2022 Hampton Roads Hazard Mitigation Plan

Public Meeting #2 – Hazard Identification and Risk Assessment Review

July 29, 2021

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Introductions

Please type your name and community in which you live in the chat.

Housekeeping Items

- All participants are muted upon entry
- If you have a question, please use the Q/A function at the bottom of your screen to type your question
- For those on the phone, we do want to hear from you. We will call on you by using the last 4 digits of your phone number and unmuting your line. If you do not have a question, please say so
- We will answer as many questions as possible.
- The meeting will be recorded

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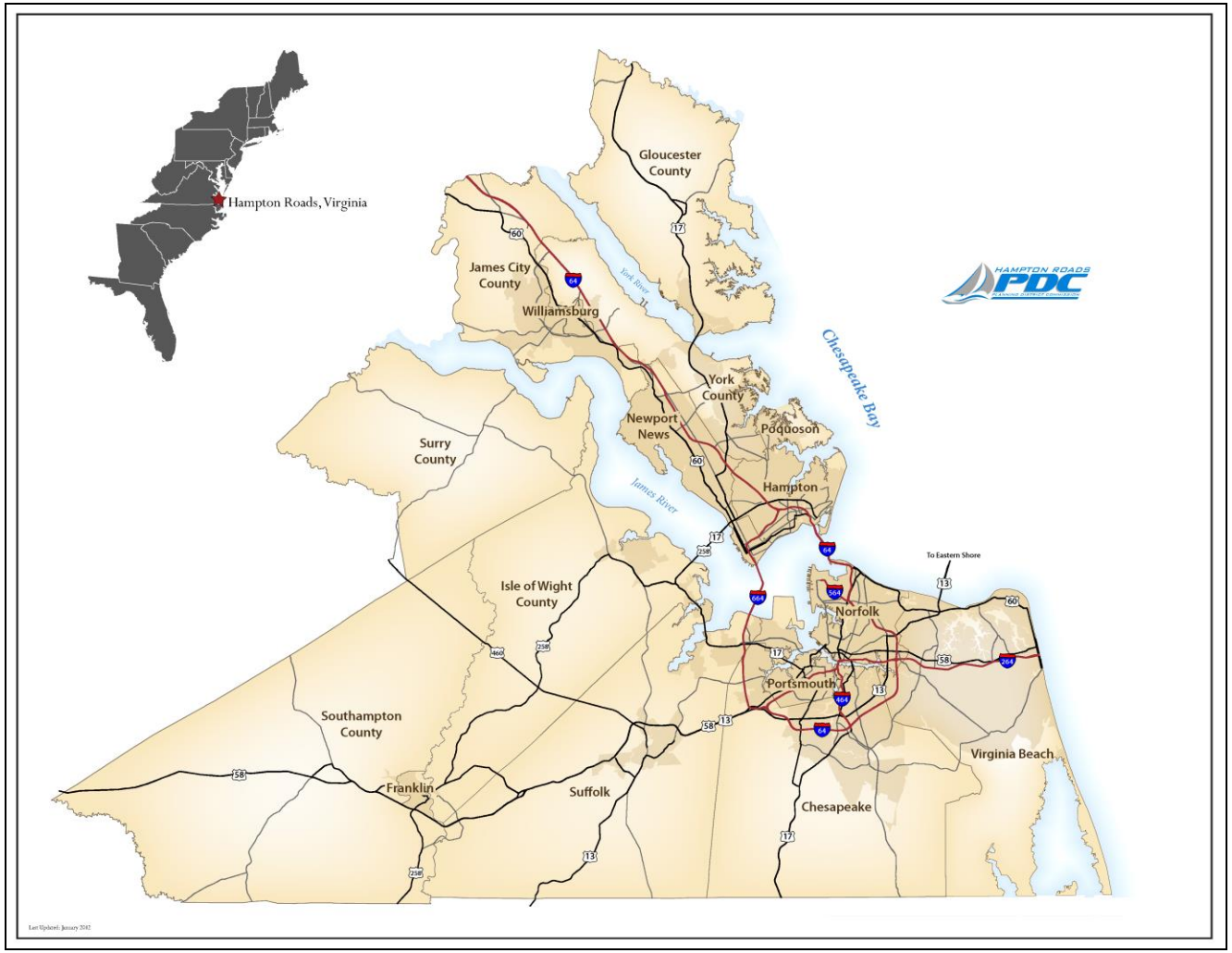
The meeting will be recorded.

25 Participating Jurisdictions

- The Cities of:
  - Chesapeake, Franklin, Hampton, Newport News, Norfolk, Portsmouth, Poquoson, Suffolk, Virginia Beach, and Williamsburg
- The Counties of:
  - Isle of Wight, James City, Southampton, Surry and York
- The Towns of:
  - Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield, Windsor, Claremont and Dendron



Note – Gloucester County is not included in this plan

Process

1

Organize Resources

- Get organized
- Plan for involvement
- Coordinate with other departments and agencies

2

Assess Risk

- Identify the hazards
- **Assess the risks**

3

Develop the Plan

- Review mitigation alternatives
- Set planning goals
- Draft action plan

4

Adopt, Implement & Maintain the Plan

Natural Hazards Summary

2017 Plan List of Hazards	
High Risk	Flooding, Tropical/Coastal Storms
Moderate Risk	Sea Level Rise & Land Subsidence, Tornado, Winter Storm, Hazardous Materials Incident
Low Risk	Shoreline Erosion, Earthquake, Wildfire
Negligible	Drought, Extreme Heat

New in 2022

- Infectious Diseases
- High Hazard Dams
- Climate Change Impacts
- Social Vulnerability Analysis for hazards

Exposure – Built Environment

Peninsula	
Hampton	$15.8 billion
James City County	$11.2 billion
Newport News	$21.2 billion
Poquoson	$1.8 billion
Williamsburg	$2.0 billion
York County	$9.7 billion

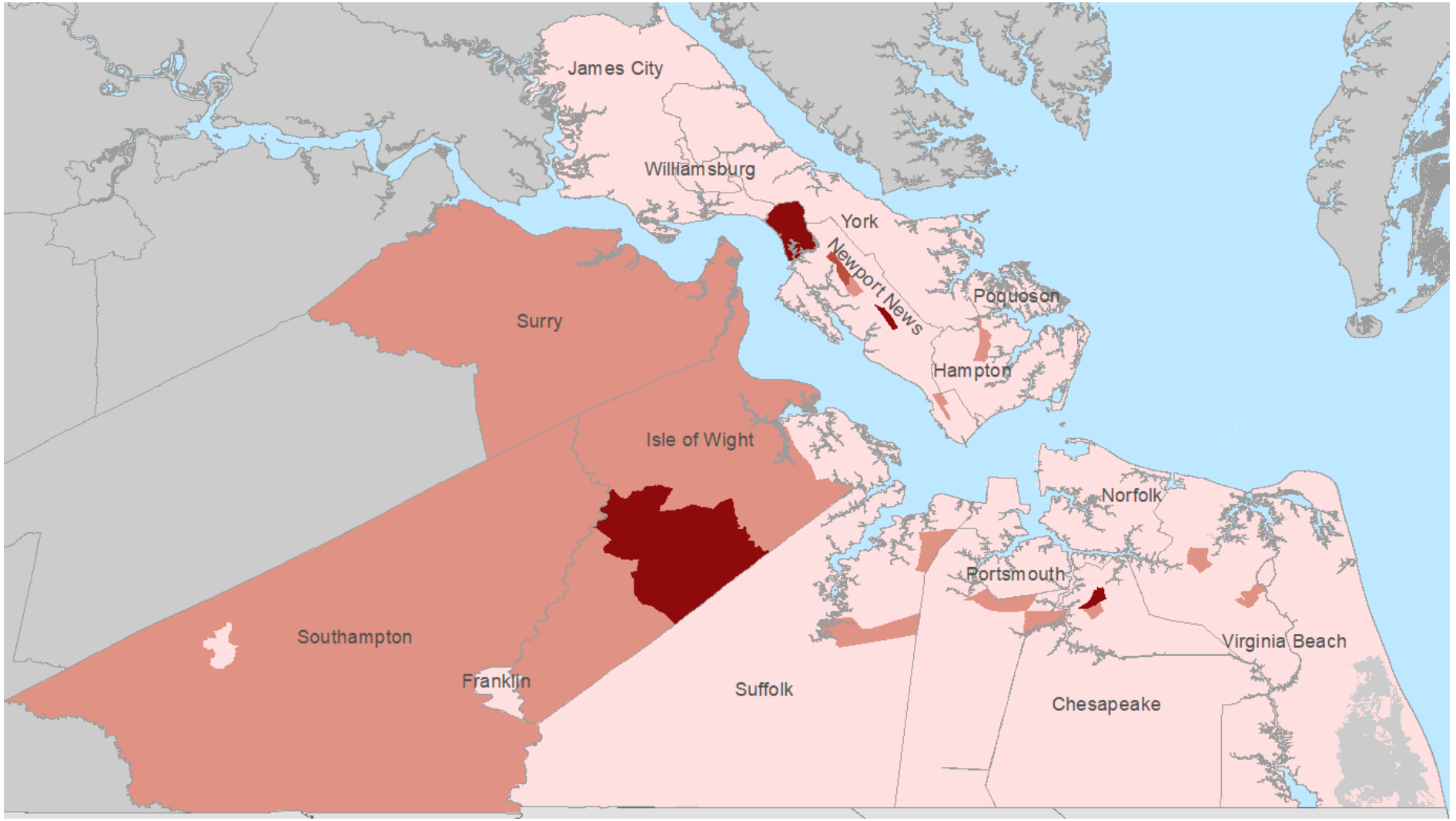
Exposure – Built Environment

Southside	
Chesapeake	$27.9 billion
Norfolk	$29.3 billion
Portsmouth	$10 billion
Suffolk	$10.2 billion
Virginia Beach	$57.2 billion

Exposure – Built Environment

Western Tidewater	
Franklin	$950 million
Isle of Wight County	$1.9 billion
Southampton County	$4.6 billion
Surry County	$796 million

Manufactured Home Exposure by Census Tract



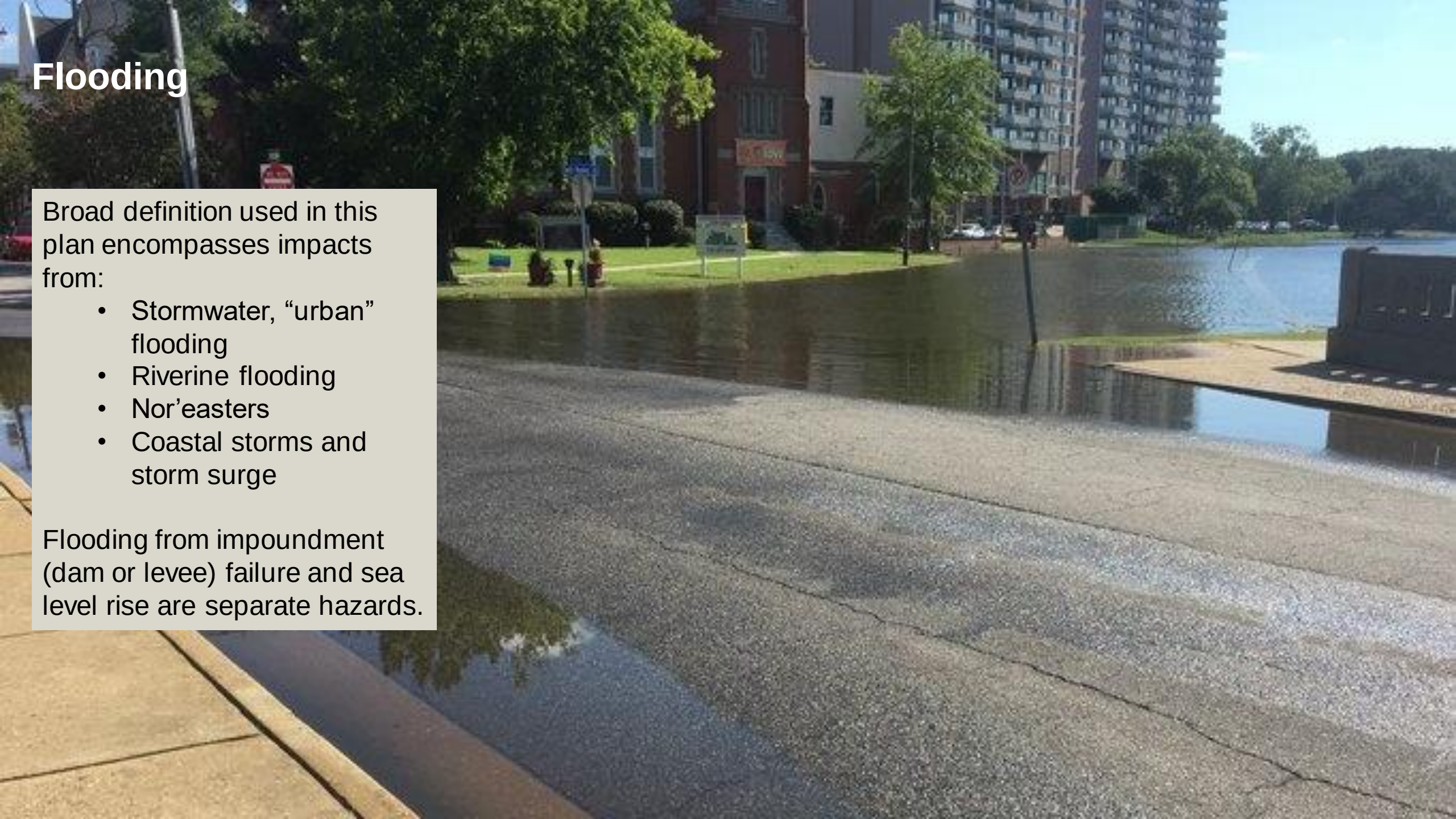
$0 - $10,000

$10,001 - $20,000

$20,001 - $ 30,000

$30,001 - $40,000

Flooding



Broad definition used in this plan encompasses impacts from:

