

VIRGINIA COASTAL RESILIENCE MASTER PLAN

PHASE ONE, DEC 2021



ASCE Future Weather & Climate Extremes Series Coastal Adaptation & Resilience in Virginia September 8th, 2022

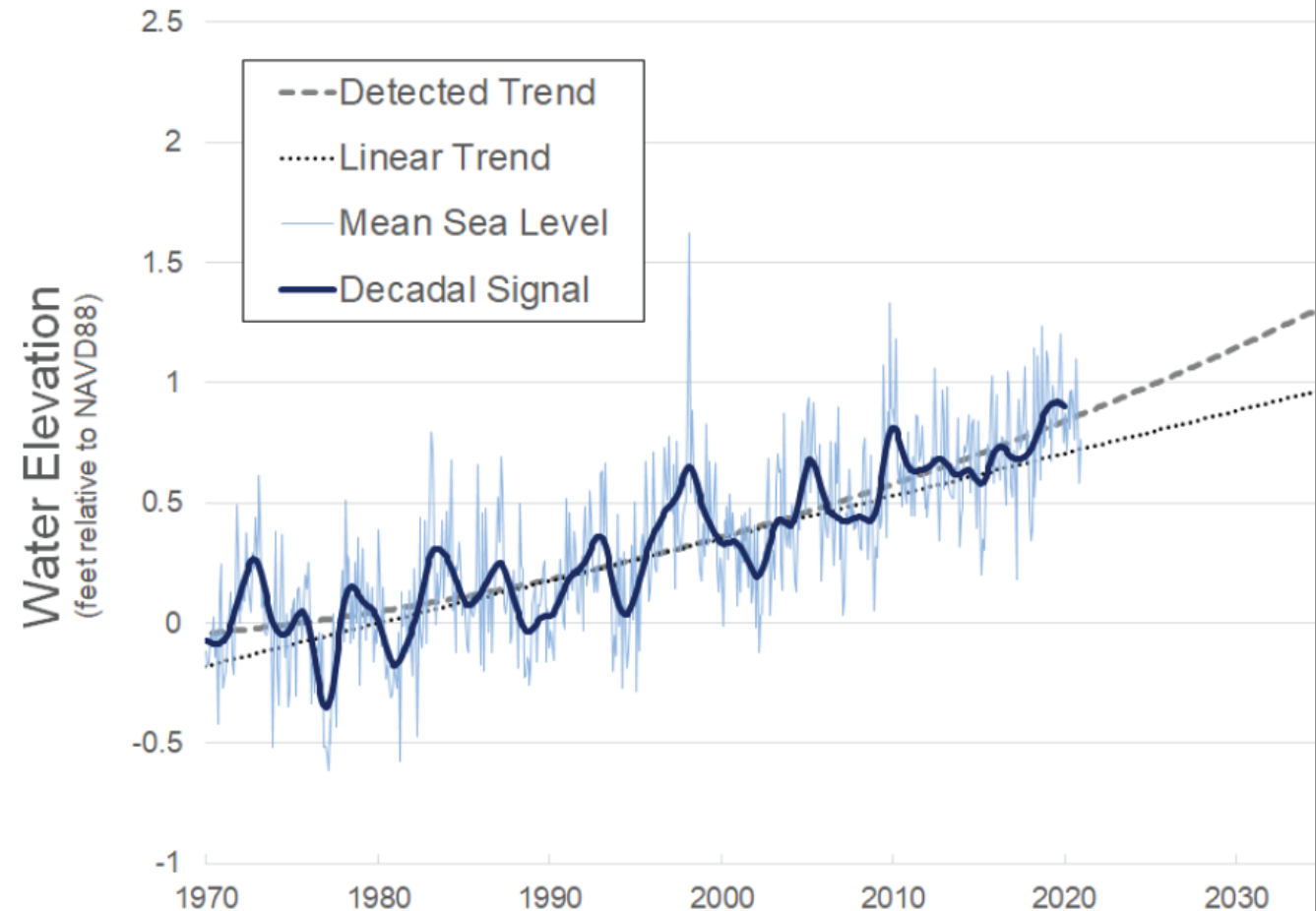
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Agenda

- Why a CRMP?
- What We've Done
- What We've Learned
- What We're Doing
- What Lies Ahead

Observed Trends of Accelerating Sea Level Rise at Sewell's Point in Norfolk, Virginia

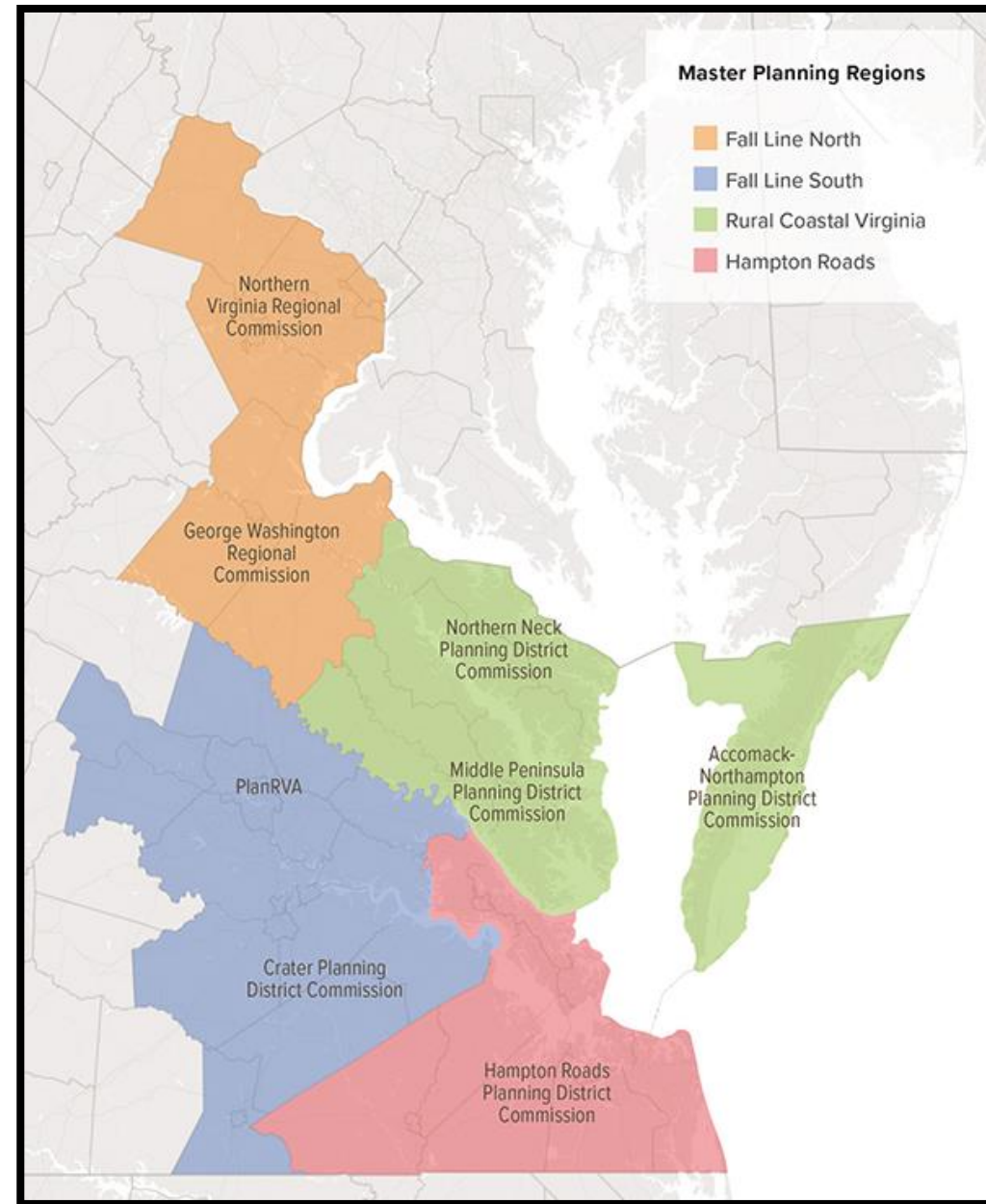
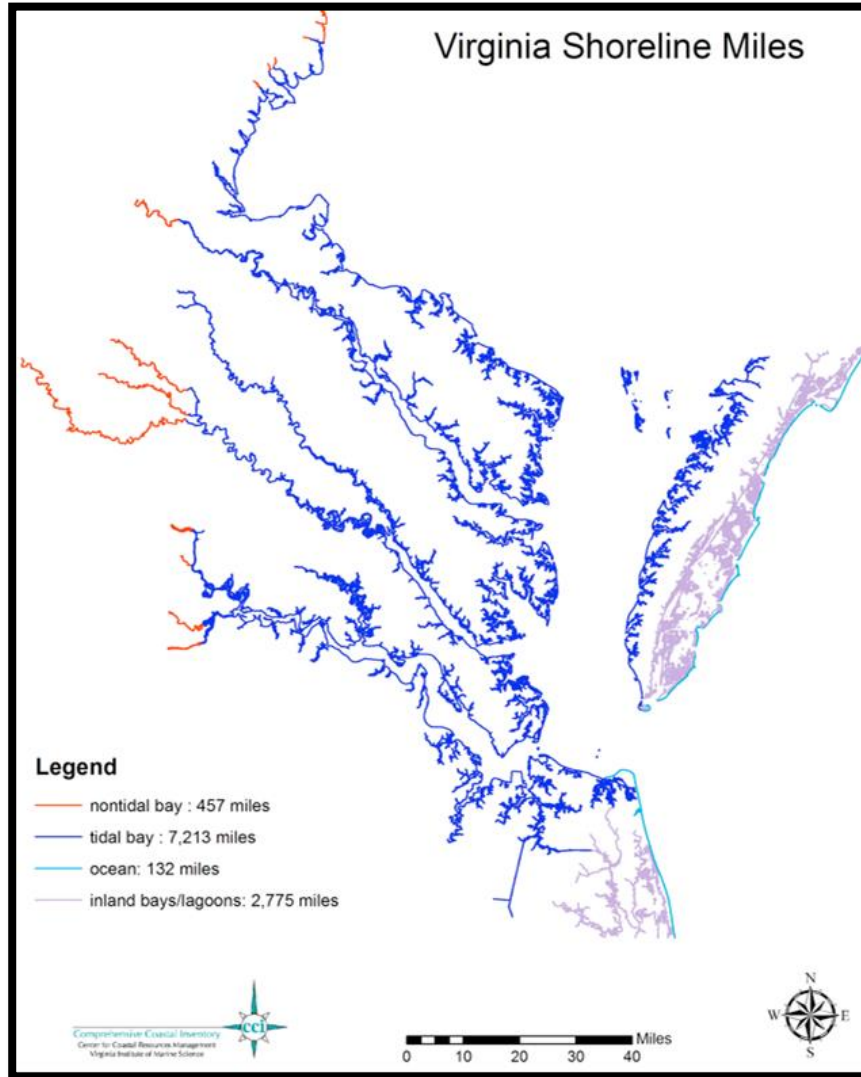
Adapted from Virginia Institute of Marine Science, 2019. Sea Level Rise Report Cards: Norfolk, Virginia.⁴⁴



