Office of Environmental and Energy Coordination

CECAP and Resilient Fairfax Update to EQAC

August 11, 2021

Climate Change Planning and Action

CECAP: Community-Wide Climate & Energy Action Plan

Reducing emissions that contribute to climate change

- Ex: Transition to renewable energy, energy efficiency, waste reduction, alternative transportation

- Community-oriented plan, because 95% of emissions are from the community

- January 2020 – July 2021 plan; Fall 2021 BOS

Resilient Fairfax

Adaptation & resilience to climate effects

- Ex: Resilience to flooding, extreme temperatures, extreme weather, health hazards, precipitation pattern changes

- Lead by government, infrastructure partners

- Feb 2021 – June 2022 plan; Fall 2022 BOS

CECAP Overview

- **CECAP is a community planning process focused on greenhouse gas (GHG) emission reduction**

- **Overall CECAP Goal:** Carbon neutral by 2050, with 87% reduction in total greenhouse gas (GHG) emissions from 2005 level

- **Interim Goals – 2030 and 2040:** 2030: 50% reduction in GHG emission / 2040: 75% reduction in GHG emissions

- **Sector-based goals**
  - Green buildings
  - Retrofitting existing housing for energy efficiency
  - Increasing transit and non-motorized commuting
  - Increasing use of electric vehicles
  - Natural resources
  - Waste

- **12 Strategies, 37 actions**

CECAP Process

Project Initiation
January 2020

GHG Reduction Inventories, Models and GOALS
March 2020 – May 2021

Climate Mitigation - STRATEGIES AND ACTIONS
December 2020 – March 2021

Community Engagement Planning
August 2020 - Ongoing

Develop Final CECAP Technical Report
January 2021 – July 2021

Education/ Outreach & Implementation
Starting in Fall 2021

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CECAP Strategies and Actions

S1	**Increase energy efficiency and conservation in existing buildings**	**S6**	**Increase energy supply from renewable natural gas (RNG), hydrogen, and power-to-gas**
1a	Energy efficiency in residential buildings	6a	Expansion in supply and use of renewable natural gas, hydrogen, and power-to-gas
1b	Energy efficiency in commercial buildings	**S7**	**Increase electric vehicle (EV) adoption**
1c	Energy efficiency in local government existing buildings and streetlights	7a	EV use across on-road vehicles and off-road equipment through the use of County assets
1d	District energy and CHP systems	7b	EV adoption by consumers and private fleets
1e	Gas and electricity demand programs	7c	EV chargers in new buildings
S2	**Pursue beneficial electrification in existing buildings**	**S8**	**Support efficient land use, active transportation, public transportation and transportation demand management (TDM) to reduce vehicle miles traveled**
2a	Beneficial electrification in existing residential buildings	8a	Bicycle and pedestrian infrastructure
2b	Beneficial electrification in existing commercial buildings	8b	Public transportation and commuter services
2c	Reduction in the use of high GWP refrigerants	8c	Smart-growth and transportation demand management (TDM) strategies
S3	**Implement green building standards for new buildings**	**S9**	**Increase fuel economy and use of low carbon fuels for transportation**
3a	Increased building code stringency for residential and commercial buildings	9a	Low carbon fuels for transportation
3b	All-electric new residential and commercial construction	9b	Fuel efficiency improvements
3c	Green building principles and practices	9c	Low carbon fuels for aviation
3d	Reuse of existing buildings	**S10**	**Reduce the amount of waste generated and divert waste from landfills and waste to energy facilities.**
S4	**Increase the amount of renewable energy in the electric grid**	10a	Reduction in overall waste generation
4a	Large offsite grid renewable energy	10b	Waste diversion from landfills and waste-to-energy through recycling and composting
4b	Grid storage	**S11**	**Responsibly manage all waste generated including collected residential and commercial waste, wastewater, and other items.**
4c	Continued operation of existing nuclear electricity production	11a	Energy capture and use at landfills and waste to energy facilities
S5	**Increase production of onsite renewable energy**	11b	Alternative options for long term waste management (landfill, waste to energy, and other options)
5a	Solar PV on existing buildings	11c	Improvements to wastewater treatment processes to capture energy
5b	Solar PV in all new construction	**S12**	**Support preservation, restoration, and expansion of natural systems and green spaces**
5c	Community Solar projects	12a	Conservation of existing tree canopy and green spaces
5d	Battery storage projects	12b	Expansion of green spaces and tree canopy
		12 c	Cross-Disciplinary County Staff Team to Evaluate Climate Change Resources, Policies and Programs

EQAC Focus Areas

- Land Use

- Transportation

- Water

- Waste Management

- Parks and Ecological Resources

- Climate and Energy

- Air Quality

- Wildlife Management

CECAP Strategies and Focus Areas

	Land Use	Transportation	Water	Waste Management	Parks and Ecological Resources	Climate and Energy	Air Quality	Wildlife Management
S1: Increase energy efficiency and conservation in existing buildings	X	--	--	--	--	X	X	--
S2: Pursue beneficial electrification in existing buildings	X	--	--	--	--	X	X	--
S3: Implement green building standards for new buildings	X	--	X	--	--	X	X	--
S4: Increase the amount of renewable energy in the electric grid	--	--	--	--	--	X	X	--
S5: Increase production of onsite renewable energy	X	--	--	--	--	X	X	--
S6: Increase energy supply from renewable natural gas (RNG), hydrogen, and power-to-gas	--	--	--	--	--	X	X	--
S7: Increase electric vehicle (EV) adoption	X	X	--	--	--	X	X	--
S8: Support efficient land use, active transportation, public transportation and transportation demand management (TDM) to reduce vehicle miles traveled	X	X	--	--	--	X	X	--
S9: Increase fuel economy and use of low carbon fuels for transportation	--	X	--	--	--	X	X	--
S10: Reduce the amount of waste generated and divert waste from landfills and waste to energy facilities.	--	--	--	X	--	X	X	--
S11: Responsibly manage all waste generated including collected residential and commercial waste, wastewater, and other items.	--	--	X	X	--	X	X	--
S12: Support preservation, restoration, and expansion of natural systems and green spaces	X	--	X	--	X	X	X	X

