

Resilient Fairfax

Climate Adaption and Resilience Plan

October 2022
A Fairfax County, VA publication



Resilient Fairfax Overview

Fairfax County
Office of Environmental and Energy Coordination
Fairfax County, Virginia



Resilient Fairfax

Resilient Fairfax Overview

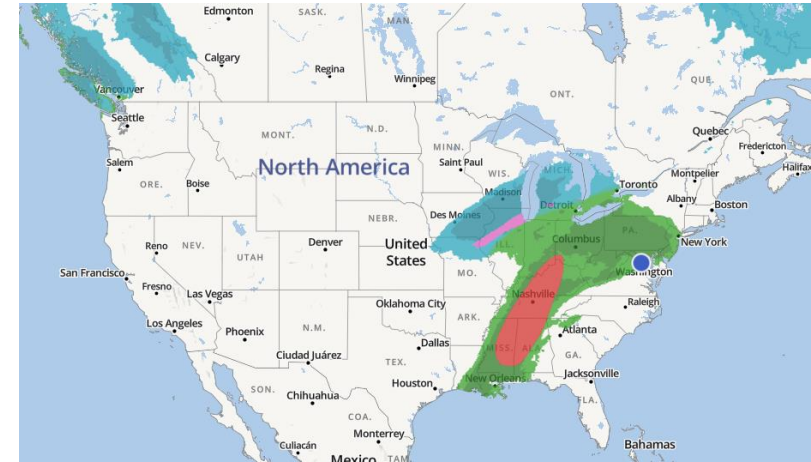
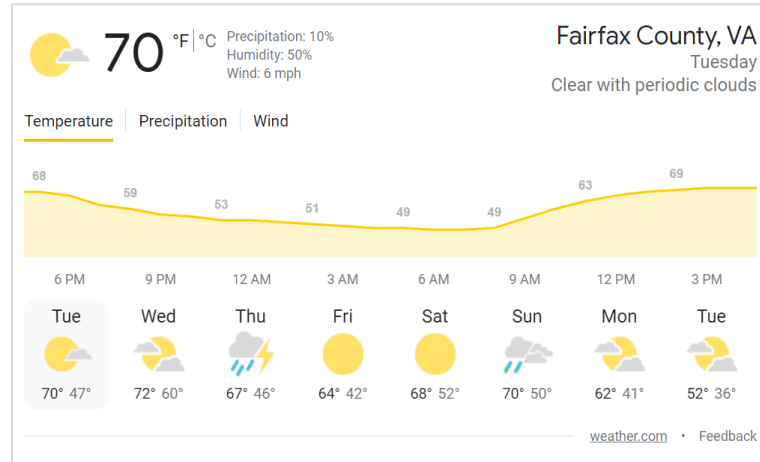
Contents of this Slide Deck

- Definitions
- Climate Plans in Fairfax County
- Resilient Fairfax Planning Process
- Climate Conditions
- Vulnerabilities and Risks
- Resilient Fairfax Pillars and Strategies
- Implementation
- What You Can Do

Definitions: What is the difference between “weather” and “climate”?

Weather = day-to-day conditions

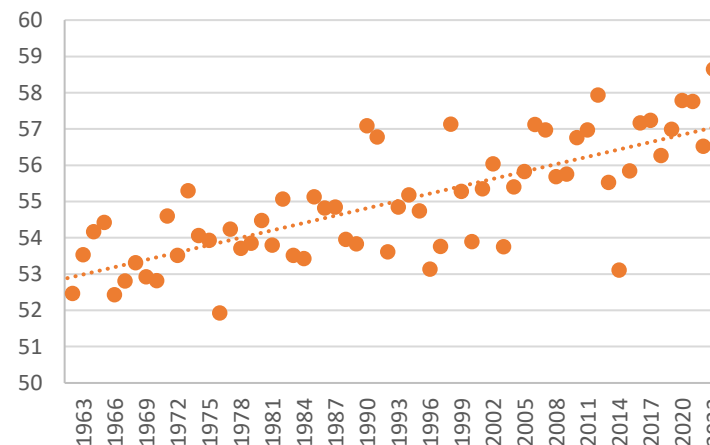
- Weekly forecasts
- Individual storms
- Individual heat events
- Individual cold days or weeks



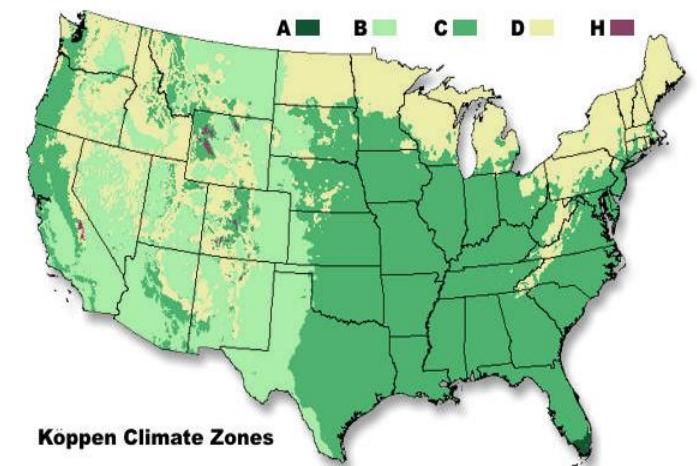
Climate = norms for an area, based on averages of 20 years or more

- Average precipitation
- Average storm intensity
- Average temperatures
- Trends over time

Average Temperatures
Per Year in Fairfax County, VA (1962-2023)
Data Source: National Weather Service



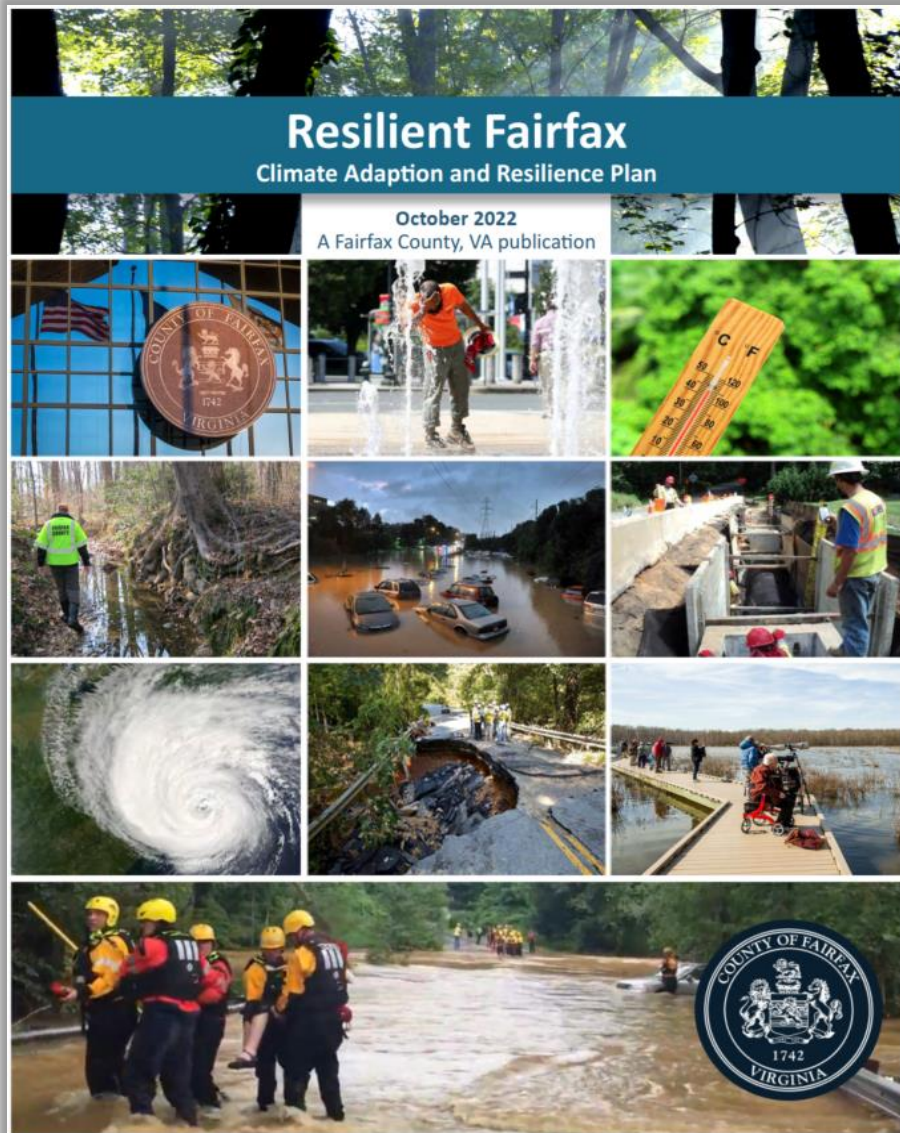
Climate Zones in the United States



Köppen Climate Zones

The major Köppen zones in the U.S.

