

EXECUTIVE SUMMARY

INTRODUCTION

The Commonwealth of Virginia is pleased to present the Virginia Coastal Master Planning Framework. This Framework lays out the core principles of our approach to coastal adaptation and protection, and the process by which the Commonwealth will develop and begin implementing Virginia's first Coastal Resilience Master Plan by the end of 2021.

Following the guidance of the U.S. Global Climate Change Research Program, we define resilience as the capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, health, the economy, and the environment.¹ Similarly, we define adaptation as adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects.²

The primary objective of the Virginia Coastal Resilience Master Plan will be to improve the Commonwealth's resilience and ability to adapt to rising seas, increased nuisance flooding, and more frequent and intense storms that result from climate change and threaten our coastal communities. This Framework promotes the roadmap for how we get there.

WHAT'S AT STAKE

The Commonwealth of Virginia has much to lose should the impacts of sea level rise and climate change continue unaddressed. Virginia's coastal region covers 8,950 square miles, approximately one quarter of the state. More than 10,000 miles of tidally influenced shoreline only exacerbate the region's flood risk. Virginia's coastal region lacks the degree of resilience needed to ensure that coastal localities can minimize loss of life and damage to private property and public infrastructure.

Recent estimates show that 250,000 acres of land, 1,469 miles of roads, and property valued at \$17.4 billion lie less than five feet above the high tide line in Virginia.³ This is a concern, as many components of coastal Virginia's economy are simultaneously both water dependent and exposed to coastal hazards. The Department of Defense and its contractors collectively employ 252,187 people; in 2017, they spent more than \$46.2 billion in Virginia.⁴ The Hampton Roads region alone is home to 139,000 military personnel and contractors, and Department of Defense related spending, including shipbuilding and ship repair, is the primary driver of the region's economy.⁵ Rural coastal communities face a separate set of challenges that includes flooded access roads, failure of septic systems, and an acute lack of resources for large-scale resilience initiatives.

Virginia's coastal ecosystems support fisheries, wildlife, aquaculture, navigation, carbon storage and tourism, and provide significant natural defenses against coastal storms. Further, troves of priceless cultural resources that tell the Commonwealth's rich history are still being discovered all along our coast, besides what we have found already at places like Jamestown, Fort Monroe, and sacred Virginia Indian sites. These natural and cultural resources are vulnerable to sea level rise, erosion, flooding, and other coastal hazards and must be protected before they are lost forever.

To protect and preserve Virginia’s way of life, its economy, and its diverse cultural and natural resources, it is imperative that the Commonwealth lead a coordinated initiative to ensure improved resilience and to protect our coasts.

THE RISK

Coastal Virginia has some of the highest relative sea level rise rates in the United States due to the combined effects of climate-driven sea level rise and land subsidence.⁶ Using the National Oceanic and Atmospheric Administration’s (NOAA) Sewell’s Point tide gauge in Norfolk as the primary tidal data reference, Virginia has experienced more than 18 inches of relative sea level rise in the past 100 years.⁷

Multiple studies, including those from the United Nations Intergovernmental Panel on Climate Change (IPCC), the National Climate Assessment, and NOAA Technical Report: Global and Regional Sea Level Rise Scenarios for the United States, report that sea level will continue to rise at an accelerating rate. The NOAA 2017 Relative Sea Level Change Scenarios for Sewell’s Point predict as much as 6.69 feet of relative sea level rise by 2100.

In addition to rising seas, the National Climate Assessment states that the Southeast United States has experienced an increase in frequency and intensity of extreme rainfall events, which often cause severe flooding, and this trend is expected to continue.⁸ The combination of relative sea level rise, increases in frequency and duration of rainfall events, rising regional water tables, and storm surge from more frequent and severe weather systems will exacerbate flooding in coastal Virginia.

For example, recurrent flooding in Hampton Roads increased from 1.7 days of flooding per year in 1960 to 7.3 days per year in 2014.⁹ Estimates project the influences of wind and coastal storms may increase this number to 200 per year by 2049.¹⁰ Coastal Virginia is also vulnerable to flooding due to higher water tables as the sea level rises, and the degree to which this impacts current and future coastal flooding is not yet fully understood.¹¹

The impacts of sea level rise and flooding are magnified by population density: Virginia’s coastal region is home to more than 70 percent of the Commonwealth’s population.¹² Coastal regions across the United States are seeing population increases, with the U.S. Department of Commerce estimating that 47 percent of the U.S. population lives along coastlines, putting a significant portion of the public at risk.¹³ At the same time, the United States has seen an increase in both the number and frequency of billion-dollar disaster events, sustaining 254 weather and climate disasters since 1980 with a total cost exceeding \$1.7 trillion.¹⁴ 2019 was the fifth consecutive year in which the United States suffered 10 or more weather and climate disasters, at an average of 12.6 events per year – more than twice the 40 year average. In 2018-2019, Virginia experienced impacts from nine such events with a total cost of approximately \$1.6 billion.¹⁵

A FRAMEWORK FOR ACTION

As detailed in this summary, Virginia’s coastal region faces a serious threat to public safety and economic viability from the various impacts of climate change. Storm surge from tropical storms and hurricanes, sea level rise, nuisance flooding, altered hydrology, and their impacts on poorly planned development are just some of the issues we must address to ensure a resilient, thriving coast for generations to come.

