



Flood Resilience Planning in VA

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Department of Conservation and Recreation

- Per Virginia Code §10.1 - 602, 658, 659
 - Coordinator of all flood protection programs and activities in the Commonwealth
 - Develop, administer, implement, and integrate the "Plans" (CRMP and VFPMP)
 - Flood waters disregard jurisdictional boundaries, and the public interest requires the management of flood-prone areas in a manner which prevents injuries to persons, damage to property, and pollution of state waters.

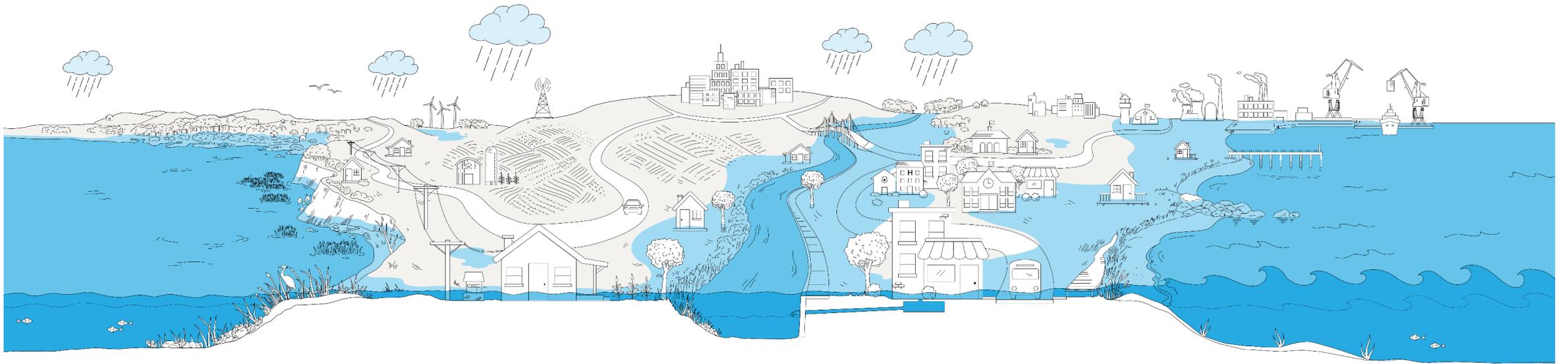
Outline

- Our Changing Environment
 - Relative Sea Level Rise
 - Coastal Flooding
 - Rainfall-Driven Flooding
 - Critical Infrastructure Impacts
 - Natural Infrastructure Impacts
- Adaptation and Resilience
 - Resilience Planning in VA
 - DCR Resilience Planning
 - Building Flood Resilience
 - Funding Flood Resilience

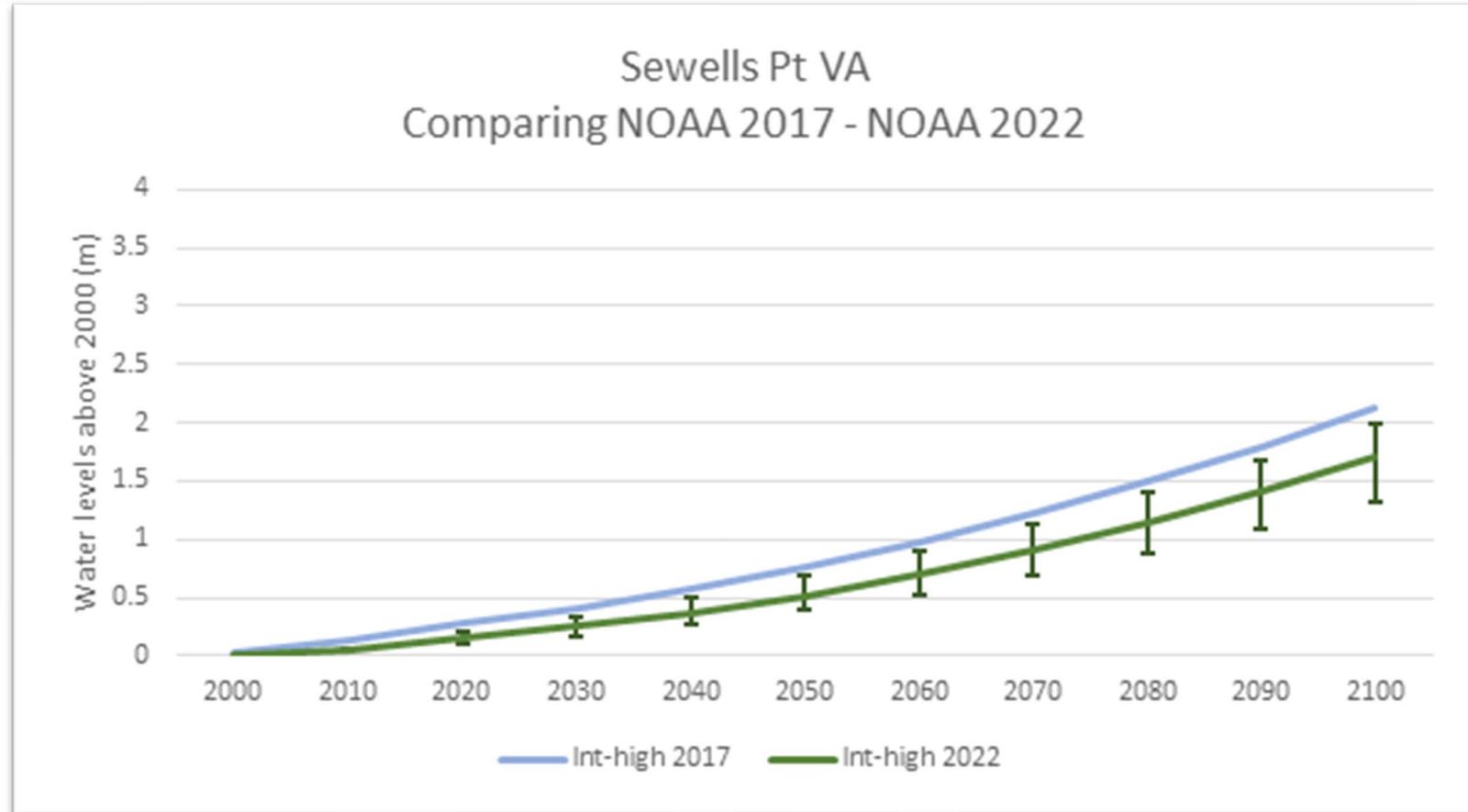
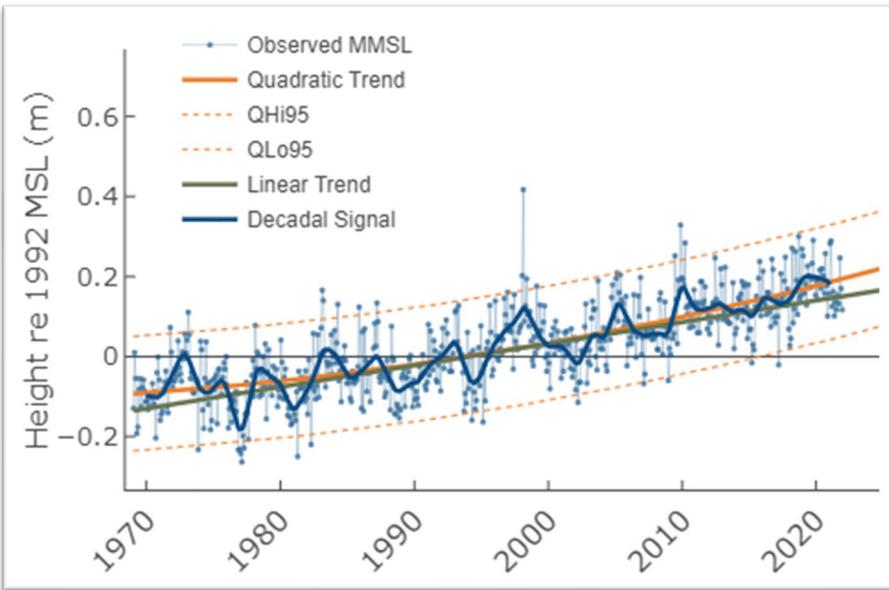
Strategic Planning Principles

