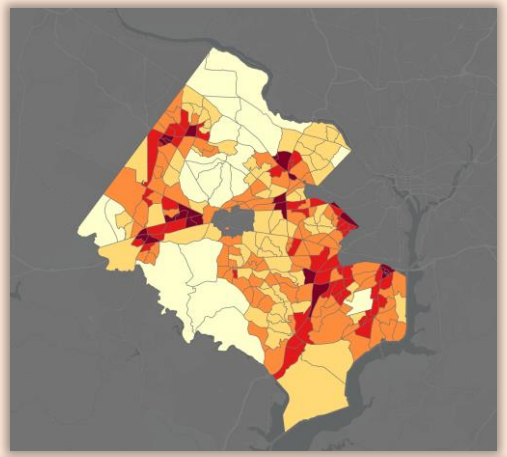
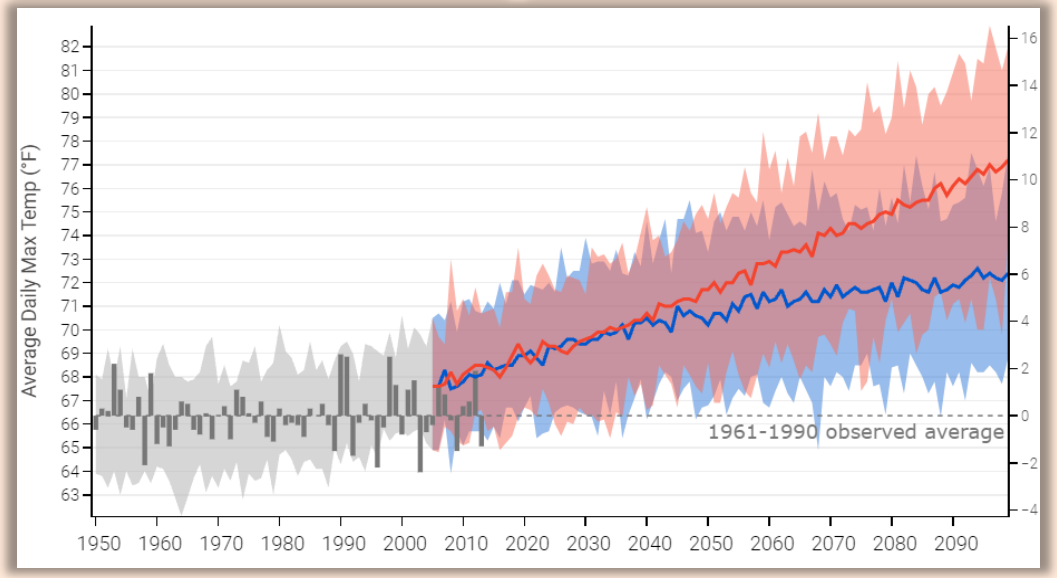




Monthly DEMS Webinar

Extreme Heat and Climate Change

June 14, 2023

Fairfax County, Virginia

Department of Emergency Management and Security (DEMS)

Office of Environmental and Energy Coordination (OEEC)

Topics for today's webinar

- ❑ What do DEMS and OEEC do?
- ❑ Weather vs. climate
- ❑ Extreme heat trends
- ❑ Who and what is most vulnerable to extreme heat?
- ❑ What the county is doing
  - ❑ Emergency preparedness
  - ❑ Emissions reduction
  - ❑ Resilience
- ❑ What you can do

What does DEMS do?

- Provide Local, Regional, State, and National Emergency Management Leadership
- Facilitate Emergency Partnerships
- Enhance Emergency Response Coordination
- Provide Emergency Planning
- Conduct Emergency Training & Exercises
- Facilitate Public Education and Community Outreach Programs
- Manage Homeland Security Grants
- Recovery Coordination
- Manage Emergency Alert and Notification Systems

What does OEEC do?

