB1392 – State agency compliance with flood plain management regulations, that directs DCR to establish standards for development in a floodplain for all state agencies and departments no later than September 30, 2023. DCR has been working with an interagency workgroup since 2021 to establish processing guidelines for state floodplain development review. Final memorandum of agreements will be completed in 2023 with VDOT and Forestry.

Appendix D. Coastal Resilience Master Plan Implementation Status

Goal 1

Goal 1 Identification of priority projects in the *Coastal Resilience Master Plan (CRMP)*			
Action	**Outcome**	**Responsible Party**	**Status**
1.1 In collaboration with local and regional entities, identify critical built and natural infrastructure.	1.1.1 Prioritized list of built infrastructure critical for national security, public health and safety, and/or the economy informs all coastal resilience planning and funding	DCR	***In progress.*** During the development of the CRMP, specific assets – spanning the areas of community resources, critical sectors, and natural infrastructure – were collected and incorporated into the impact assessment models. This effort touched on identifying all critical infrastructure, such as emergency service provision facilities, transportation infrastructure, energy infrastructure, communications infrastructure, and water, waste, and wastewater facilities. Through the *Status of Flood Resilience* report and future resilience plan updates, DCR will partner with Critical Infrastructure Coordinators to identify and prioritize critical infrastructure, which will be used to inform project prioritization (Action 1.2).
	1.1.2 Prioritized list of natural infrastructure critical for flood and storm protection, water quality management, and/or wildlife habitat services informs all coastal resilience planning and funding	DCR	
1.2 Identify projects to protect and sustain the functions of critical built and natural infrastructure	1.2.1 Adaptation strategies for sustaining benefits from existing infrastructure wherever practical	DCR	***In progress.*** Phase I of the CRMP created an inventory of resilience projects through a survey call for information to localities and PDCs. The information collected has been inventoried in the Coastal Resilience Database. An initial, data-driven approach to evaluate and prioritize projects based on projects' alignment with the guiding principles of the *Coastal Resilience Master Plan Framework* was conducted during the CRMP Development. Phase II of the CRMP will result in additional project identification at the regional and local levels, as well as identifying new statewide initiatives to address adaptation, protection, and relocation.
	1.2.2 Where adaptation is impractical, structural solutions for infrastructure risk reduction over the next 20, 40, and 60 years that consider social and economic equity, ecological impacts, and financial realities	DCR	
	1.2.3 Relocation strategies for built and natural infrastructure for which adaptation and/or protection is not practical	DCR	

Goal 2 Establishment of a financing strategy			
Action	**Outcome**	**Responsible Party**	**Status**
2.1 Develop a detailed needs assessment and list of recommended funding sources to support implementation of the Master Plan	2.1.1 funding and financing sources for priority projects	DCR	***In progress.*** Phase I of the CRMP created an inventory of funding and financing sources for projects in the database; however, priority projects were not identified. When priority projects are identified, progress on this desired outcome can begin.
	2.1.2 authorizations for use of new and innovative funding mechanisms	CRO, SNR, and Gov	***In progress***. Virginia created and funded the Resilient Virginia Revolving Loan Fund. The grant manual is available on the DCR RVRF website. DCR issued the first offering of this fund in September 2023, with applications due December 2023.
2.2 Establish guidelines for administering the Community Flood Preparedness Fund	2.2.1 evaluation and prioritization of projects based on their effectiveness in reducing current and future risk, meaningful incorporation of equity and natural resource principles, and financial realities	DCR	***Completed.*** The CFPF has a scoring sheet for all application types to evaluate and inform the award decision. The CFPF Round 4 grant manual that includes a revised scoring procedure is available on the DCR CFPF website.
	2.2.2 monitoring, evaluation, and adaptive management to ensure desired results are achieved	DCR	***In progress.*** The CFPF grant manual was released for public comment, and the manual was updated prior to the first grant round (2021) and the fourth grant round (2023). Input from the public and an internal review of applications and awards are the basis for the adaptative management approach. Additionally, DCR has developed an online grants management portal to facilitate this process. C