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

Our Changing Environment

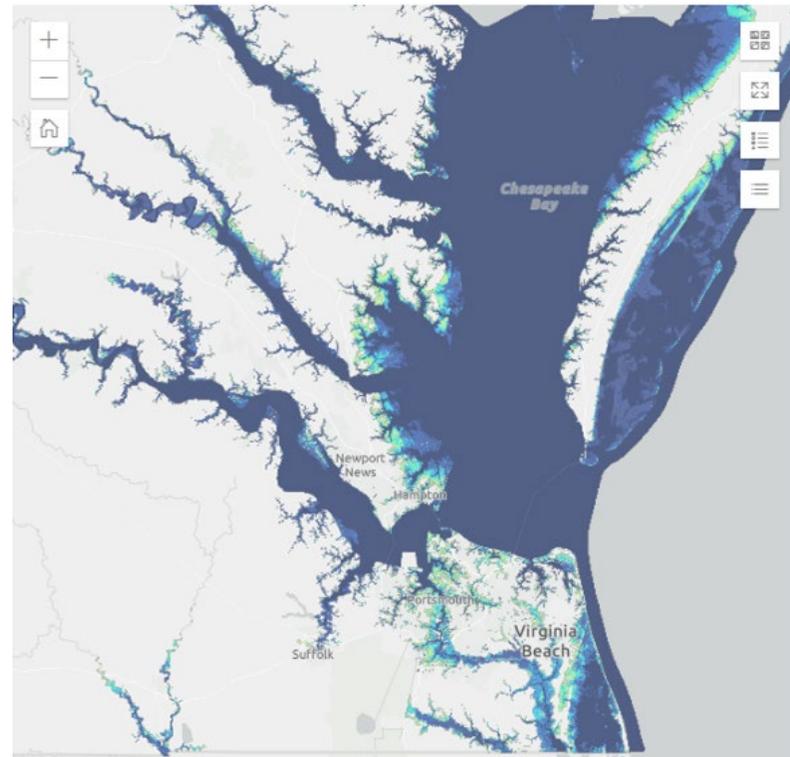
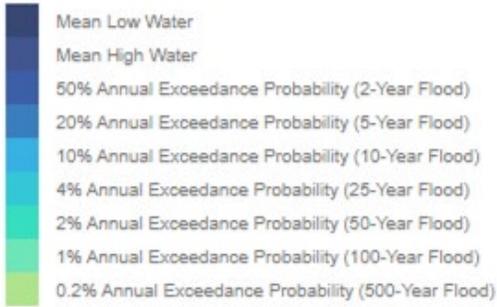
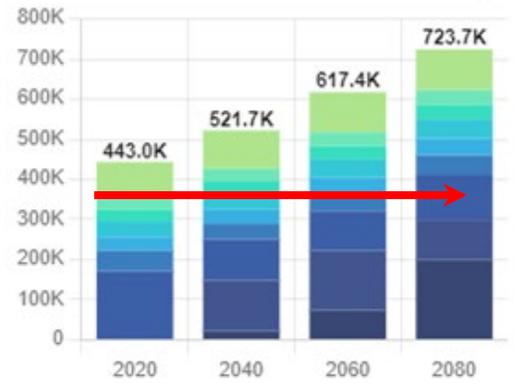