Environmental Administration & Policy

Environmental…

- Legislative tracking
- BOS initiatives
- BAC staffing
- Funding allocations
- Grants for county
- Incentives for the community
- Progress reporting
- Awards & recognitions

Making County Gov Operations Greener

- Operational Energy Strategy
- Green buildings for county facilities
- Solar energy for county
- Energy efficiency improvements
- Electric vehicle chargers
- County government energy tracking

Community Programs & Innovation

Carbon-Free Fairfax

Fairfax County Green Business Partners

Fairfax County HomeWise

SOLARIZE Fairfax County

Fairfax County Green Bank

Virginia PACE Authority – Clean Energy Financing

Fairfax County Tree Canopy Program

Charge Up Fairfax

Climate Planning

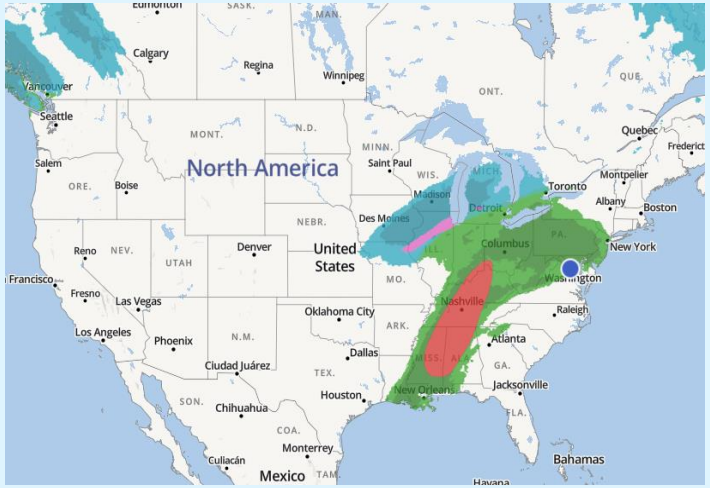
- **Emissions Reduction**:
  - Community-wide Energy and Climate Action Plan (CECAP)
  - Reducing emissions in the community
- **Adaptation & Resilience**:
  - Resilient Fairfax
  - Severe storms, Extreme Heat, Flooding

Environmental Coordination & Communications across:

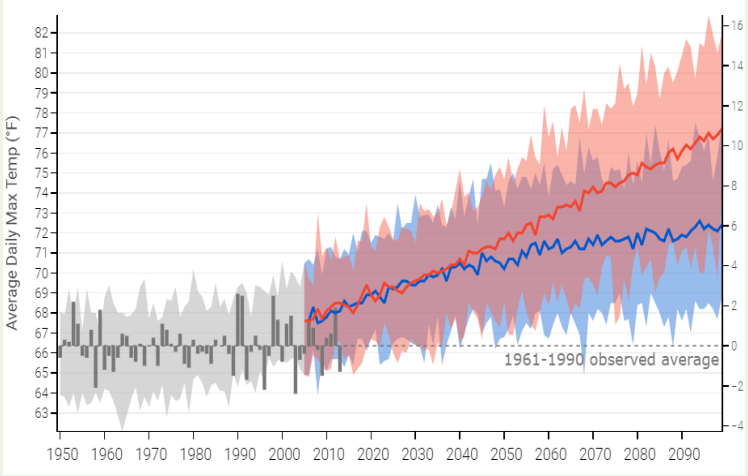
BOS, BACs, County Departments, County Partners, State & Federal Government, Other Jurisdictions, Regional Groups, Non-profits, Utilities, Community Groups, General Public

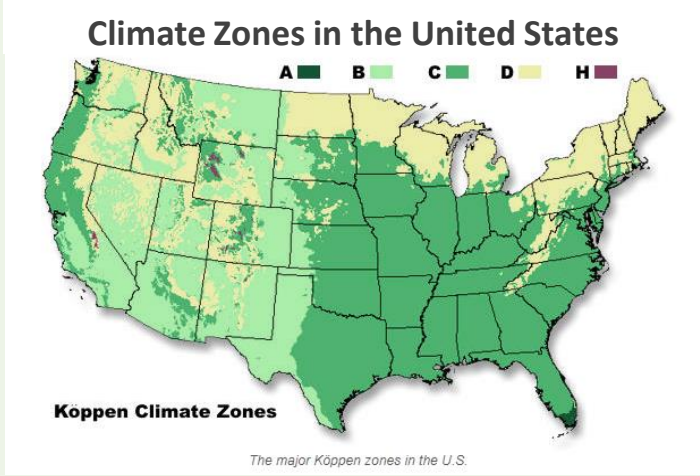
What is the difference between **weather** and **climate?**

