

# Flooding in the Commonwealth

Presentation to the Virginia Housing Commission

Matthew Wells, Director

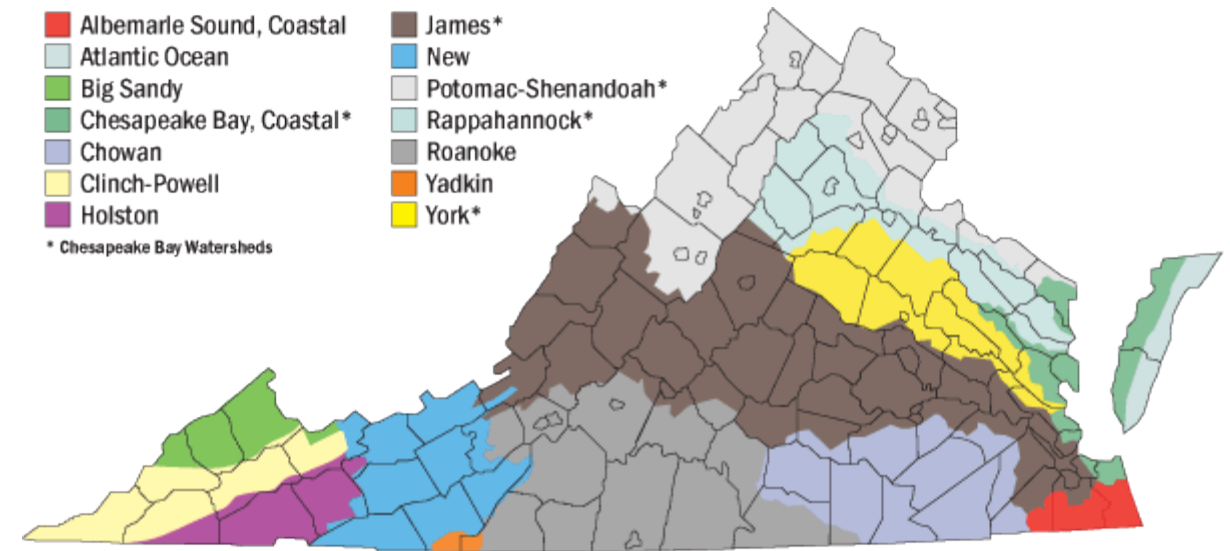
Virginia Department of Conservation and Recreation

June 5, 2024



# About the Virginia Department of Conservation and Recreation

- The Department of Conservation and Recreation (DCR) is the state's lead natural resource conservation agency. DCR protects what Virginians care about - natural habitat, parks, clean water, dams, open space and access to the outdoors.
  - Virginia State Parks
  - Natural Heritage
  - Land Conservation
  - Planning and Recreation Resources
  - Soil and Water Conservation
  - Floodplain Management
  - Resilience Planning
  - Dam Regulation
  - Office of Environmental Education



Virginia Major River Basins

# Today's Presentation

- Overview of Virginia's Flood Risk
- Flood Preparedness and Mitigation Resources
- Looking Ahead



# Overview of Flood Risk in Virginia



# Flooding in the Commonwealth

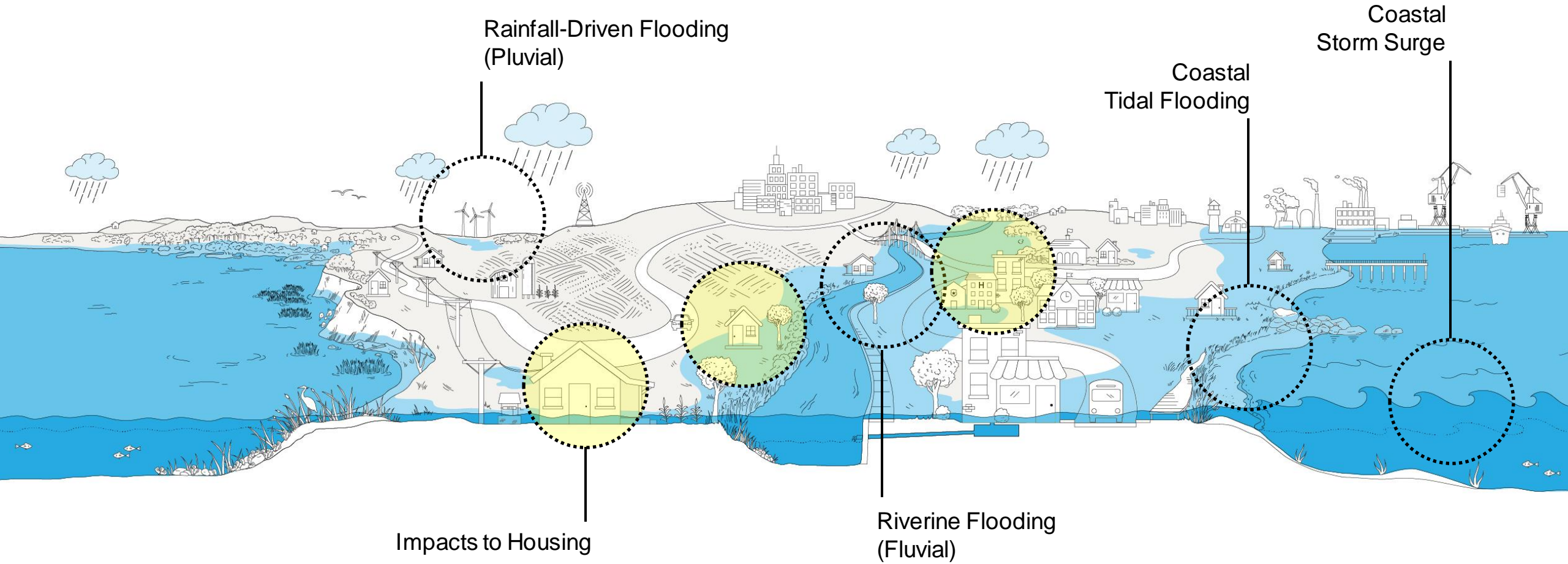
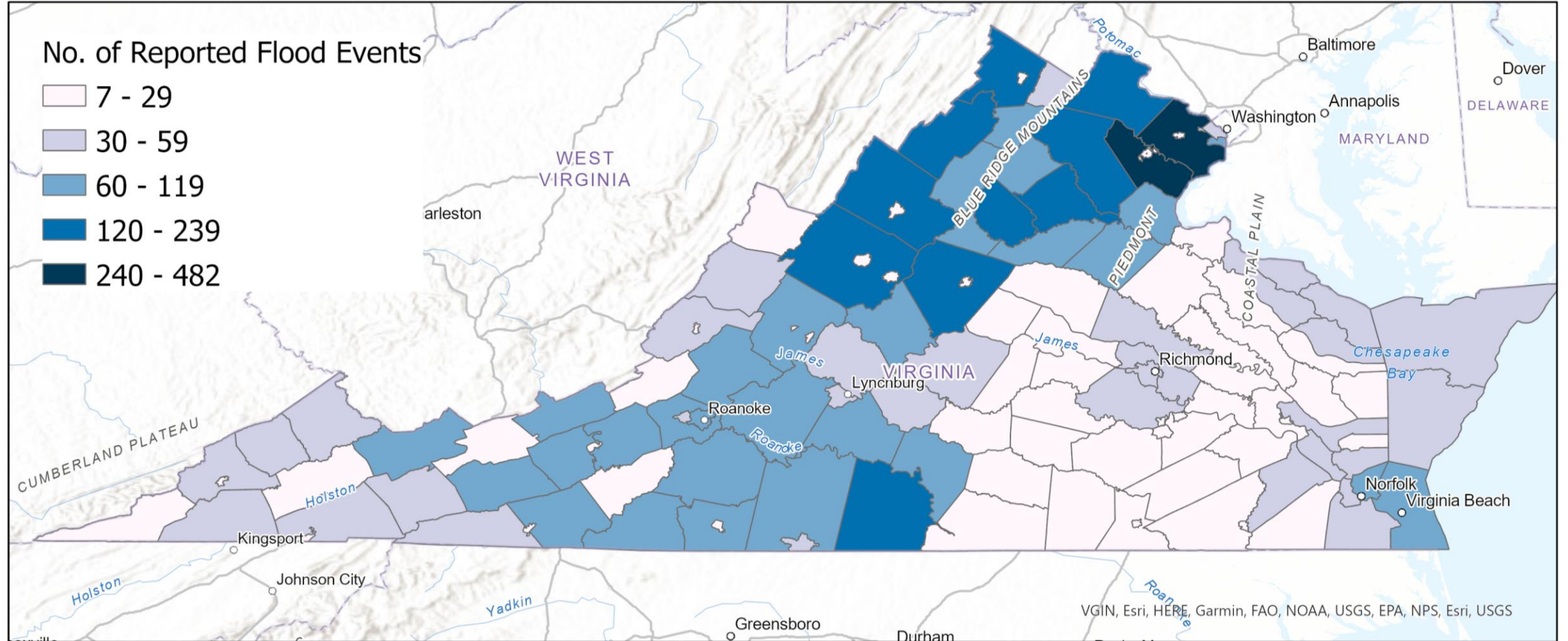