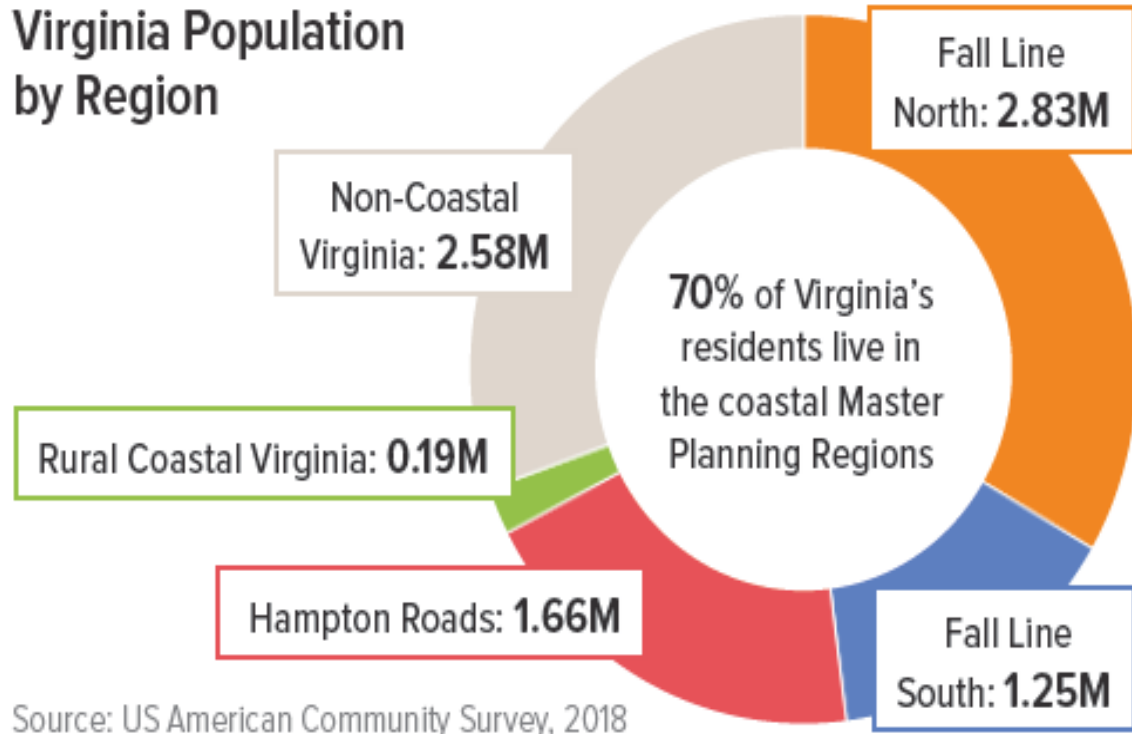
Why a Virginia Coastal Resilience Master Plan?



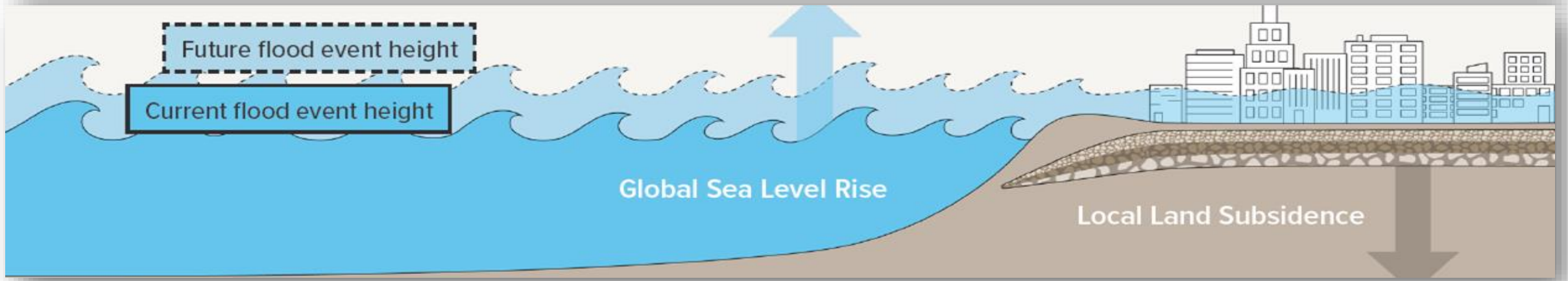
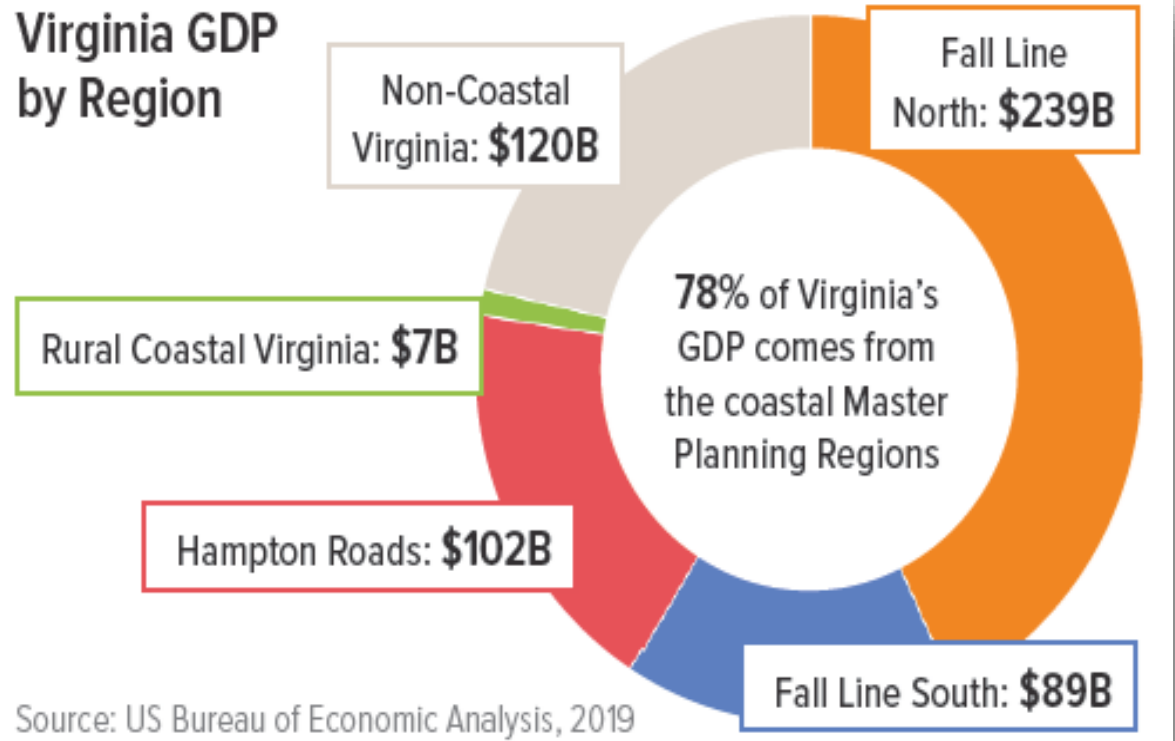
Coastal Virginia