- Stormwater, “urban” flooding
- Riverine flooding
- Nor’easters
- Coastal storms and storm surge

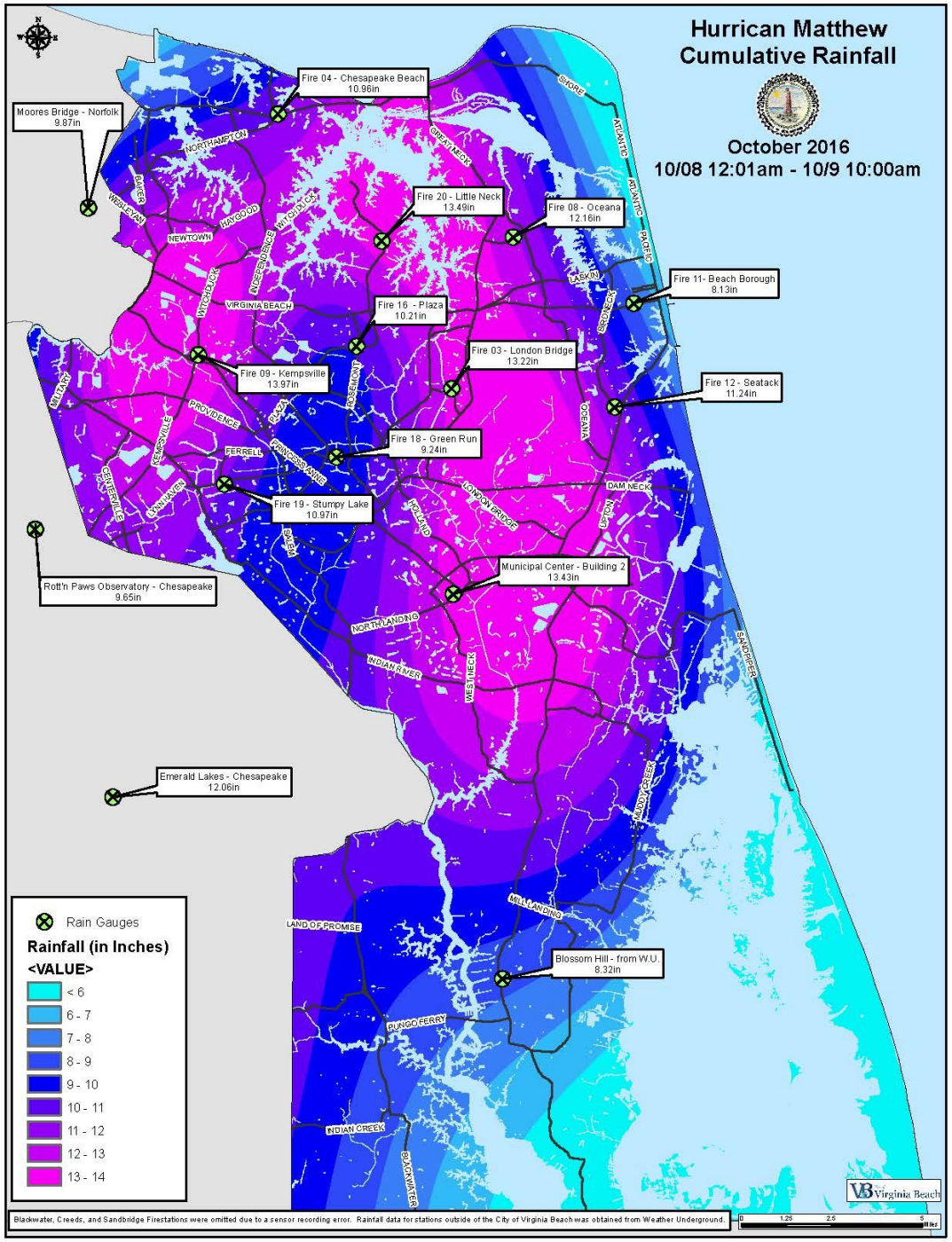
Flooding from impoundment (dam or levee) failure and sea level rise are separate hazards.

Recent Flood Events

Hurricane Matthew, October 8, 2016

$56.1 million in damage

50% of the annual rainfall fell in 1 month, and 25% in one day



Recent Flood Events

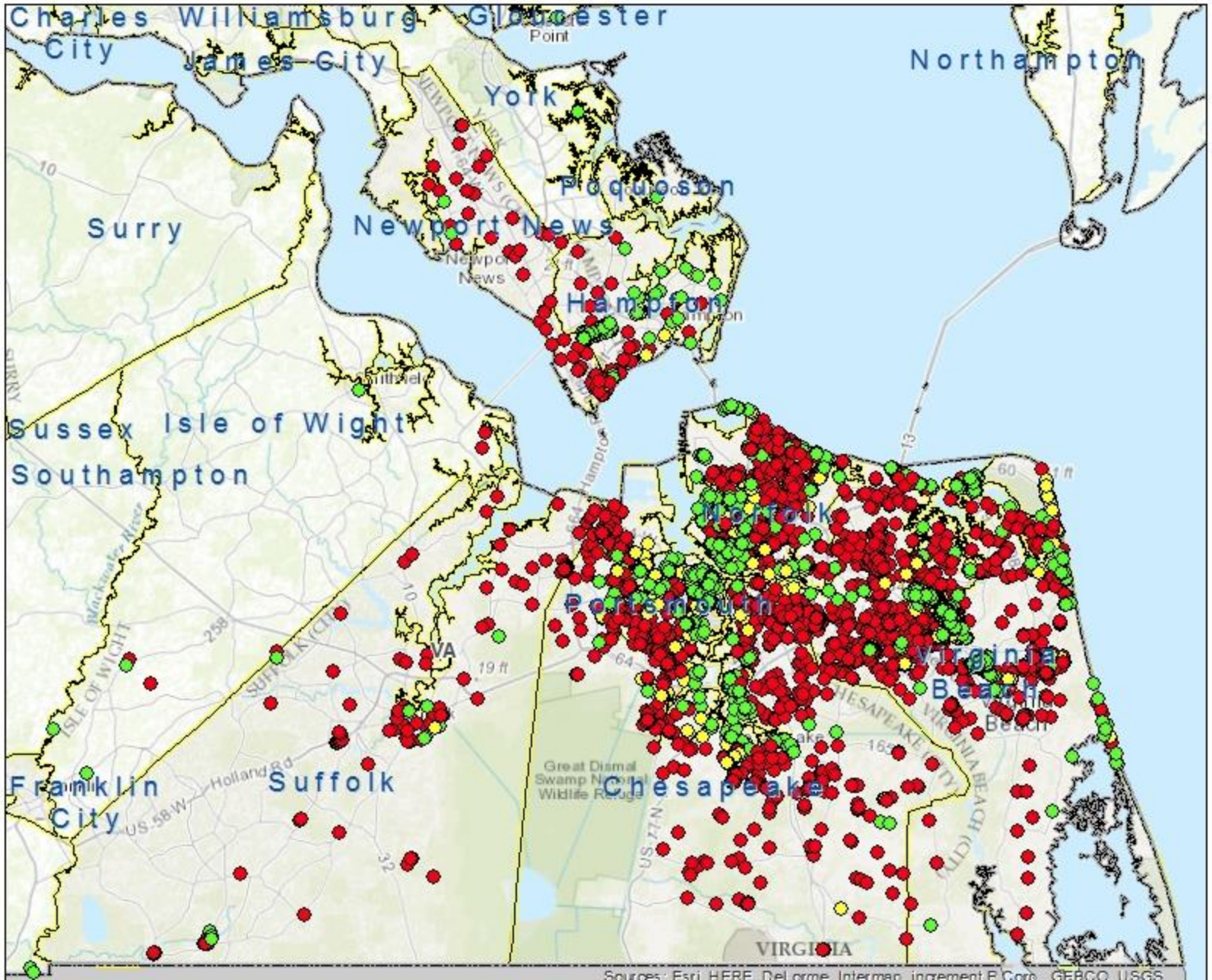
Hurricane Matthew, October 8, 2016

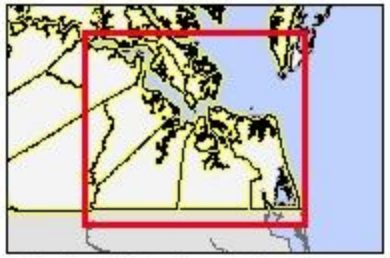
- Pre-Existing saturated conditions throughout the Tidewater area
- Hurricane (Post-Tropical Storm) Matthew was not a statistically significant storm surge or wave action event along the coastal waterfront despite the damage
- The existing storm drainage network cannot handle that volume of precipitation.

IA Registrations, PDAs & Claims Outside the Floodplain: (21 November 2016)

FEMA-4291-DR-VA

FEMA





Data Layer/Map Description:
This map shows where IA Registrations, PDAs, and Claims are inside or outside the FEMA Special Flood Hazard Area. Data Currency is 11/17/2016.

LEGEND

- 1% Floodplain (SFHA)
- 0.2% Floodplain
- Area of Minimal Flood Hazard

N
W
E
S

Data Sources:
FEMA, ESRI;
Initial Declaration: 11/02/2016

HAZUS Level 2 Flood Risk Assessment
100-year Flood Analysis – Damages Expected

COMMUNITY	# of Residential Buildings Damaged	DOLLAR LOSSES			Average Annual Damages
		ALL BUILDINGS	ALL CONTENTS	TOTAL	
Hampton	4,012	$93,763,321	$70,335,791	$164,099,112	$6,813,410
Newport News	435	$6,045,697	$4,586,632	$10,632,329	$486,054
Poquoson	1,446	$47,041,110	$34,242,395	$81,283,504	$3,985,578
James City County	64	$1,762,201	$1,000,658	$2,762,858	$156,374
Williamsburg					<$1,000
York County	266	$4,716,520	$3,376,412	$8,092,932	$687,866

HAZUS Level 2 Flood Risk Assessment
100-year Flood Analysis – Damages Expected

COMMUNITY	# of Residential Buildings Damages	DOLLAR LOSSES			Average Annual Damages
		ALL BUILDING	ALL CONTENTS	TOTAL	
Norfolk	2684	$163,342,598	$177,157,526	$340,500,124	$19,264,918
Portsmouth	658	$8,197,586	$8,921,847	$17,119,433	$982,084
Suffolk	40	$1,997,698	$1,421,059	$3,418,757	$190,613
Virginia Beach	2322	$149,052,336	$65,543,442	$214,595,778	$9,524,586
Chesapeake	1382	$17,411,115	$14,887,712	$32,298,827	$1,795,921

HAZUS Level 2 Flood Risk Assessment
100-year Flood Analysis – Damages Expected

COMMUNITY	# Residential Buildings Damaged	DOLLAR LOSSES			Average Annual Damages
		ALL BUILDING	ALL CONTENTS	TOTAL	
Isle of Wight County	47	$3,278,669	$2,844,448	$6,123,118	$410,568
Franklin		$109,000	$91,000	$200,000	$11,000
Southampton County		$854,000	$929,000	$1,783,000	$111,446
Surry County	23	$1,052,801	$906,209	$1,959,011	$111,192

