VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Technical Advisory Committee Meeting

9/2/2021

Agenda

- Hazard and Impact Assessment
- Stakeholder and Public Engagement Update
- Project Identification and Evaluation

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Hazards and Impact Assessment Summarization

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Updates to the Impact Assessment Methodology & Documentation

- Sourced and analyzed additional asset datasets
- Highlighted notable approaches, limitations, and assumptions throughout the methodology documentation
- Clarified approach to preparing building footprint dataset and provided recommendations for enhancing data for future iterations
- Tested and validated regional impact priority areas for project evaluation with PDCs/RCs at charettes and public meetings

Hazard & Impact Assessment

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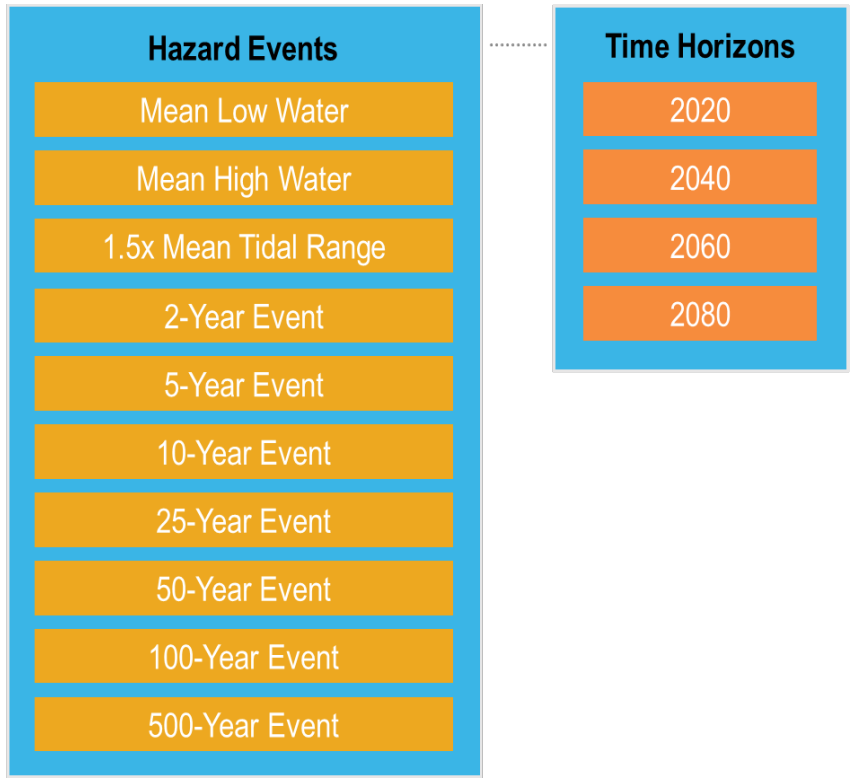
CRMP Hazard Products

- **Topography:**
  - State-wide DEM, best-available LiDAR
- **Water Elevation Surfaces:**
  - Latest NOAA Tidal Surfaces
  - Probabilistic Coastal Water Elevation Surfaces
- **Derived Products:**
  - Flood Extents
  - Flood Depths (with and without waves)



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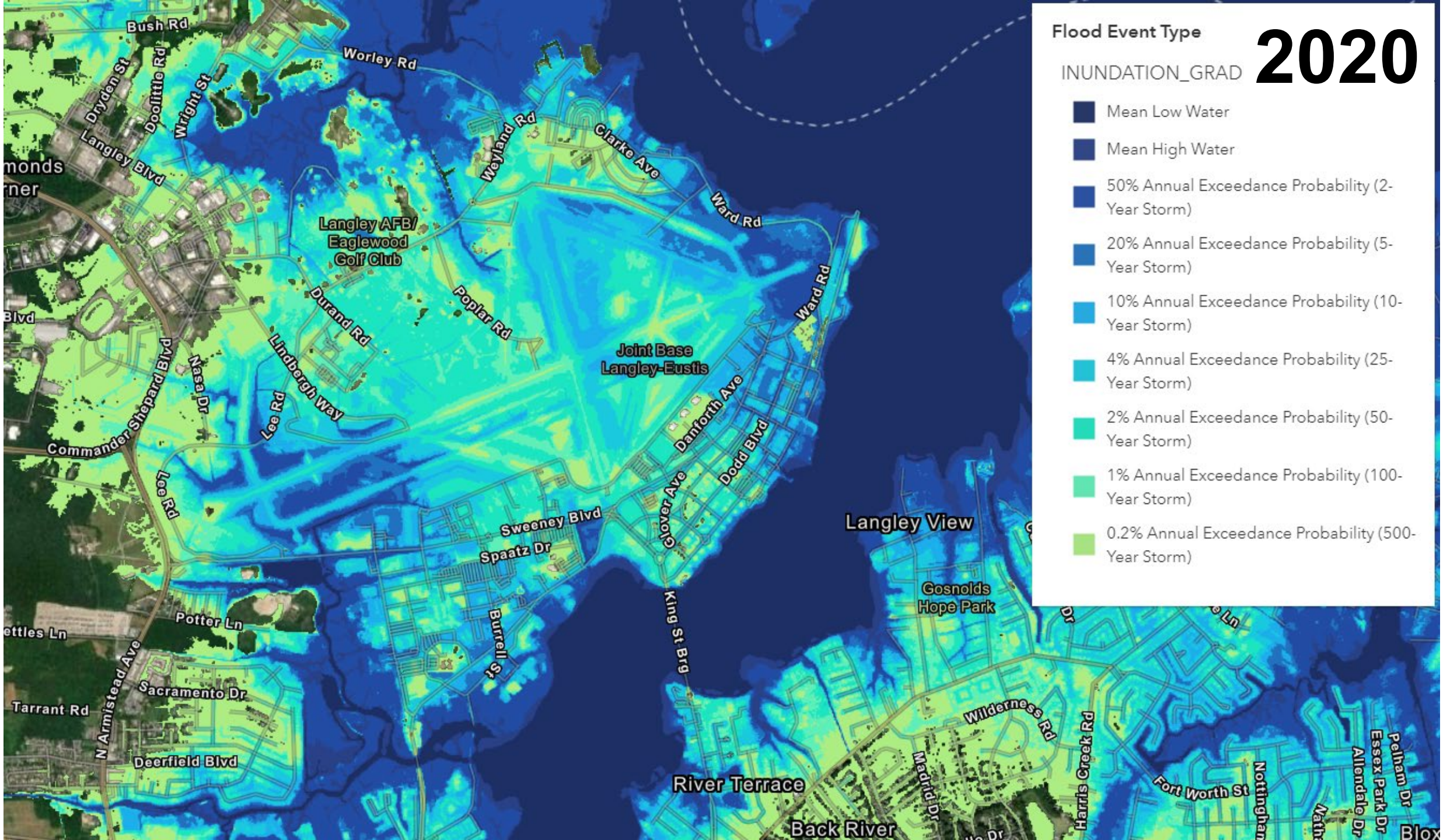
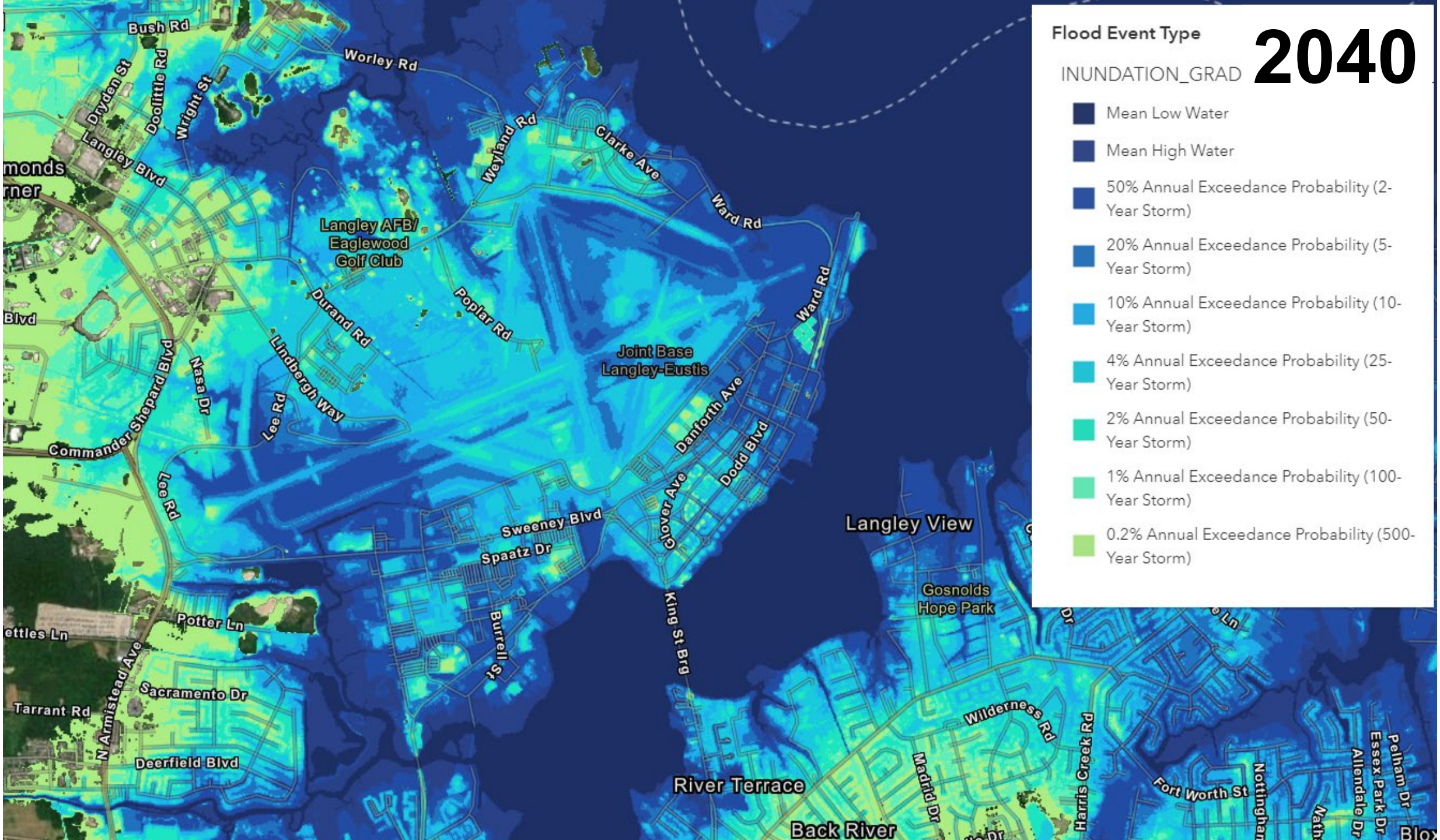

Flood Event Type
INUNDATION_GRAD
2020
Mean Low Water
Mean High Water
50% Annual Exceedance Probability (2-Year Storm)
20% Annual Exceedance Probability (5-Year Storm)
10% Annual Exceedance Probability (10-Year Storm)
4% Annual Exceedance Probability (25-Year Storm)
2% Annual Exceedance Probability (50-Year Storm)
1% Annual Exceedance Probability (100-Year Storm)
0.2% Annual Exceedance Probability (500-Year Storm)
Bush Rd
Worley Rd
Dryden St
Doolittle Rd
Wright St
Langley Blvd
Weyland Rd
Clarke Ave
Ward Rd
Langley AFB/ Eaglewood Golf Club
Durand Rd
Poplar Rd
Lindbergh Way
Joint Base Langley-Eustis
Nasa Dr
Lee Rd
Commander Shepard Blvd
Danforth Ave
Dodd Blvd
Clover Ave
Sweeney Blvd
Spaatz Dr
Burrell St
King St Brg
Langley View
Gosnolds Hope Park
Potter Ln
N Armistead Ave
Sacramento Dr
Tarrant Rd
Deerfield Blvd
Wilderness Rd
Harris Creek Rd
Fort Worth St
River Terrace
Back River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Mean Low Water
Mean High Water
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20% Annual Exceedance Probability (5-Year Storm)
10% Annual Exceedance Probability (10-Year Storm)
4% Annual Exceedance Probability (25-Year Storm)
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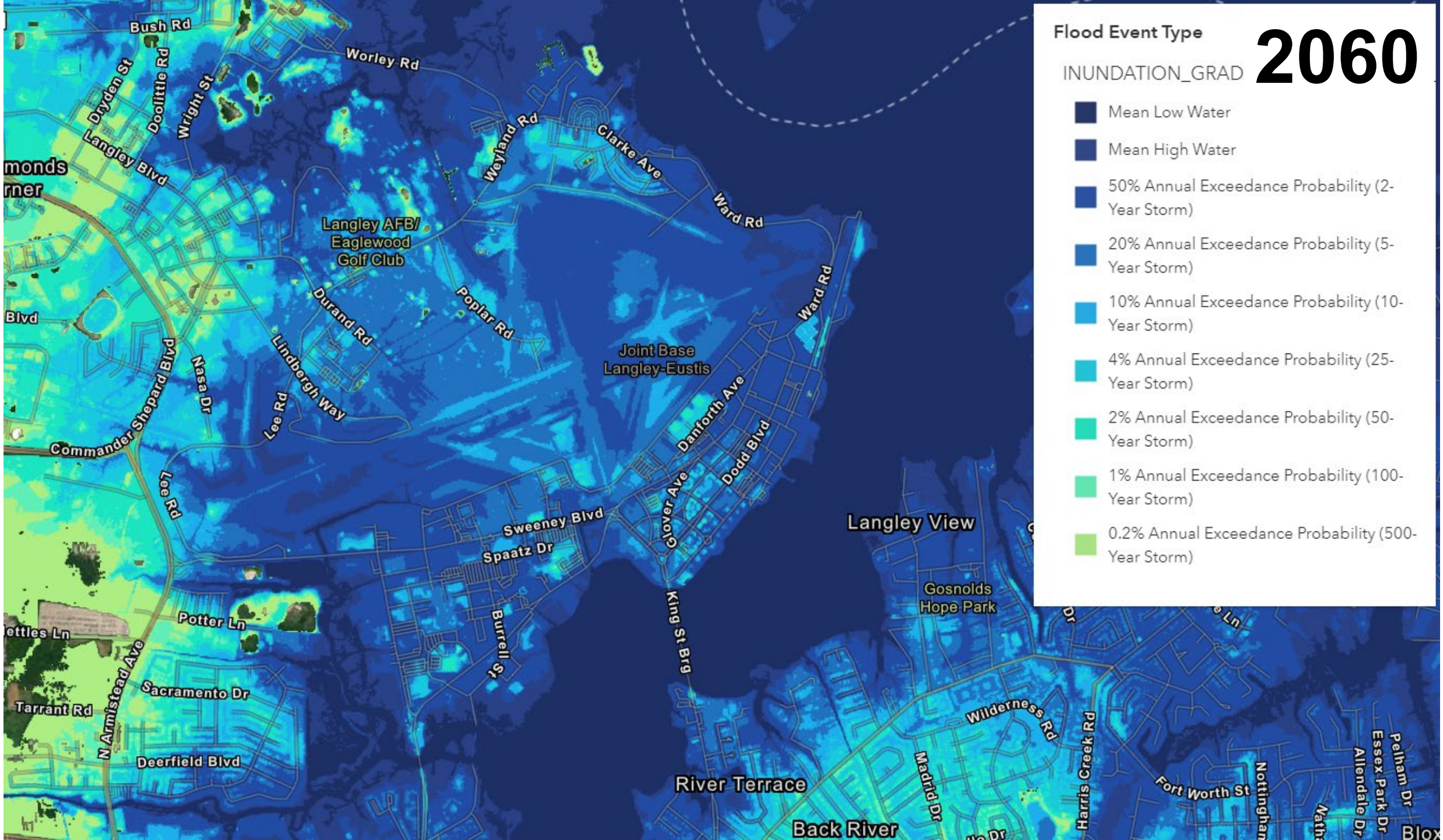
Allendale Dr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INUNDATION_GRAD
2060
Mean Low Water
Mean High Water
50% Annual Exceedance Probability (2-Year Storm)
20% Annual Exceedance Probability (5-Year Storm)
10% Annual Exceedance Probability (10-Year Storm)
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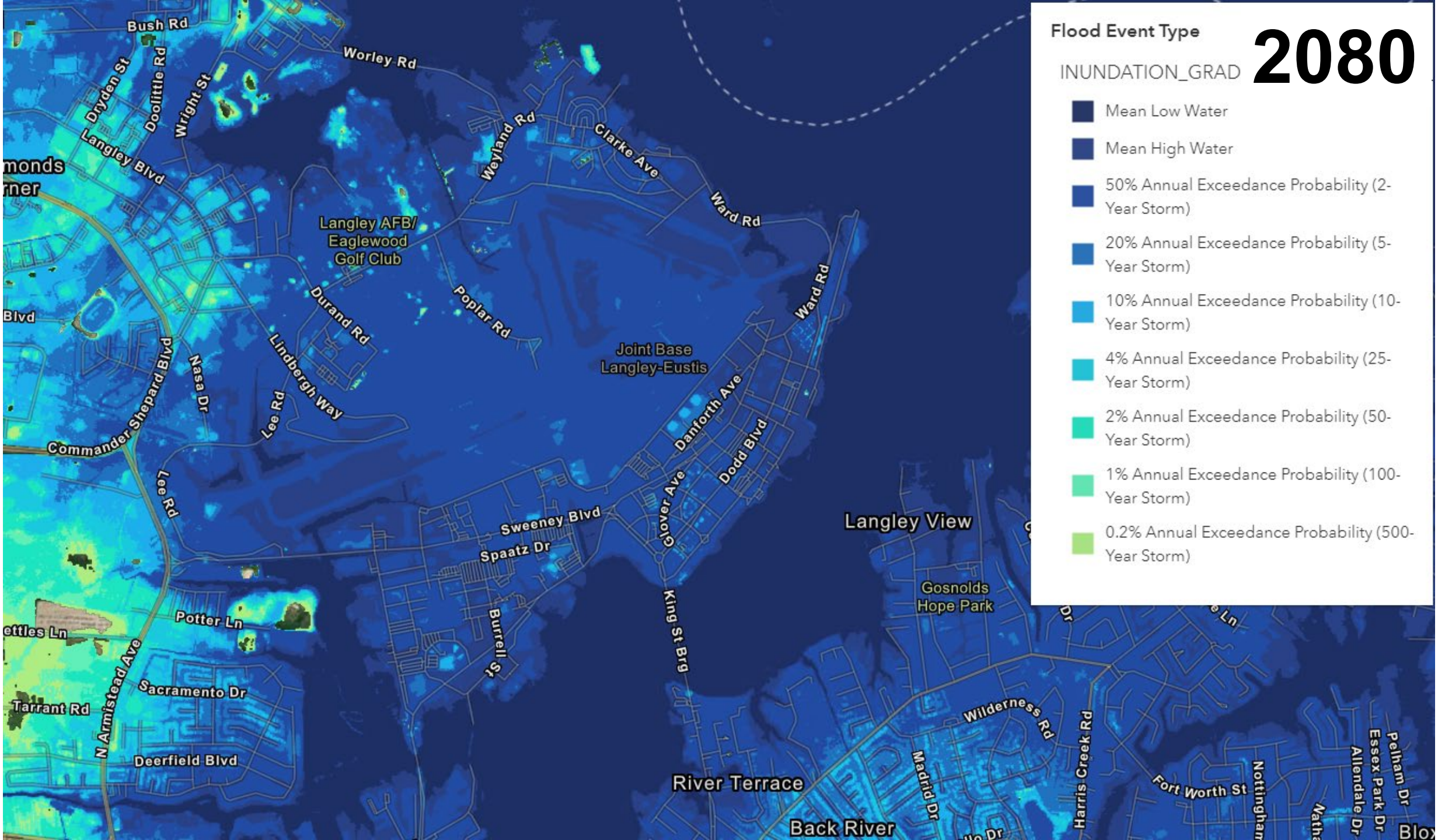
Flood Event Type
INUNDATION_GRAD
2080
Mean Low Water
Mean High Water
50% Annual Exceedance Probability (2-Year Storm)
20% Annual Exceedance Probability (5-Year Storm)
10% Annual Exceedance Probability (10-Year Storm)
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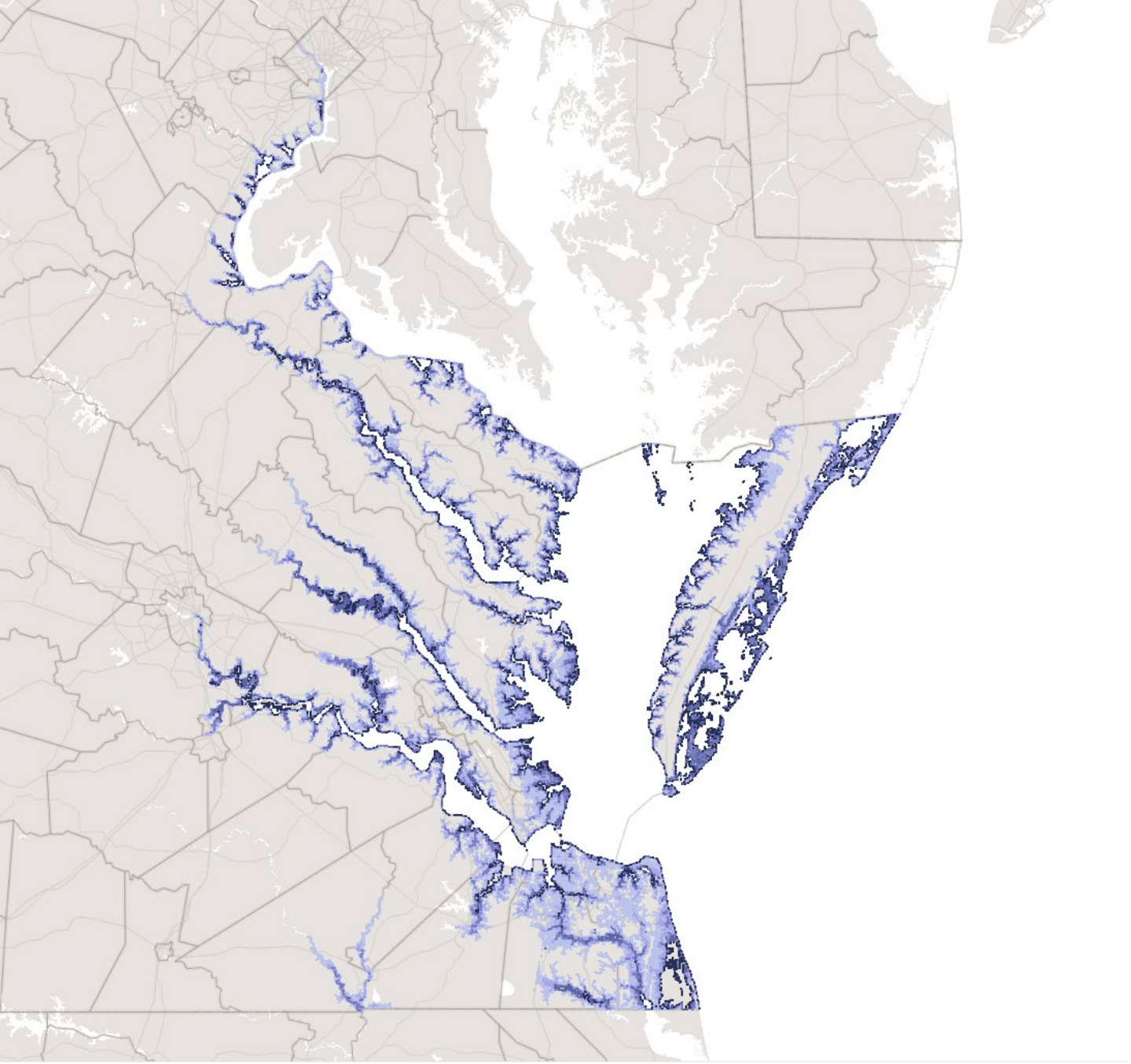
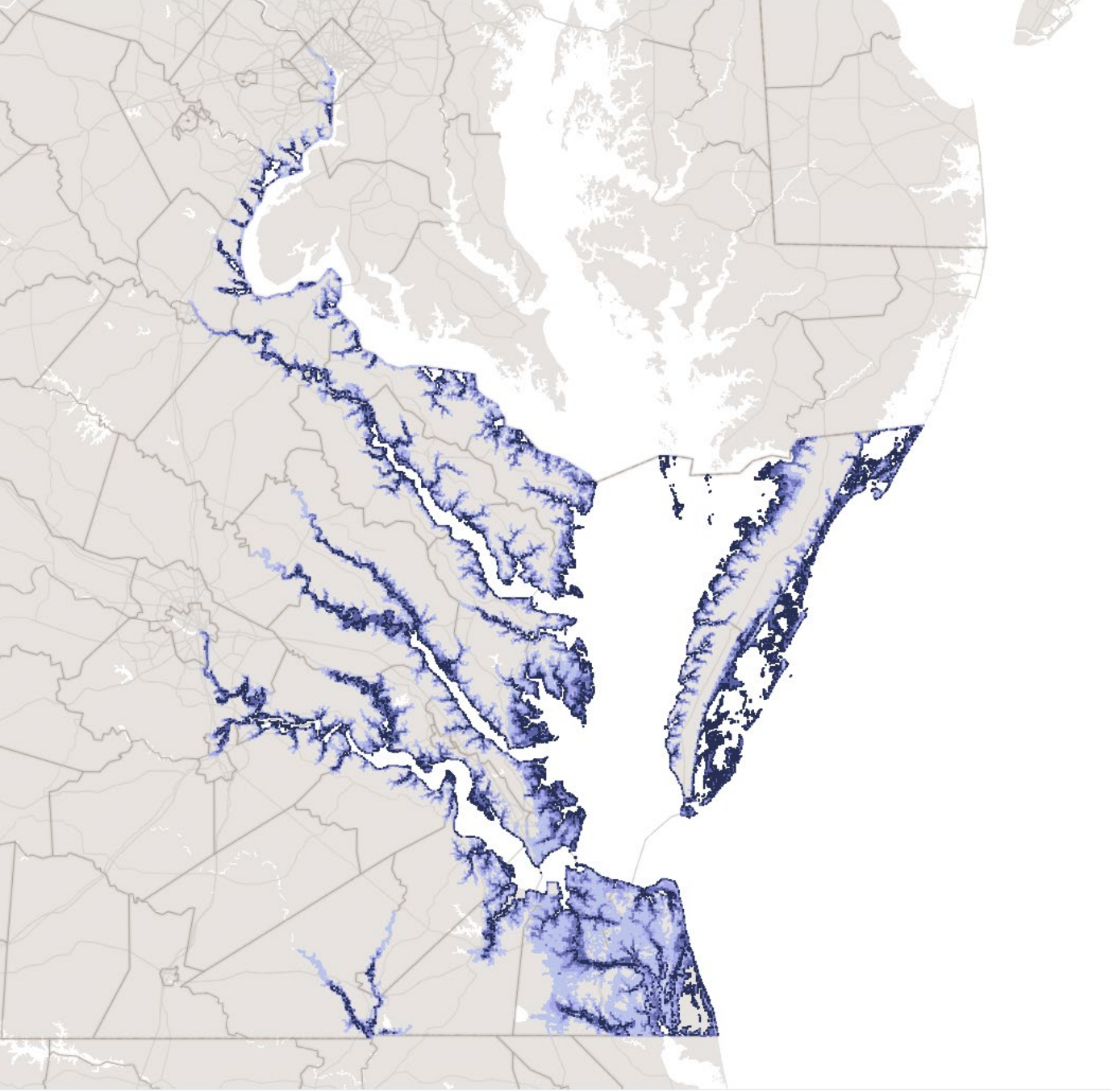
2020



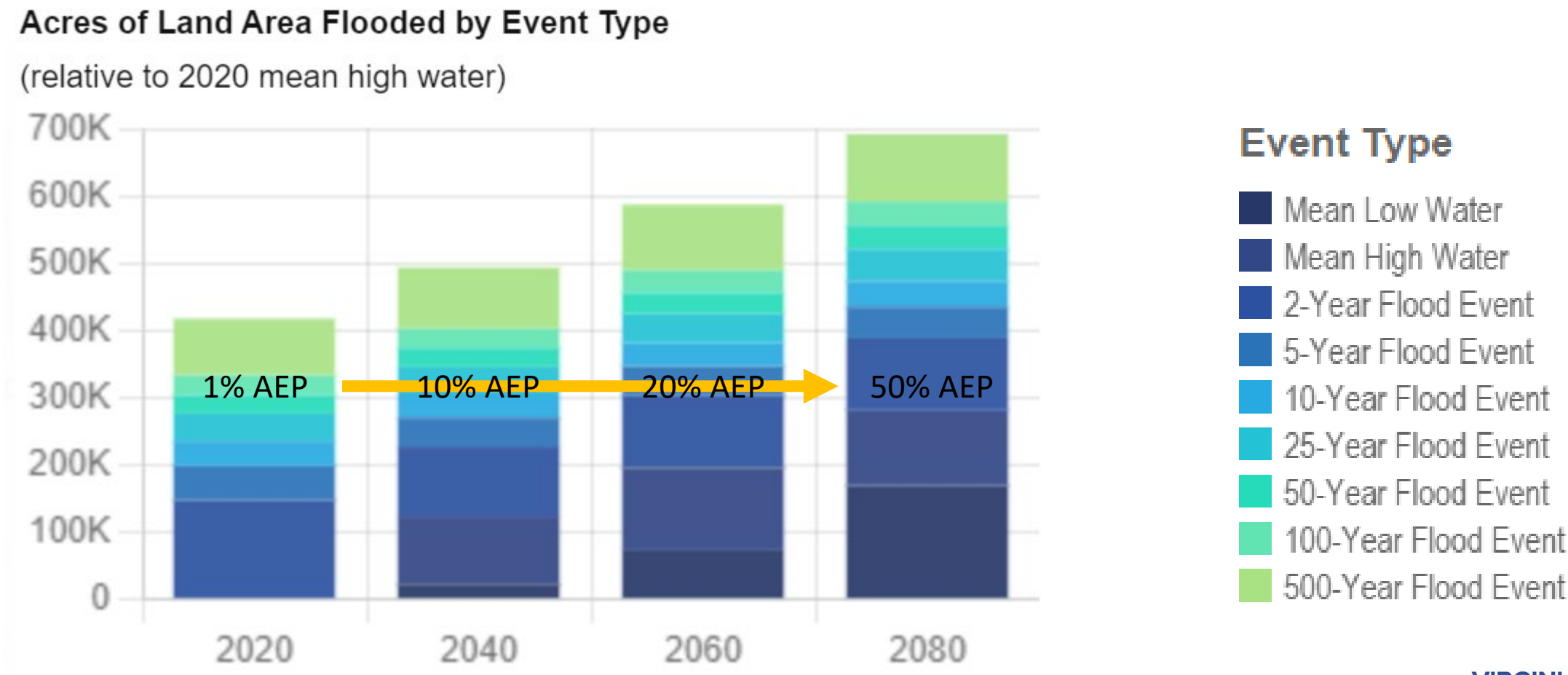
Coastal Flood Hazard Exposure:
Annualized Acres Flooded

2080



Coastal Flood Hazard Exposure:
Annualized Acres Flooded

Changes in Flood Hazard



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Simplification of Hazard Events for Communication

	Event type	Annual Exceedance Probability	Chance of flooding in…		
			5 years	10 years	30 years
Daily tidal flooding	Daily high tide	100%	Certain, flooded daily		
Chronic coastal flooding	Coastal storm, gale	20%	70%	90%	100%
Moderate coastal storm	Tropical storms, nor'easters	4%	19%	30%	71%
Major coastal storm	Strong Nor'easter, Cat 2 hurricane	1%	5%	10%	26%
Extreme coastal storm	Strong Cat 2 or higher Hurricane	0.2%	1%	2%	6%

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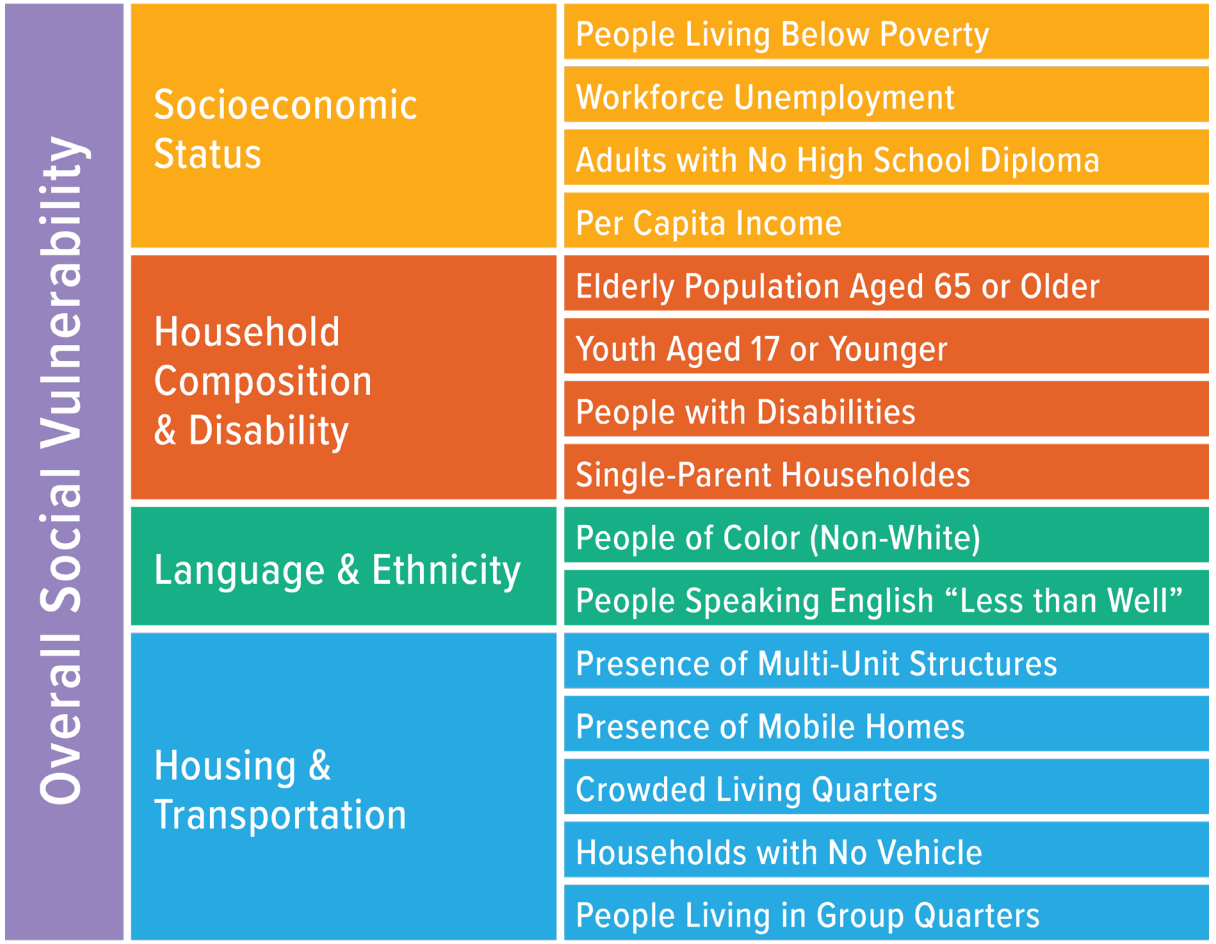
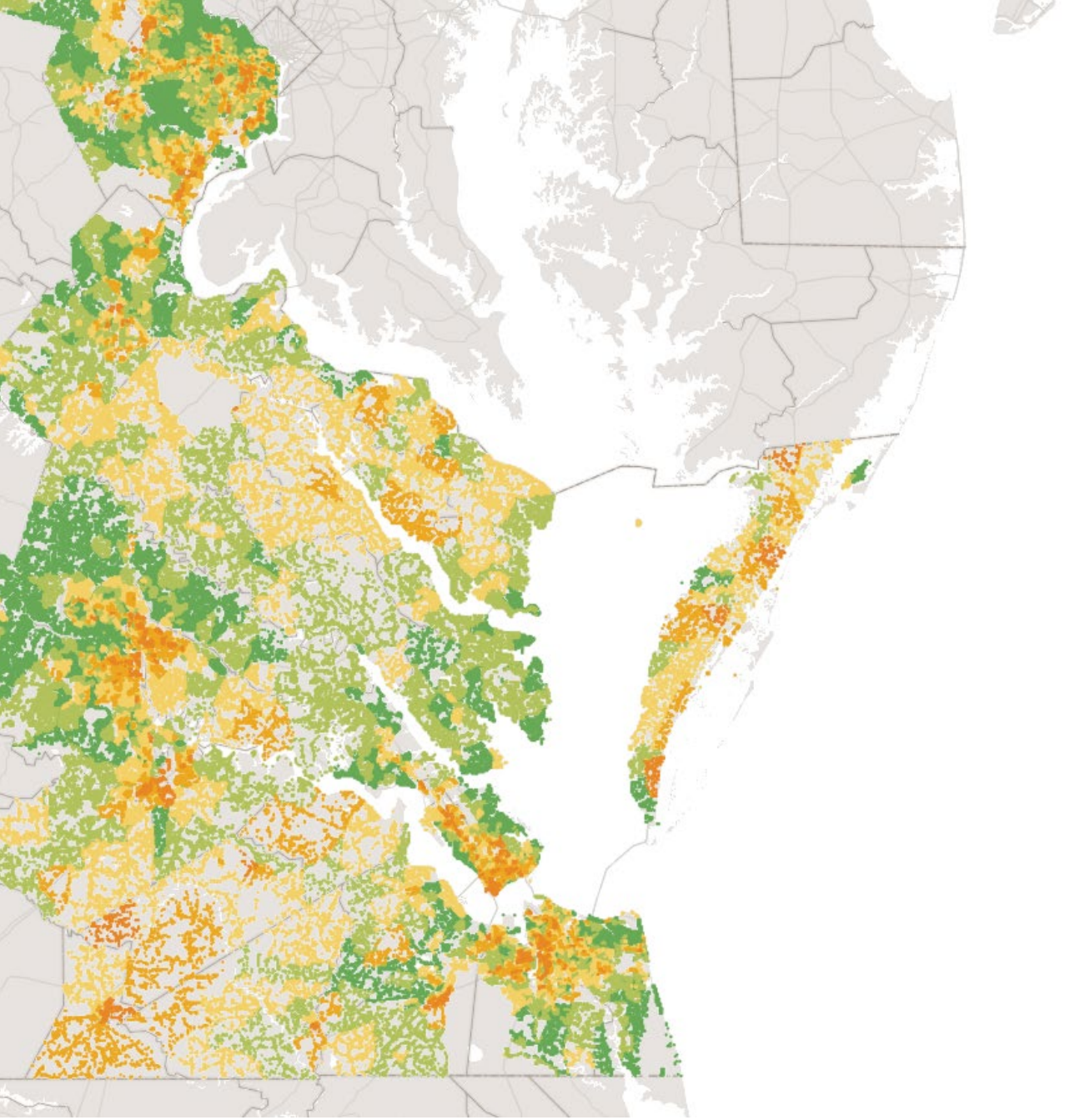
Social Vulnerability