Virginia Population by Region

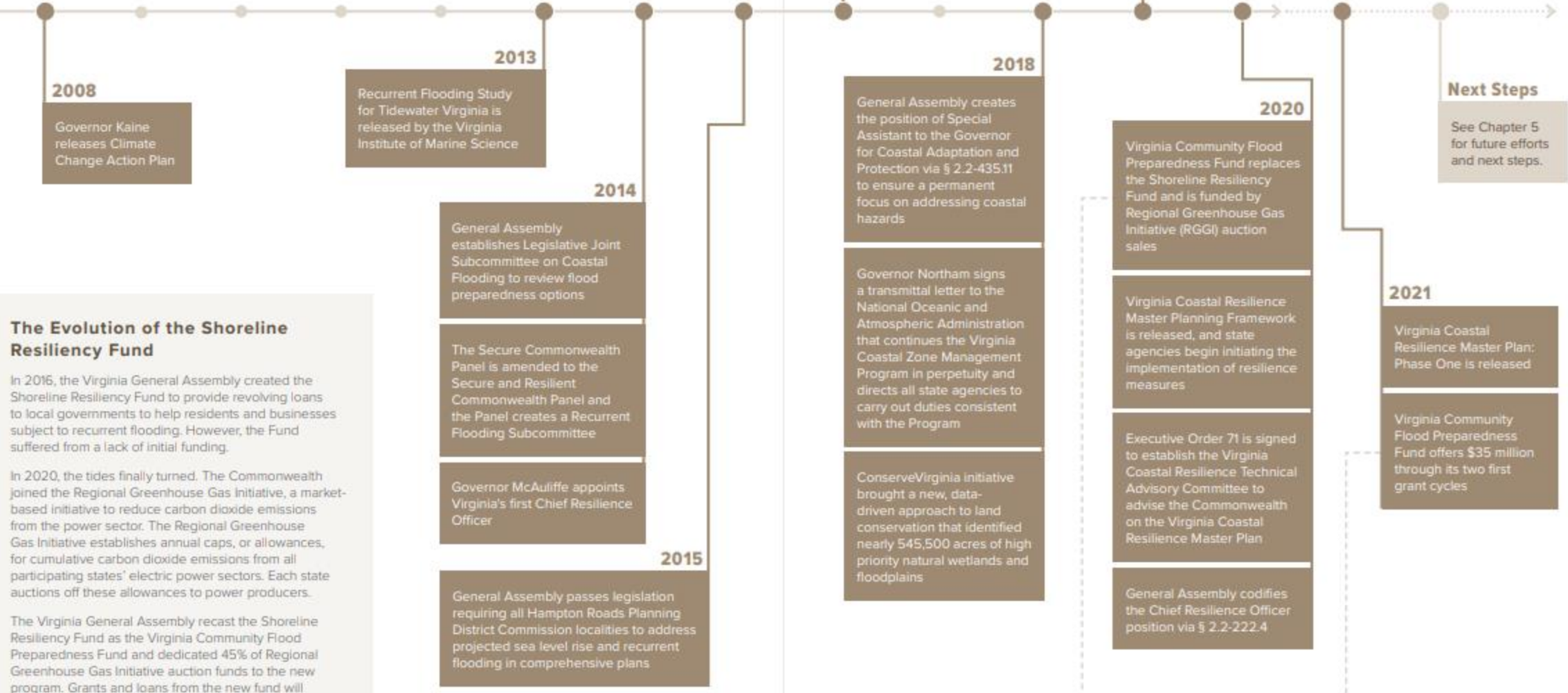


Virginia GDP by Region



A Continuation of Efforts

Since 2008, the Commonwealth has attempted to lead a coordinated planning process to fill unmet and emerging resilience needs. While the state has made headway, building upon the previous work of multiple administrations, commissions, and studies has proved challenging. These cumulative efforts underscore the need for a unified coastal resilience strategy in Virginia. This prior work leveraged the creativity and ingenuity of the many coastal communities involved and should be considered as we chart a path forward that is both holistic and inclusive.



The Evolution of the Shoreline Resiliency Fund

In 2016, the Virginia General Assembly created the Shoreline Resiliency Fund to provide revolving loans to local governments to help residents and businesses subject to recurrent flooding. However, the Fund suffered from a lack of initial funding.

In 2020, the tides finally turned. The Commonwealth joined the Regional Greenhouse Gas Initiative, a market-based initiative to reduce carbon dioxide emissions from the power sector. The Regional Greenhouse Gas Initiative establishes annual caps, or allowances, for cumulative carbon dioxide emissions from all participating states' electric power sectors. Each state auctions off these allowances to power producers.

The Virginia General Assembly recast the Shoreline Resiliency Fund as the Virginia Community Flood Preparedness Fund and dedicated 45% of Regional Greenhouse Gas Initiative auction funds to the new program. Grants and loans from the new fund will