Goal 3 Effective incorporation of climate change projections in state programs			
Action	**Outcome**	**Responsible Party**	**Status**
3.1 Fully implement Executive Order 45	3.1.1 state agency compliance with the new freeboard and sea level rise planning standards	DCR	***In progress.*** In accordance with HB1807/SB1392 of the 2023 General Assembly, DCR shall establish state standards for development in a flood plain for all state agencies and departments of the Commonwealth no later than September 30, 2023.
	3.1.2 all state-sponsored development activities in flood-prone areas meet National Flood Insurance Program (NFIP)-compliant requirements and standards	DCR	
3.2 Amend the Chesapeake Bay Preservation Act (CBPA) guidance to address the anticipated inland migration of regulated areas as sea level rises (HB 504)	3.2.1 local implementation of the CBPA addresses pressure to protect developed property from encroaching sea level while avoiding, or minimizing and mitigating, the environmental consequences	DEQ	***Completed.*** On June 29, 2021, the Virginia State Water Control Board adopted amendments to the CBPA regulations that incorporate climate adaptation and the preservation of mature trees.
	3.2.2 coordination of the CBPA implementation with the Tidal Wetlands Act implementation to integrate project reviews and compensatory mitigation of unavoidable impacts	DEQ	
3.3 Amend the Tidal Wetlands Act guidance to accommodate inland migration of tidal wetlands as sea level rises (SB 776)	3.3.1 local and VMRC decisions make no net loss of wetland resources possible by requiring riparian buffers and/or effective compensatory mitigation of probable future impacts	VMRC	***Completed.*** VMRC issued updated guidelines on May 19, 2021, which were approved by the VA Marine Resources Commission on May 25, 2021. These guidelines went into effect immediately after VMRC approval.
	3.3.2 coordination of the Tidal Wetlands Act implementation with CBPA implementation	VMRC	
3.4 Incorporate coastal resilience considerations into water management programs	3.4.1 management of stormwater, wastewater, groundwater, and surface water that accounts for projected sea level rise in a manner that avoids or minimizes and mitigates current and future risks to built and natural infrastructure	DEQ	***In progress.*** EPA will work with Virginia prior to the release of its final Phase III WIP to determine if the additional climate change reduction commitments (with the associated nutrient exchanges and state-basin exchanges) will achieve water quality standards in the Chesapeake Bay and its tidal tributaries.
	3.4.2 incorporation of resilience criteria into water quality grant programs	DEQ	***In progress.*** In 2021, the Special Advisor on Coastal Adaptation and Policy (SACAP) discussed incorporating resilience criteria into the DEQ Stormwater Local Assistance Fund (SLAF). However, the code and budget governing language do not allow for incorporating resilience into the SLAF guidelines.

Goal 4 Coordination of state, federal, regional, and local coastal efforts			
Action	**Outcome**	**Responsible Party**	**Status**
4.1 Ensure that state and federal hazard mitigation and community development grant programs administered by the Commonwealth and localities are aligned under the Master Plan	4.1.1 Virginia Department of Emergency Management (VDEM)-administered hazard mitigation grants in the coastal zone align with Master Planning Framework guiding principles and support projects and strategies identified in the Master Plan	VDEM	***In progress.*** Federal funding sources available to state agencies are aligned with the federal funding source requirements. Throughout 2023, the Resilience Coordination Working Group (RCWG) is evaluating opportunities to improve interagency coordination for federal funding sources to increase flood resilience across the Commonwealth.
	4.1.2 Department of Housing and Community Development (DHCD)-administered grants in the coastal zone align with Master Planning Framework guiding principles and support projects and strategies identified in the Master Plan	DHCD	
4.2 Empower localities and individuals to make informed decisions	4.2.1 localities have access to sea level rise and freeboard guidance	CRO/ SACAP	***Completed.*** The Virginia Flood Freeboard Standard is available on DCR's website.
	4.2.2 a strategic coastal relocation handbook is available to inform local planning	TAC	***In progress.*** A draft Introduction to Strategic Coastal Relocation was produced by the Coastal Resilience Technical Advisory Committee Members and Advisors. The draft document has not been approved for release.
	4.2.3 localities have the legal tools necessary to prevent irresponsible land development	VA	***In progress.*** § 15.2-2200 of the Virginia Code enables localities to improve the public health, safety, convenience, and welfare of their citizens and to plan for the future development of communities.
	4.2.4 sellers of real estate are required to disclose if a property is located in a special flood hazard area, has sustained flood damage, or contains a dam	VA	***In progress.*** § 55.1-708.2 of the Virginia Code requires that the owner of residential real property located in the Commonwealth who has actual knowledge that the dwelling unit is a repetitive risk loss structure shall disclose such fact to the purchaser.
	4.2.5 all coastal localities have engaged in the Resilience Adaptation and Feasibility Tool (RAFT) process	CRO/ SACAP	***In progress.*** Localities within the following PDCs have completed the RAFT process: A-NPDC, NNPDC, and MPPDC. Hopewell and Petersburg, within Crater PDC, are currently enrolled in the RAFT process.