Critical Facilities Analysis

Community	Floodway	100-Year Floodplain	500-year Floodplain	Storm Surge Zone
Hampton		4 fire (inc. 2 LAFB), 5 schools	EOC, 3 fire (inc. 1 FMA), 1 police, 8 schools	17 hazmat, 2 EOCs, 14 fire (inc. LAFB & FMA), 3 medical, 6 police, 54 schools (inc. LAFB)
Newport News		2 hazmat, 1 fire (Eustis)	2 medical, 1 school	16 hazmat, 4 fire (inc. Eustis), 2 medical, 2 police, 17 schools
Poquoson		EOC, 1 fire, 1 police, 1 school	1 fire, 1 school	EOC, 2 fire, 1 police, 4 schools
James City County				
York County		1 fire		28 hazmat, 2 fire, 1 school
Williamsburg				

Critical Facilities Analysis

Community	Floodway	100-Year Floodplain	500-year Floodplain	Storm Surge Zone
Norfolk		10 hazmat, 2 fire, 6 schools	4 fire, 2 medical, 4 police, 14 schools	30 hazmat, EOC, 20 fire, 8 medical, 9 police, 103 schools
Portsmouth		EOC, 14 hazmat, 2 fire, 2 police	1 hazmat, 1 fire, 1 medical, 4 schools	15 hazmat, EOC, 9 fire, 2 medical, 2 police, 39 schools
Suffolk				9 hazmat, 1 fire, 1 medical, 8 schools
Virginia Beach		2 fire	4 schools	3 hazmat, EOC, 21 fire (inc. Ft Story), 1 medical, 4 police, 117 schools
Chesapeake		29 hazmat, 3 fire, 4 schools	4 hazmat, 5 schools	59 hazmat, EOC, 10 fire, 5 police, 52 schools

Critical Facilities Analysis

Community	Floodway	100-Year Floodplain	500-year Floodplain	Storm Surge Zone
Isle of Wight County				
Smithfield				
Windsor				
Franklin	22 hazmat	34 hazmat, 1 fire		
Southampton County	EOC, 1 police			
Boykins				
Branchville				
Courtland		EOC, 1 police	4 hazmat, 1 police, 1 school	
Ivor				
Surry County				
Claremont				

Flood Insurance Analysis

Peninsula

Community	% change (2016-2021)
Hampton	(-10%)
Newport News	(-26%)
Poquoson	(-4%)
Williamsburg	(-13%)
James City County	(-5%)
York County	(-8%)

Southside

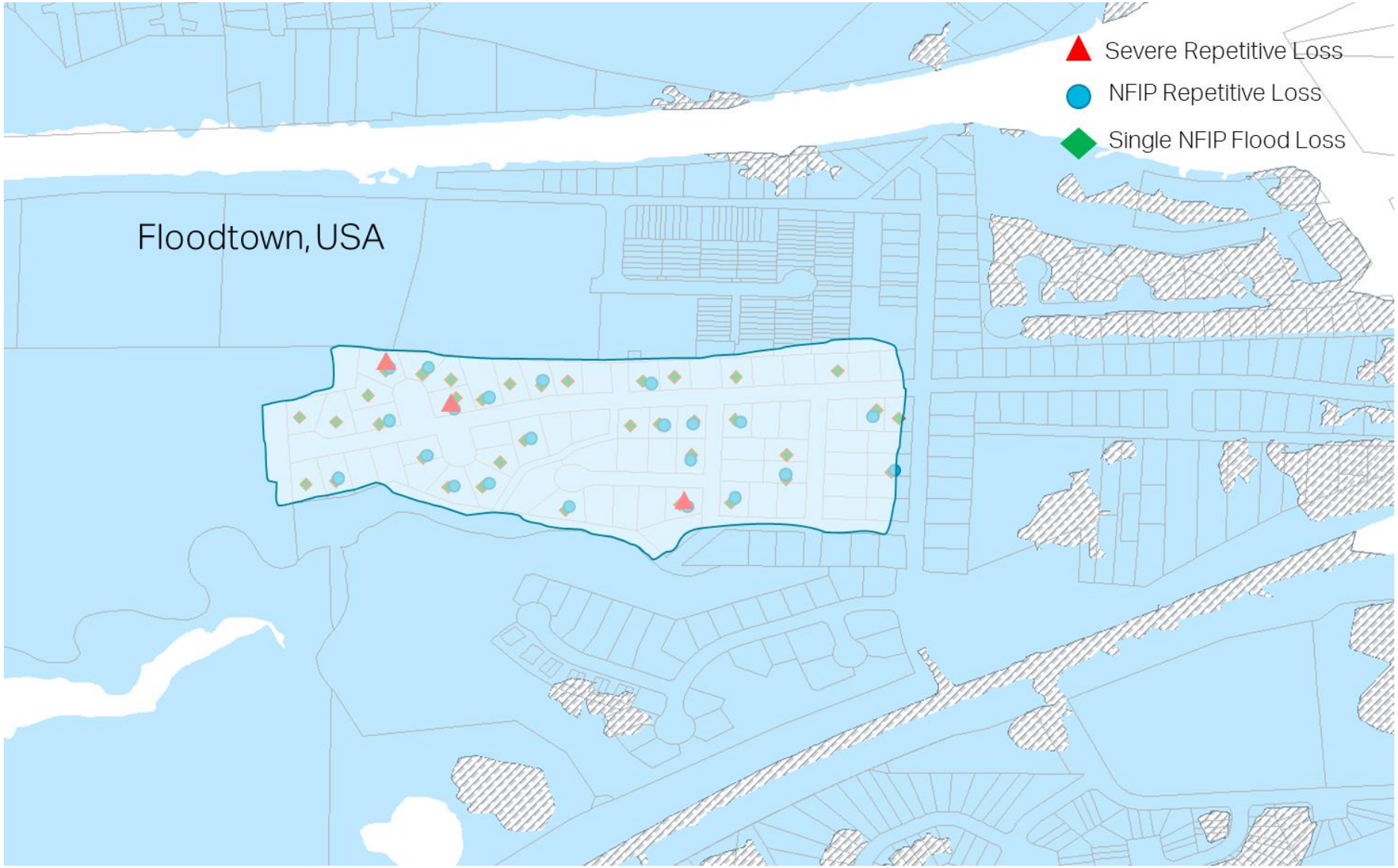
Community	% change (2016-2021)
Norfolk	(-4%)
Portsmouth	(9%)
Suffolk	(6%)
Virginia Beach	(-2%)
Chesapeake	(-1%)

Flood Insurance Analysis

Western Tidewater

Community	% change (2016-2021)
Isle of Wight County	(-19%)
Smithfield	(-21%)
Windsor	(0%)
Franklin	(-28%)
Southampton County	(-1%)
Boykins	(-14%)
Branchville	(0%)
Courtland	(15%)
Ivor	(-100%)
Surry County	(8%)
Claremont	(13%)