Image credit: Dewberry

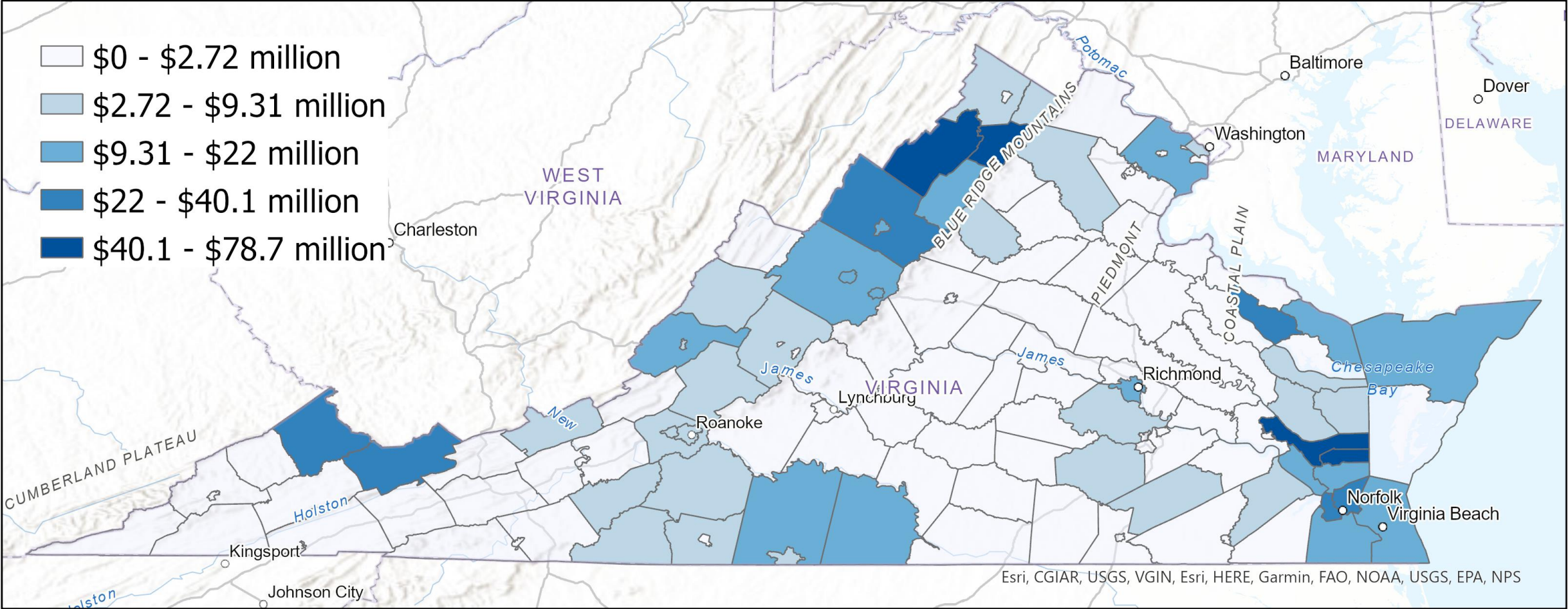
# Reported Flood Events (1950-2023)