Goal 4 Coordination of state, federal, regional, and local coastal efforts			
Action	**Outcome**	**Responsible Party**	**Status**
4.3 Implement 2019 DCR Dam Safety and Floodplain Management Report recommendations	4.3.1 all coastal localities act to protect the natural functions of floodplains and to ensure all essential structures are located outside of known floodways	DCR	***In progress.*** All coastal localities participate in the NFIP, meeting the minimum NFIP standard and have a floodplain ordinance.
	4.3.2 all coastal localities fully participate in NFIP Community Rating System (CRS).	DCR	***In progress.*** In Virginia, 22 coastal communities participate in the CRS program. This is approximately 39% of the 57 total coastal localities, as defined by the CRMP.
4.4 Protect and enhance natural coastal defenses	4.4.1 state, federal, regional, and local authorities all fully incorporate the ConserveVirginia assessments in planning and implementation	VA	***In progress.*** ConserveVirginia assessments are included in planning on a voluntary basis.
	4.4.2 state, federal, regional, and local authorities utilize restoration and protection of natural shorelines and coastal landscapes as a resilience strategy whenever possible	VA	***Completed.*** In accordance with § 28.2-104.1 of the Virginia Code, living shorelines are required unless the best available science shows that the practice would not be suitable on the site.

Appendix E. Additional Flood Resilience Planning Efforts

In addition to the CRMP and VFPMP, there are numerous other planning processes that aid in advancing resilience planning at the state, regional, and local levels. A summary of several of the most relevant planning efforts is presented here; however, this is not an exhaustive account of all plans.

Commonwealth of Virginia (COVA) Hazard Mitigation Plan

The Virginia Department of Emergency Management (VDEM) is responsible for producing the *Commonwealth of Virginia Hazard Mitigation Plan*. This plan guides risk-informed decision-making at the state level. It also guides local governments engaged in mitigation planning, including vulnerable and underserved communities. All state mitigation plans are updated, which means that the planning process should continuously improve and become more inclusive and comprehensive over time (FEMA, State Mitigation Planning Policy Guide: FP 302-094-2, 2022) .

In accordance with 44 CFR § 201.4(a), states must have an approved state mitigation plan meeting the requirements in 44 CFR § 201.4 as a condition of receiving certain non-emergency Stafford Act assistance and FEMA mitigation grants. State mitigation plans must be submitted to FEMA for approval every five years to maintain this condition of eligibility.

The *Virginia State Hazard Mitigation Plan* was recently updated, approved, and adopted in 2023 and is renewed every five years. Flooding is one of many natural hazards considered in the Plan and is listed as a high risk across the commonwealth relative to the other natural hazards. The plan identified 21 mitigation actions that address flood hazards across the commonwealth, one mitigation action that addresses erosion, and 28 multi-hazard actions that will address flooding alongside other hazards.