Land Use

Strategies:

- S1: Increase energy efficiency and conservation in existing buildings

- S2: Pursue beneficial electrification in existing buildings

- S3: Implement green building standards for new buildings

- S5: Increase production of onsite renewable energy

- S7: Increase electric vehicle (EV) adoption

- S8: Support efficient land use, active transportation, public transportation and transportation demand management (TDM) to reduce vehicle miles traveled

- S12: Support preservation, restoration, and expansion of natural systems and green spaces

Implementation example: Support for green building, energy efficiency, retrofitting, renewable energy, land use policies and incentive programs

Transportation

Strategies:

- S7: Increase electric vehicle (EV) adoption

- S8: Support efficient land use, active transportation, public transportation and transportation demand management (TDM) to reduce vehicle miles traveled

- S9: Increase fuel economy and use of low carbon fuels for transportation

Implementation example: Support for EV infrastructure policies and incentive programs

Water

Strategies:

- S3: Implement green building standards for new buildings
- S11: Responsibly manage all waste generated including collected residential and commercial waste, wastewater, and other items.
- S12: Support preservation, restoration, and expansion of natural systems and green spaces

Implementation example: support for policies protecting green spaces as they relate to water quantity and quality

Waste Management

Strategies:

- S10: Reduce the amount of waste generated and divert waste from landfills and waste to energy facilities.

- S11: Responsibly manage all waste generated including collected residential and commercial waste, wastewater, and other items.

Implementation example: Support for policies on zero waste (also a sector-based goal)

Parks and Ecological Resources

Strategy:

- S12: Support preservation, restoration, and expansion of natural systems and green spaces

Implementation example: Support for policies to strengthen and protect natural resources in Fairfax County

Climate and Energy

Strategies: All!

Implementation example: Any of the recommended activities for implementation in the CECAP report!

Air Quality

Strategies: All!

Implementation example: Any of the recommended activities for implementation in the CECAP report!

Wildlife Management

Strategy:

- S12: Support preservation, restoration, and expansion of natural systems and green spaces

Implementation example: Support for policies to strengthen wildlife management or land use policies that support wildlife management in Fairfax County

Next steps for CECAP

- Presentations to Board
  - Board adopts Final CECAP Report in September

- Transition from planning to implementation
  - Initial implementation
    - Public education and outreach, including public survey
    - Build on existing County policies, programs, and efforts
    - Analyze legislative recommendations
  - Develop an implementation plan with Board guidance
  - Identify and create community implementation partnerships

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Resilient Fairfax Update to EQAC

August 11, 2021

Resilient Fairfax: Background

- **Board of Supervisors direction**
  - Environmental Vision
  - Fairfax Green Initiatives Board Matter
- **Purpose: address climate effects already taking place**
  - Flooding, severe storms, extreme heat, other effects
  - Example: single 2019 storm: $14.8 million
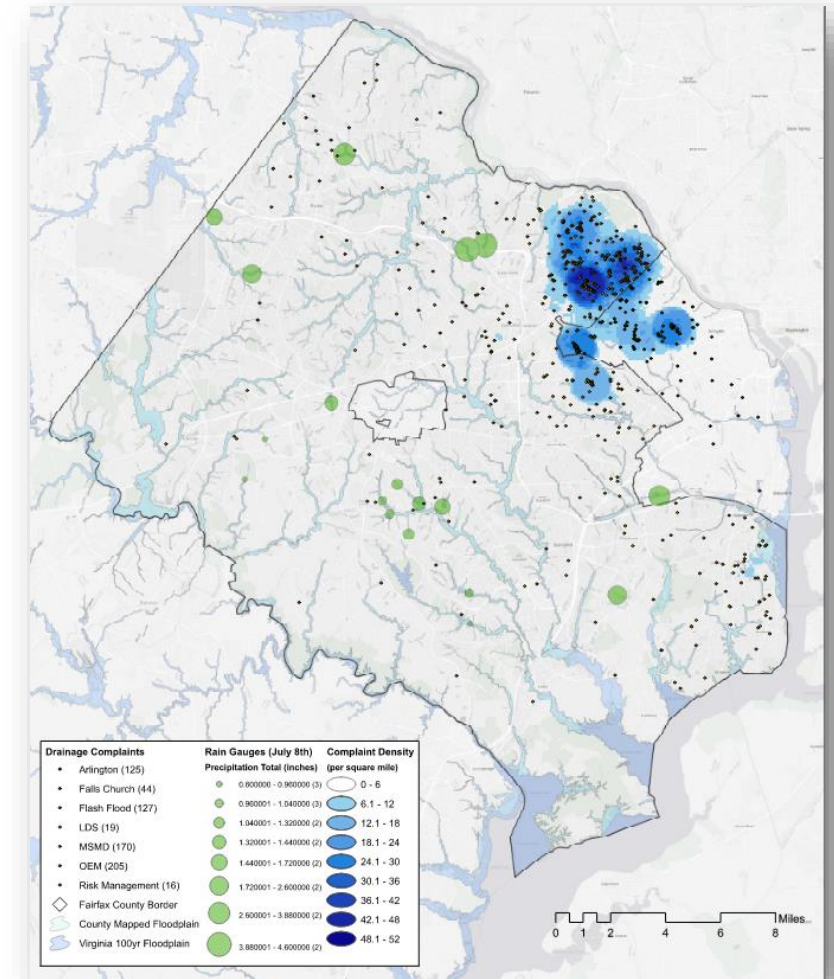
Map of flooding complaints

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Resilient Fairfax's purpose is to determine:

- **What climate change *effects* will our county face?**
  - Flooding, temperature, storm severity, etc.
- **Where are we vulnerable?**
  - Infrastructure, Population, Services/Operations
- **What policies, programs, and plans do we have in place?**
  - Which work well and can be expanded?
  - Where are the gaps?
- **Which strategies will strengthen our resilience?**
  - Feasibility, Priority
- **What is the path to implementation?**
  - Funding, policies, operations, partnerships