Source: NOAA NCEI Storm Events Database



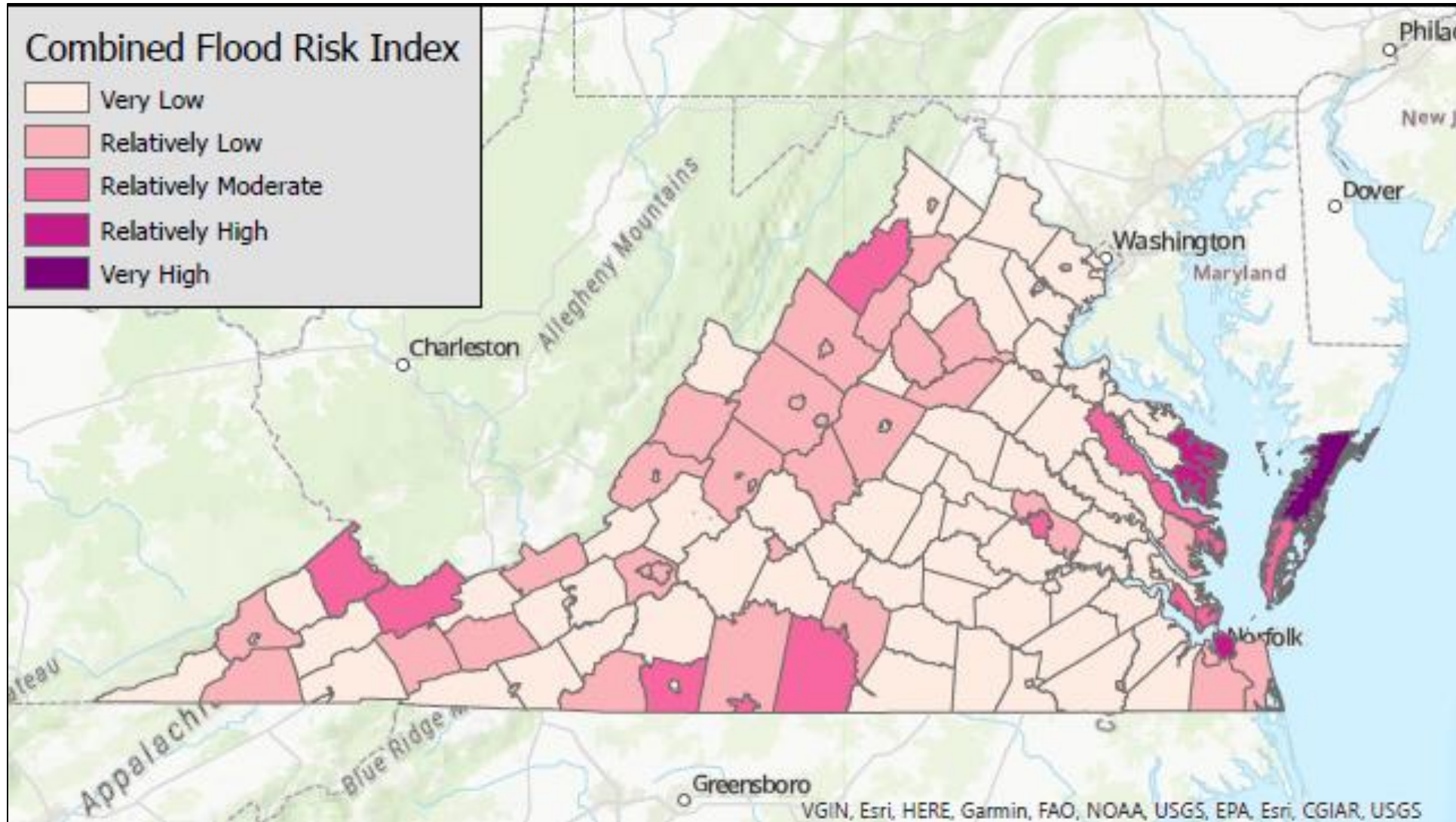
# Value of Flood Damages to Crops and Property (1950-2021)

Source: COVA Hazard Mitigation Plan, 2023 via NCEI



# National Risk Index: Combined Flood Risk (2021)

Source: FEMA NRI



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# Virginia Flood Risk Information System

## Know your risk. Protect your property. Get flood insurance.

- VFRIS is a digital mapping platform 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 trusted sources, VFRIS allows users to quickly locate and see if property is located within the Special Flood Hazard Area (SFHA).
- Knowing flood zone locations:
  - Helps property owners and buyers understand their flood insurance rates and consider flood-proofing options.
  - Helps insurance agents assess rates.
  - Offers builders insight on potential building restrictions and standards.
  - Allows communities to plan where growth should be focused.



Are you in a flood zone?

**Annual Flood Risk: Minimal Risk**

This Location has minimal risk of flooding



[Learn More about Special flood Hazard Areas \(SFHA's\)](#)

*Did you know?*

*During the span of a 30-year mortgage, areas in the 1% annual risk floodplain have at least a one-in-four chance of flooding*

[View More Details](#)



# Properties in the Regulatory Floodplain

*There are 108,500 structures in Virginia's  
regulatory floodplains.*

*(as of 2023)*

# Properties in the Regulatory Floodplain

Repetitive Loss (RL) and Severe Repetitive Loss (SR) Properties

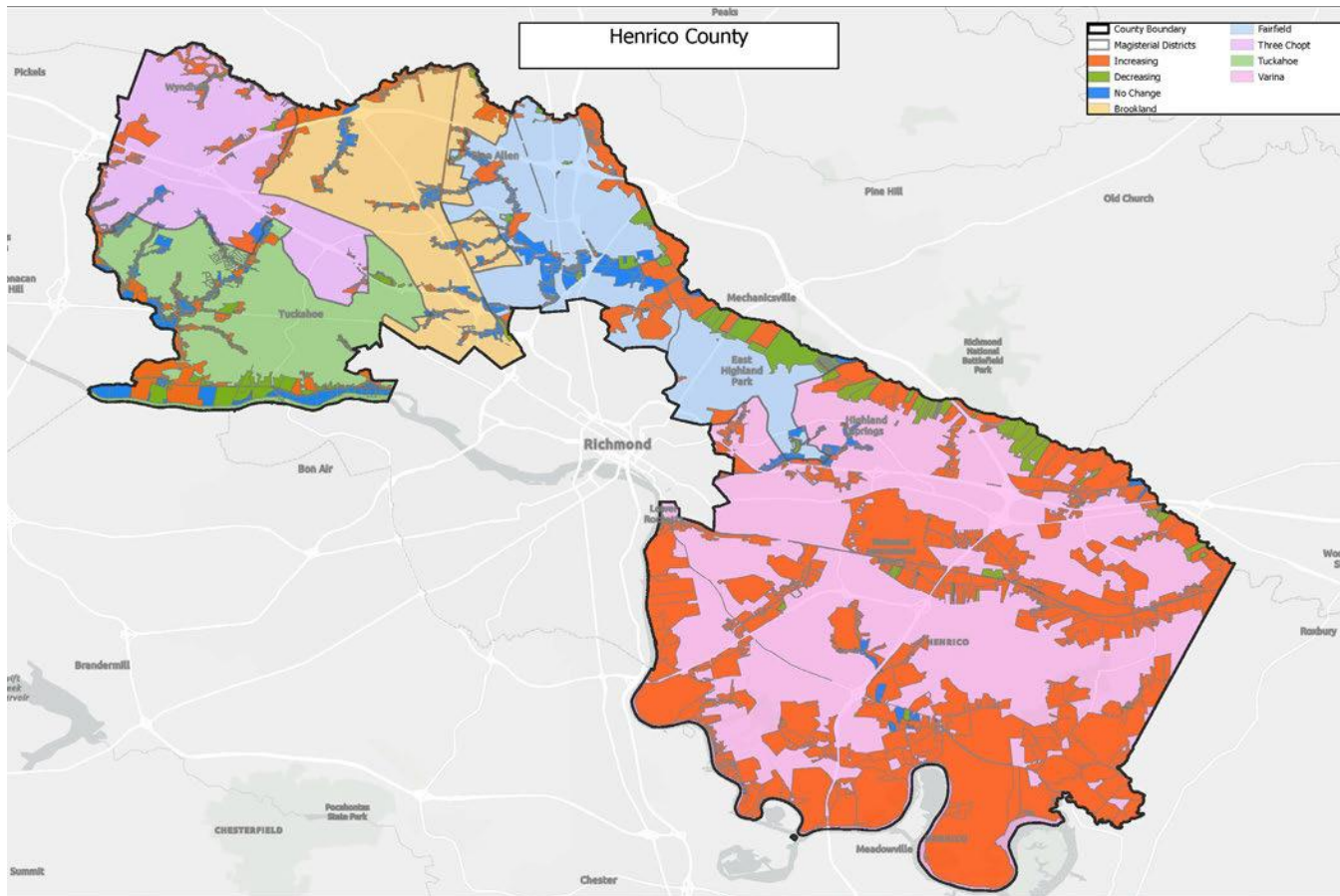
*6,570 repetitive loss properties (18,891 losses)*