Weather:
the conditions we experience day-to-day



Climate: norms for a region, based on averages of <u>20 years</u> or more

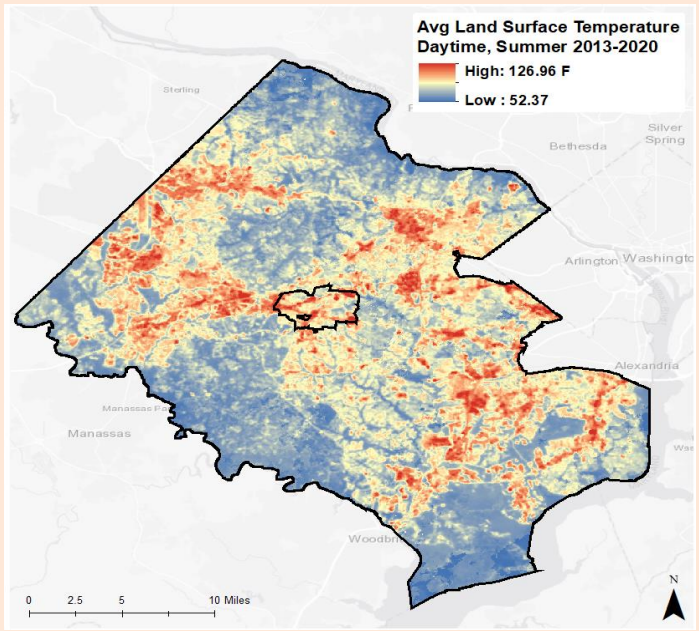




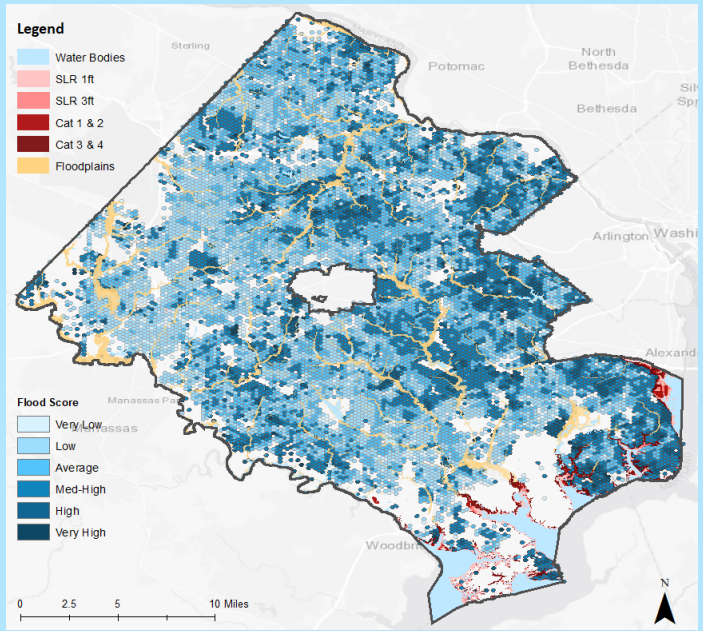
What is the greenhouse effect?