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Resilient Fairfax Key Players

Project Management Team: Office of Environmental and Energy Coordination Staff

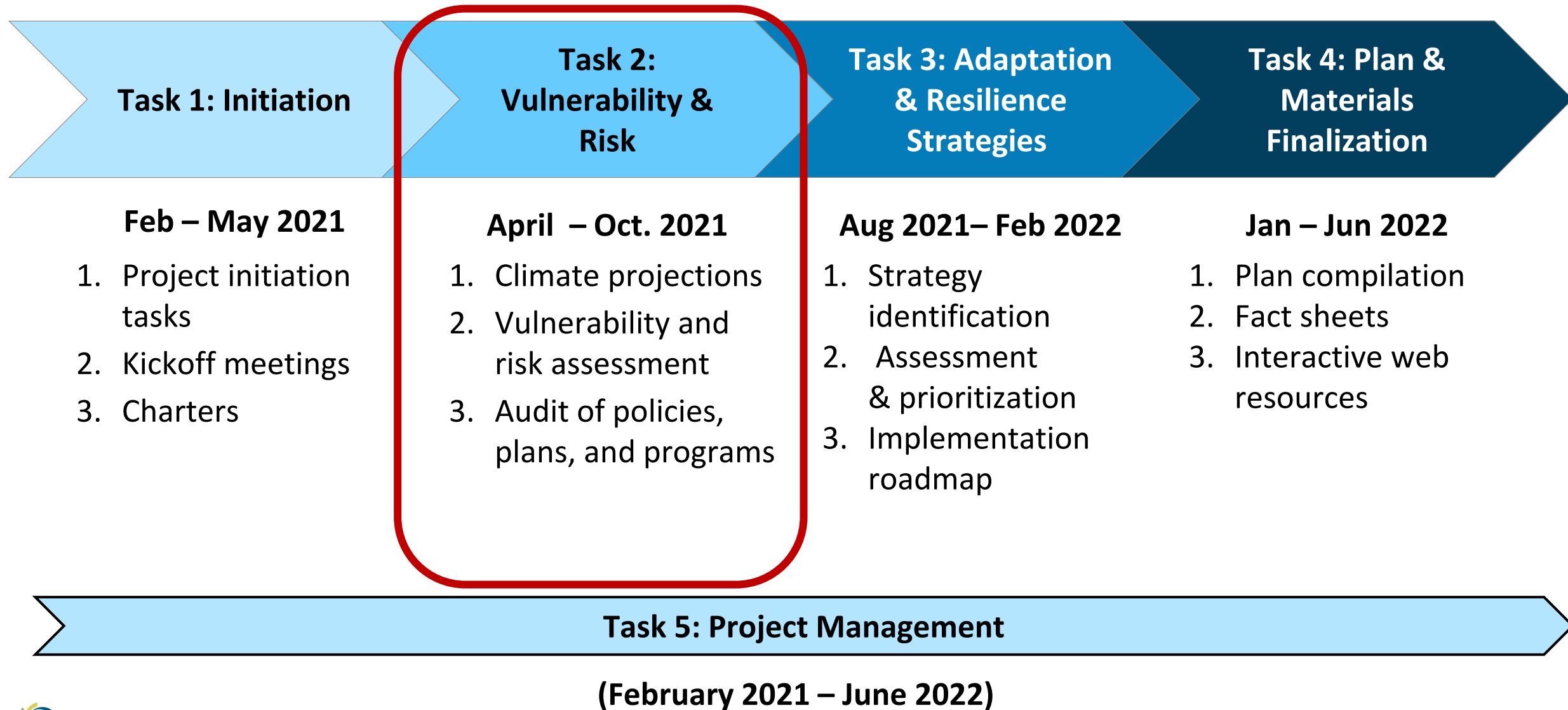**Consultant Team:** Cadmus, WSP, NSpireGreen

Planning Team (PT): County departments & agencies (DFS, DOT, DPD, DPWES, DVS, FCPA, FCPS, FMD, GIS, HD, HCD, LDS, NCS, NVSWCD, OEEC, OEM, OneFairfax, PSC)

Infrastructure Advisory Group (IAG): Utilities, authorities, building industry groups, transportation commissions, regional partners, state agencies, federal agencies

Community Advisory Group (CAG): District reps, community, advocacy groups

Steering Committee (SC): Deputy County Executives, Equity Officer

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Resilient Fairfax Scope of Work

Task 1: Initiation	Task 2: Vulnerability & Risk	Task 3: Adaptation & Resilience Strategies	Task 4: Plan & Materials Finalization
Feb – May 2021	**April – Oct. 2021**	**Aug 2021– Feb 2022**	**Jan – Jun 2022**
1. Project initiation tasks 2. Kickoff meetings 3. Charters	1. Climate projections 2. Vulnerability and risk assessment 3. Audit of policies, plans, and programs	1. Strategy identification 2. Assessment & prioritization 3. Implementation roadmap	1. Plan compilation 2. Fact sheets 3. Interactive web resources

Task 5: Project Management

(February 2021 – June 2022)

Resilient Fairfax Progress Update

Task	Sub-Task	Status
Task 1	✓ Project Initiation, Charters, Schedule, Budget, SOW	Done
	✓ PT, IAG, CAG Meetings #1	Done
Task 2	✓ Public Meeting #1	Done
	✓ Public Survey	Done
	✓ PT Meeting #2, Audit & VRA interviews	Done
	✓ Public Survey Results Report	Done
	✓ Draft Climate Projections Report	Done
	• Draft Audit of Existing Plans, Policies, Programs	Drafts available in Sept
	• Draft Vulnerability and Risk Assessment	Drafts available in Sept

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Task 2: Climate Projections in Fairfax County