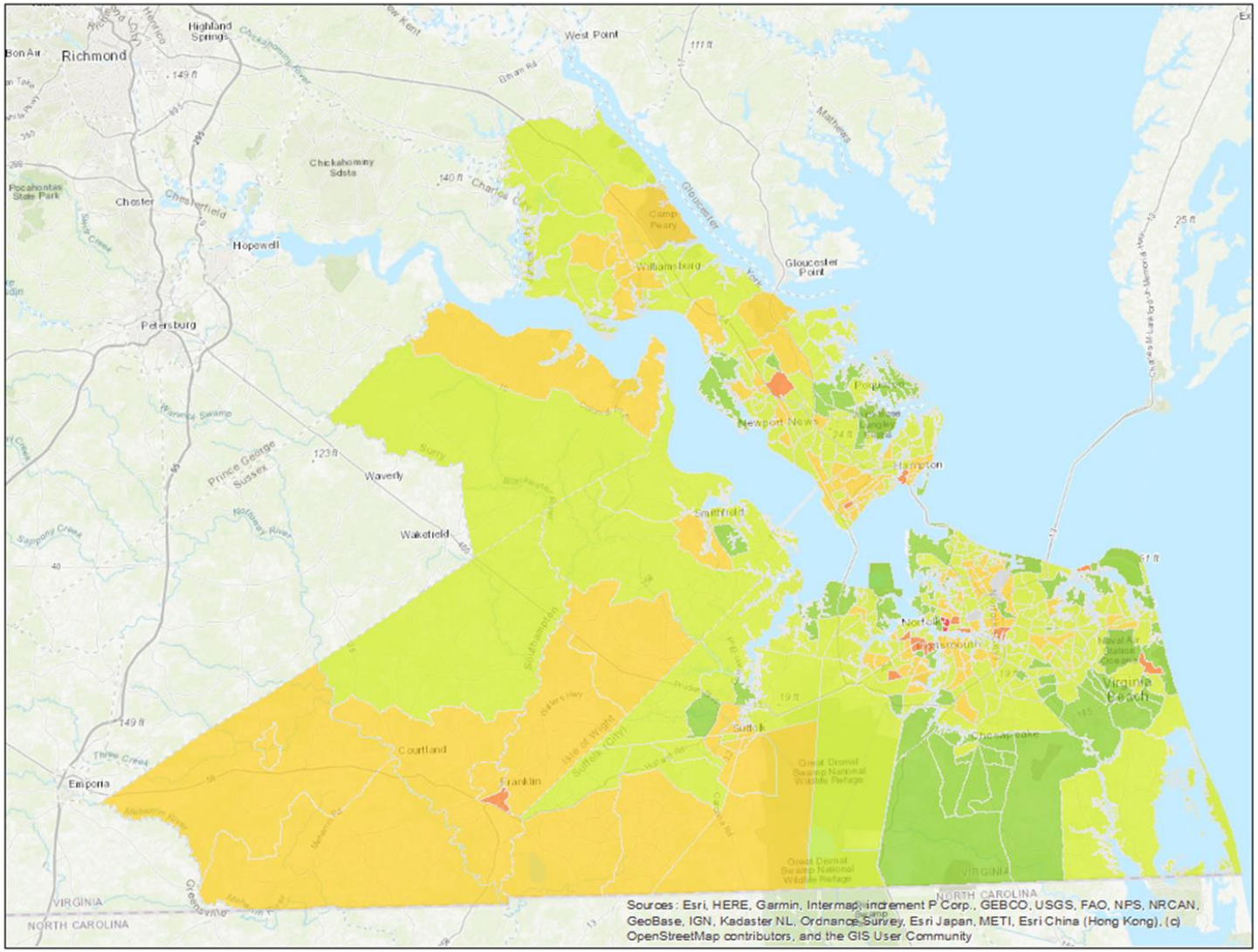
Repetitive Flood Loss Analysis



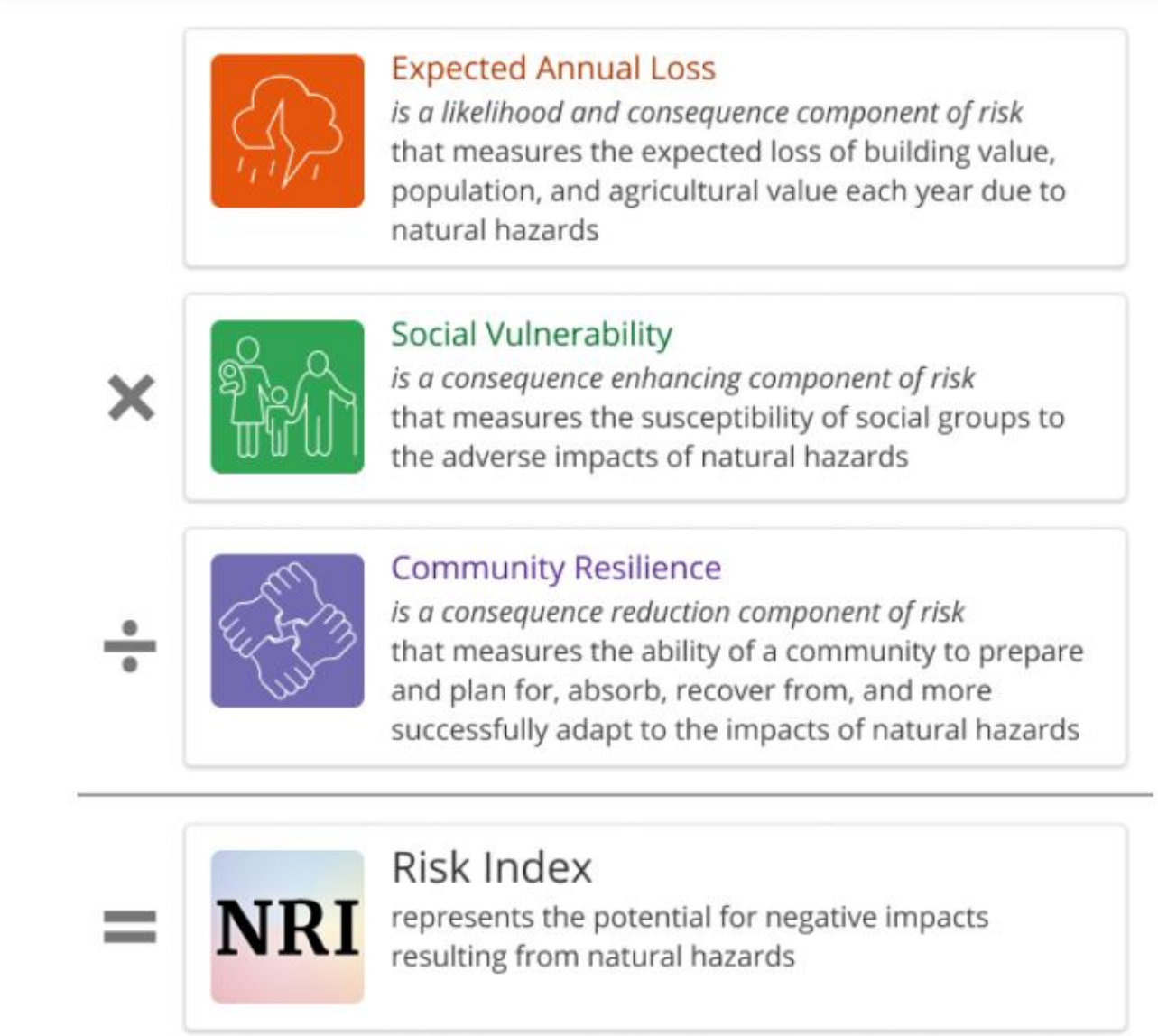
Measuring Social Vulnerability

NRI

- Very Low
- Relatively Low
- Relatively Moderate
- Relatively High
- Very High



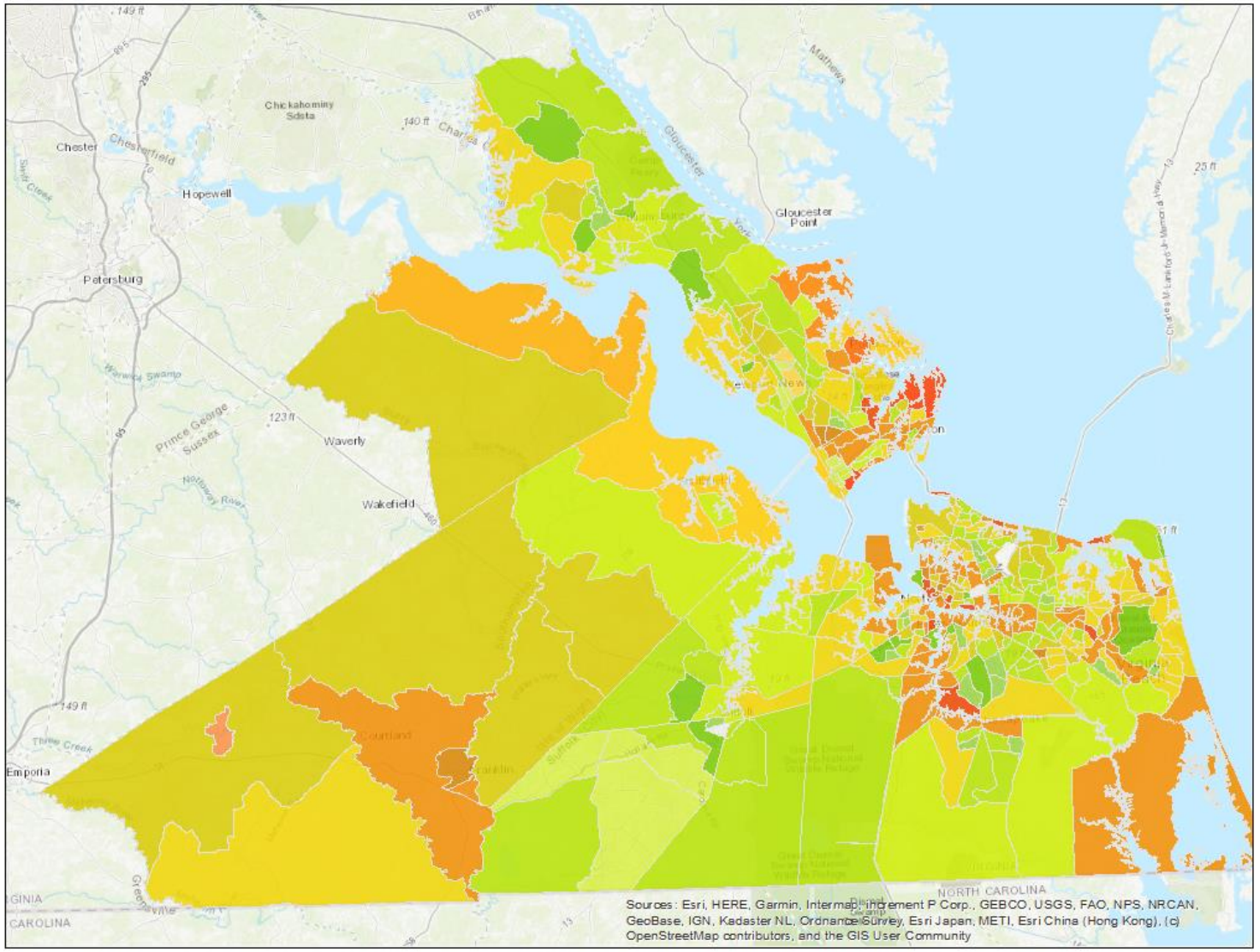
Measuring Social Vulnerability



Coastal Flooding + Riverine Flooding Risk Rating

NRI

- Very Low
- Relatively Low
- Relatively Moderate
- Relatively High
- Very High



Sea Level Rise – Estimating Cost Methodologies

FEMA report to Congress, 1991

Existing development in the coastal zone would experience a 36% to 58% increase in annual damages for a 1-foot rise in sea level by 2100, and a 102% to 200% increase resulting from a 3-foot rise by 2100

$89.9 million to $133.5 million Average Annual Damages

HRPDC *Climate Change in Hampton Roads, Phase III: Sea Level Rise in Hampton Roads, Virginia,* 2012

Costs from three feet of sea-level rise in the Hampton Roads region are expected to range between $12 billion and $87 billion

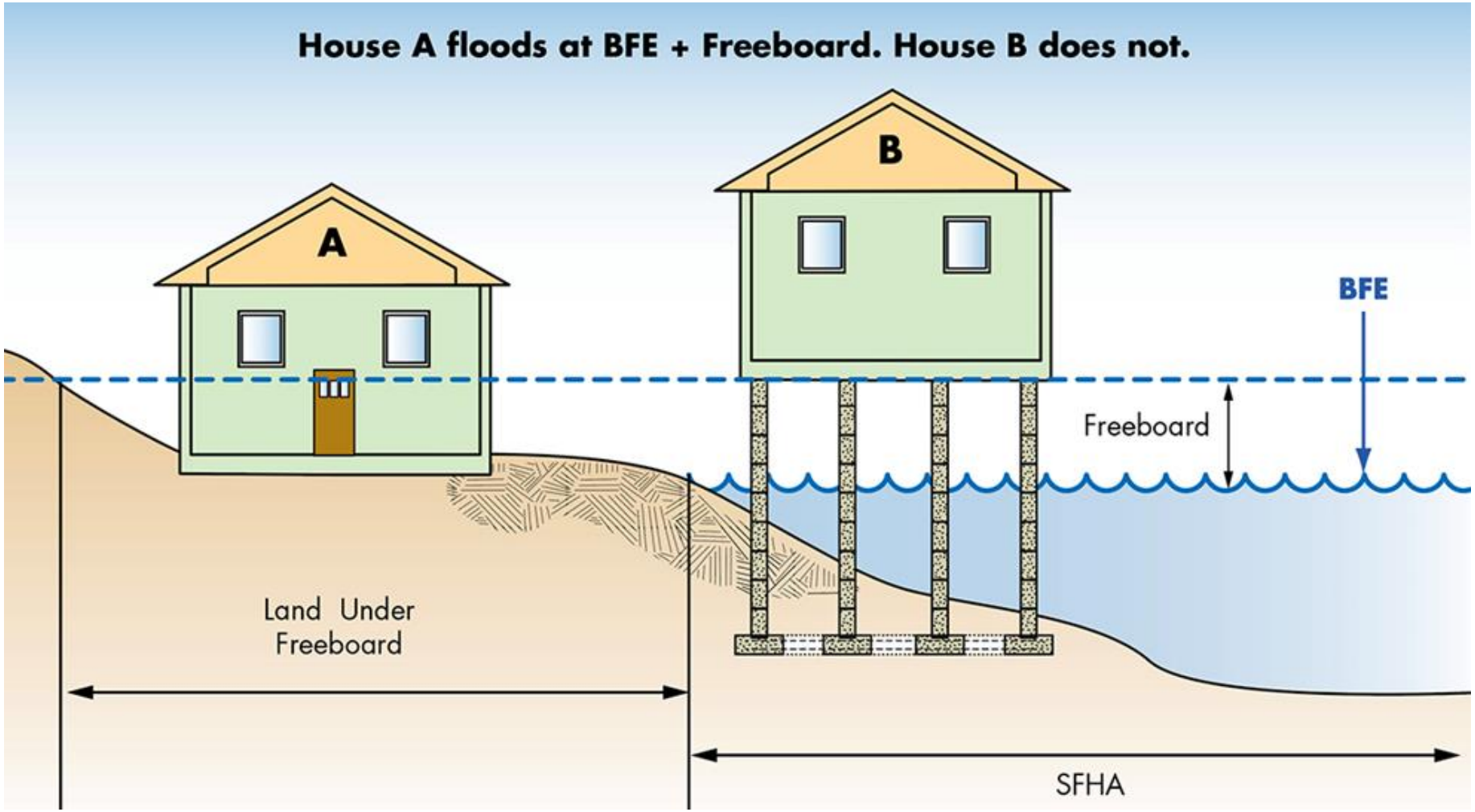
$150 million to $1.1 billion Average Annual Damages

Jochen Hinkel, *et al*, Proceedings of National Academy of Sciences, 2014

In 2100 . . . expected annual losses of 0.3–9.3% of global gross domestic product [other studies indicate coastal impacts are higher, so used 4% for Hampton Roads]

$4.1 million Average Annual Damages

Sea Level Rise – Estimating Costs



High Hazard Dams - Peninsula

Jurisdiction	Dam Name	Year Built	EAP Status (last approval)	Downstream Impacts
Newport News	Lee Hall Reservoir Dam	1893	Active (1/31/2019)	861 homes, 1 business, 3 schools, 2 parks, 28 roadways
York County	Harwood's Mill Dam	1919	Active (08/18/2016)	172 homes, 21 roadways
York County	Waller Mill Dam	1965	Expired (8/25/2005)	3 homes, 1 business, 3 roadways, 1 downstream dam
James City County	Little Creek Dam	1980	Active (4/26/2016)	2 homes, 2 roadways
James City County	Diascund Creek Dam	1961	Active (08/18/2016)	208 homes, 25 roadways
Williamsburg	Lake Matoaka Dam	1694	Expired (04/30/2008)	7 homes, 2 businesses, 4 utilities, 1 roadway

High Hazard Dams Southside

Jurisdiction	Dam Name	Year Built	EAP Status (last approval)	Downstream Impacts
Suffolk	C-Pond Dam	1962	Active (04/24/2020)	287 homes, 4 roadways, 1 downstream dam
Suffolk	Godwin's Millpond Dam	1960	Expired (03/14/2013)	1 home, 3 businesses, 1 road
Suffolk	Lake Burnt Mills	1942	Active (09/16/2019)	310 homes, 8 roadways, 1 downstream dam
Suffolk	Lake Cohoon	1919	Active (07/13/2015)	39 homes, 1 business, 1 railroad, 5 roadways, 1 downstream dam
Suffolk	Lake Kilby	1892	Active (07/13/2015)	1 downstream dam
Suffolk	Lake Meade Dam	1958	Active (08/10/2020)	86 homes, 29 businesses, 5 railroads, 2 parks, 17 roadways
Suffolk	Speight's Run Dam	1957	Active (07/13/2015)	2 downstream dams
Suffolk	Western Branch	1963	Active (09/16/2019)	310 homes, 8 roadways