Community Flood Preparedness Fund Supported Regional and Local Resilience Plans

The Virginia Community Flood Preparedness Fund (CFPF) was established to provide support for regions and localities across Virginia to reduce the impacts of flooding. To qualify for project funding, an applicant must have a resilience plan that has been approved by DCR. To qualify, a resilience plan must be a locally adopted plan that describes the entire local government's approach to flooding and must meet the following criteria:

1. It is project-based, with projects focused on flood control and resilience.
2. It incorporates nature-based infrastructure to the maximum extent possible.
3. It includes considerations of all parts of a local government regardless of socioeconomics or race.
4. It includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for plan implementation.
5. It is based on the best available science and incorporates climate change, sea level rise, storm surge (where appropriate), and current flood maps.

Resilience Plan may refer to a previously adopted "stand-alone" plan that meets the definition or references the elements of other plans or may be multiple documents that address the elements of the definition when compiled. Sources of elements of compiled plans may include sections from a local comprehensive plan or other land use plans or ordinances, a local hazard mitigation plan, a plan developed that addresses flooding and resilience but may include other elements, and plans developed for the local government by a third party that addresses any of the elements described in 1 – 5 above. These may also include regional strategies or plans in which a local government is a party. In either case, a stand-alone plan or a document that includes the compiled elements of multiple plans or documents should be submitted and include identification of the sources of the plans or elements submitted. If a locality does not already have one or more plans that meet the criteria for a resilience plan, the locality may apply for funding through the CFPF to support the development of such a plan.

Currently, 21 communities and 3 PDCs have an approved flood resilience plan by DCR. Of the Commonwealth's 17 communities with a FEMA National Flood Risk Index score of "relatively moderate" or higher, 35% have an approved locality or PDC flood resilience plan. There are an additional 20 communities and 3 PDCs that are currently developing flood resilience planning products with funding from the CFPF. Figure 4 identifies where Resilience Plans have been approved by DCR or are funded by CFPF and are in development. Each plan is valid for three (3) years and must be renewed if seeking future project funding via the CFPF.

USACE Coastal Storm Risk Management Plans

The United States Army Corps of Engineers (USACE) plays an important role in flood protection planning at the federal level and in partnership with localities at risk. The USACE-produced Coastal Storm Risk Management Plans require congressional authorization and funding but also lead to congressional authorization for cost-shared engineering and construction of coastal storm risk management projects. USACE requires a local, non-federal sponsor to support the planning effort, and ultimately, the local sponsor is expected to work together with USACE to implement storm reduction strategies that increase resilience and reduce risk from future storms and the future impacts of sea level change (SLC).

These plans typically follow the 3x3x3 rule, meaning that the plan is completed in a target goal of 18 months, but no more than three years, at a cost not greater than $3 million, and requires three levels of vertical coordination to complete.

There are three (3) USACE Coastal Storm Risk Management Plans that are currently underway in Virginia.

1. **Virginia Beach**:[8] The Virginia Beach Coastal Storm Risk Management Study is an investigation that will address the risk caused by storm surge flooding, waves, and erosion citywide. The plan will formulate strategies to manage the impacts that coastal storms have on the people and development in the city. The study began on July 21, 2022, and is expected to take at least three years to determine appropriate coastal storm risk management solutions.

2. **Northern Virginia**[9]: The Northern Virginia Regional Commission and the Metropolitan Washington Council of Governments, in a cost-share partnership with USACE, the Commonwealth of Virginia, the Metropolitan Washington Airports Authority, and Fairfax County, are partnering to complete this study. The study aims to understand, define, and determine solutions for coastal flooding and negative environmental impacts along the Virginia

[8] https://www.nao.usace.army.mil/About/Projects/VBCSRM/
[9] https://www.nab.usace.army.mil/DC_Coastal_Study/

shores of the Potomac River from the fall line to Prince William County. This Northern Virginia study was restarted in 2019 and was submitted to Army Corps North Atlantic Division and Army Corps Headquarters in 2023. A Chief's signed report is anticipated in March 2024.

3. **Norfolk**[10]: The Norfolk Coastal Storm Risk Management Study is a comprehensive investigation of flood-risk management problems and solutions in the city. The study considered past, current, and future flood-risk management and resilience-planning initiatives and projects underway at USACE and other federal, state, and local agencies. The Norfolk study was conducted in 2016-2019 and is now advancing to funding and implementation stages. Additional information is available at the Resilient Norfolk Coastal Storm Risk Management website.