Social Vulnerability Metrics



Source: Adapted from CDC Social Vulnerability Index



Social Vulnerability

Demographic factors that decrease adaptive capacity and increase susceptibility to harm

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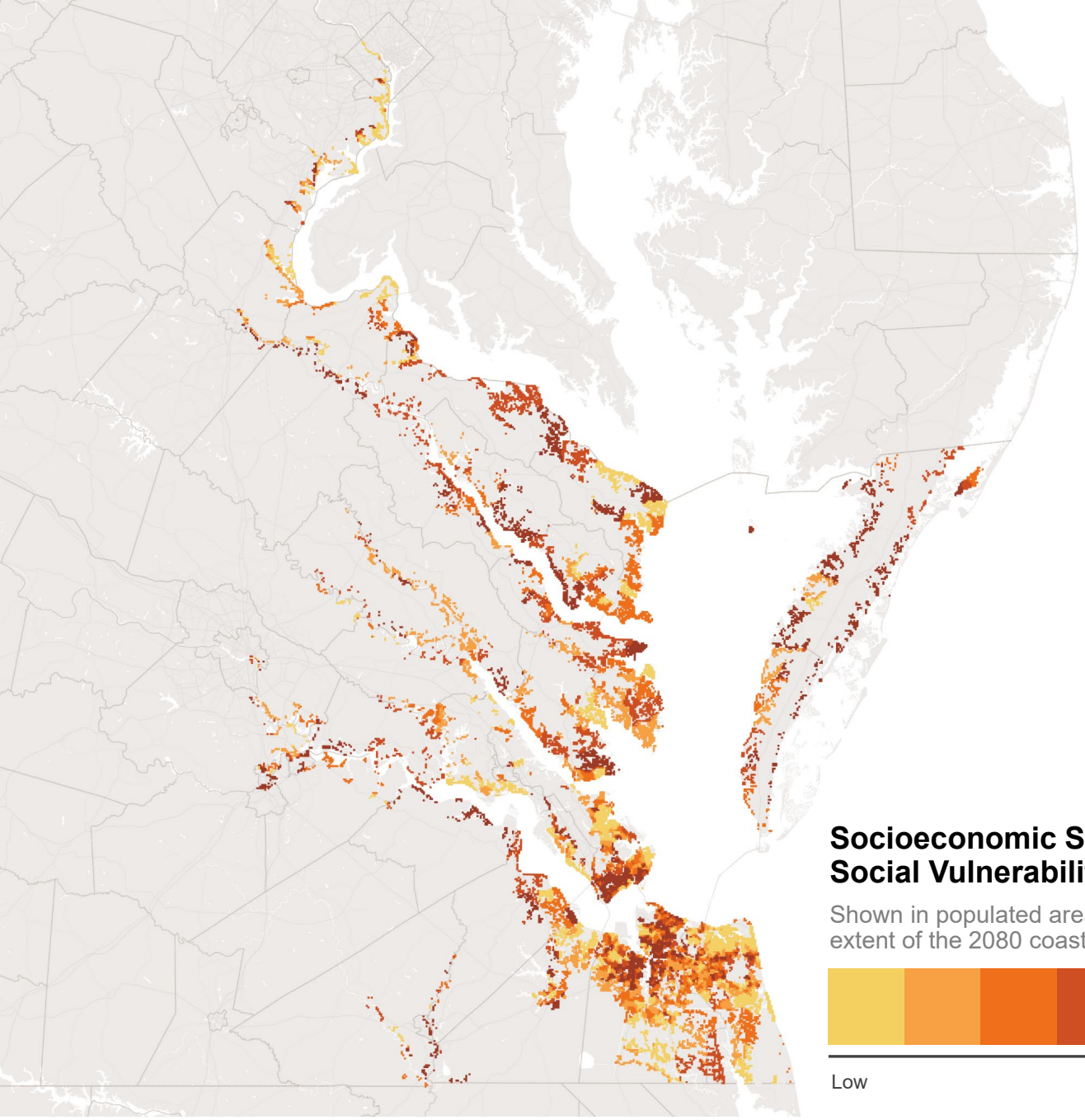
Social Vulnerability

Socioeconomic Status

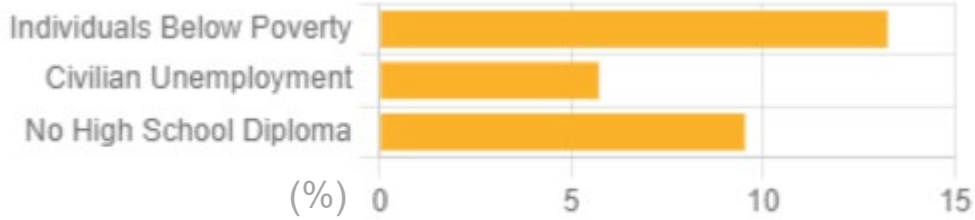


Socioeconomic Status
Social Vulnerability

Shown in populated areas, within the extent of the 2080 coastal floodplain

Low — High

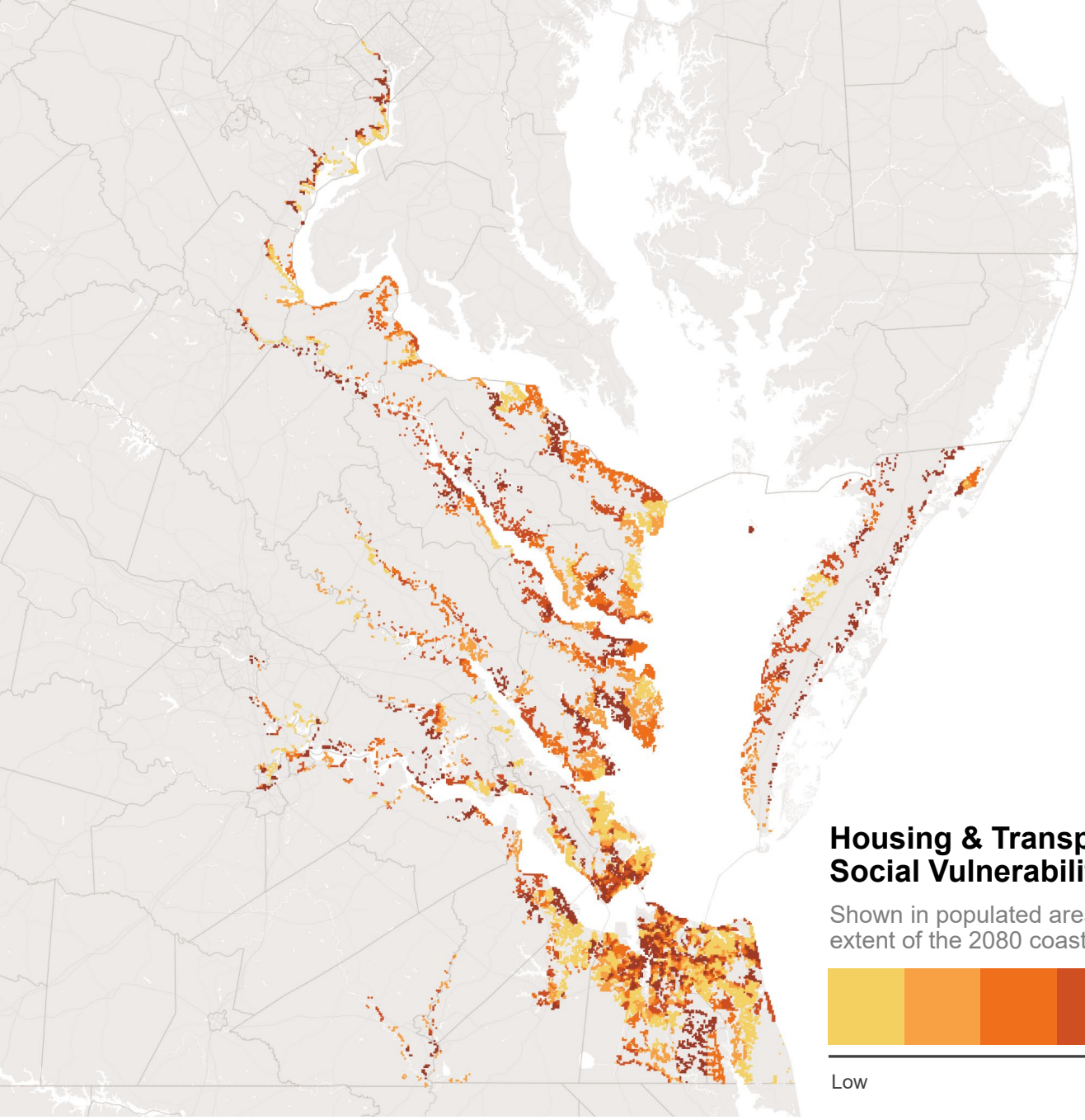
Overall Socioeconomic Status Statistics
in 2080 flood-exposed areas



Per Capita Income: **$32,580.009**

Social Vulnerability

Housing & Transportation



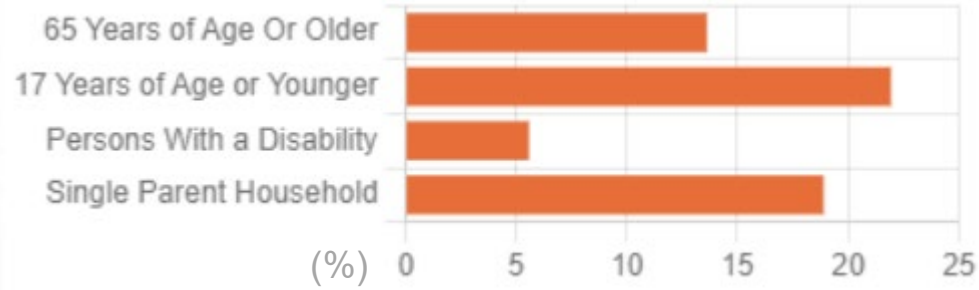
Housing & Transportation Social Vulnerability

Shown in populated areas, within the extent of the 2080 coastal floodplain

Low — High

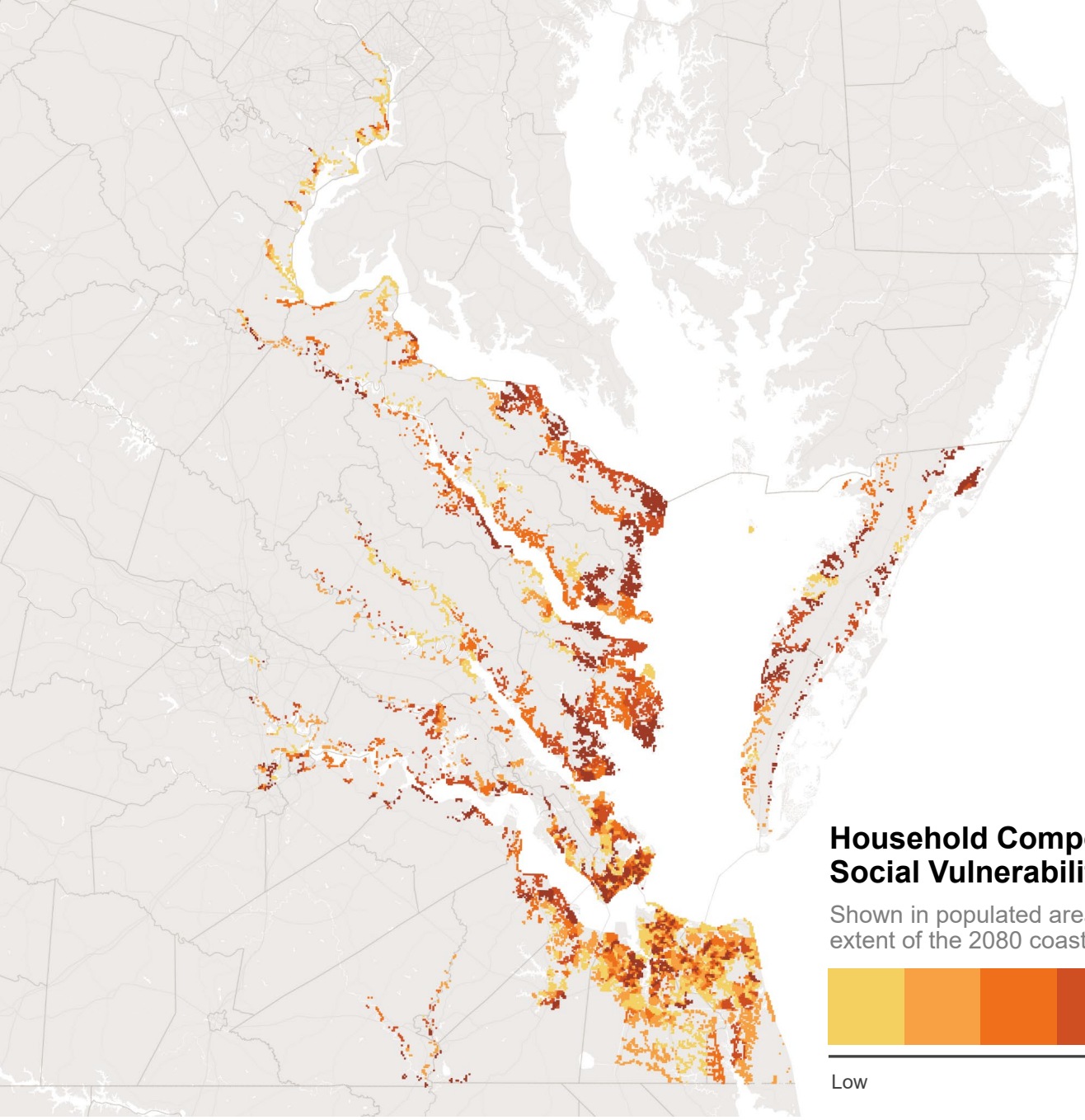
Overall Housing & Transportation Statistics

in 2080 flood-exposed areas



Social Vulnerability

Household Composition



Household Composition Social Vulnerability

Shown in populated areas, within the extent of the 2080 coastal floodplain

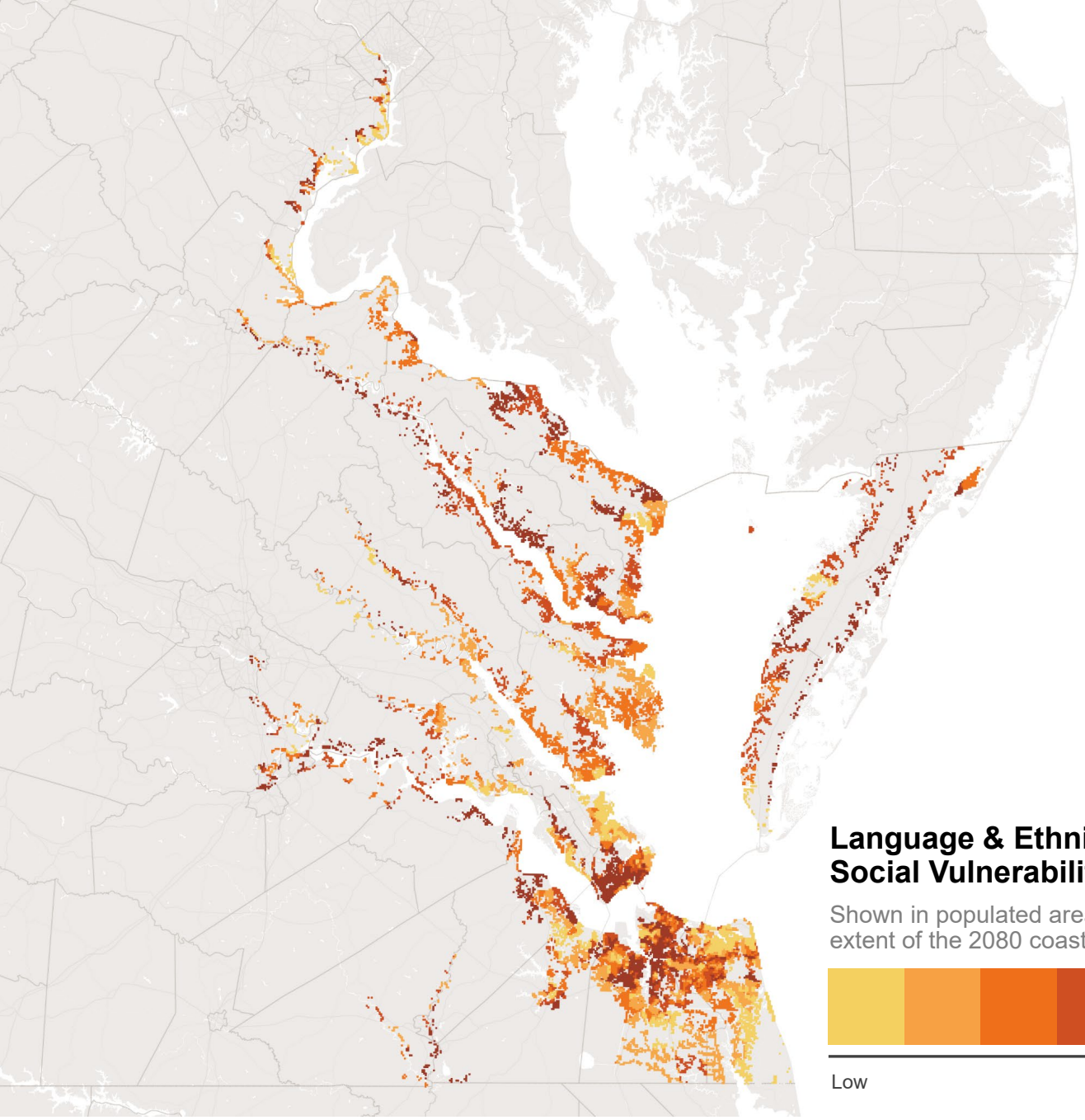
Low — High

Overall Household Composition Statistics

in 2080 flood-exposed areas

Social Vulnerability

Language & Ethnicity



Language & Ethnicity Social Vulnerability

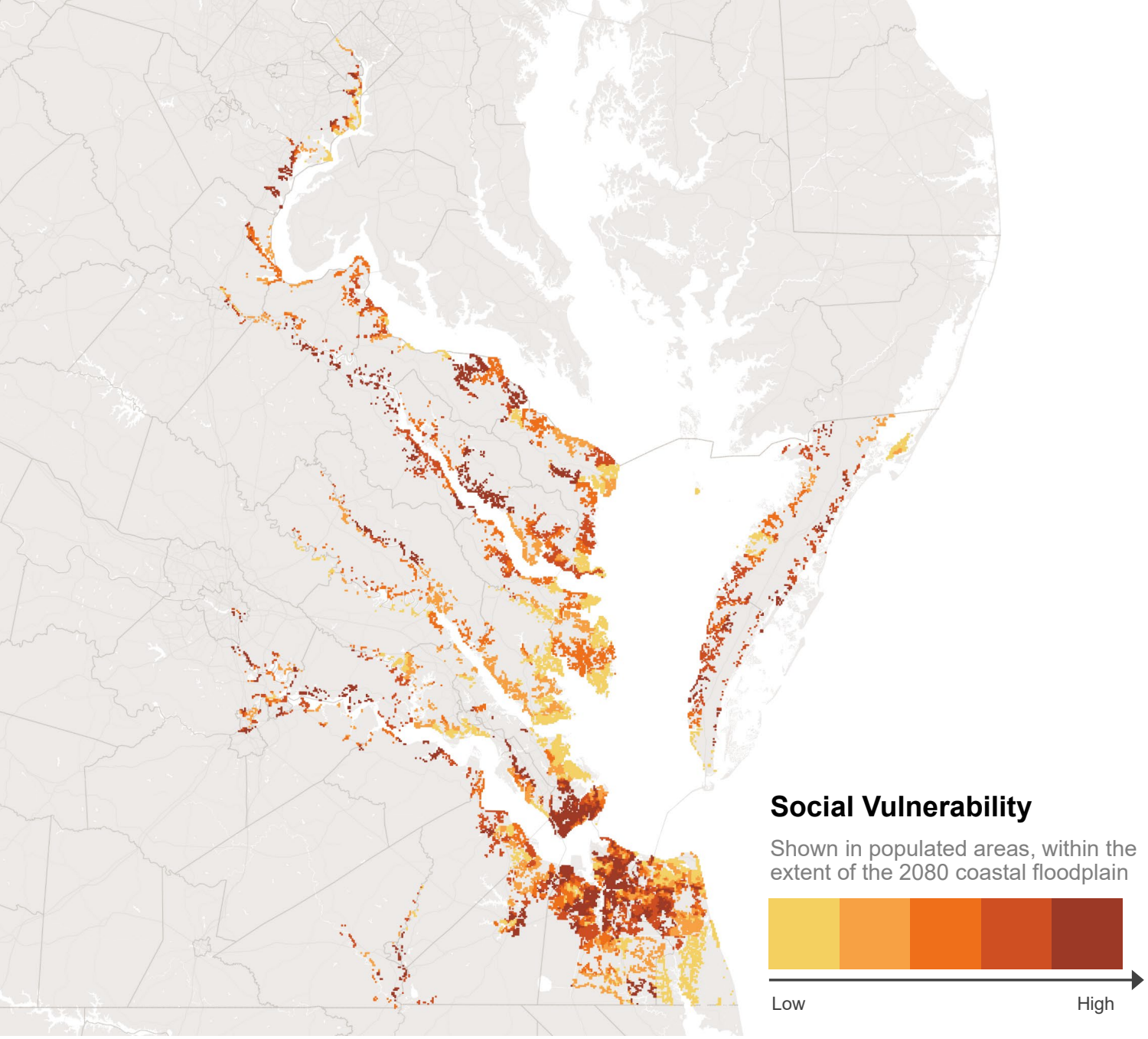
Shown in populated areas, within the extent of the 2080 coastal floodplain

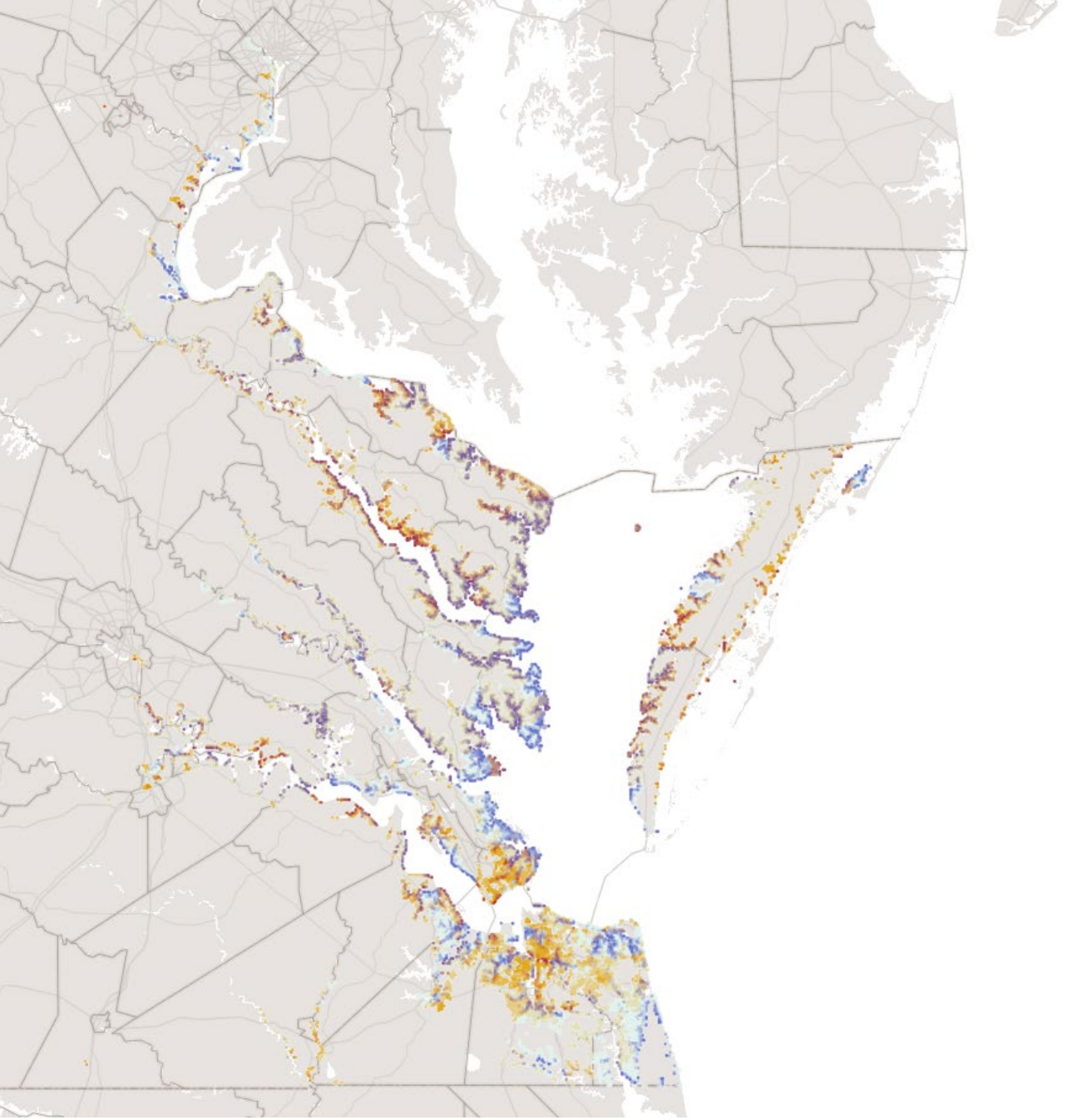
Overall Language & Ethnicity Statistics

in 2080 flood-exposed areas

Social Vulnerability

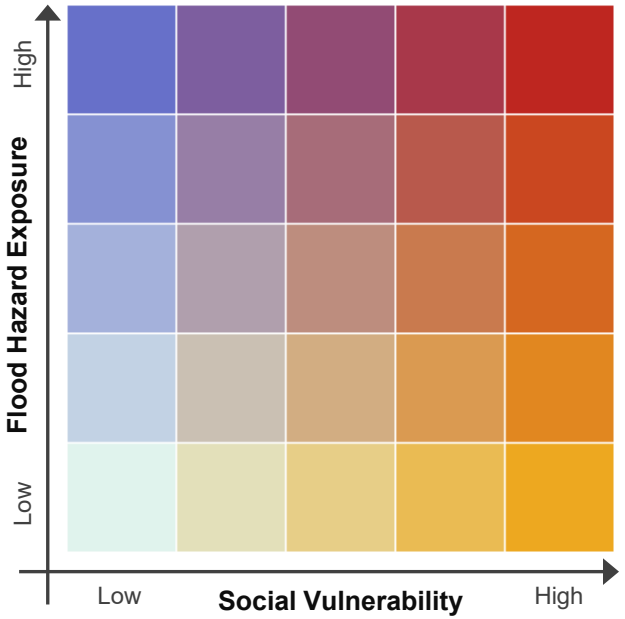
Total Score





Community Hazard Exposure & Social Vulnerability

2020



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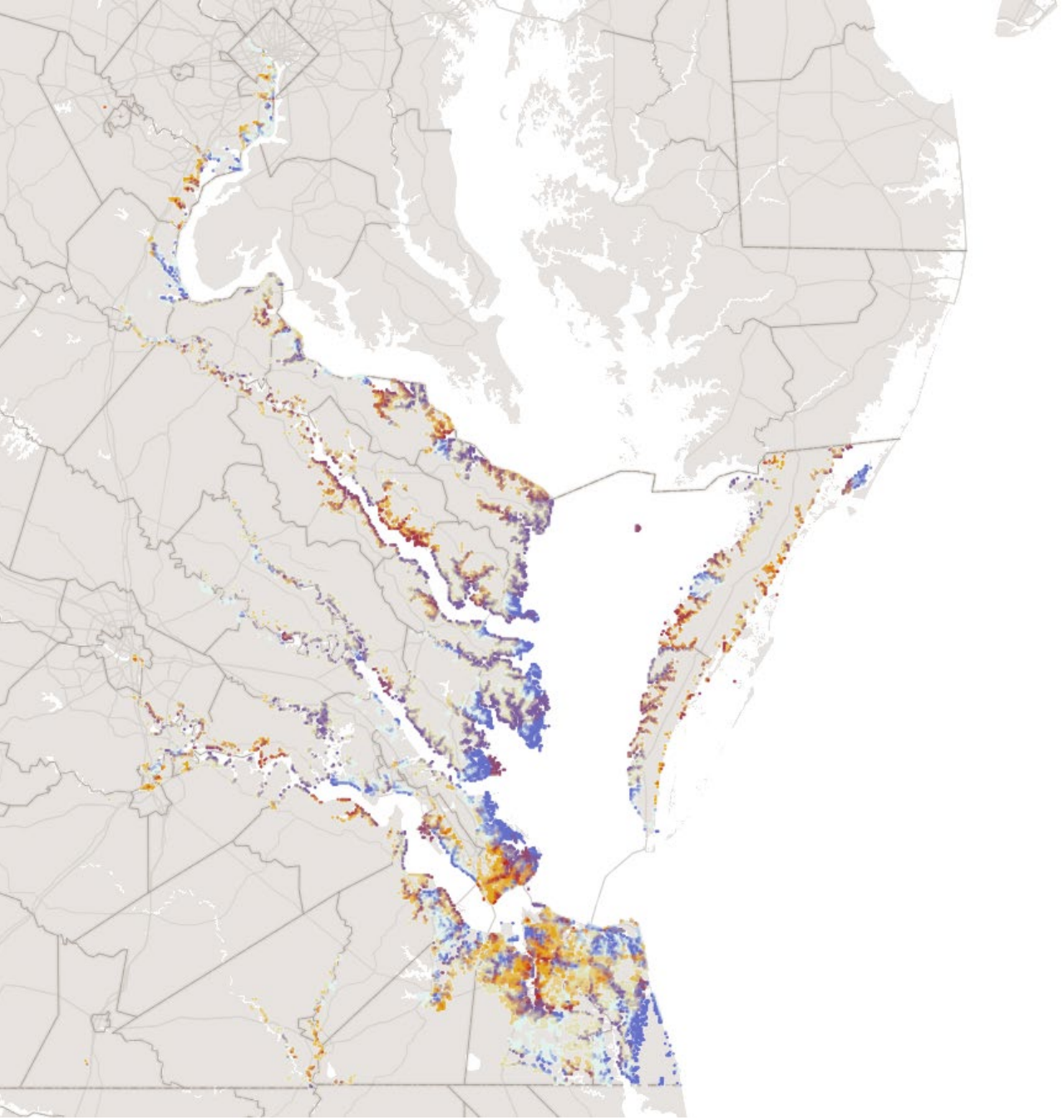
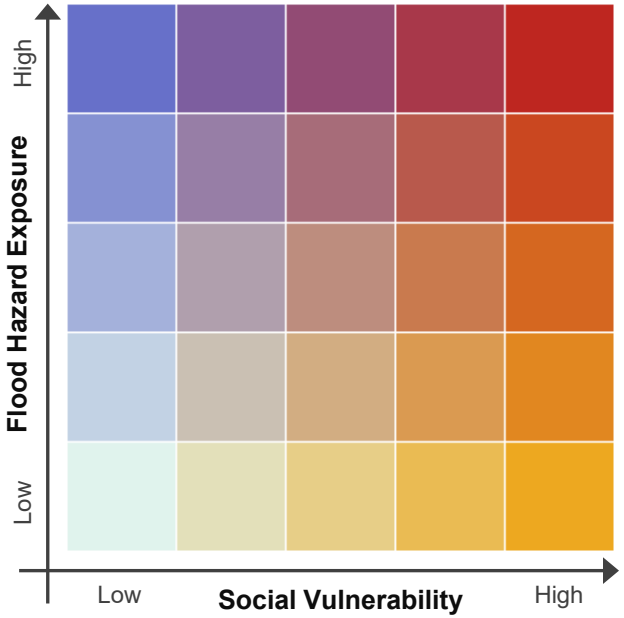


Community Hazard Exposure & Social Vulnerability

2080



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Impact Assessment - Asset Types

Community Resources

- Residential Populations
- Residential Structures
- Commercial & Public Structures
- Federal/State Tribal Lands

Critical Sectors

- Transportation
- Communications
- Critical Commercial & Manufacturing Facilities
- Military Installations
- Energy Infrastructure
- Food and Agriculture
- Health and EMS
- Government facilities
- Waste & wastewater systems

Natural Infrastructure

- Beaches and Dunes
- Tidal Marshes
- Non-Tidal Marshes
- Uplands
- Woodlands and Shrub-Scrub
- Submerged Aquatic Vegetation (SAV)
- Oyster Habitat
- Conservation Lands