VA Coastal Resilience Goals



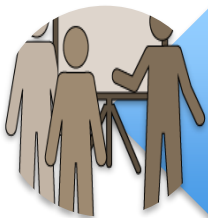
Prioritize Projects



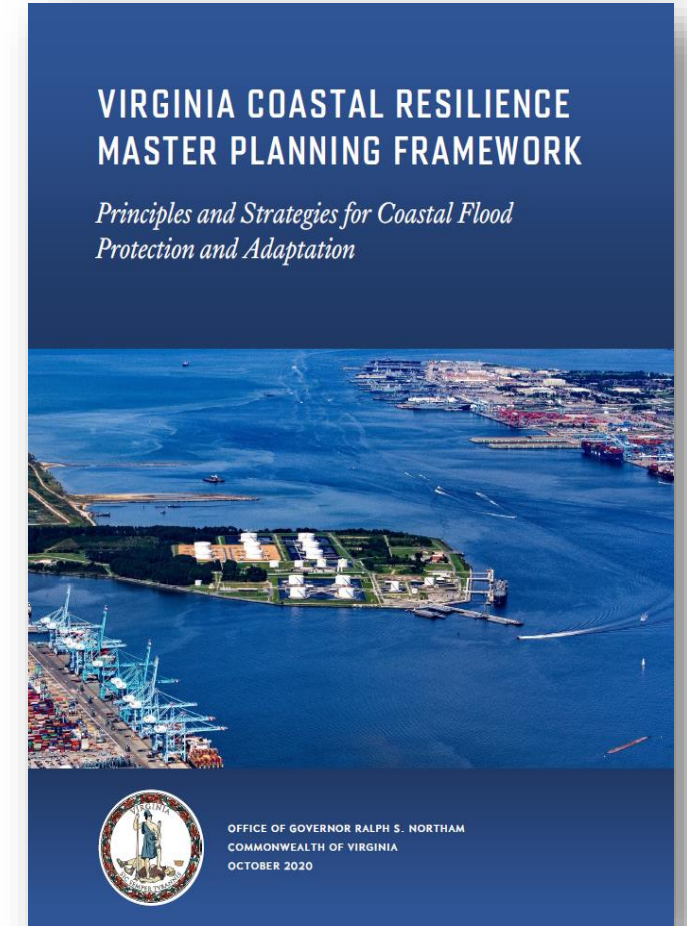
Financing Strategy



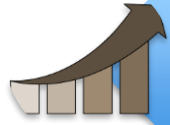
Incorporate Climate Change Projections



Coordinate Efforts



VA Coastal Resilience Principles



Best Available Science



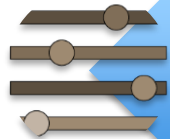
Socioeconomics



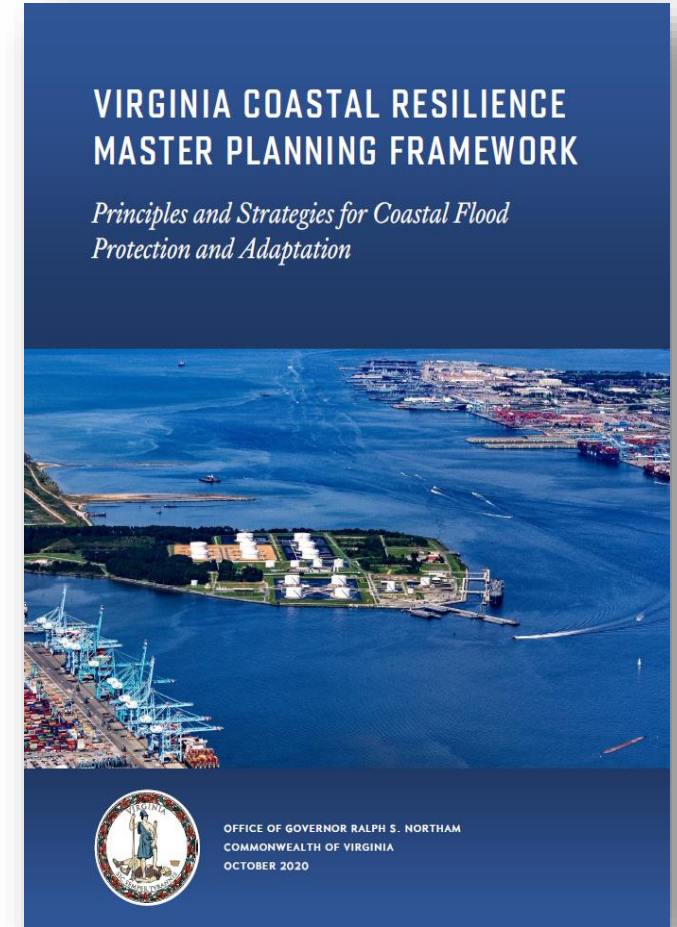
Nature-Based Solutions



Community and Regional Scale



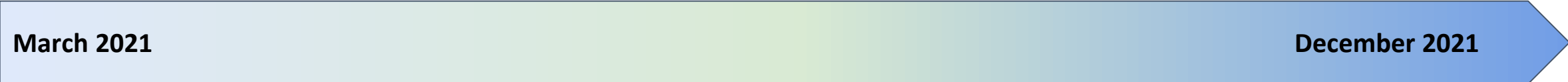
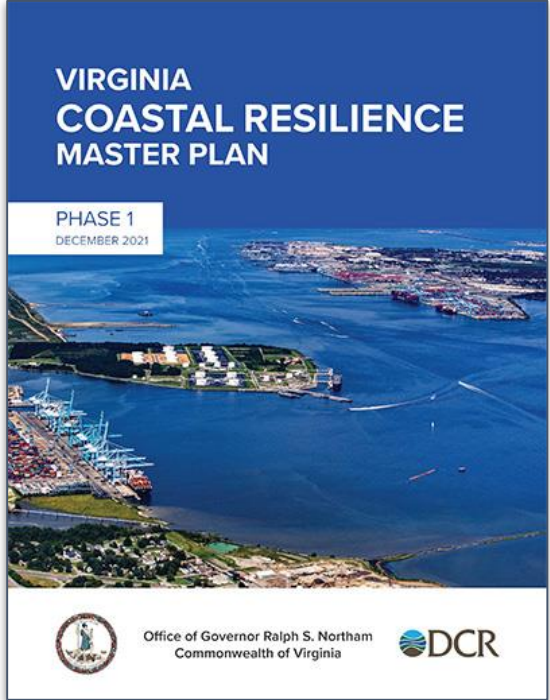
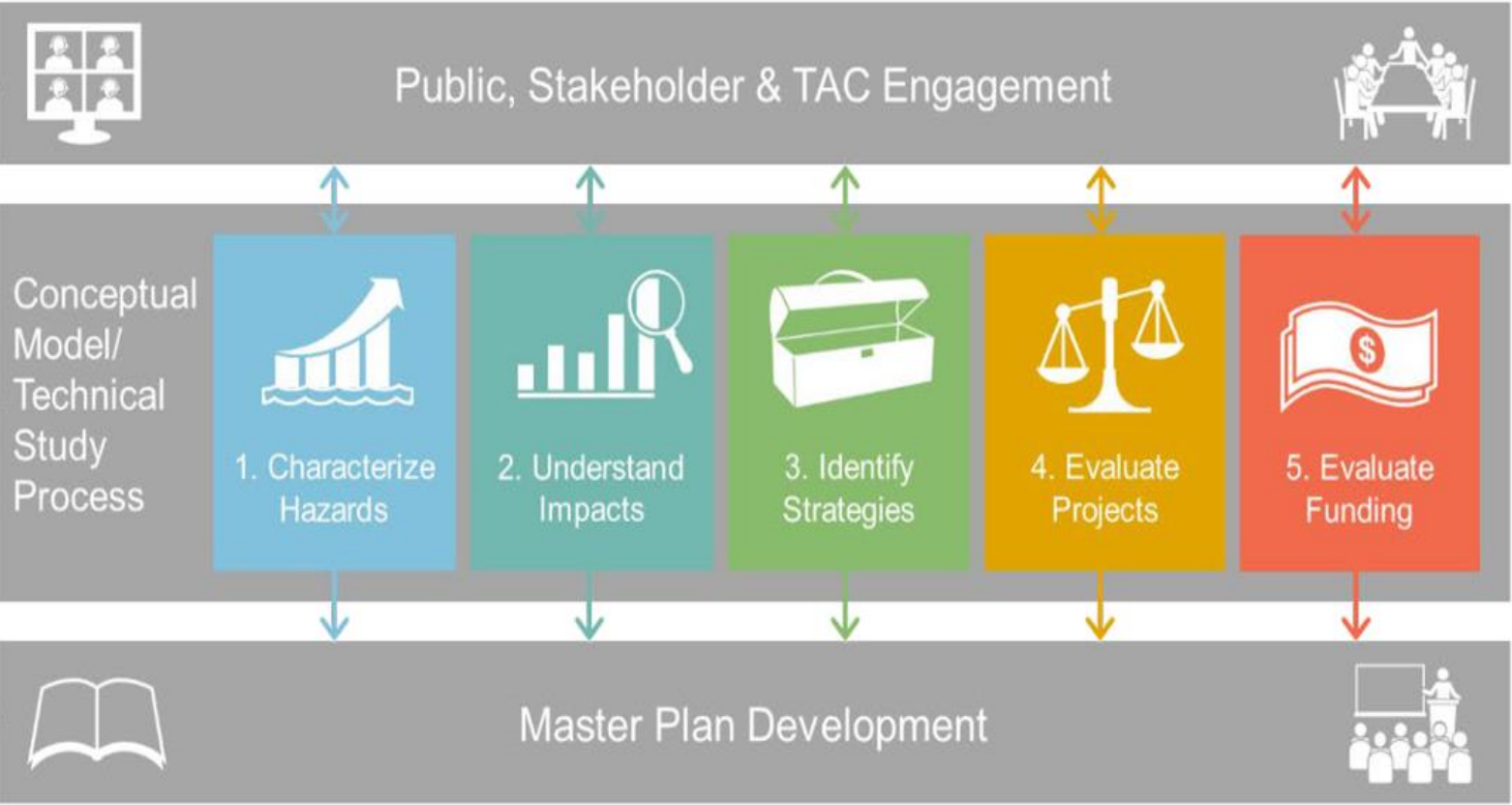
Cost-Effective Solutions