Definitions: What is climate resilience?



Climate resilience is the ability to prepare for and adapt to changing climate-related conditions, such as changes in temperature, precipitation, and storm severity.

Resilient Fairfax is the county's plan to boost climate resilience.

Climate resilience can take many forms:

- **At the community and county level:**
 - Updating infrastructure to handle more flooding, heat, and storms
 - Updating development standards and land use plans to create communities that are more climate-ready
 - Protecting and enhancing adaptive natural resources
 - Expanding public services that boost community resilience
 - Developing the workforce for resilience skillsets
- **At the individual level:**
 - Installing heat-resilient and flood-proof home improvements
 - Planting trees and vegetation that absorb flooding and reduce heat
 - Awareness of and access to services available
 - Strengthening ties amongst neighbors

Definitions : Difference Between “Mitigation” and “Adaptation”

Climate mitigation:
Addressing the causes of climate change



Doing our part to reduce greenhouse gas emissions that contribute to climate change

- Examples: Transitioning to renewable energy, energy efficiency, waste reduction, alternative transportation to do our part to reduce emissions
- Emissions reduction is **global**

Climate adaptation and resilience:
Addressing the effects of climate change



Boosting resilience and adapting to climate hazards and conditions

- Examples: becoming better at handling flooding, extreme temperatures, severe storms, health hazards, precipitation pattern changes that occur locally
- Resilience is **local**

Climate Plans in Fairfax County

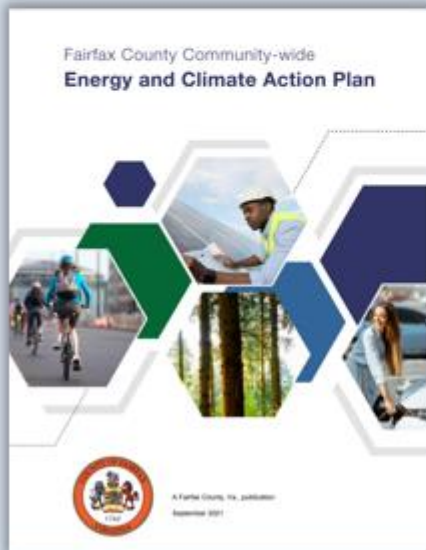
We are addressing both the **cause** and the **effects** of climate change.



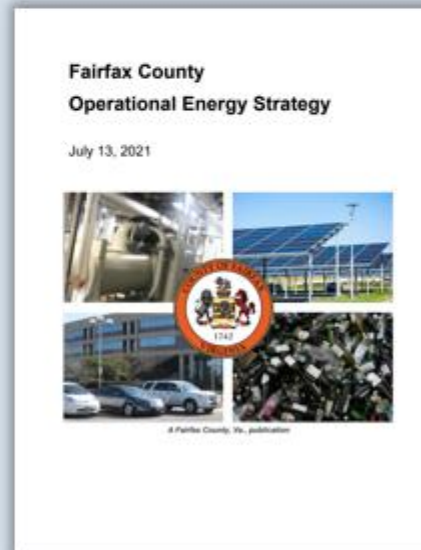
Addressing the Cause:

by doing our part
in the global effort to reduce emissions

CECAP (Community-wide)



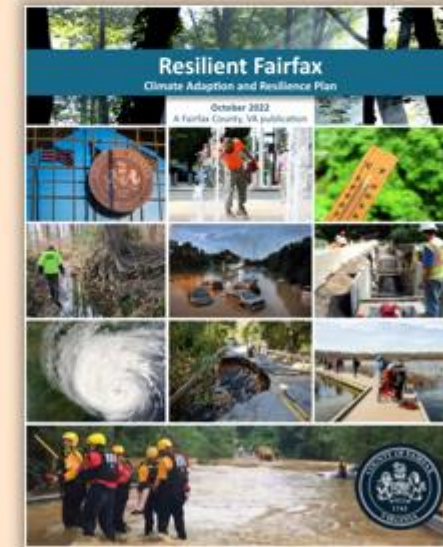
Operational Energy Strategy (Government operations only)



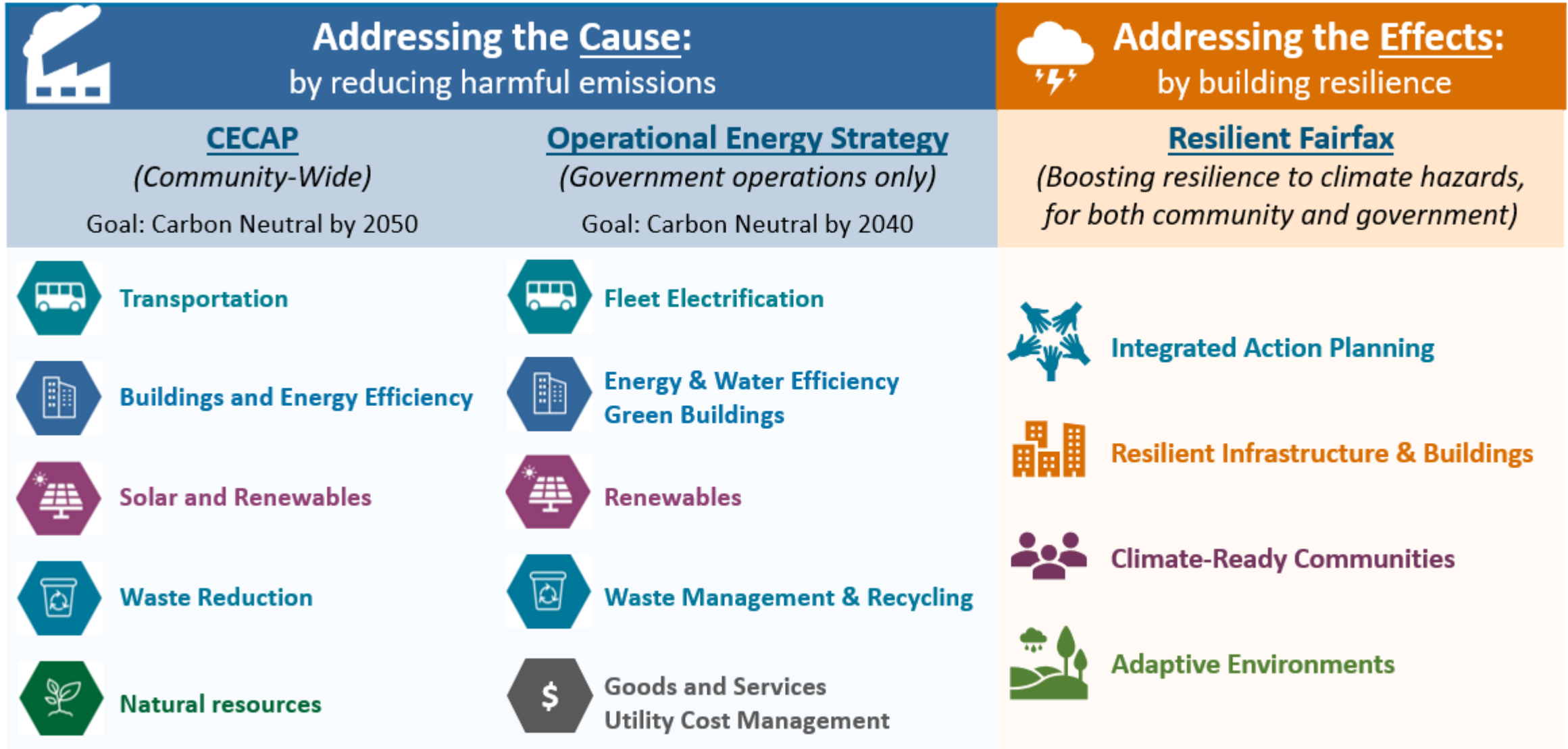
Addressing the Effects:

adapting/building resilience to the
impacts we experience locally

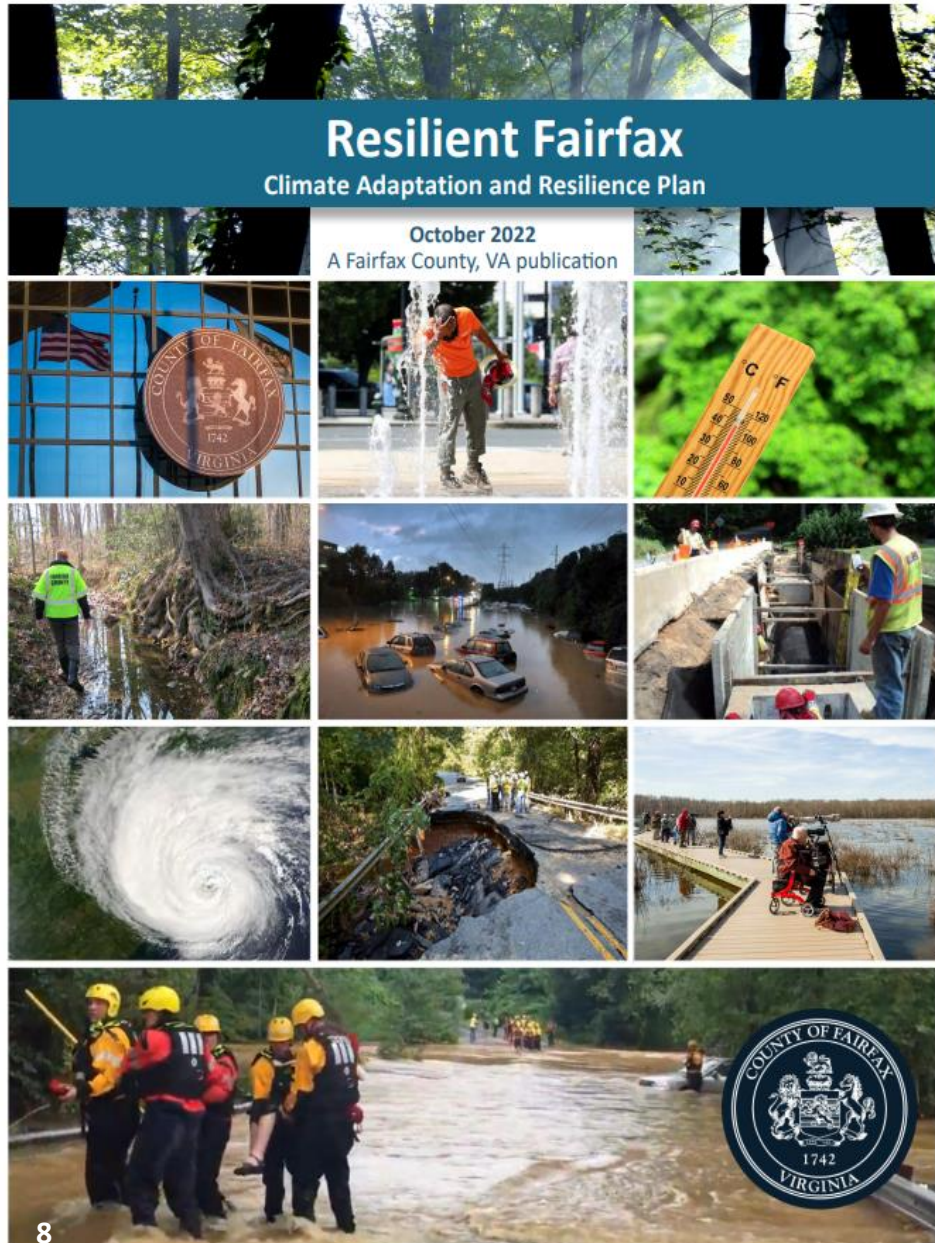
Resilient Fairfax (Government and community)



Climate Plans in Fairfax County, cont.



Resilient Fairfax Planning Process



The Resilient Fairfax planning process was divided into five major steps. Technical reports were released after each step. The [Resilient Fairfax plan](#) folds in information from all five steps.

1. What climate conditions and hazards do we face?

- [Climate Projections Report \(CPR\)](#)

2. What are our top vulnerabilities to these climate hazards?

- [Climate Vulnerability and Risk Assessment \(VRA\)](#)

3. How are we currently doing in terms of resilience?

- [Audit of Existing Policies, Plans, and Programs \(Audit\)](#)

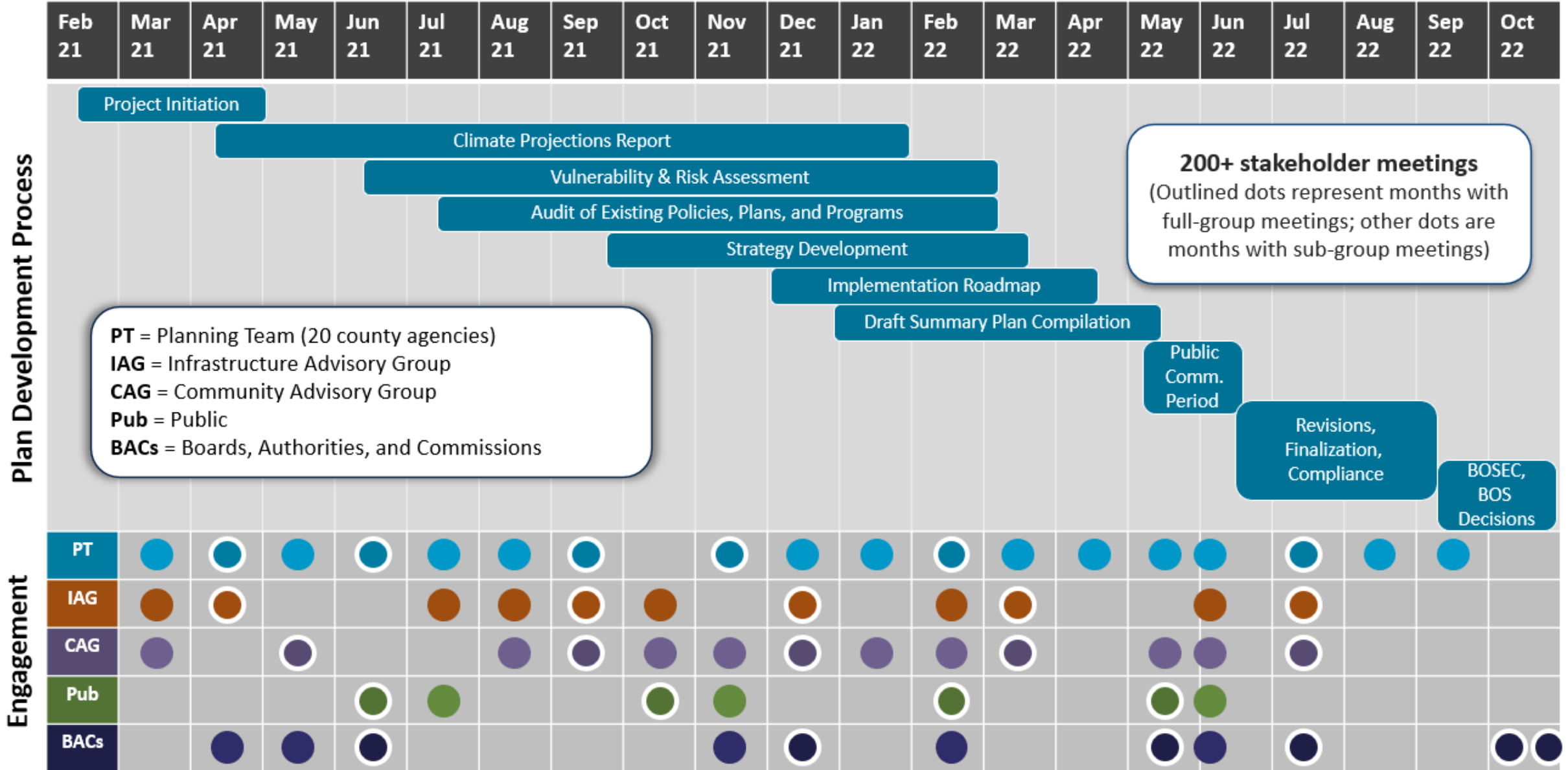
4. Which strategies will strengthen our resilience?