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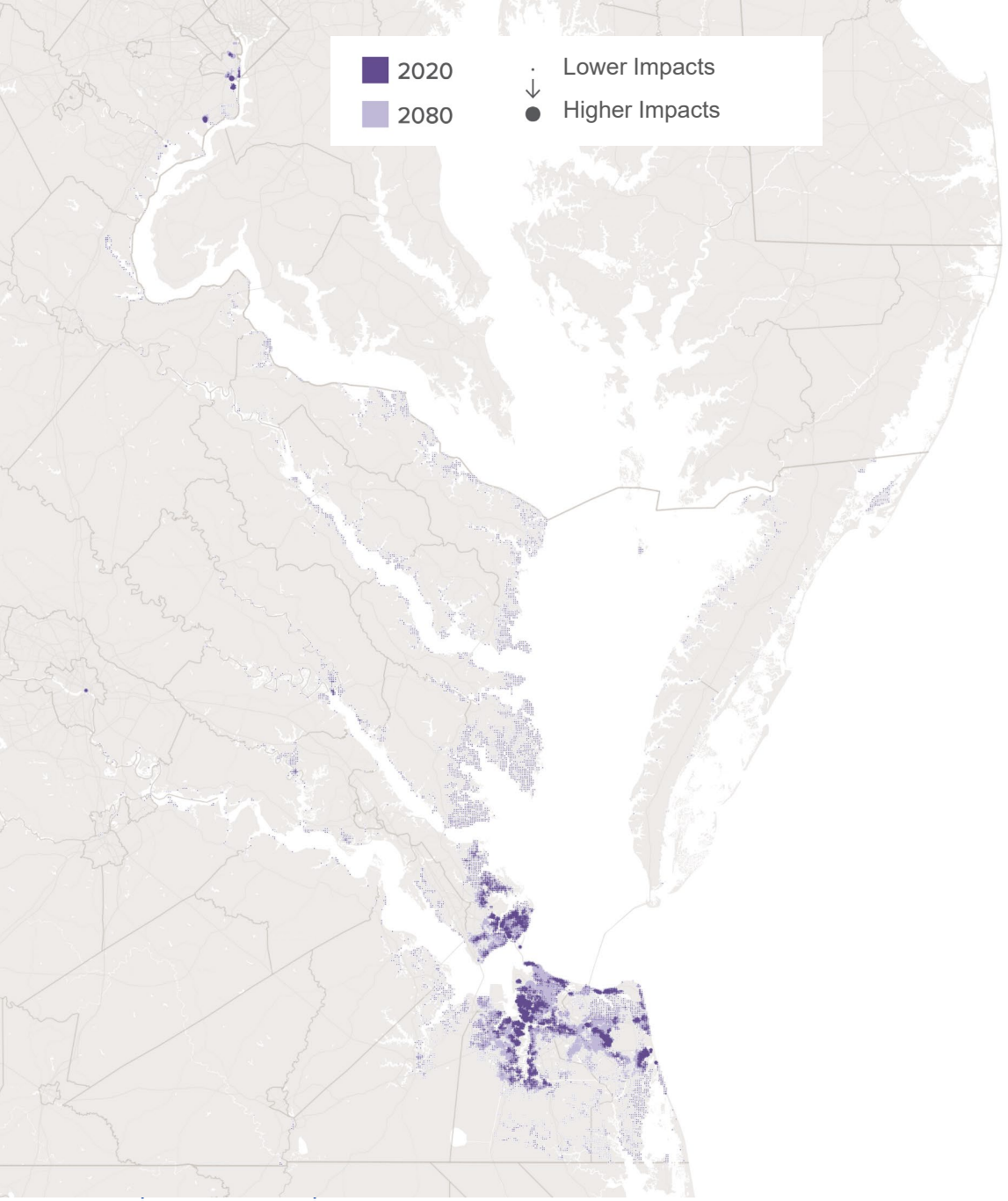
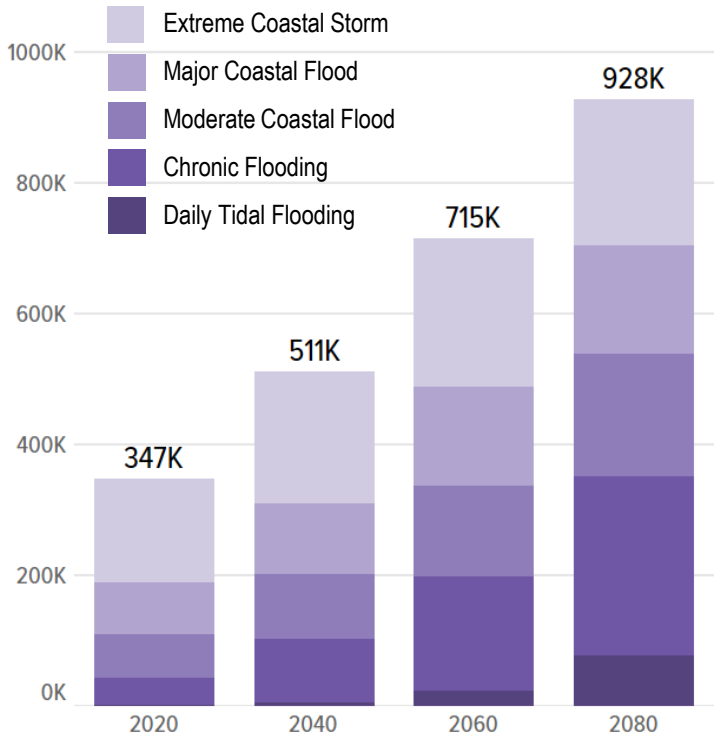
Community Resources

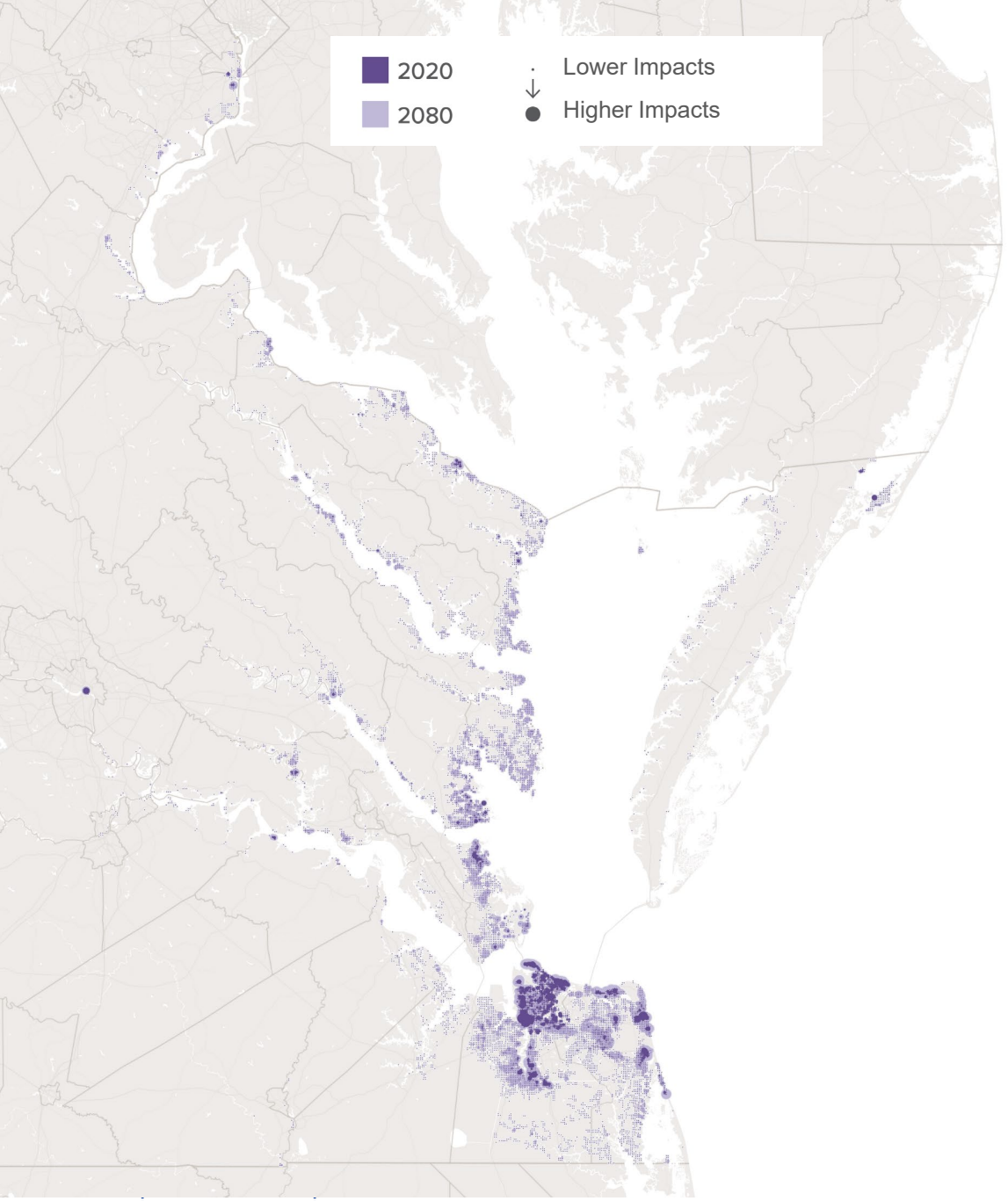


Impacts on

Residential Population

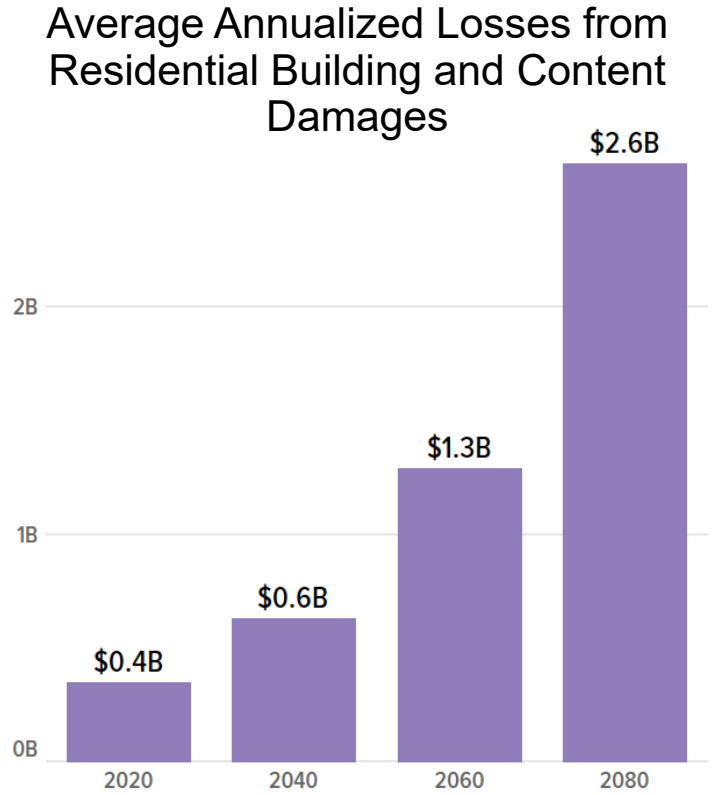
Number of Residents Exposed

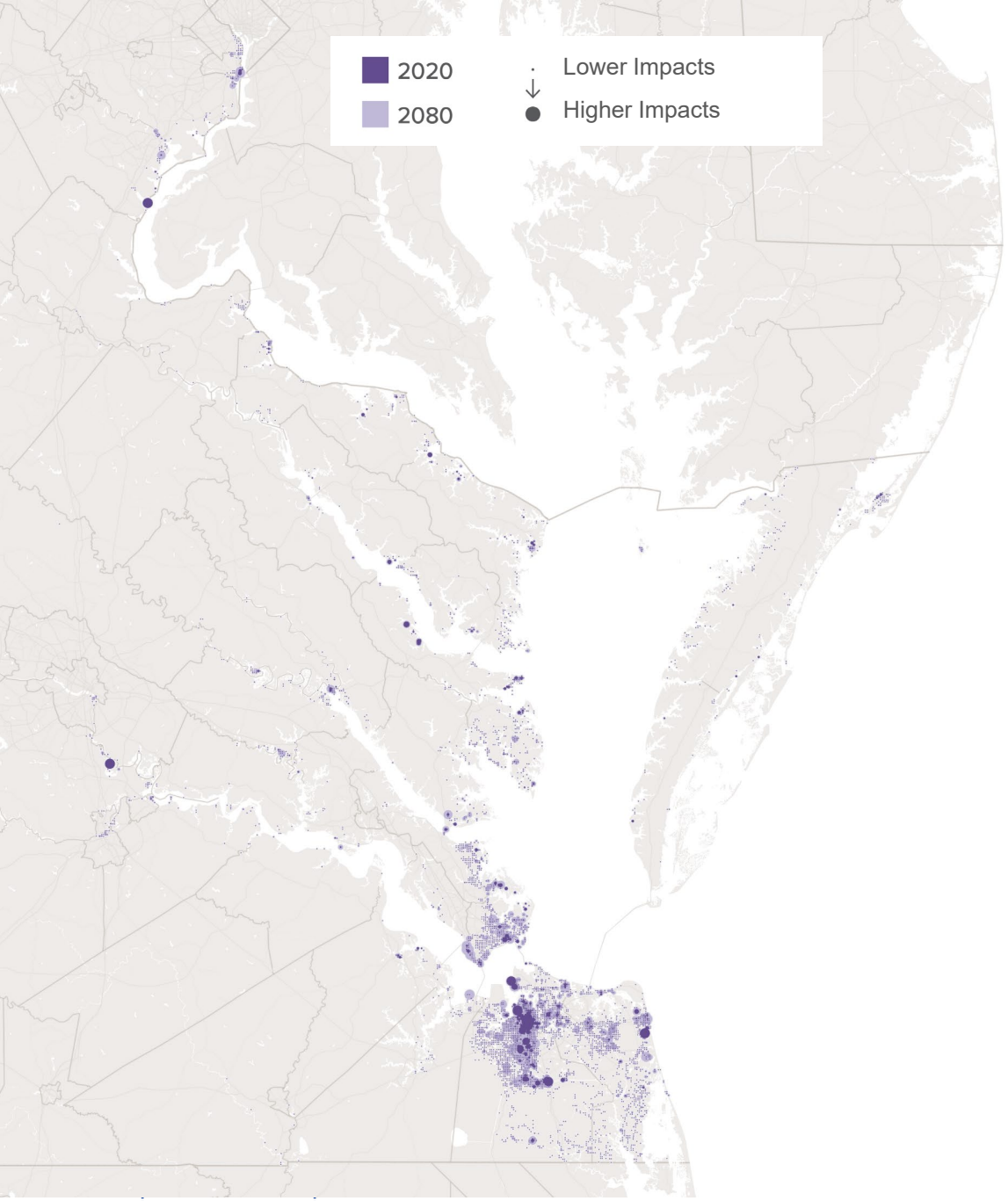




Impacts on

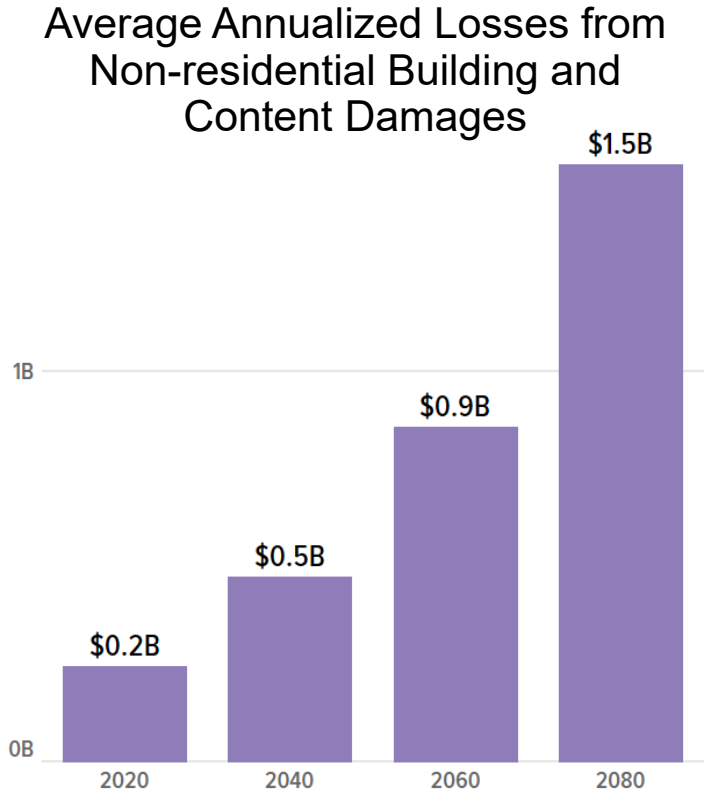
Residential Structures

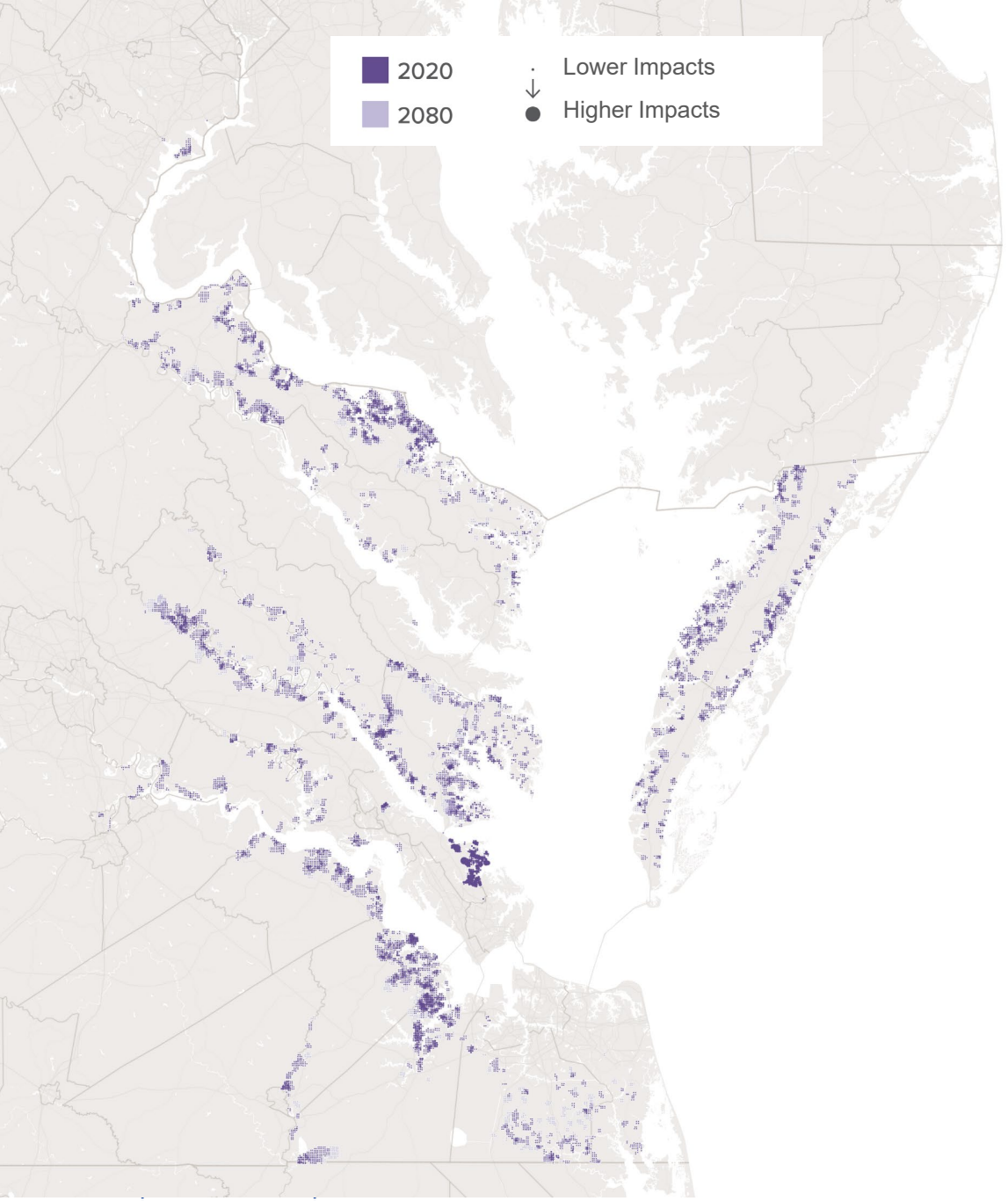




Impacts on

Commercial & Public Structures

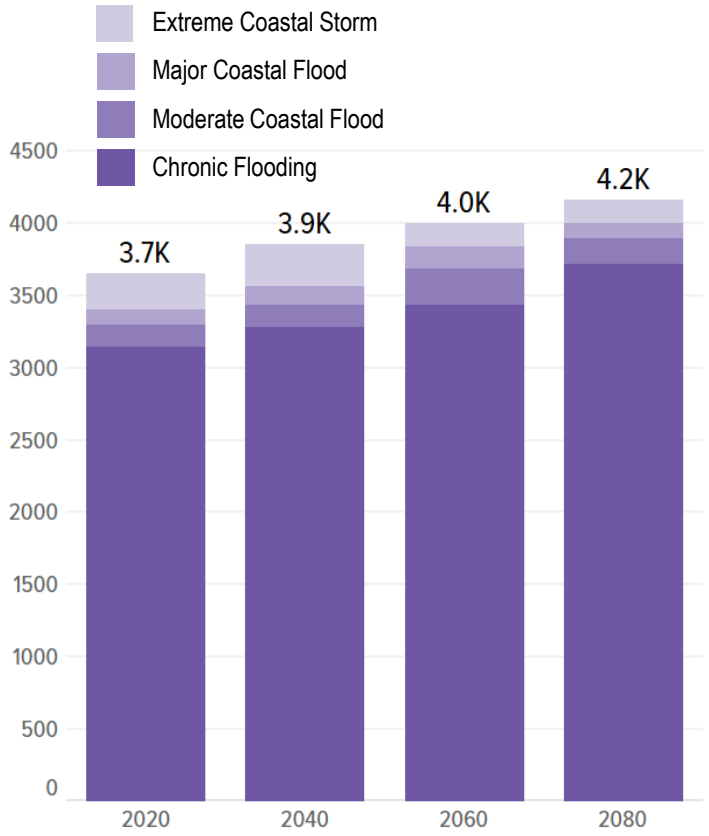




Impacts on

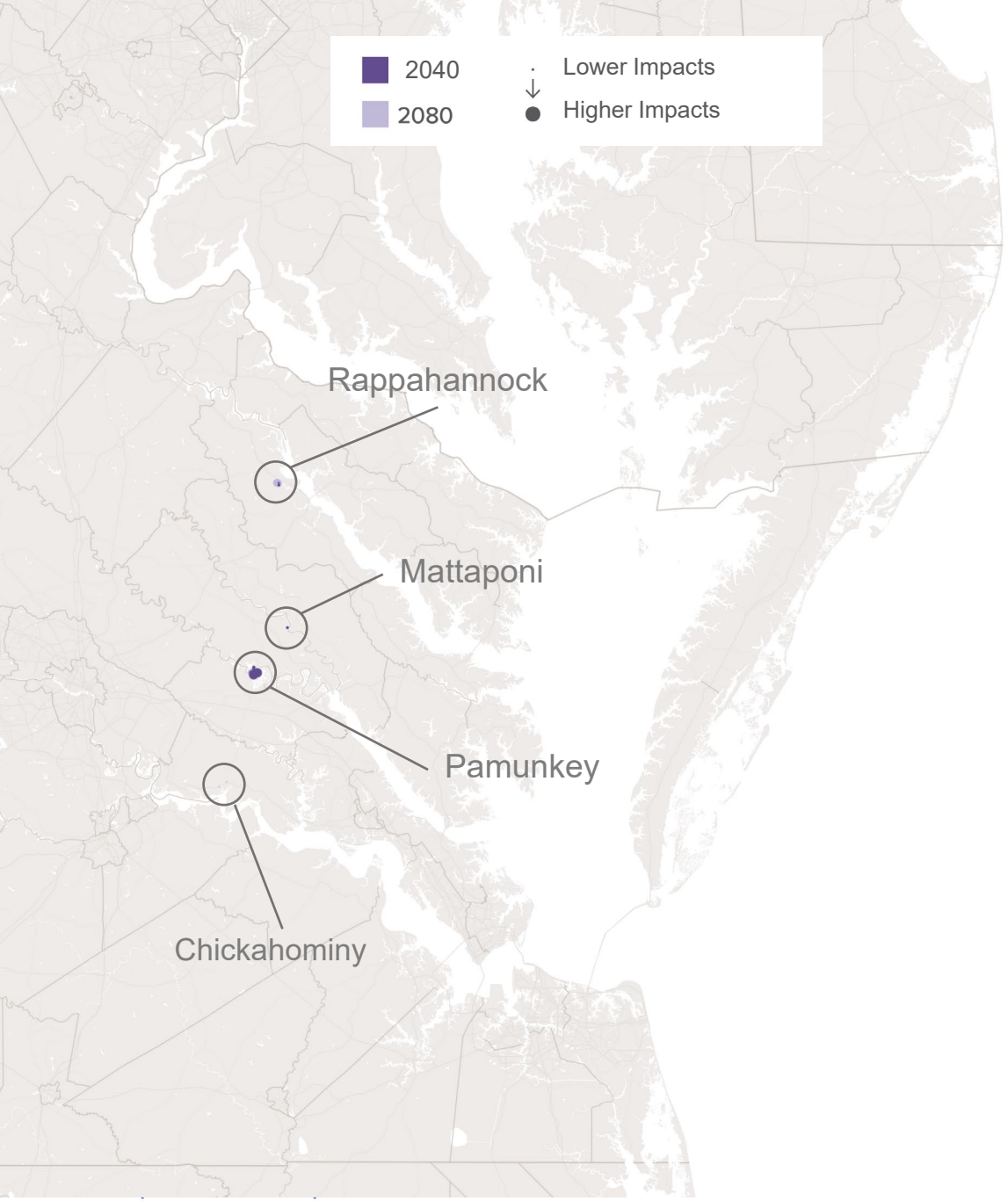
Agricultural Lands

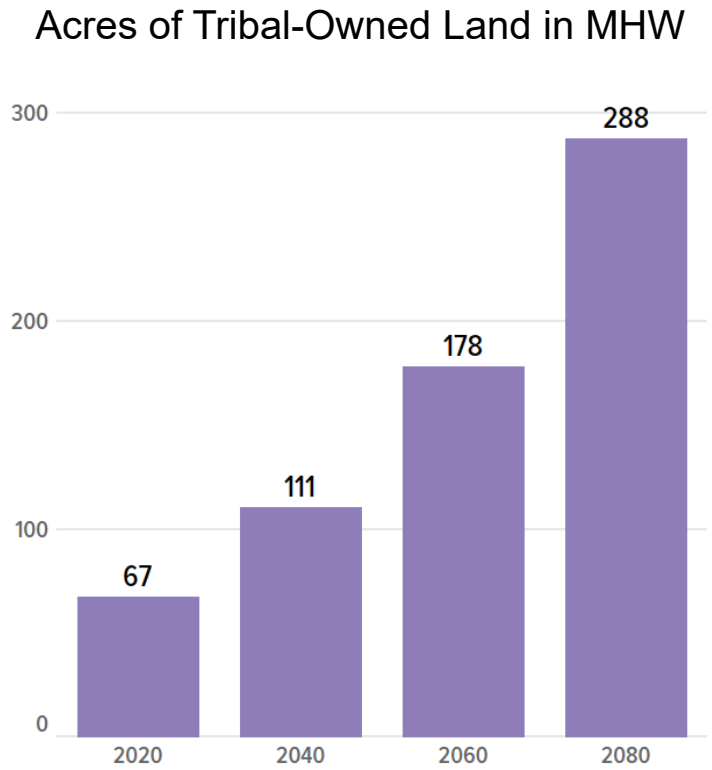
Agricultural Parcels Exposed



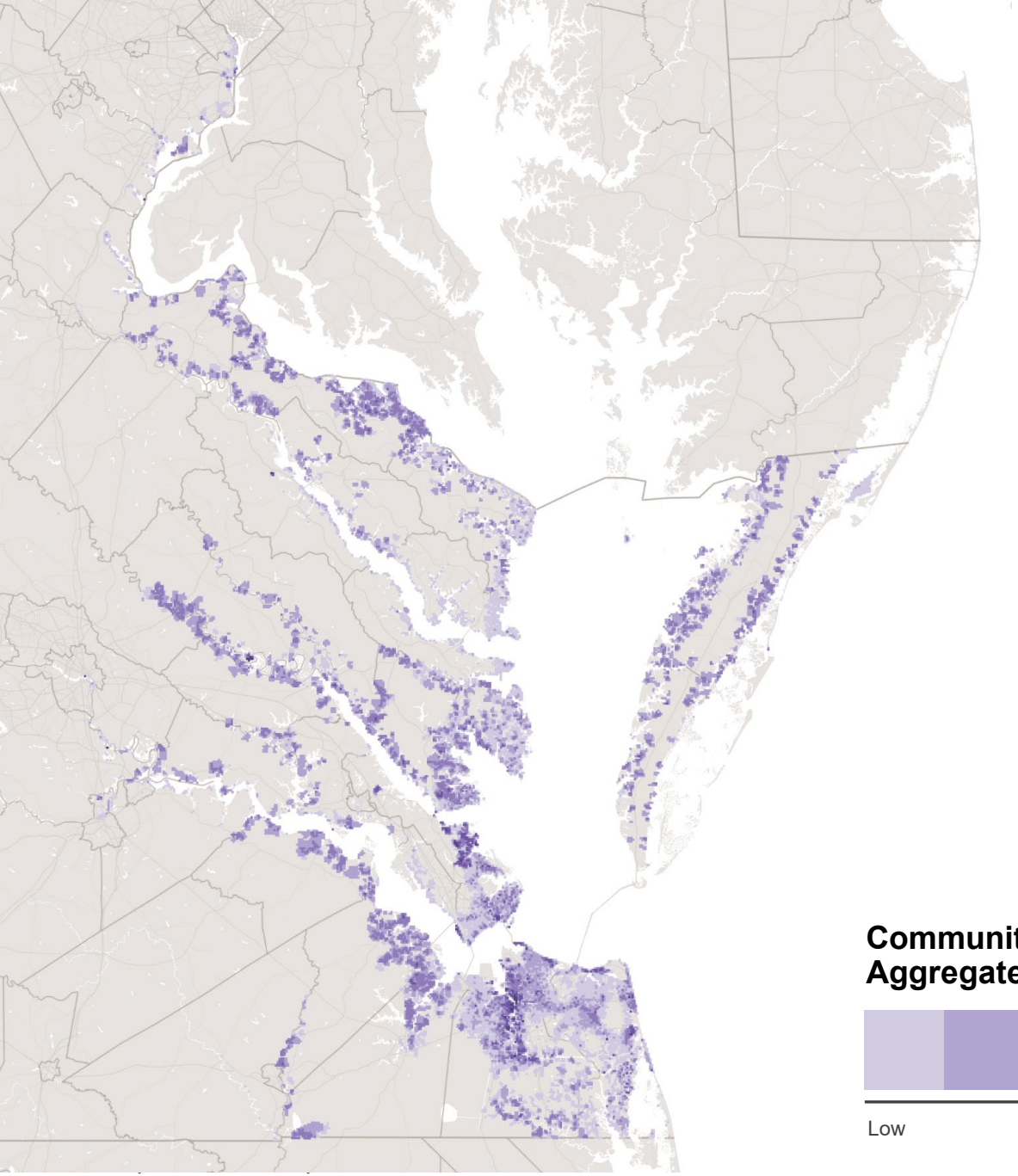
Impacts on

Tribal Lands





Impacts Across All **Community Resources**



Between now and 2080*…

- Population exposed to flooding during a major storm is estimated to increase by 270%
- Coastal flood damages to homes are estimated to increase by approximately 650%
- Coastal flood damages to public and commercial structures are estimated to increase by approximately 520%

*Estimate assumes changing coastal hazard but no change in population and development

Community Resources Aggregated Impact Levels

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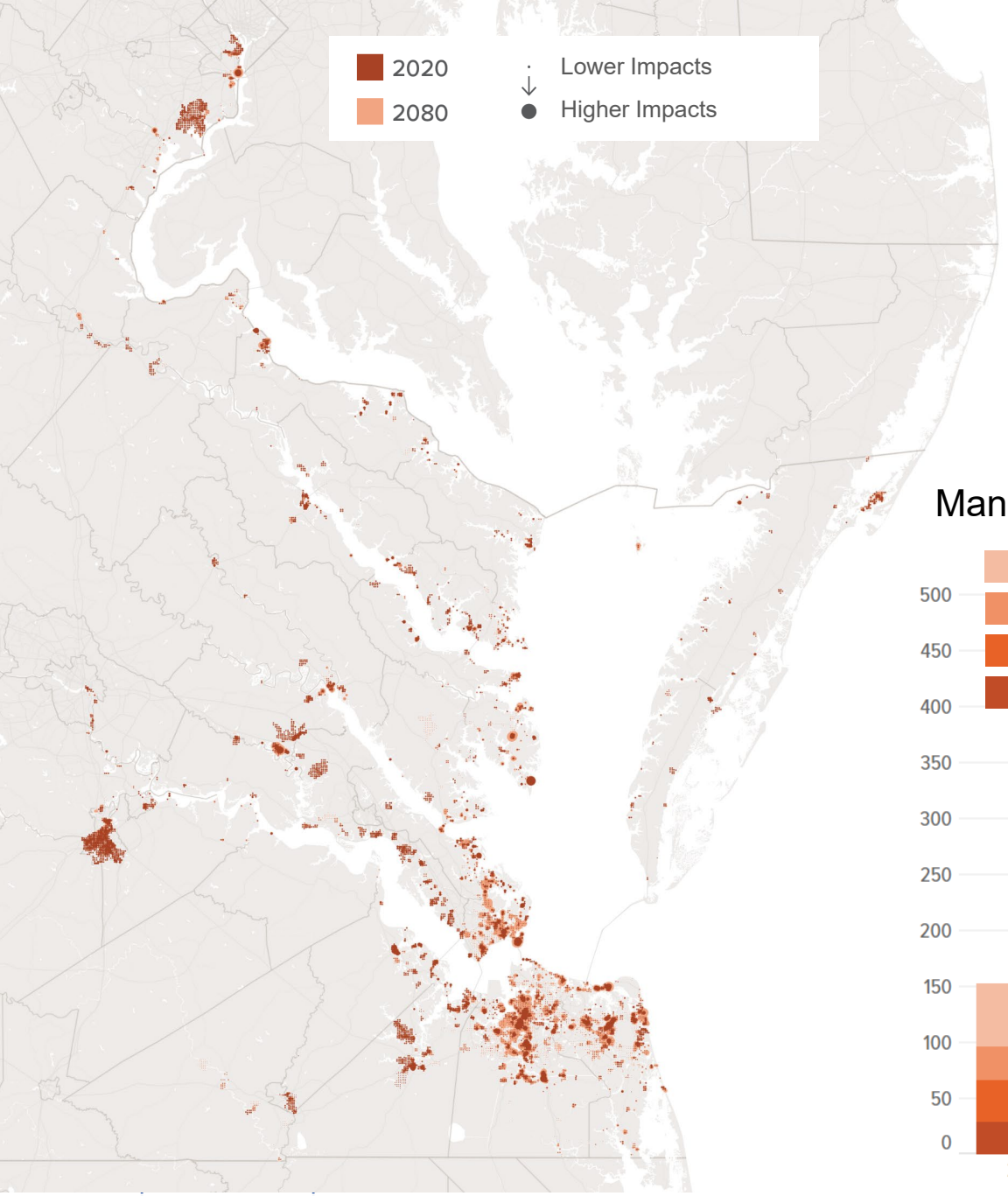
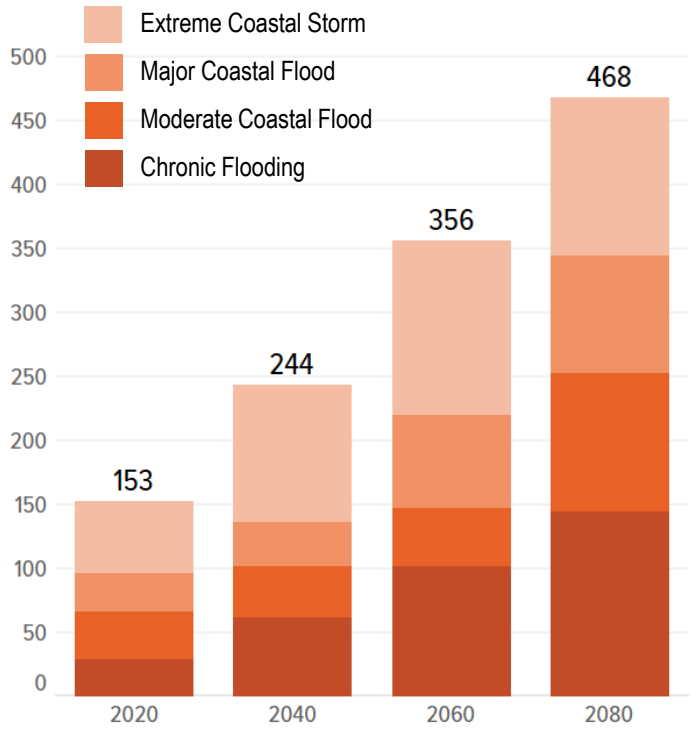
Critical Sectors