*674 severe repetitive loss properties (3,661 losses)*

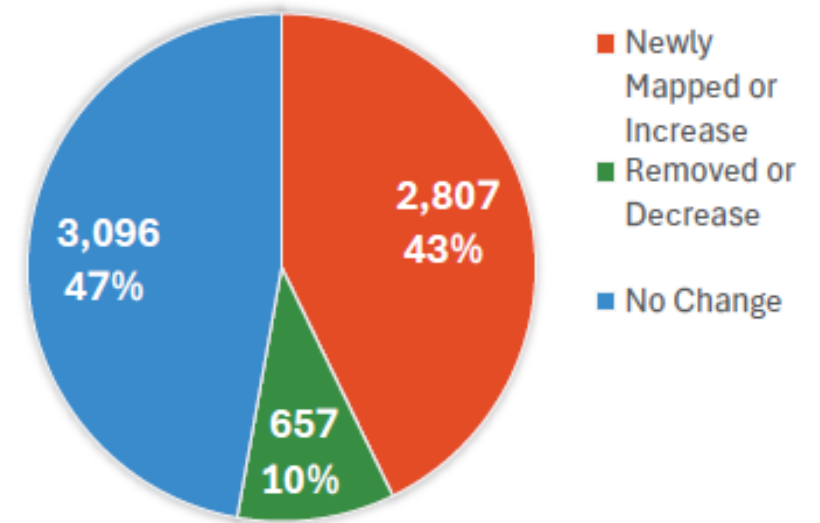
(Source: FEMA)

# Properties in the Regulatory Floodplain

## FEMA Map Updates – Henrico County Example



### Impacted Parcels Countywide



Source: Henrico County



# Flooding beyond FEMA's Special Flood Hazard Areas



# Flooding Beyond the Regulated Floodplain

Regulated Floodplain = FEMA Special Flood Hazard Area

*On average, 40% of  
National Flood Insurance Program (NFIP)  
flood insurance claims occur  
**outside** the high-risk flood areas.*

(Source: FEMA)

