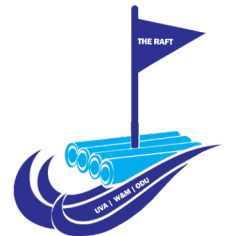


# The RAFT

Resilience Adaptation Feasibility Tool

Sept. 7, 2022



# WORKSHOP AGENDA

Time	Topic	Speaker
9:00 AM	Welcome and Introductions	Elizabeth Andrews, Director of William & Mary Law School's VCPC
9:05 AM	Background on The RAFT	Tanya Denckla Cobb, Director, UVA IEN
9:10 AM	Introduction of Speakers	Elizabeth Andrews
9:15 AM	Predicted SLR in the region and risks to wells, septic systems, roads, buildings, shorelines, and marshes, with 5-minute Q&A	Dr. Molly Mitchell, Research Assistant Professor at VIMS
9:40 AM	MPPDC's Fight the Flood Program and sharing of a link to an informational video	Elizabeth Andrews
9:45 AM	The Community Flood Preparedness Fund, with 5-minute Q&A	Darryl Glover, Deputy Director for Dam Safety, Floodplain Management, and Soil & Water Conservation, VA DCR
10:05 AM	DCR's Shoreline Erosion Advisory Service (DCR SEAS), with a 5-minute Q&A	Aaron Wendt, Environmental Specialist, VA DCR, Division of Soil & Water Conservation, SEAS
10:20 AM	Bay Aging's and Bay Transit's services throughout the Middle Peninsula, with a 5-minute Q&A	Hunter LeClair, Asst. Director, Multifamily Housing Management, Bay Aging & Ken Pollock, Transit Director for Bay Transit
10:40 AM	Community gardens and how the Master Gardeners program can support resilience, with a 5-minute Q&A	Christina Murray, VA Cooperative Extension Service at Virginia Tech
10:55 AM	Closing Remarks	Dr. Wie Yusuf, ODU ICAR

## RELEVANT LINKS

Curt Smith, MPPDC's *Fight the Flood* Presentations:

<https://www.youtube.com/watch?v=--qzhqPPfhM&list=PLX1zjRLo43ypK8ptsWcuFyR-ek56ham0l&index=1>

VA Cooperative Extension's Well Water Testing & Drinking Water Clinics: <https://www.wellwater.bse.vt.edu/clinics.php>