Relative Sea Level Rise



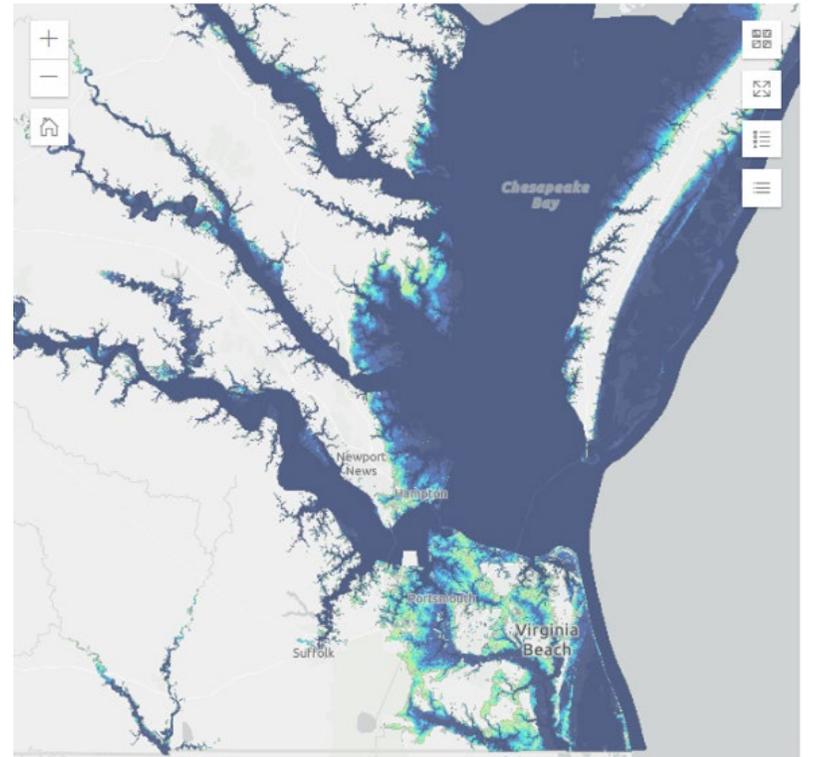
Coastal Flood Hazard with SLR_[NOAA 2017 Int-High]

Acres of Land Area Inundated Across Flood Event Type



City of Newport News, VITA, Esri, HERE, Garmin, SafeGraph, FAO, MET/NASA, USGS, EPA, NPS Powered by Esri