High Hazard Dams Southside

Jurisdiction	Dam Name	Year Built	EAP Status (last approval)	Downstream Impacts
Norfolk	Lake Whitehurst	1900	Expired (5/31/2011)	none listed
Virginia Beach	Lake Smith Dam	1885	Expired (5/31/2012)	352 homes, 2 roadways, 1 downstream dam
Virginia Beach	Little Creek Reservoir	1899	Expired (5/31/2011)	none listed
Chesapeake	Chesapeake Energy Center Bottom Ash and Sediment Pond Dam	1955	Active (11/14/2018)	none listed

High Hazard Dams - Western Tidewater

Jurisdiction	Dam Name	Year Built	EAP Status (last approval)	Downstream Impacts
Isle of Wight County	ASB Pond	1901	Active (4/24/2020)	52 homes, 7 roads, 1 downstream dam
Isle of Wight County	B-1 Pond Dam	1950	Expired (12/17/2013)	54 homes, 6 roadways
Isle of Wight County	B-2 Pond Dam	1901	Expired (12/17/2013)	54 homes, 6 roadways

High Hazard Dams and Social Vulnerability

n High Hazard Dam

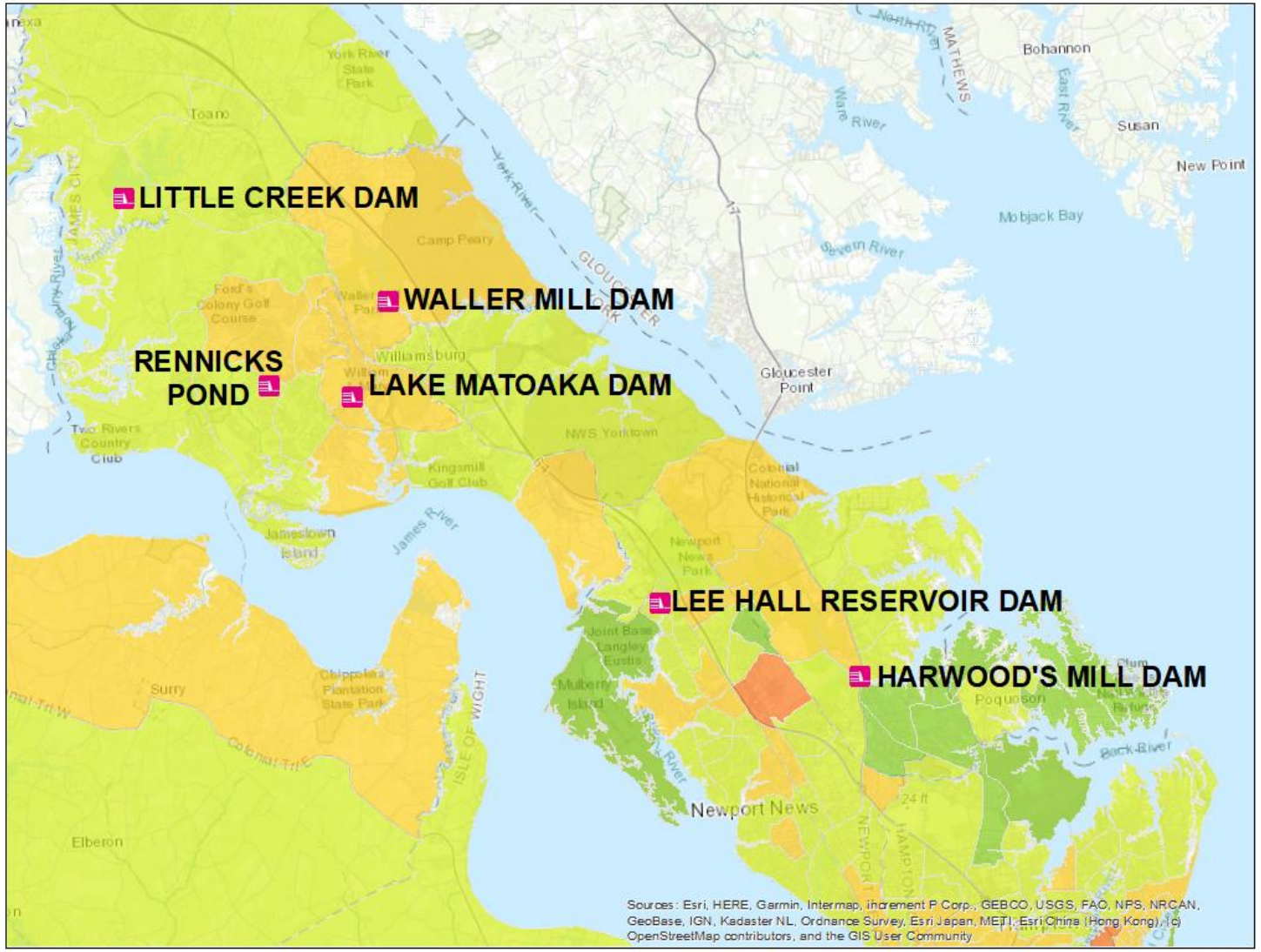
Very Low Social Vulnerability

Relatively Low

Relatively Moderate

Relatively High

Very High Social Vulnerability



High Hazard Dams and Social Vulnerability

n High Hazard Dam

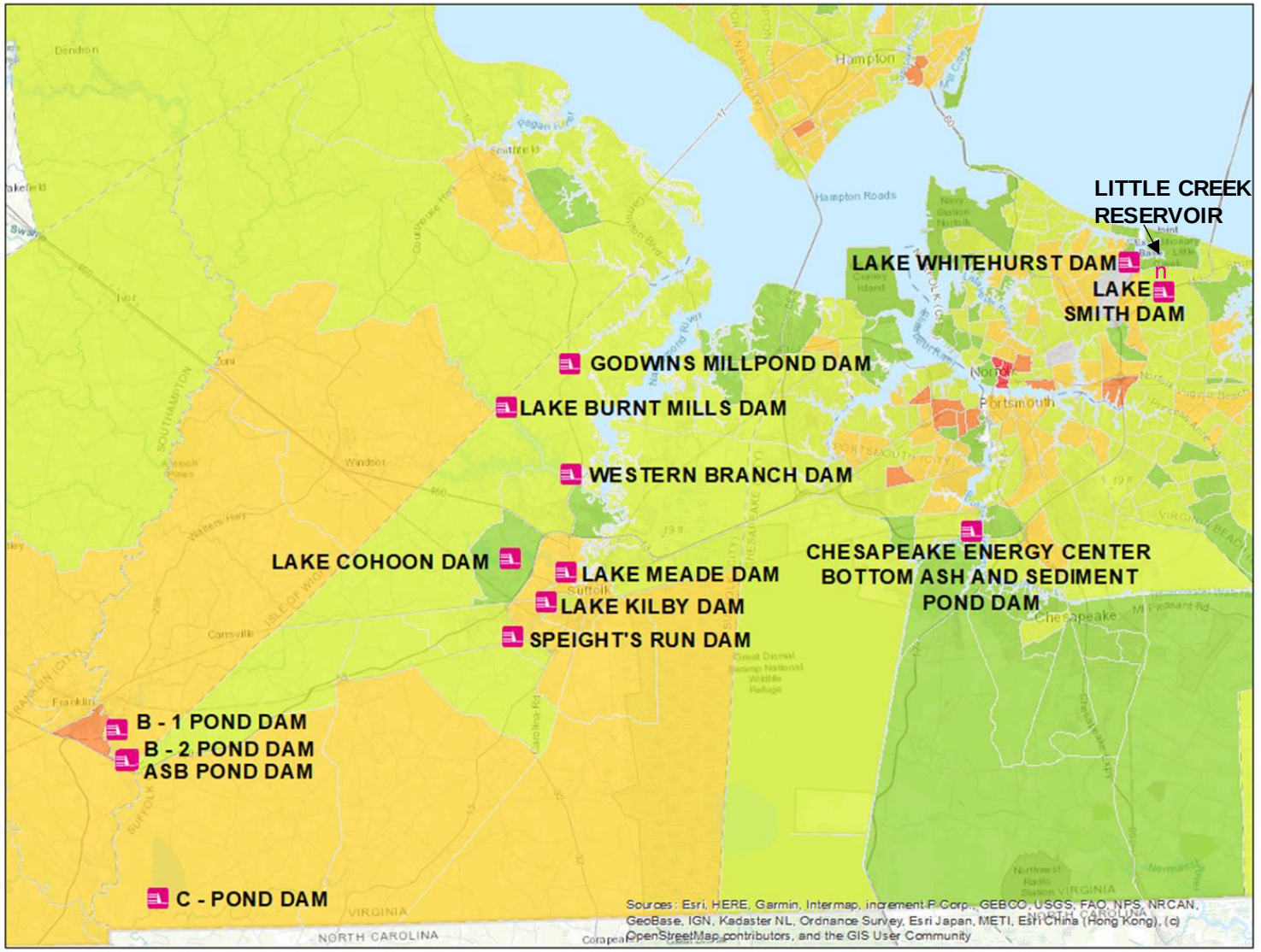
Very Low Social Vulnerability

Relatively Low

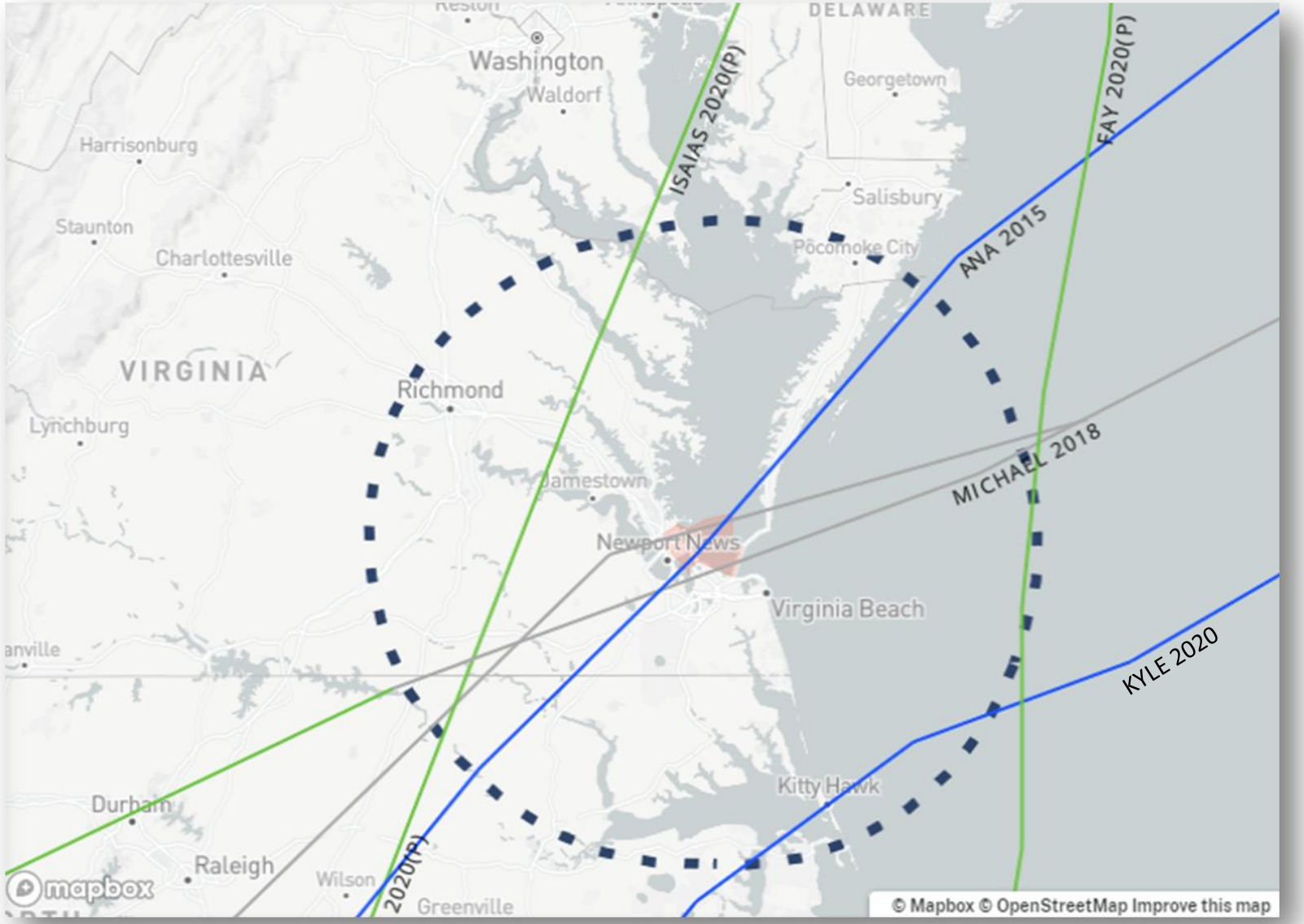
Relatively Moderate

Relatively High

Very High Social Vulnerability

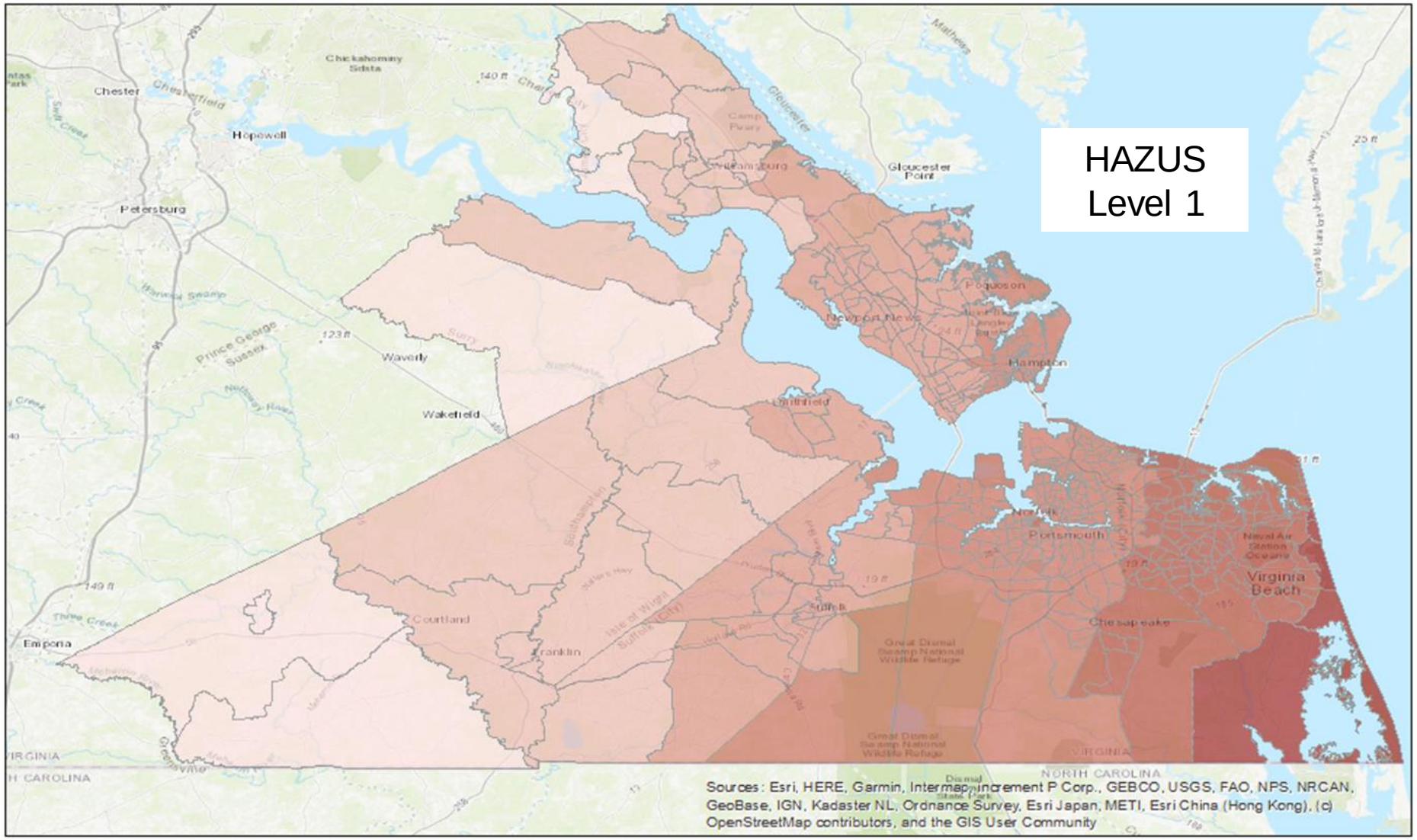


Tropical Storms Since Last Update



Tropical Storms