# Predicted sea level rise in Virginia

Risks to wells, septic systems, roads, buildings, shorelines

Molly Mitchell

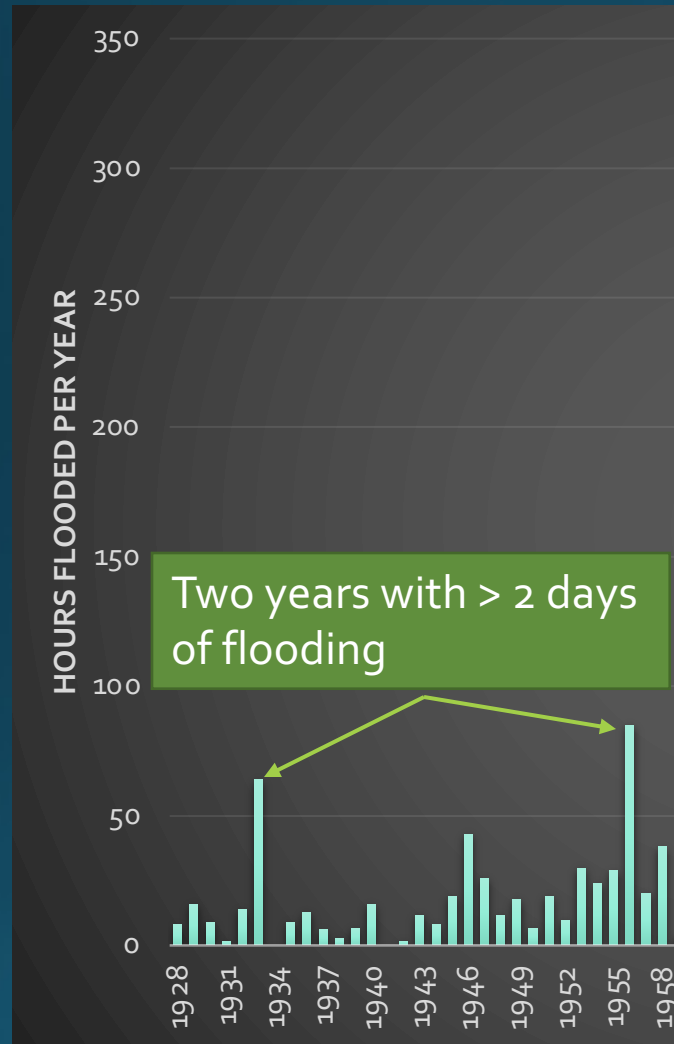
Sept 2022

Raft Resilience Education Workshop

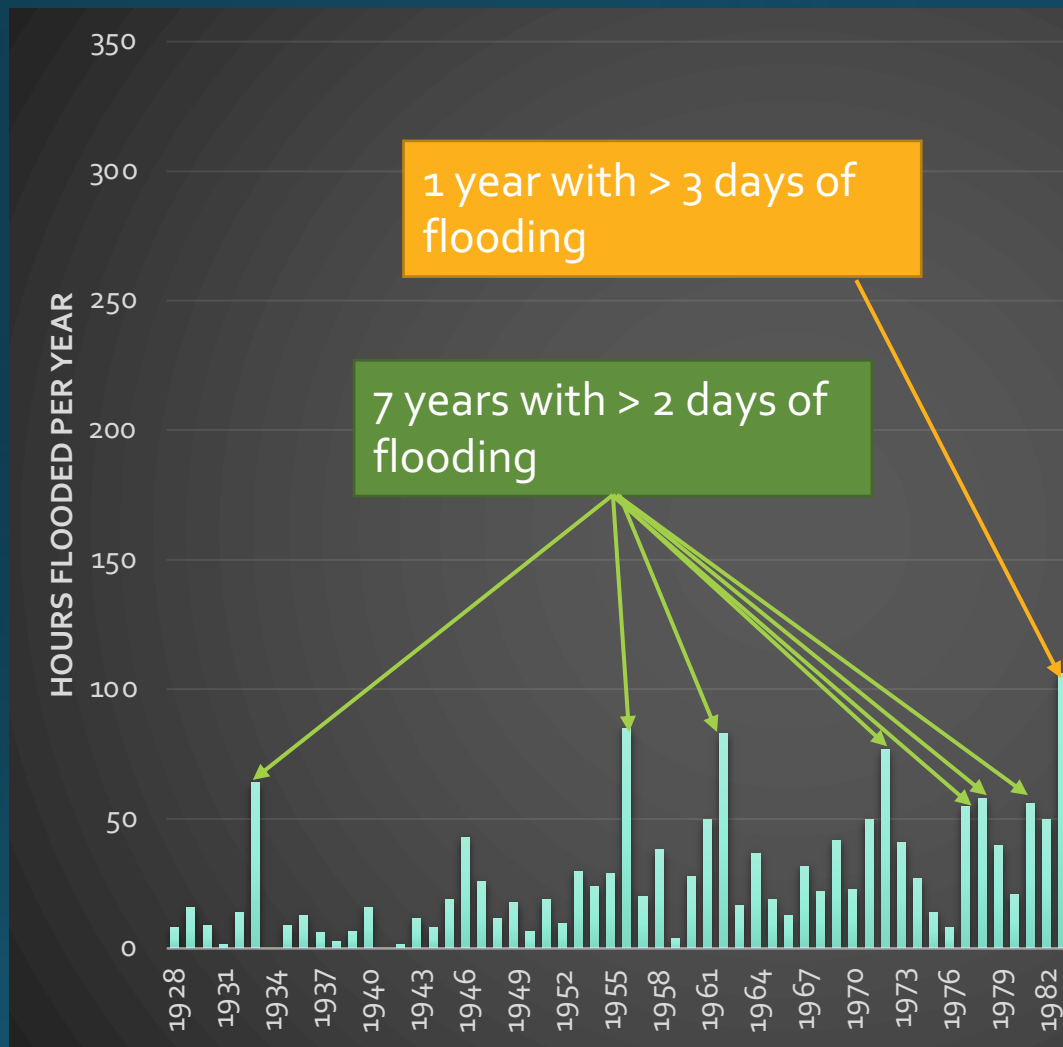


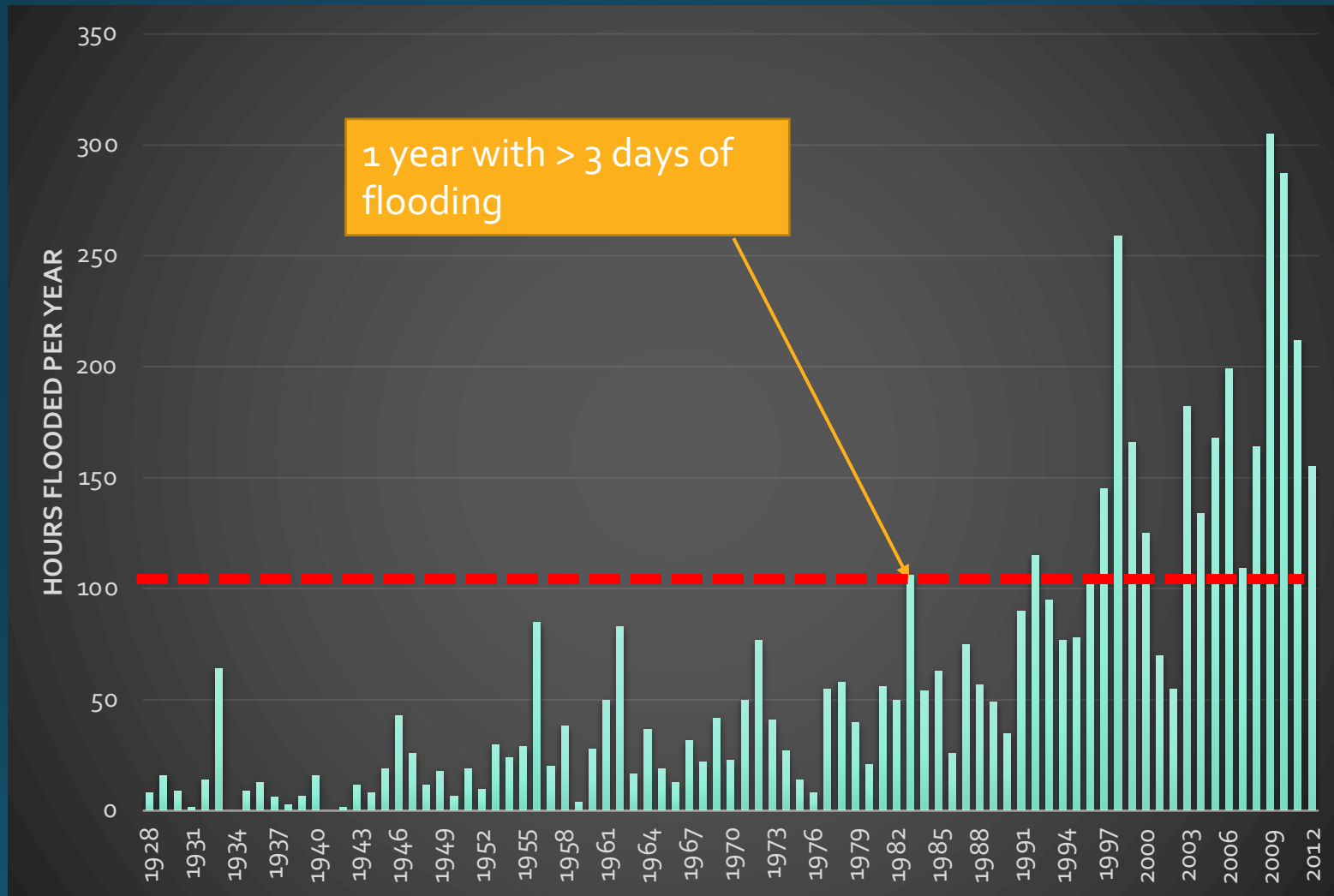
VIRGINIA INSTITUTE OF MARINE SCIENCE  
CENTER FOR COASTAL RESOURCES MANAGEMENT

# 1960



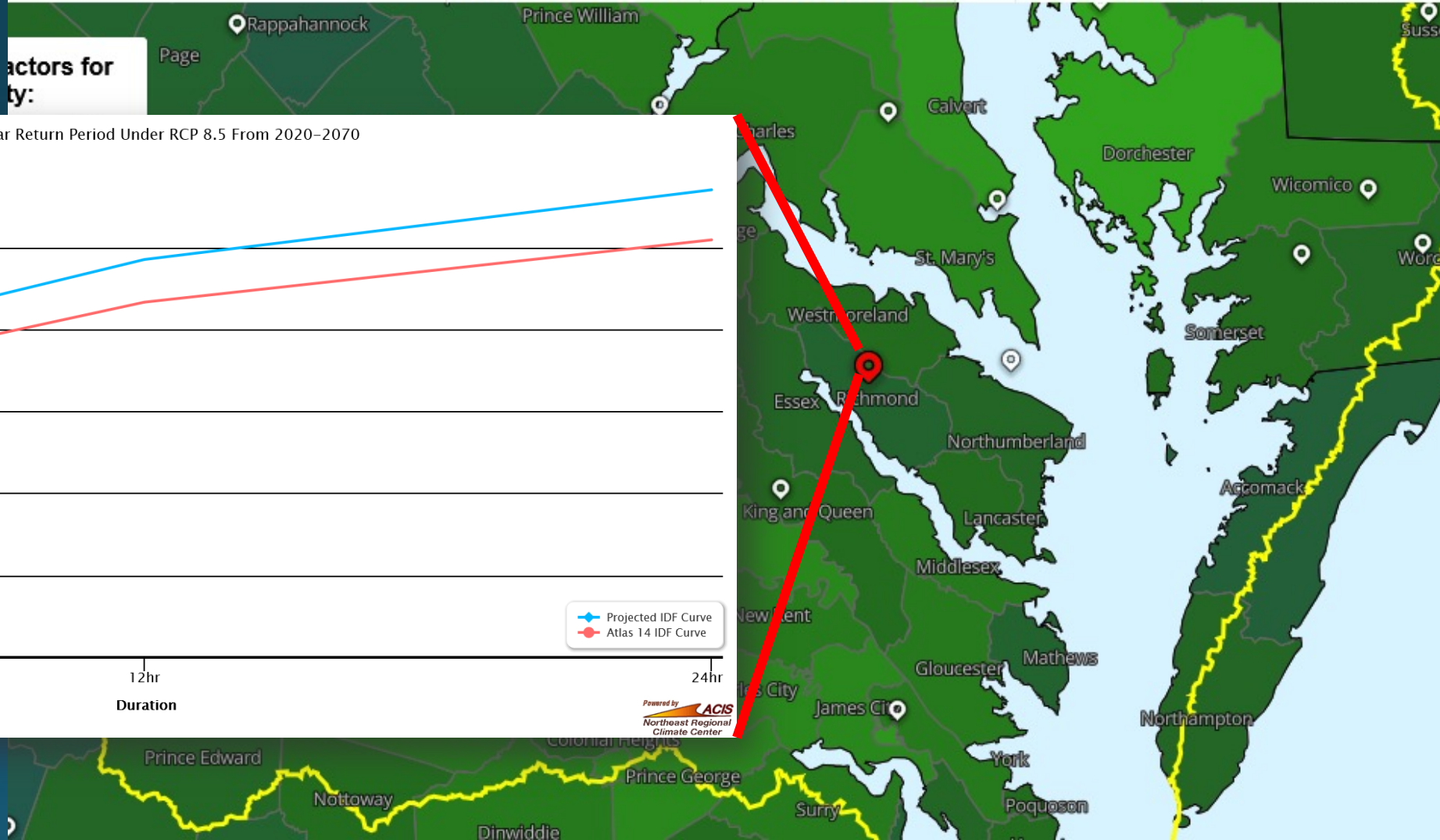
# 1985



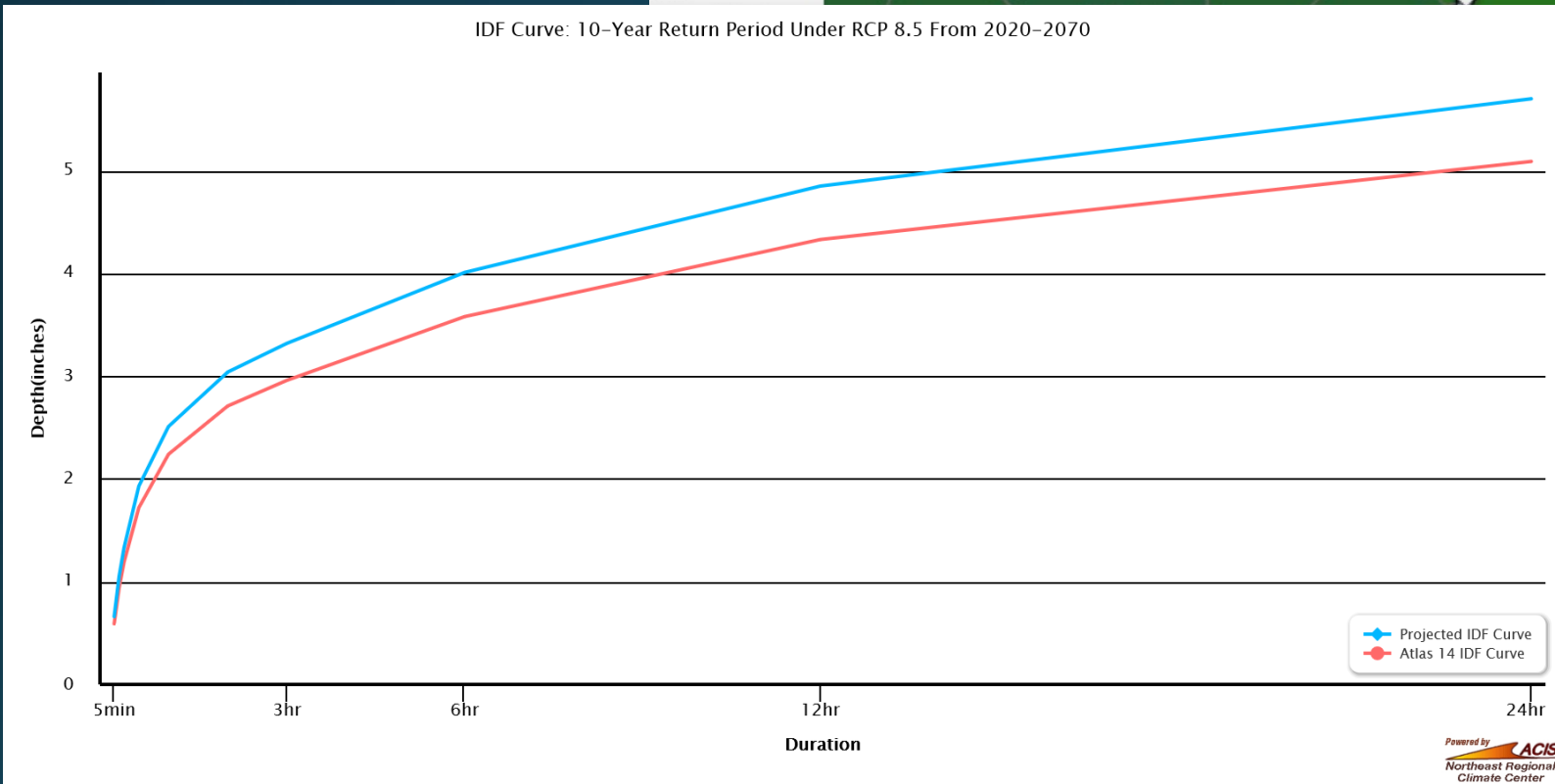


Data courtesy of Dr. Larry Atkinson, CCLRI, Old Dominion University

Factors for  
city:



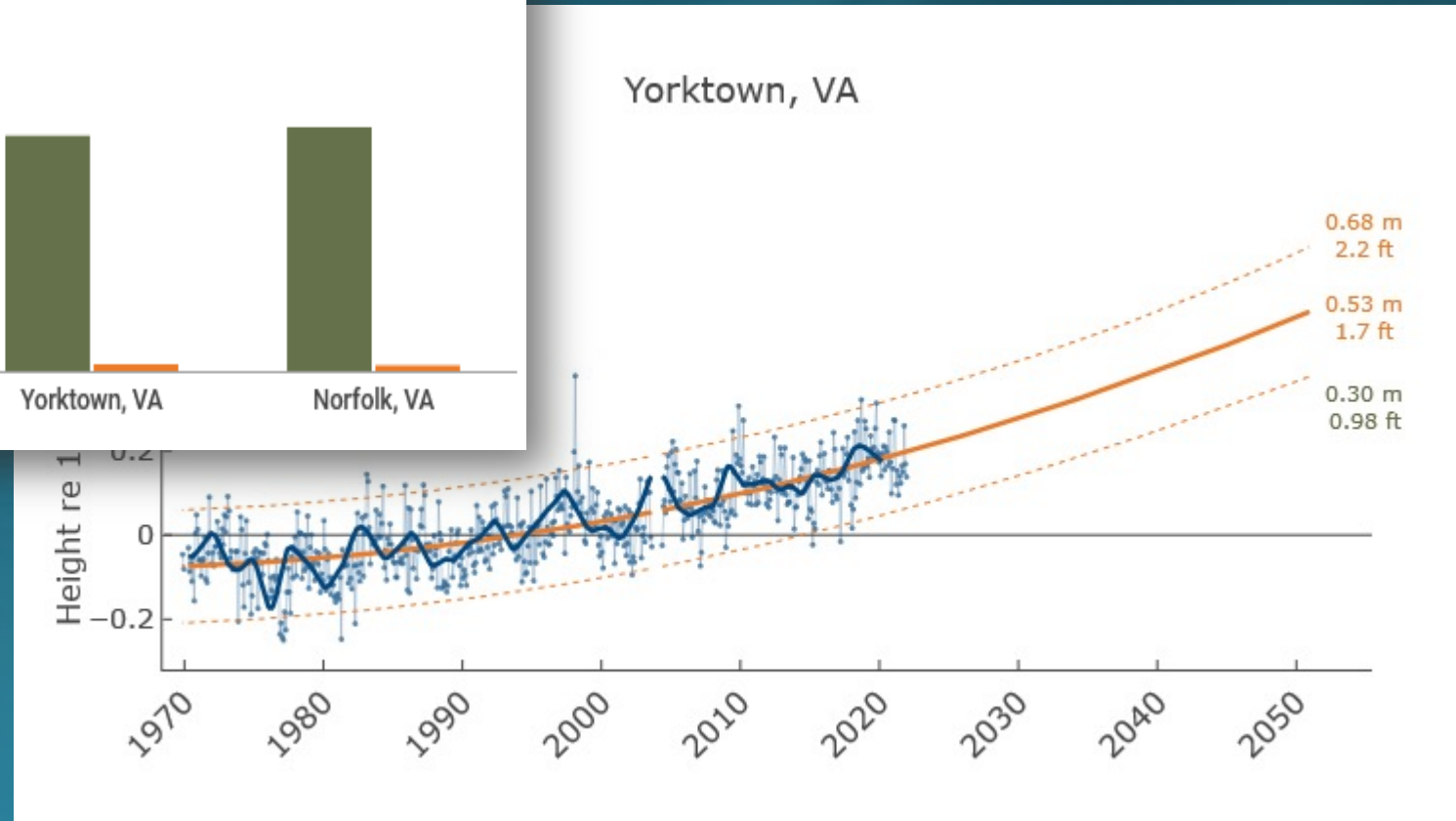
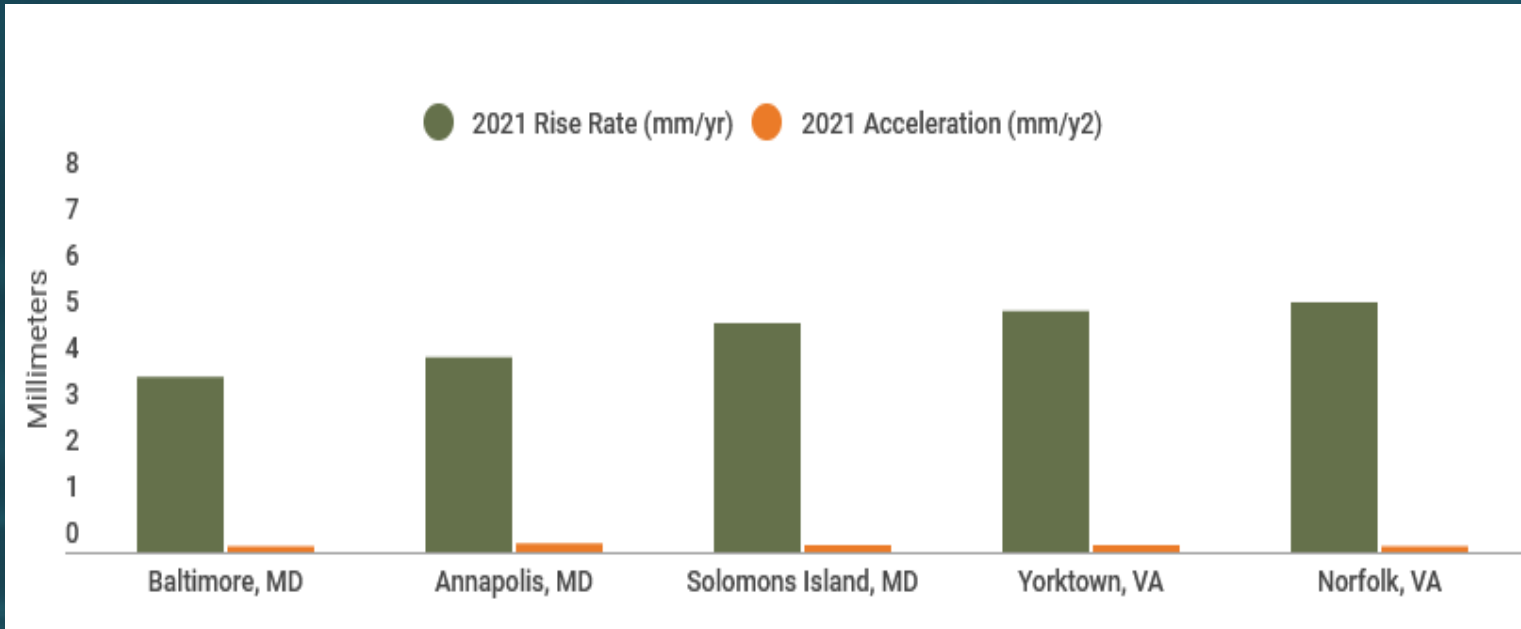
IDF Curve: 10-Year Return Period Under RCP 8.5 From 2020-2070