Fairfax County's Climate Trends

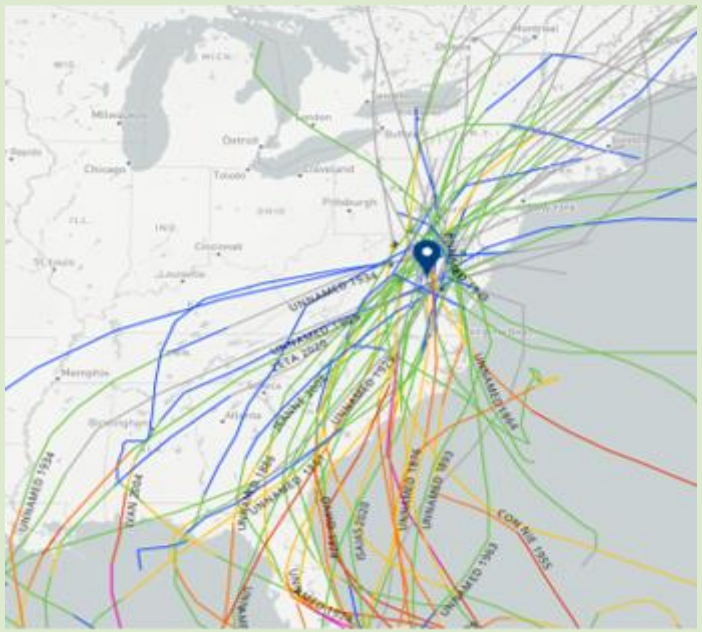
Warmer



Wetter



Weirder

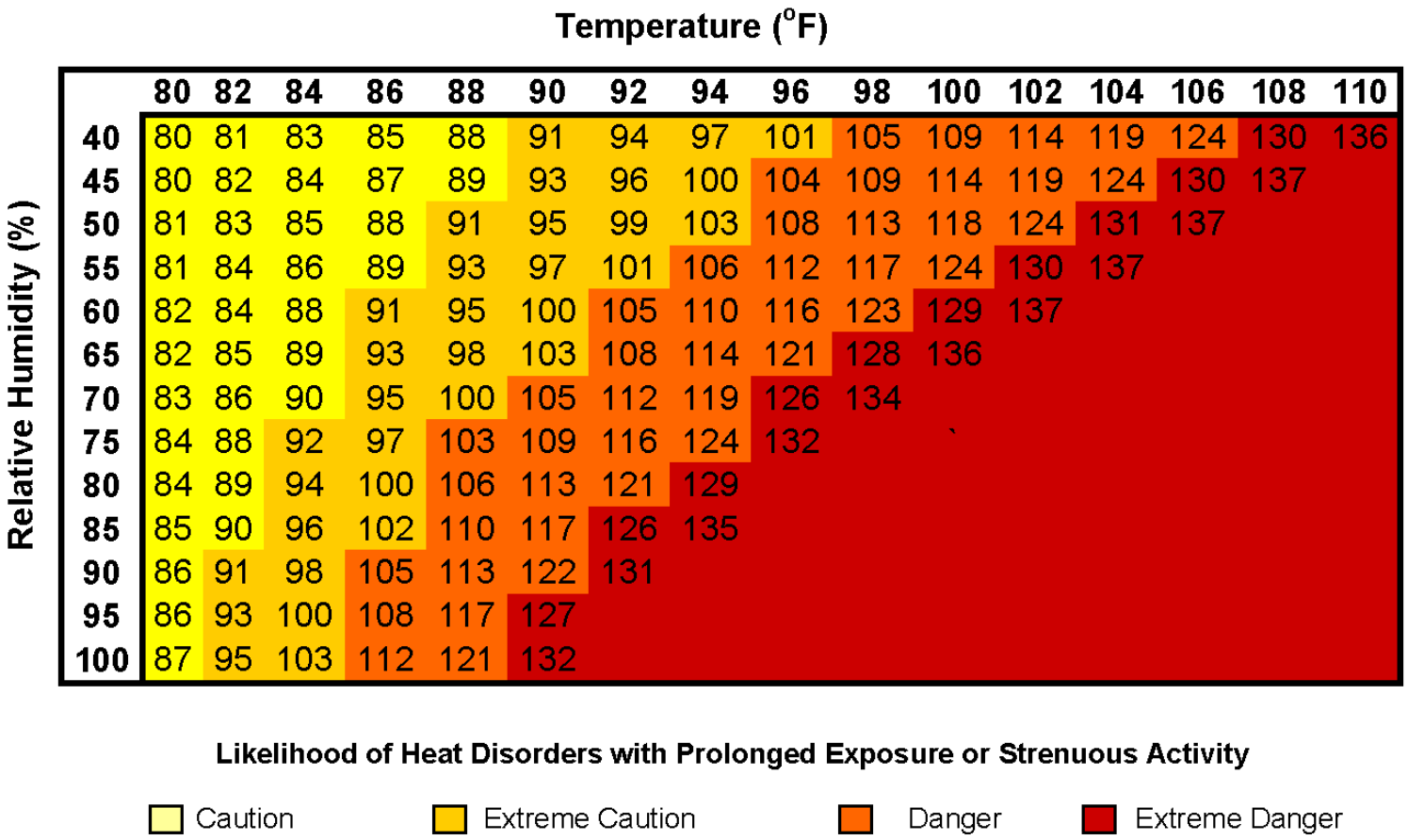


Please see Resilient Fairfax Climate Projections Report (CPR) for more information

How is “extreme heat” defined?