- [Adaptation and Resilience Strategies \(in full plan\)](#)




5. How do we implement those strategies?

- [Implementation Roadmap \(in full plan\)](#)

Resilient Fairfax Planning Timeline



Who is involved?

Lead	Office of Environmental and Energy Coordination (OEEC)			
<p>County Government (Interagency Climate Team)</p> 	<p>County departments and agencies</p>	<p>Group 1: All Hands</p> <p>Group 2: Development</p> <p>Group 3: Community</p> <p>Group 4: Nature</p> <p>Group 5: Facilities</p> <p>Group 6: Data</p>	<p>OEEC (Lead); County Attorney; Economic Initiatives; Emergency Mgmt. & Security; Facilities Mgmt.; Family Services; GIS; Health; Health & Human Services; Housing; Land Development Services; Neighborhood & Community Services; NVSWCD; One Fairfax; Park Authority; Planning & Development (PD, ZAD, CR); Procurement & Materials Mgmt.; Public Affairs; Public Safety Comms.; Public Schools; Public Works (STW, WW, SW, UFMD, Cap Facilities); Transportation; Vehicle Services</p>	<p>25+ entities 150+ ppl</p>
<p>Infrastructure Advisory Group (IAG)</p> 	<p>Utilities, authorities, & infrastructure managers at local, state, regional, federal levels</p>	<p>(Meets as 1 Full Group)</p>	<p>Columbia Gas, Cox, DEMS, Dominion, DPWES, Fairfax Water, ESI, FCPS, FEMA, MWCOG, NAIOP, NOVEC, NVBIA, NVRC, NVTA, OEEC, RUCA, TAC, USDOD, VDCR, VDEM, VDEQ, VDOT, Verizon, Washington Gas, WMATA, WTS</p>	<p>27 entities 50+ ppl</p>
<p>Community Advisory Group (CAG)</p> 	<p>Residents of each Supervisor District, & advocacy organizations, non-profits, BACs, community groups</p>	<p>(Meets as 1 Full Group)</p>	<p>Residents of Braddock, Dranesville, Hunter Mill, Lee, Mason, Mount Vernon, Providence, Springfield, Sully; 350; Chamber; Cornerstones; Disability Services Board; EcoLatinos; EQAC; FACS; FCA; GMU; League of Women Voters; Multicultural Advisory Council; NAACP; NVSWCD; Resilient VA; Reston Association; Sierra Club; Small Business Commission; Tysons</p>	<p>27 entities 30+ ppl</p>
				<p>80+ entities 230+ ppl</p>

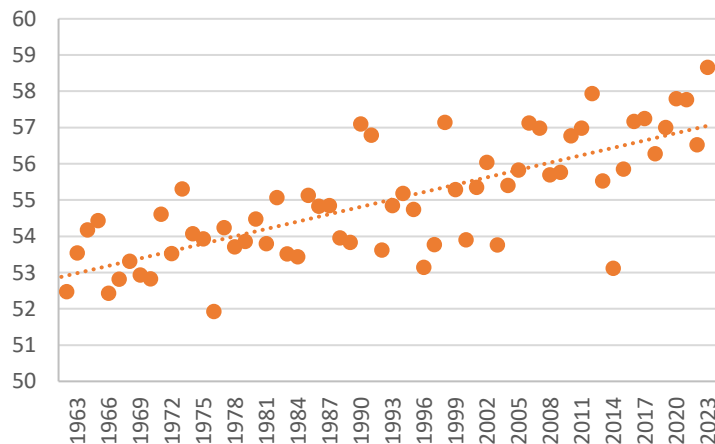
Climate Conditions: Warmer, Wetter, Weirder

The climate in Fairfax County has gotten measurably “warmer, wetter, and weirder” in recent decades. These trends are projected to continue in the future. (Please see the [Climate Projections Report](#) and the [Resilience Dashboard](#) for more information).

Warmer



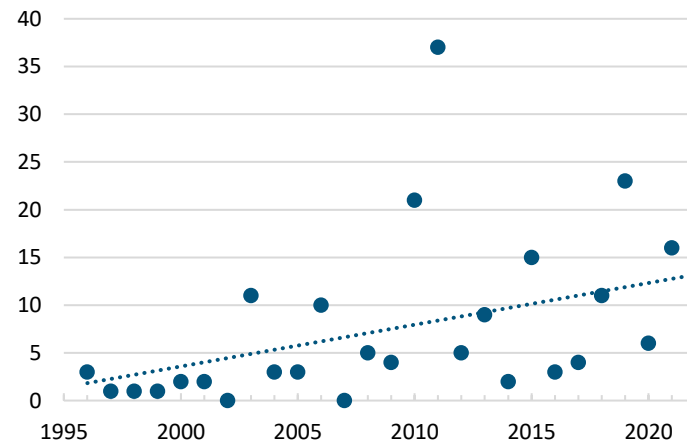
Average Temperatures
Per Year in Fairfax County, VA (1962-2023)
Data Source: National Weather Service



Wetter



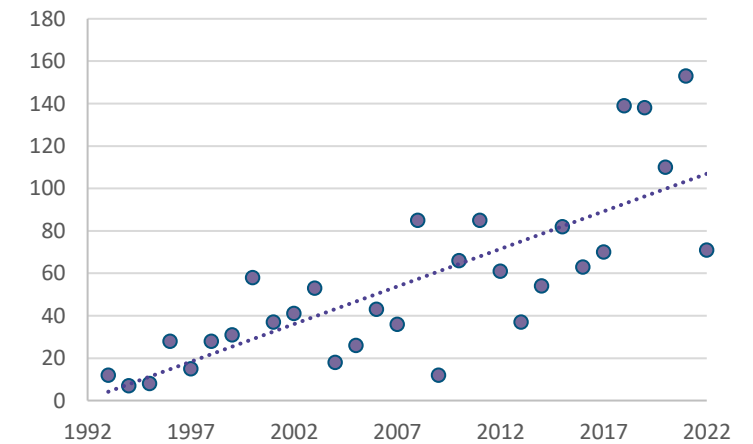
Number of Flash Flood Events Per Year
in Fairfax County, VA (1996-2022)
Data Source: NOAA



Weirder

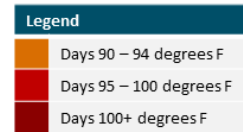


Number of Major Storm Events Per Year
in Fairfax County, VA. (1992-2022)
Data Source: NOAA