Powered by **ACIS**  
Northeast Regional  
Climate Center



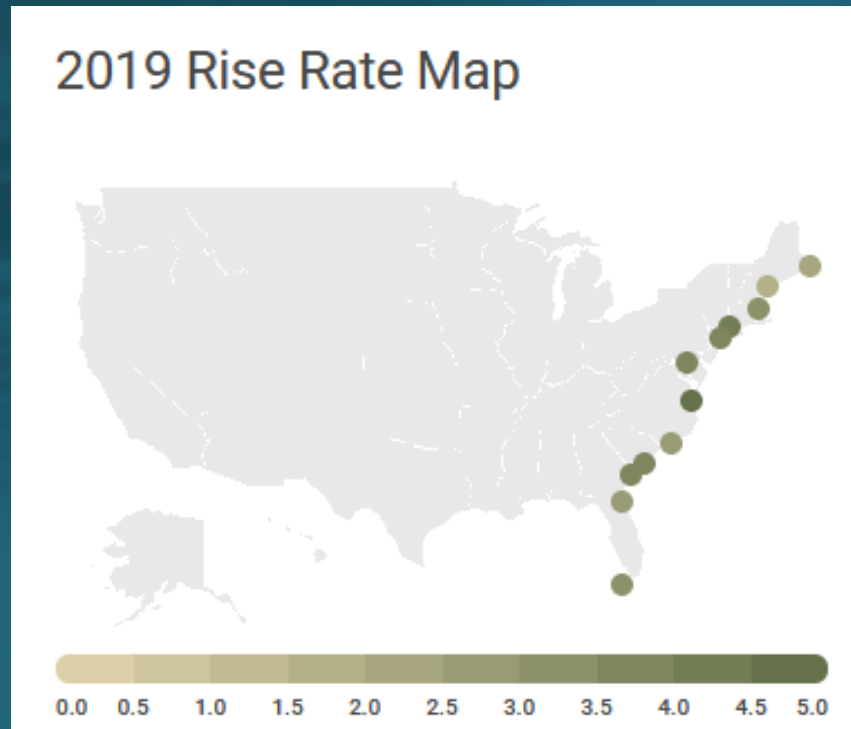
# Sea level rise around the Bay



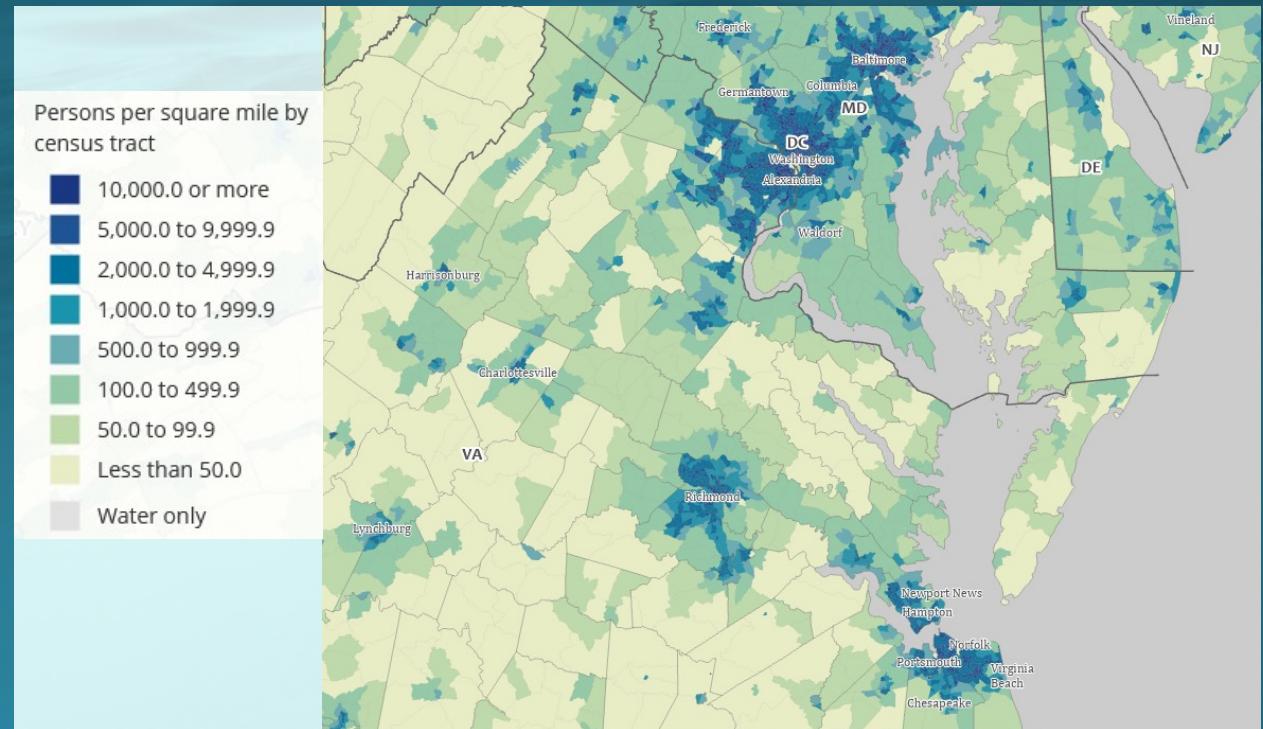


# Problem

- Virginia has one of the highest rates of sea level rise on the East Coast
- Many rural adaptation measures (e.g., elevating houses, re-digging wells) have two significant limitations:
  - 1) they place the entire cost of the adaptation on the private property owner, which
  - 2) directs available resources to short-term solutions, which buy time, but do not resolve issues.



Sea Level Report Card



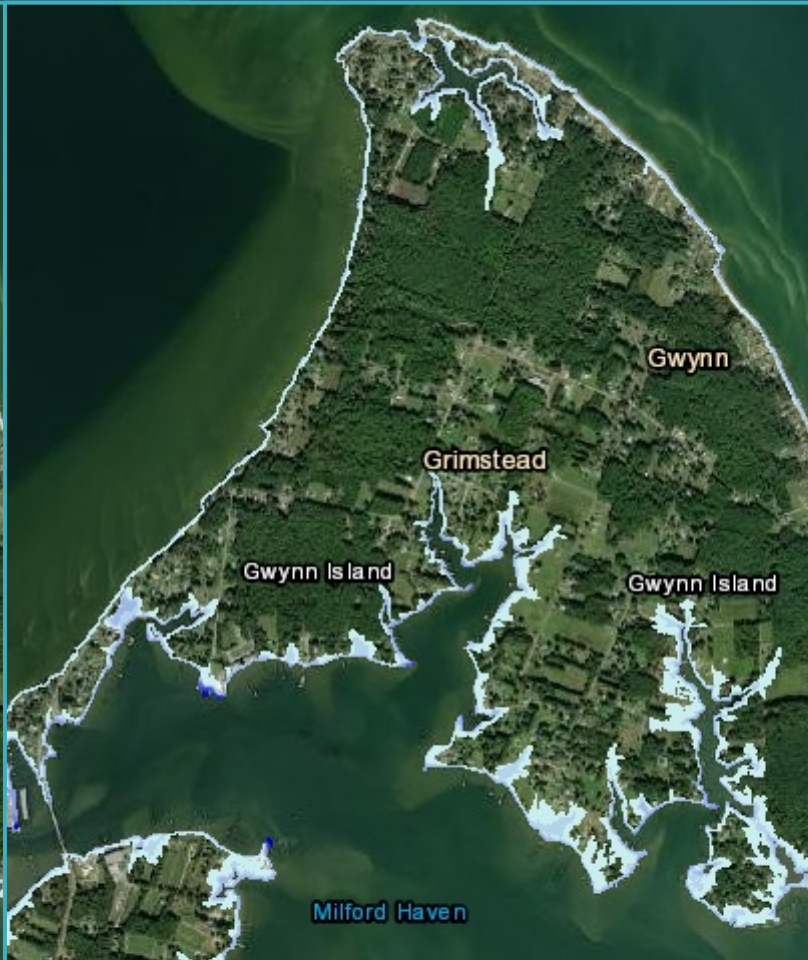
2020 Census Demographic Data Map Viewer

Property flooding

2020

2050

2100

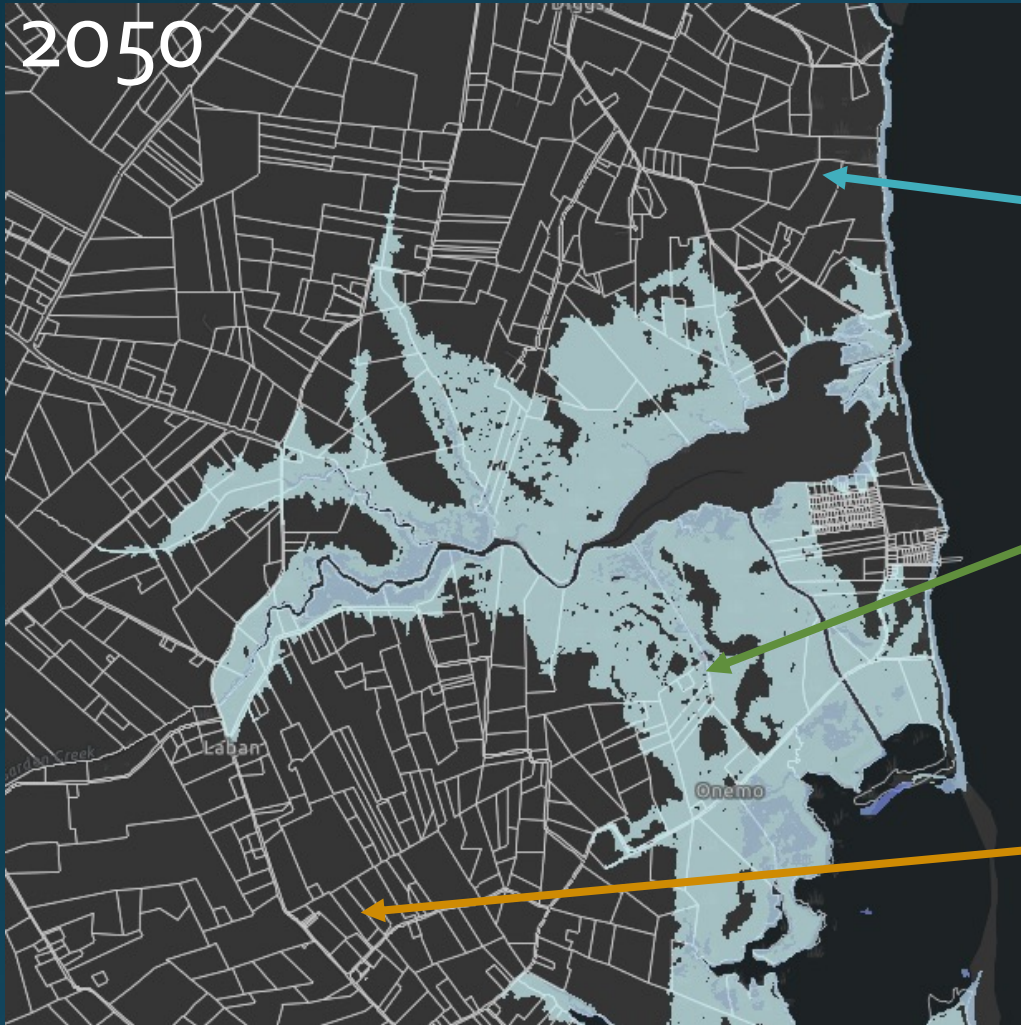


Gwynn's Island – MHW under state planning guidelines NOAA 2017 Intermediate-High scenario

# Best case

MHW NOAA 2017 Low scenario

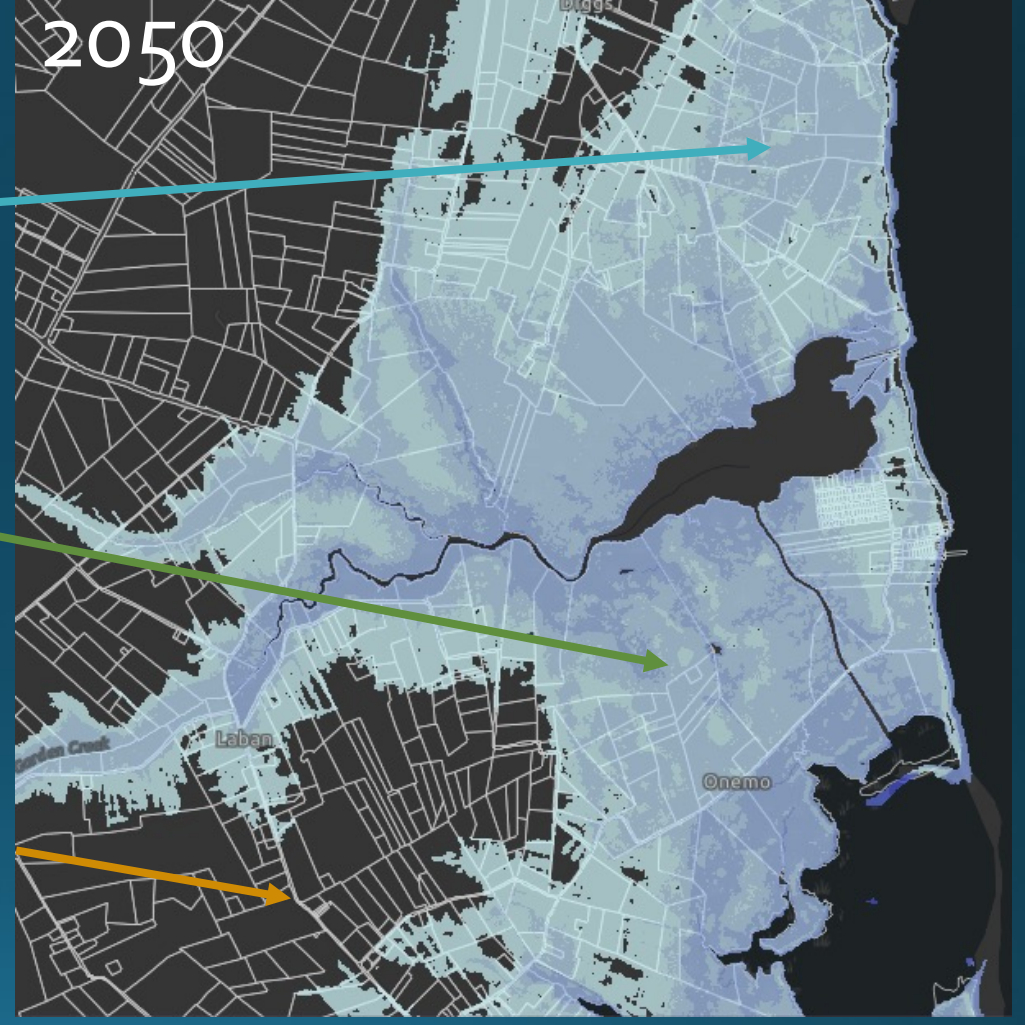
2050



# Worst case

MHW NOAA 2017 Extreme scenario

2050



Hard to predict outcome

Likely to be underwater

Unlikely to flood

[http://adaptva.org/info/tools\\_rd.html](http://adaptva.org/info/tools_rd.html)

COASTAL VIRGINIA  
ROAD ACCESSIBILITY AND FLOODING



Eastern Shore

Northern Virginia

Northern Neck

Middle Peninsula

Peninsula

Southside

# Road flooding

# COASTAL VIRGINIA ROAD ACCESSIBILITY AND FLOODING

Choose a *locality* to filter the map and statistics. *Click on a road in the map to view detailed statistics*, or *download a table* of detailed road accessibility of at the bottom of this page.