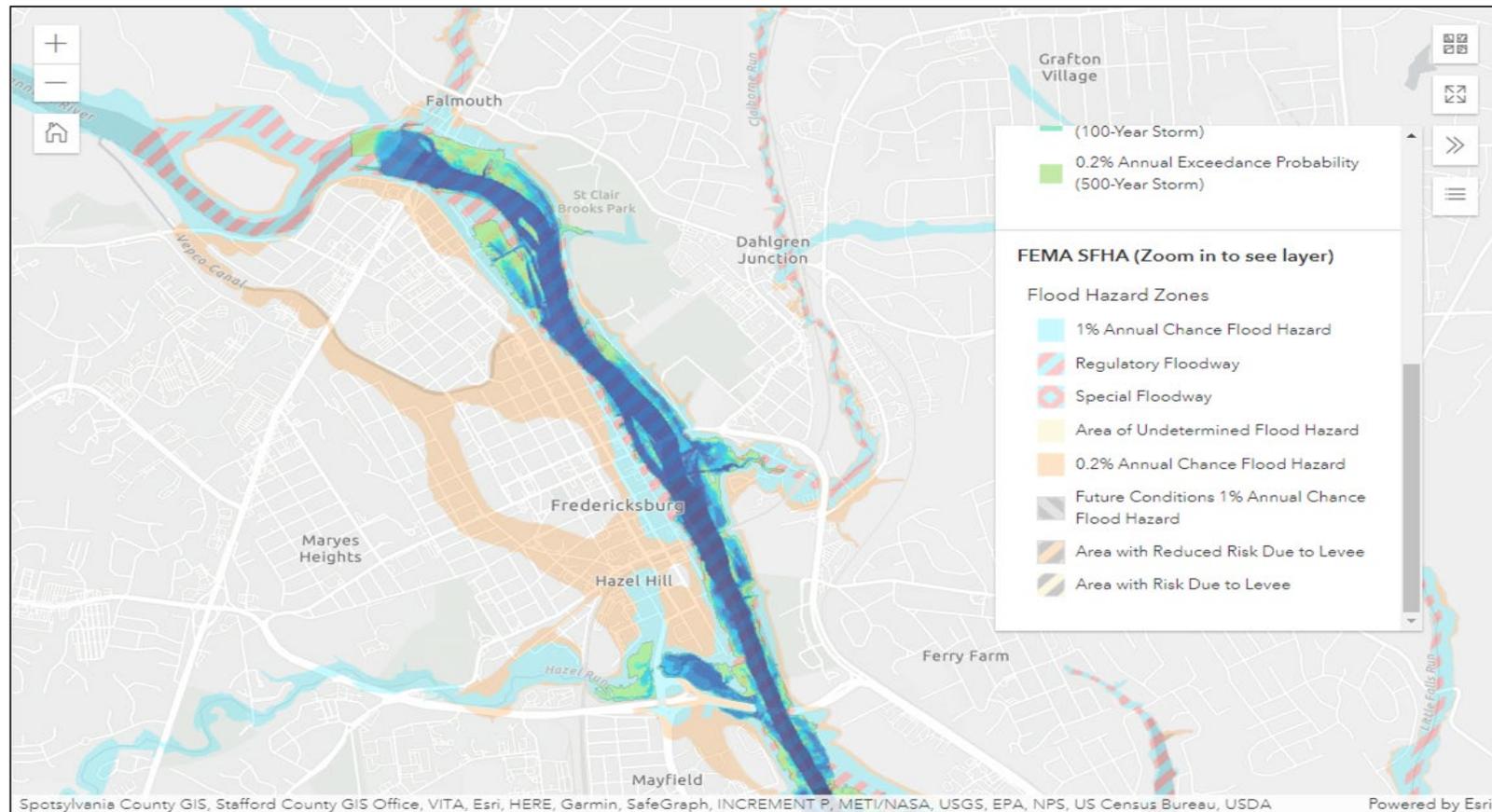
2020



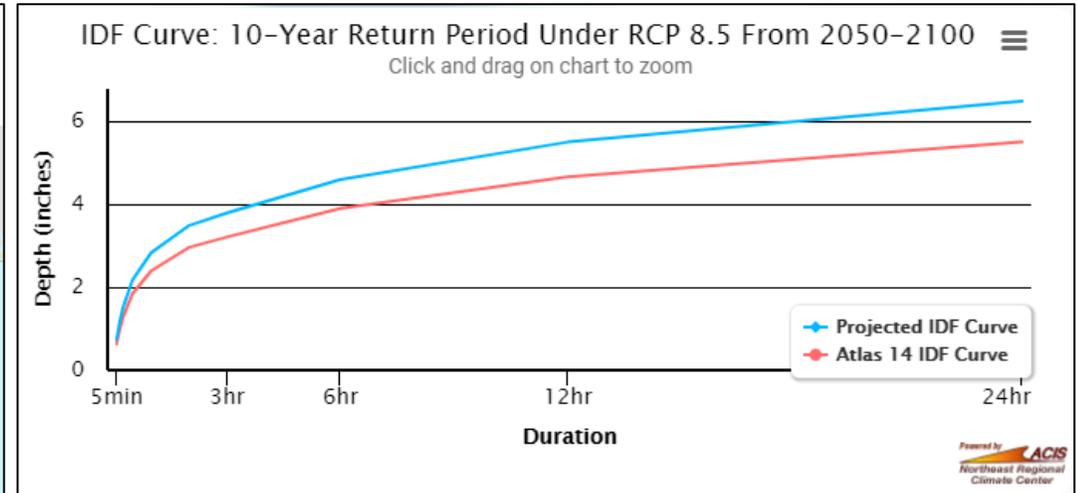
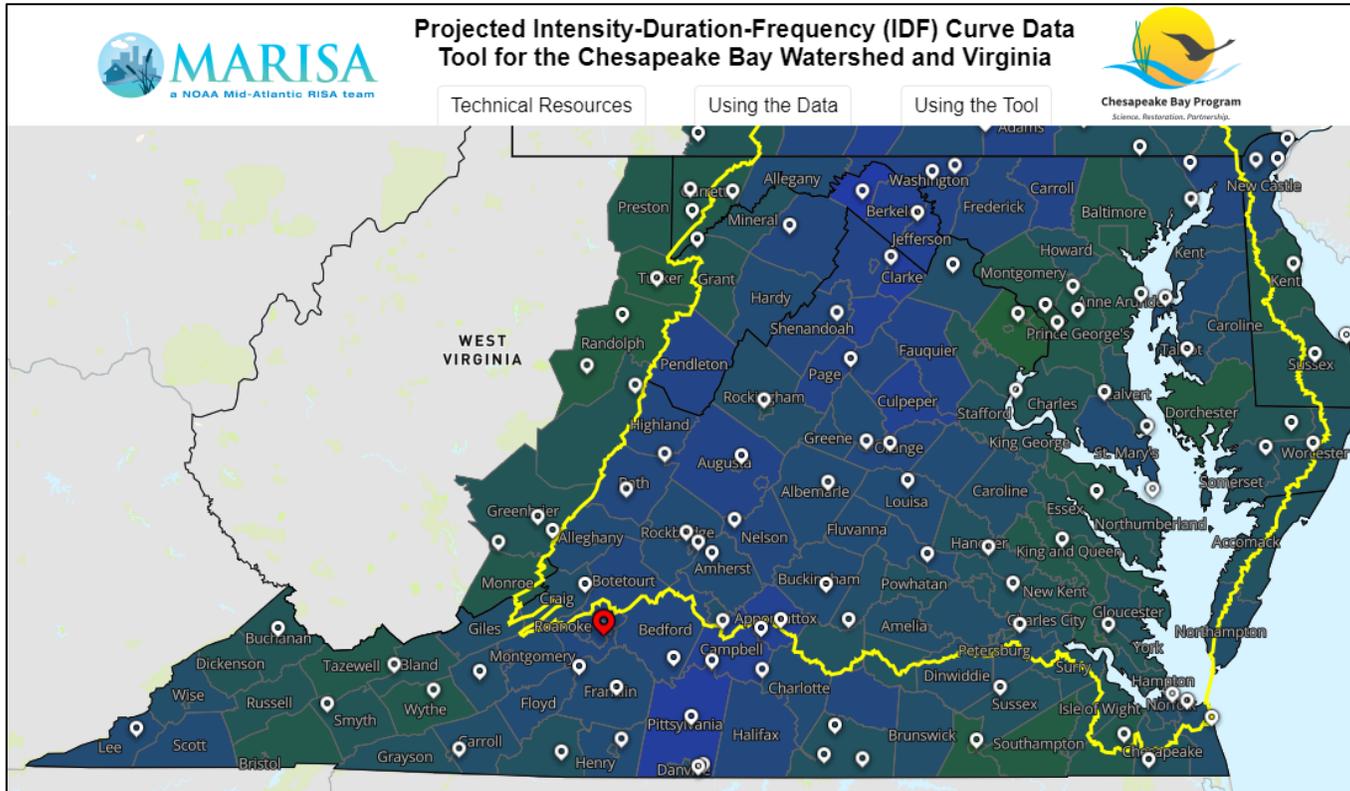
City of Newport News, VITA, Esri, HERE, Garmin, SafeGraph, FAO, MET/NASA, USGS, EPA, NPS Powered by Esri

2080

Coastal Flood Hazard \neq Total Flood Hazard



Pluvial Flooding



Atlas 14 Change Factors for Norfolk City:

10th Percentile:	1.04
25th Percentile:	1.10
Median:	1.18
75th Percentile:	1.25
90th Percentile:	1.31

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

Atlas 14 Change Factors for Bedford County:

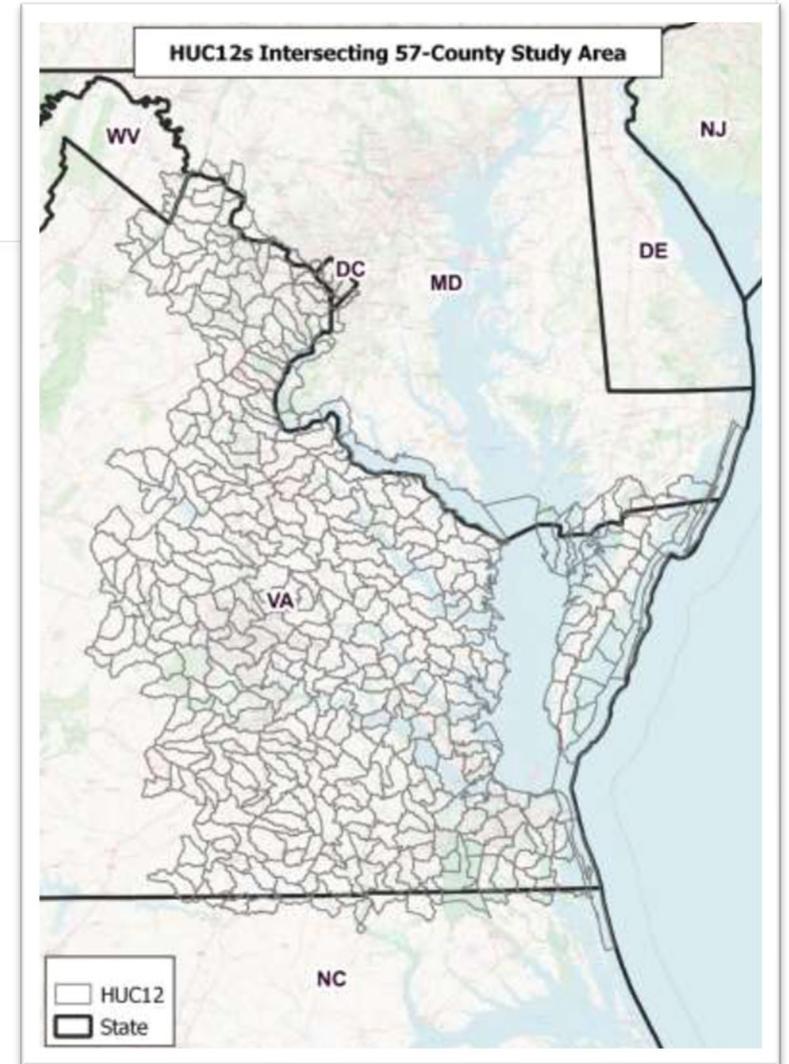
10th Percentile:	1.08
25th Percentile:	1.12
Median:	1.20
75th Percentile:	1.27
90th Percentile:	1.31