- It depends on **temperature, humidity, duration,** and **location**.
- As humidity rises, the “feels like” temperature rises, because it is harder to keep our bodies cool.
- Excessive Heat Warning: **Heat Index of 105° F** (usually above **95° F** *temperature*)

NOAA’s National Weather Service Heat Index



Extreme heat days are becoming more common

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

Average Number of Extreme Heat Days Per Year in Fairfax County

Baseline						
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

Average for 1976-2005

Today's Climate						
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

Average for 1991-2020

Near Future						
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

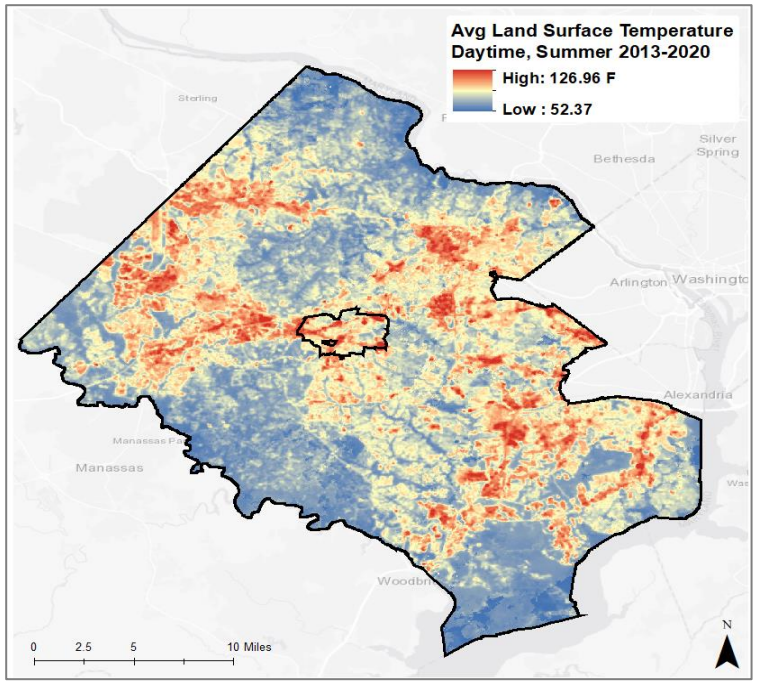
Projected Average for 2035-2064

End of Century						
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

Projected Average for 2070-2099

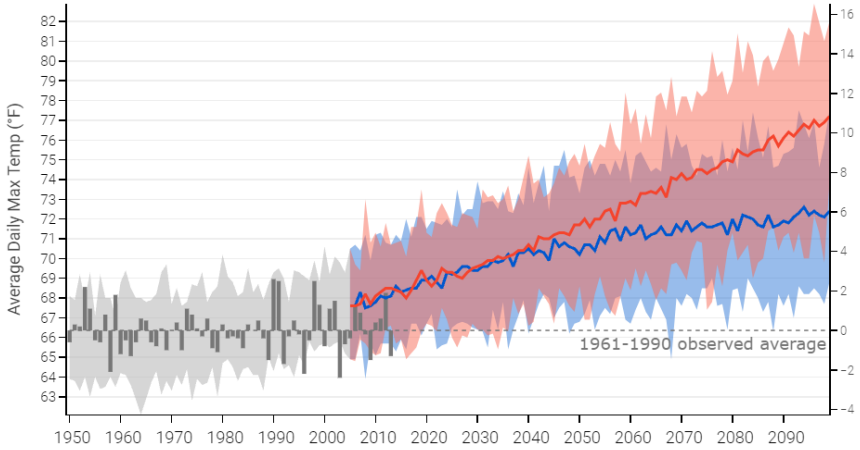
Are there other temperature trends?

Urban Heat Island Effect



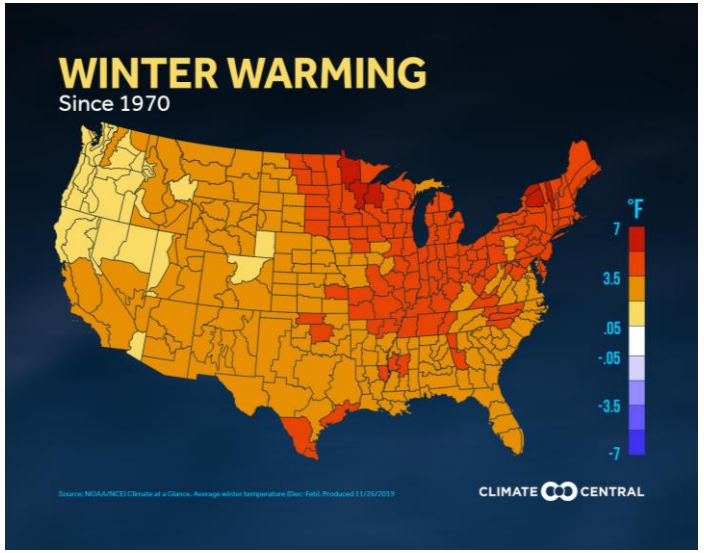
Urbanized areas of the county are **significantly hotter** on the ground than natural areas or areas with adequate green space