[http://adaptva.org/info/tools\\_rd.html](http://adaptva.org/info/tools_rd.html)

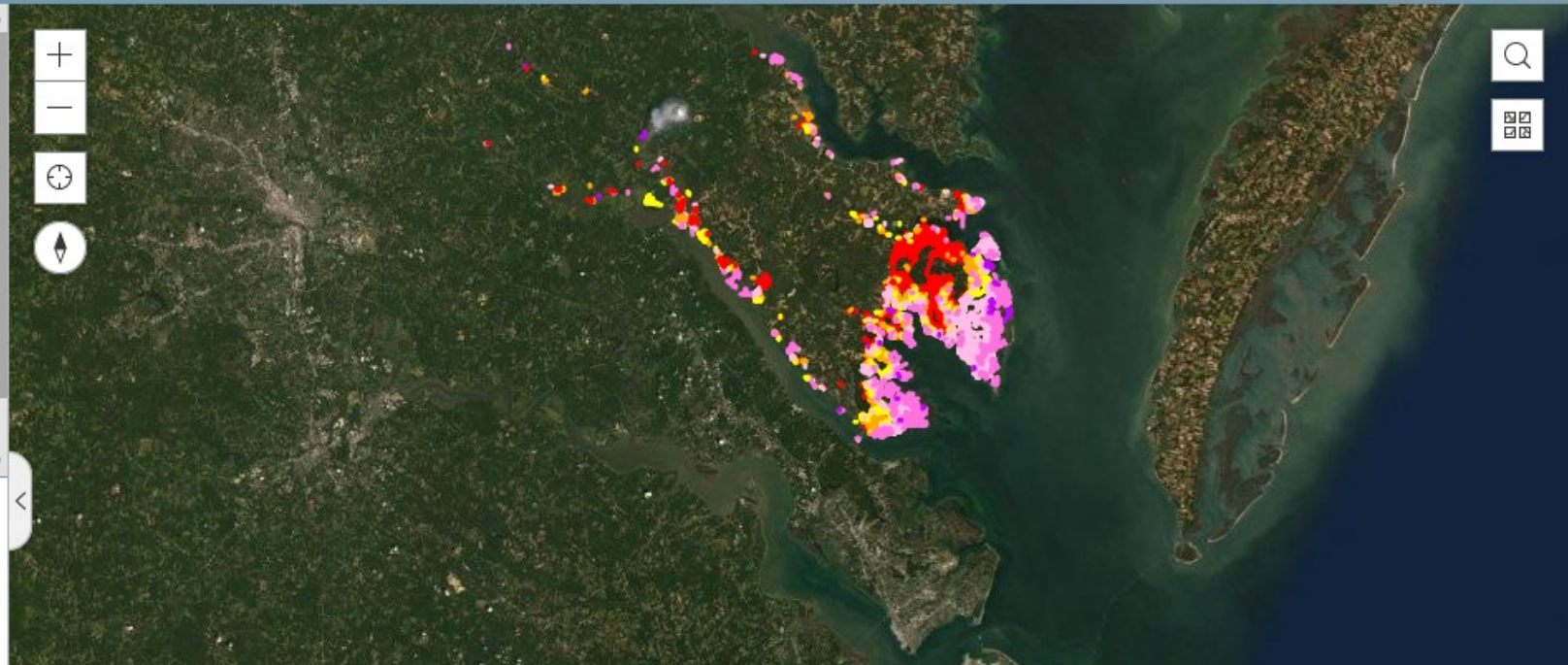
- All -
- Gloucester County
- King and Queen County
- King William County
- Mathews County
- Middlesex County

- ▶  Middle Peninsula Infrastructure
- Middle Peninsula Inaccessible Roads
- Middle Peninsula Accessible Roads
- ▶  Social Vulnerability
- ▶  Flooding Duration Maps
- 2020 FEMA Flood

### Middle Peninsula Inaccessible Roads

Road Inaccessible at Flooding Level

- < 0.5 meters
- 0.6 - 1 meter
- 1.1 - 1.5 meters
- 1.6 - 2 meters
- 2.1 - 2.5 meters
- 2.6 - 3 meters



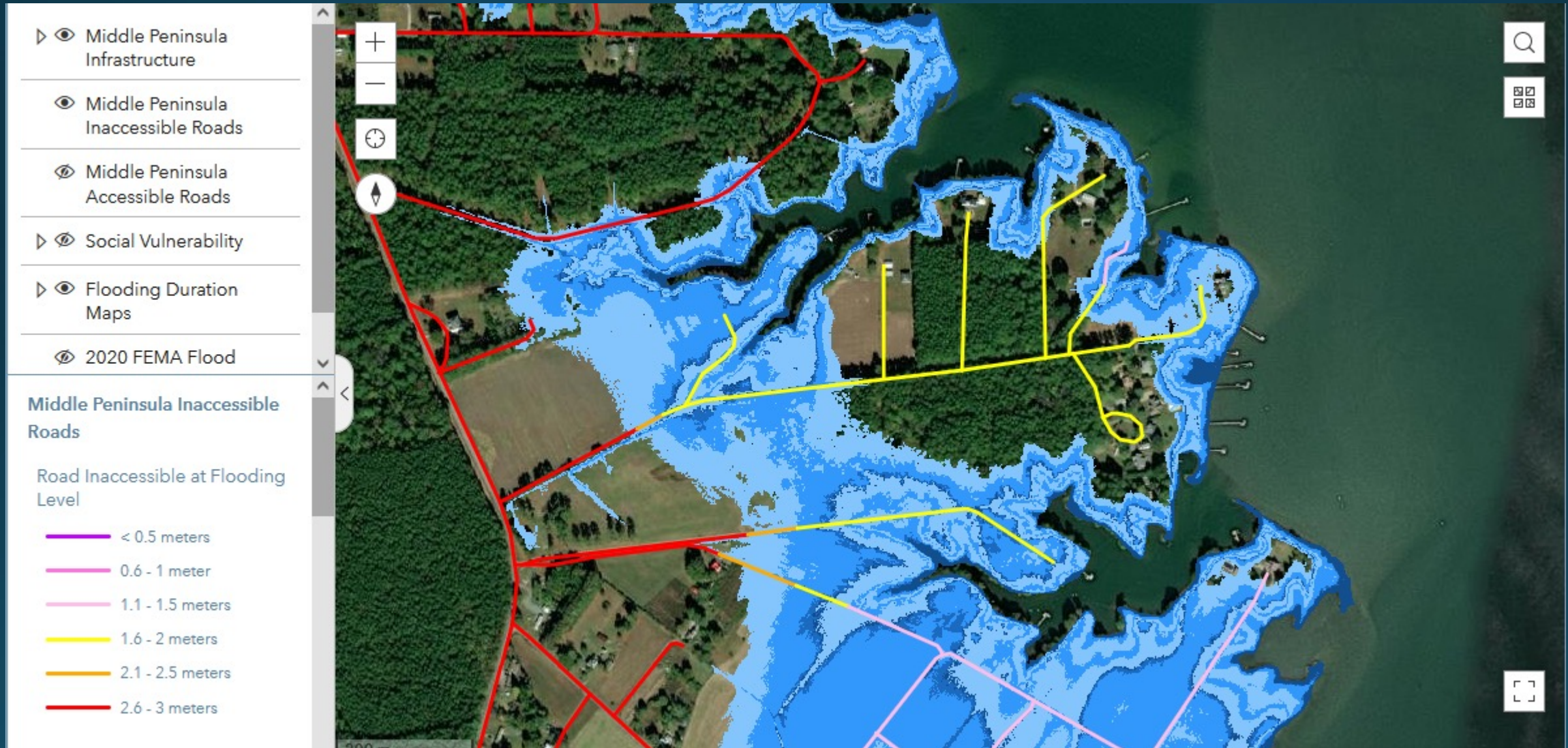
<b>10.549</b> miles of roads become inaccessible at 0.5 meter flooding	<b>175.206</b> miles of roads become inaccessible at 1.0 meters flooding	<b>389.005</b> miles of roads become inaccessible at 1.5 meters flooding	<b>480.593</b> miles of roads become inaccessible at 2 meters flooding	<b>609.679</b> miles of roads become inaccessible at 2.5 meters flooding	<b>825.846</b> miles of roads become inaccessible at 3 meters flooding
------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------	------------------------------------------------------------------------------------

^  
2050 sea level = +0.68 meters  
NOAA projections recommended by the State of Virginia for planning

^  
2100 sea level = +2 meters  
NOAA projections recommended by the State of Virginia for planning



# Inaccessible vs flooded



# Road planning info

## Gloucester County Inaccessible Roads Summary

**Data Notes:** Accessibility/inaccessibility is determined by whether one can reach the county seat from any location.

A blank road name means there is no name recorded in the database for that road segment. Often these road segments are parking lot roads and driveways.

### Summary

	When water rises this much:		This length of road becomes inaccessible:	
	Flooding Level (in meters)	Flooding Level (in feet)	Inaccessible (miles)	Inaccessible (feet)
All Roads in Locality	0.1	0.3	0	592
	0.2	0.7	1	3,154
	0.3	1.0	1	3,344
	0.4	1.3	1	3,715
	0.5	1.6	1	7,767
	0.6	2.0	10	52,836
	0.7	2.3	21	110,426
	0.8	2.6	41	218,835
	0.9	3.0	54	284,133
	1	3.3	80	423,632
	1.1	3.6	90	476,053
	1.2	3.9	100	525,004







### Detailed Road Summary

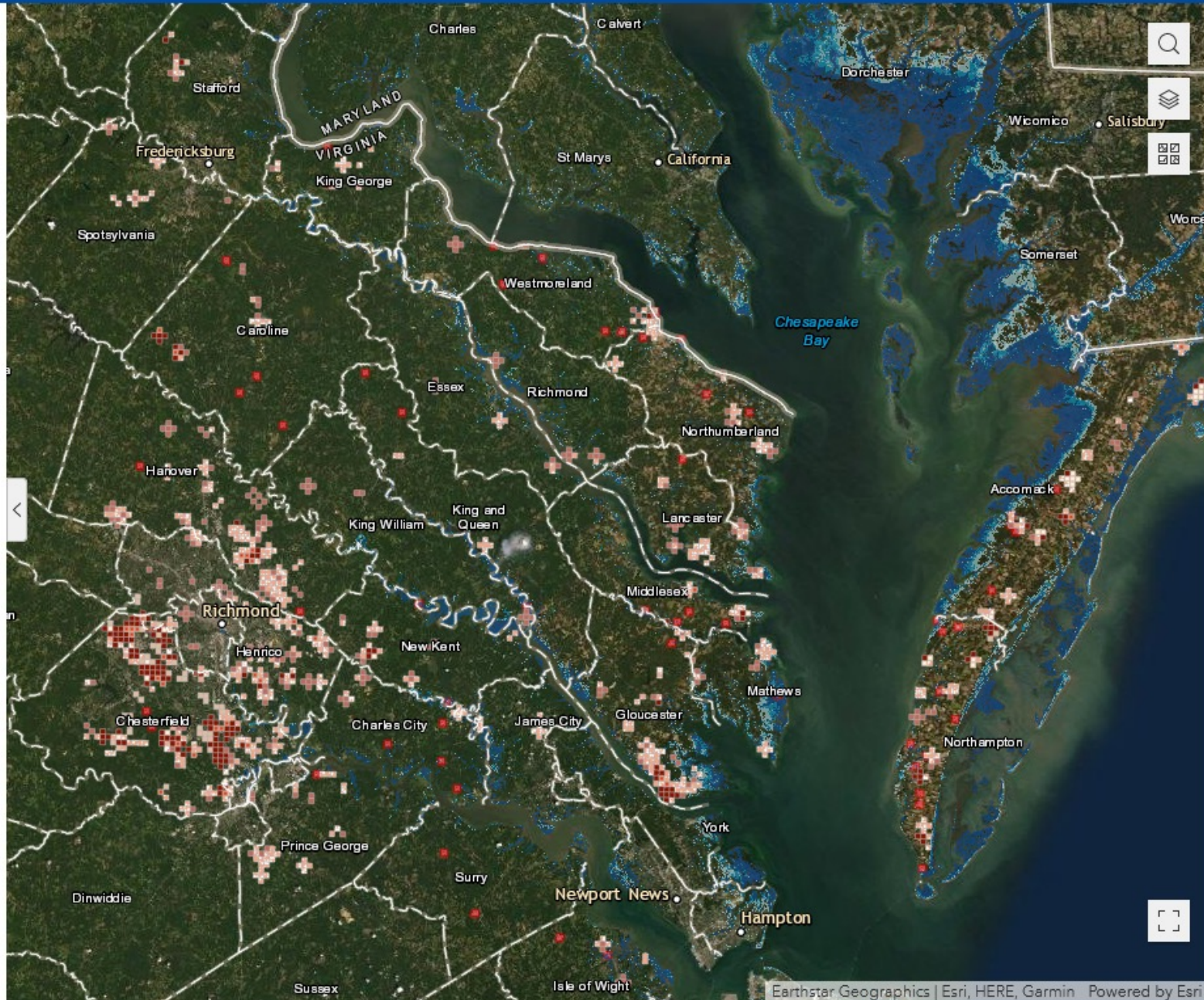
Road Name	When water rises this much:		This length of road becomes inaccessible:	
	Flooding Level (in meters)	Flooding Level (in feet)	Inaccessible (miles)	Inaccessible (feet)
	0.1	0.3	0	504
Inlet Lane	0.1	0.3	0	40
Meekins Lane	0.1	0.3	0	48
	0.2	0.7	0	1804
Holly Trail	0.2	0.7	0	39
Hope Haven Lane	0.2	0.7	0	1205
Inlet Lane	0.2	0.7	0	44
Kingswood Lane	0.2	0.7	0	4
Meekins Lane	0.2	0.7	0	58
	0.3	1.0	0	1960
Holly Trail	0.3	1.0	0	46
Hope Haven Lane	0.3	1.0	0	1205
Inlet Lane	0.3	1.0	0	44
Kingswood Lane	0.3	1.0	0	4
Maryus Road	0.3	1.0	0	1
Meekins Lane	0.3	1.0	0	62
Qualifield Lane	0.3	1.0	0	3
Seawells Point Lane	0.3	1.0	0	20

Can also overlay:

- Vulnerability indices
- FEMA flood zones
- Building footprints
- Parcels

Septic issues

- ▶  Tidewater Hot Spot Results ...
- ▶  Areas within 3 feet of MSL ...
-  High Density Failures ...
-  Sewer Lines ...
-  Building Addresses ...
- ▶  Social Vulnerability Data ...