What We've Done



The Process



Virginia Coastal Resilience Master Plan



2021 Virginia Coastal Resilience Master Plan



Coastal Resilience Web Explorer



Open Data Portal



Master Planning Framework



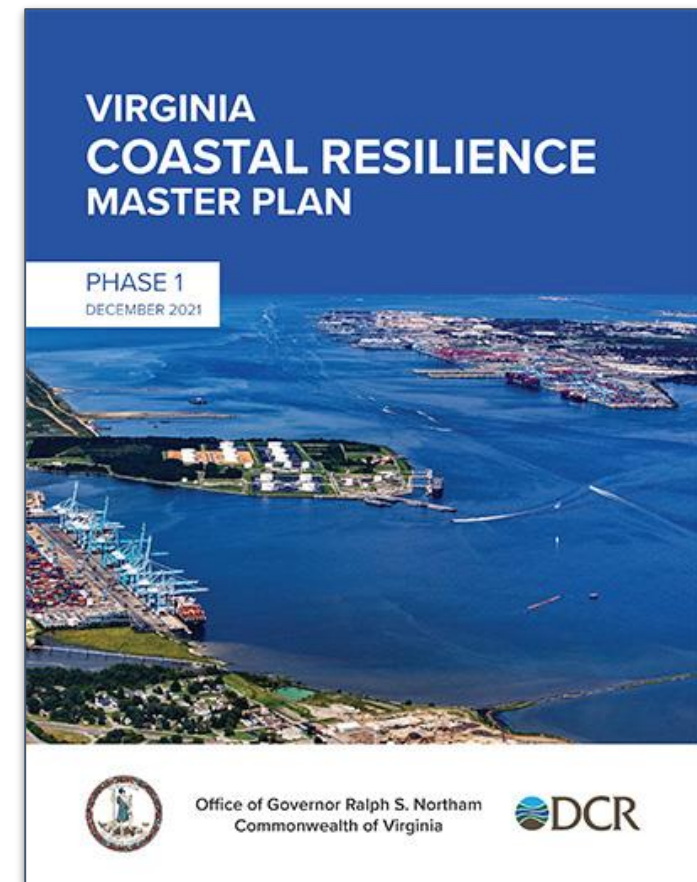
Technical Advisory Committee



Outreach and Engagement

Phase 1 Accomplishments

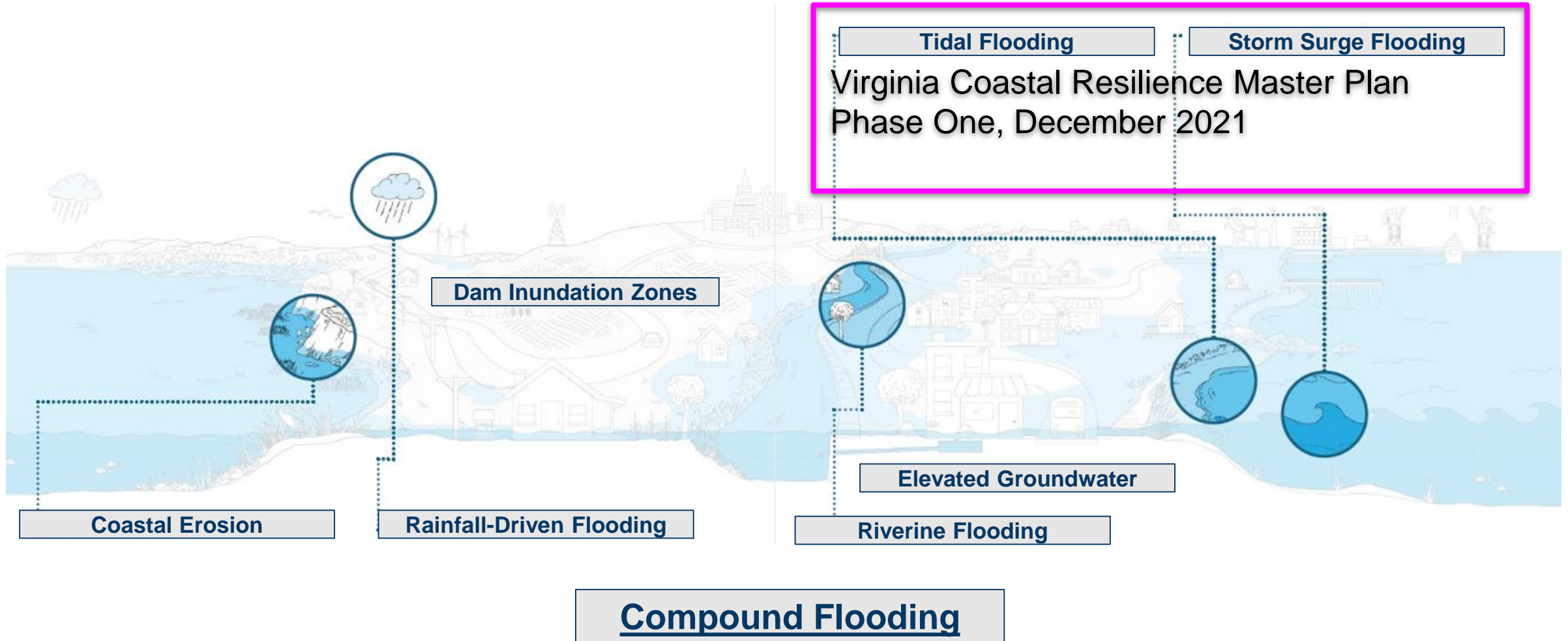
- Determined the consequences of inaction.
- Established a project database.
- Identified where the Commonwealth can support.
- Built a foundation for planning and partnership.



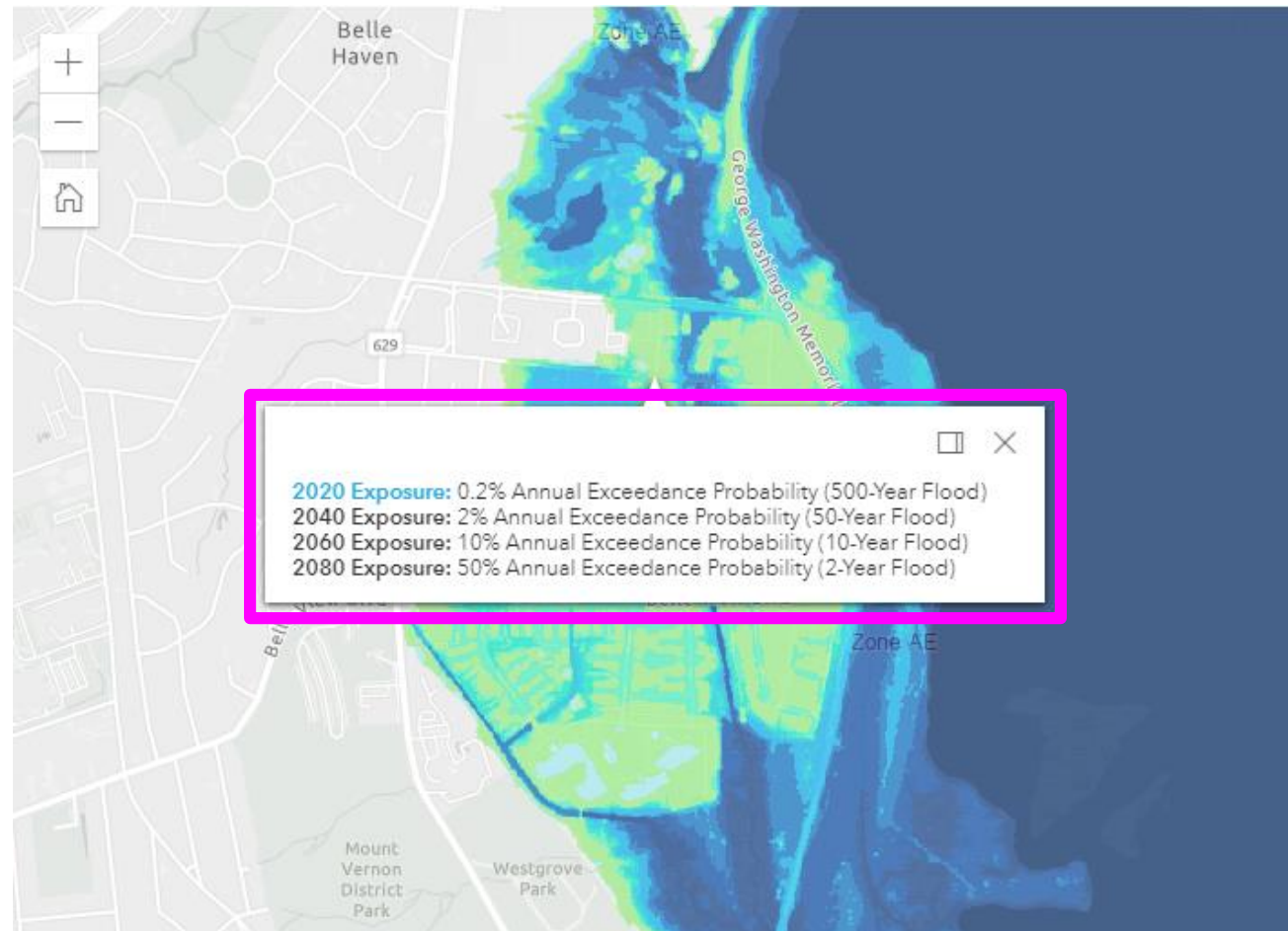
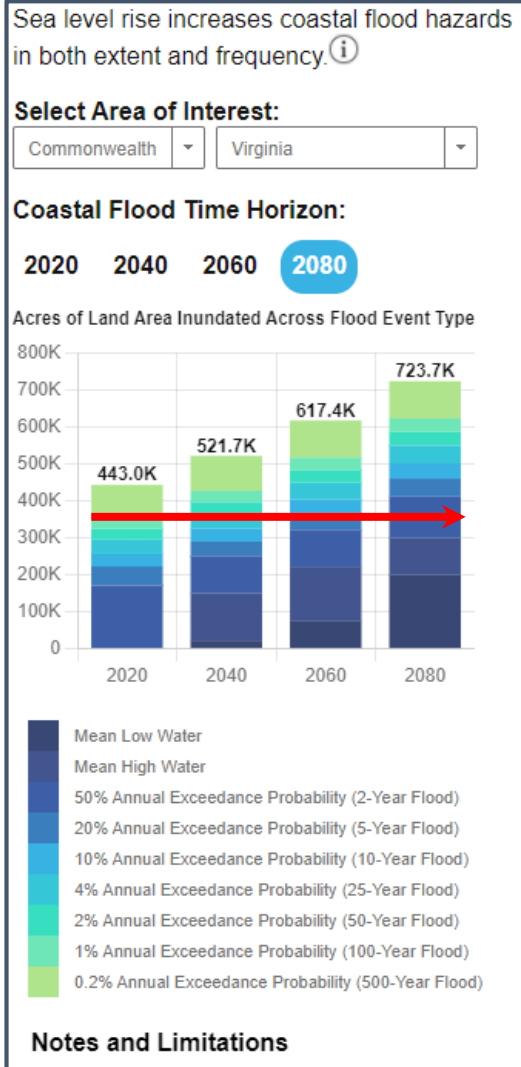
What We've Learned