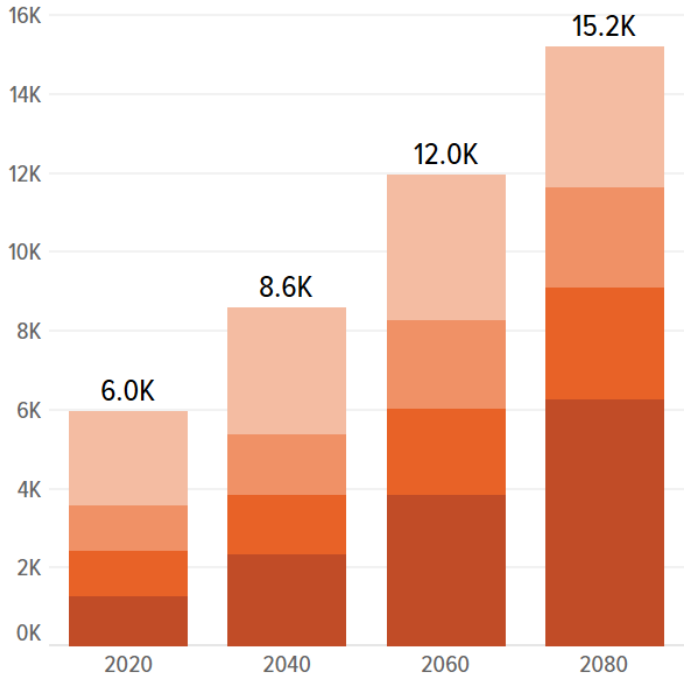
Impacts on

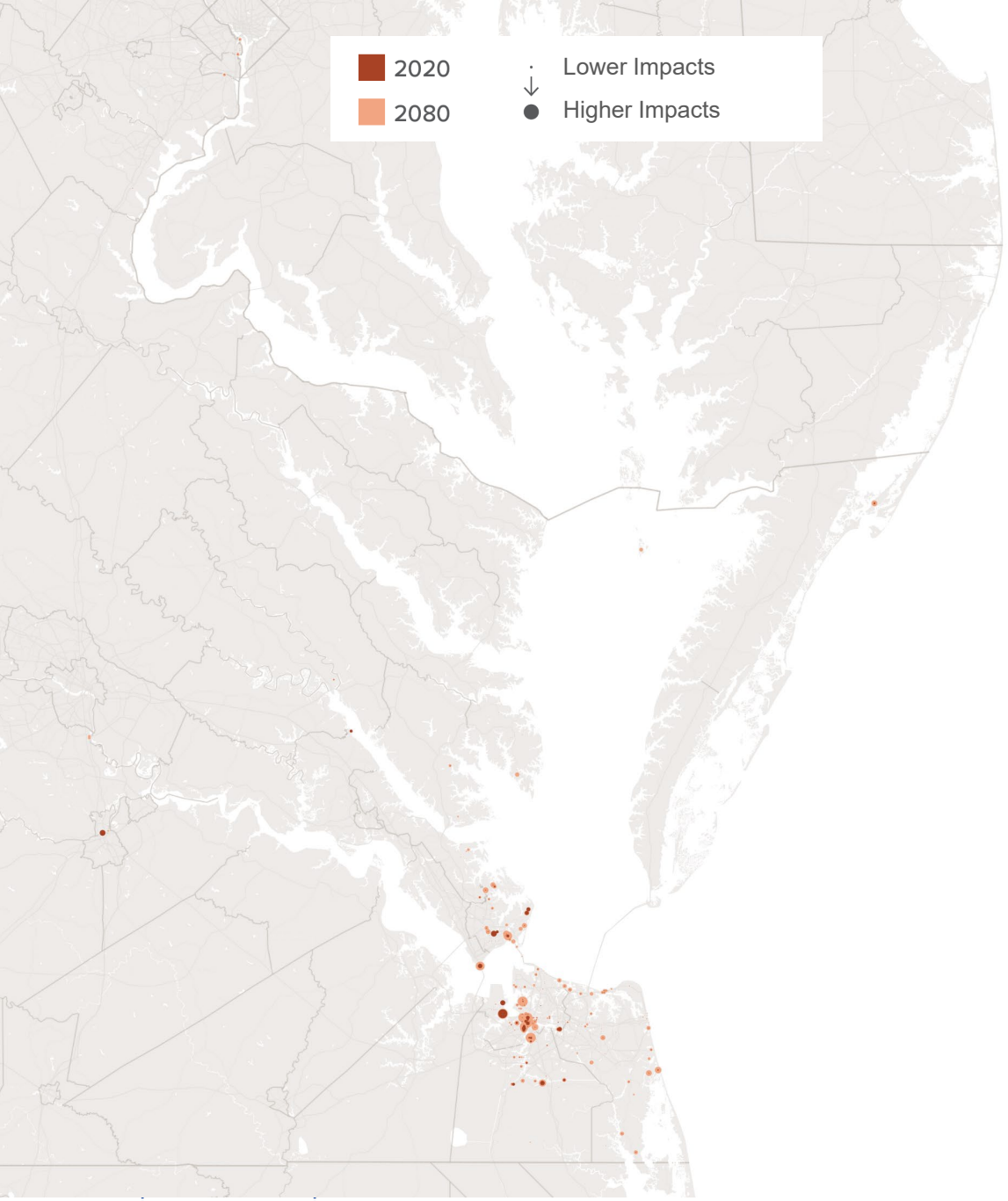
Commercial & Manufacturing

Manufacturing Facilities Exposed



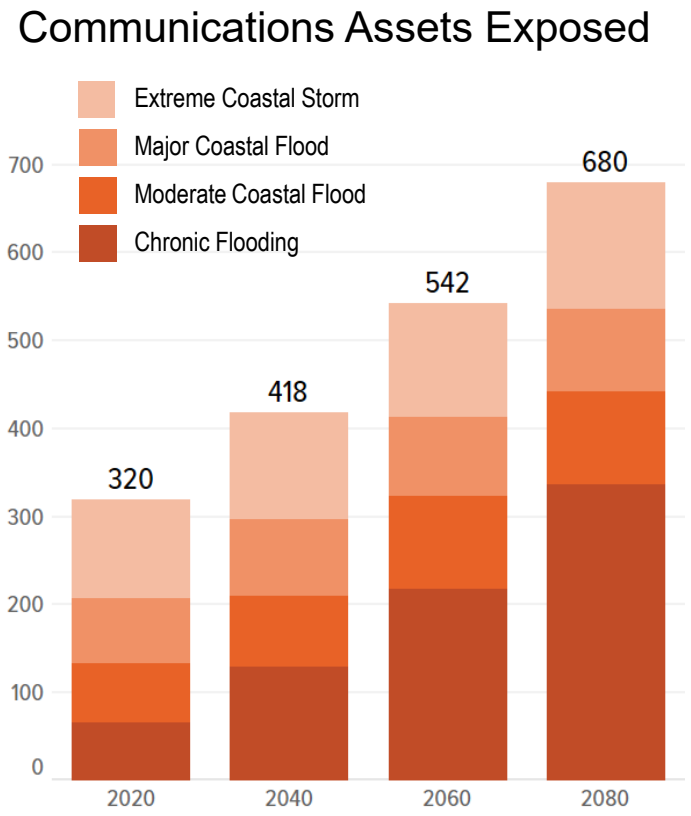
Commercial Facilities Exposed

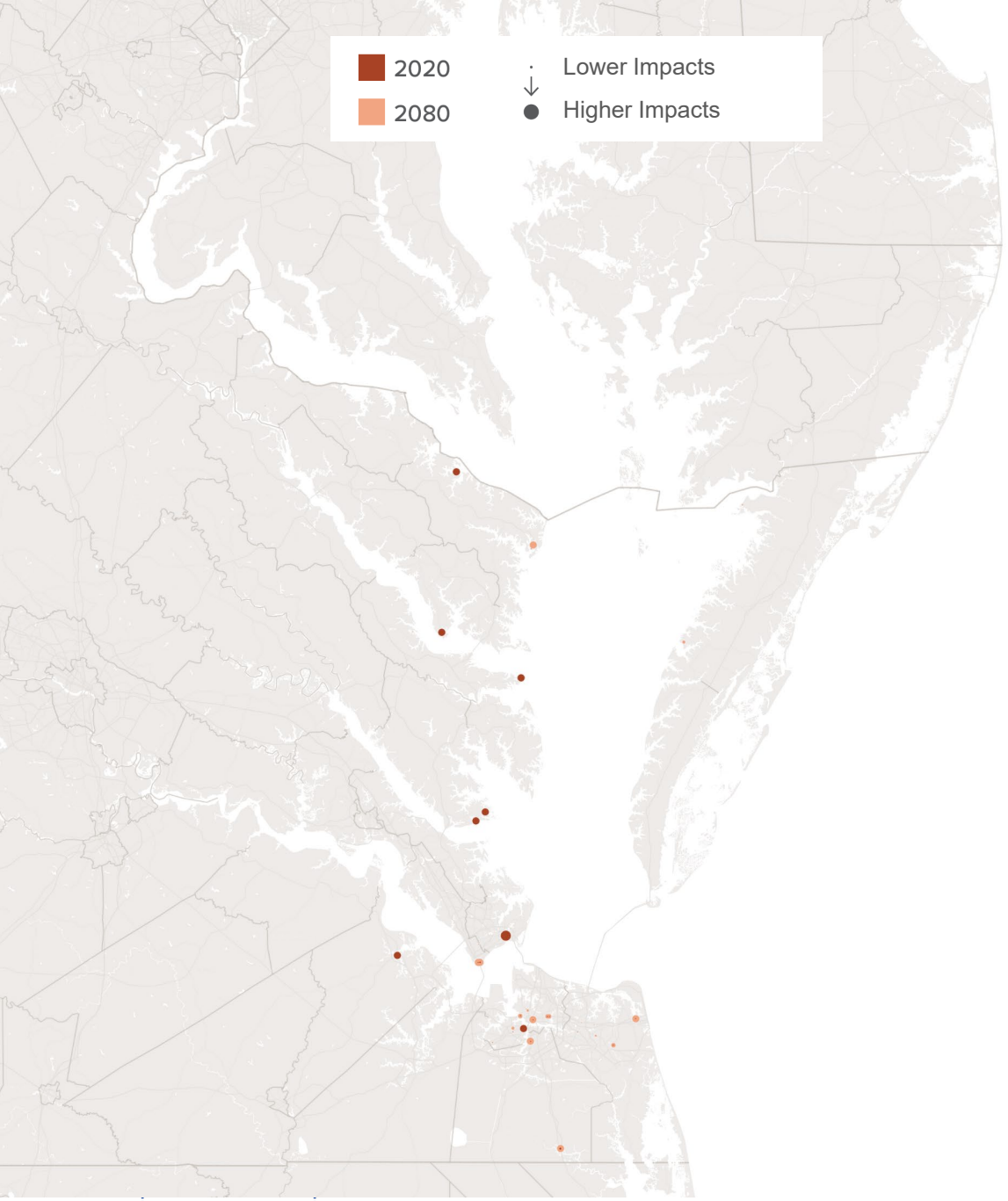




Impacts on

Communications Systems

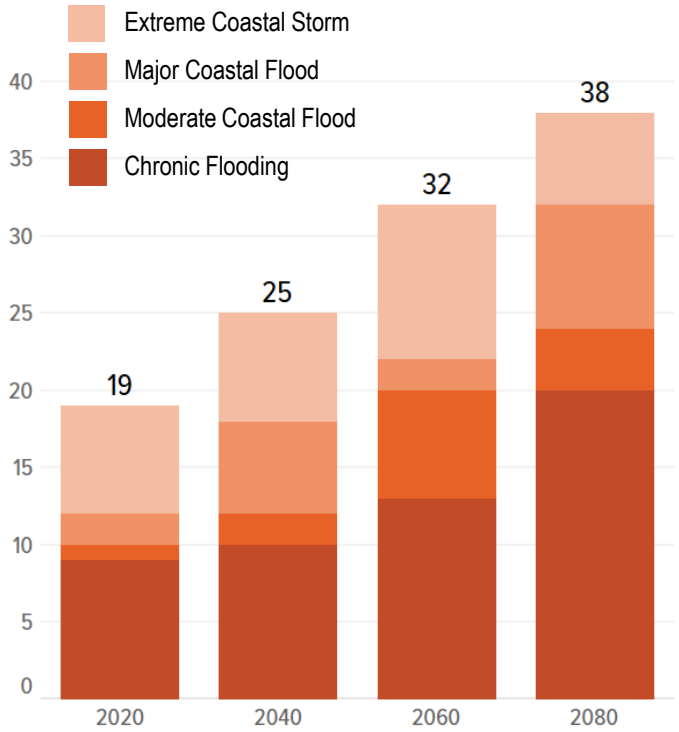


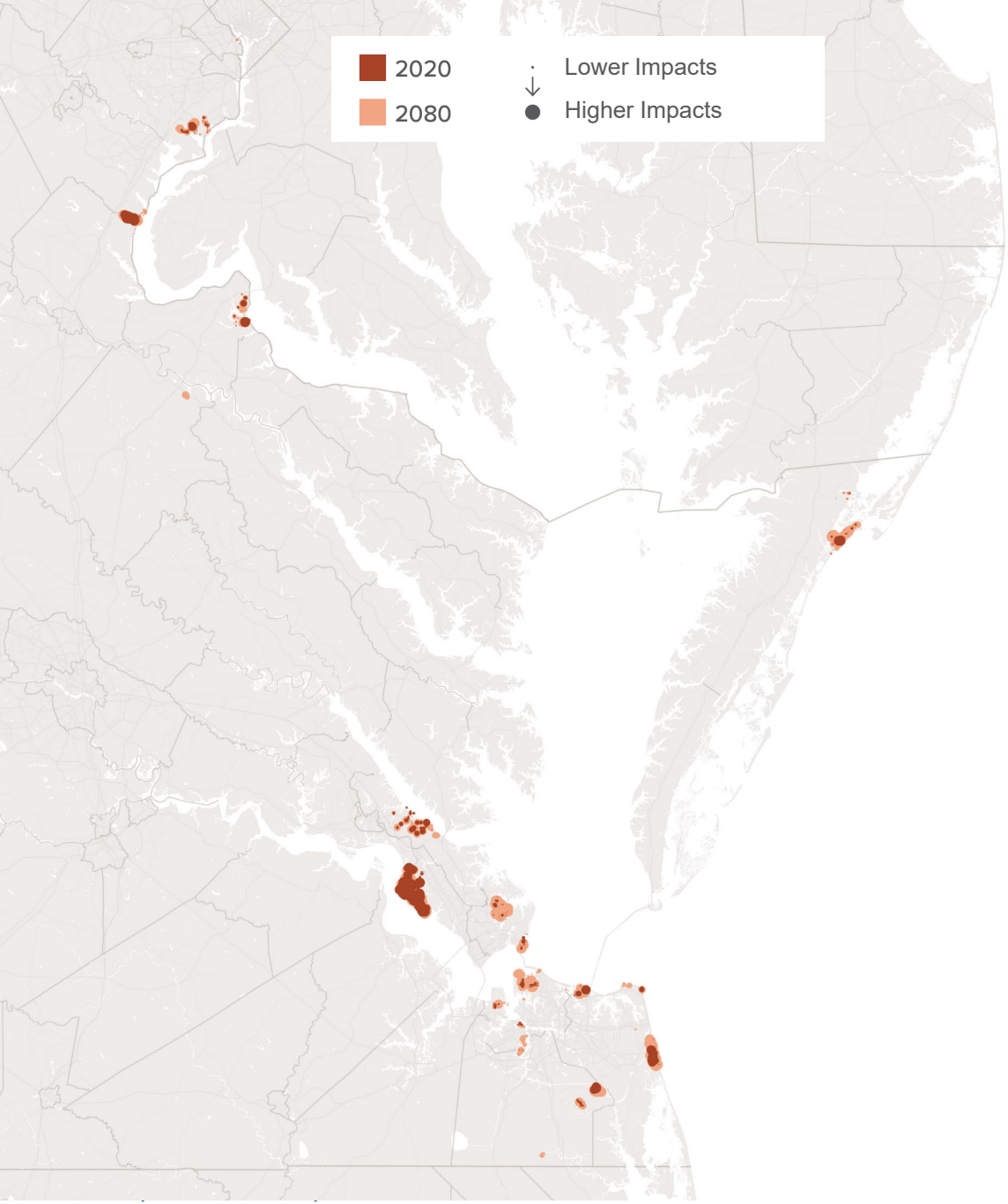


Impacts on

Food Processing

Food Processing Facilities Exposed

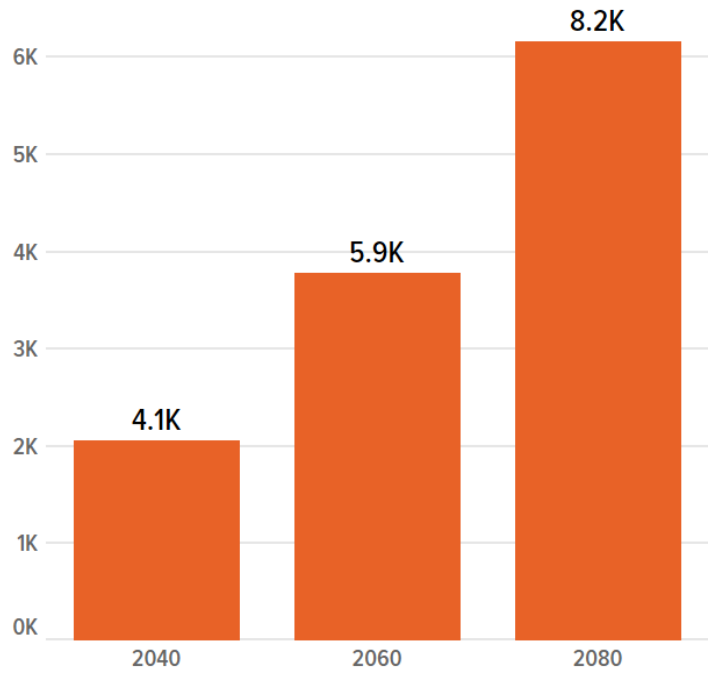


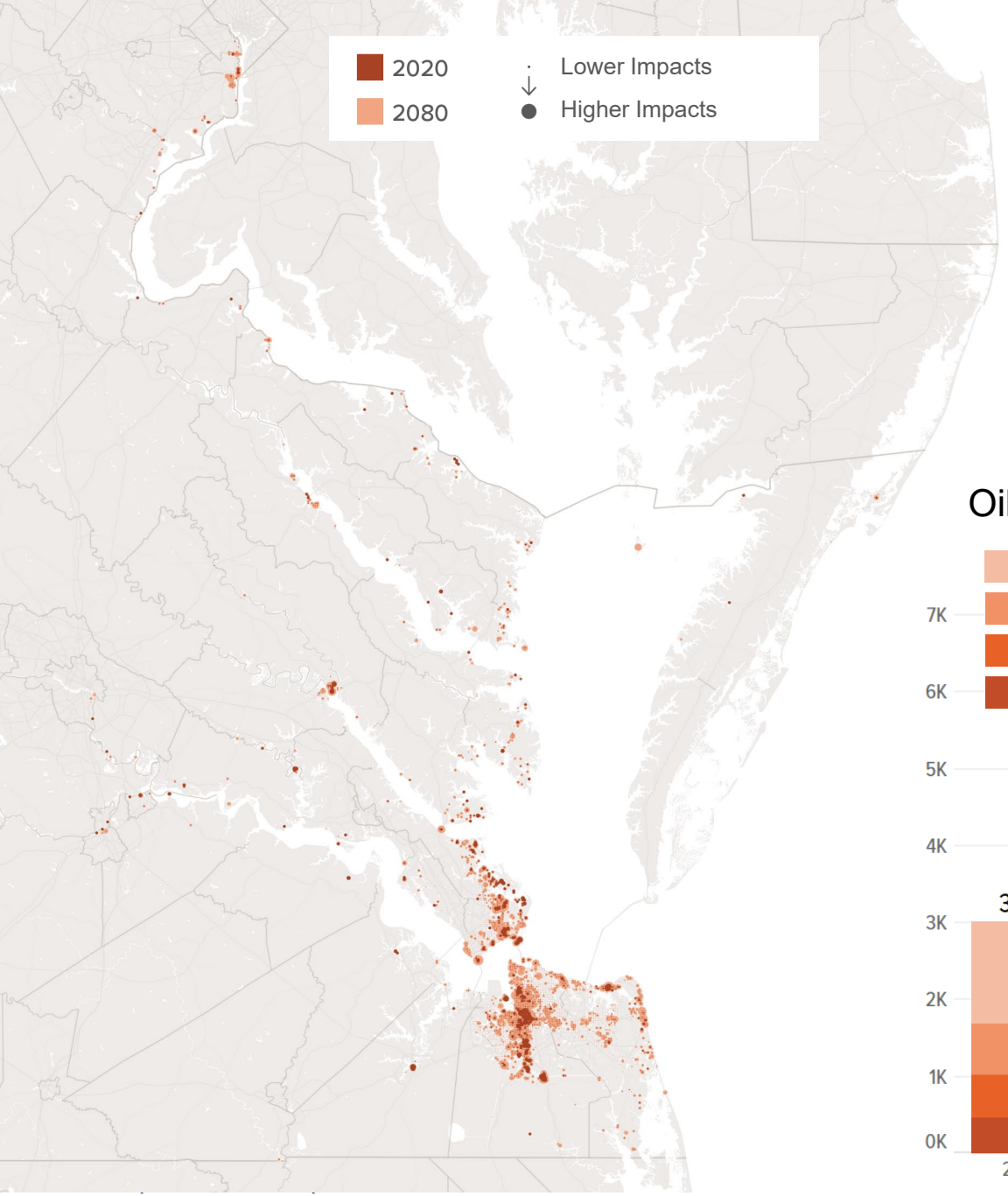


Impacts on

Defense Industry

Acres of DoD Facilities exposed during high tide (lost due to SLR)