## Tidewater Hot Spot Results

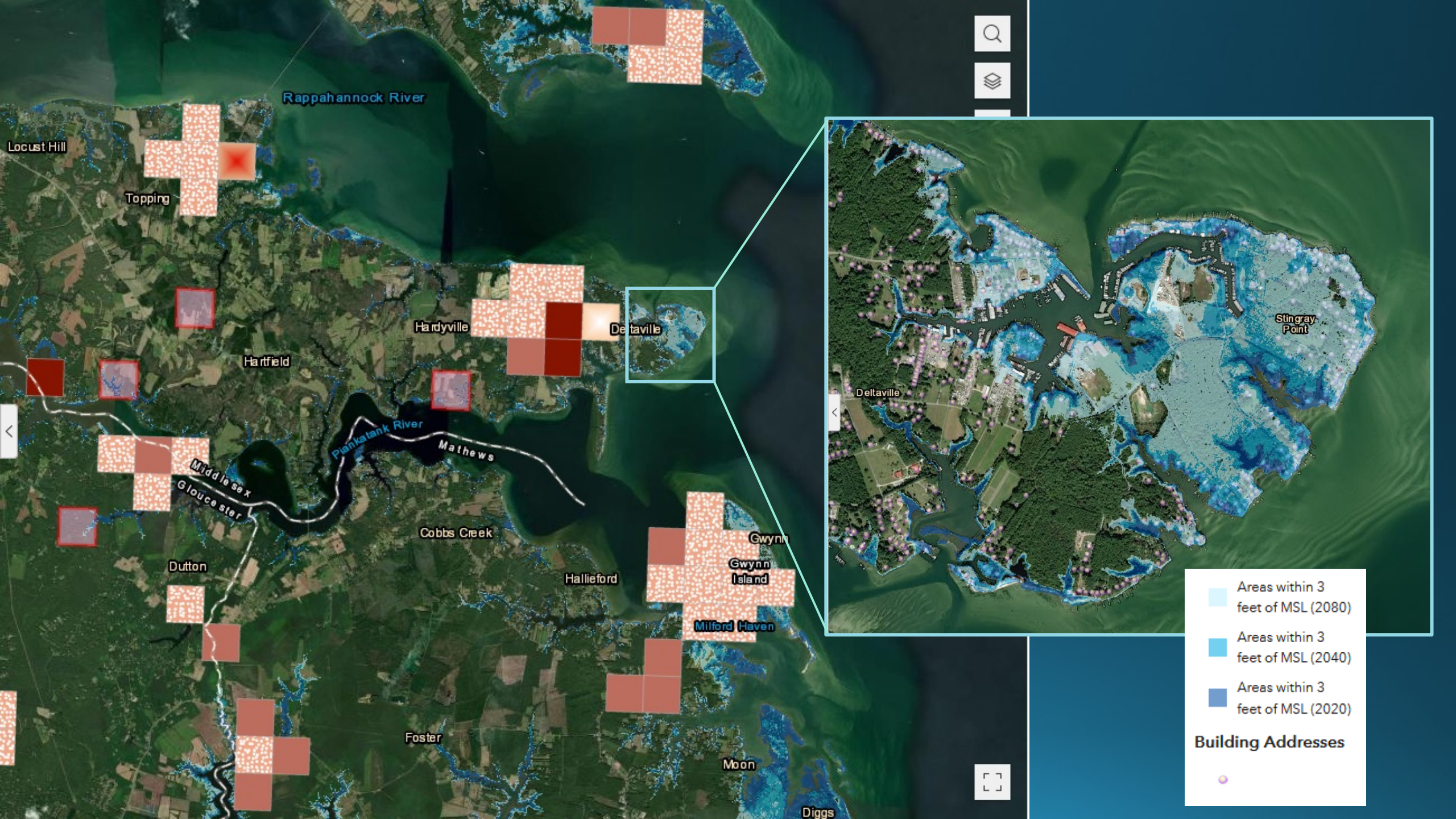
### Tidewater Hot Spots

-  New Hot Spot
-  Consecutive Hot Spot
-  Intensifying Hot Spot
-  Persistent Hot Spot
-  Diminishing Hot Spot
-  Sporadic Hot Spot
-  Oscillating Hot Spot
-  Historical Hot Spot

### Areas within 3 feet of MSL

#### Areas\_within\_3\_feet\_above\_MSL.tif

-  Areas within 3 feet of MSL (2080)
-  Areas within 3 feet of MSL (2040)
-  Areas within 3 feet of MSL (2020)



Well water concerns



**Richmond County**

Richmond County Well Records (PDC Land Records Prior to 2000)



Richmond Geocoded Well Records



**Westmoreland County**

Westmoreland Well Records (PDC Land Records Prior to 2000)

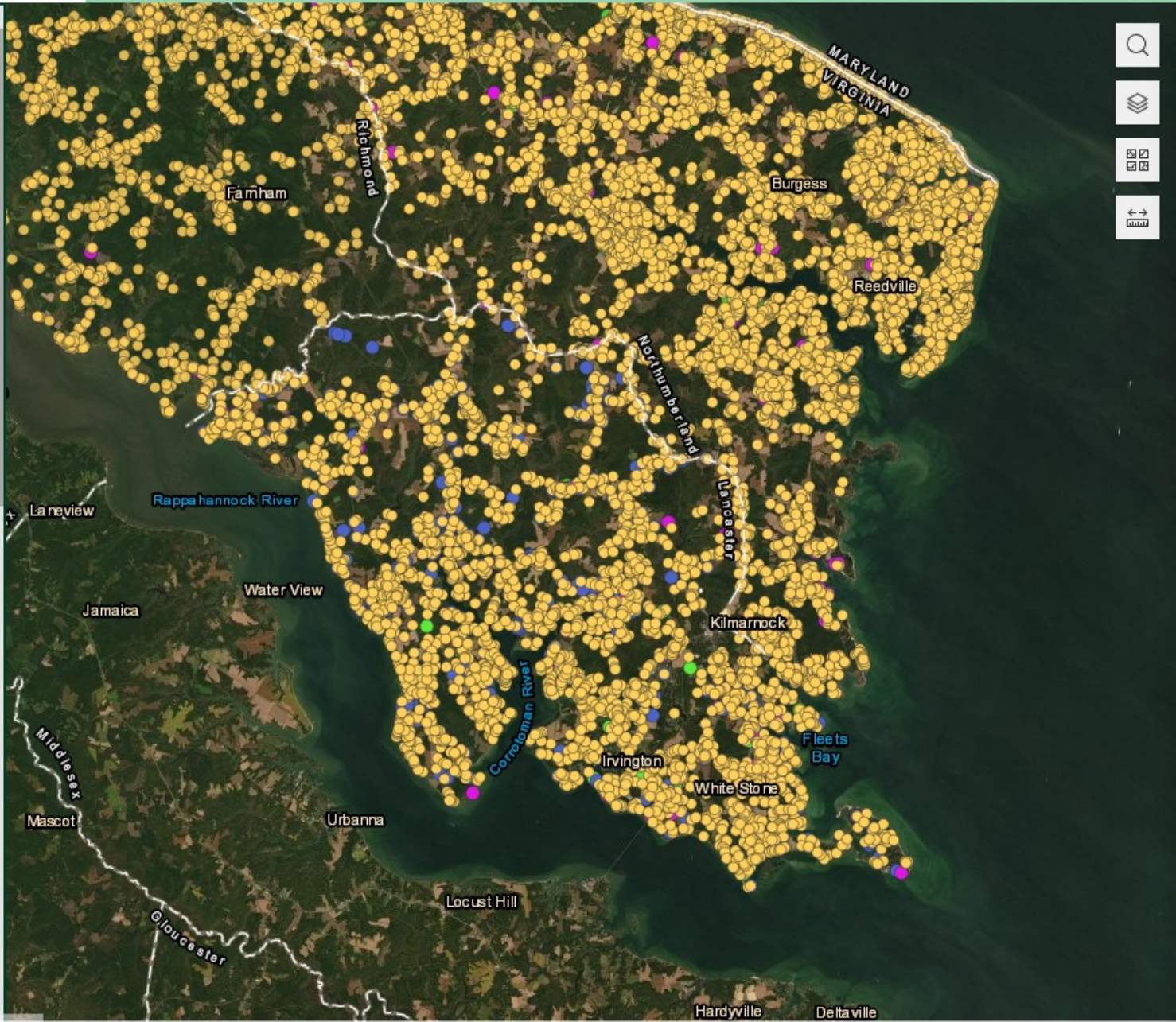


Westmoreland Geocoded Well Records



**Lancaster County**

Lancaster Well Records (PDC Land Records Prior 2000)



Map navigation controls including a search icon, a layer stack icon, a grid icon, and a zoom in/out icon.

- ▶  Richmond County ...
- ▶  Westmoreland County ...
- ▶  Lancaster County ...
- ▶  Northumberland County ...

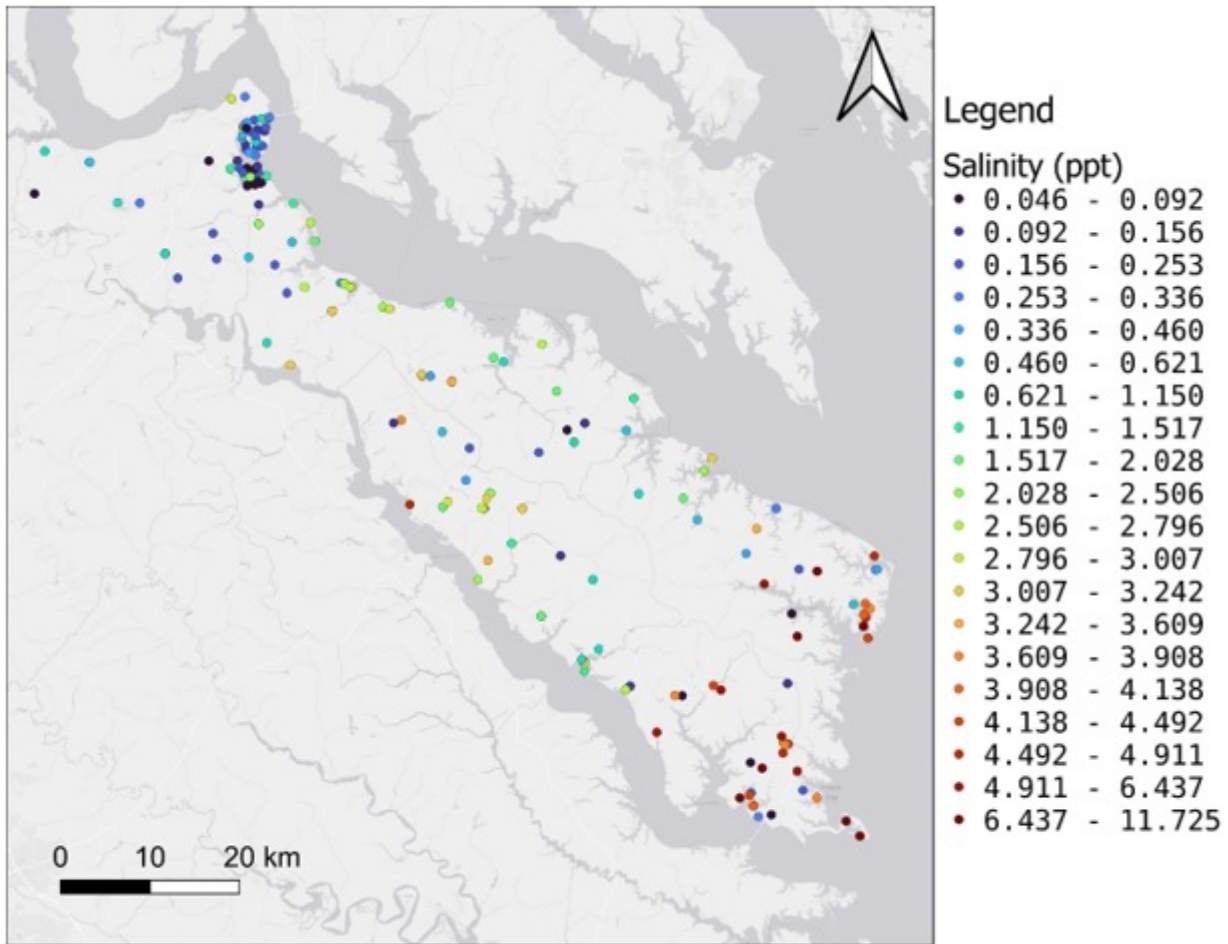


Figure 2 USGS monitoring well salinity data.