100-year return period Peak Gust (mph) by Census Tract



- 51 – 60 mph
- 61 – 70 mph
- 71 – 80 mph
- 81 – 90 mph
- 91 – 100 mph
- 101 – 110 mph

Tropical Storms

Probabilistic Loss Estimates, ANNUALIZED LOSSES

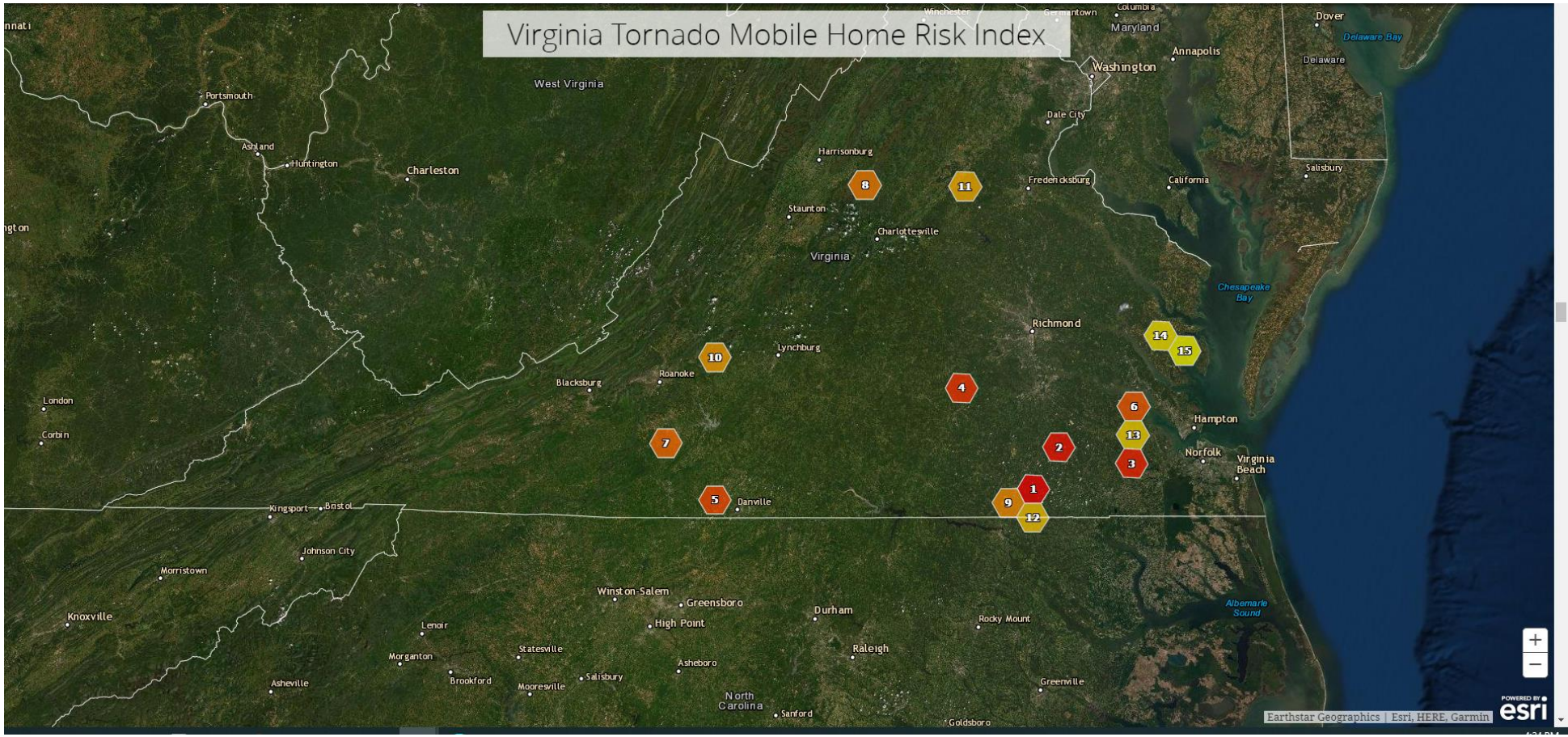
Peninsula	Total
Hampton	$7,537,000
Newport News	$5,166,000
Poquoson	$698,000
James City County	$2,081,000
Williamsburg	$256,000
York County	$3,161,000

Western Tidewater	Total
Isle of Wight County	$1,227,000
Franklin	$215,000
Southampton County	$457,000
Surry County	$165,000

Southside	Total
Norfolk	$10,600,000
Portsmouth	$3,711,000
Suffolk	$3,180,000
Virginia Beach	$3,855,000
Chesapeake	$13,002,000

Tornadoes & Social Vulnerability

- Ongoing research concerning spatial variability and trends in tornado occurrence.
- Overlaid areas of increased tornado activity with areas of high manufactured home percentages to identify high risk areas



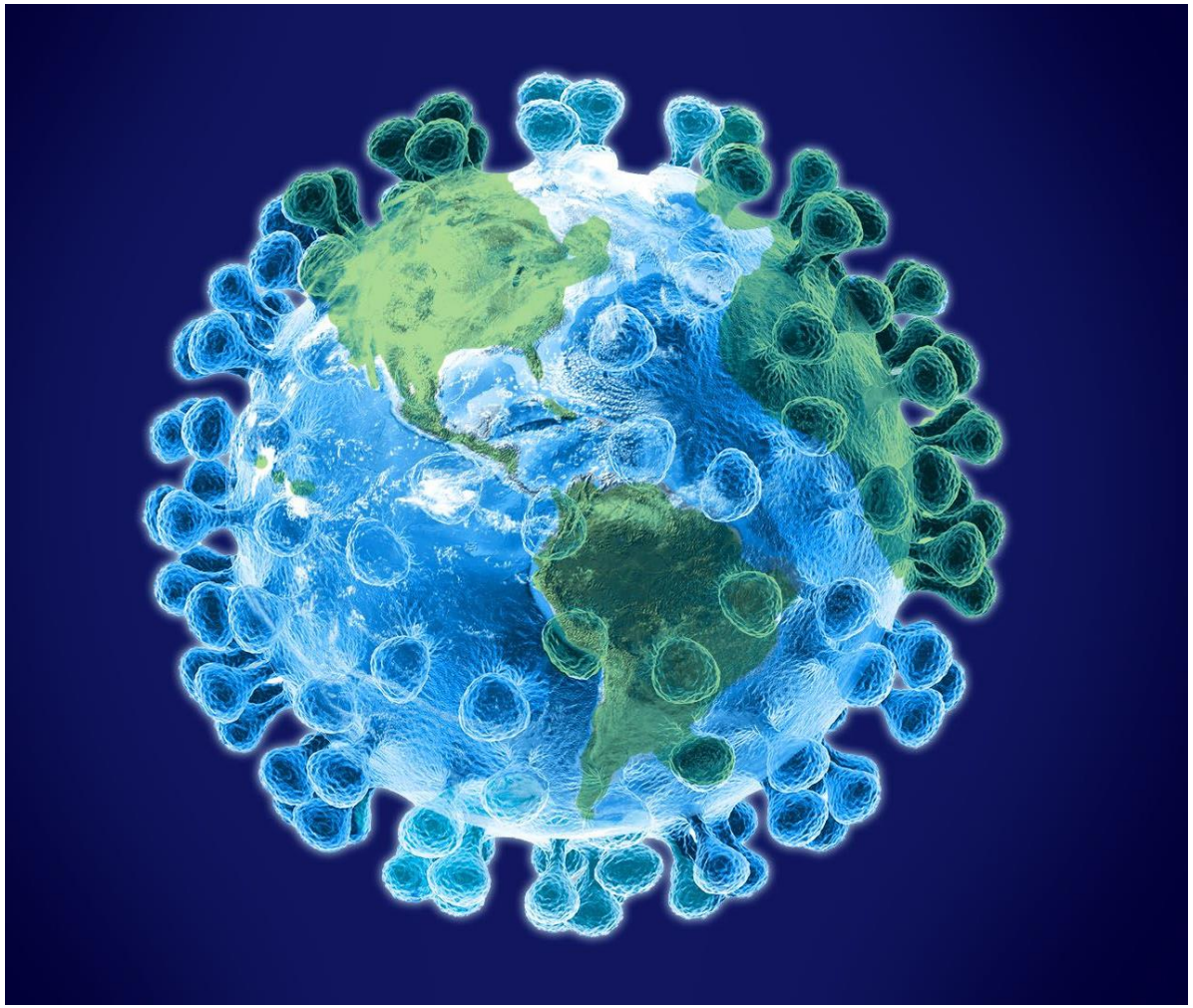
Tornadoes

Potential climate change impacts:

- *Could* cause prolonged tornado outbreaks, versus individual events
- Changes in population *could* impact number of people in harm's way
- Increase in atmospheric heat and moisture *could* increase favorable conditions for thunderstorms and tornadoes

National Weather Service photo of damage to a building in Downtown Suffolk from tornado spawned by Tropical Storm Isaias, August 4, 2020.