Warmer annual temperatures



Average annual temperatures have risen **2.2 °F** per century in Fairfax County, and are projected to rise **4.4 – 8°F by 2085.**

Milder winters

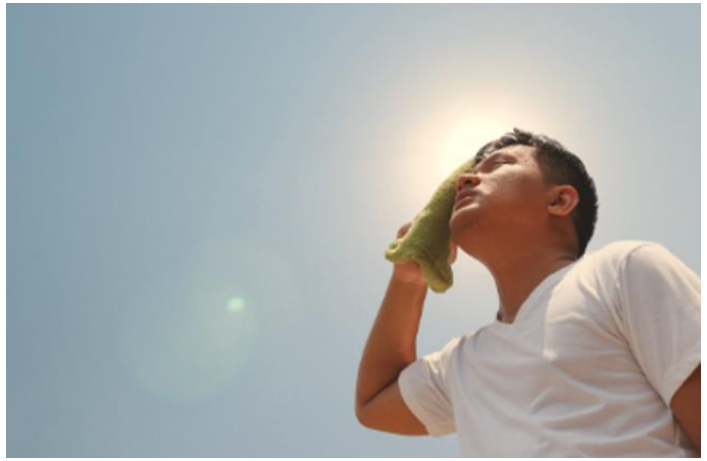


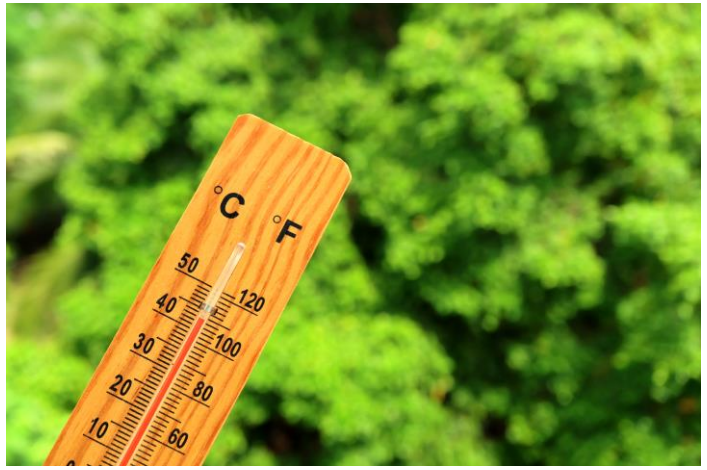
# of days below freezing on track to decrease from **3 months** per year (86 days) to **2 months** per year (62-67 days) by 2050 and **1.5 - 2 months** per year (40-60 days per year) by 2085.

Office of Environmental and Energy Coordination

Who is most vulnerable to extreme heat?

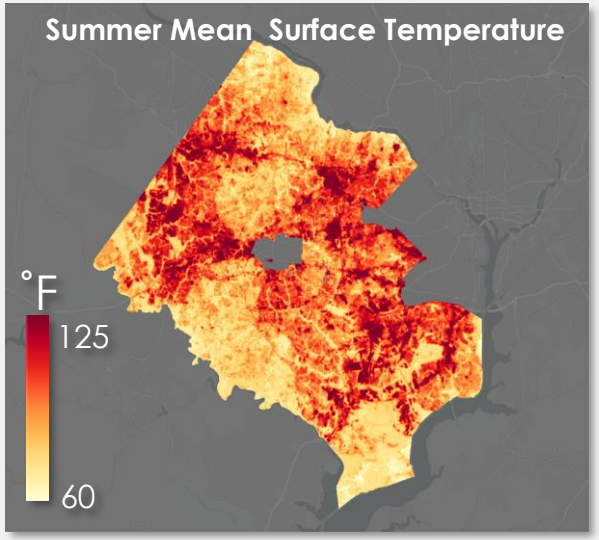
- People experiencing homelessness
- Outdoor workers
- People with health conditions
- People with disabilities
- People unable to afford air conditioning
- People without a vehicle
- Children
- Older Adults
- Pregnant women
- People of color (due to systemic factors)
- People with limited English proficiency
- Incarcerated people
- Undocumented immigrants and refugees
- People without social networks