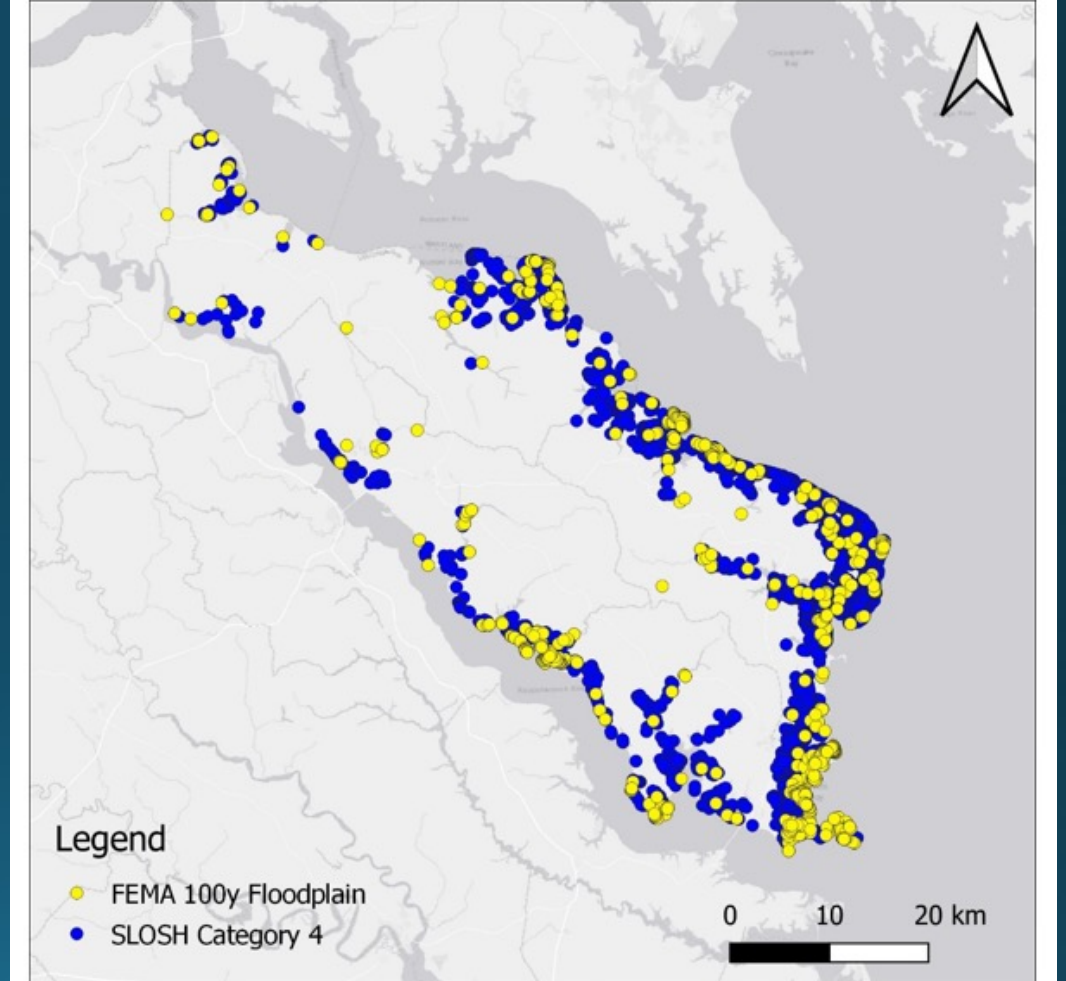
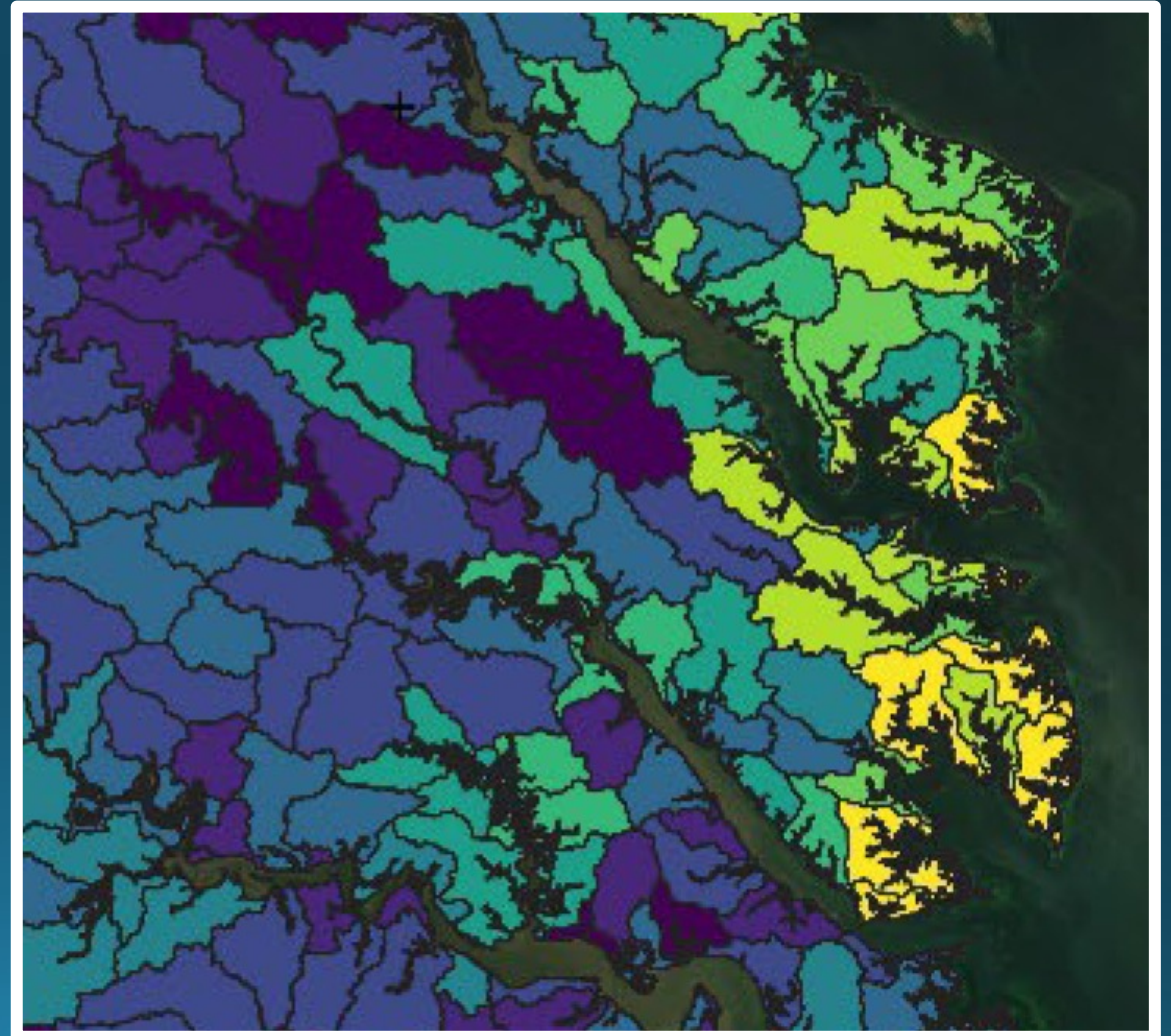
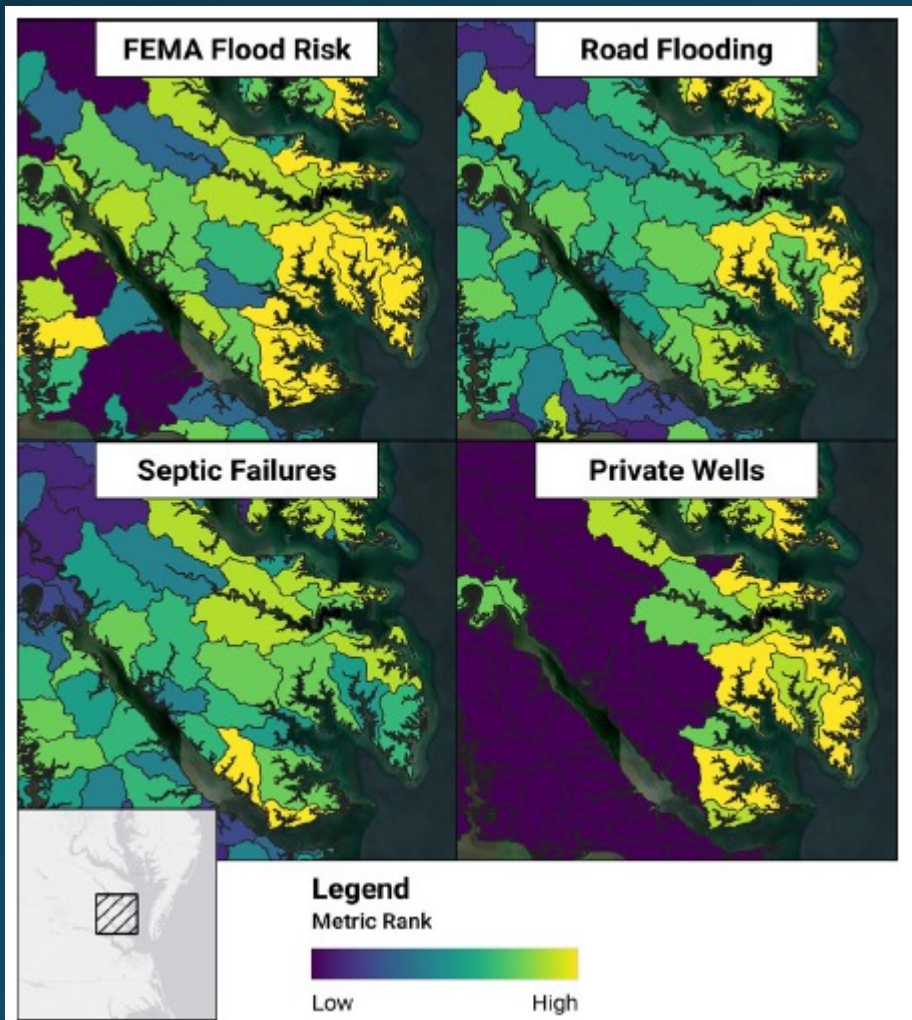


Figure 3 Wells at risk of overtopping from storm surge events.



# Putting it all together (ongoing NOAA grant) Rural Coastal Vulnerability Index (RCVI)

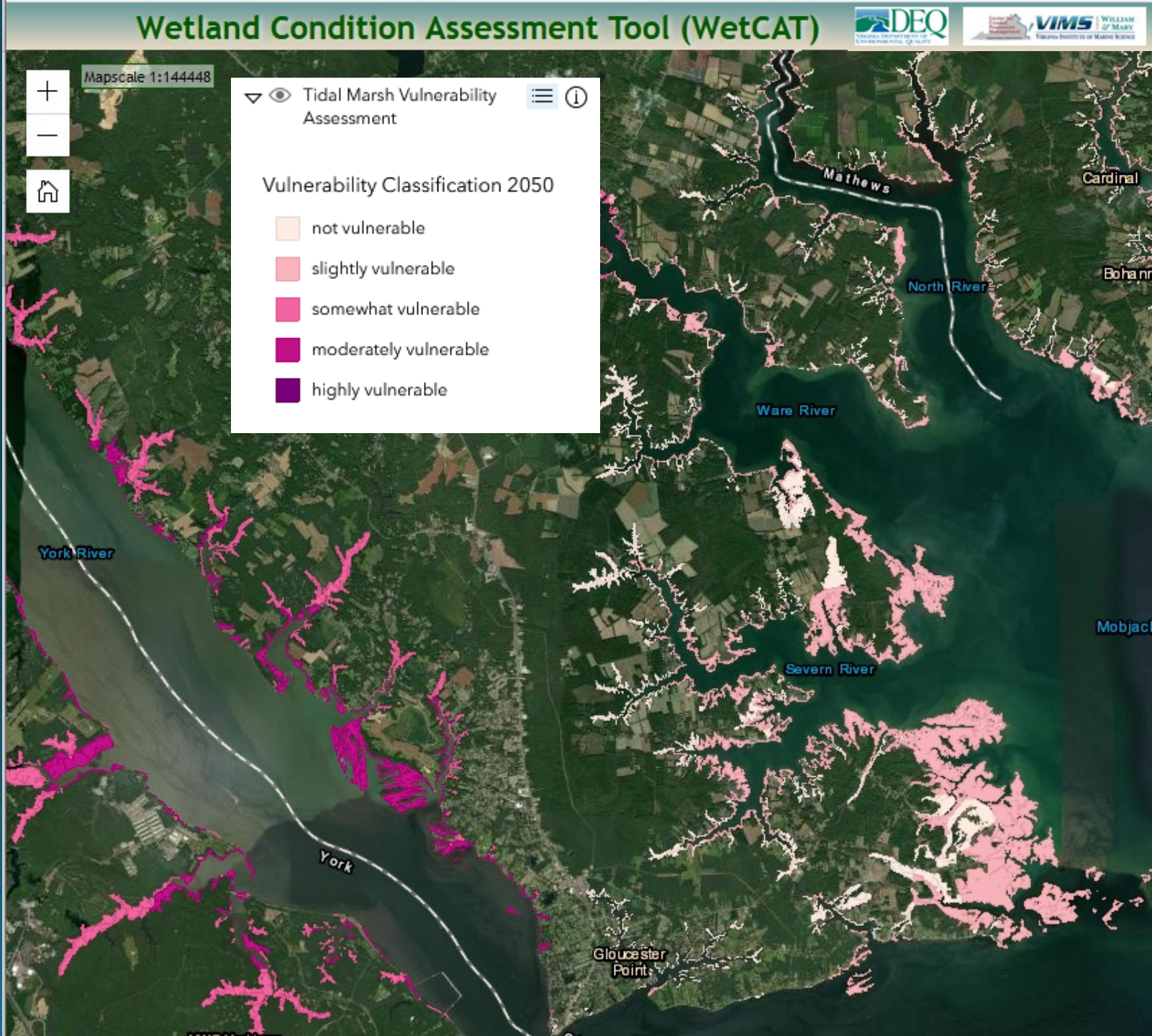


Natural resources

# WetCAT

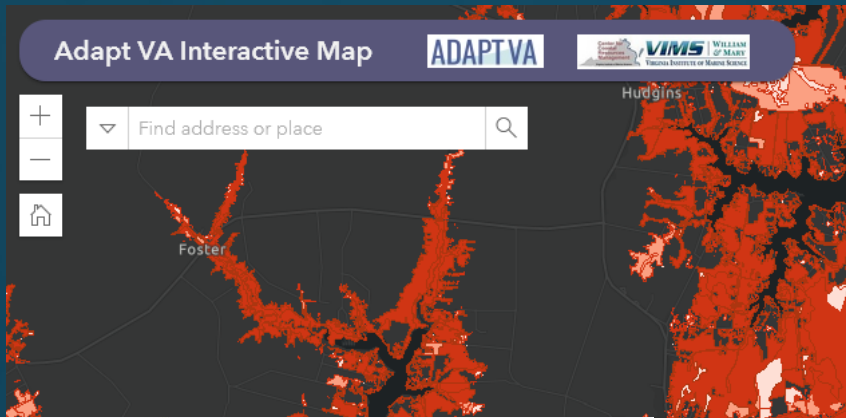
This project assesses the vulnerability of tidal marshes to climate change for the time periods 2050 and 2100 throughout Virginia.