Most Severe Projections

Extreme Heat

Extreme Precipitation Events

Minor

Drought
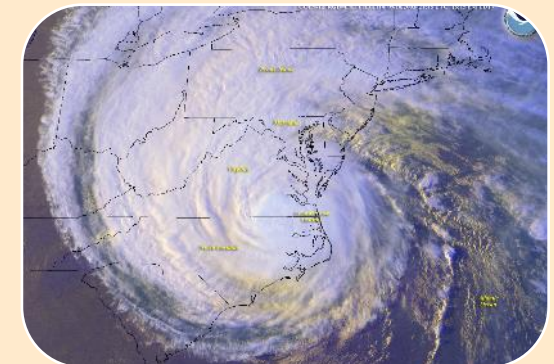
Decreasing

Extreme Cold

Moderately Severe Projections

Severe Wind
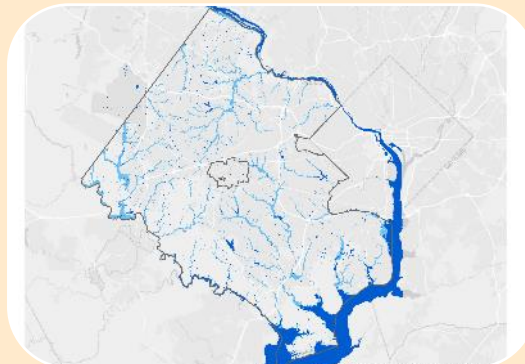
Coastal Flooding

Inland Flooding

Extreme Storms

24

Task 2: Projections - Extreme Heat

Legend:
- Days 90 – 94 degrees F
- Days 95 – 100 degrees F
- Days 100 + degrees F

Extremely Hot Days per Summer - Today

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49
50	51	52	53	54	55	56
57	58	59	60	61	62	63
64	65	66	67	68	69	70
71	72	73	74	75	76	77
78	79	80	81	82	83	84
85	86	87	88	89	90	91
92	93	94	95	96	97	98
99	100	101	102	103	104	105

Extremely Hot Days per Summer - 2050

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49
50	51	52	53	54	55	56
57	58	59	60	61	62	63
64	65	66	67	68	69	70
71	72	73	74	75	76	77
78	79	80	81	82	83	84
85	86	87	88	89	90	91
92	93	94	95	96	97	98
99	100	101	102	103	104	105

Extremely Hot Days per Summer - 2085

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49
50	51	52	53	54	55	56
57	58	59	60	61	62	63
64	65	66	67	68	69	70
71	72	73	74	75	76	77
78	79	80	81	82	83	84
85	86	87	88	89	90	91
92	93	94	95	96	97	98
99	100	101	102	103	104	105

Today

2050
(RCP 8.5)

2085
(RCP 8.5)

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Task 2: Urban Heat Island Effect (NASA Project)

These maps display daytime temperature anomalies within the county in relationship to the countywide mean (left) and the reference area mean (right).
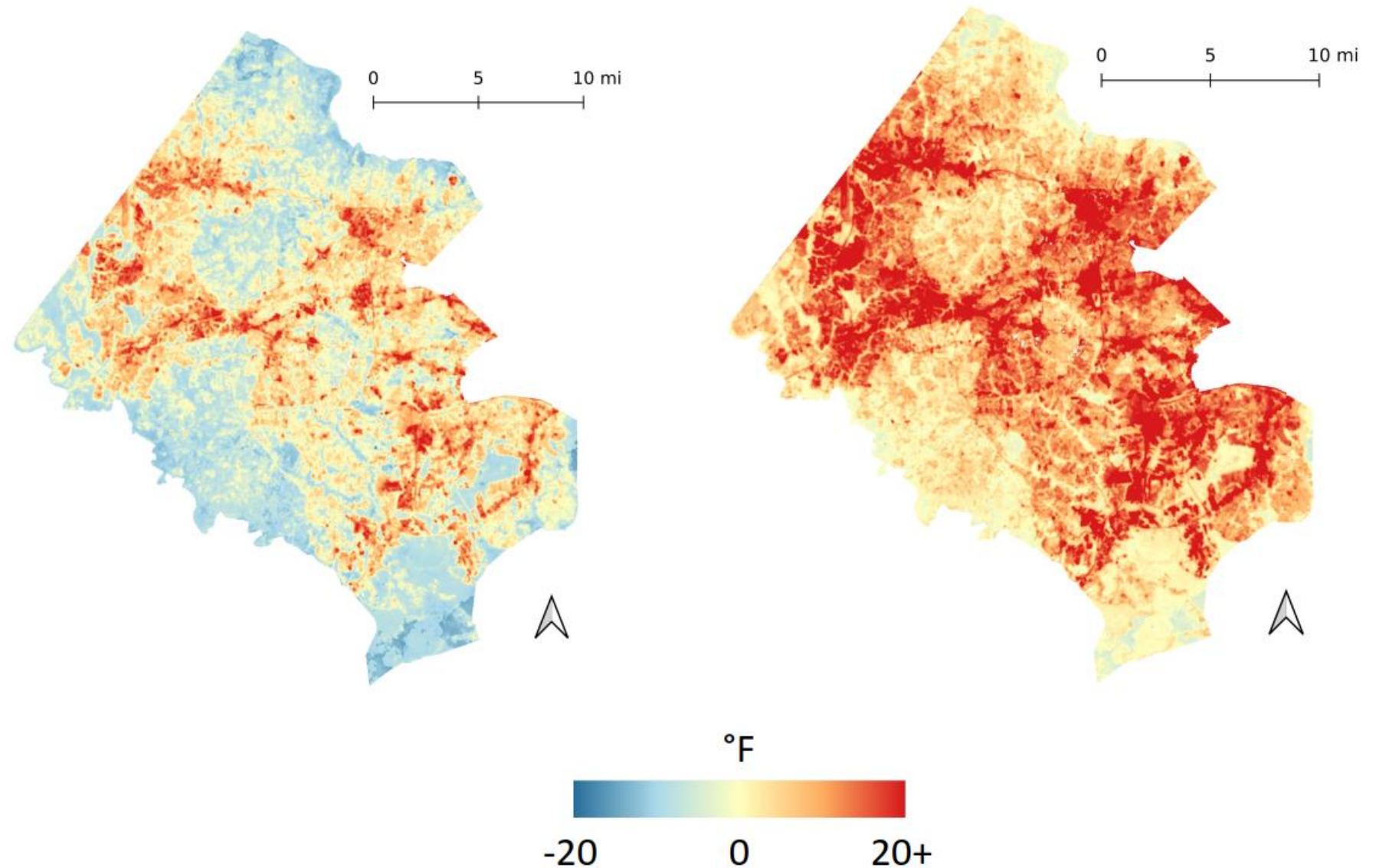
Task 2: Projections - Extreme Precipitation