# Flooding Beyond the Regulated Floodplain

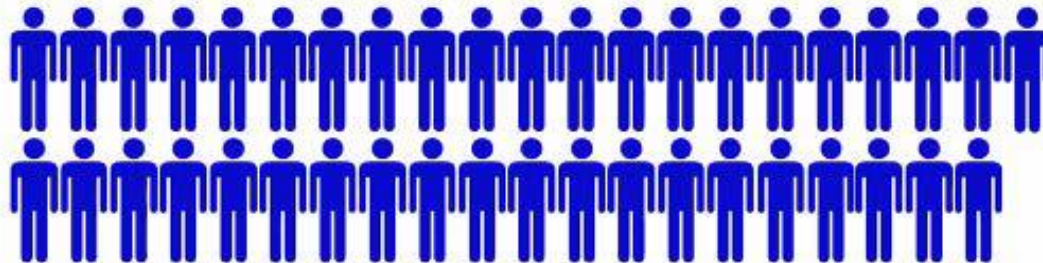
fathom.global

**FEMA Exposure = 13M**



 = 1 Million People

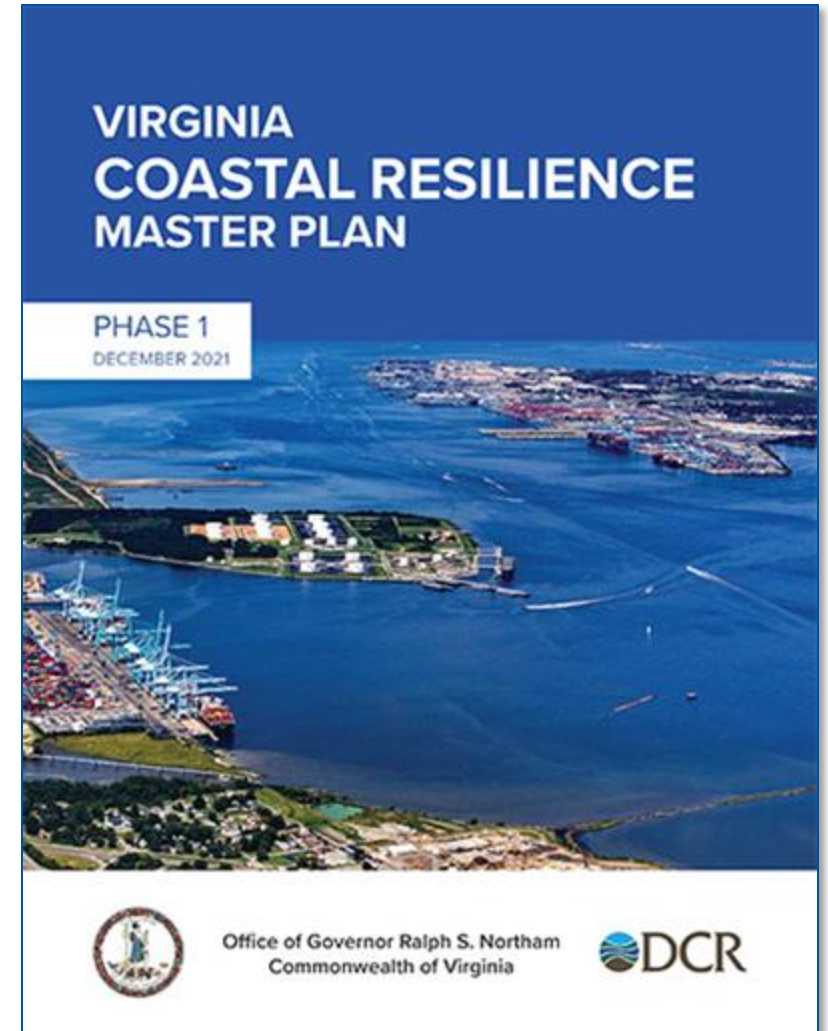
**Fathom Exposure = 41M**



# Coastal Resilience Master Plan

## Partial Flood Risk Assessment for Coastal Virginia

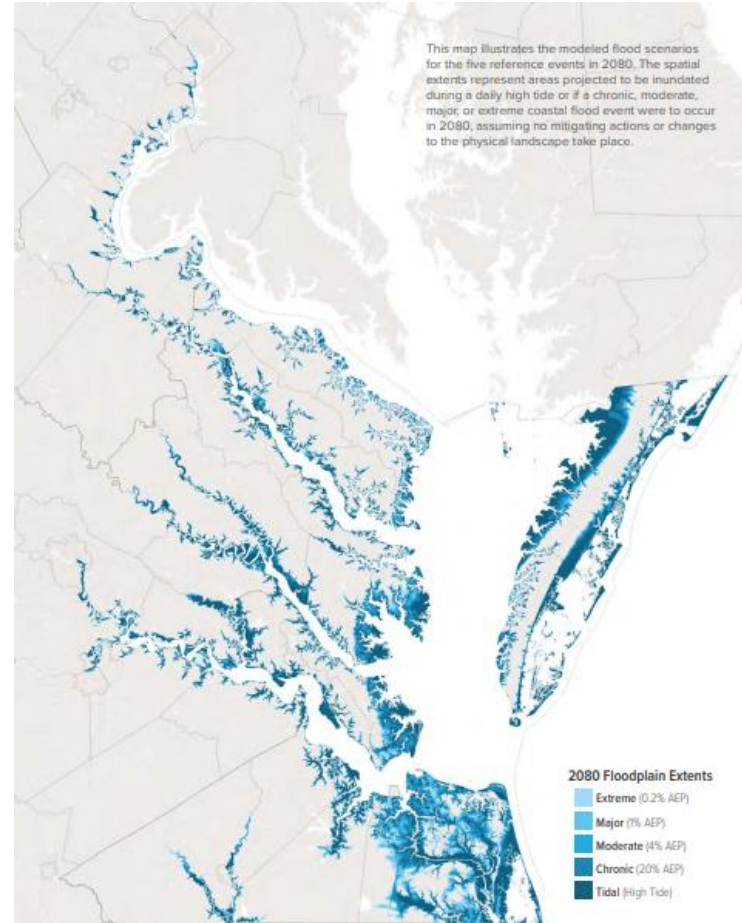
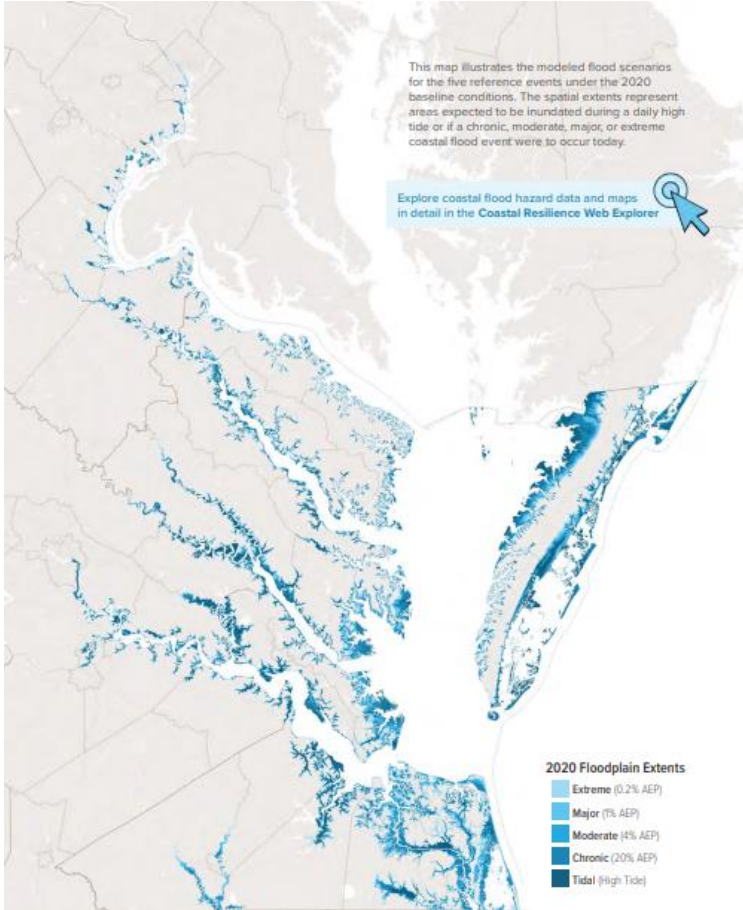
- Released in December 2021, The Virginia Coastal Resilience Master Plan (CRMP) Phase I assesses the impacts of tidal and storm surge coastal flooding on coastal Virginia.
- Establishes a database of example projects.
- Identifies where the Commonwealth can provide support.
- Builds a foundation for planning and partnership.



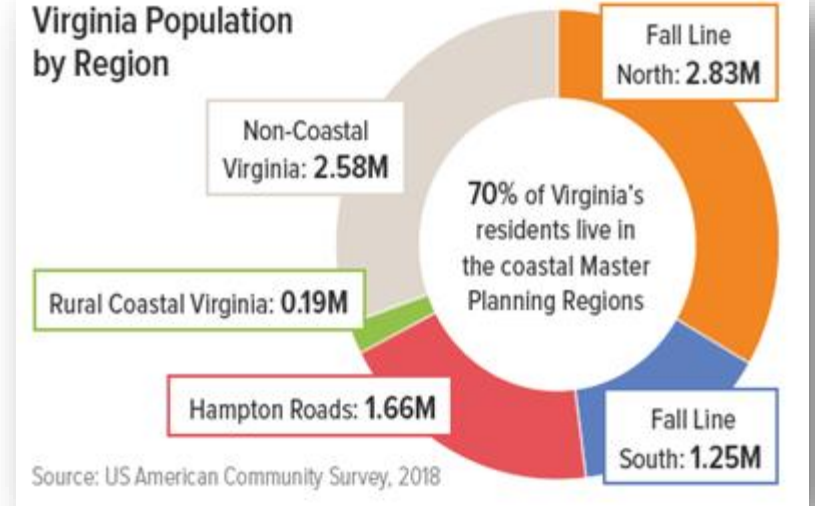


# Coastal Resilience Master Plan

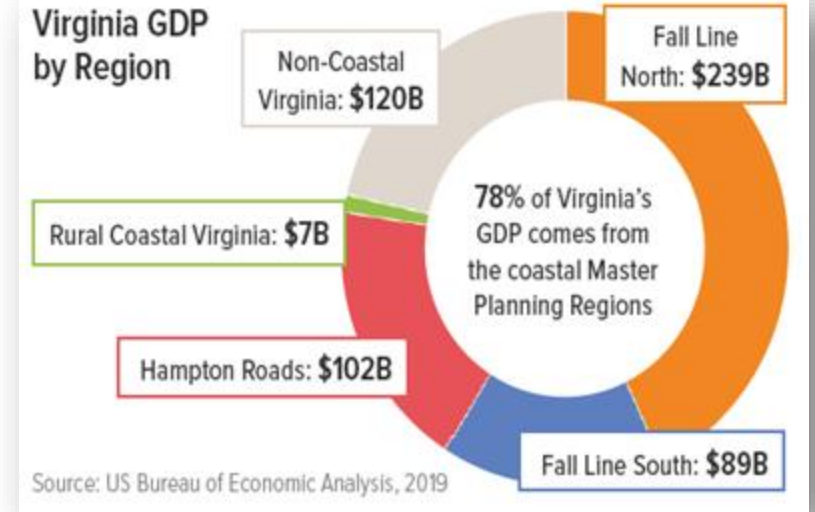
## Coastal Virginia Sea Level Rise Risk Projections