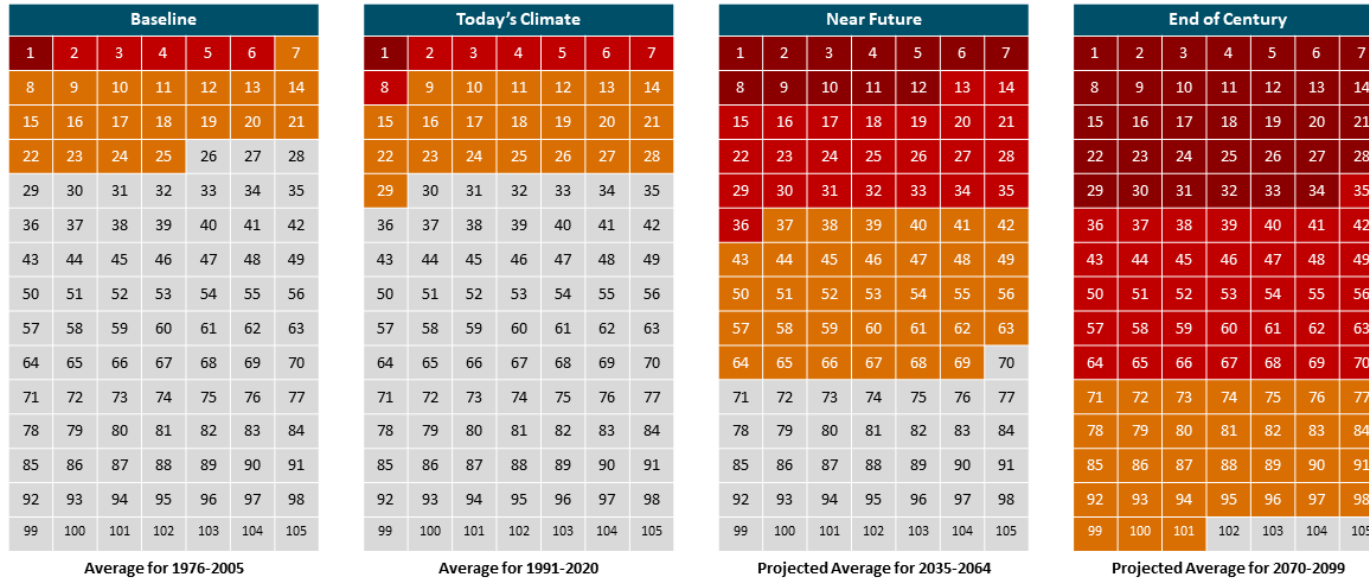


Climate Conditions: Warmer

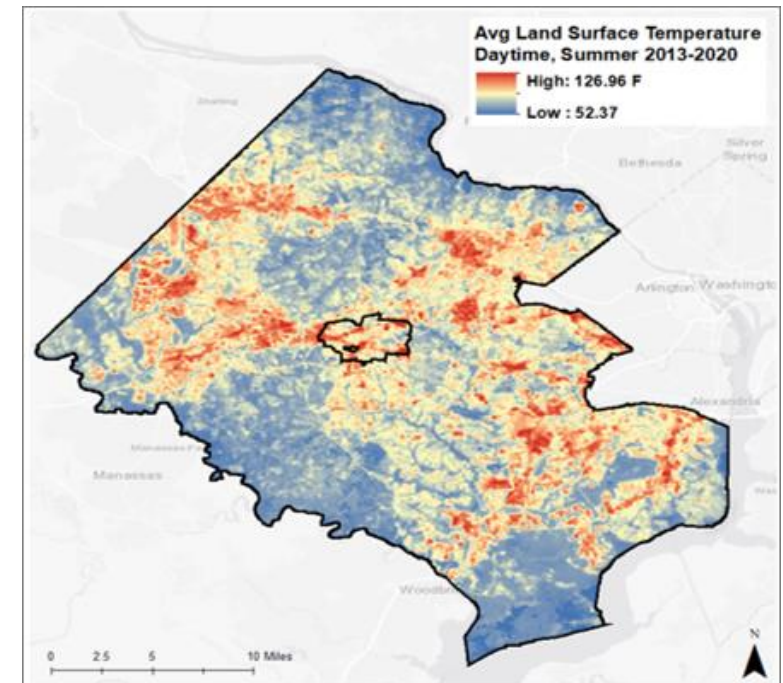
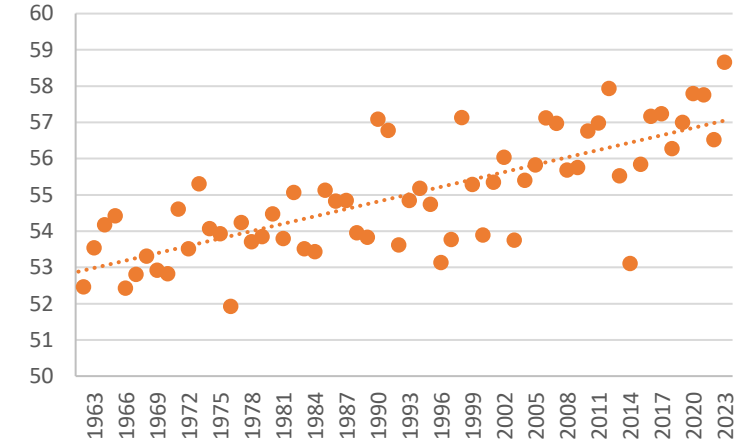
Warmer



Average Number of Extreme Heat Days Per Year in Fairfax County (High Scenario)



Average Temperatures Per Year in Fairfax County, VA. Source: NWS (1962-2023)



In the “warmer” category, **average annual temperatures have risen +4 °F** since 1962 in Fairfax County. An **additional rise of 4.4 – 8°F is projected** by 2085. The number of **extreme heat days** per year is projected to increase from 7 days per year to 68 days per year by 2085. On top of general temperature trends, the **Urban Heat Island Effect** (shown on the map) causes urbanized parts of the county to stay significantly hotter than rural or greener parts of the county. (Please see the [Climate Projections Report](#) and the [Resilience Dashboard](#) for more information).

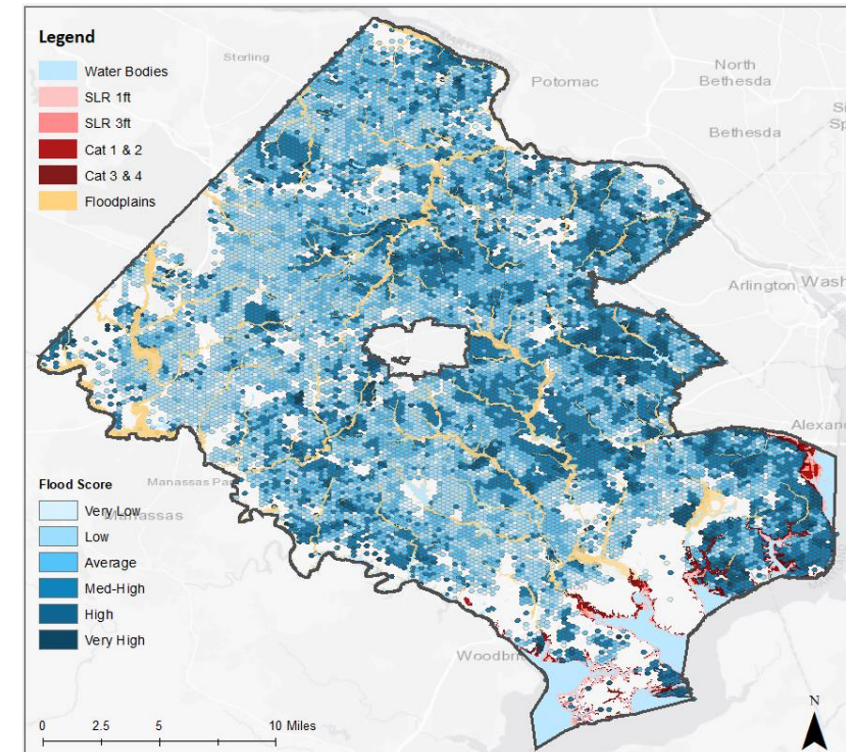
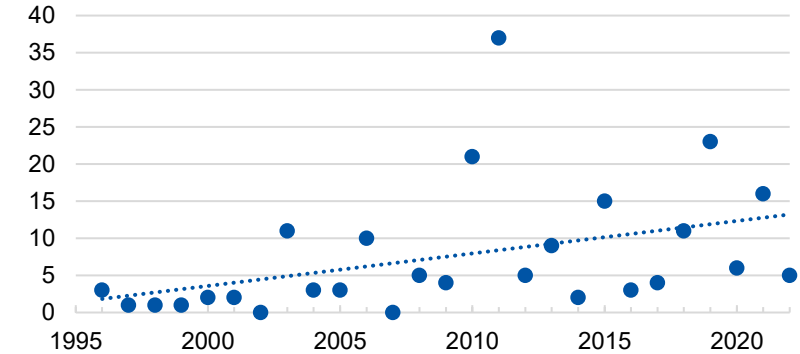
Climate Conditions: Wetter