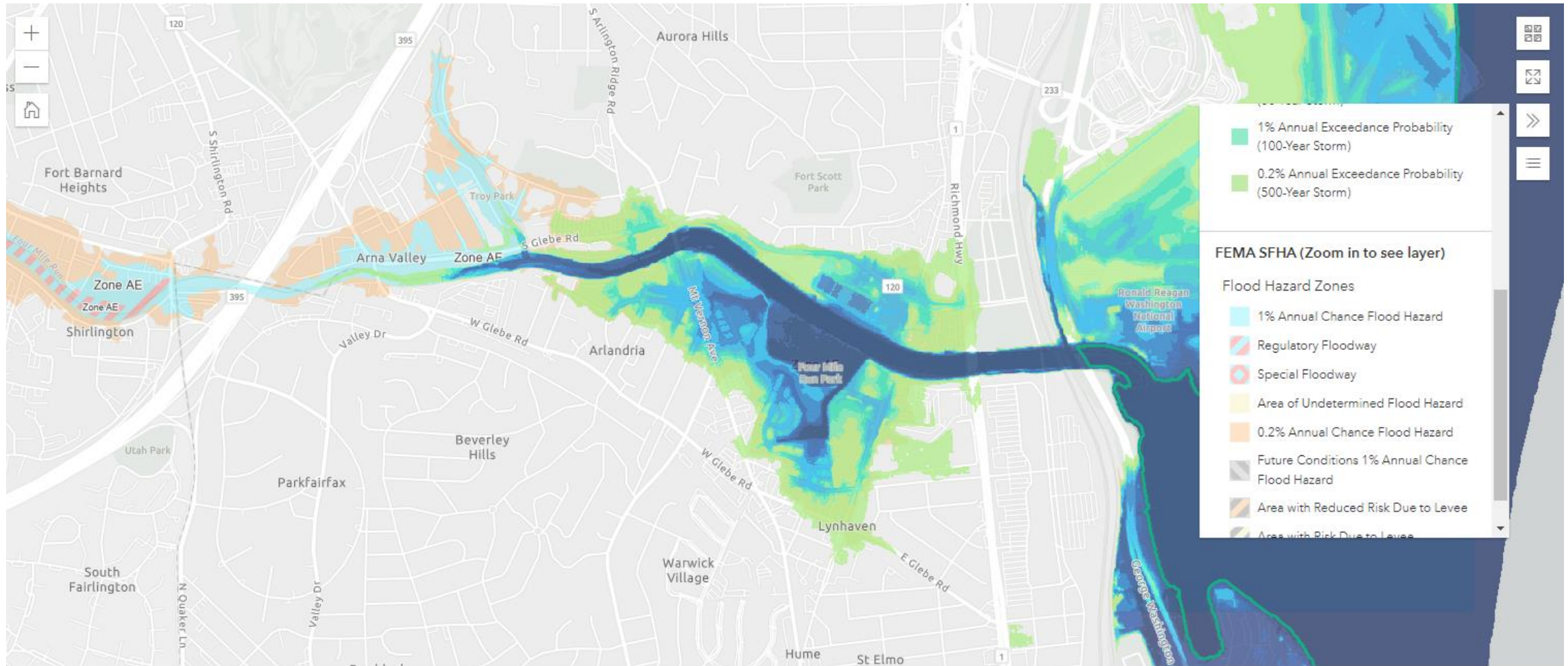
Flood Hazards



Coastal Flood Hazard with SLR [NOAA 2017 Int-High]



Coastal Flood Hazard \neq Total Flood Hazard

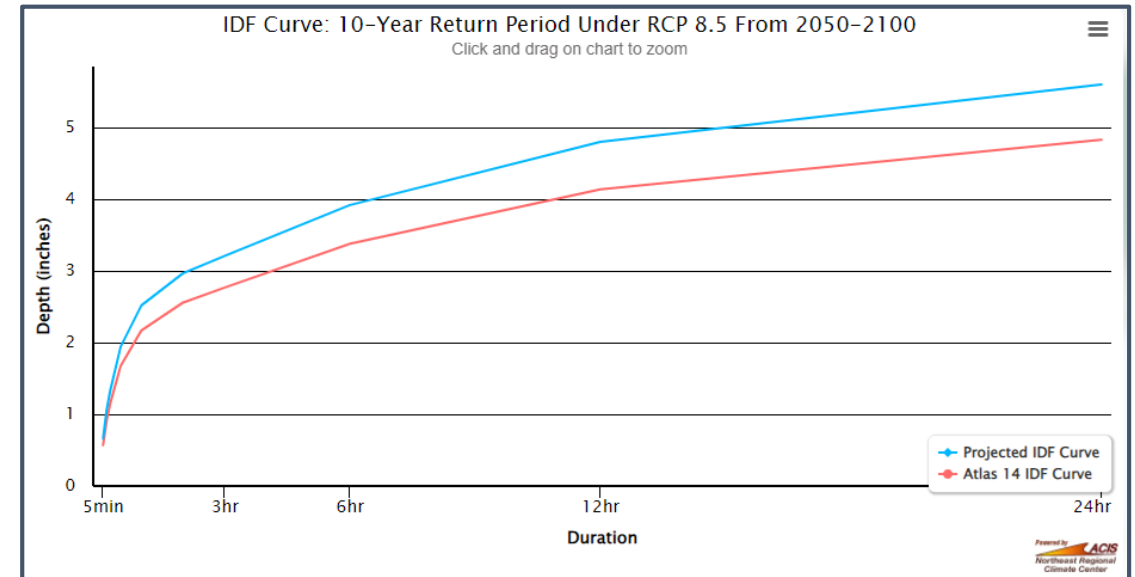
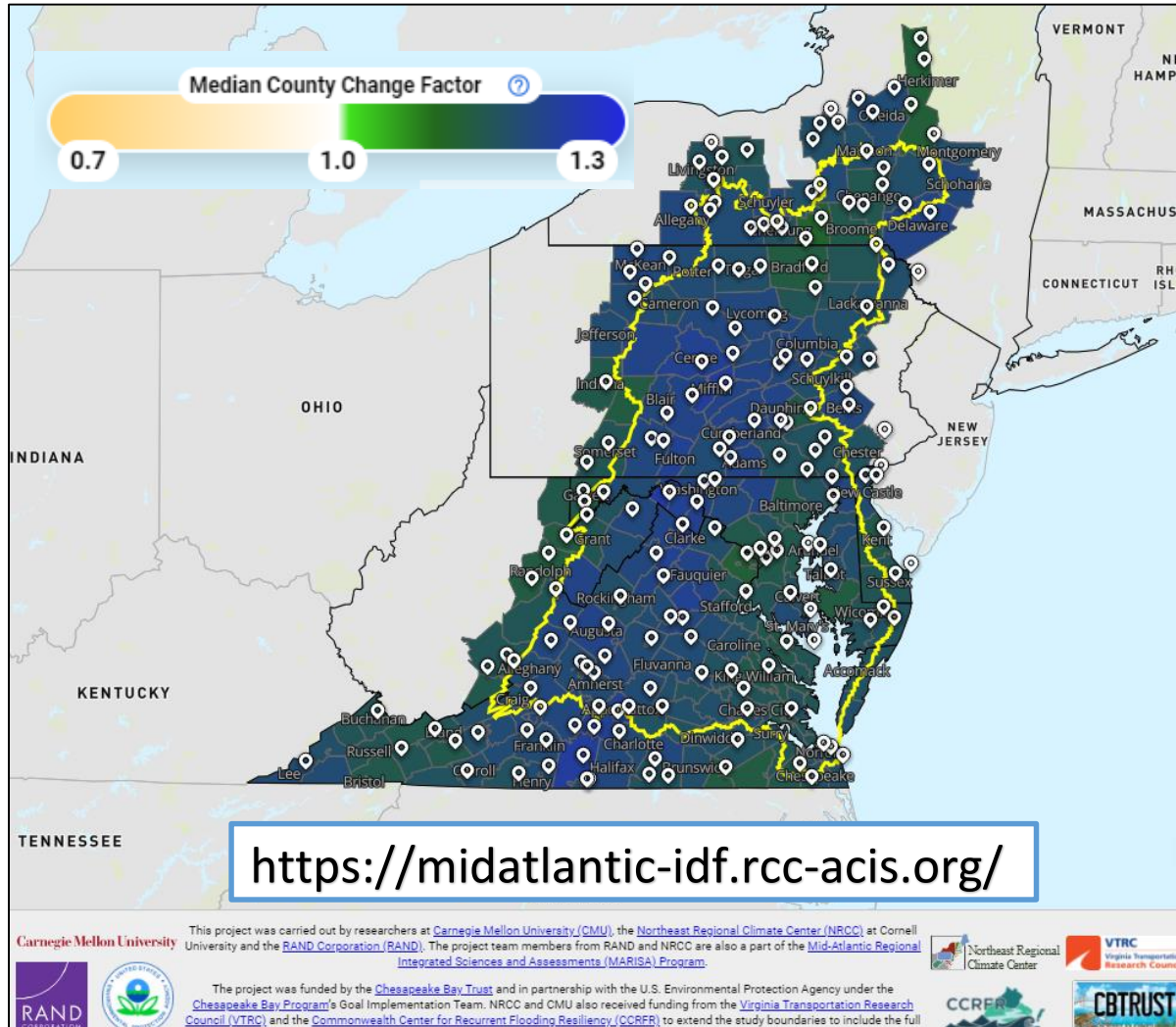