More frequent, higher intensity events

- Increase in the top 1-percentile of daily precipitation

- Increase in maximum 5-day precipitation

- Shift from snow to rain

- Increase in precipitation depths across all return periods (2-year to 500-year) and durations (24-hr, 12-hr, 6-hr, 3-hr, 2-hr, 10hr)

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Task 2: Projections - Coastal Flooding
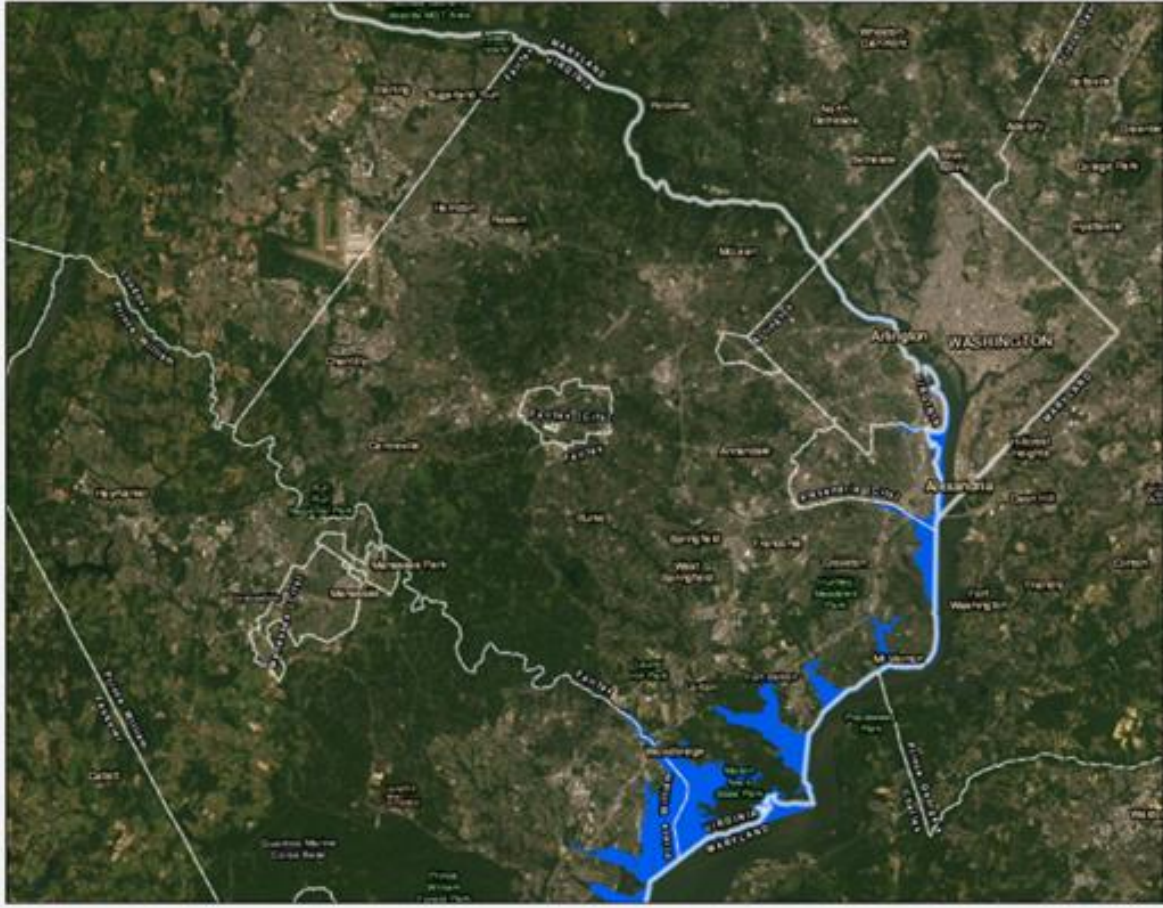
3 feet of sea level rise
Source: NOAA
(2050 relative to 1991-2009)
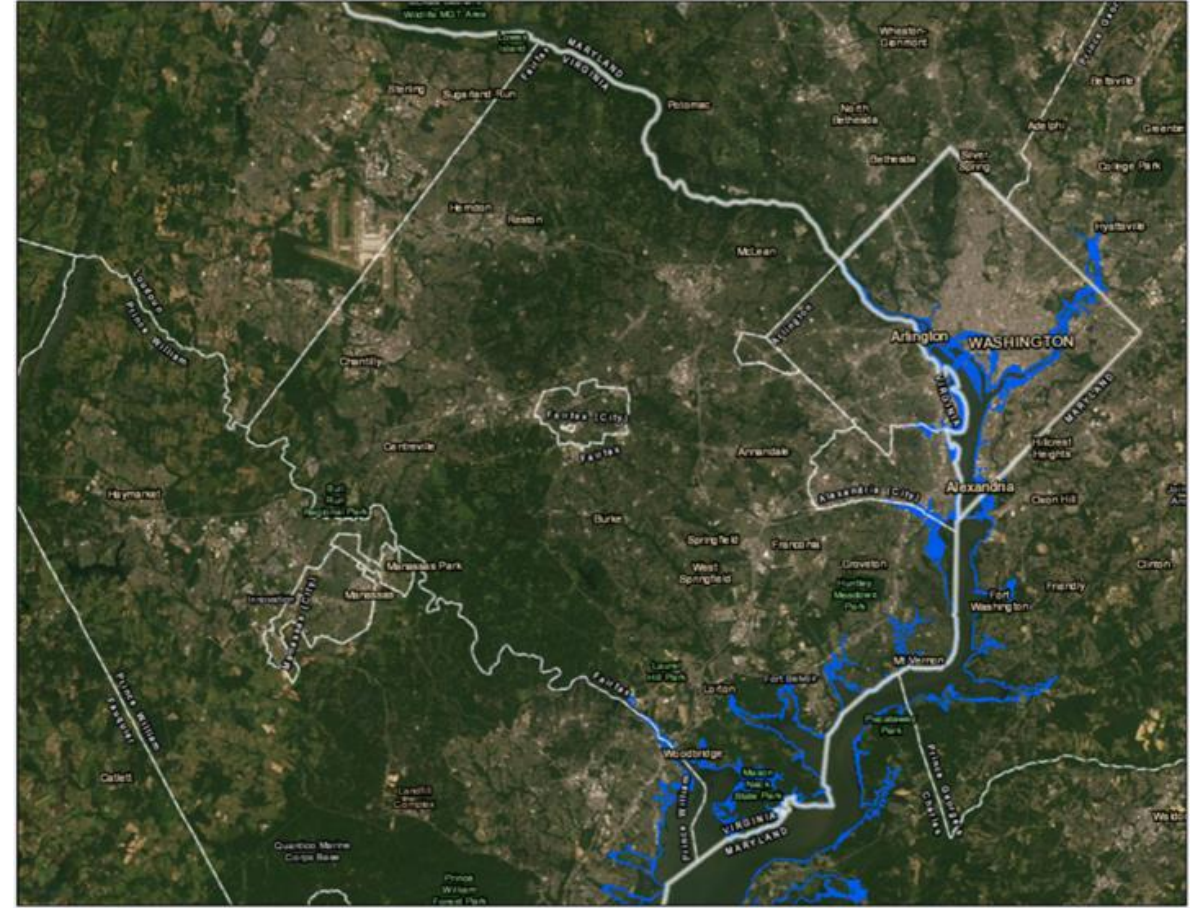
Category 2 hurricane storm surge
Source: USACE
(2050 of coastal flooding under 3 feet of rise)