Wetter



In the “wetter” category, we are seeing an increase in the intensity of precipitation (**it is raining harder than it used to**). This is because a warmer atmosphere can hold larger amounts of moisture. More intense rain causes flooding because our natural and built stormwater management systems are not designed to handle large sudden volumes of water all at once. (Please see the [Climate Projections Report](#), the [Resilience Dashboard](#), and [MARISA](#) for more information).

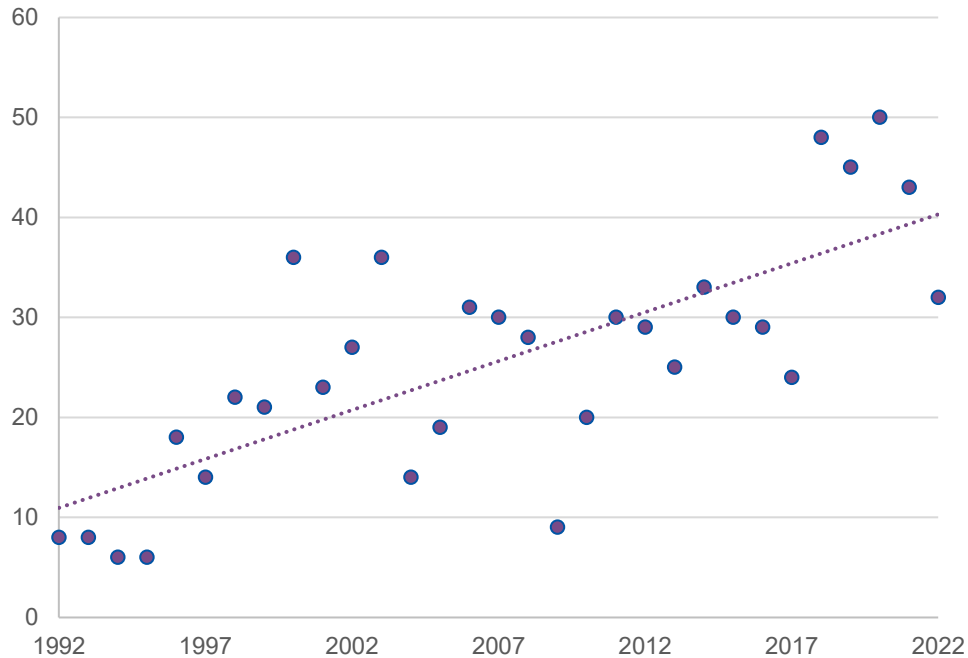
Number of Flash Flood Events Per Year
in Fairfax County, VA (1996-2022)
Data Source: NOAA



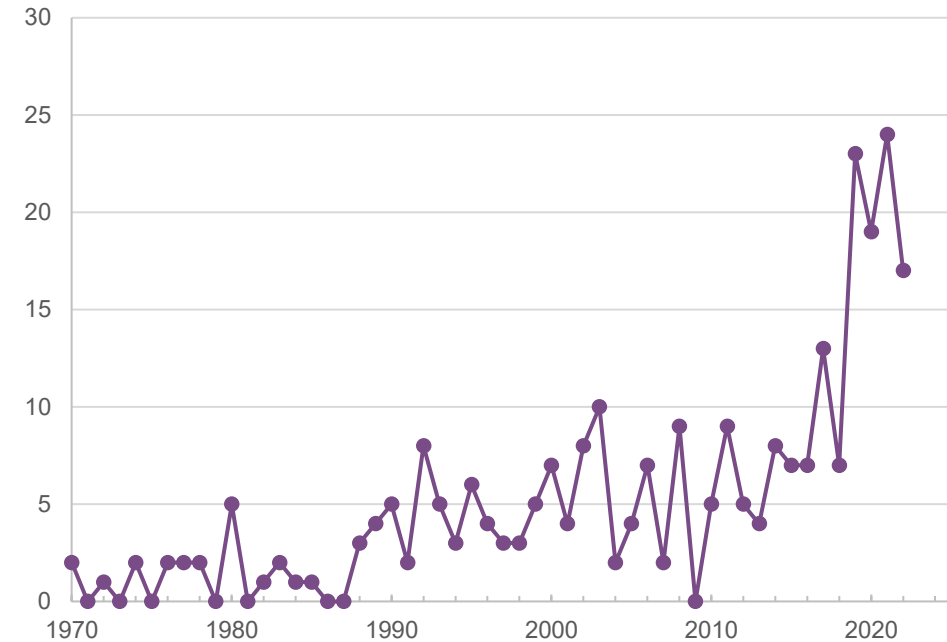
Climate Conditions: Weirder

Weirder

Number of Days Per Year with Storm Events
in Fairfax County, VA. (1992-2022)
Data Source: NOAA



Number of Days per Year with "Thunderstorm Wind" Events
in Fairfax County, VA. (1970-2022)
Data Source: NOAA



In the “weirder” category, Fairfax County has also seen an increase in the number of stormy days per year, the total number of storm events per year, and the number of storm events that cause property damage per year, according to data tracked by NOAA. Predicting storm events is more complex than other climate projections, so there is some uncertainty for future projections. However, it is likely that these trends will continue. (Please see the [Climate Projections Report](#) and the [Resilience Dashboard](#) for more information).

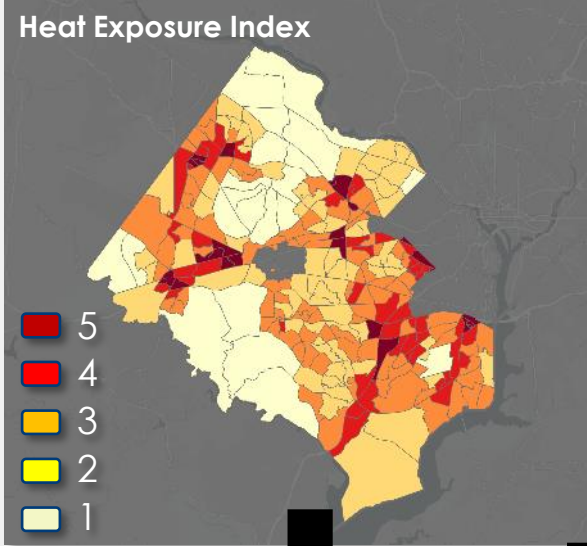
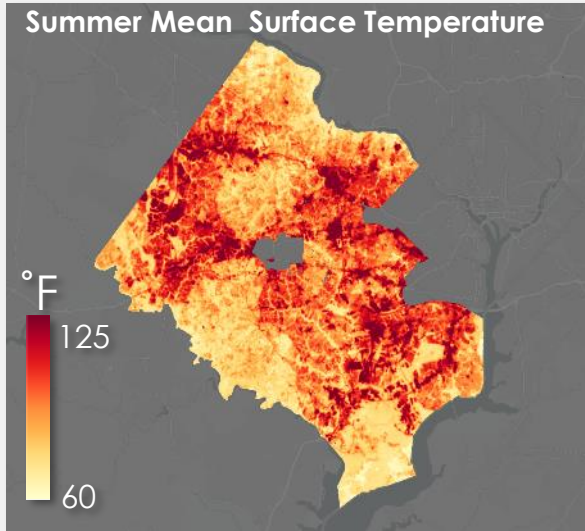
Vulnerabilities and Risks

These changing climate conditions exacerbate vulnerabilities for our populations, public services, infrastructure, and natural resources. These include health and safety risks, property damage and financial losses, infrastructure damage, power outages, natural resource degradation and changes, and more. Please see the Resilient Fairfax [Vulnerability & Risk Assessment \(VRA\)](#) for more information.