Master Plan Centralized Survey Results

Flood Hazard Priority by Master Planning Region

Hampton Roads (HRPDC)	Rural Coastal (NNPDC, MPPDC, A-NPDC)	Fall Line South (Crater PDC, PlanRVA)	Fall Line North (NVRC, GWRC)
<ol style="list-style-type: none"> Rainfall-Driven Flooding Storm Surge Impacts Tidal Flooding Riverine Flooding Coastal Erosion Groundwater Impacts 	<ol style="list-style-type: none"> Rainfall-Driven Flooding Tidal Flooding Coastal Erosion Storm Surge Impacts Groundwater Impacts Riverine Flooding 	<ol style="list-style-type: none"> Rainfall-Driven Flooding Riverine Flooding Tidal Flooding Storm Surge Impacts Coastal Erosion Groundwater Impacts 	<ol style="list-style-type: none"> Rainfall-Driven Flooding Riverine Flooding Coastal Erosion Tidal Flooding Storm Surge Impacts Groundwater Impacts

Rainfall-Driven Flooding



Atlas 14 Change Factors for Prince William County:

10th Percentile:	1.03
25th Percentile:	1.09
Median:	1.16
75th Percentile:	1.23
90th Percentile:	1.30

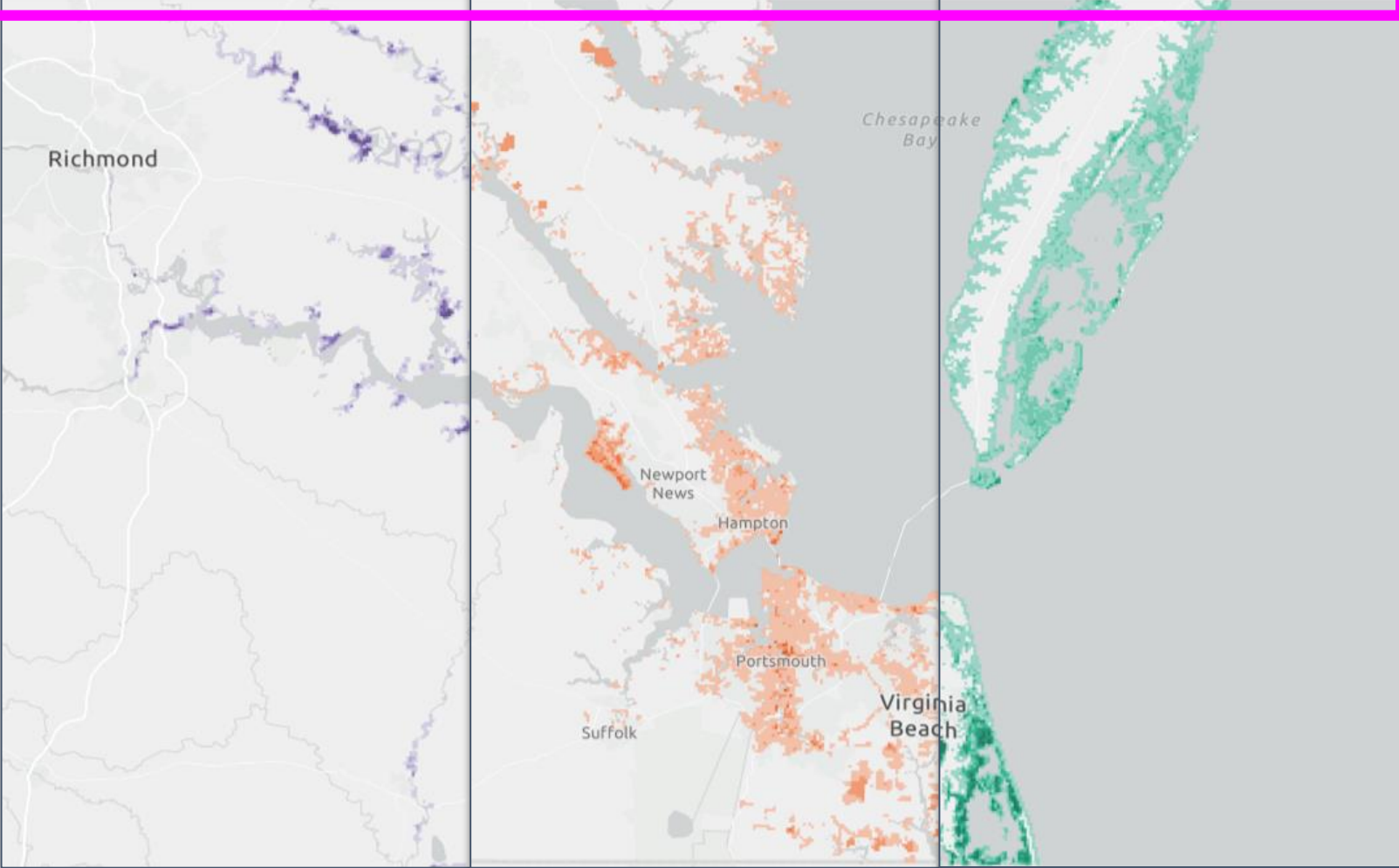
See "Using the Data" above for correct and incorrect application of these change factors.