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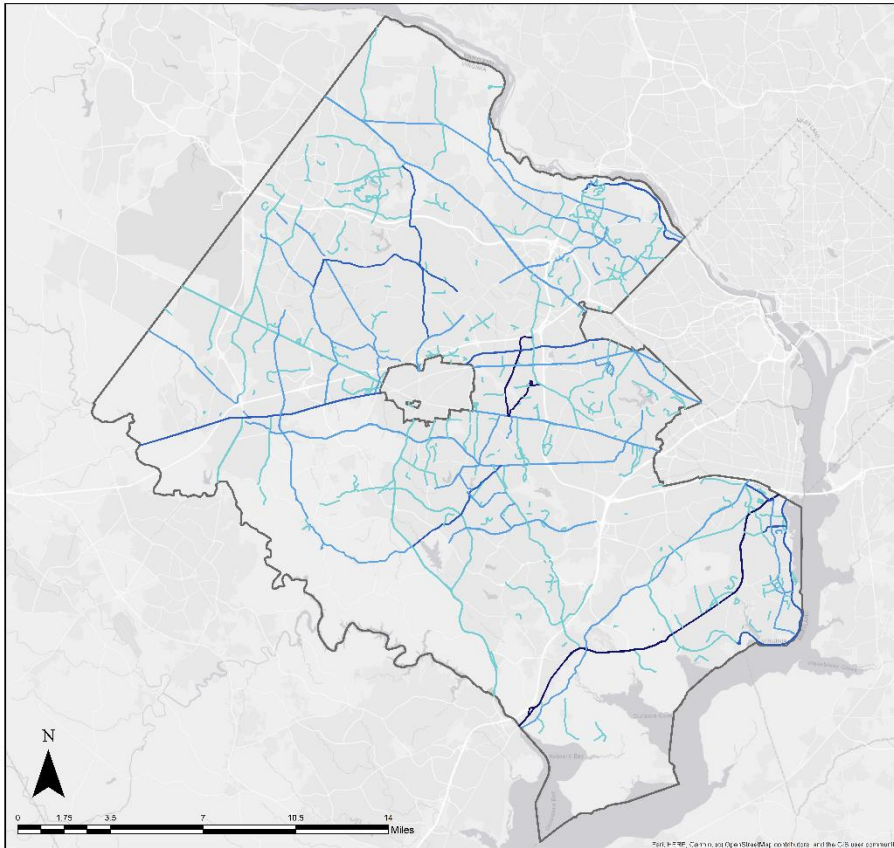# Coastal Flooding – Coordination with Other Projects