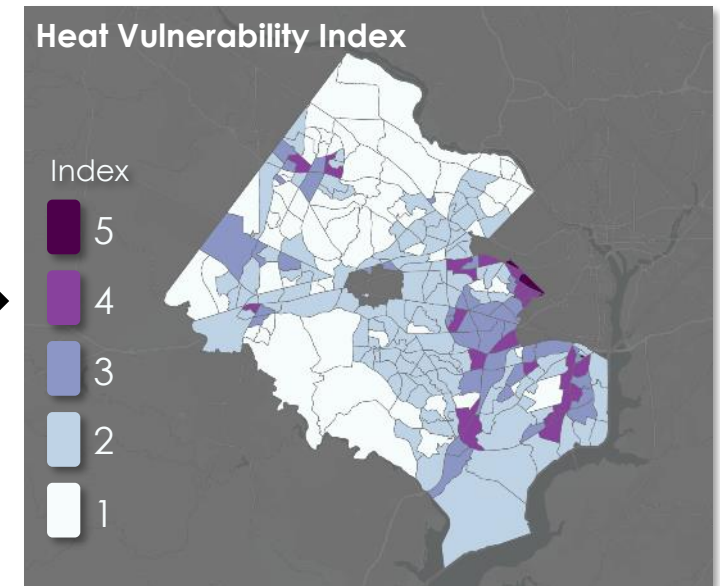


Example of Incorporating Equity into Climate Vulnerability and Risk

Exposure

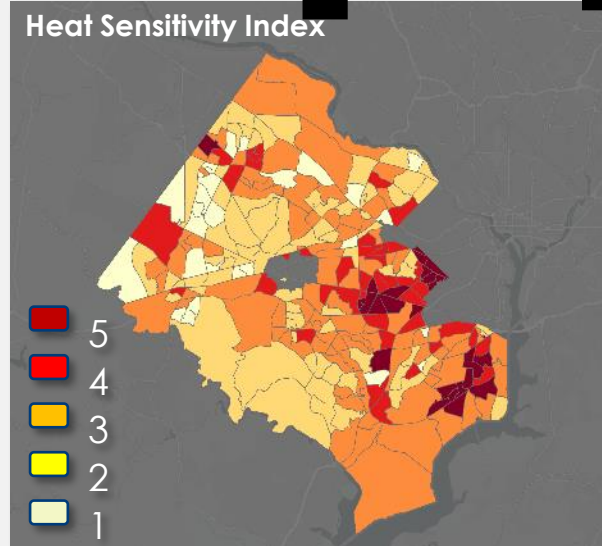


Climate hazards affect some populations more than others. For example, certain populations are more **exposed** to extreme heat because they live in Urban Heat Islands. Other populations are more **sensitive** to extreme heat.



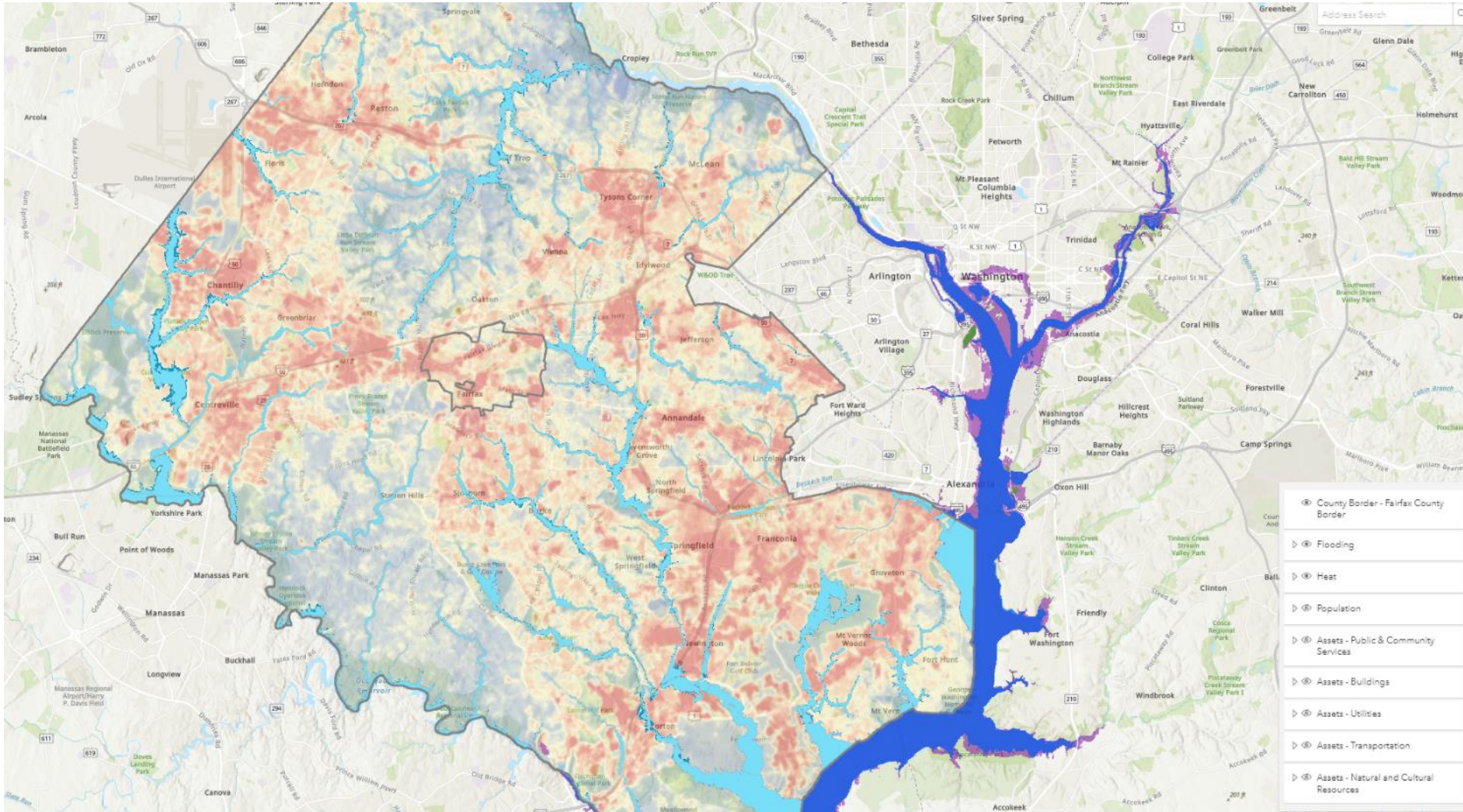
Sensitivity

- Pre-existing Health Conditions & Disability
- Elderly
- Children
- Race & ethnicity
- Limited English Proficiency
- Sub-standard housing
- Low Income



We consider both heat **exposure** and heat **sensitivity** to understand **total heat vulnerability**. The areas with higher vulnerability are where we prioritize tree plantings, cooling centers, and other heat risk reduction strategies.