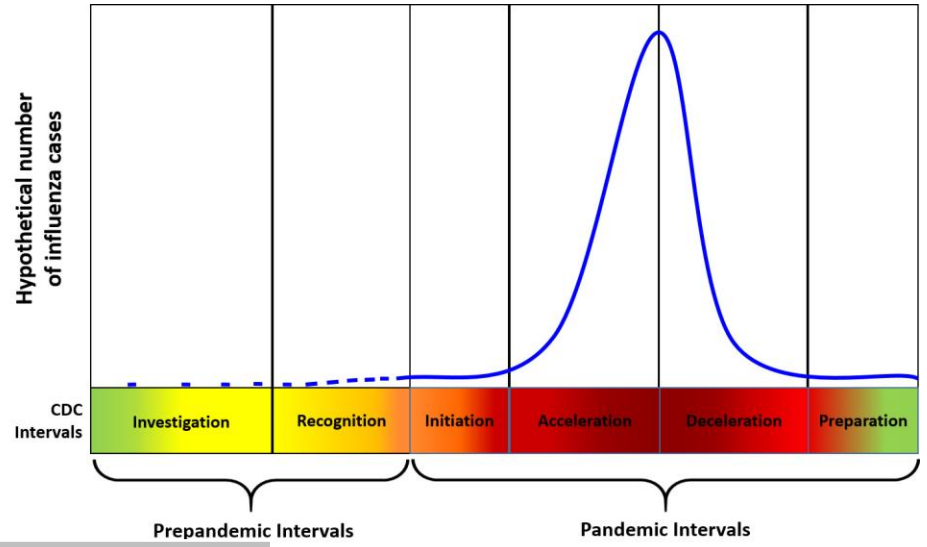
Infectious Diseases: Pandemic Flu



Pandemic is defined as an epidemic of:

- Influenza virus
- Worldwide spread
- Infection of large proportion of human population

Infectious Diseases: Pandemic Flu



Interval	Description
1) Investigation	Monitoring & investigation of cases in humans
2) Recognition	Control outbreak, treat sick
3) Initiation	Pandemic wave begins when virus has ability to spread person to person
4) Acceleration	Focus on non-pharma interventions and medications to reduce spread/prevent death
5) Deceleration	Pandemic wave slows down when cases consistently decrease; reduce non-pharma interventions
6) Preparation	Monitor for future waves

COVID 19 or SARS-CoV-2 - Peninsula

Community	Cases	Hospitalizations	Deaths
Hampton	10,617	397	178
Newport News	14,191	462	229
Poquoson	889	22	16
Williamsburg	770	28	13
James City County	4,633	157	72
York County	3,774	71	54

VDH, 5/28/2021

COVID 19 or SARS-CoV-2 - Southside

Community	Cases	Hospitalizations	Deaths
Norfolk	17,858	1,015	262
Portsmouth	9,123	678	199
Suffolk	7,970	455	191
Virginia Beach	36,137	1,657	406
Chesapeake	21,071	1,016	298

VDH, 5/28/2021

COVID 19 or SARS-CoV-2 – Western Tidewater

Community	Cases	Hospitalizations	Deaths
Isle of Wight County	3,161	150	69
Franklin	1,134	55	32
Southampton County	1,983	57	56
Surry County	421	21	9

VDH, 5/28/2021

Social Vulnerability and COVID-19

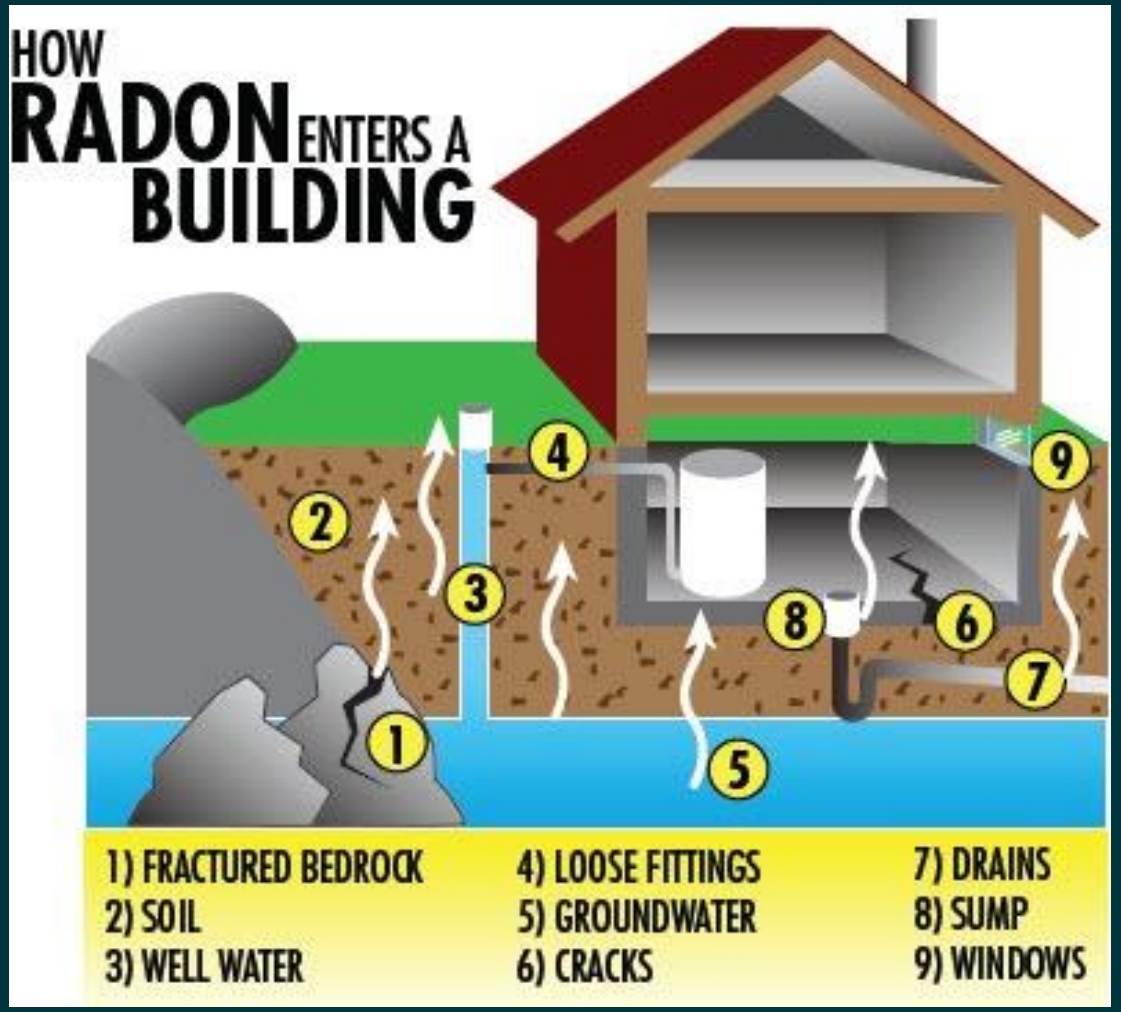
Social Vulnerability is a factor of:

- financial health
- physical health
- mental health
- other aspects of where and how a person lives
- access to virus testing
- healthcare for those who contract the virus
- access to medications and vaccinations

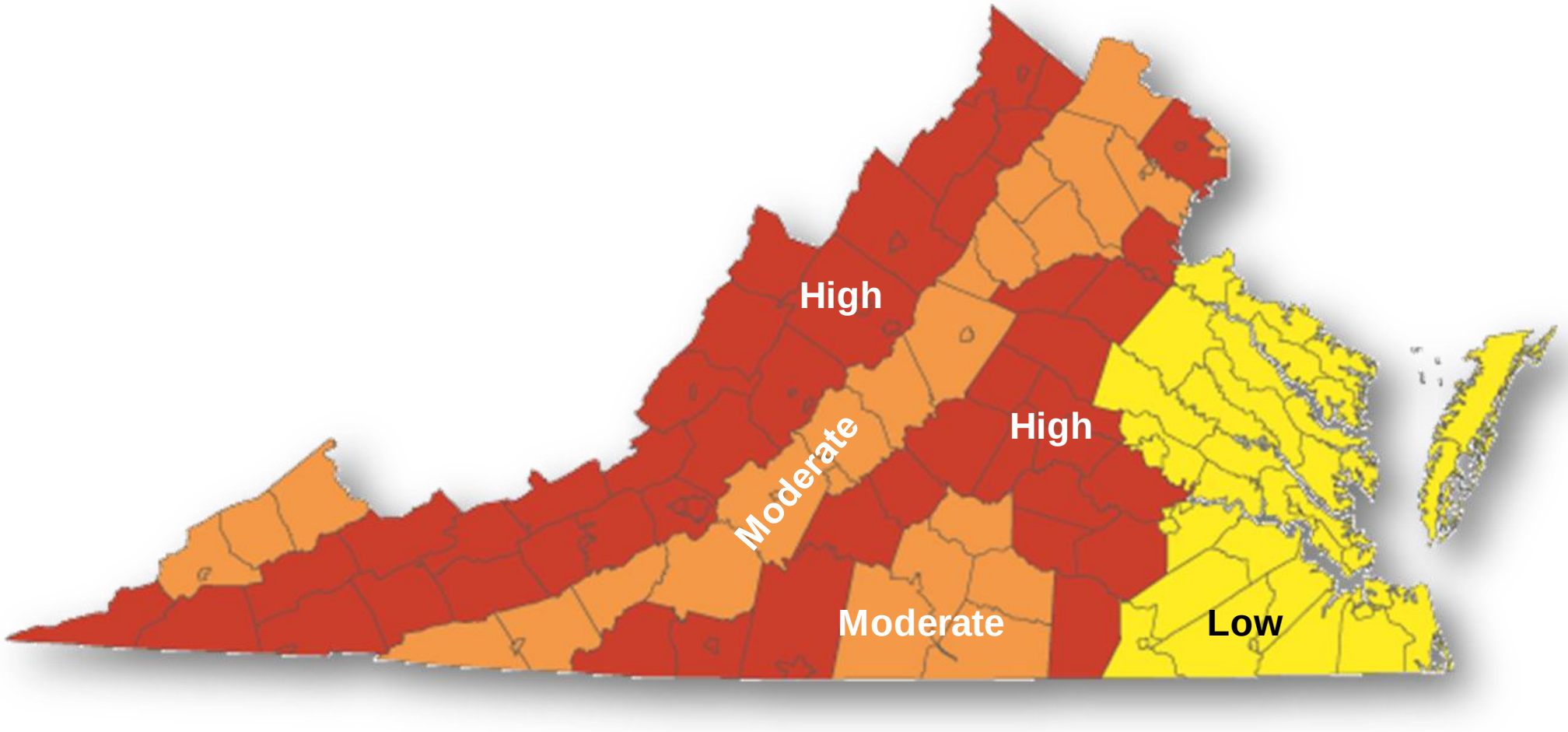
Radon Exposure

What is Radon?