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

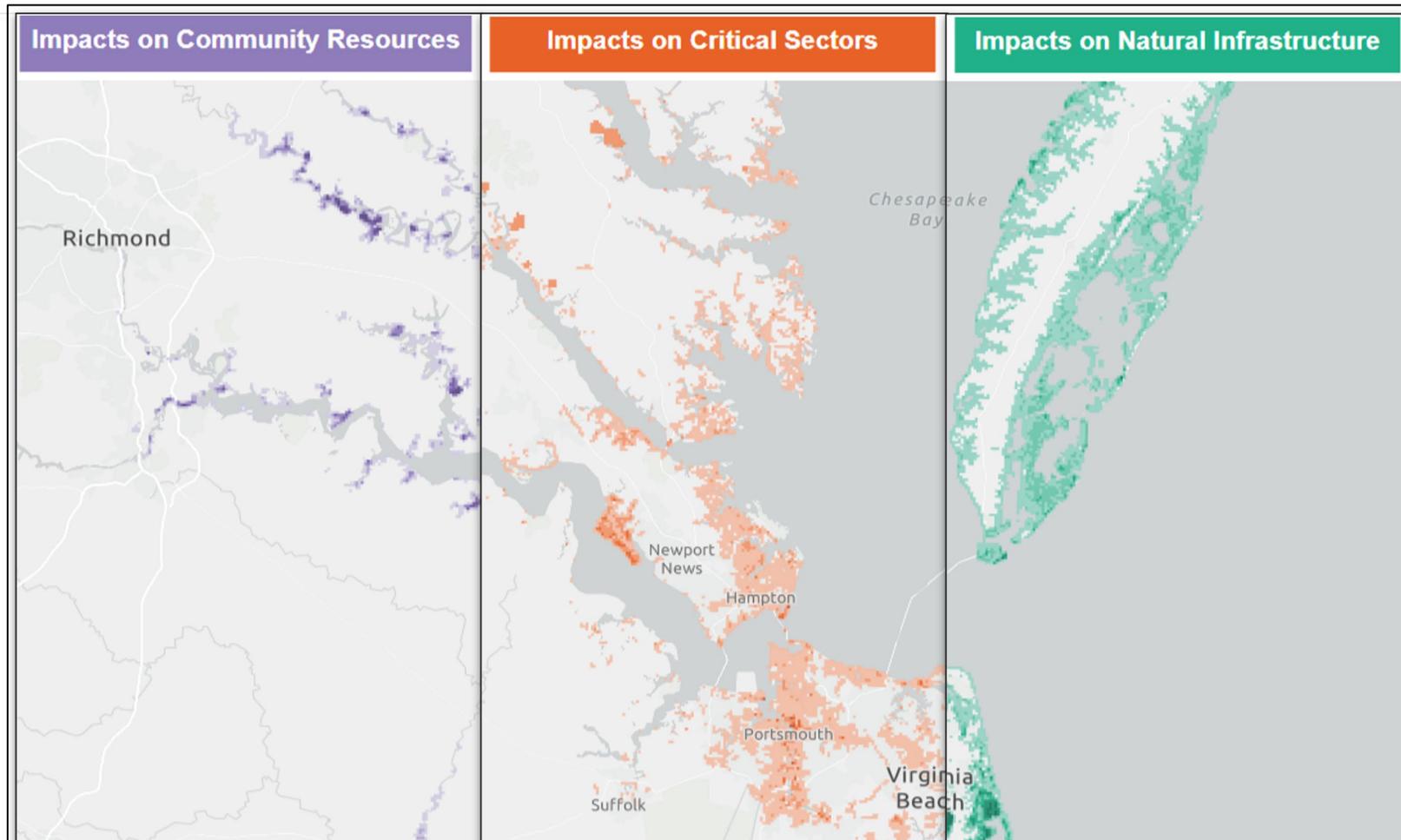


Pluvial Flood Modeling

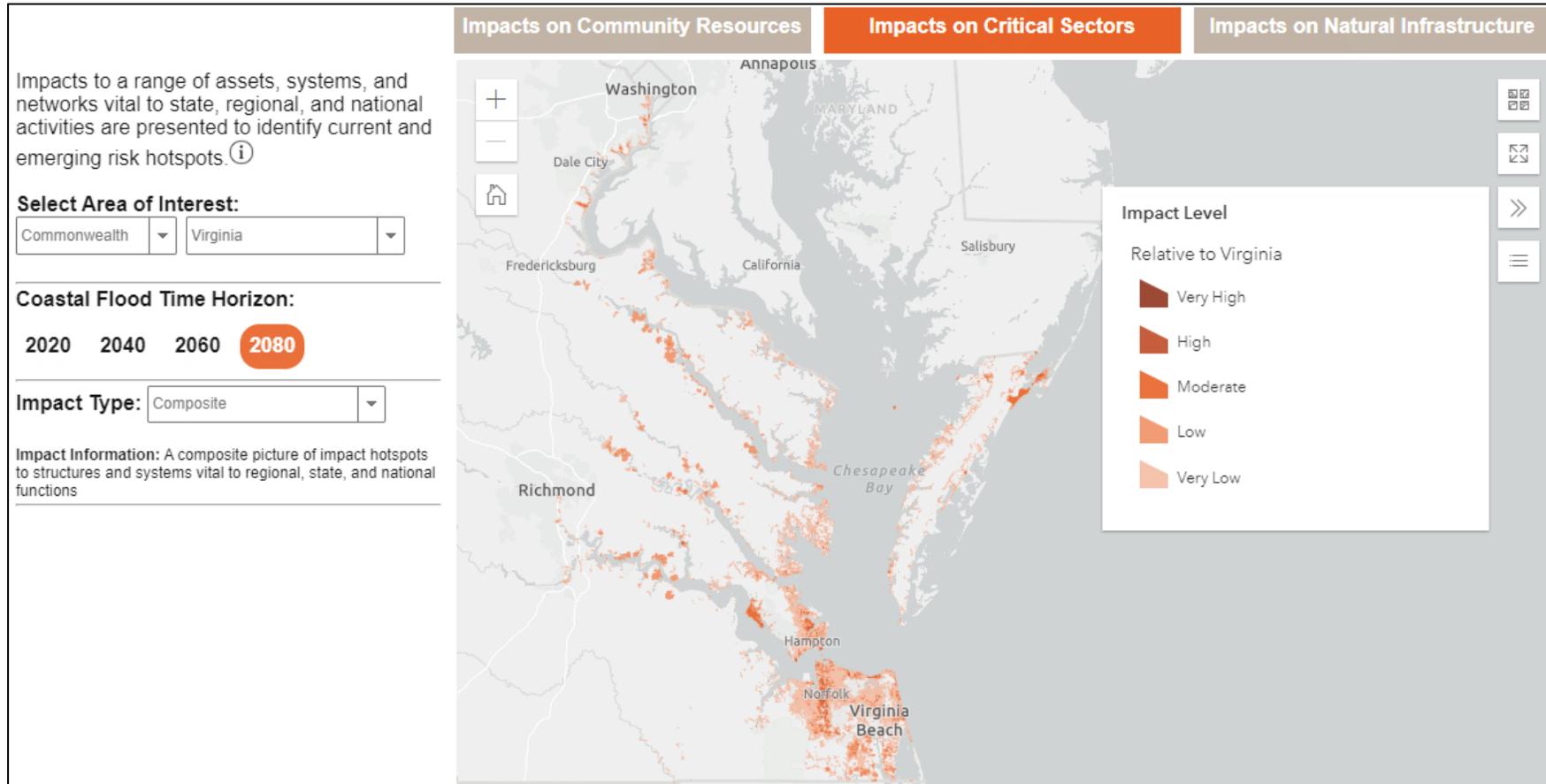
- Coastal Resilience Master Plan to include Precipitation-Driven Flooding
- 440 HUC12 ~ 3,000 Basins
- 50 Basin Pilot to Inform Full Production
- Public Model Inventory
- Pluvial Impacts Analysis