The vulnerability scores given to the marshes combine exposure, sensitivity and adaptive capacity of wetland habitats within tidally-connected wetland complexes.





Find address or place



### Coastal NNBFs Ranked: Benefits to Coastal Buildings

Type of NNBF: **Tidal Marsh** [fact sheet](#) (opens in a new tab)

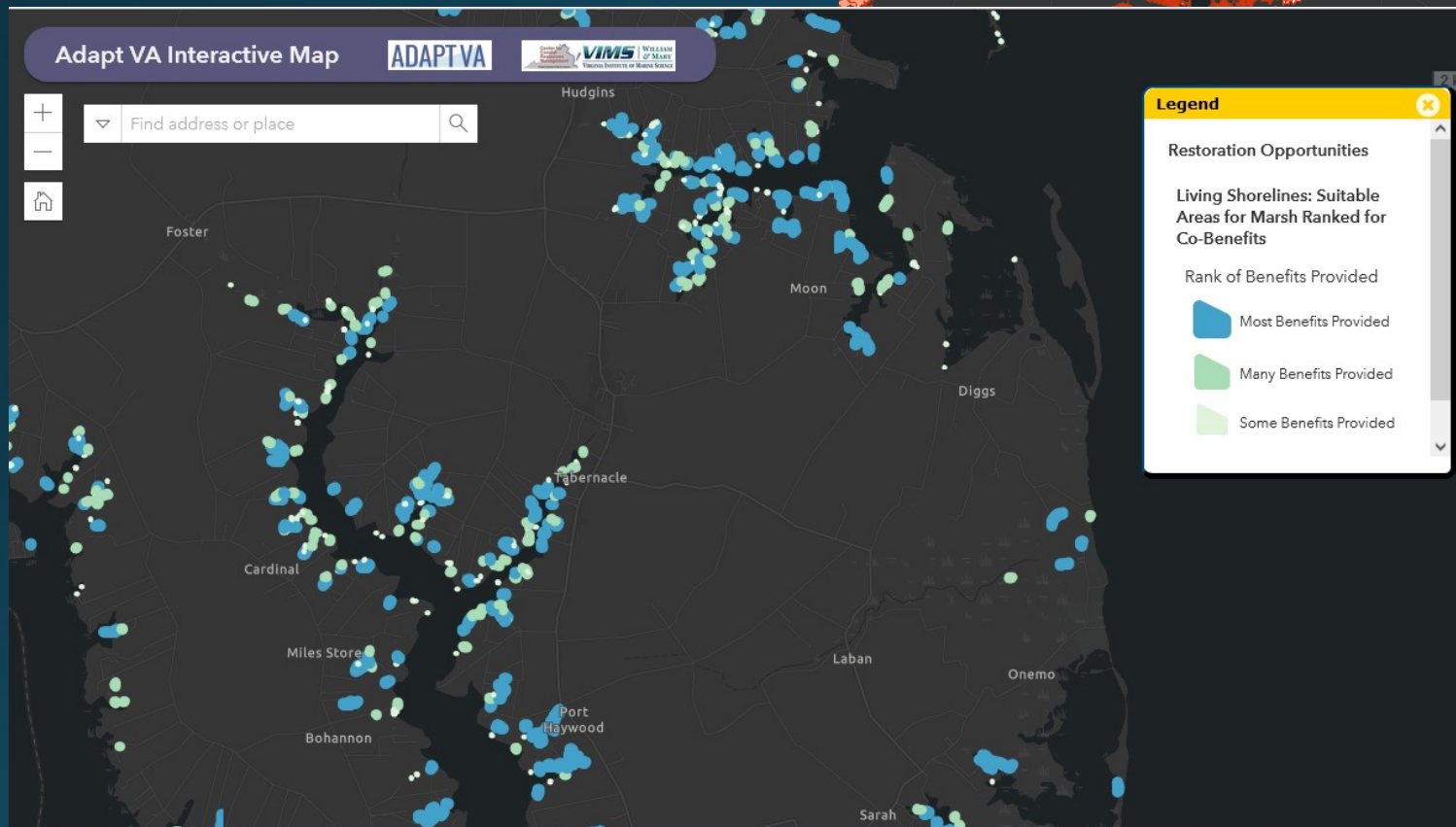
This Tidal Marsh feature provides the **Most Benefits** to buildings and communities, including:

- **High rank** for the natural capacity of NNBF to mitigate coastal flooding
- **High rank** for the number of buildings on land less than 10 feet in elevation that the NNBF benefits (*12 buildings*)
- **Low rank** for the number of critical community facilities on land less than 10 feet in elevation that the NNBF benefits (*0 critical community facilities*)
- **High rank** for the NNBF to be used for incentive programs (2 out of 2: The NNBF has water quality benefit of

Zoom to



Find address or place



**Legend**

Restoration Opportunities

Living Shorelines: Suitable Areas for Marsh Ranked for Co-Benefits

Rank of Benefits Provided

- Most Benefits Provided
- Many Benefits Provided
- Some Benefits Provided

**Legend**

Lands for Protection

Coastal NNBFs Ranked: Benefits to Coastal Buildings

NNBF Ranked

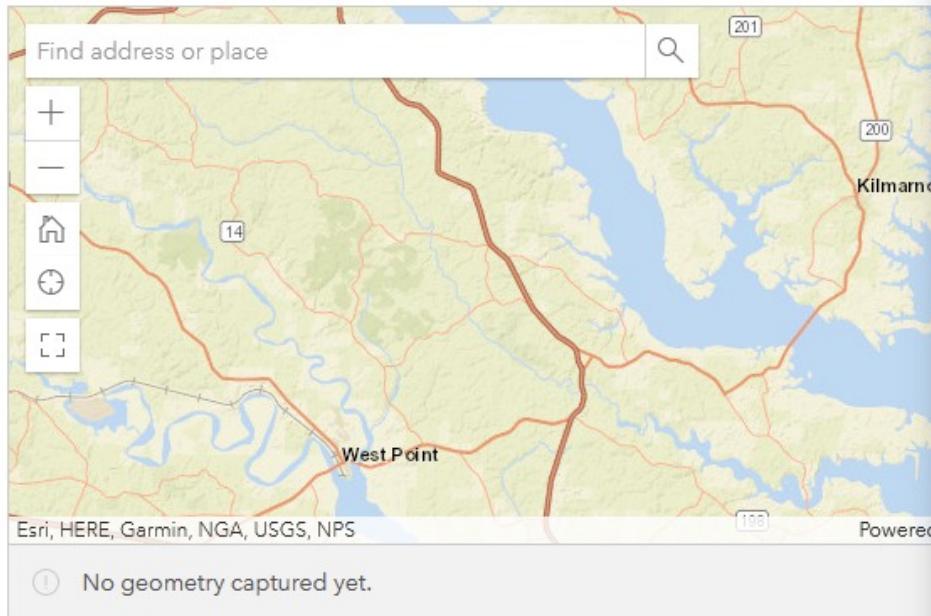
- Most Benefits
- Many Benefits
- Some Benefits

# New effort—needs your help!

## Locate Socially Vulnerable Areas

**Delineate socially vulnerable area.** Input an address or zoom into your area of interest on the below map (Use Ctrl+ scroll to zoom the map). Click on the polygon icon in the upper-right corner of the map, move to your area of interest. Start creating a polygon in your chosen location by first single-clicking at the starting point, moving the mouse to the next point (do not hold the clicker down). Single-click at your next polygon point and continue single-clicking and moving to the next pivot point of your polygon until you are ready to complete your polygon and then double-click to close the polygon.

Then answer the below survey questions about the socially vulnerable area outlined in the map.



Find address or place

+

-

Home

Location

Full Screen

Esri, HERE, Garmin, NGA, USGS, NPS

West Point

Kilmarnock

138

198

200

201

No geometry captured yet.

## Social Vulnerability Category(s)\*

Check all social vulnerability categories that apply

25 Year Old and up with less than High School

People of Color

Linguistic Isolation

Under 5 Years Old

Over 65 Years Old

Housing Units Pre 1960

Percent Low Income

Percent Low Income - 200% of Federal poverty

## Housing Characteristic\*

Is the majority of the housing in the area delineated characterized by rentals or homeowners

Rentals

Homeowners

Even mix of rentals and homeowners

Unsure

Questions?  
molly@vims.edu



RAFT Resilience Education Workshop for the Middle Peninsula

# **State Funding For Flood Resilience By Virginia Communities**

**September 7, 2022**

**Darryl Glover – Deputy Director, DSFPM/SWC  
Department of Conservation and Recreation**

# Regional Greenhouse Gas Initiative

[www.RGGI.org](http://www.RGGI.org)

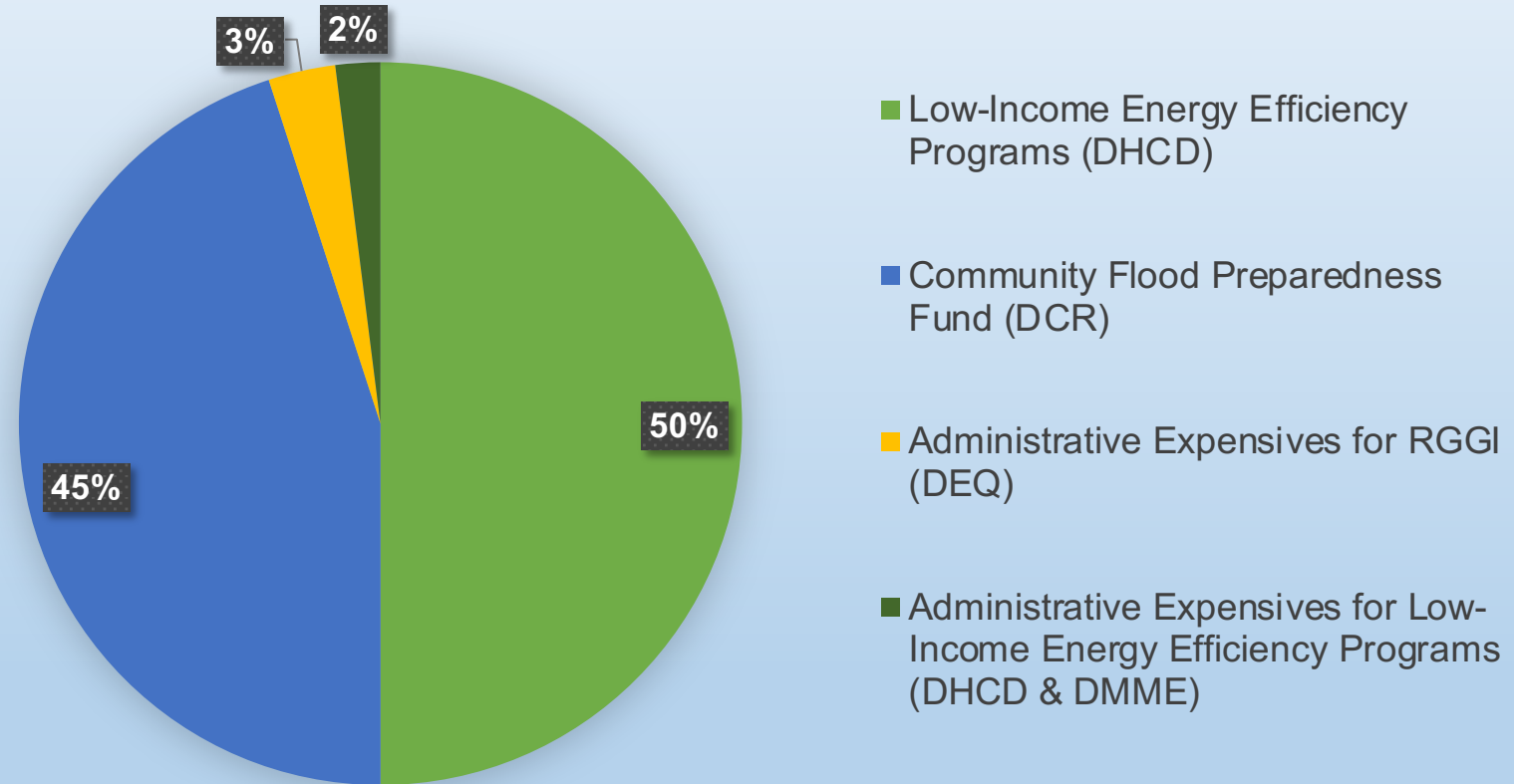
DEQ coordinates Virginia's participation in the Regional Greenhouse Gas Initiative (RGGI), an auction-based program that generates funding through the sale of carbon allowances to electric utilities.

Virginia is one of 11 RGGI members along with Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.





# How RGGI Funds Are Allocated



# How RGGI Funds Are Used

- **Provide Grants (and Future Loans) to Localities and Communities**
- **Fund Coastal Resilience Master Plan**
  - **Phase One Completed December 2021**
  - **Phase Two Refinements to Be Completed by 2024**
- **Fund Required Flood Protection (Resilience) Planning Across Virginia**
- **Funds DCR Staff That Support CFPF Related Activities and Resilience Planning**

# Community Flood Preparedness Fund (CFPF) - § 10.1- 603.25

- Per statute, moneys in the Fund shall be used **solely for the purposes of enhancing flood prevention or protection and coastal resilience.**
- Moneys in the Fund may be used to mitigate future flood damage and to assist inland and coastal communities **across the Commonwealth** that are **subject to recurrent or repetitive flooding.**
- No less than 25 percent of the moneys disbursed from the Fund each year shall be used for projects in **low-income geographic areas.**
- Priority shall be given to projects that implement **community-scale** hazard mitigation activities that use **nature-based solutions** to reduce flood risk.