Local and Regional Hazard Mitigation Plans

A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy. In Virginia, plans are generally aligned by Planning District regions, with most regional hazard mitigation plans coordinated and led by local emergency managers. VDEM assists regions with the planning process and provides a preliminary review of the plan prior to submittal to FEMA.

Figure 5 shows the status of hazard mitigation plans and plan expiration dates for each of the 20 regional hazard mitigation plans in Virginia. Not included in the figure are hazard mitigation plans from federally recognized tribes. However, the Chickahominy Indian Tribe has an adopted Multi-Hazard Mitigation Plan which will expire in 2027.

[10] https://www.nao.usace.army.mil/NCSRM/

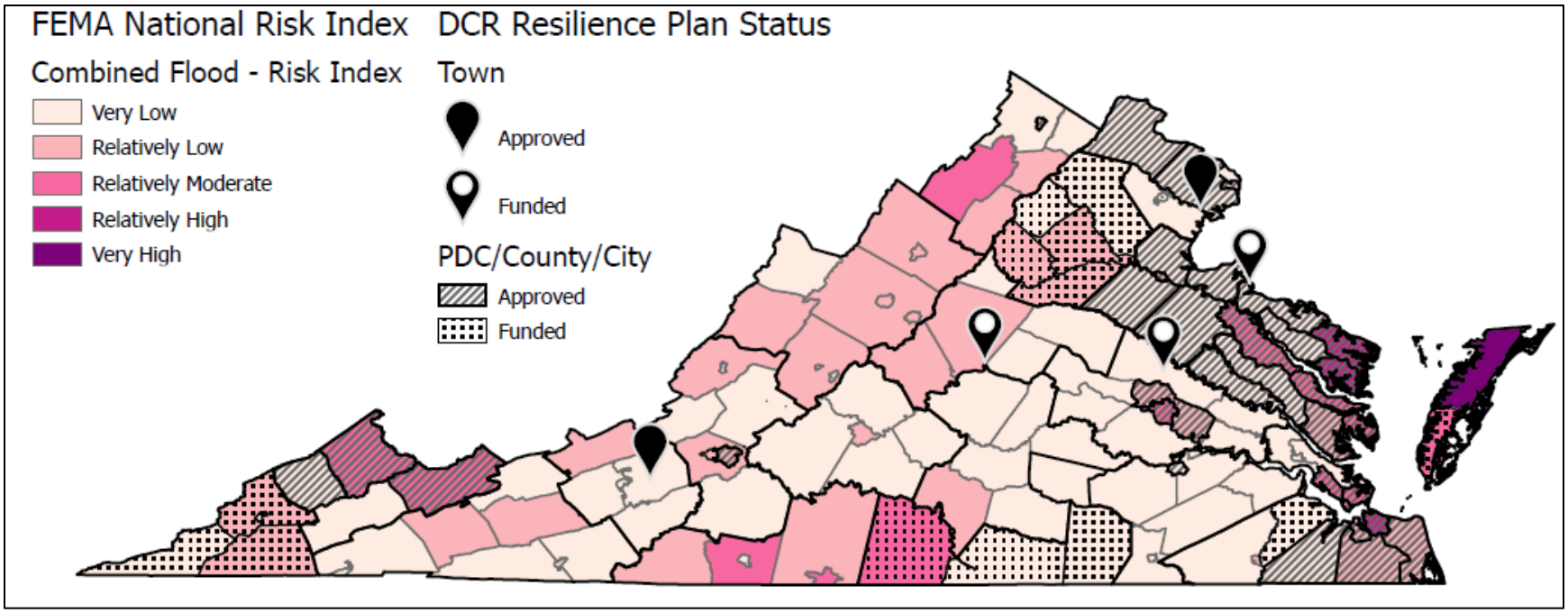

Figure 4. Status of DCR Approved or CFPF Funded Resilience Plans as of December 2023 (FEMA 2022 NRI Data)