### Virginia Population by Region

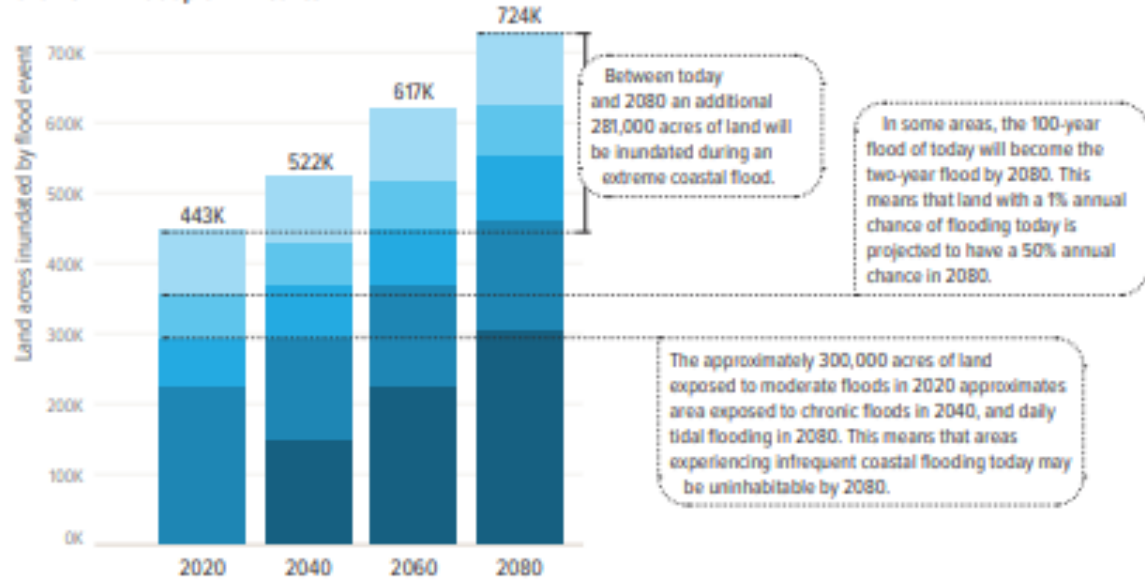


### Virginia GDP by Region



# Coastal Resilience Master Plan

Growth in Floodplain Extents



Between 2020 and 2080...



the number of **residents** living in homes exposed to major coastal flooding is projected to grow from approximately 360,000 to 943,000, an increase of **160%**.



the number of residential, public, and commercial **buildings** exposed to an extreme coastal flood is projected to increase by almost **150%**, from 140,000 to 340,000, while annualized flood damages increase by over **930%** from \$550 million to \$5.7 billion.



the number of miles of **roadways** exposed to chronic coastal flooding is projected to increase from approximately 500 to nearly 2,800 miles, an increase of **460%**.

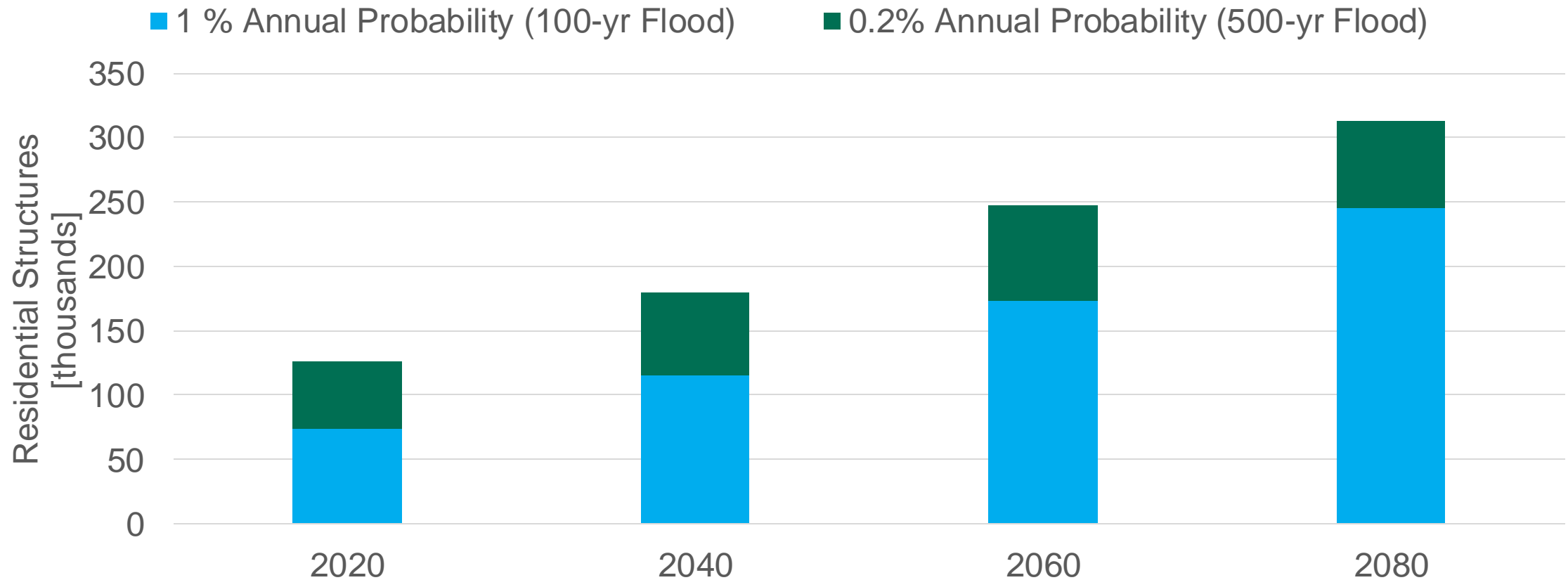


an estimated 170,000 acres, or **89%**, of existing **tidal wetlands** and 3,800 acres, or **38%**, of existing **dunes and beaches** may be permanently inundated, effectively lost to open water.

Reference

| Flood Event | Annual Exceedance Probability (AEP) | Average Return Interval (Frequency) | Example Storm/Event Type                |
|-------------|-------------------------------------|-------------------------------------|---|
| Tidal       | Mean High Water                     | Inundated Daily                     | Daily High Tide                         |
| Chronic     | 20% AEP                             | 5 years                             | Gale, Smaller Coastal Storm             |
| Moderate    | 4% AEP                              | 25 years                            | Tropical Storm, Nor'easter              |
| Major       | 1% AEP                              | 100 years                           | Strong Nor'easter, Category 2 hurricane |
| Extreme     | 0.2% AEP                            | 500 years                           | Category 3+ hurricane                   |

# Increasing Housing Risk from Coastal Flooding



Source: [Virginia Coastal Resilience Web Explorer](#)

# Coastal Resilience Web Explorer



Introduction

Hazards

**Impacts**

Community Context

Projects and Initiatives

Funding Opportunities

Impacts on Community Resources

Impacts on Critical Sectors

Impacts on Natural Infrastructure

Impacts to a range of community resource physical assets are presented to identify current and emerging risk hotspots. [i](#)

Select Area of Interest:

Commonwealth  Virginia

Coastal Flood Time Horizon:

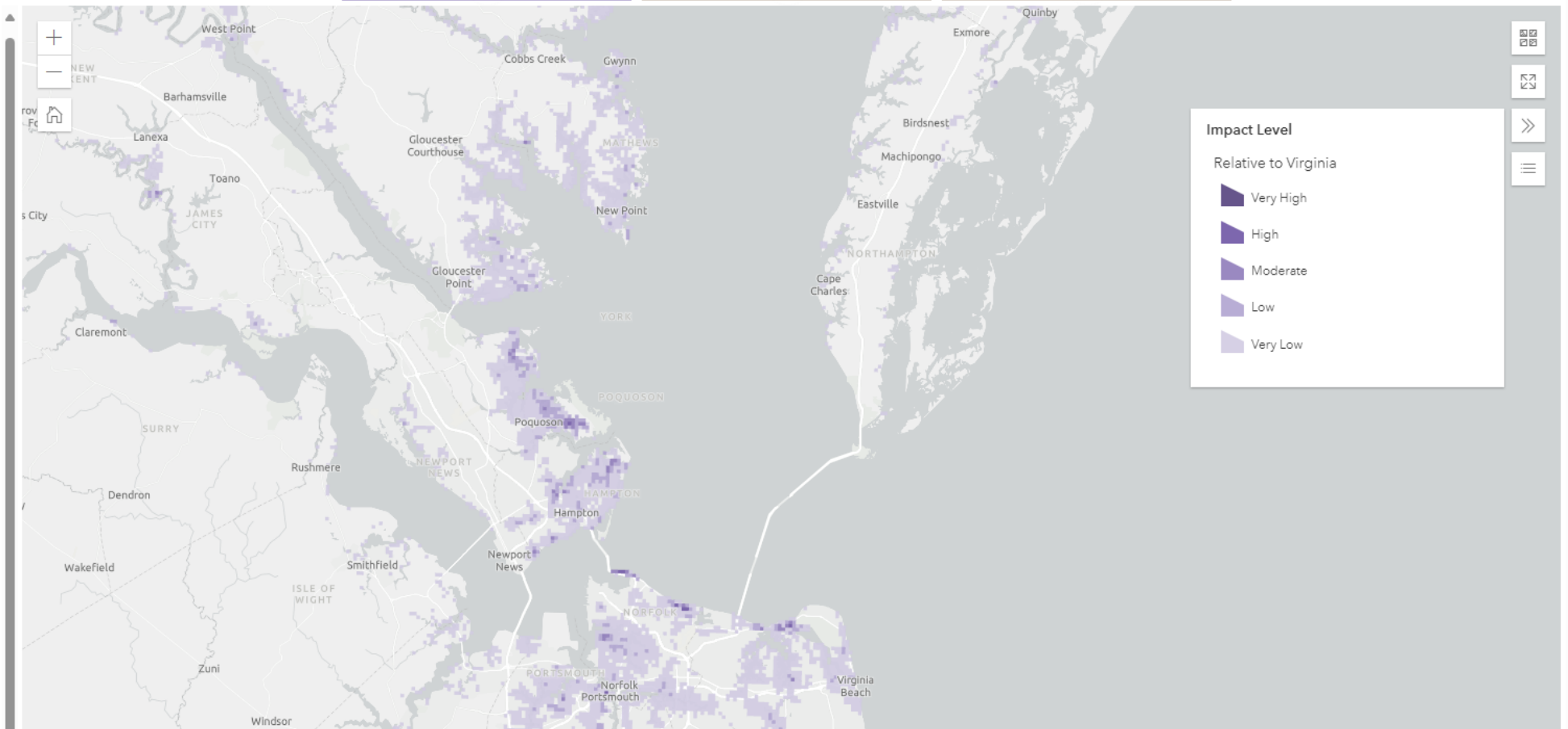
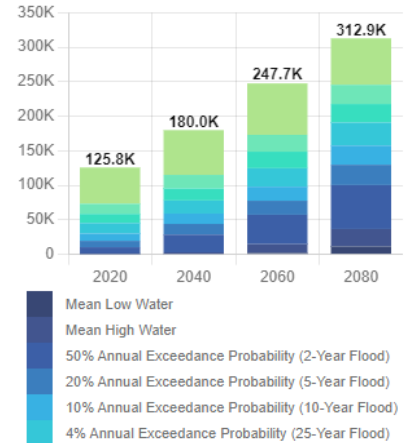
2020 2040 2060 2080

Impact Type:

Residential Structures (Exposure)

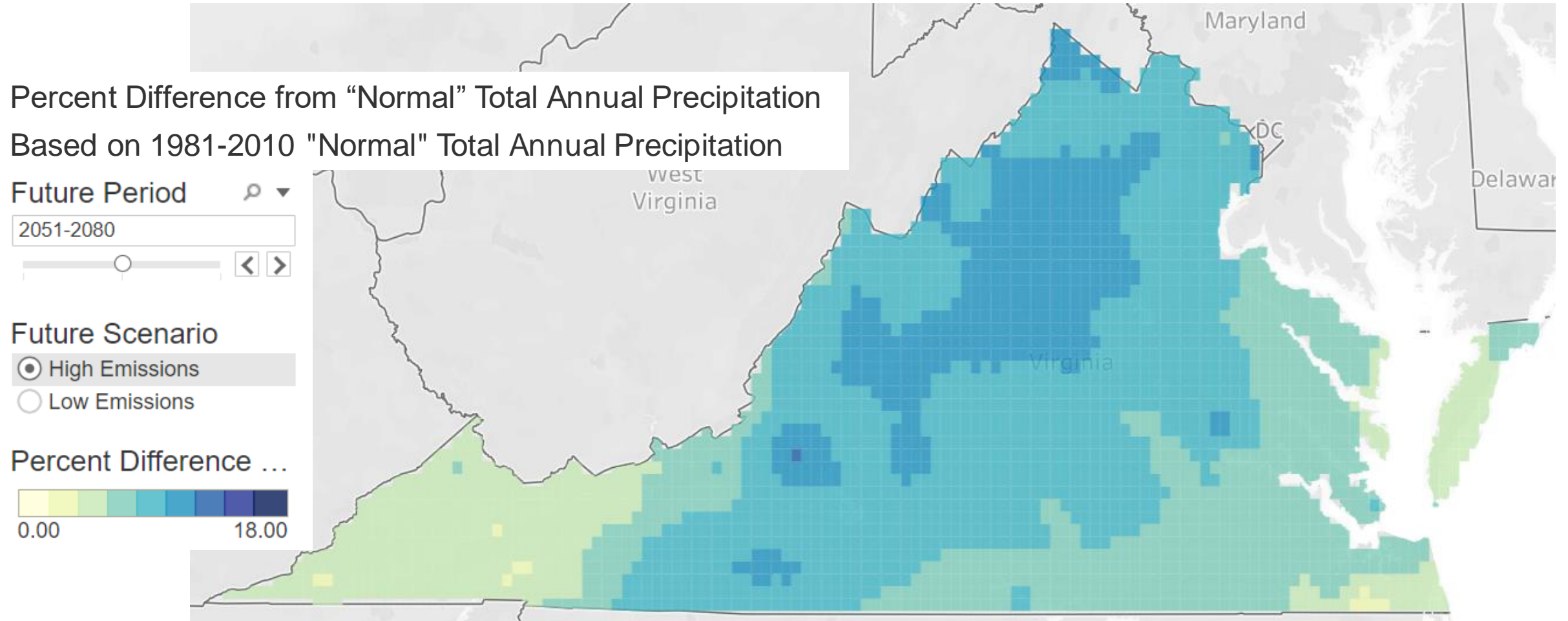
Impact Information: Residential Structure Exposure Across Event Types