Interactive Climate Map Viewer



Check out the [Resilient Fairfax Interactive Map Viewer](#) to see heat data, flooding data, and how those hazards overlap with buildings, utilities, transportation, natural and cultural resources, and more.



Resilient Fairfax Pillars

Integrated Action Planning (IAP) 	Climate Ready Communities (CRC) 	Resilient Infrastructure & Buildings (RIB) 	Adaptive Environments (AE) 
			
<ul style="list-style-type: none">• Resilience into county plans and policies• Resilience data collection• Resilience funding• Interagency coordination	<ul style="list-style-type: none">• Network of safe & resilient spaces• Community capacity to prepare for, withstand, and recover from events• Climate-ready development	<ul style="list-style-type: none">• Resilience in major county infrastructure decisions• County building & facility resiliency• Advocacy for external infrastructure resiliency, i.e., energy grid & transit	<ul style="list-style-type: none">• Protection of natural resources that enhance resilience• Restoration of damaged areas with nature-based and natural solutions

There are 48 resilience strategies in the [Resilient Fairfax Plan](#), organized into these 4 pillars.



Resilient Fairfax Strategies

Pillars	Integrated Action Planning				Climate Ready Communities			Resilient Infrastructure and Buildings		Adaptive Environments	
Goals	IAP.1. Integrate Resilience into General Planning	IAP.2. Coordinate and Enhance Data Collection	IAP.3. Obtain and Track Funding	IAP.4. Enable Interagency Collaboration	CRC.1. Create Safe and Resilient Spaces	CRC.2. Build Community Capacity	CRC.3. Pursue Climate Ready Development	RIB.1. Incorporate Climate Resilience into County Infrastructure Decisions	RIB.2. Advocate for Infrastructure Resilience Outside of County Control	AE.1. Protect Natural Resources that Enhance Resilience	AE.2. Restore Damaged Areas Through Nature-Based and Natural Solutions
Strategies	IAP.1a. Inventory and Update the Comprehensive Plan to Enhance Resilience	IAP.2a. Develop Resilience Metrics and a Tracking System for Ongoing Assessment of Community Resilience and Improvements	IAP.3a. Develop a County Climate Fund	IAP.4a. Establish a Long-Term Interagency Collaboration System	CRC.1a. Develop Adaptation Action Areas Where Resilience Action is Prioritized	CRC.2a. Provide Community Aid and Services to Alleviate Resilience Needs	CRC.3a. Pursue and Implement a Flood-Risk Reduction Plan for the Fairfax County Community	RIB.1a. Update the Capital Improvement Program Process to Include Climate Resilience Considerations	RIB.2a. Advocate and Partner for Energy Resilience	AE.1a. Develop a Consolidated Natural Resources Management Plan	AE.2a. Pursue Green Infrastructure Projects that Provide Climate Resilience Benefits
	IAP.1b. Update the Strategic Plan to Enhance Climate Resilience	IAP.2b. Support Climate Research and Data Collection	IAP.3b. Pursue Federal and State Funding Opportunities	IAP.4b. Build County Staff Capacity to Lead on Climate Resilience Planning and Implementation	CRC.1b. Pursue Development of a Network of Resilience Hubs in Climate-Vulnerable Areas of the County	CRC.2b. Launch a Climate Resilience Education and Guidance Program	CRC.3b. Encourage Heat-Resilient Design, Development, Upgrades, and Practices	RIB.1b. Enhance Flood Resilience of County Government Buildings and Other Facilities	RIB.2b. Advocate for Resilience Updates to the Building Code	AE.1b. Survey and Protect Areas that Provide Natural Resilience Benefits	AE.2b. Support Continued Stream Corridor Restoration
	IAP.1c. Complete the Climate Health Plan	IAP.2c. Create Consolidated Database of Flood-Prone Areas	IAP.3c. Identify Funding for Long-Term Data Collection		CRC.1c. Expand Targeted Tree Plantings	CRC.2c. Support Resilience Related Workforce Development	CRC.3c. Pursue Amendments to the Zoning Ordinance and other County Codes	RIB.1c. Enhance Energy Resilience for County Buildings and Facilities	RIB.2c. Advocate and Partner with Transportation Agencies to Support Transportation Resilience	AE.1c. Update Provisions for Conservation Easements	AE.2c. Support Continued Urban Reforestation
	IAP.1d. Coordinate Hazard Mitigation and Emergency Management Planning with Climate Resilience Planning	IAP.2d. Continue to Collect Rainfall Data	IAP.3d. Identify Additional Funding Opportunities		CRC.1d. Enhance C-PACE Program Outreach and Technical Assistance	CRC.2d. Expand Heat Warning System	CRC.3d. Update the Public Facilities Manual	RIB.1d. Enhance Heat Resilience for County Buildings and Facilities		AE.1d. Integrate Climate Change Considerations into Urban Forestry Program	AE.2d. Explore Living Shoreline Opportunities
		IAP.2e. Create Database to Track Hazard Mitigation Actions						RIB.1e. Update Procurement Practices for Resilience			AE.2e. Restore Wetlands and Floodplains
		IAP.2f. Continue to Collect Tree Canopy Data									AE.2f. Explore Regenerative Agriculture Opportunities
		IAP.2g. Support Updates to LiDAR Data									
		IAP.2h. Collect Climate Change and Vector-Borne Disease Data									

4 PILLARS.

11 GOALS.

18 PRIORITY STRATEGIES.

30 ADDITIONAL STRATEGIES.

How are the plans being implemented?



150+ staff from
25+ agencies are involved
in climate plan implementation.

OEEC coordinates
across all agencies, and with
community groups, businesses,
fellow jurisdictions, utilities, state
and federal government, and the
general public.

What YOU can do: resilience to extreme heat



- Plant resilient shade trees in your neighborhood.
- Switch to cool roofs and cool pavements.
- Weatherize your home to keep it cooler.
- Reduce asphalt on your property.
- Change schedules for outdoor work and recreation to allow for more breaks, more water, and work in cooler parts of the day.
- Wear cooler uniforms for outdoor work and recreation.
- Apply for Cooling Assistance if you cannot afford air conditioning during extreme heat.
- Know where your Cooling Centers are located.
- Check on neighbors during heat.
- Spread awareness of DEMS' resources.

Resources

- [Resilient Fairfax \(OEEC\)](#)
- [Plant NOVA Natives \(PNN\)](#)
- [Using Cool Roofs to Reduce Heat Islands \(EPA\)](#)
- [Financial Incentives - Cool Roof Rating Council \(coolroofs.org\)](#)
- [Cooling Assistance | Family Services \(DFS\)](#)
- [Extreme Heat | Emergency \(DEMS\)](#)

What YOU can do: flooding resilience



- Report your flooding issues to DPWES
- Get flood insurance (*even if not in a floodplain*)
- Check for blocks of stormwater flow paths
- Remove excess impervious cover
- Install sump pumps and vacuums in basements
- Install basement window covers
- Elevate or cover HVAC and other equipment
- Use temporary flood gates over your doors
- Flood-proof building materials and paints
- Turn around, don't drown!
- Keep a window breaker in car glove compartment
- Plant a rain garden

Resources and Incentives

- [Report storm drain issues | DPWES](#) or 703-877-2800
- [Receive help with drainage and erosion on your property | NVSWCD](#)
- [Flood Information | DPWES](#)
- [Flood Insurance: Protect the Life You Have Built | News Center](#)
- [Flood Insurance | FEMA.gov](#)
- [FloodSmart.gov](#)
- ([Dozens of larger SWM infrastructure improvement projects are ongoing](#))
- (Small grant program for residents is currently in development)
- [Rain Garden Design and Construction | NVSWCD](#)



Resilient Fairfax

Resources

- [Resilient Fairfax webpage](#)
- [Resilient Fairfax Plan](#)
- [Climate Action Dashboard](#)
- [Resilient Fairfax Interactive Map Viewer](#)
- Questions? Contact us at ResilientFairfax@fairfaxcounty.gov