# CFPF Funds

- Capacity Building and Planning
- Studies
- Flood Prevention and Protection Projects (if an approved Resilience Plan)

# DCR & VRA Partnership

- Community Flood Preparedness Fund
  - Funded via Regional Green House Gas Initiative (RGGI)
  - Quarterly RGGI Auctions (next auction is today!)
  - DEQ Air Board will Pursue a Regulation to Withdraw from RGGI by Dec. 2023
  - Funding from ongoing auctions until withdrawal
- Virginia Resilience Revolving Loan Fund
  - Established by 2022 General Assembly
  - Capitalized using \$25 million from CFPF
  - Loan interest could possibly perpetuate this fund indefinitely

# Current CFPF Offering

## CFPF Round 3

- Grant round January 2022 – April 2022
- \$40 million advertised
- 64 applications received for \$91 million
- Much higher requests than funds advertised
- Review of applications near completion
- Transparency efforts: all applications posted online (<https://www.dcr.virginia.gov/dam-safety-and-floodplains/dsfpm-cfpf>), final scoring will be posted
- Award announcements anticipated by Sept. 30

# Previous CFPF Awards

	Round 1	Round 2	Round 3	Totals
Funds Available	18,000,000	17,000,000	40,000,000	75,000,000
Number of Applications	32	37	64	133
CFPF Funds Requested	14,532,740	29,725,495	92,472,050	136,730,285
Funds Awarded	7,796,040	24,551,923	tbd	32,347,963
Low Income Awarded	3,766,515	19,759,944	tbd	23,526,459
Non-Low Income Awarded	4,029,525	4,791,979	tbd	8,821,504

*Note: Awardees have three years to obligate CFPF awards*

# Future Funding Opportunities

## CFPF Round 4

- Amount TBD (by RGGI auctions)
- Will be a significantly revised grant manual to improve clarity about Caps, Community Scale, Low Income, impacts of previous floods
- Transparency: Will post grant manual for public comment, review committee will be established to review applications



# Future Funding Opportunities

## Resilient Virginia Revolving Fund - § 10.1-603.28 et seq.

- Established in 2022 by HB1309 (Bulova) / SB 756 (Lewis)
- Fund has been capitalized with \$25 million from moneys previously allocated to the CFPF
- Will make loans and grants to local governments for resilience projects via Virginia Resources Authority (VRA)
- DCR will administer and is developing guidelines with VRA
- Anticipate accepting first round of applications in early CY2023
- Transparency: Fund guidelines/manuals will be put out for public comment; review committee will be established to review applications

# Virginia Coastal Resilience Technical Advisory Committee

- Codified by HB516 (Bulova) / SB551 (Marsden) to assist with developing, updating, and implementing the Virginia Coastal Resilience Master Plan.
- Now required to meet quarterly. First meeting in September. The Committee shall be comprised of
  - representatives of state agencies
  - coastal planning district commissions,
  - regional commissions,
  - academic advisors,
  - and any other representatives as needed.

Members shall serve at the pleasure of the Governor and shall include the following individuals or their designees:

- Executive directors of coastal planning district commissions and regional commissions
  - Special Assistant to the Governor for Coastal Adaptation and Protection;
  - Director of DCR
  - Director of the Virginia Department of Emergency Management;
  - Director of the Virginia Department of Housing and Community Development;
  - Executive Director of the Virginia Resources Authority;
  - Director of the Department of Environmental Quality;
  - Commissioner of the Virginia Department of Transportation;
  - Director of the Virginia Transportation Research Council;
  - Commissioner of the Virginia Marine Resources Commission;
  - Director of the Institute for Coastal Adaptation and Resilience;
  - Associate Dean for Research and Advisory Services at the Virginia Institute of Marine Science;
  - The Director of the William and Mary School of Law Coastal Policy Center;
  - Director of the Virginia Tech Center for Coastal Studies;
  - Director of the Environmental Resilience Institute at the University of Virginia;
  - Director of Virginia Sea Grant; the Director of Diversity, Equity, and Inclusion;
  - Chief Data Officer of the Commonwealth.
  - Chief Resilience Officer shall serve as chairman of the Committee.
- The Chief Resilience Officer shall invite participation by
- Commander of the U.S. Army Corps of Engineers, Norfolk District;
  - Commander of the Navy Region Mid-Atlantic;
  - Representatives of the seven federally recognized Tribal Nations indigenous to the Commonwealth of Virginia

# Upcoming In 2022

## Working Group on Resilience Entity

- Administration supported legislation (HB 847 (Bloxom) / SB569 (Kiggins)) to create a Coastal Virginia Resiliency Authority to serve as a single entity to coordinate resilience efforts and federal funding.
- Legislation was unsuccessful, but significant interest in continuing discussion.
- A working group to discuss a resilience entity will be convened administratively this fall to discuss.

## Community Outreach and Engagement Plan

- Established by HB516 (Bulova) / SB551 (Marsden)
- DCR Director, jointly with the DE&I Director, and in coordination with CRO and SACAP shall prepare a Community Outreach and Engagement Plan for updates to the Virginia Coastal Resilience Master Plan and for development and updates to the Virginia Flood Protection Master Plan
- Must be prepared no later than Dec 31, 2022

**Questions?**



# BAY AGING

DIGNITY AT EVERY AGE



**BAY HEALTH**  
A DIVISION OF BAY AGING



**BAY HOUSING**  
A DIVISION OF BAY AGING



**BAY TRANSIT**  
A DIVISION OF BAY AGING

# Bay Aging Established in 1978

## Vision

Every neighbor in our region will have a **CHOICE** and range of services that will assist them to remain independent in their chosen home.

## Mission

Deliver the programs and services people of all ages need to live independently in their communities for as long as possible.

# Bay Health

Numerous health related services that help people achieve better health outcomes and increase their ability to live independently longer.



## OPTIONS COUNSELING - GATEWAY TO SERVICES

### Health & Wellness

- Adult Day Care
- Active Lifestyle Centers
- Care Coordination
- Chronic Disease Self-Management
- Dementia Friendly Communities
- Fall Prevention
- Home & Personal Care
- Insurance Counseling
- Meals on Wheels
- Prevention Education
- Transitional Care
- Veterans-Directed Home and Community Based Services

# Bay Health

Numerous health related services that help people achieve better health outcomes and increase their ability to live independently longer.



## OPTIONS COUNSELING - GATEWAY TO SERVICES

### Advocacy & Outreach

- Advance Care Planning
- Community Action Program
- Community Integrated Health Network
- Ombudsman
- Retired & Senior Volunteer Program
- Senior Medicare Patrol
- Senior Employment Title V



# Bay Housing

- Age- and Income-Restricted Service-Enriched Rental Housing
  - 373 apartments at 12 community locations
- Community Development Block Grants
- Emergency Home Repair
- Homeless Solutions
- Housing Choice Voucher Program
- Indoor Plumbing Rehabilitation
- Maintenance Technicians
- Resident Service Coordination
- Rural Development 504 Loan
- Weatherization Assistance



# Bay Transit

Transportation initiatives that help people of all ages access jobs, health services, education and other consumer needs.

- ONLY public transportation provider for Middle Peninsula / Northern Neck, Charles City & New Kent
- Curb-to-Curb Service
- Localized Connector Services
- Deviated Fixed-Routes
- Expanded App-based Service
- Mobility Management
- Seasonal Trolleys





Information & Options Counseling  
800.493.0238

Transportation Needs & Requests  
804.693.6977

[www.bayaging.org](http://www.bayaging.org)

[www.baytransit.org](http://www.baytransit.org)



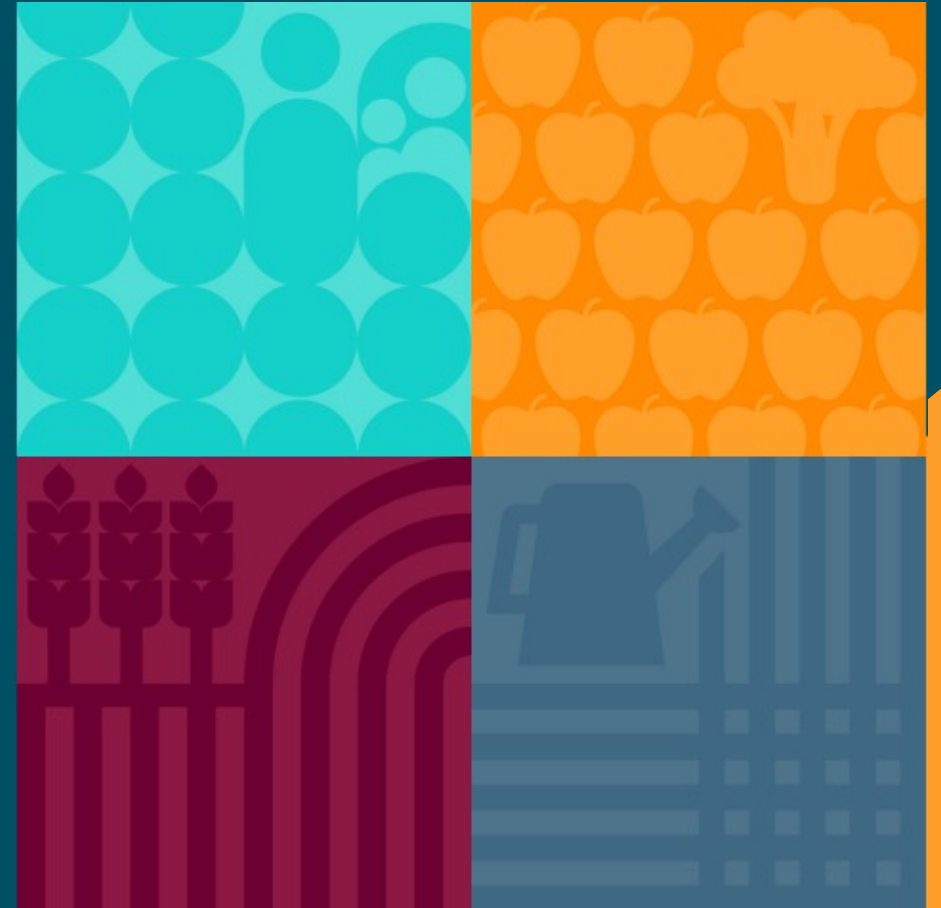
# VCE, Community Gardens & Master Gardeners



Christina Ruszczyk-Murray, Extension Agent  
King William & King and Queen counties

# About Virginia Cooperative Extension

- Extension of the Land Grant University System
- Our mission is to improve the lives of Virginians through education
- We are research based
- We partner and work with volunteers
- Needs driven
- Local, State and Federal governmental partnership



# VCE Programming

- Agriculture and Natural Resources
- Family and Consumer Sciences
- Community Viability
- 4-H Positive Youth Development



# Master Gardeners/Volunteers



## Core Values:

- Respect - The environment, each other, and those we serve.
- Accountability - Wise stewardship of resources. To our organization, our community, and each other.
- Collaboration - Willing to work with a diverse group to reach a common goal. Actively seeking out partners.

# Community Gardens

- Garden plots
- Youth gardens
- Family gardens
- Serves the needs of community





# Impacts



# Master Gardener Chapters

- Gloucester has MG chapter, Essex is part of the Northern Neck MG chapter.
- Mathews is restarting a chapter that had dissolved during the pandemic.
- King William and King and Queen would like to start a MG chapter.



# Extension Office on the Middle Peninsula

<https://ext.vt.edu/>

Essex

804-443-3551

Robbie Longest, ANR Agent, Unit Coordinator

Gloucester

804-693-2602

Krista Gustafson, 4-H Agent, Unit Coordinator

Glenn Sturm, FCS Agent

King William &  
King and Queen

804-769-4955

Christina Ruszczyk-Murray, 4-H Agent, Unit Coordinator

Turner Minx, ANR Agent

Middlesex

804-758-4120

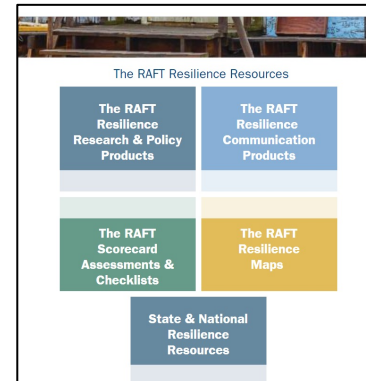
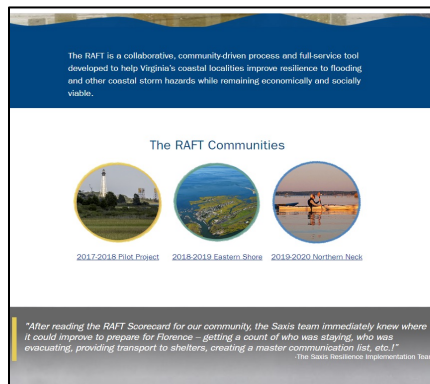
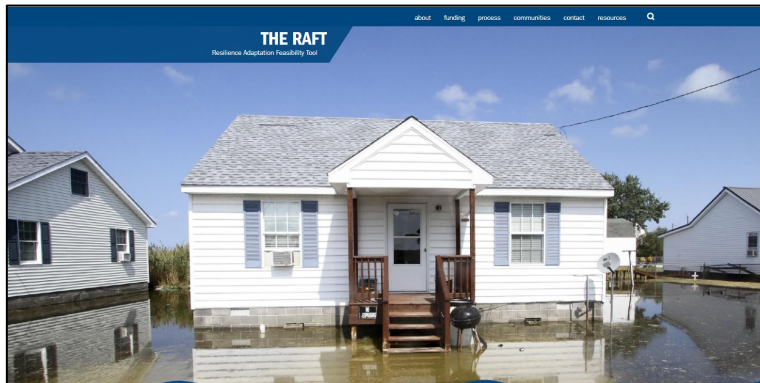
Frank Long, ANR Agent, Unit Coordinator

Mathews

804-725-7196

Rachael Morris, 4-H Agent, Unit Coordinator

VISIT THE RAFT WEBSITE: <https://raft.ien.virginia.edu/>



PLEASE COMPLETE THE WORKSHOP EVALUATION!

THANK YOU  
TO OUR  
SPEAKERS!



INSTITUTE for  
ENGAGEMENT & NEGOTIATION  
Shaping Our World Together