Flood Hazard Impacts



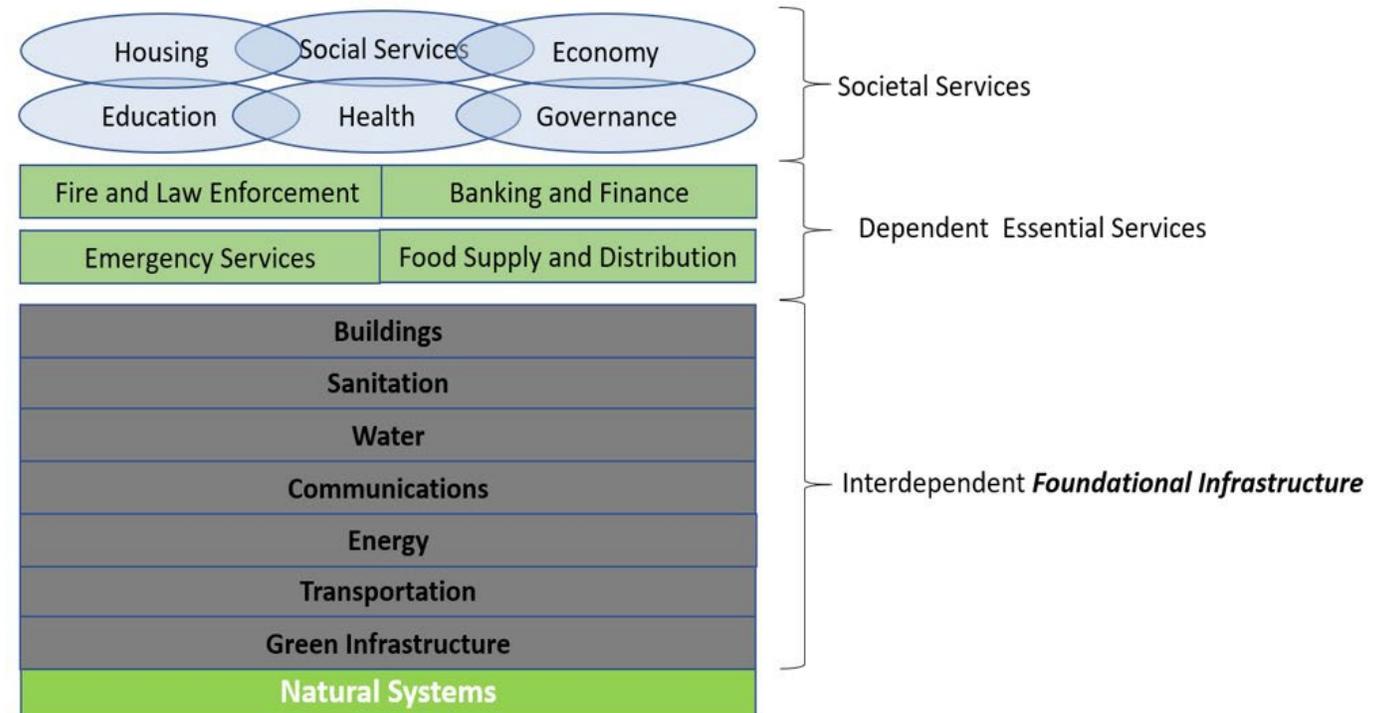
Critical Infrastructure



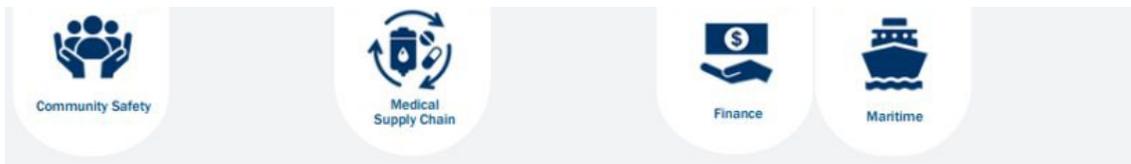
Critical Infrastructure

- Status of Flood Resilience

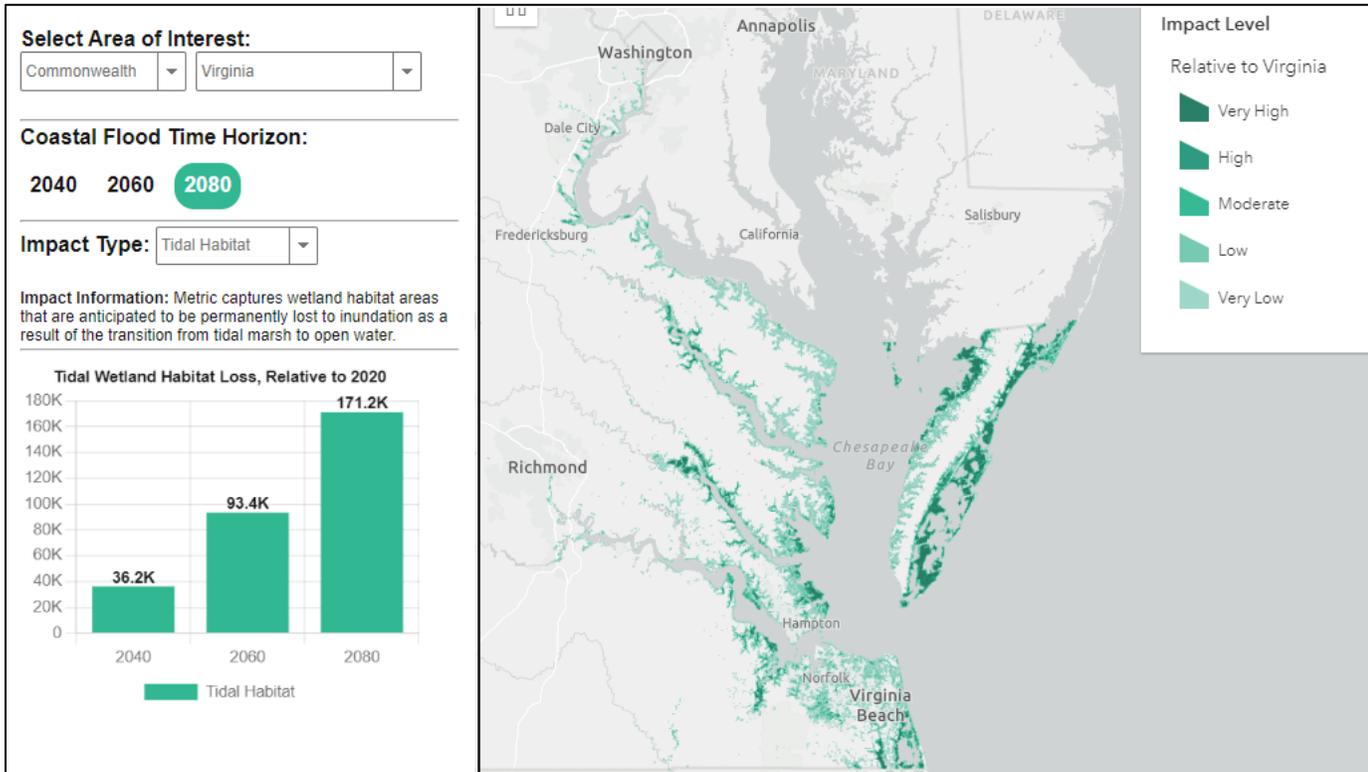
- Natural Systems
- Human Infrastructure
 - Transportation
 - Energy
 - Communication
 - Waste Management
 - Water and Food Supply
 - Emergency Services
 - Health



Foundational Infrastructure Framework (FIF) Reiner and McElvaney, 2017



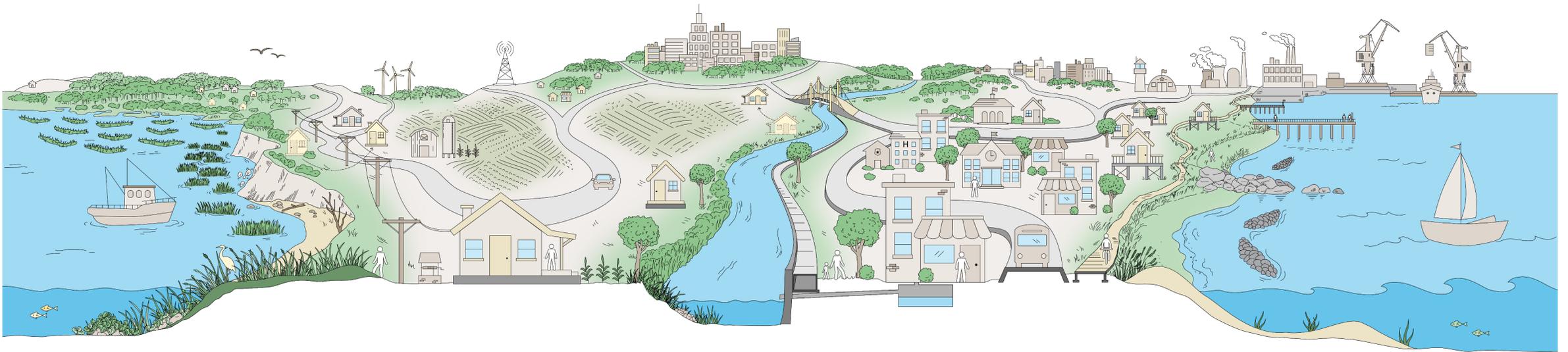
Wetland Inundation



“Coastal wetlands will survive rising seas, but only if we let them”