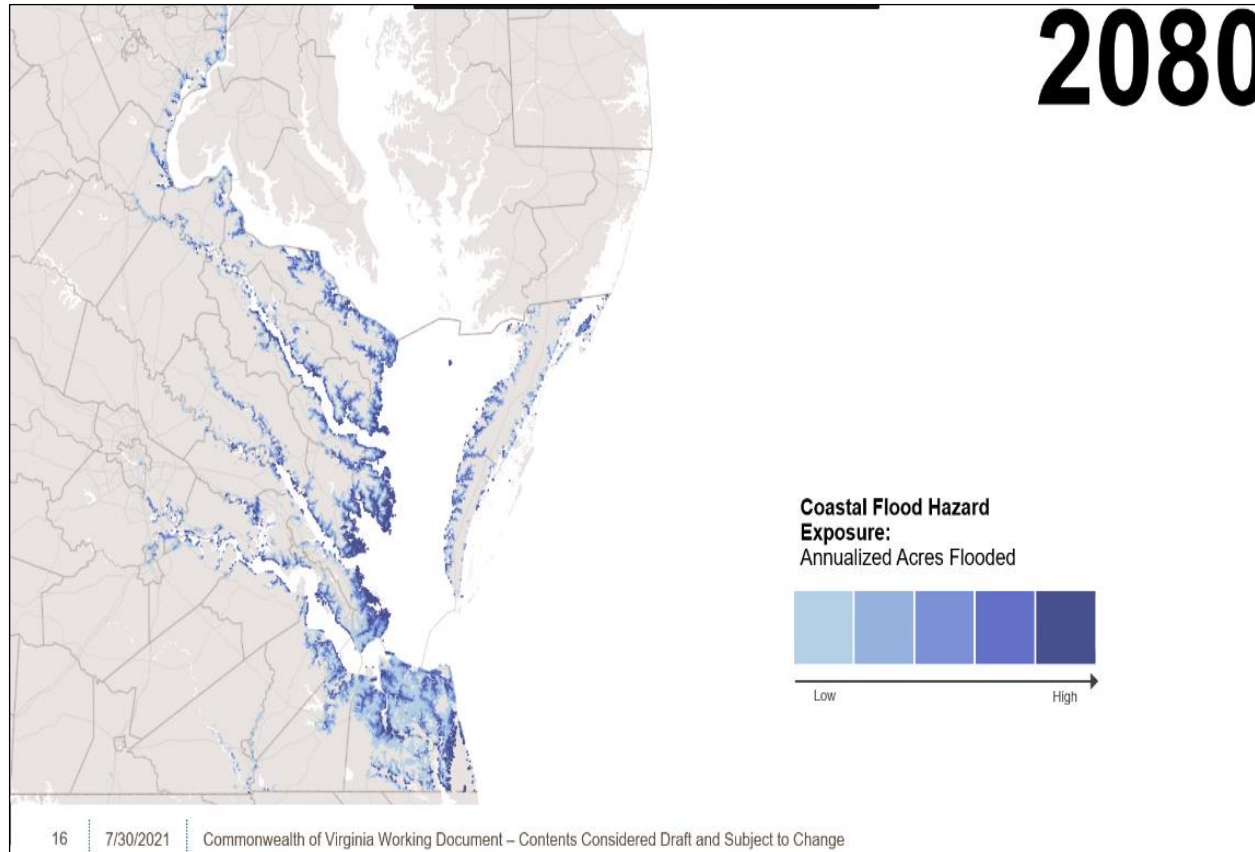
Virginia Coastal Resilience Master Plan (VDCR)
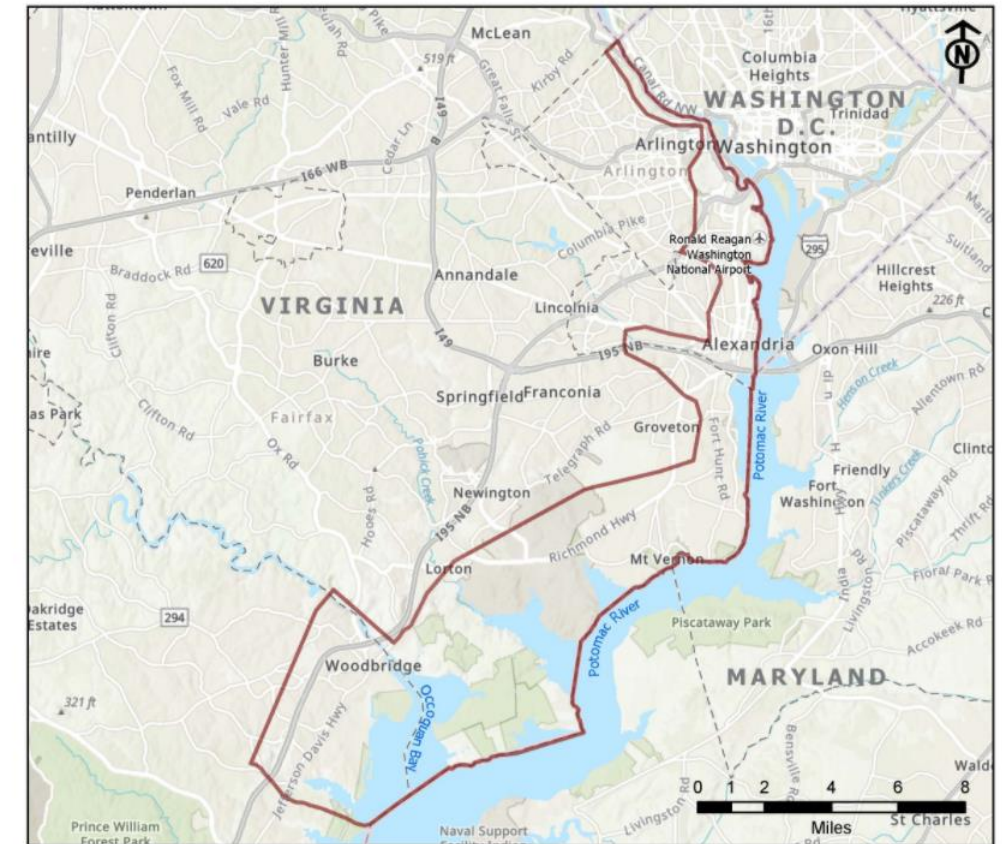
NOVA Coastal Storm Risk Mgmt Study (USACE)