Residential Structure Exposure Across Event Types



# Changing Landscape of Flooding

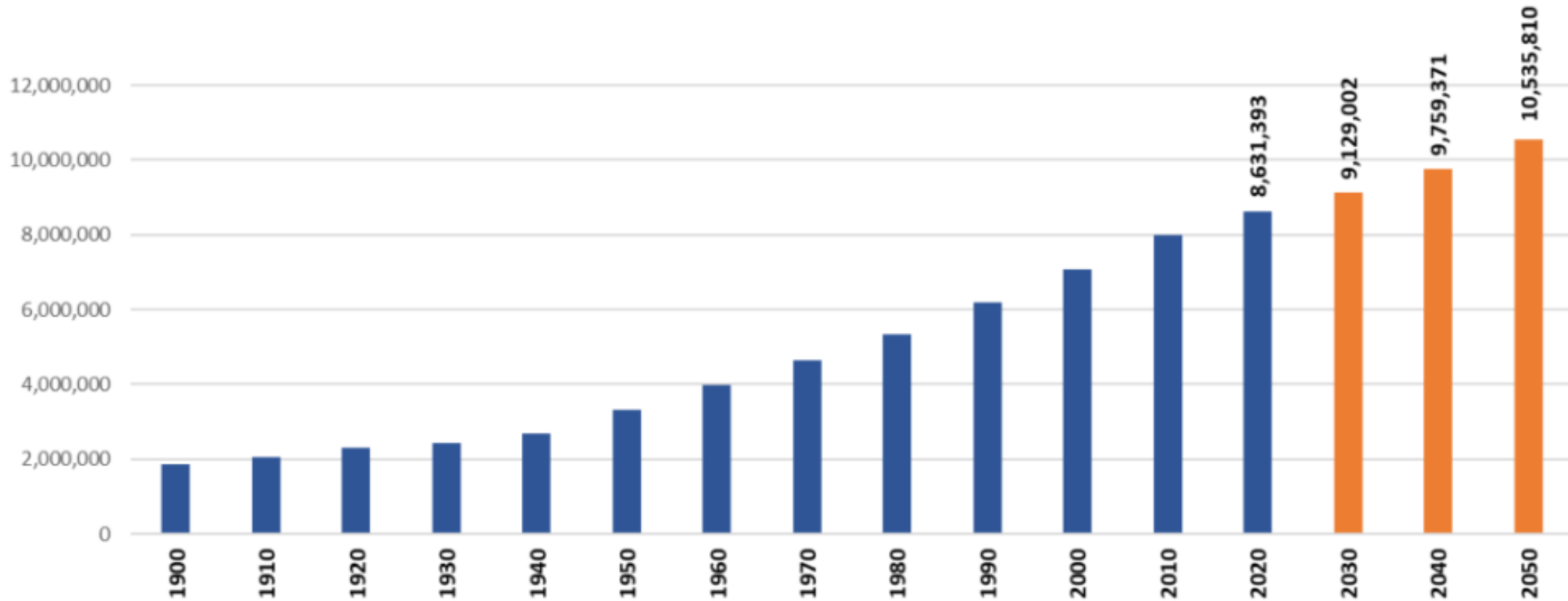
## Increased Precipitation



# Changing Landscape of Flooding

## Population Growth

Historic Census Counts and Projections for Virginia



# Flood Preparedness and Mitigation Resources



# National Flood Insurance Program (NFIP)

Protection for private property, with a caveat.

- Communities can participate in the NFIP **only if they adopt and enforce** a floodplain ordinance.
- NFIP participation by localities makes federally-backed flood insurance available to **all** of their residents.

## DCR's Role

- Compliance audits
- Ordinance assistance
- Technical support
- Training for officials
- Awareness outreach



# National Flood Insurance Program (NFIP)

## Quick facts about NFIP insurance

- Purchased through insurance agent or NFIP Direct
- Rates are risk-based, according to several factors:
  - type of flooding (riverine flash floods, coastal storm surge)
  - construction type and elevation (piers, solid foundation, slab on grade)
  - distance to flooding source
  - replacement cost
- 75% of policies in VA include storm surge as a risk factor

# National Flood Insurance Program (NFIP)

## Quick facts about NFIP insurance

### Two types of coverage:

Building (mechanical systems, built-in appliances/cabinetry, walls, flooring...)

Contents (clothes, furniture, washer/dryer, other valuables)

*Not Covered: temporary housing, decks, outdoor amenities, currency, cars,  
personal property in basements*

# National Flood Insurance Program (NFIP)

## Quick facts about NFIP insurance

### Increased Cost of Compliance (ICC)

- 30k in mitigation assistance for elevation / relocation / demolition / floodproofing (non-residential)
- Only available when “substantial damage” is declared and damage was *caused by a flood specifically*.

# National Flood Insurance Program (NFIP)

% of properties in the SFHA with NFIP Flood Insurance Policies

*47% of structures in Virginia's regulatory floodplains carry NFIP policies.*

# Flood Risk Data Resources

## Virginia resources to assist individuals and communities answer...

- Will I need flood insurance or a floodplain permit for this house?
  - Virginia Flood Risk Information System (VFRIS)
- Could my home be impacted by a dam failure?
  - Dam Safety Inventory System (DSIS)
- What hurricane evacuation zone do I live in?
  - VDEM Know Your Zone
- Is coastal flooding going to be more frequent in my area in the future?
  - Virginia Coastal Resilience Web Explorer

# DCR Flood Resilience Funds

## Financial Assistance for Local Governments

- Community Flood Preparedness Fund
  - Capacity building
  - Flood studies
  - Project planning and Resilience Plans
  - Project funding (with an approved resilience plan)
- Resilient Virginia Revolving Fund
  - Non-federal match
  - Hazard mitigation of buildings
  - Local flood resilience revolving funds
- Dam Safety Flood Prevention and Protection Assistance Fund
  - Dam safety evaluation, engineering, and projects
  - Also available to private entities

# Looking Ahead - Planning for Future Flooding



# Updating Virginia's Flood Plans

**VIRGINIA COASTAL**



**RESILIENCE  
MASTER PLAN**

- Dec 2024
- 8 Coastal PDCs
- PDCs and Localities



- Dec 2025
- Statewide
- State Agencies

**The Plans will Evaluate Housing Exposure from Rain, River, and Coastal Flooding Today and in the Future Under Changing Conditions**



# Questions?