- Colorless, odorless naturally-occurring gas
- Forms by radioactive decay of uranium, thorium or radium
- In Virginia, found in mostly granite & shales (or associated soils & groundwater)

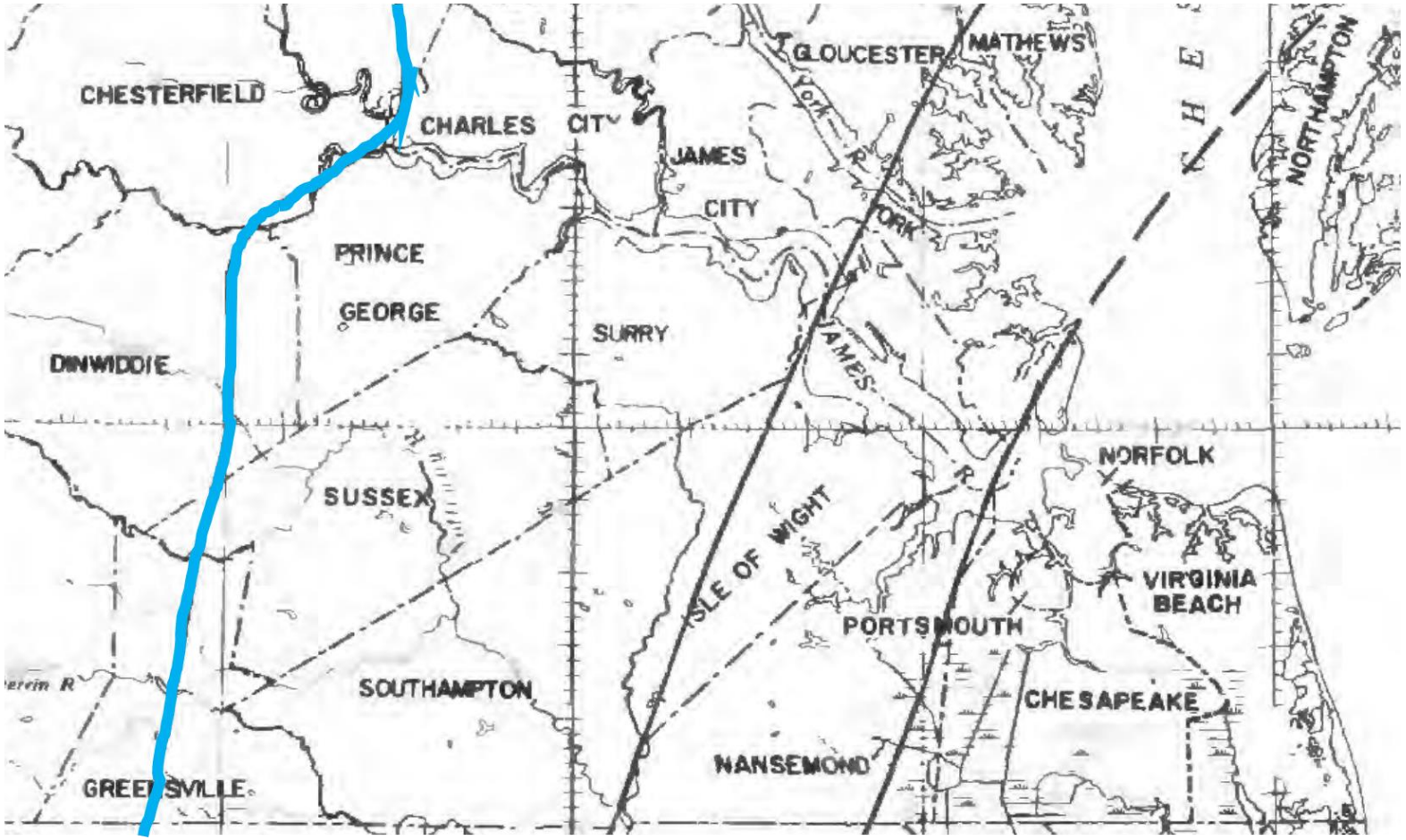


Radon Exposure



U.S. EPA Map of Radon Zones in Virginia, 1993

Investigating the Yorktown Formation

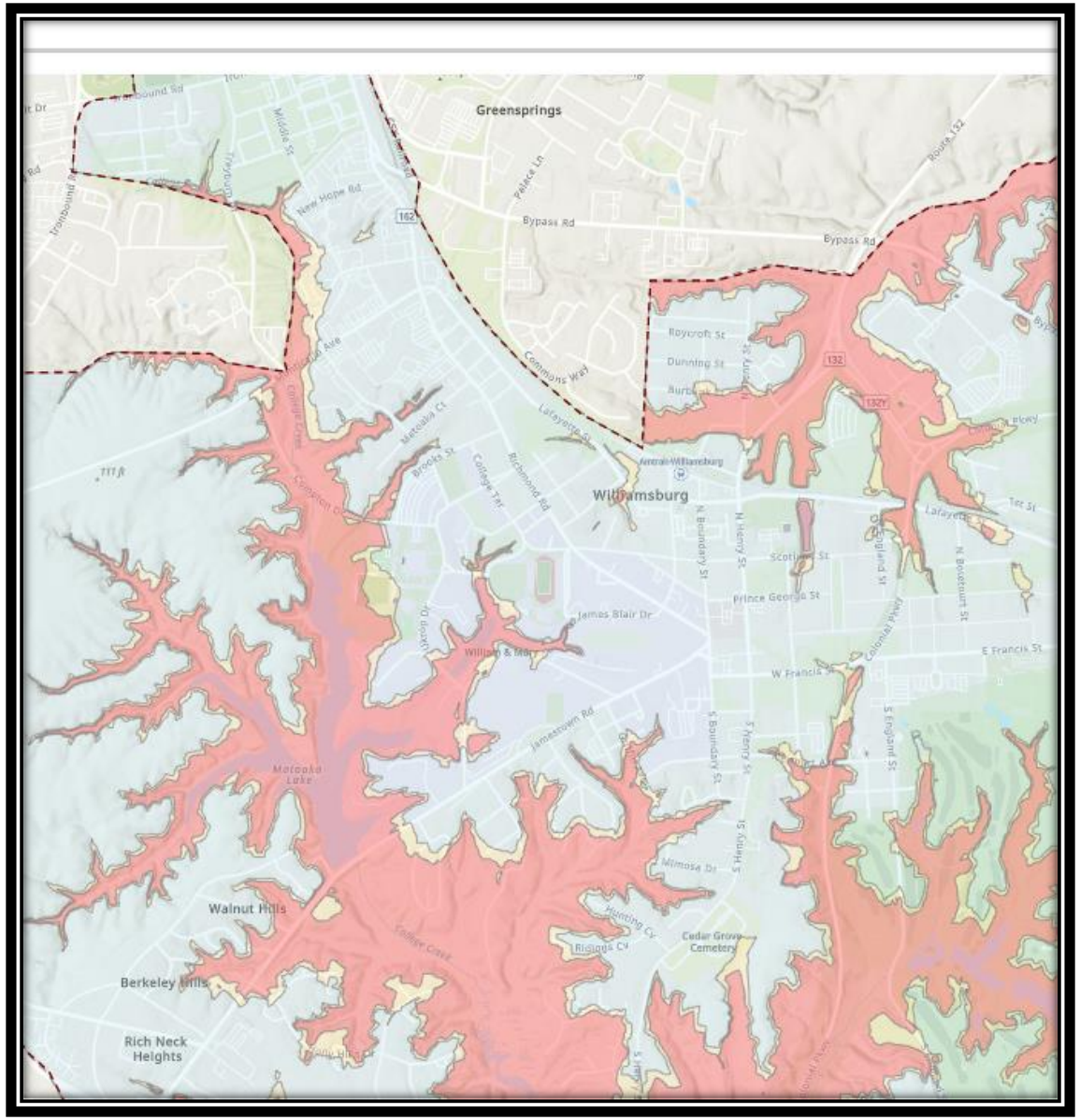


Investigating the Yorktown Formation

Low Radon Risk

Moderate Radon Risk

High Radon Risk



Damages & Frequency

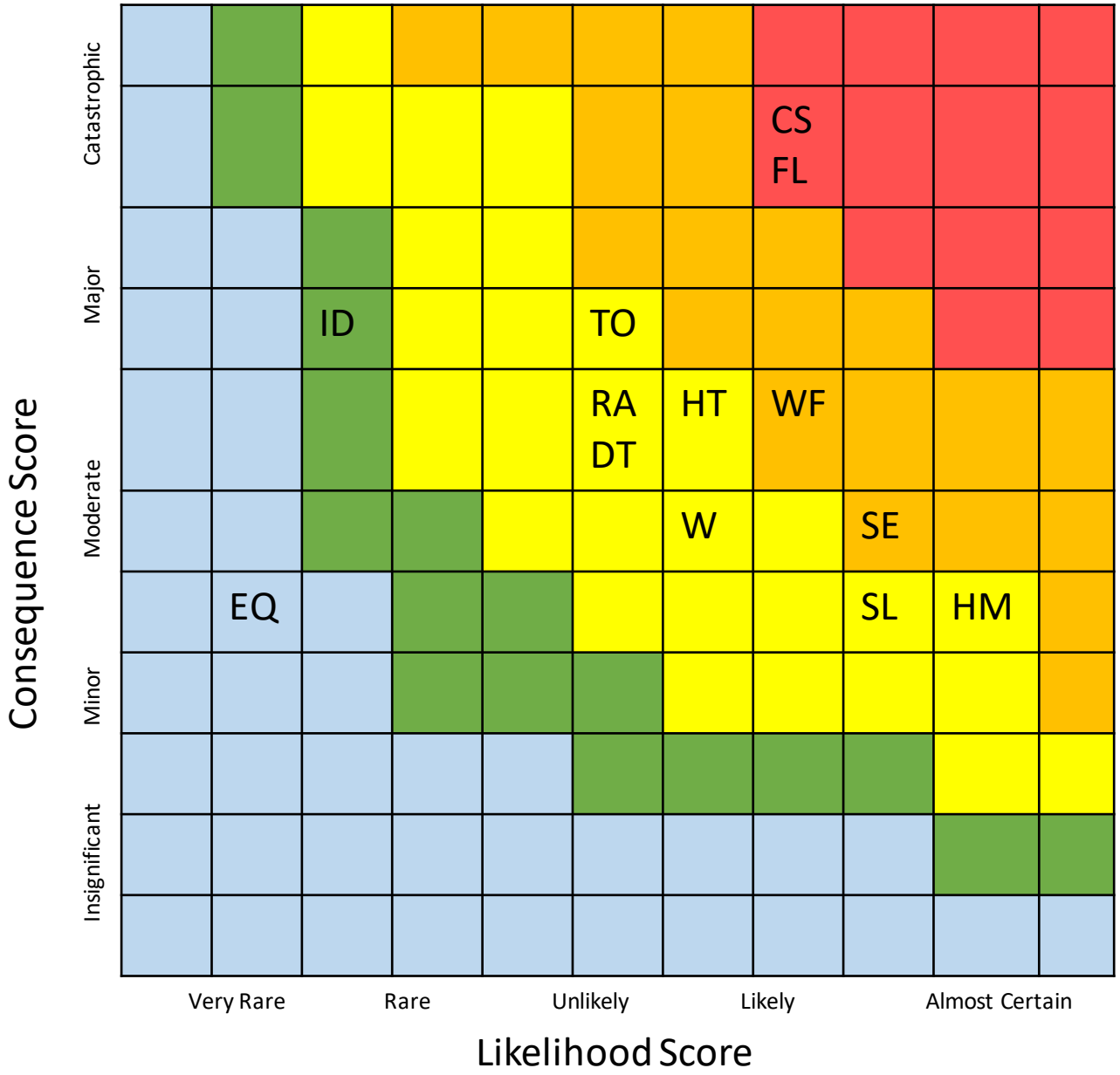
Hazard	Average Annual Estimated Losses
Sea Level Rise & Land Subsidence	$4.1 million - $1.1 billion
Flooding	$44,531,600 (HAZUS)
Tropical/Coastal Storm	$55,311,000
Tornado	$24,265,000
Earthquake	$1,119,000
Hazardous Materials Incident	$135,063
Wildfire	$37,000
Winter Storm	$9,000
Extreme Heat	$0
Shoreline Erosion	Not quantified
Radon Exposure	Not quantified
Infections Disease	Not quantified
Drought	Not quantified

Re-ranking the Hazards for 2022

2017 Plan Hazard Rankings

CRITICAL HAZARD - HIGH RISK	FLOODING TROPICAL/COASTAL STORM
CRITICAL HAZARD - MODERATE RISK	SEA LEVEL RISE AND LAND SUBSIDENCE TORNADO WINTER STORM HAZARDOUS MATERIALS INCIDENT
NONCRITICAL HAZARD - LOW RISK	SHORELINE EROSION EARTHQUAKE WILDFIRE
NEGLIGIBLE	DROUGHT EXTREME HEAT

Re-ranking the Hazards for 2022



HM – Hazardous Materials Incident

DT – Drought

WF –Wildfire

EQ – Earthquake

SE - Shoreline Erosion

FL - Flooding

ID – Infectious Disease

W – Winter Storm

HT – Extreme Heat

CS – Coastal/Tropical Storm

TO - Tornado

RA - Radon Exposure

SL – Sea Level Rise

Extreme Risk

High Risk

Medium Risk

Low Risk

Very Low Risk

Next Steps and Schedule

- Hazard Mitigation Planning Committee Work Session 2 – late summer 2021
  - Review Capability Assessment
  - Review Goals & Objectives
- Hazard Mitigation Planning Committee Work Session 3 - early fall 2021
  - Review and rewrite Mitigation Actions
- Public Meeting on Final Plan - fall 2021
- Final FEMA approved draft target - winter 2022
- Adoption by communities by April 2022

Additional Opportunities for Input

- View 2017 plan and download 2022 draft (when available) at:

https://www.hrpdcva.gov/departments/emergency-management/hampton-roads-hazard-mitigation-plan

- Submit comments via email to:

jsadler@hrpdc.com

Thank you.


HAMPTON ROADS
PDC
PLANNING DISTRICT COMMISSION


AECOM


Salter's Creek
CONSULTING