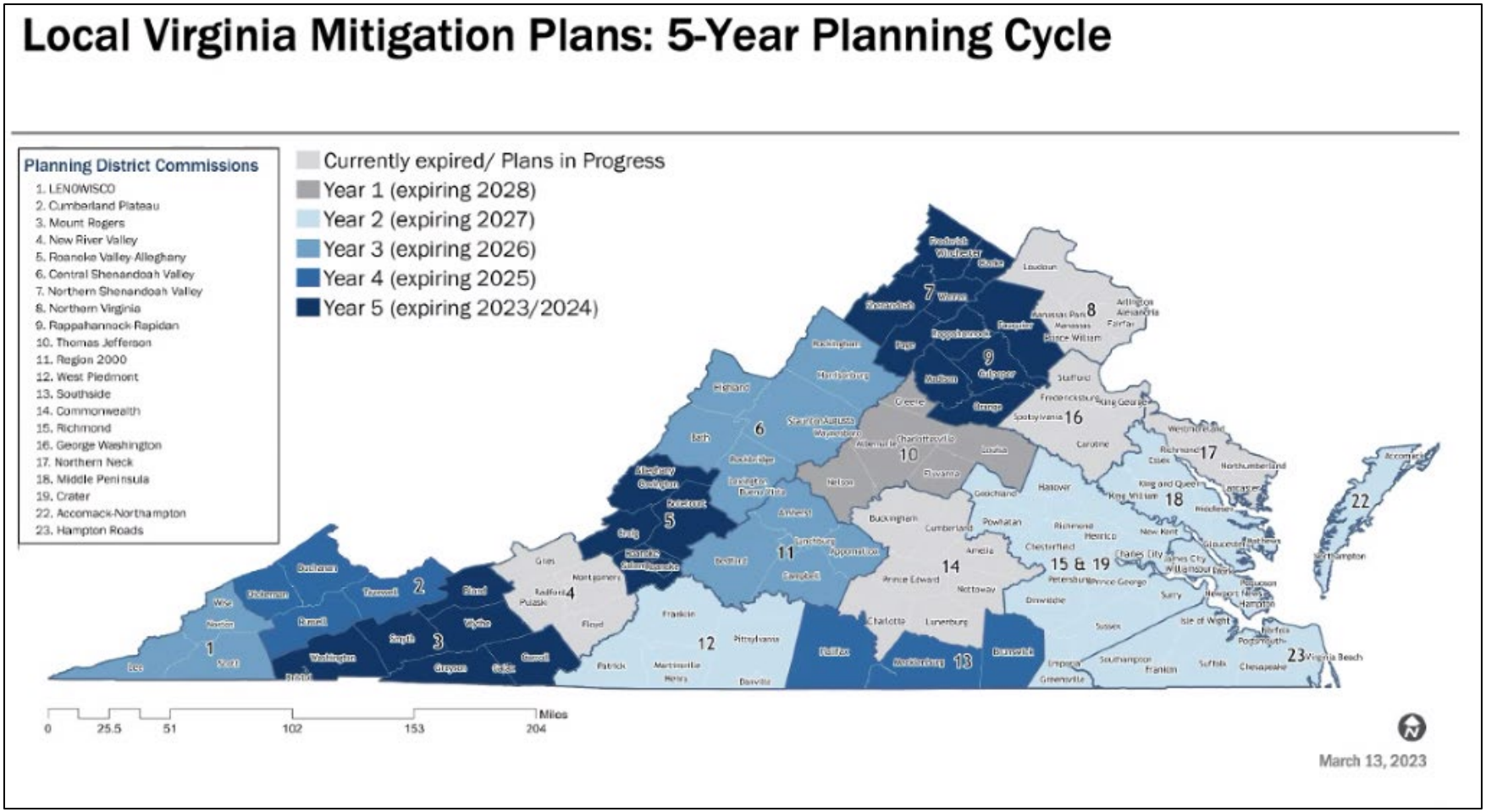

Figure 5. Local Hazard Mitigation Plan Status and Expiration Date as of March 2023 (FEMA Region 3)