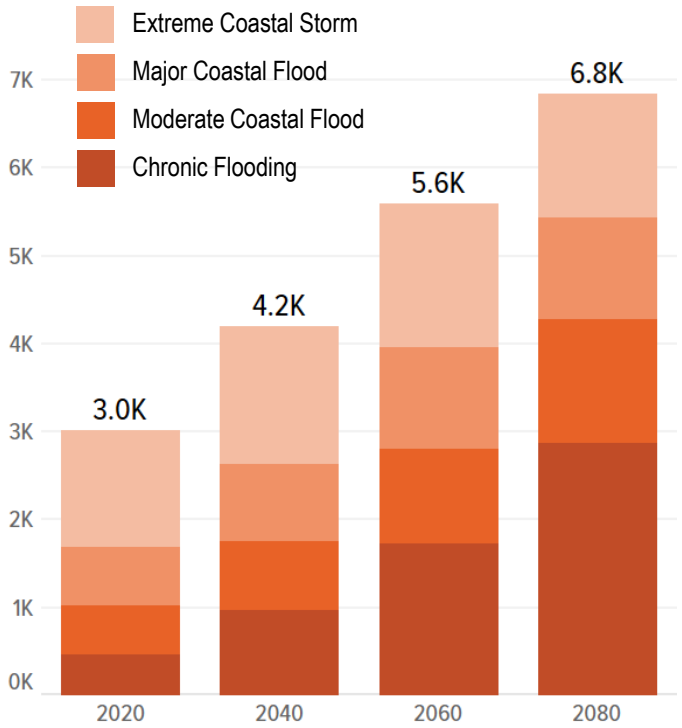




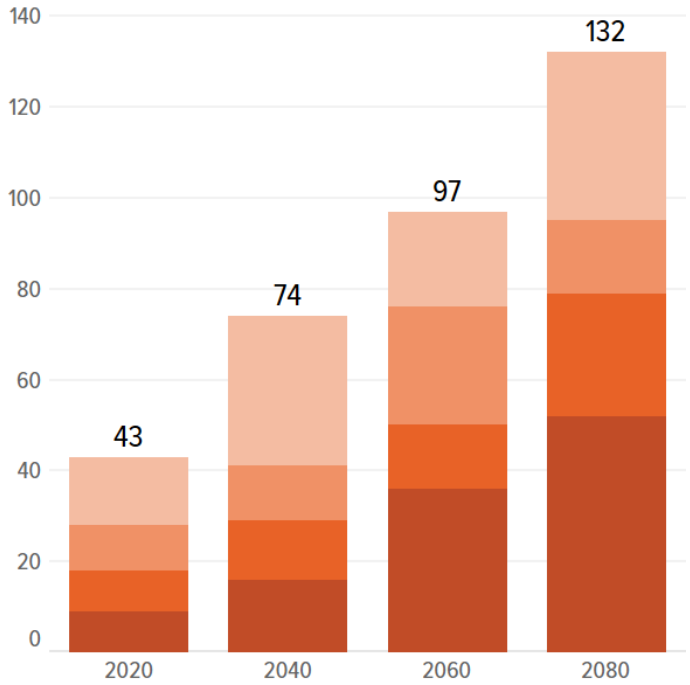
Impacts on

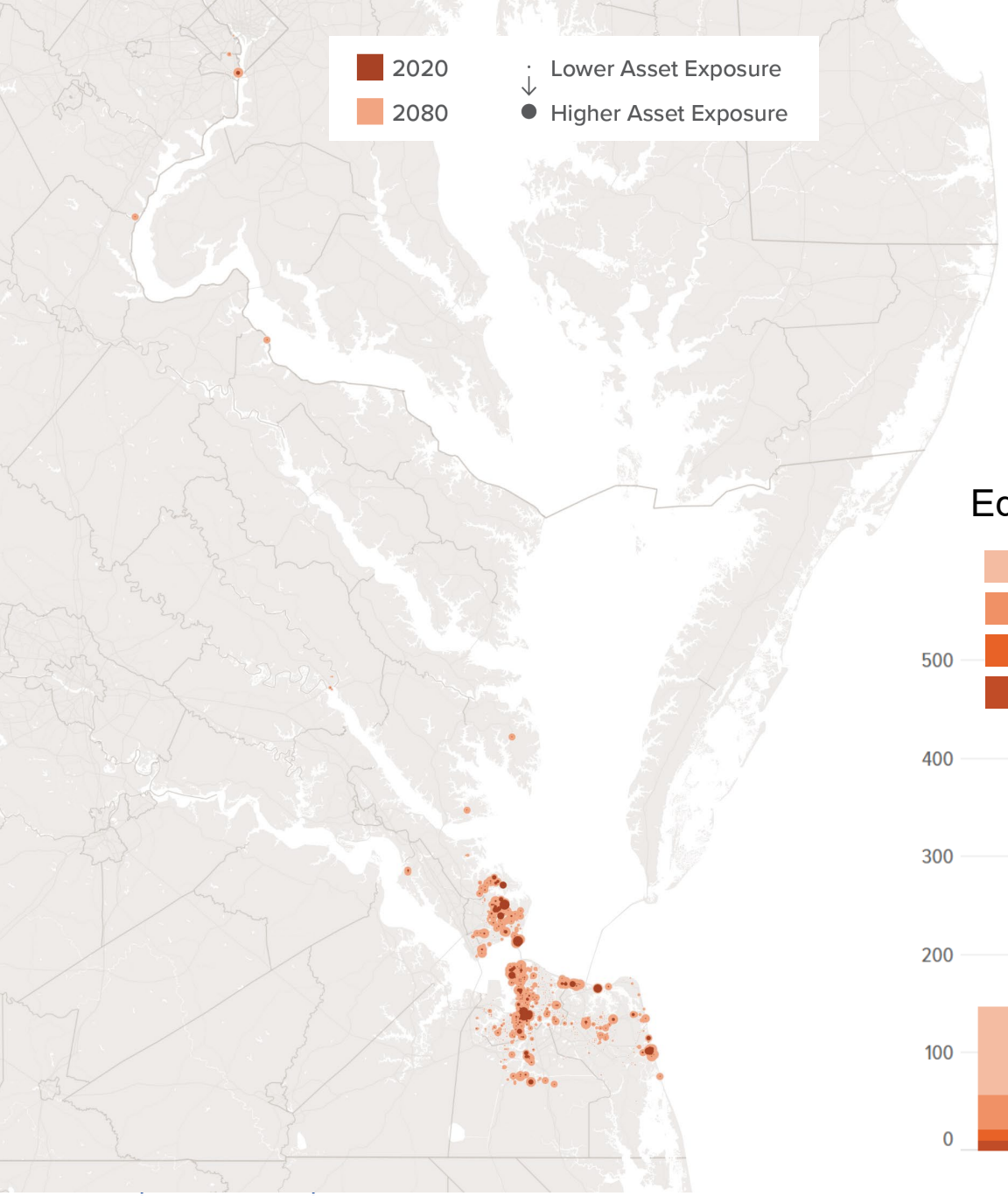
Energy Systems

Oil & Biofuel Assets Exposed



Electricity Assets Exposed

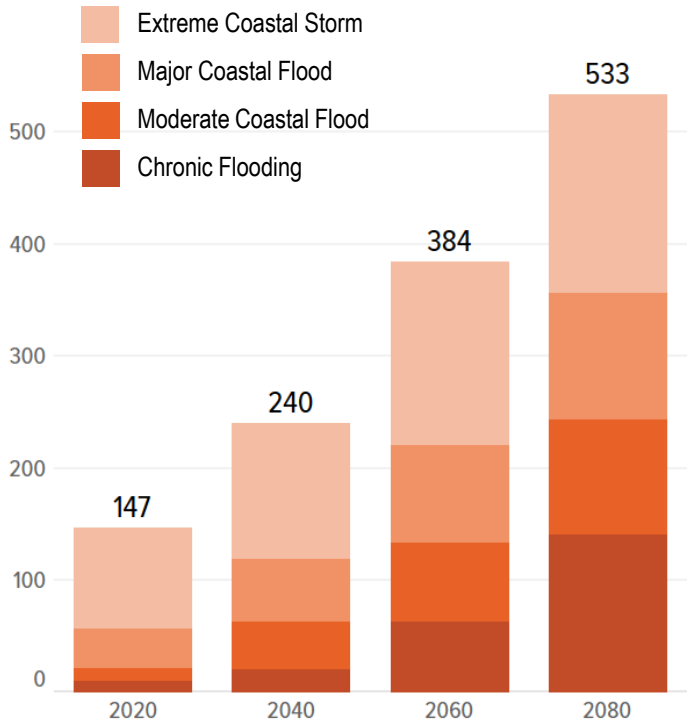




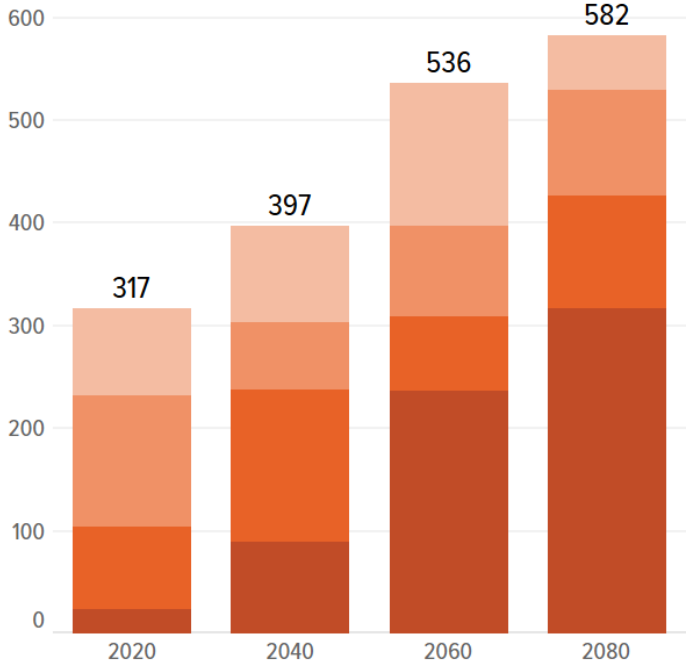
Impacts on

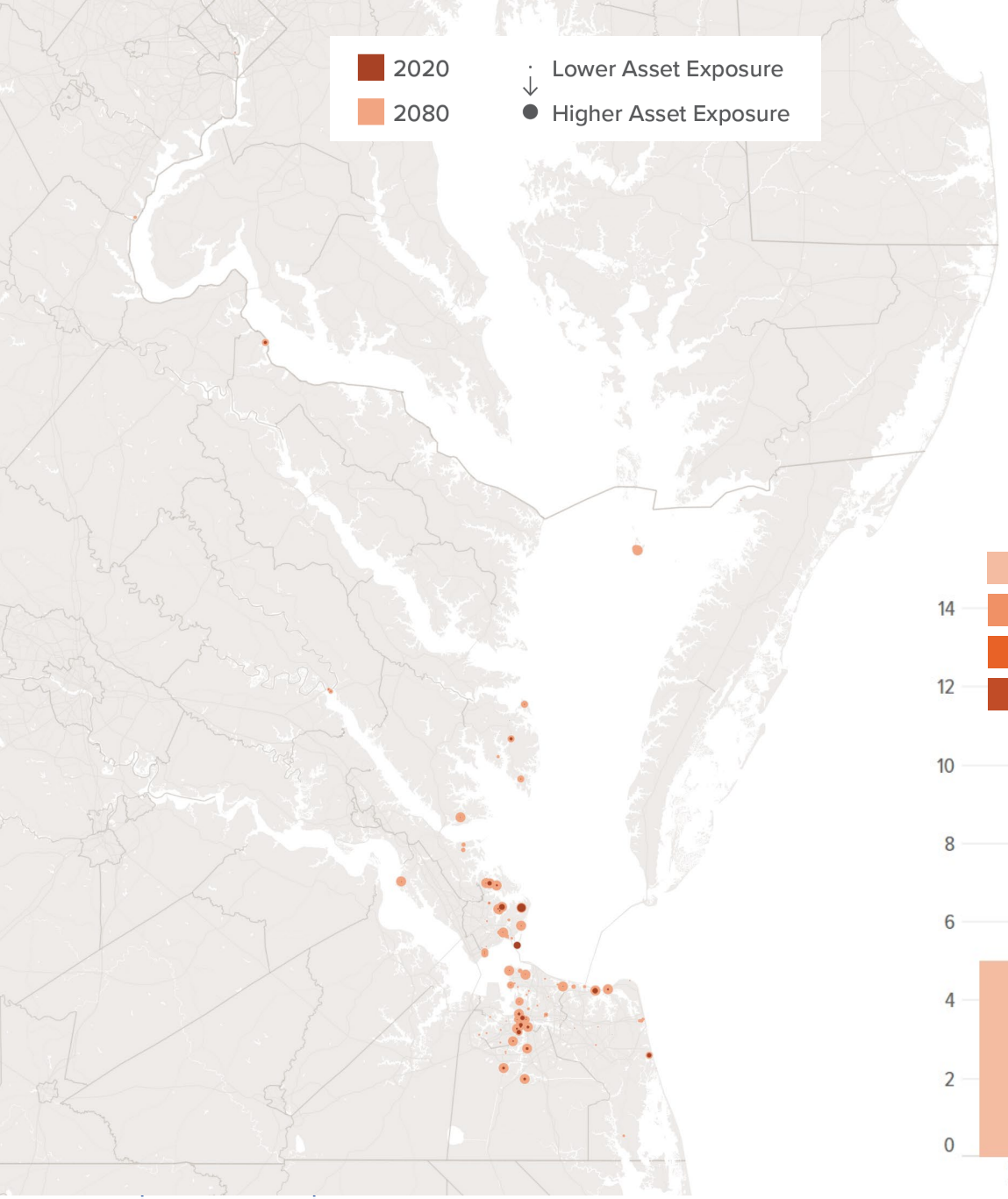
Government Facilities

Education Facilities Exposed



Government Facilities Exposed

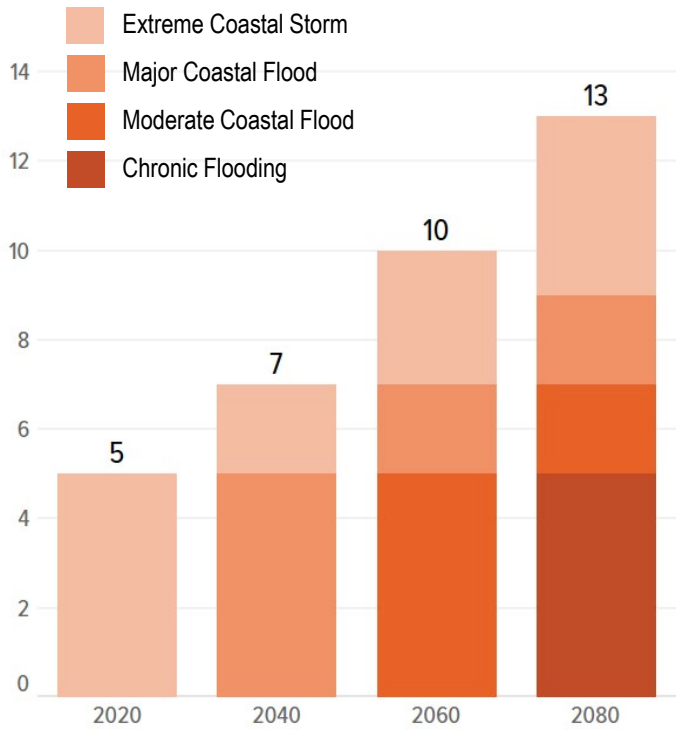




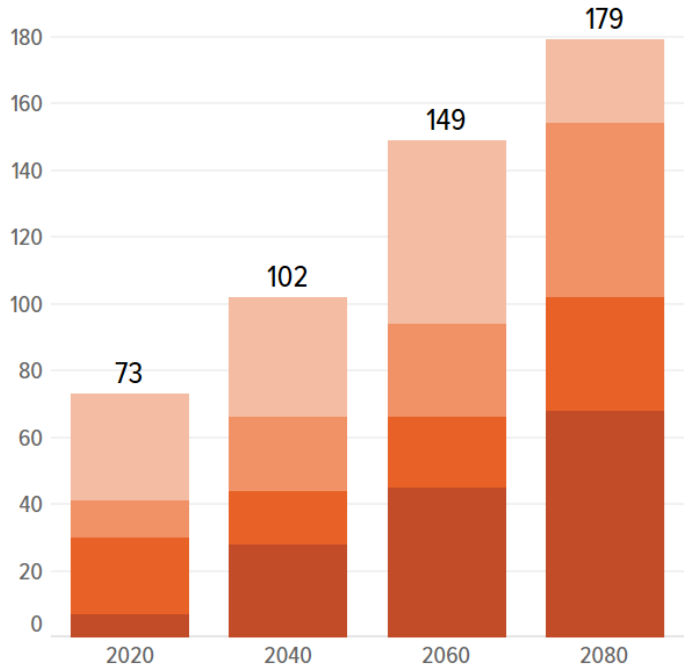
Impacts on

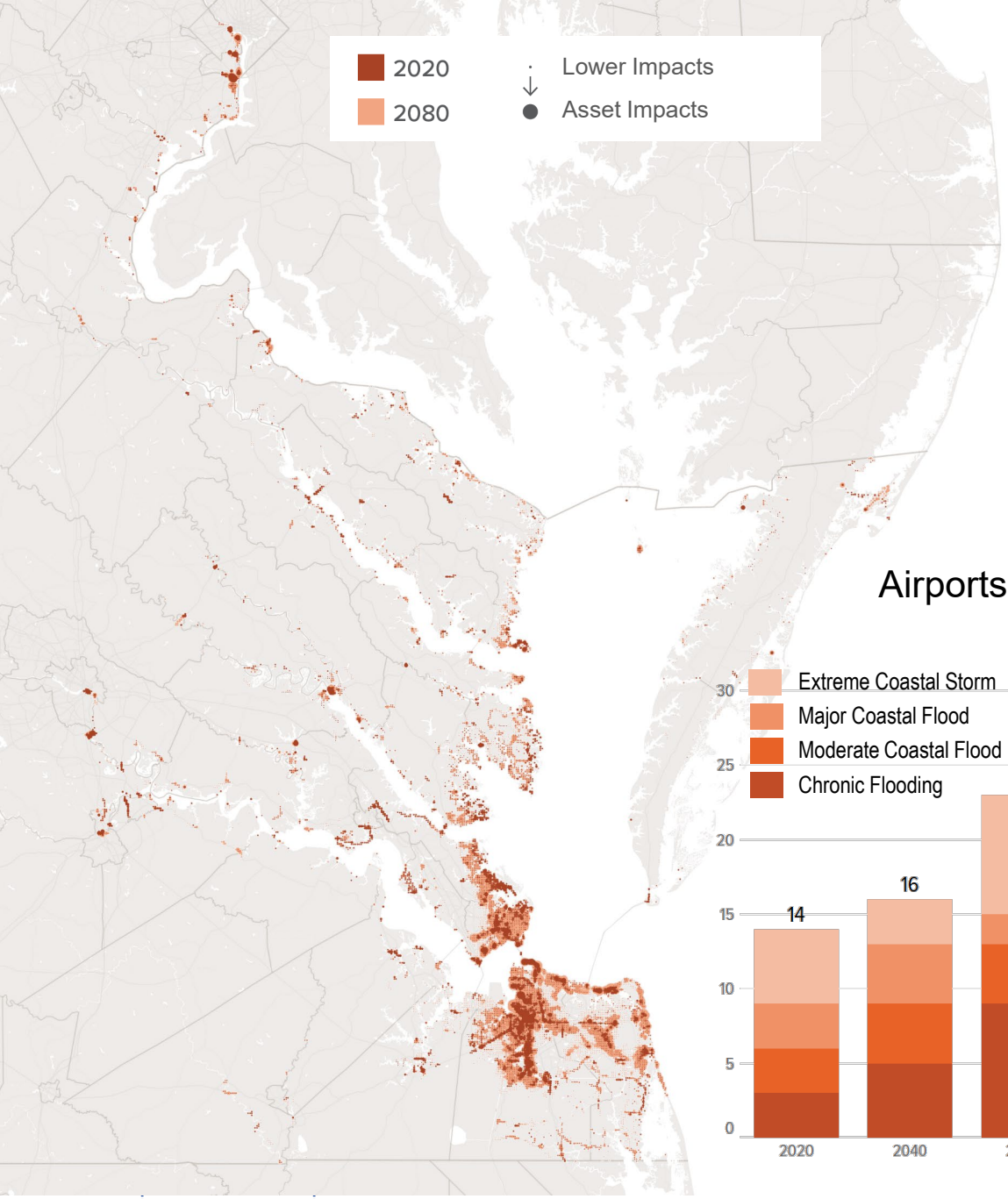
Health & Emergency Services

Hospitals Exposed



Emergency Services Facilities Exposed

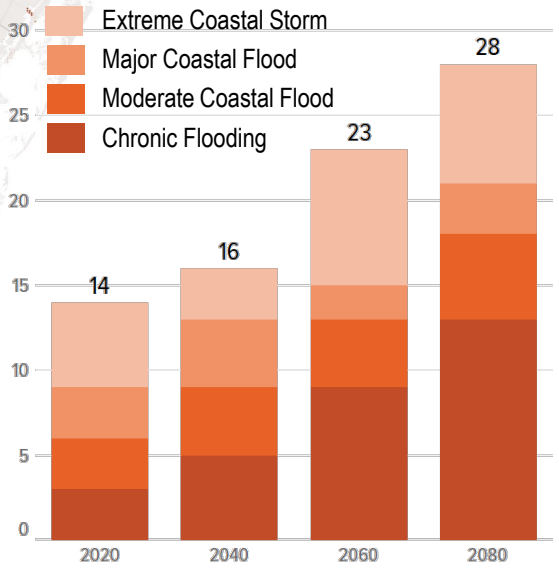




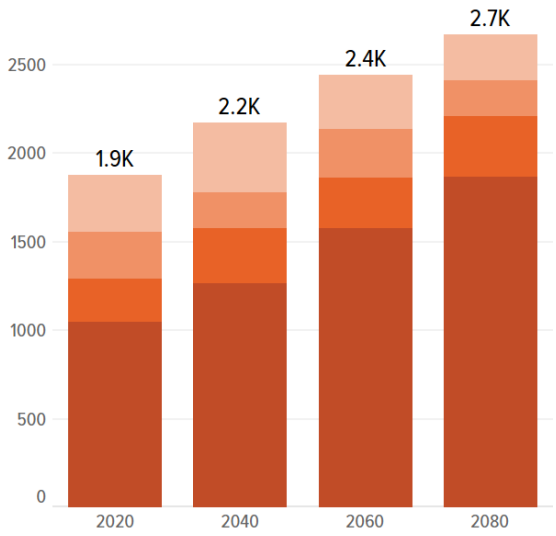
Impacts on

Transportation Networks

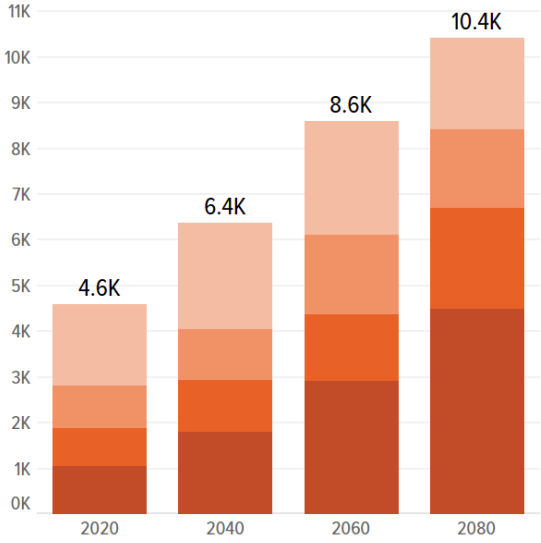
Airports



Freight, Ports & Shipping

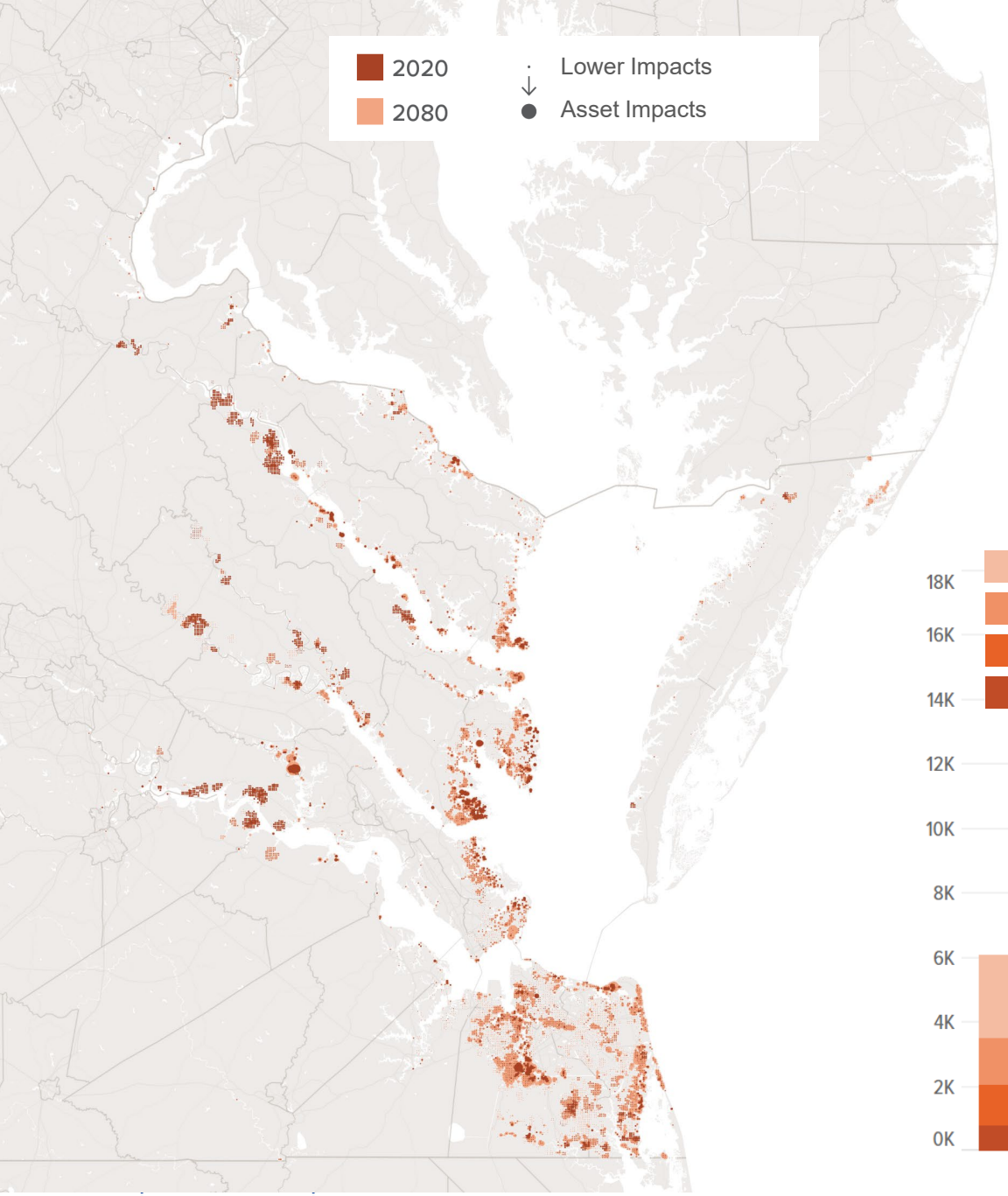


State Roadway Segments

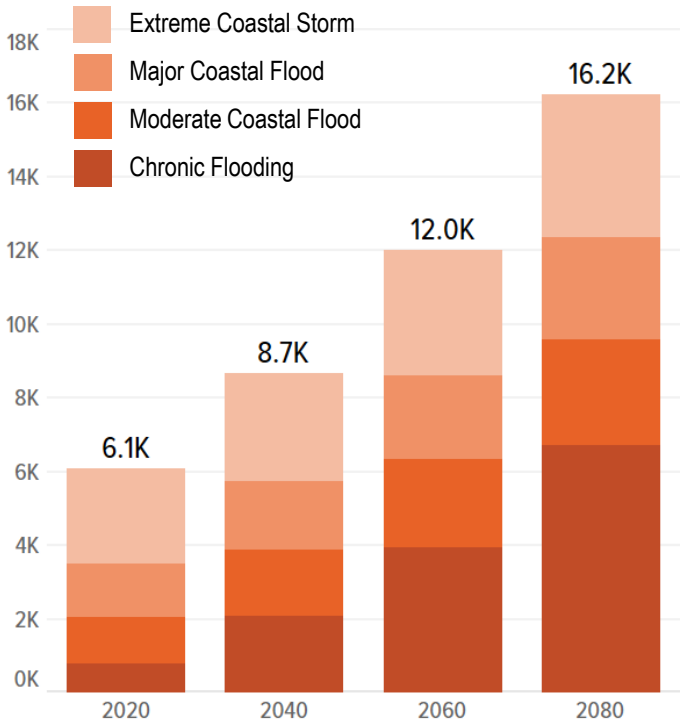


Impacts on

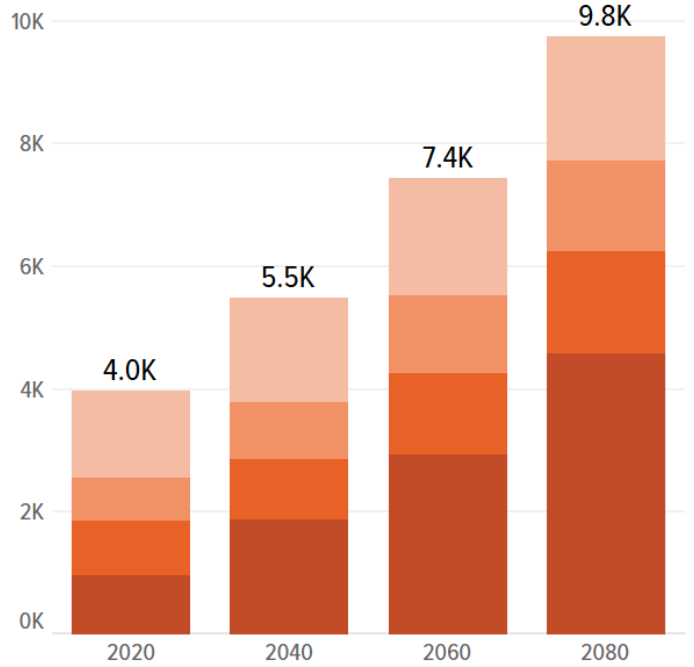
Water, Waste, and Wastewater



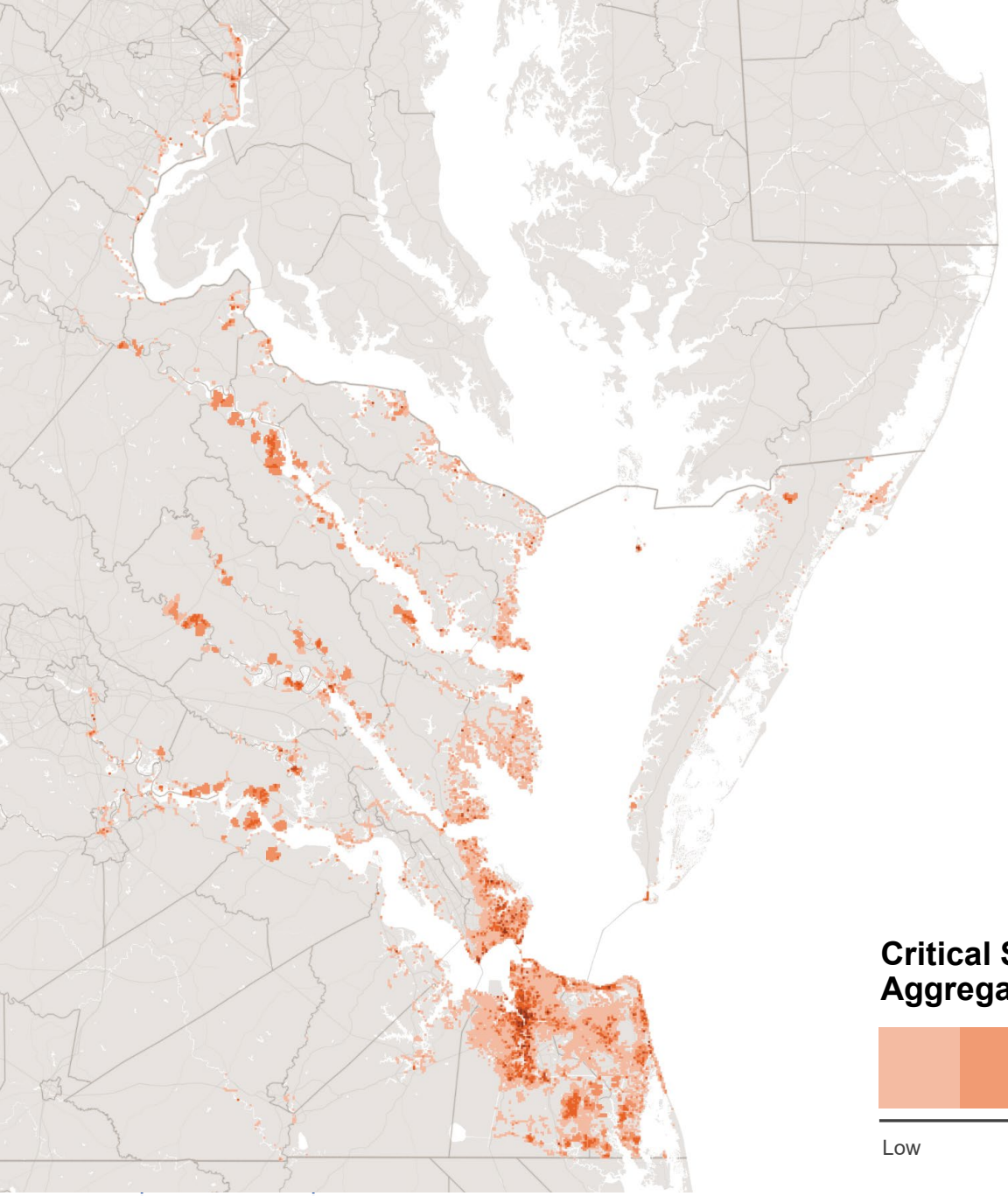
Water Assets Exposed



Waste & Wastewater Assets Exposed



Impact Hot Spots Across All **Critical Sectors**

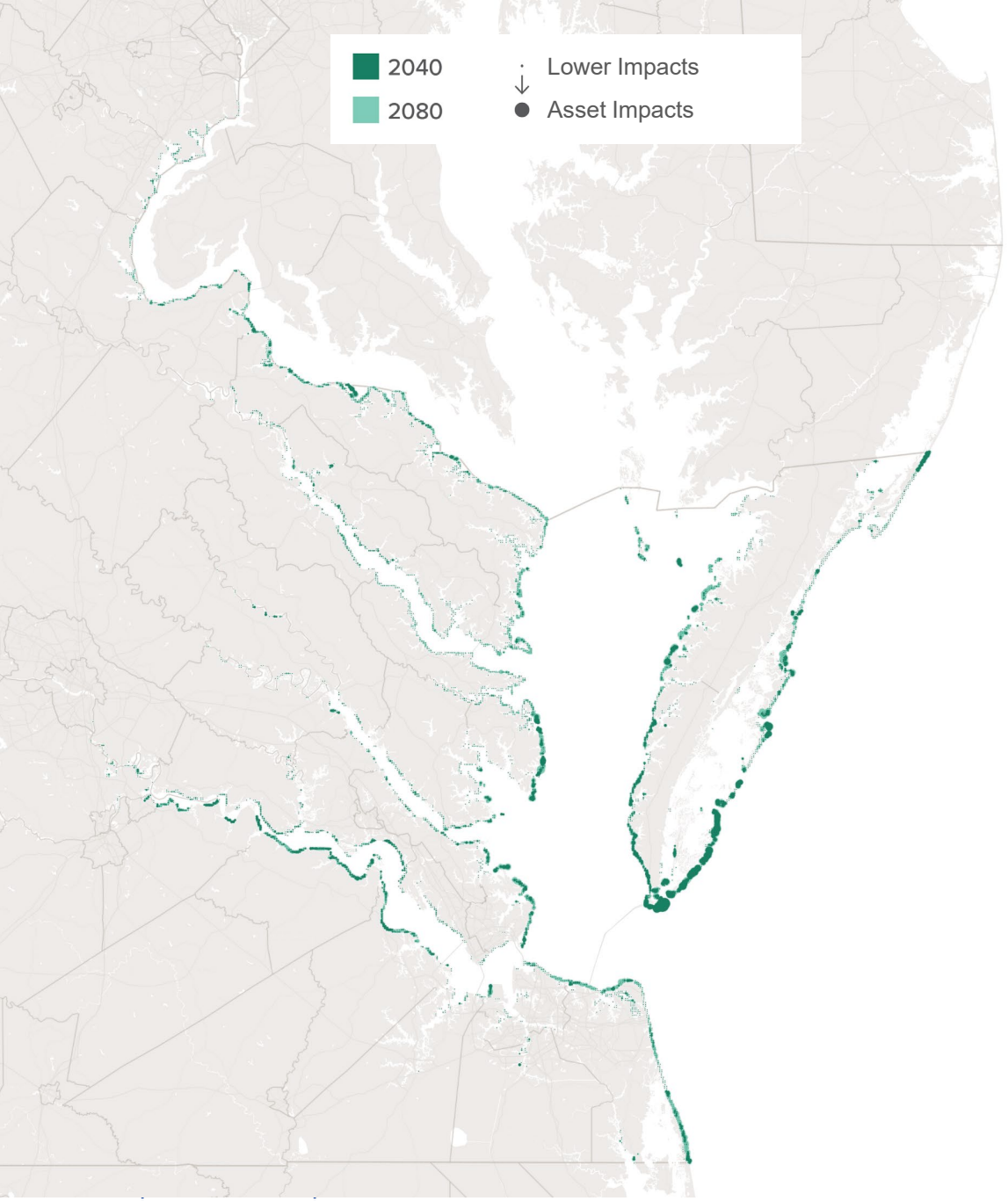


Most assets exposed to flooding during a major storm today would be exposed to at least a moderate storm under 2040 projected sea levels, and subject to chronic flooding under 2060 projected 2060 sea levels.