“Rural areas will bear the brunt of U.S. sea-level rise”

Adaptation and Resilience



Resilience Planning Across Virginia



DCR Flood Resilience Planning

Virginia Flood
Protection
Master Plan

Virginia Coastal
Resilience
Master Plan

Community
Outreach and
Engagement
Plan

Bi-Annual Status
of Flood
Resilience Report

Quarterly
Coastal
Resilience TAC
Meetings

Annual Flood
Resilience
Coordination
Meeting(s)

Resilience
Coordination
Workgroup

Building Flood Resilience

Select Area of Interest:
Commonwealth: Virginia

Filters:
Category: All
Hazard Addressed: All
Project Class: All
[Reset All Filters & Map](#)

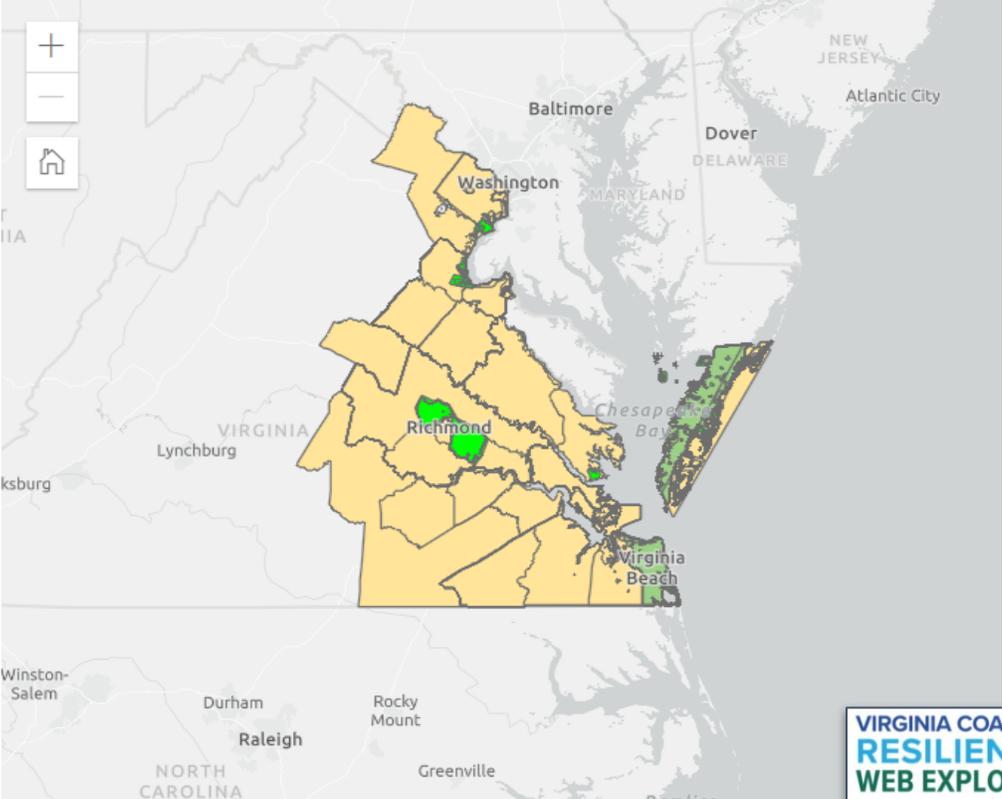
Additional Map Layers: [Clear Map Layers](#)

- 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



VIRGINIA COASTAL RESILIENCE WEB EXPLORER
Ver 1.0

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 multiple parameter physical, chemical, or biological observing systems and/or conduct multiple stressor experimental resees priorities of this funding opportunity are to (1) build or strengthen relationships between the shellfish aquaculture industry a aquaculture research community (including university, industry, private sector, tribal, state, and/or federal scientists represen perspectives), (2) develop scientific knowledge on the impact of ocean and coastal acidification in combination with other st 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 th 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) implementa evaluation of adaptation actions that address the threats identified in the Compendium; and 3) use and dissemination of eva to improve adaptation actions and enhance understanding of effective climate resilience adaptations in public health and re
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 support prepare for climate change impacts on tribal treat and trust resources, economies, infrastructure, and human health and safe of Available Funding: - Adaptation planning - Ocean and Coastal Management Planning - Capacity Building - Relocation, M or Protect-in-Place Planning - Internships and Youth Engagement

Community Flood Preparedness Fund

[§ 10.1-603.24-27]

	Round 1	Round 2	Totals	Round 3
Funds Advertised	\$18M	\$17M	\$35M	\$40M + \$30M
Funds Requested	\$14.5M [32]	\$29.7M [37]	\$44.2M [69]	\$91M [64]
Funds Awarded	\$7.8M [19]	\$24.5M [30]	\$32.3M [49]	\$13.6M+
<i>Low Income Geographic Area</i>	<i>\$3.8M (48%)</i> [11]	<i>\$19.7M (79%)</i> [15]	<i>\$23.5M (72%)</i> [26]	<i>TBD</i>
<i>Non Low Income Geographic Area</i>	<i>\$4.0M</i> [8]	<i>\$4.8M</i> [15]	<i>\$8.8M</i> [23]	<i>TBD</i>

Resilient Virginia Revolving Fund

[§10.1-603.29]

- Established 2022 by HB1309 (Bulova) / SB 756 (Lewis)
- Fund is capitalized with \$25 million from the CFPF
- Loans and grants for resilience projects via Virginia Resources Authority (VRA)
- DCR will administer and will develop guidelines with VRA
- Anticipate accepting first round of applications early CY2023
- Transparency:
 - Fund guidelines/manuals will be put out for public comment
 - Review committee will be established to review applications



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