From its first cities to its fishing and farming communities, coastal Virginia faces massive challenges in adapting to the new reality created by climate change and sea level rise. The enormity of this problem requires a whole of government approach, and that is the goal of the Coastal Master Planning Framework and subsequent Virginia Coastal Resilience Master Plan.

This Framework is premised on the stark realities we face, including the fact that current federal, state, regional, and local efforts are insufficient to achieve a resilient coast, and are not optimally aligned. It also accounts for the fact that in most cases, more work is necessary to identify the suite of possible solutions to specific problems posed by coastal hazards. Finally, we recognize that there is not, nor will there ever be, enough funding to protect all homes, businesses, infrastructure, and other coastal assets where they currently exist.

These realities illustrate the difficult task that we as a Commonwealth must undertake. They make it clear that Virginia needs a unified and comprehensive strategy to identify critical assets and areas of concern, and preferred approaches to improve resilience. Virginia needs to decide how to best integrate nature based or green infrastructure – including protection of floodways through strategic coastal relocation – with structural flood control, considering both the direct and indirect benefits. Virginia must decide which areas or projects are most deserving of limited resources, and Virginia must harmonize those projects to ensure that one region’s flood control project does not exacerbate flooding in adjacent areas. Finally, Virginia must create a plan to finance these projects.

These objectives will be accomplished in the Virginia Coastal Resilience Master Plan. A detailed plan, divided by region, will prioritize projects according to state guidelines and local and regional needs. This prioritization will drive state-administered flood preparedness and pre-disaster mitigation funding.

This Virginia Coastal Resilience Master Planning Framework lays out the values, policy objectives, and strategy for developing the Coastal Resilience Master Plan. The pages ahead identify the Goals and Guiding Principles that will inform Master Plan development. This Framework also details ongoing efforts that support the Plan, as well as the scientific, legal, and socioeconomic underpinnings of the planning process.

Chapter One outlines the Master Planning Goals and Guiding Principles, as well as action items to support the Master Planning Process.

Master Planning Framework Primary Goals:

1. Identify priority projects to increase the resilience of coastal communities, including both built and natural assets at risk due to sea level rise and flooding
2. Establish a financing strategy, informed by regional differences and equity considerations, to support execution of the plan
3. Effectively incorporate climate change projections into all of the Commonwealth’s programs addressing coastal zone built and natural infrastructure at risk due to sea level rise and flooding
4. Coordinate all state, federal, regional, and local coastal adaptation and protection efforts in accordance with the guiding principles of this Framework

Master Planning Framework Guiding Principles:

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

Central to this process will be the establishment of a Technical Advisory Committee. Utilizing its considerable expertise and the Goals and Guiding Principles above, that Committee will advise the Governor's Chief Resilience Officer and Special Assistant for Coastal Adaptation and Protection in Master Plan development, including resilience project identification and prioritization.

Chapters Two and Three of this Framework include important background information that underpins the case for state-level action, and the need for the Master Plan. Chapter Two details the social and economic vulnerability of communities along the coast, and Chapter Three explains the science behind the problems we face, and identifies scientific efforts to support sound decision making.

Chapter Four explains the key units of organization for the Coastal Resilience Master Plan: four coastal regions, made up of localities within the coastal Planning District Commissions and Regional Commissions. Different areas along Virginia's coast have both shared and unique challenges associated with sea level rise and other coastal hazards. Chapter Four examines these challenges and describes ongoing local and regional resilience efforts.

Chapter Five describes coastal adaptation and protection programs and projects already underway at the state and federal levels. This catalog includes many worthwhile initiatives, but makes clear the fact that coordination of activities through the Governor's office is necessary to maximize their impact and ensure that the Commonwealth is able to increase coastal resilience in a cost-effective way that minimizes duplication of effort and unintended consequences.

Chapter Six provides a detailed framework for research, organization and planning actions that must be accomplished prior to the finalized Coastal Resilience Master Plan. It calls for three immediate actions: Elevating the Coastal Zone Management Program, establishing a Technical Advisory Committee, and engaging in community roundtables. These three activities are imperative to creating and implementing a Master Plan and must begin as soon as possible. Chapter Six continues by describing near-term actions necessary to increase resilience and finalize the Master Plan.

Chapter Seven closes the Planning Framework by discussing a number of potential funding options.

SUMMARY

The Commonwealth is poised to assume the lead role in making Virginia's coast more resilient to the impacts of climate change. This leadership is key to addressing the economic, social, environmental, and public health and safety threats of coastal natural hazards. This Coastal Resilience Master Planning Framework provides a sound approach to developing and implementing solutions that will build resilience and maintain thriving coastal communities.