Task 2: Public Survey #1

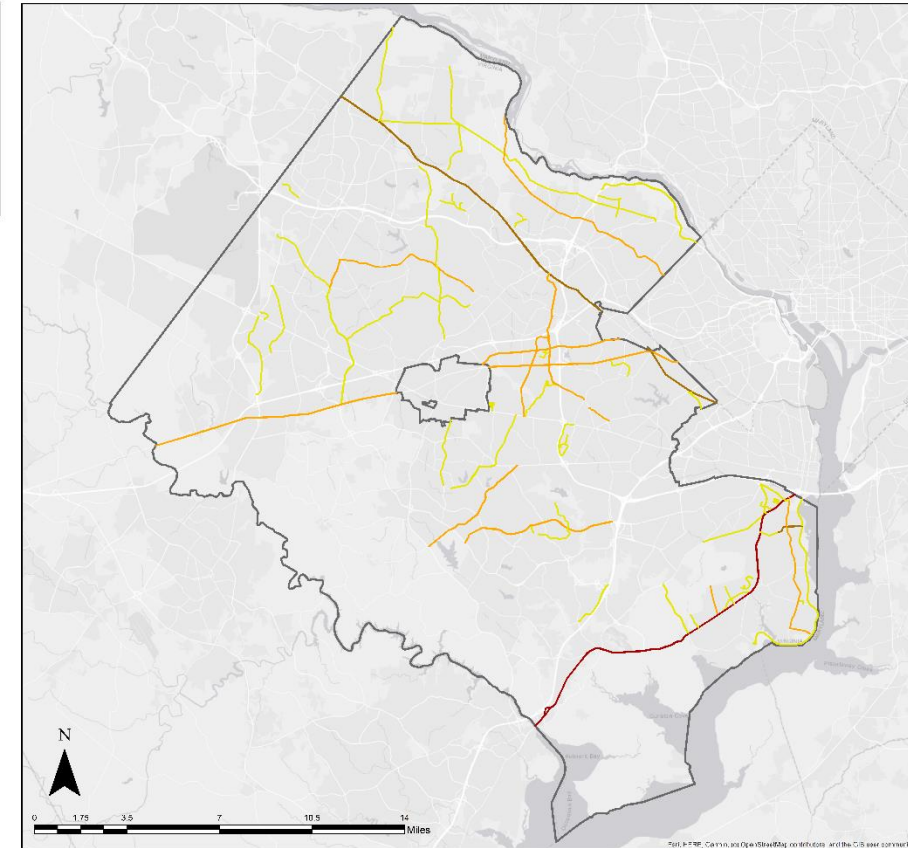**Public Survey: Roads identified as vulnerable to flooding**

Roads Vulnerable to Flooding (Frequency of Responses)

— 1 - 2
— 3 - 6
— 7 - 14
— 15 - 25

Through this survey, Fairfax County asked its residents to identify specific locations that are especially vulnerable to climate change.
This map shows roads identified by the community as vulnerable to Flooding.

Public Survey: Roads identified as vulnerable to heat

Roads Vulnerable to Heat (Frequency of Responses)

— 1
— 2
— 3 - 4
— 5 - 18

Through this survey, Fairfax County asked its residents to identify specific locations that are especially vulnerable to climate change.
This map shows roads identified by the community as vulnerable to heat.

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Task 2 : Vulnerability & Risk Assessment (Ongoing)

- *"Given the climate projections, where are we vulnerable?"*
- Infrastructure, populations, systems
- **Vulnerability = Exposure x Sensitivity x Adaptive Capacity**
- **Risk = Vulnerability x Severity of consequence x Likelihood**
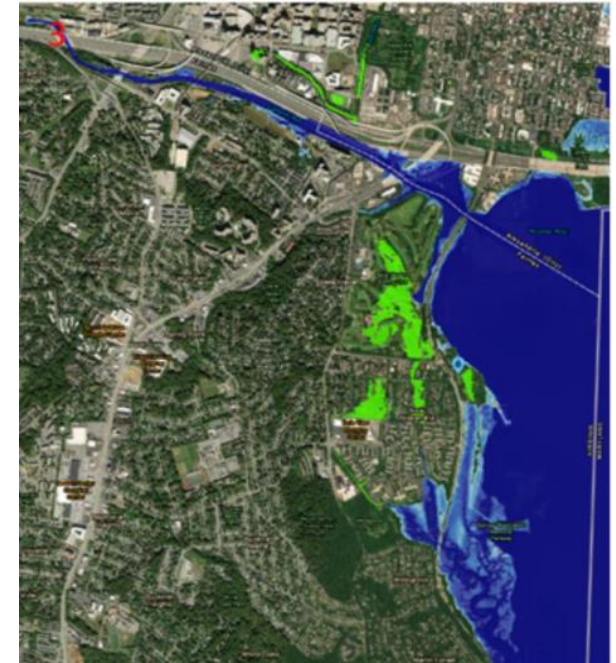
Example: Roadways **This is a demonstration only; these are not final numbers*				
	Exposure	Sensitivity	Adaptive	**Vulnerability**
Heat	3	2	2	12
Precipitation	3	3	3	27
Storms/Wind	3	2	2	12
Cold	1	2	1	2
Coastal	2	3	3	12
Drought	1	1	2	2

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Task 2 : Audit of Policies, Plans, & Programs (Ongoing)

- *"Given the results of the Vulnerability & Risk Assessment, how is the County government doing?"*

Roadway example, continued:

- **Q:** Does the local government include standards for considering climate change impacts in CIP assessment criteria?

- **Q:** Has a vulnerability assessment been completed for transportation infrastructure across local, regional, state, and federal levels?

- **Q:** Are climate projections factored into transportation planning, design, and engineering decisions?

- **Q:** Do transportation standards take into account the latest climate projections?

The results of the VRA and the Audit then help us identify strategies (Task 3).

Looking Ahead

Task 2 Remaining Items (Fall 2021)

- Planning Team (PT), Infrastructure Advisory Group (IAG), Community Advisory Group (CAG) Meetings
- **Deliverable:** Vulnerability & Risk Assessment – drafts, revisions, final
- **Deliverable:** Audit – drafts, revisions, final

Task 3 (Fall- Winter 2021)

- Planning Team (PT), Infrastructure Advisory Group (IAG), Community Advisory Group (CAG) Meetings
- Public Meeting
- Public Survey #2
- **Deliverable:** Strategies – drafts, revisions, final
- **Deliverable:** Implementation Roadmap – drafts, revisions, final

Task 4 (Spring 2021)

- Planning Team (PT), Infrastructure Advisory Group (IAG), Community Advisory Group (CAG) Meetings
- Public Comment Period
- **Deliverable:** Fact Sheets
- **Deliverable:** Interactive Maps
- **Deliverable:** Full Resilient Fairfax Plan

Office of Environmental and Energy Coordination

Thank you

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