Critical Sector Aggregated Impact Levels

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

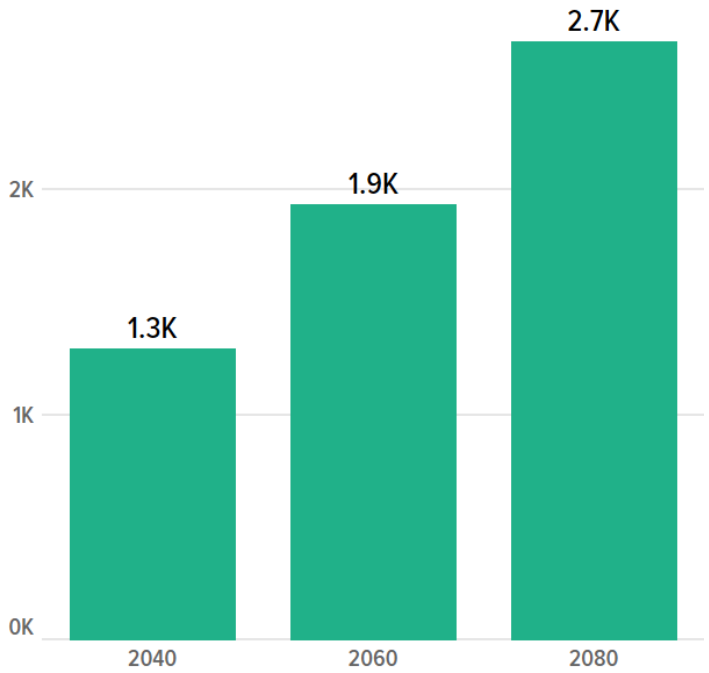
Natural Infrastructure

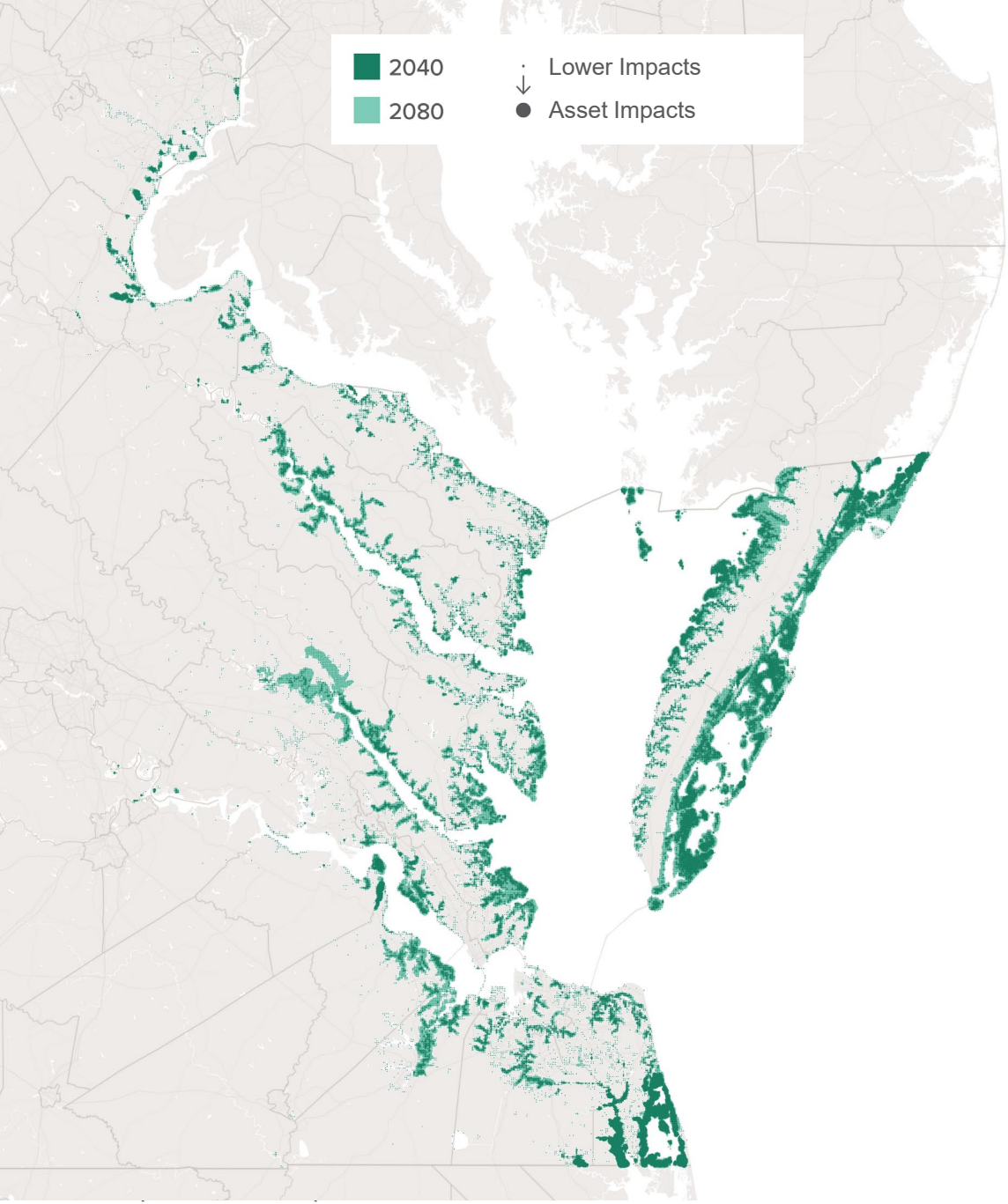


Impacts on

Beaches & Dunes

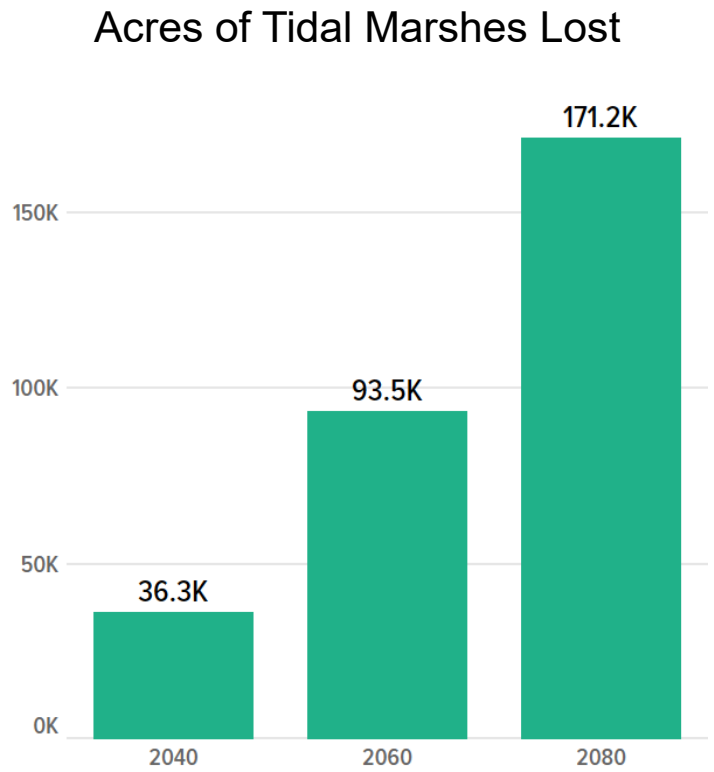
Acres of Beaches & Dunes Lost

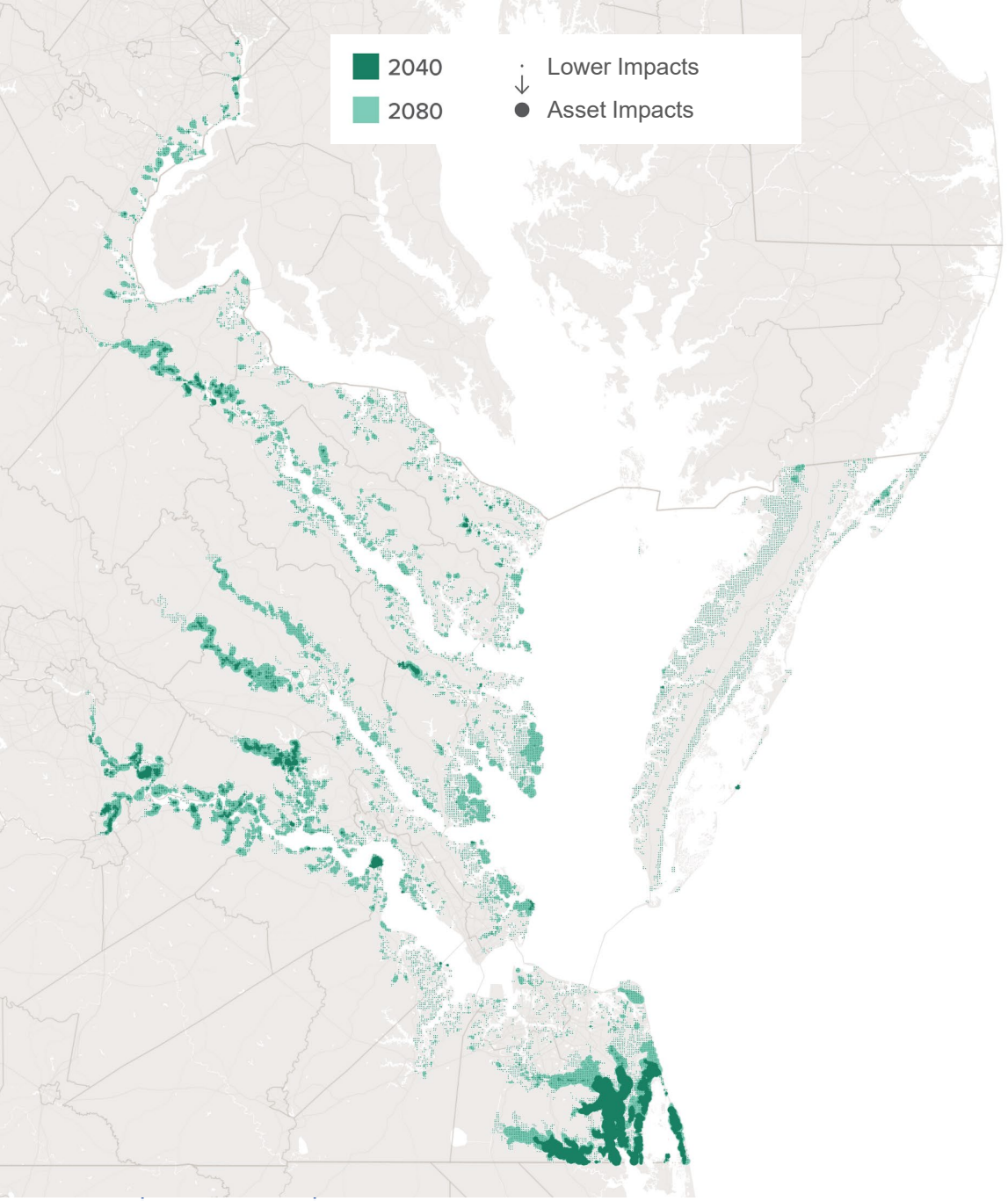




Impacts on

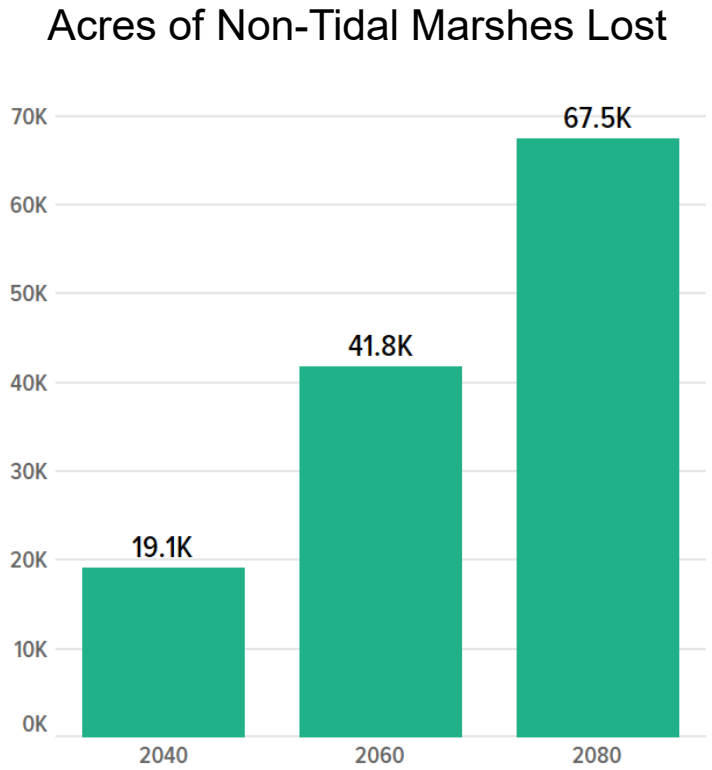
Tidal Marshes

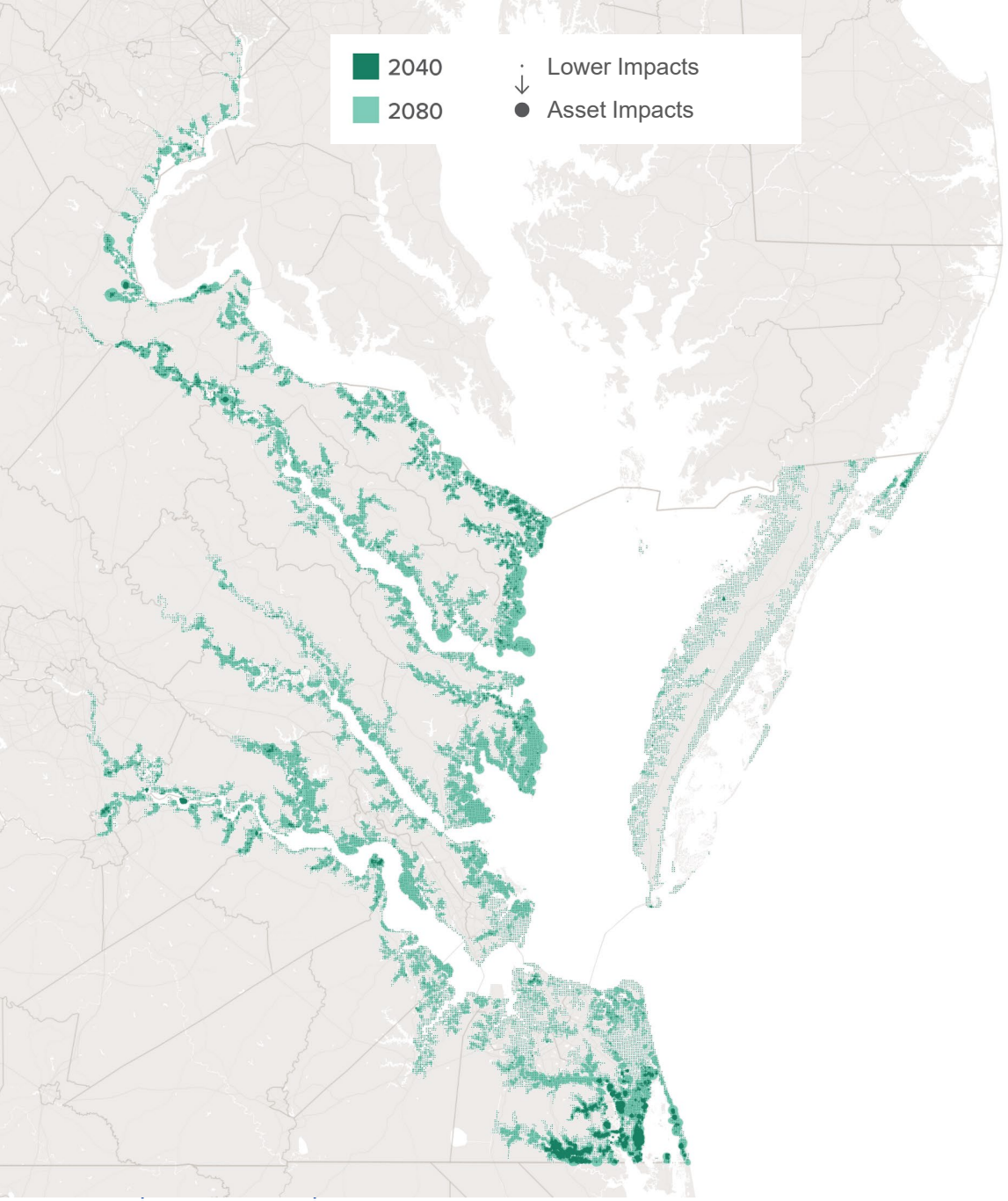




Impacts on

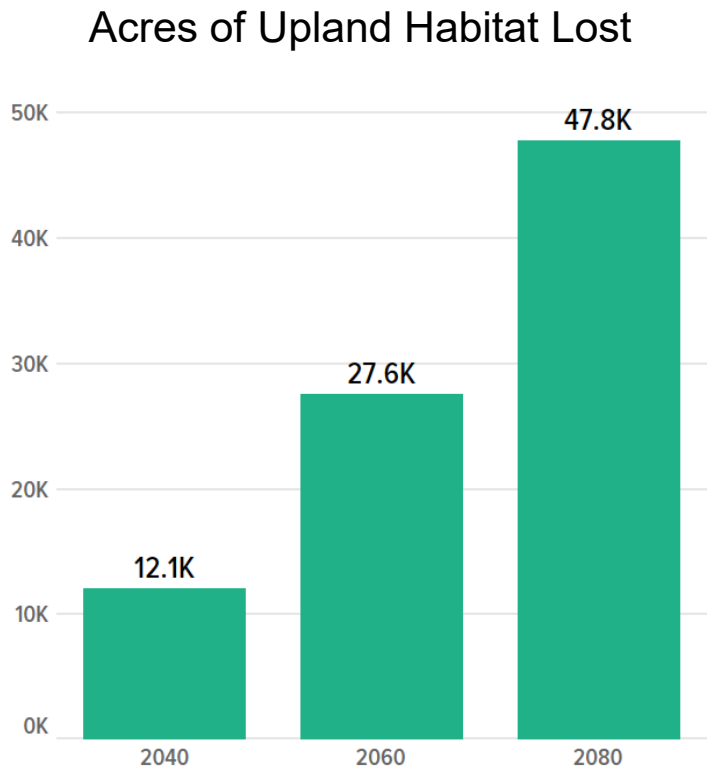
Non-Tidal Marshes

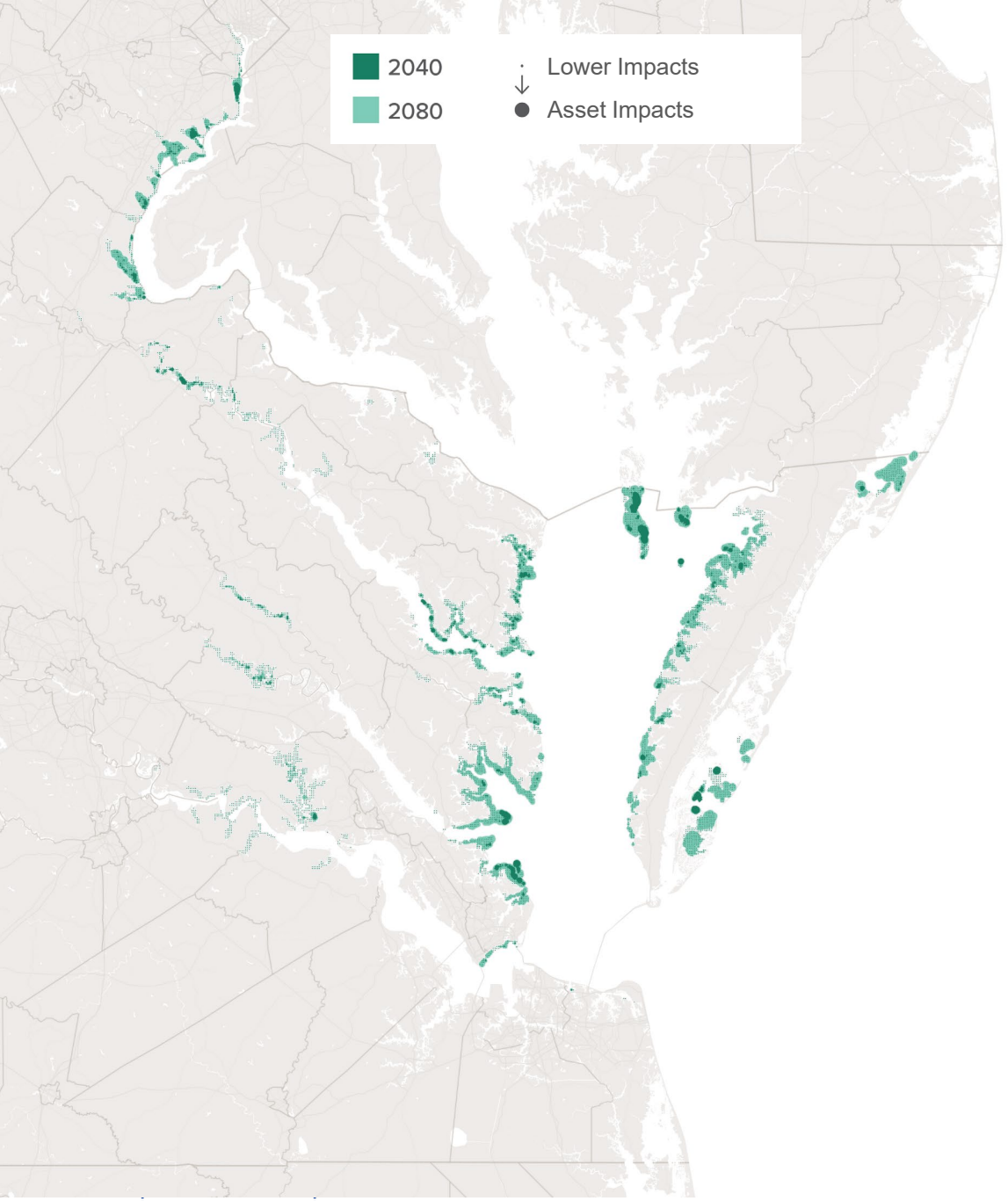




Impacts on

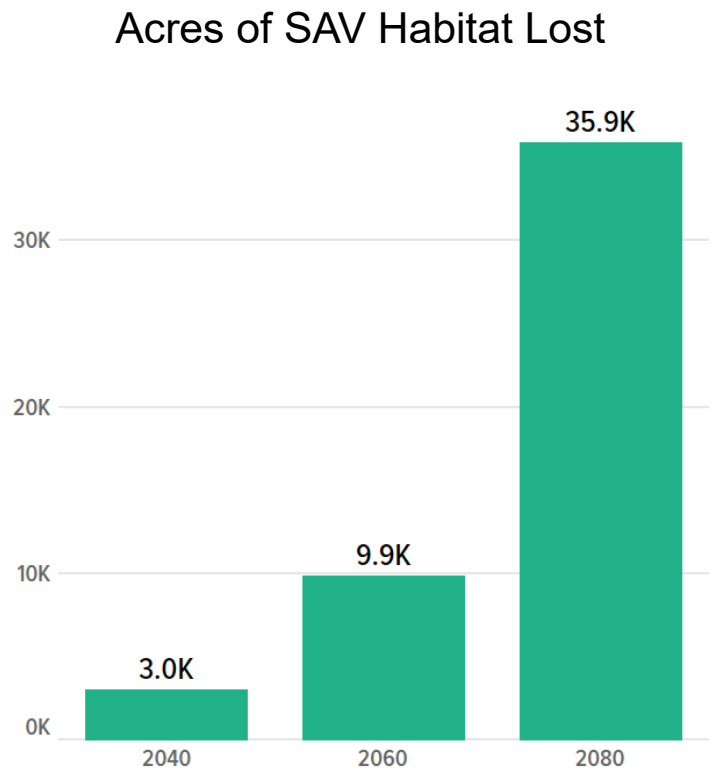
Woodlands & Shrub-Scrub





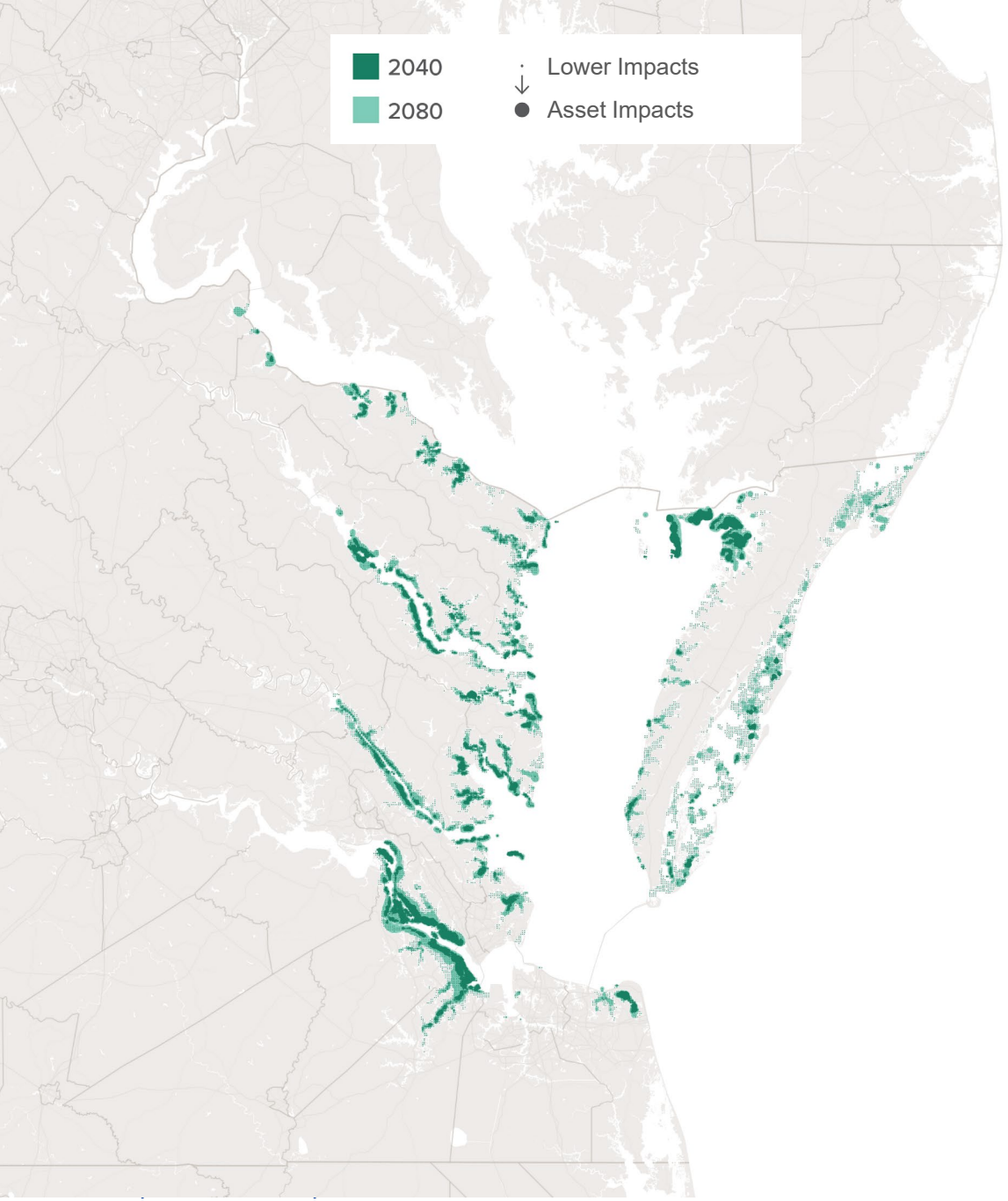
Impacts on

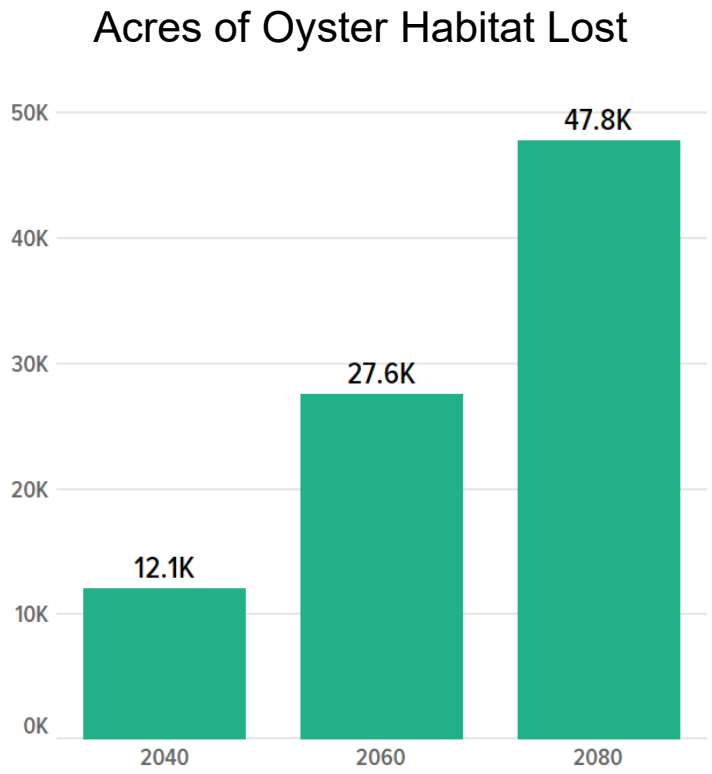
Submerged Aquatic Vegetation



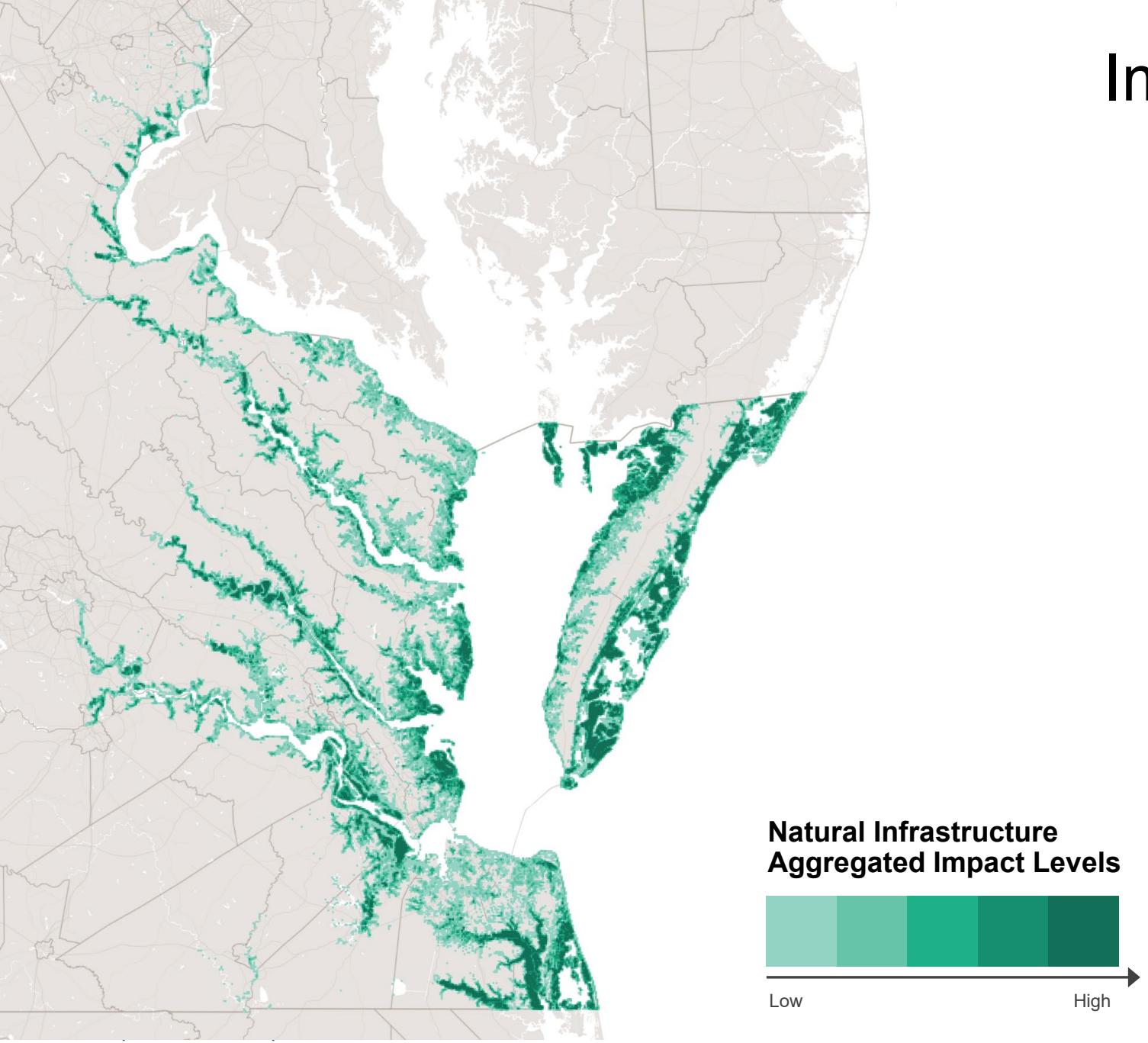
Impacts on

Oyster Habitat





Impact Hot Spots Across All **Natural Infrastructure**



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Notably Innovative Approaches

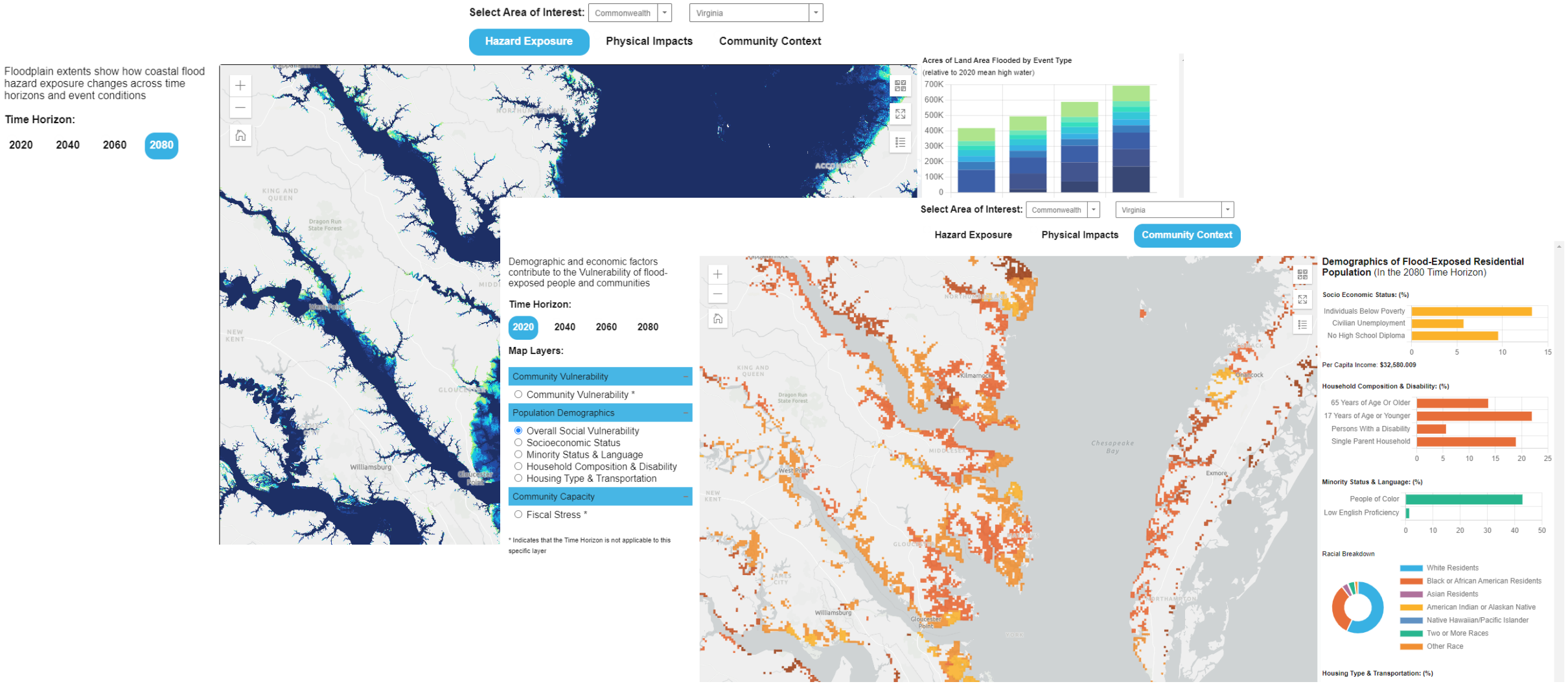
- Used mixed-methods and diverse datasets
- Employed USACE cloud-optimized flood loss estimation methods
- Accounted for variations in population density through characterization of the built environment

Opportunities for Further Development

- Integrate analysis of pluvial, fluvial, and enhanced coastal hazards
- Incorporate Census 2020 and future projections related to land use and population
- Improve asset spatial fidelity and attribution
- Enhance evaluation of susceptibility, adaptive capacity, and value for all assets
- Expand tribal engagement and understanding of cultural resources

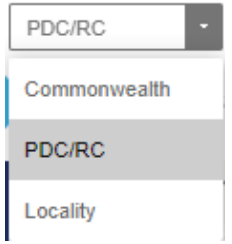
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Draft Web Application

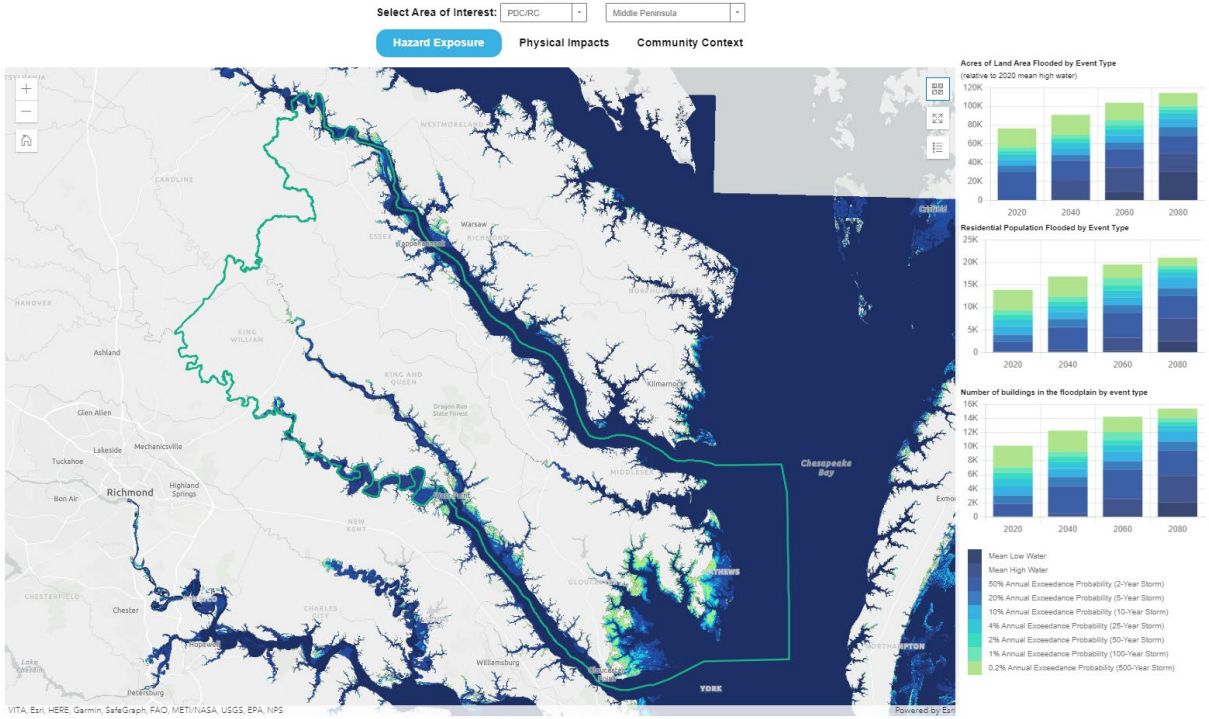


Draft Web Application

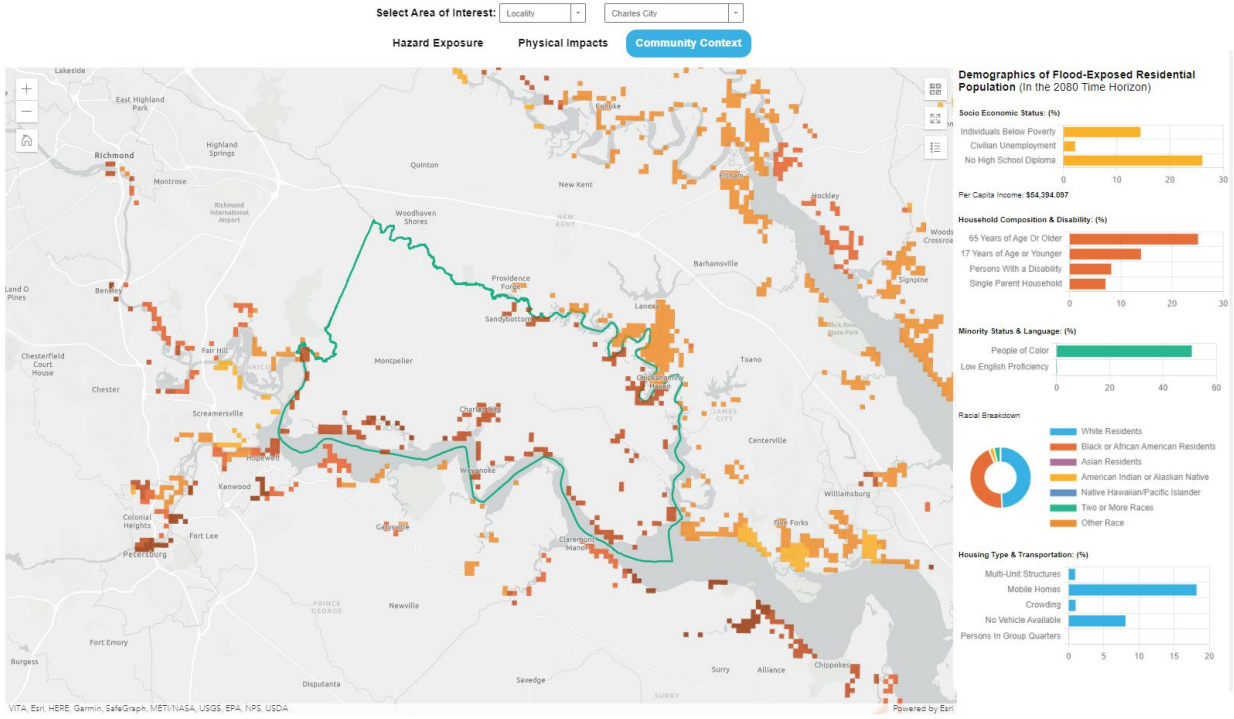
- **Nested Geographies enable on-the-fly summaries at the Commonwealth, PDC/RC, and locality levels**



PDC/RC: Middle Peninsula

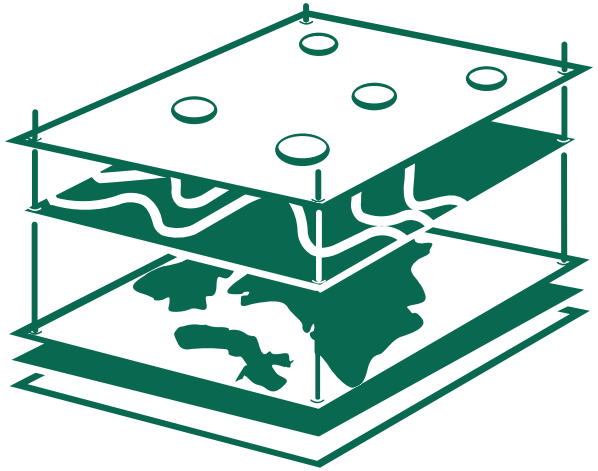


Locality: Charles City



Accessibility

- **Available in November**
  - VA CRMP Web Application
  - GIS Web Services
  - Data Download Services



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Questions?

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Stakeholder and Public Engagement Update

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Topics

- Summary of PDC/RC Workshops/Charettes
- Centralized Stakeholder and Public Survey Outcomes
- Outreach and Public Engagement Update

PDC/RC Workshops/Charettes

PDC	Date	Location	Attendees	Hybrid?
George Washington	7/27	Germanna Comm Coll.	15	N
PlanRVA	7/28	PlanRVA Boardroom	10	N
Crater	8/2	Tabernacle Community Center	19	Y
Middle Peninsula	8/3	Rappahannock Comm Coll.	3	N
Northern Neck	8/4	NN Electrical Coop Auditorium	12	Y
Hampton Roads	8/5	HRPDC Boardroom	AM – 28 PM - 19	N
Northern Virginia	8/10	NoVA CC – Annandale	30	Y
Accomack - Northampton	8/11	Eastern Shore Comm. College	20	Y

PDC/RC Workshops/Charettes

Charette Agenda

- Presentation
- Q&A
- Visioning Activity
- Mapping Exercise
- Centralized Survey
- Evaluation Criteria Poll
- Capabilities/Data Survey

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021


NASA
NAVAL BASE
Norfolk Naval Base
Langley AFB
Phoebus Community
Tax Base
URBAN CENTERS & RURAL LANDSCAPES
Oceana Air Station
Ocean View Beach
ODU
NSU
HU
VA Hospital
Access to Water
Beaches
Natural Resources
Historic Places
Hampton History Museum
Fort Eustis
The Hermitage
Jefferson Labs


Natural Area Preserves
Wetlands
Critical habitat
Seaside Bays + Lagoons
UVA LTER
Commercial Operations
Ag Lands
CBBT
Ecotourism + Hospitality
Roadways Vulnerable in Low AREAS
Nature trails
Public Boat Ramps
Power Lines
Roads
Aquaculture Facilities (land)
Aquaculture Operations (water)
Hospital + Health Centers
Farmlands vs Salt Water intrusion surface water
Wallops
property with high elevation

Resilience is...
- Driven by financial source / provider of resources

★ Resilient employment sectors
- Intact / resilient tax base
- Readily available funding
- Fed / State agencies delivering on promises to get resources / funding to rural communities
- Support to buy time to work on larger issues of managed retreat
- Keep people and businesses in the region
- High quality of life
- Maximize utility of waterfront properties
  ↳ nuanced uses of private land
- public access authority
- high quality local jobs

- Establish vision policy for development along waterways
- Capacity to support inward migration
- Regional development plan
- Green infrastructure, riparian buffers combined w/ recreation
- Standardization of environmental regulations + policies across jurisdictional boundaries + watersheds + regions
- Management of the impacts of upstream development on downstream flooding
- Guidance, support, + authorization to enforce regulations
  ↳ political will / public support
- Education, engagement, + assistance from the state → support
- Identification of needed capacity
- Project support at PDC level / regional organization
- Funding for capacity building + resilience planning
- Data collection + analysis
  - ditch, groundwater, stormwater / drainage mapping
- Interdisciplinary resilience → streets, environment, ~~transportation~~, economy
- Interagency communication / coordination / collaboration
  → and inter-locality

PDC/RC Workshops/Charettes

Common Themes

- Increased impacts of heavy rainfall
- Need for additional resources
  - FUNDING
  - Support from region and state
- Preservation/protection of natural infrastructure
- Improved integration and alignment of processes
  - Across localities
  - Across levels of government
- Improved governmental coordination
- Building awareness and trust, community capacity

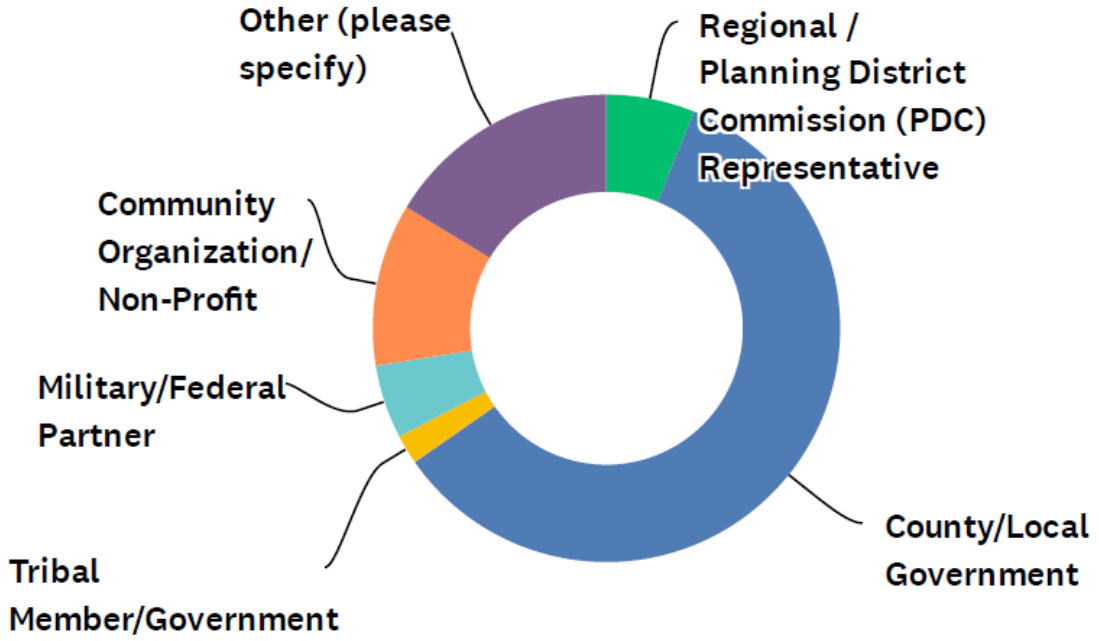
Federal Partners Meeting

- **Held 8/18 at HRPDC**
- **25 attendees**
- **Agenda:**
  - Overview of CRMP Goals and Objectives
  - Data Assets
  - Project data call and federal installations
  - TAC Federal Installation Subcommittee goals and actions
  - Roundtable discussion
    - Activities, approaches, and data
    - How to improve coordination
    - How can the state help?