Coastal Flood Hazard Impacts

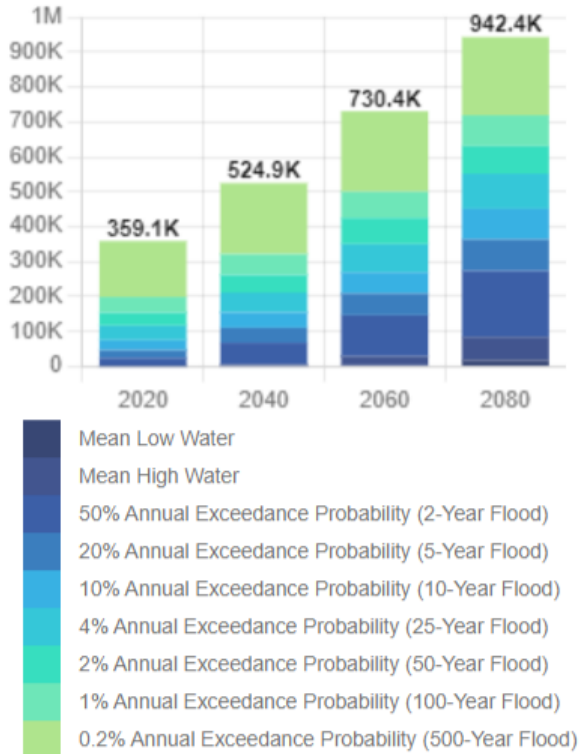
Impacts on Community Resources

Impacts on Critical Sectors

Impacts on Natural Infrastructure

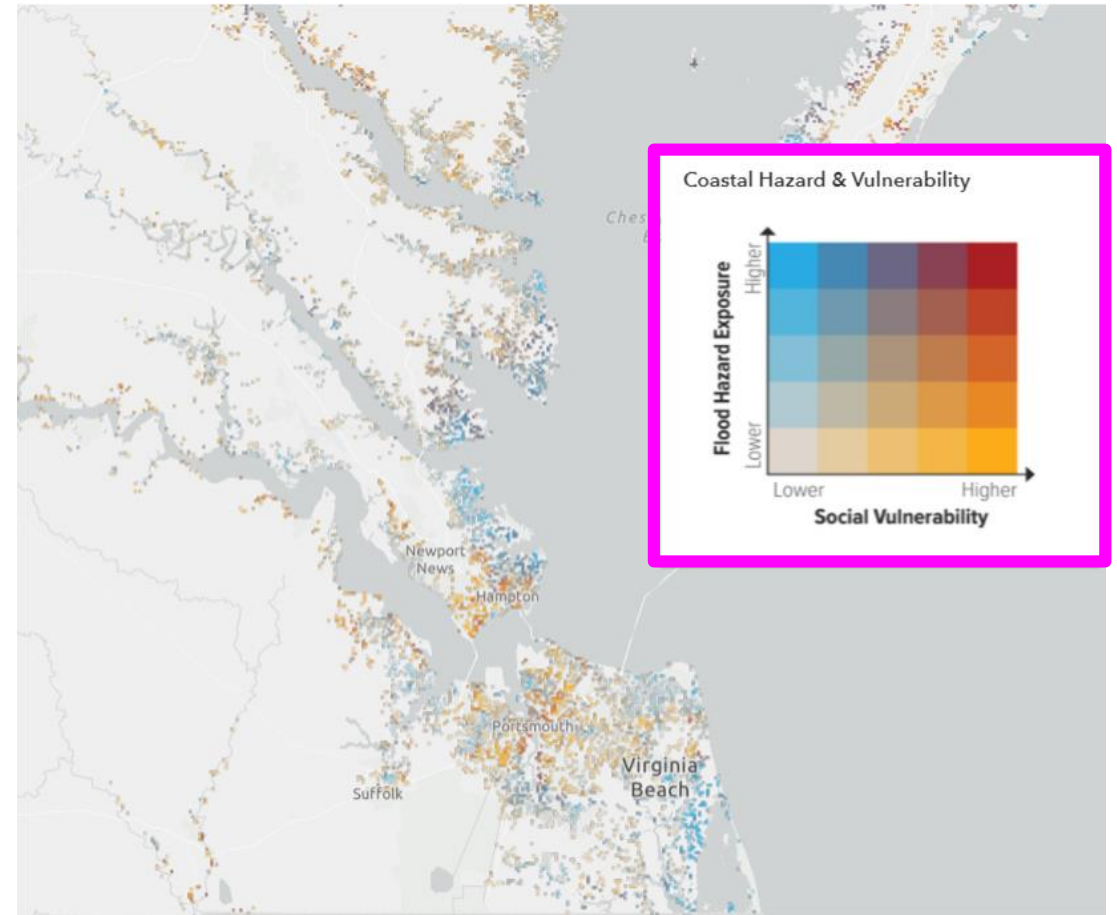
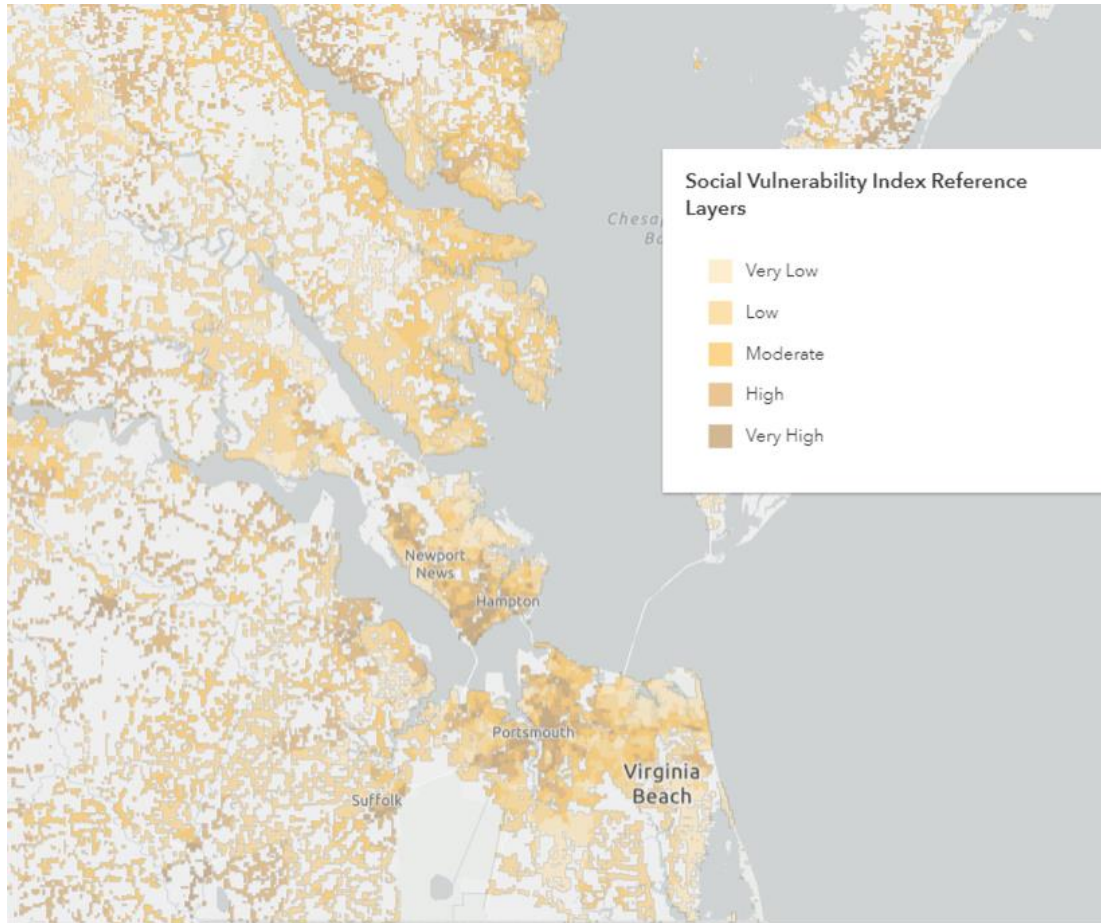


Population Exposure Across Event Types



Community Context

Virginia Coastal Resilience Master Plan, Phase 1 Dec 2021, Chapter 2 Who We Are, Chapter 3 Community Vulnerabilities



Impact Summary

Projected Impacts by 2080 Under the No Action Scenario



Population Exposure to Major Floods +600,000 (+160%)



Building Exposure to Extreme Floods +200,000 (+\$5B AAL)



Roadway Exposure to Chronic Flooding +2,000mi (+460%)



Wetland Inundation 170,000ac (89% of existing)

What We're Doing About It



Building Flood Resilience

Select Area of Interest:

Commonwealth: ▼ Virginia ▼

Filters:

Category: All ▼

Hazard Addressed: All ▼

Project Class: All ▼

Reset All Filters & Map

Additional Map Layers: **Clear Map Layers**

- Coastal Floodplains +
- Community Resource Impact Areas +
- Critical Sector Impact Areas +
- Natural Infrastructure Impact Areas +
- Coastal Hazard and Social Vulnerability +

Search: **Clear**

Projects and Initiatives (Features: 517, Selected: 0) ...

<input checked="" type="checkbox"/>	Name
<input type="checkbox"/>	18th Street Drainage Improvements
<input type="checkbox"/>	1. Crow's Nest Peninsula and Estuary Conservation
<input type="checkbox"/>	2019 FMA
<input type="checkbox"/>	5th Street Improvements
<input type="checkbox"/>	Aberdeen Gardens Drainage Improvements
<input type="checkbox"/>	Aberdeen Road Disconnect Wet Pond
<input type="checkbox"/>	Aberdeen School Neighborhood Park ED Wetland Retrofit
<input type="checkbox"/>	Amherst Road Wetlands
<input type="checkbox"/>	Annual Coastal Bays seagrass restoration
<input type="checkbox"/>	Appomattox River Trail (blueway and greenway)
<input type="checkbox"/>	Aquatic Center Parking Lot
<input type="checkbox"/>	Aquisition of LiDAR Data
<input type="checkbox"/>	Aragona Drainage Improvements

Funding Flood Resilience

VA Funding for Projects (Features: 96, Selected: 0)

Name	Administering Office	Funding Source	Funding Type	Purpose
Addressing the Impacts of Multiple Stressors on Shellfish Aquaculture Through Research/Industry Partnerships	National Oceanic and Atmospheric Administration (NOAA) Oceanic and Atmospheric Research	NOAA	Federal	Supports: establishing, continuing, and/or expanding collaboration between researchers and shellfish growers in order to address how acidification and at least one other environmental stressor affects the U.S. shellfish aquaculture industry. Project priorities of this funding opportunity are to (1) build or strengthen relationships between the shellfish aquaculture industry and aquaculture research community (including university, industry, private sector, tribal, state, and/or federal scientists represent perspectives), (2) develop scientific knowledge on the impact of ocean and coastal acidification in combination with other stressors on shellfish aquaculture, and (3) create data products, tools, technologies, management practices, or other deliverables that are applicable to building resilience within the shellfish aquaculture sector.
Building Resilience Against Climate Effects: Implementing and Evaluating Adaptation Strategies that Protect and Promote Human Health	National Center for Environmental Health	CDC	Federal	Supports: the building and enhancement of the resilience of U.S. cities and states to the health impacts of climate change through overarching strategies. These strategies include 1) collaboration with stakeholders to create a Climate Impact Compendium data on local climate projections, health effects, social determinants of health, and current adaptive capacity; 2) implementation and evaluation of adaptation actions that address the threats identified in the Compendium; and 3) use and dissemination of evidence to improve adaptation actions and enhance understanding of effective climate resilience adaptations in public health and research.
Bureau of Indian Affairs (BIA) Tribal Climate Resilience Program	Department of Interior, Bureau of Indian Affairs (BIA), Trust Services, Tribal Climate Resilience Program	BIA	Federal	Supports: tribal resilience and ocean and coastal management and planning. The Tribal Climate Resilience Program supports tribes to prepare for climate change impacts on tribal trust and trust resources, economies, infrastructure, and human health and safety. Available Funding: - Adaptation planning - Ocean and Coastal Management Planning - Capacity Building - Relocation, Mitigation, or Protect-in-Place Planning - Internships and Youth Engagement

What Lies Ahead

GA Session 2022 HB 516 / SB551 codified the CRMP and the TAC and established the following milestones:

[[§10.1-602](#), [§10.1-658](#), [§10.1-659](#)]

- Quarterly Coastal Resilience TAC Meetings, NLT Sept 2022
- Community Outreach and Engagement Plan, NLT Dec 2022
- Annual Flood Resilience Meeting, NLT July 2023
- Bi-Annual Status of Flood Resilience Report, NLT July 2023
- Virginia Coastal Resilience Master Plan, NLT Dec 2024
- Virginia Flood Protection Master Plan, NLT Dec 2026

QUESTIONS

Website:

dcr.virginia.gov/crmp/

AWS Open Data Portal:

<https://registry.opendata.aws/vadcr-crmp-aws/>

Email Questions or Comments to:

Flood.Resilience@dcr.virginia.gov