Centralized and Public Surveys

Centralized

- 98 Respondents (online)
- 6% - RC/PDC Representatives
- 58% - County/Local Government
- 2 (total) - Tribal Members/Govt.
- 5% - Military/Federal Partners
- 12% - Community Org./Non-Profit
- 17% - Other



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Centralized and Public Surveys

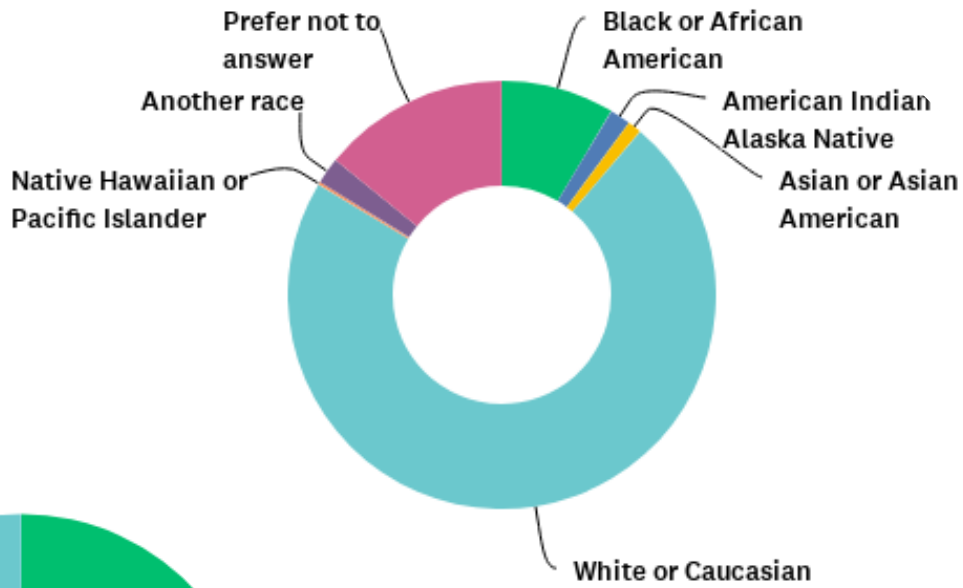
Major Concerns on Coastal Resiliency and Flooding

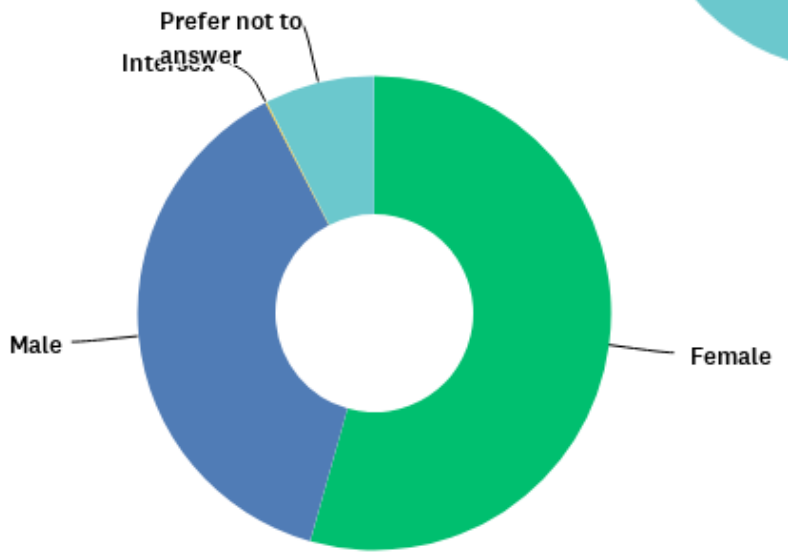
- Lack of funding and knowledge of grants/financial resources
- Lack of governmental/institutional buy-in
- Not in a coastal area- difficulty understanding vulnerability/getting stakeholders involved
- Inadequate stormwater drainage systems
- Lack of cooperation and buy-in from private landowners
- Education of community members and government
- Riverine flooding
- Incentivizing development outside floodways/discouraging development within
- Inadequate staff capacity
- Creating plans/implementing solutions that address vulnerable and underserved areas
- Protecting shorelines and conserving natural resources
- Lack of technical knowledge to address coastal resiliency issues

Centralized and Public Surveys

Public Surveys

- **1,176 Respondents (online and hard copies)**
- Age
  - 20% - 18-39 years
  - 49% - 40-65
  - 30% - Aged 66 or over
- Sex
  - 50% - Female
  - 38% - Male
  - 7% - prefer not to answer
- Race
  - 72% - Caucasian
  - 8% - Black or African American
  - 2% - Native American/Alaska Native
  - 1.3% - Asian and Pacific Islander
  - 14% - prefer not to answer





VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Centralized and Public Surveys

Public Surveys Perceived Negative Impacts on Community

- Lack of funding, or money would be spent elsewhere, instead of where it is needed most.
- Governments could begin over-regulating private property.
- Timeliness of Implementation - projects will move too slowly and the situation will get worse and require more resources.
- Distrust of local governments to follow through and use the funds for the projects appropriately
- Increased taxes on residents who already pay high taxes without seeing the benefits of projects in the community.
- Only affluent communities will see the benefits of these projects - low- or fixed-income communities would be treated unequally
- Structural solutions can be destructive or may not be in the best interest of the community
- Lack of updated flood maps and data that accurately measure increased rainfall

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

PDC/RC Public Meetings

PDC	Date	Location	Attendees	Hybrid?
George Washington	7/27	Germanna Comm Coll.	0	N
PlanRVA	7/28	PlanRVA Boardroom	4	N
Crater	8/2	Tabernacle Community Center	10	Y
Middle Peninsula	8/3	Rappahannock Comm Coll.	6	N
Northern Neck	8/4	Northern Neck PDC Office	5	Y
Hampton Roads	8/5	HRPDC Boardroom	38	N
Accomack-Northampton	8/11	Eastern Shore Comm. College	13	Y
Northern Virginia	8/19	NoVA CC – Annandale	12	Online Only

PDC/RC Public Meeting

Public Meeting Agenda

- Presentation
- Q&A
- Visioning Station
- Mapping Station
- Survey Station
- Comments Box

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

PDC/RC Public Meetings

Major Concerns

- Inland rainfall flooding
- VDOT pipes /ditches maintenance
- Continued building/granting permits
- Consideration historic and cultural resources
- Taking land from Native Tribes and Freedmen African American Communities for acquisition/demolition
- Drainage pipes installed to drain affluent communities into underserved communities

Under-resourced Community Meetings

- **Targeted to under-resourced communities with moderate to high flood risk**
- **Guided listening sessions**
- **Scope for up to 32 - five scheduled through Sept 27, primarily in Hampton Roads**
    - Portsmouth - Sept 2: TCC Portsmouth Student Center
    - Norfolk (1) - Sept 9: Norfolk State Student Center, Section B
    - Norfolk (2) - Sept 14: Old Dominion University Webb Center, Hampton Newport News Room
    - Newport News - Sept 20: HRACP, 2410 Wickham Ave
    - Hampton - Sept 21: HRCAP, 1919 Commerce Drive
    - VA Beach - Sept 27: Corporate Landing Middle School
    - Hampton – Oct 5: Location TBD

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Questions?

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

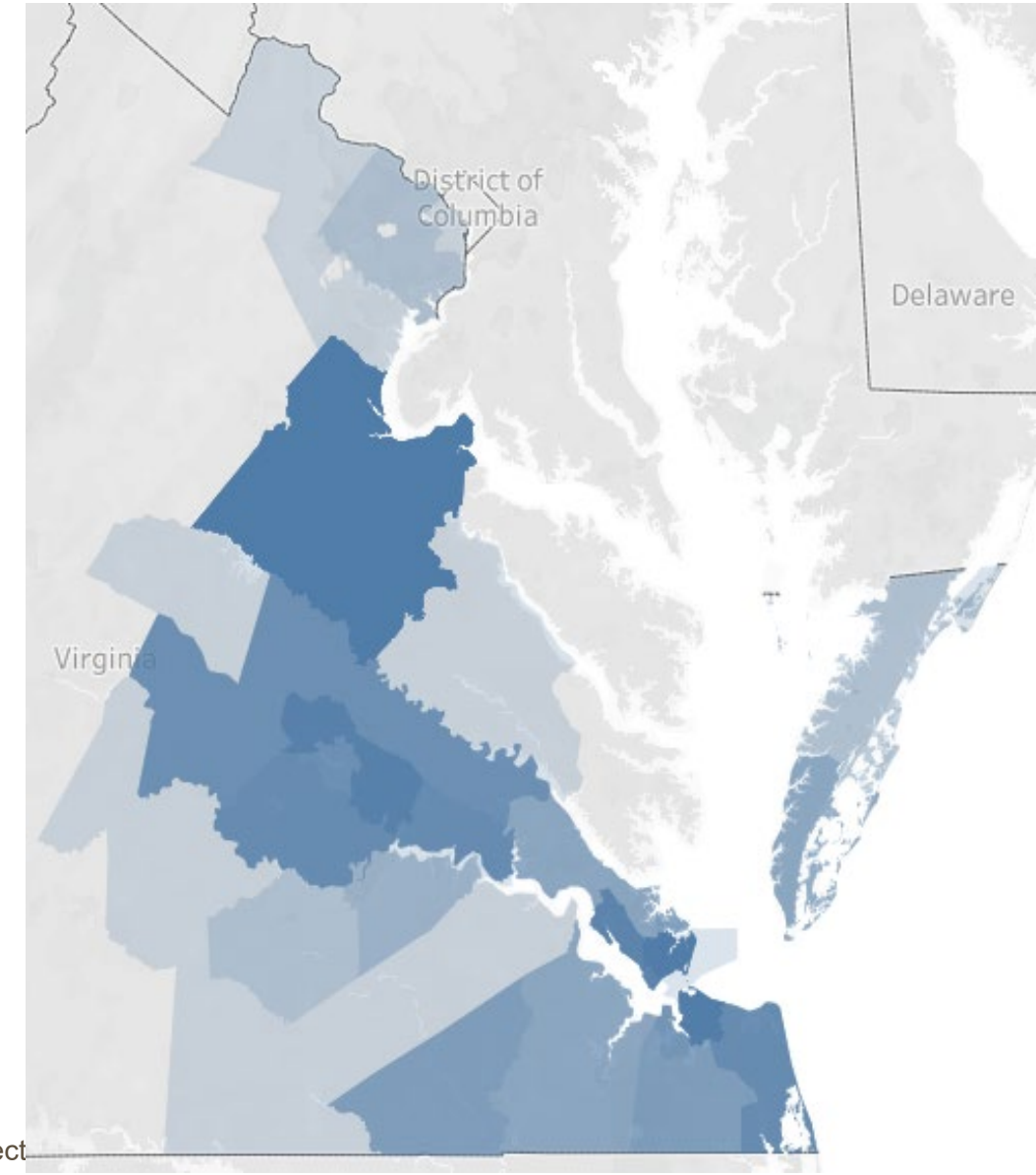
Project Identification and Evaluation

Topics

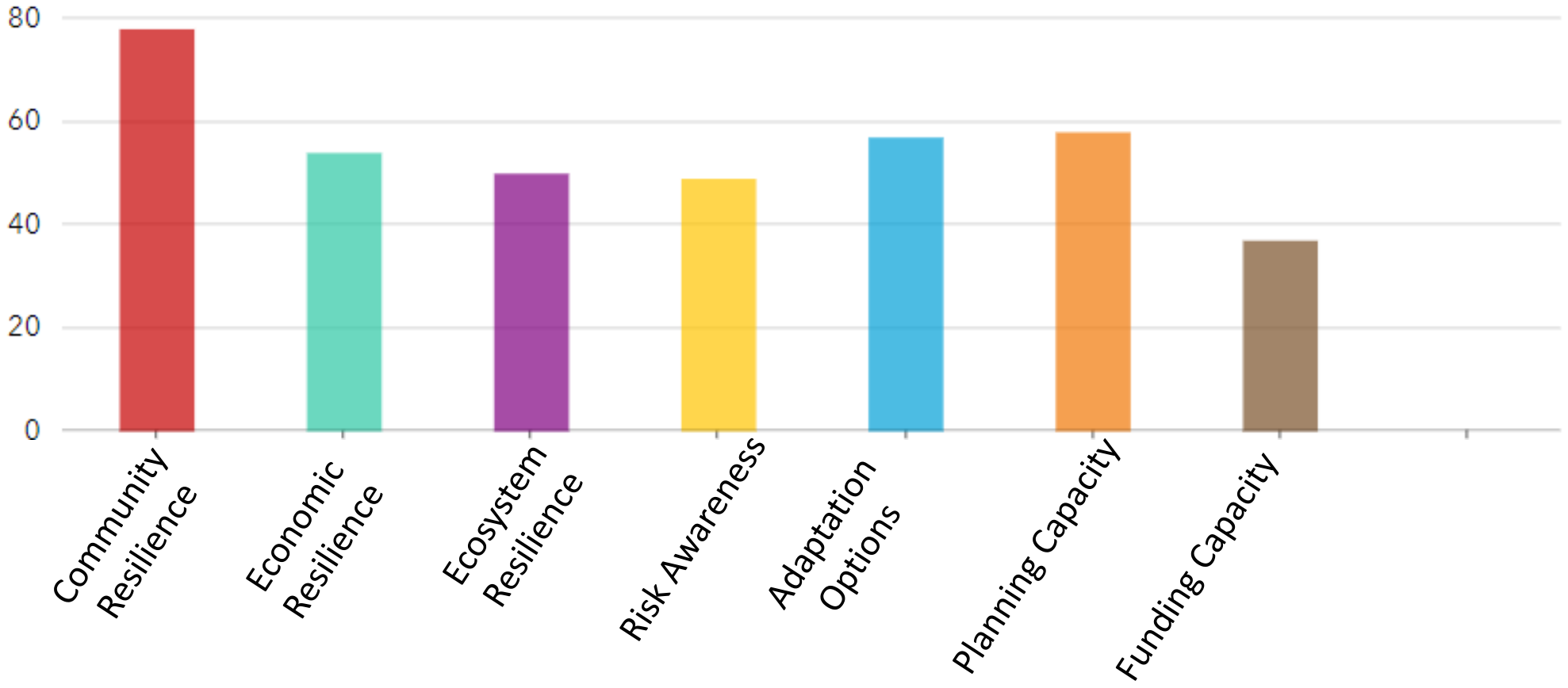
- Data Call – Capacity Building Needs
- Data Call – Projects
- Update on changes to Evaluation Criteria
- Project Evaluation/Prioritization Outcomes

Data Call –Capacity Building Needs

- **As of 8/30:**
  - 86 surveys submitted
- **Total Estimated Cost:** $79.3 Million
- **Missing**:
  - Northern Neck
  - Middle Peninsula

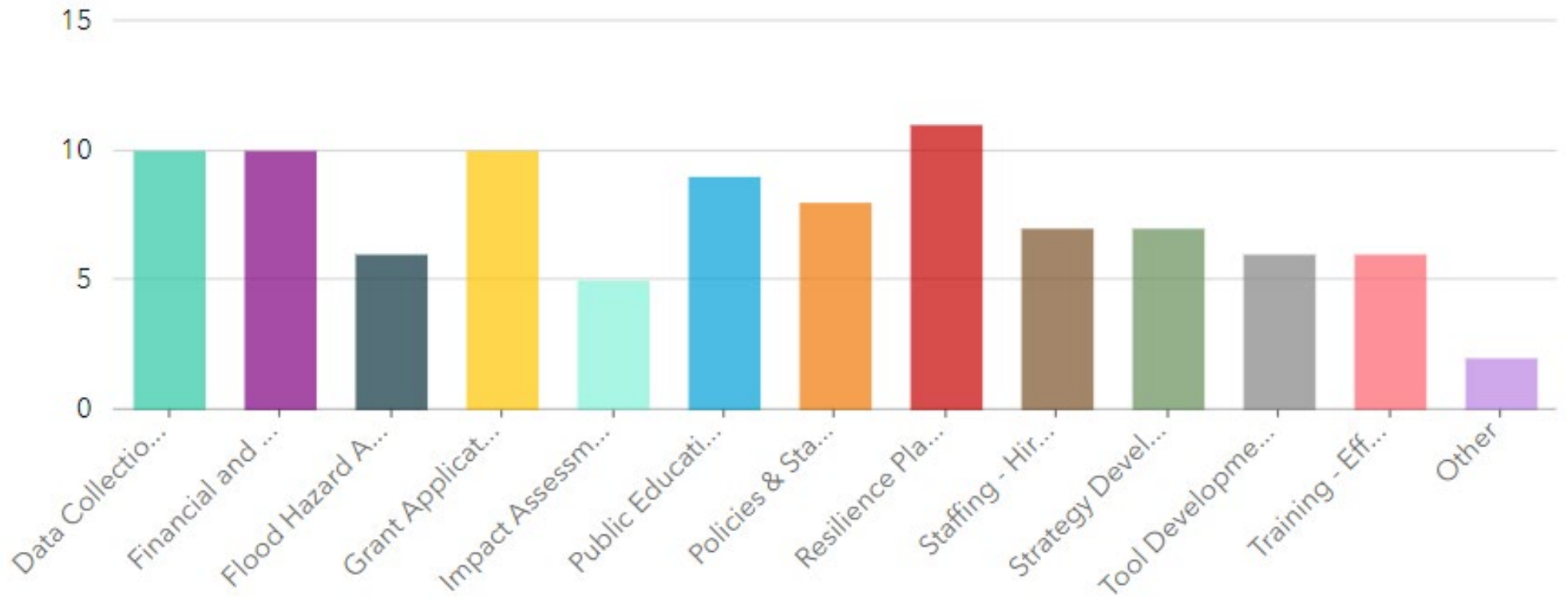


Types of Needs



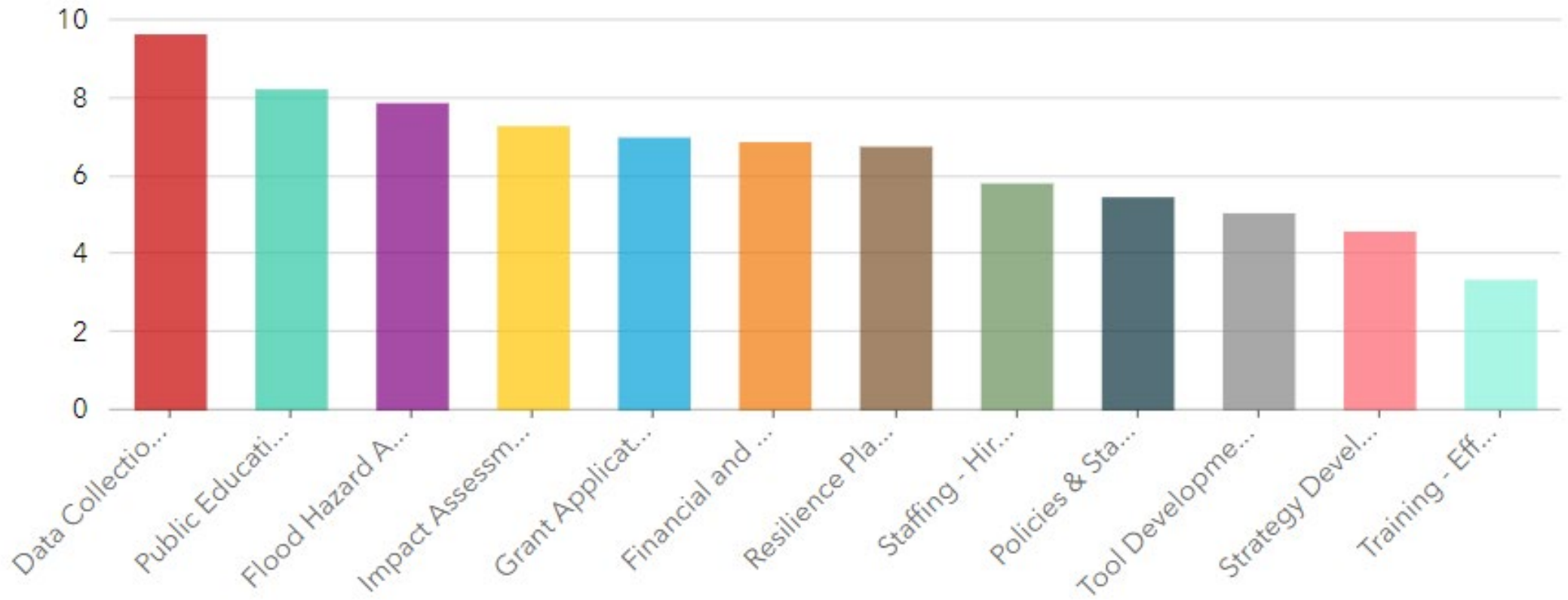
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Existing Capacity



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Other Capacity Needs



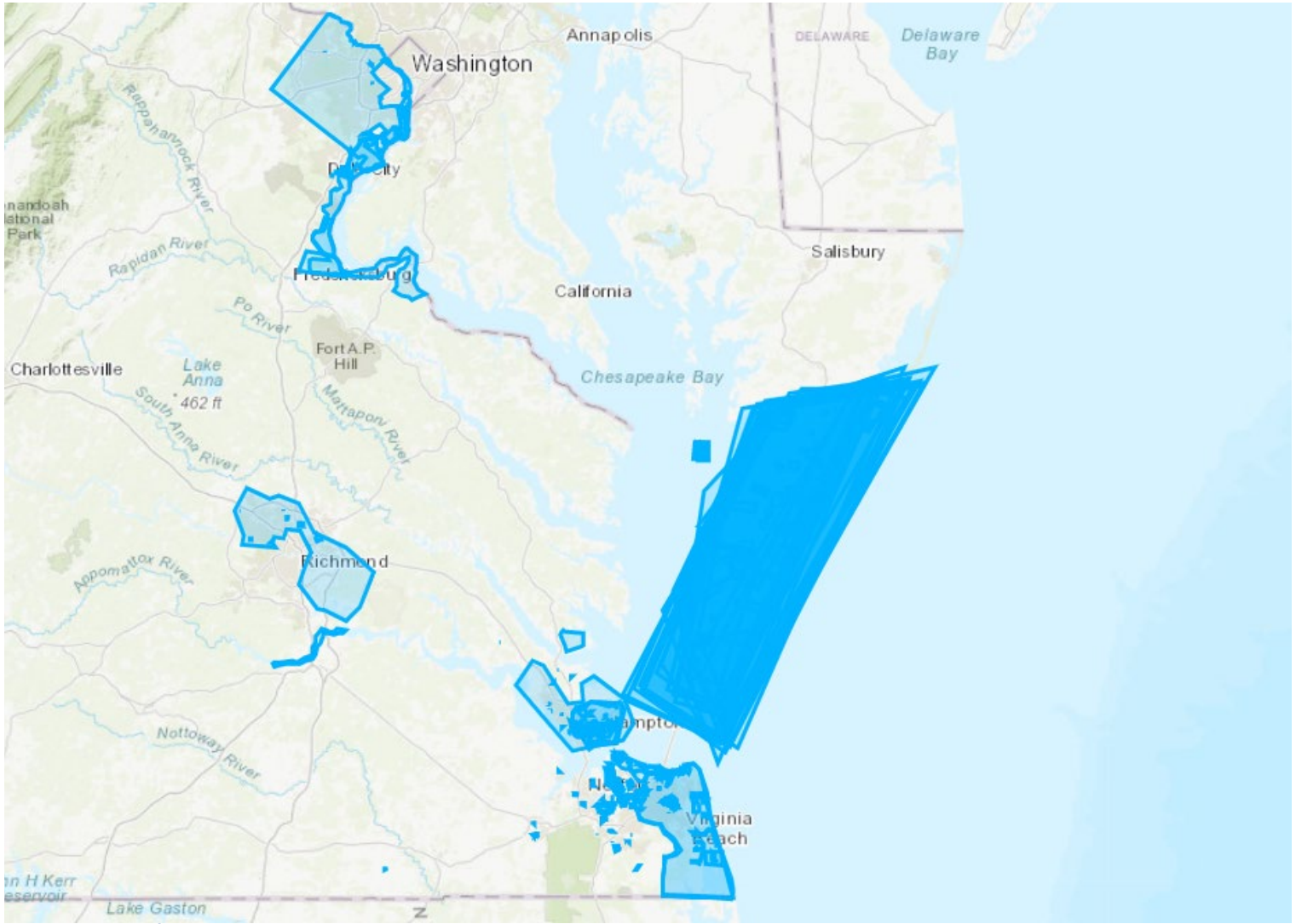
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Data Call – Projects

- **As of 8/13:**
  - 417 projects submitted
- **Total Implementation Cost:** $3.9 Billion
- **Survey will remain open to collect projects past 8/13, but projects may not be evaluated if entered after**

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

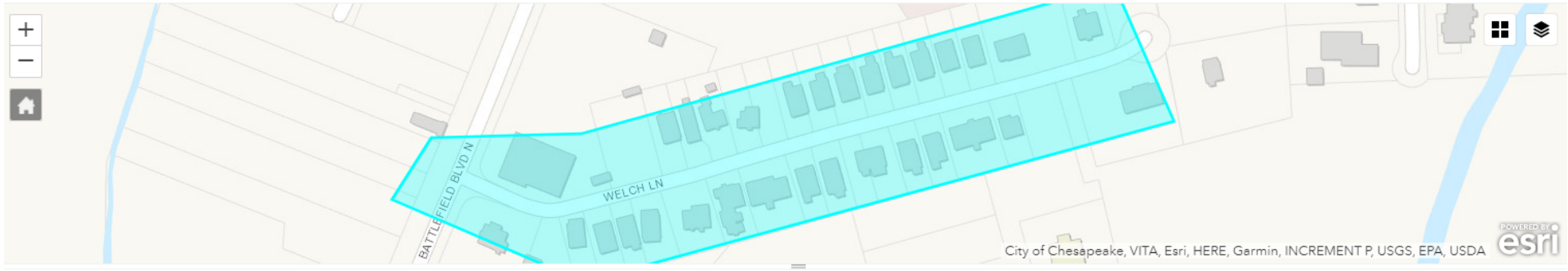
Spatial Distribution



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Project Footprints

6/28/21 - 8/8/21 | Filter | Report | Export | Open in Map Viewer | Form view



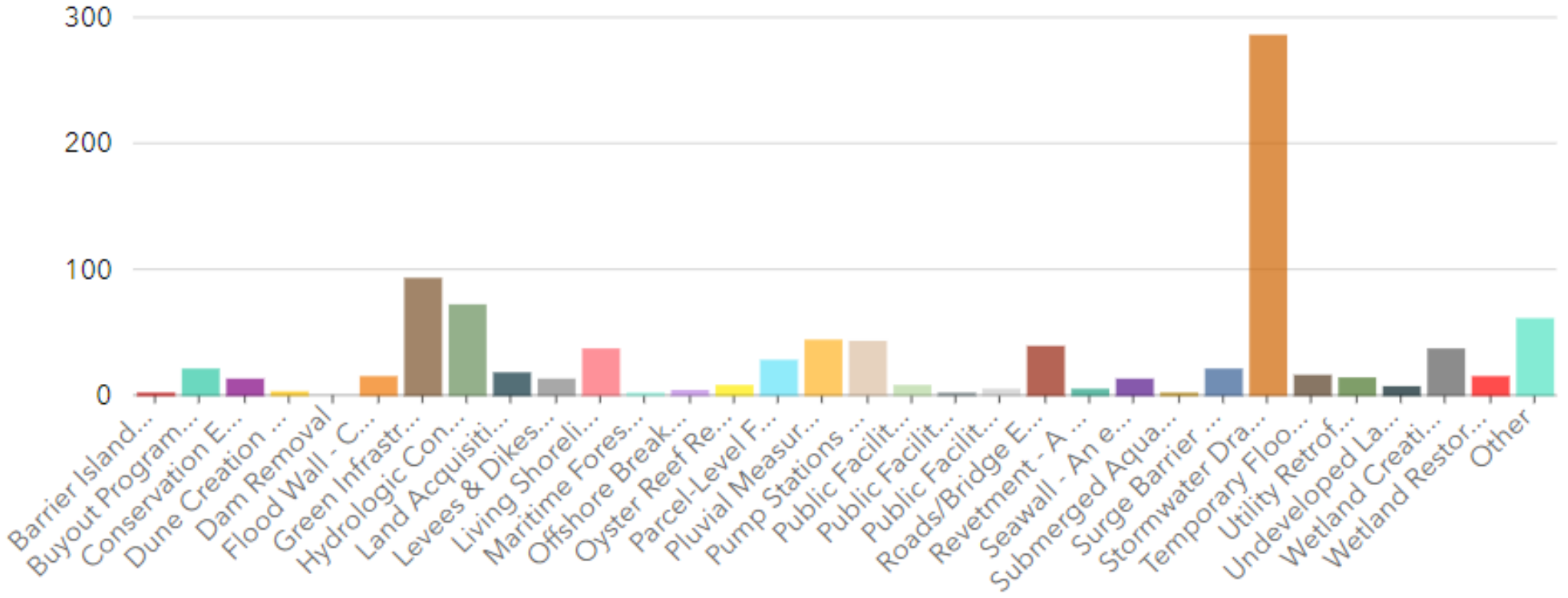
Virginia Coastal Resilience ...

Submitter Name	Submitter contact Info	Project Owner	Project Name	Related Initiative?	Description	Purpose and Need	Future Condition Considerations	Project Subtypes	Othe Proje Subt	Project Status
Crystal Bloom	cbloom@cityofchesapeake.net	City of Chesapeake	Welch_Lane_Drainage_Improvements	No	Provide a public stormwater system along Welch Lane and outfall upgrades to mitigate flooding issues.	Stormwater_Flooding	Local_Lower_Scenarios,No_Scenarios	Stormwater_Drainage_Improvement		Under Final Design and Permitting - Projects in this pha involve advancing conceptual or preliminary design into final designs a engineering plans, developing detailed cost estimates, engaging the community, prepar permit applications and other related tasks to position projects for implementation.

Owners with Multiple Submissions

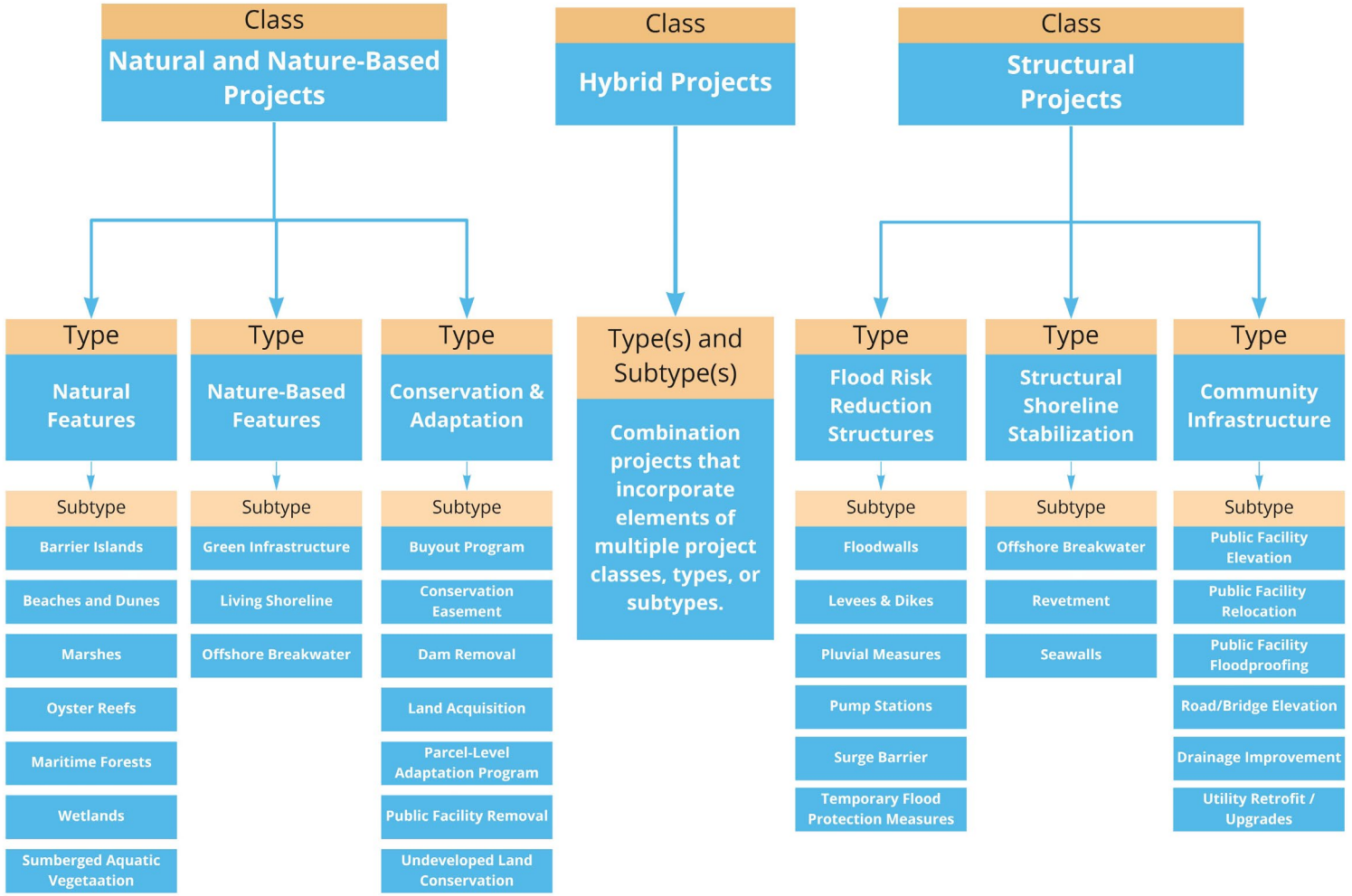
Response	Count
Hampton	145
City of Norfolk	42
The City of Virginia Beach	28
City of Chesapeake	23
A-NPDC	23
City of Virginia Beach	22
Newport News	16
Henrico County	12
A-NPDC/Eastern Shore Regional Navigable Waterway Committee	12
City of Suffolk	10

Project Subtypes



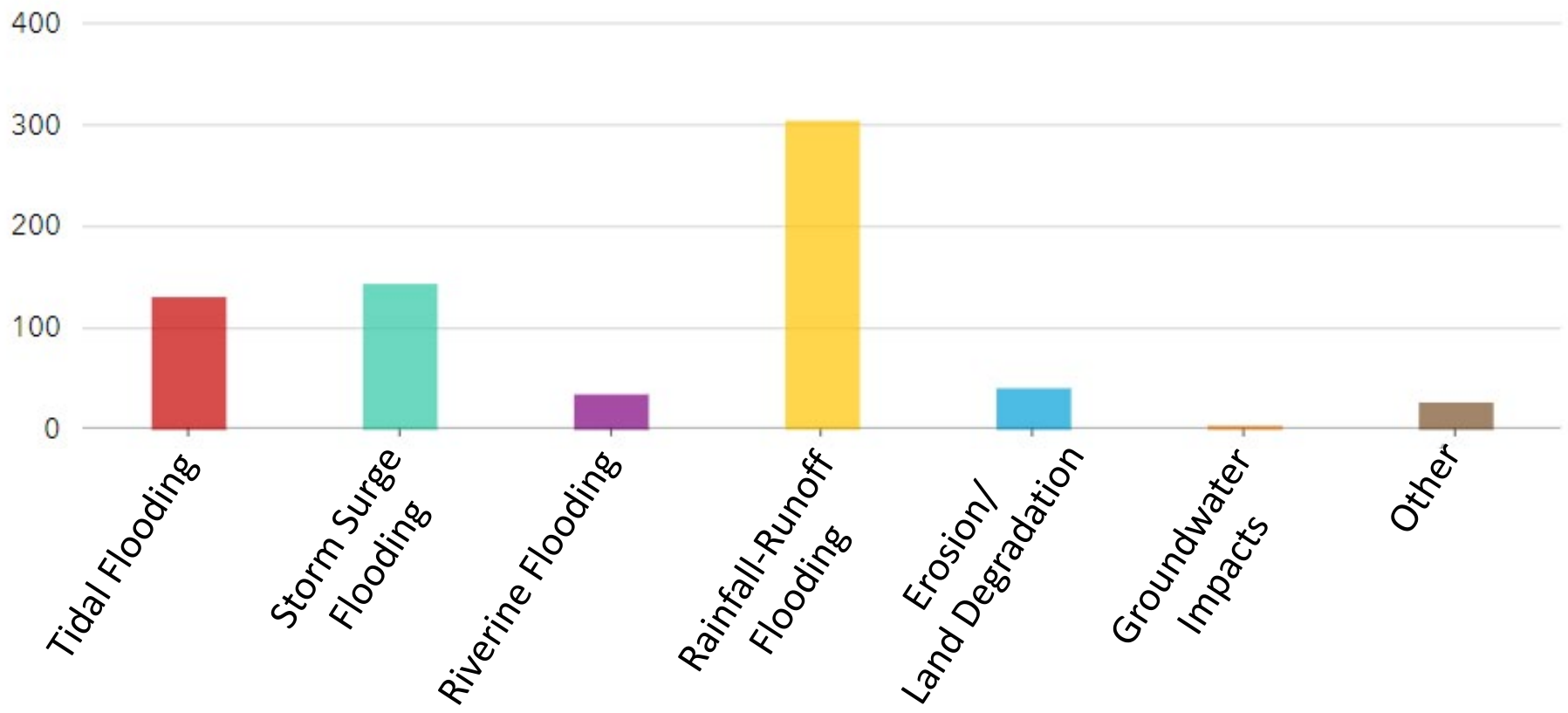
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Updated Project Classification Schema



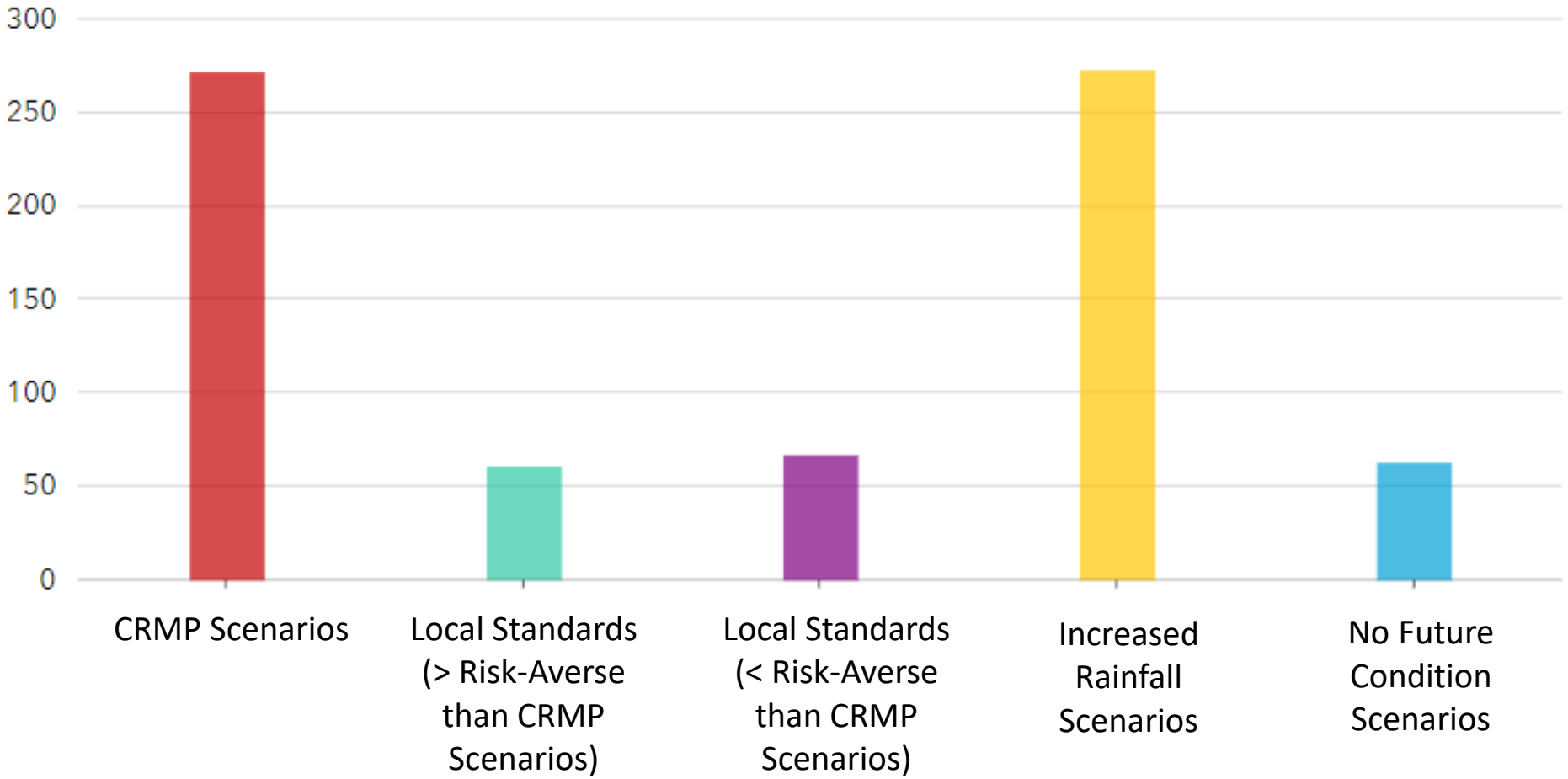
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Project Purpose and Need



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Future Condition Considerations



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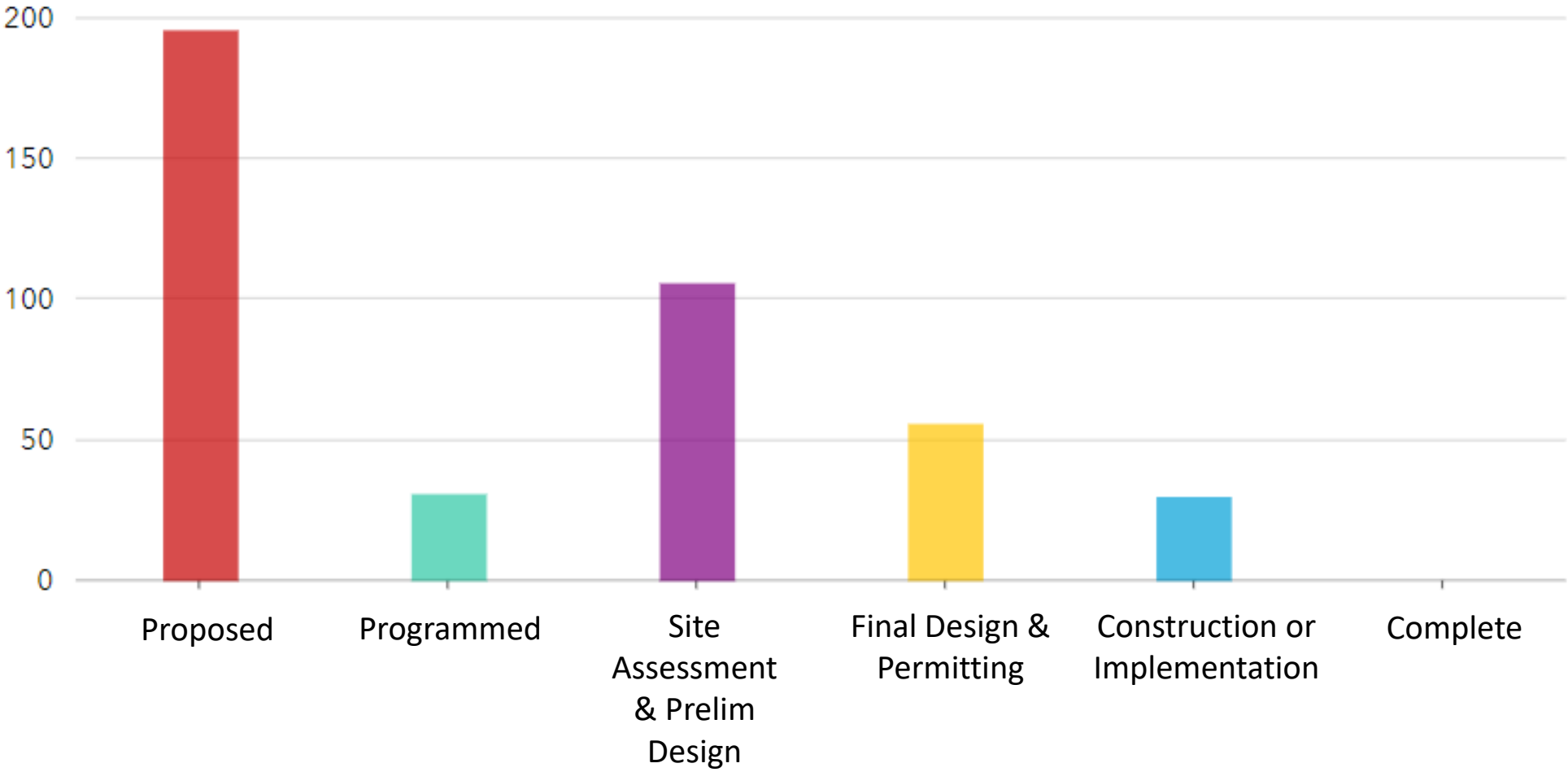
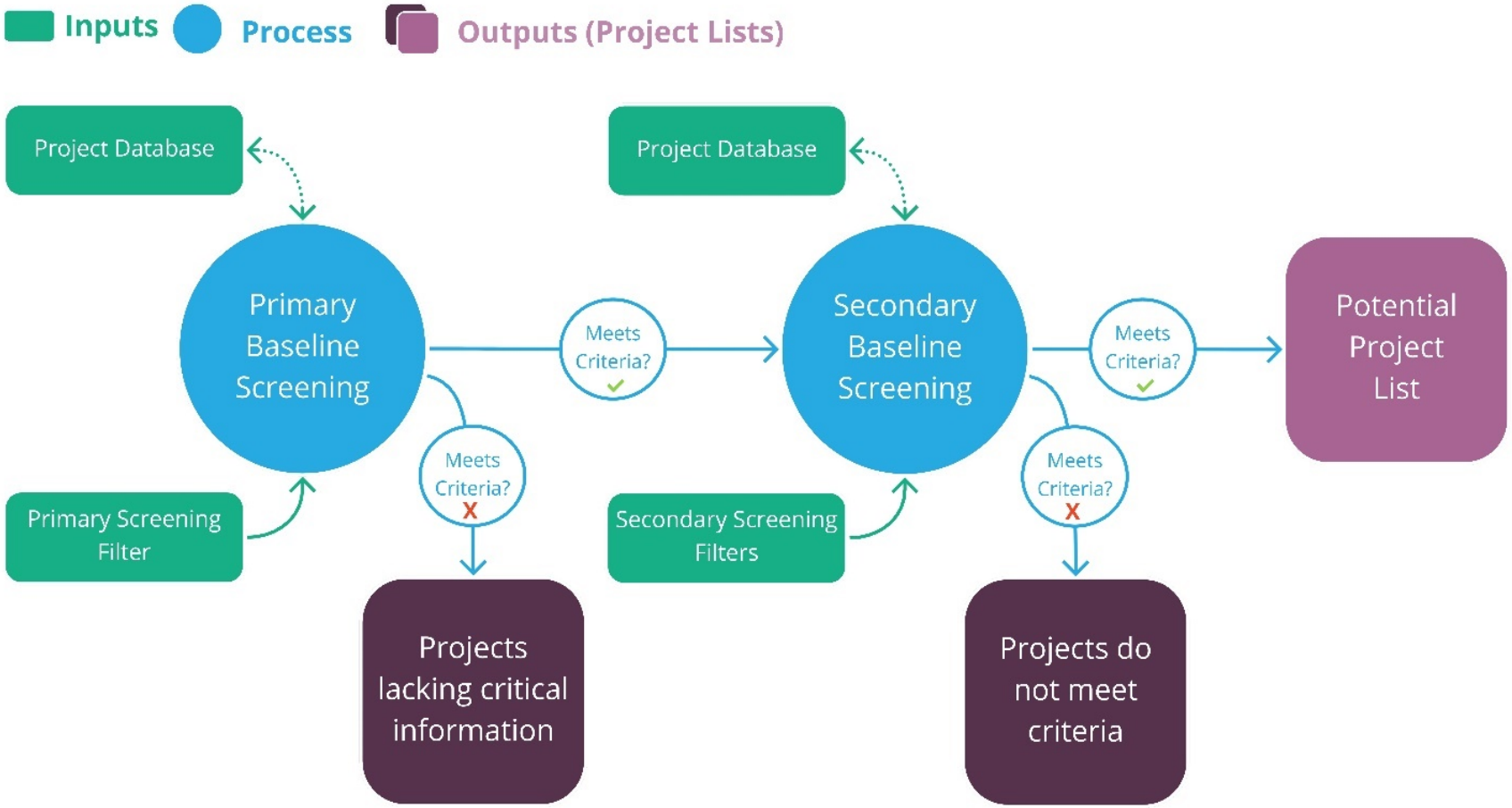
Project Status



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Baseline Screening



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Primary Screening

- ***Primary Screening Filter: Extent of Information***
  - ✓ All projects meet criteria

Question:
Did project owner provide necessary information to enable prioritization?

Secondary Screening

- ***Filter 1: Project Location within VA Coastal PDCs/RCs***
  -  All projects meet criteria
- ***Filter 2: Project Status***
  -  All projects meet criteria
- ***Filter 3: Project Contribution to Coastal Resilience***
  -  Many projects meet criteria
  -  Some projects do not meet criteria
  -  Some projects moved to Capacity Building

Questions:

Is the project located within VA Coastal PDCs/RCs?

Is the project not already complete?

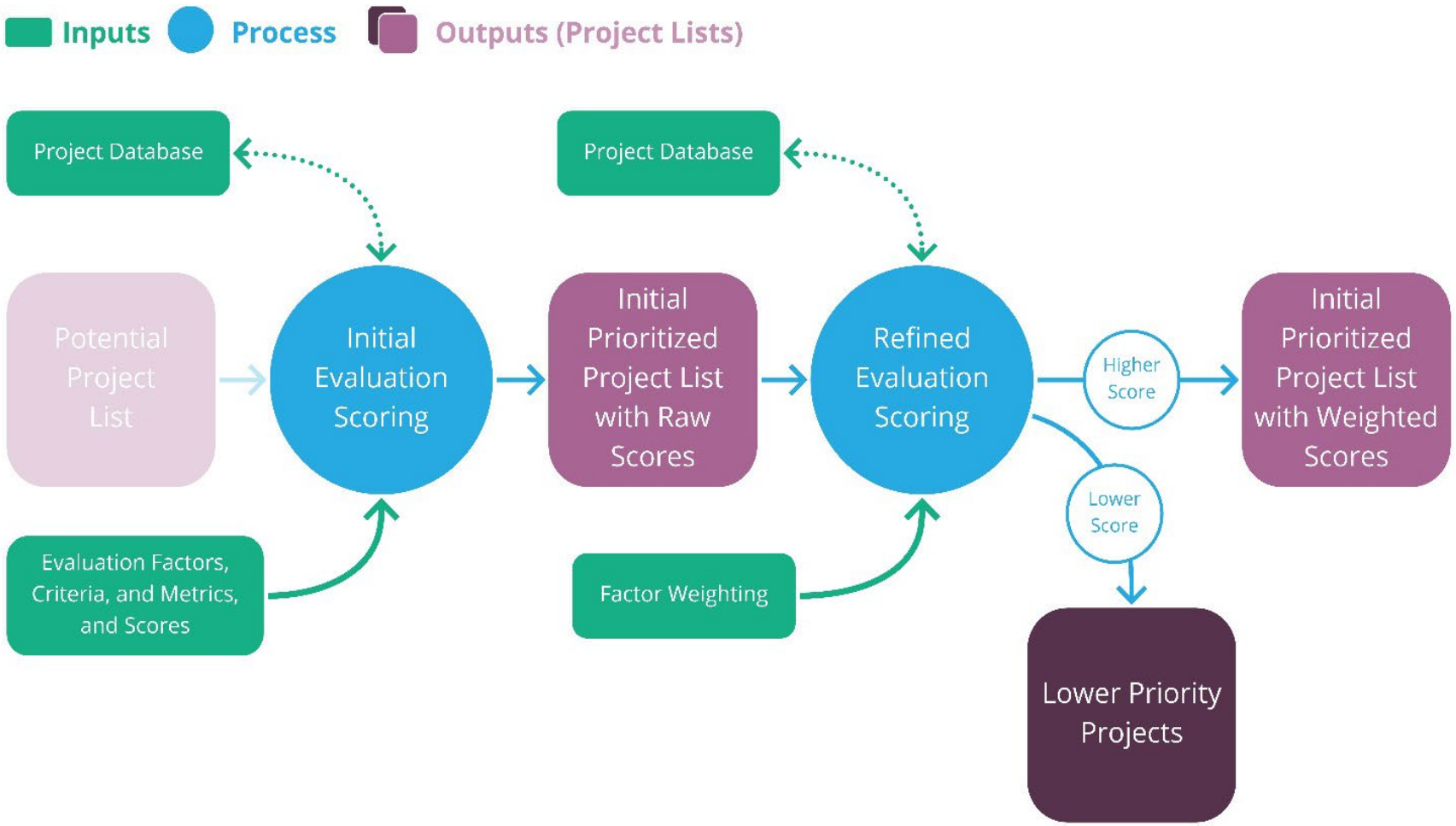
Does the project contribute to coastal resilience as defined by CRMP Framework?

Examples of Potential Screened Items

- This project will protect water resources and improve water quality by replacing maintained vegetation (lawns) with native trees, shrubs, and groundcovers.
- Conduct a Regional Dredging Needs Assessment for the Waterways on the Coast of Virginia (WCV) for Red Bank Creek to Hog Island Bay. This will include a beneficial use of dredged material assessment. We anticipate Part B of the application to be submitted to the Virginia Port Authority in fiscal year 2022.
- Dry hydrant for fire department to access creek water
- Demolish and remove abandoned and dangerous building - risk in high winds
- Generator for police station during power outage
- Mapping of change in ghost forests over time*

Note: Example of a project that would be moved to Capacity Building

Evaluation Scoring



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Evaluation Factors

Factor 1: Resilience Planning and Design

Factor 2: Equity Considerations

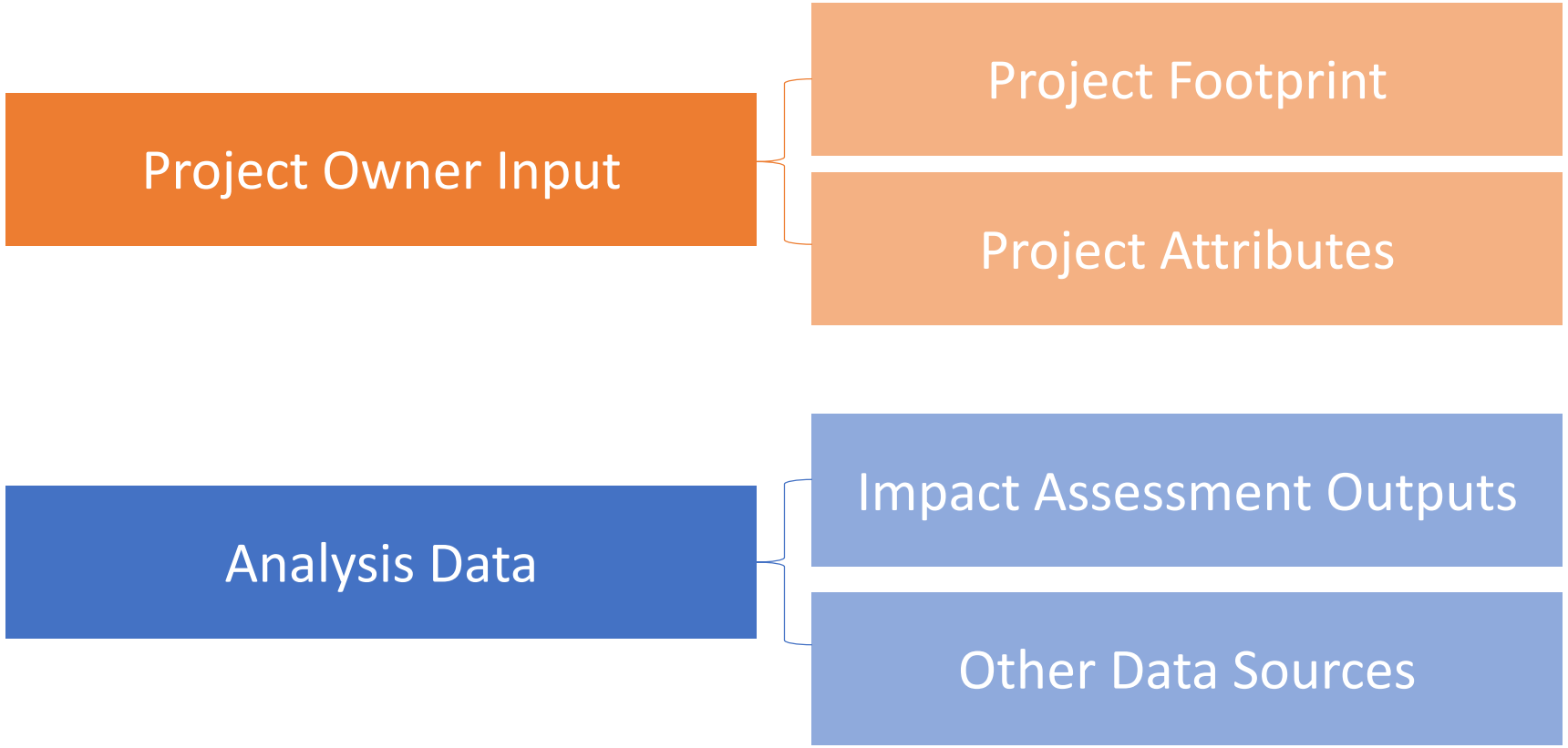
Factor 3: Natural and Nature-Based Approaches

Factor 4: Regional Collaboration

Factor 5: Project Benefits

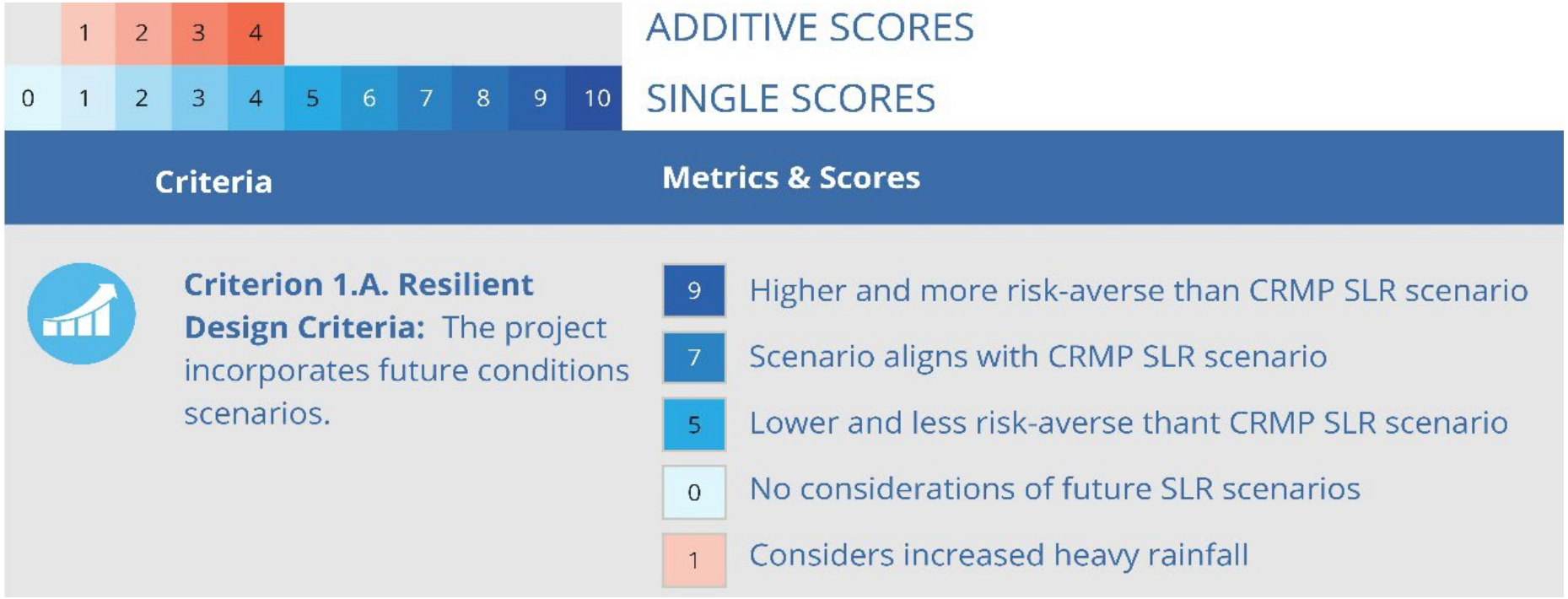
VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Evaluation Data Inputs & Approaches



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 1b – Resilient Design Criteria



Data Inputs	Project Data Call Entry – Future Conditions Considerations

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 1b – Project Need

1 2 3 4 ADDITIVE SCORES

Criteria	Metrics & Scores	
Criterion 1.B. Project Need: The project is needed to address both existing and future coastal flood exposure.	1	Existing exposure (tidal flooding)
	1	Existing exposure (10-year flood event)
	1	Existing exposure (100-year flood event)
	1	Near-term exposure (tidal flooding)
	1	Near-term exposure (10-year flood event)
	1	Near-term exposure (100-year flood event)
	1	Mid-term exposure (tidal flooding)
	1	Mid-term exposure (10-year flood event)
	1	Mid-term exposure (100-year flood event)
	1	Long-term exposure (tidal flooding)
	1	Long-term exposure (10-year flood event)
	1	Long-term exposure (100-year flood event)

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 1c – Project Purpose

1 2 3 4

ADDITIVE SCORES

Criteria	Metrics & Scores	
Criterion 1.C. Project Purpose: The project addresses coastal hazards and compounding stressors that exacerbate coastal hazards.	2	Coastal Flooding
	2	Riverine flooding
	2	Rainfall flooding
	1	Land degradation
	1	Groundwater impacts

Data Inputs | Project Data Call Entry – Purpose & Need

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 2a – Community Resources & Capacity

0 1 2 3 4 5 6 7 8 9 10 SINGLE SCORES

Criteria	Metrics & Scores
Criterion 2.A. Community Resources & Capacity The project provides communities with chronic fiscal stress- defined as communities facing lack of economic resources and capacity to address current and future increases in flooding.	10 Benefits a community with high fiscal stress 6 Benefits a community with above average fiscal stress 5 Benefits a community with below average fiscal stress 0 Does not benefit a community with fiscal stress

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 2b – Social Vulnerability

0 1 2 3 4 5 6 7 8 9 10 SINGLE SCORES

Criteria	Metrics & Scores
Criterion 2.B. Social Vulnerability: The project has the potential to add resilience to socially vulnerable communities.	10 Very high social vulnerability 8 High social vulnerability 6 Moderate social vulnerability 5 Low social vulnerability 0 Very low social vulnerability

Data Inputs | Project Footprint | Social Vulnerability Index

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 3 – Nature-Based Outcomes

0	1	2	3	4	5	6	7	8	9	10	SINGLE SCORES

Criteria	Metrics & Scores
Criterion 3.A. Nature-Based Ouctomces: The project supports the Commonwealth's priorities for coastal resilience (e.g. flood mitigation) and natural resource enhancement by protecting or enhancing natural systems.	10 Natural and nature-based projects 5 Hybrid projects 0 Other projects

Data Inputs	Project Data Call – Project Subtype	Project Classification Schema

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 4 – Regional Adaptation Priorities

1 2 3 4 ADDITIVE SCORES

Criteria	Metrics & Scores	
Criterion 4.A: Regional Adaptation Priorities: The project addresses regional adaptation priorities for community resources, critical sector assets, and natural infrastructure.	3	Highest Priority Community Resource Adaptation Area
	3	Highest Priority Critical Sectors Adaptation Area
	3	Highest Priority Natural Infrastructure Adaptation Area
	2	High Priority Community Resource Adaptation Area
	2	High Priority Critical Sectors Adaptation Area
	2	High Priority Natural Infrastructure Adaptation Area
	1	Medium Priority Community Resource Adaptation Area
	1	Medium Priority Critical Sectors Adaptation Area
	1	Medium Priority Natural Infrastructure Adaptation Area

Data Inputs | Project Footprint | Impact Assessment Outputs (Gridded Summaries)

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

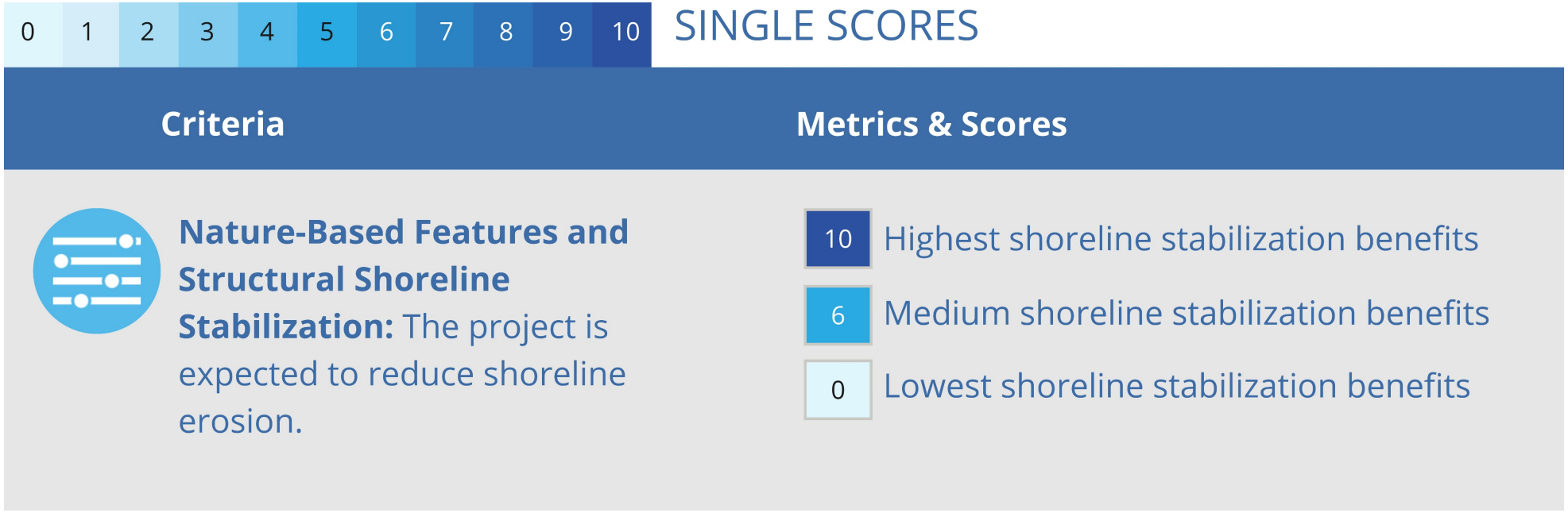
Criteria 5 – Project Benefits (Flood Reduction Structures)

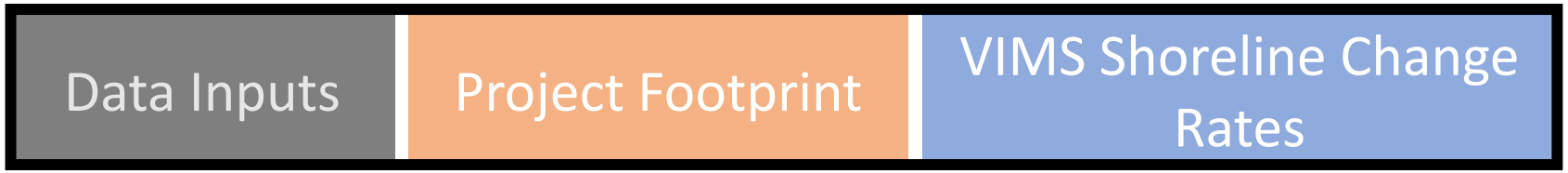
0 1 2 3 4 5 6 7 8 9 10 SINGLE SCORES

Criteria	Metrics & Scores
Flood Risk Reduction Structures: The project is expected to reduce existing and future coastal flood risk.	10 High economic flood risk reduction 6 Moderate economic risk reduction 2 Very low economic risk reduction 0 No economic risk reduction

Data Inputs	Project Impact Area (based on Extent of Benefits in Data Call)	Impact Assessment Average Annualized Loss

Criteria 5 – Project Benefits (NBF and Structural Shoreline Stabilization)





VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 5 – Project Benefits (NF, NBF, and Conservation & Adaptation)

1 2 3 4 ADDITIVE SCORES

Criteria	Metrics & Scores	
Natural Features; Nature-Based Features; Conservation and Adaptation: The project is expected to protect and/or enhance natural systems critical for natural habitat and ecosystem diversity, flood resilience, scenic preservation, and water quality improvements.	2	Floodplains and flooding resilience
	2	Natural habitat and ecosystem diversity
	2	Agriculture and forestry preservation
	2	Protected landscape resilience
	2	Water quality improvements

Data Inputs | Project Footprint | ConserveVA Layers

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Criteria 5 – Project Benefits (Community Infrastructure)

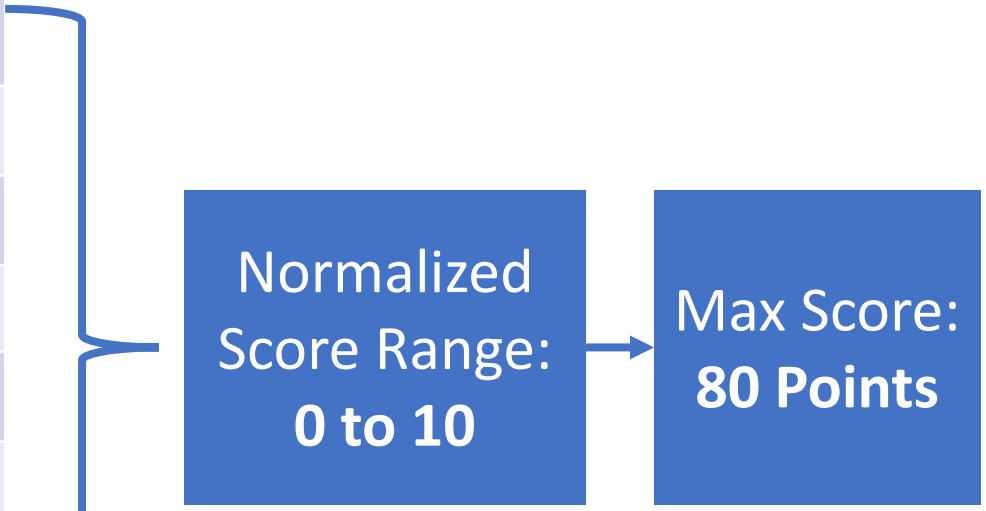
0 1 2 3 4 5 6 7 8 9 10 SINGLE SCORES

Criteria	Metrics & Scores
Community Infrastructure: The project is expected to provide community-scale benefits to the populated area surrounding the project.	10 High community benefit 8 Medium benefit 4 Small community benefit

Data Inputs	Project Impact Area (based on Extent of Benefits in Data Call)	Population or Average Annual Daily Traffic Counts

Scoring Normalization

Criteria	Raw Score Range
1a: Resilient Design	0 to 10
1b: Project Need	0 to 12
1c: Project Purpose	0 to 8
2a: Community Resources & Capacity	0 to 10
2b: Social Vulnerability	0 to 10
3: Nature-Based Outcomes	0 to 10
4: Regional Adaptation Priorities	0 to 9
5: Project Benefits	0 to 40



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Project Tiers

Tier 1

- Top 75th Percentile
- Pass baseline screening

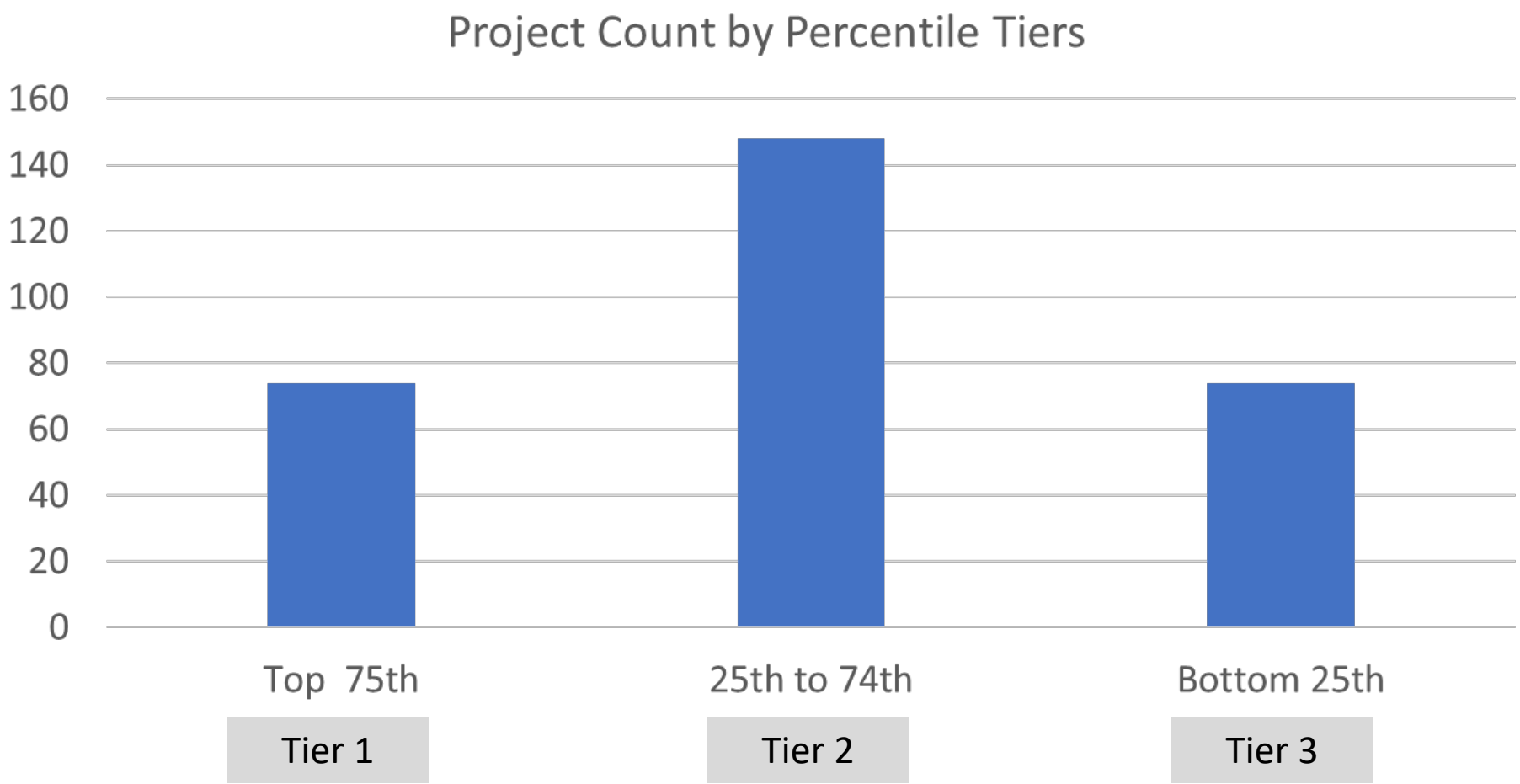
Tier 2

- Between 50th and 74th Percentile
- Pass baseline screening

Tier 3

- Bottom 25th Percentile
- Do not pass baseline screening

Initial Tiering Explorations - Example



VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021

Status

- Scoring undergoing iterative review and discussion by the Commonwealth and consultant team
- Anticipate additional vetting of project data prior to final product
- Working on increased alignment with Commonwealth goals

Questions?

VIRGINIA COASTAL RESILIENCE MASTER PLAN 2021