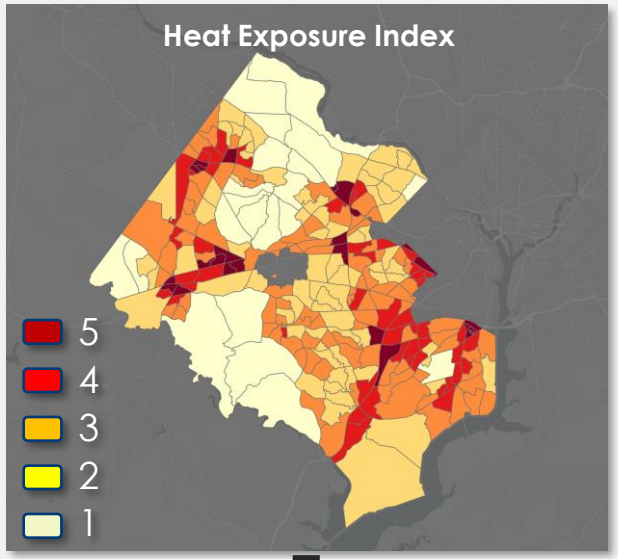




Which areas of the county are most vulnerable?

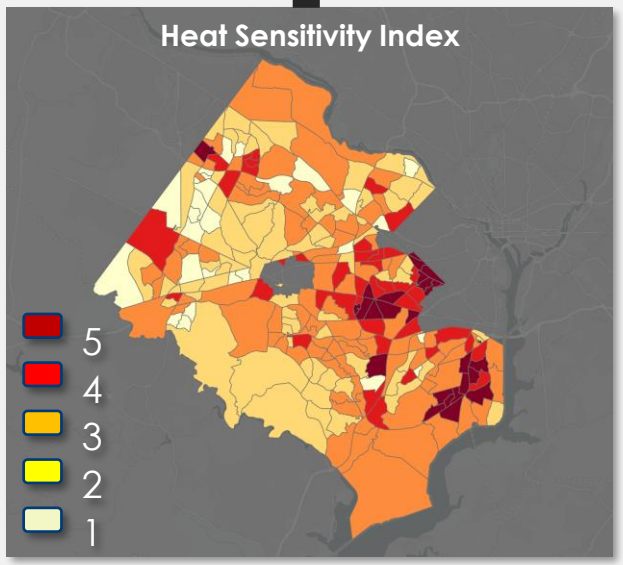
Exposure



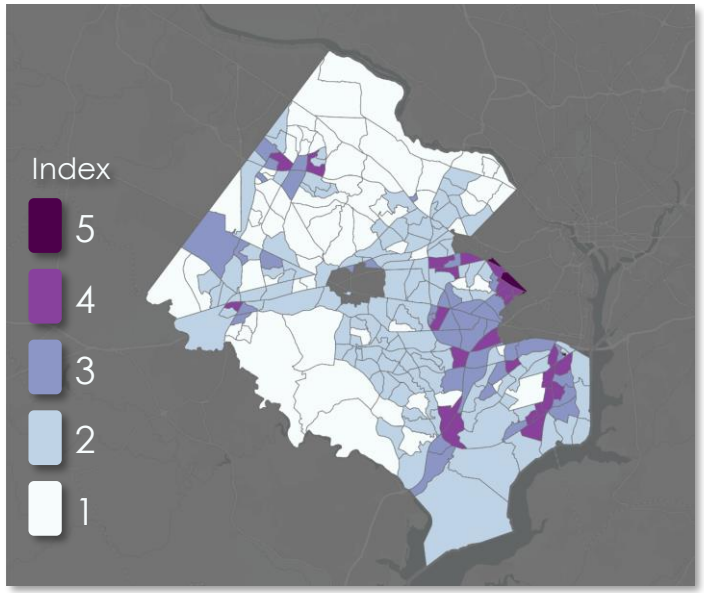


Sensitivity

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



Areas that may need the most help



Office of Environmental and Energy Coordination

Impacts of increased temperatures and extreme heat

- Increase in heat stroke & related illnesses
- Cardiovascular & respiratory issues
- Reduced air quality and water quality
- Longer pollen season, increased allergies

- Heat-related risks for emergency responders
- Reduced capacity for emergency responders

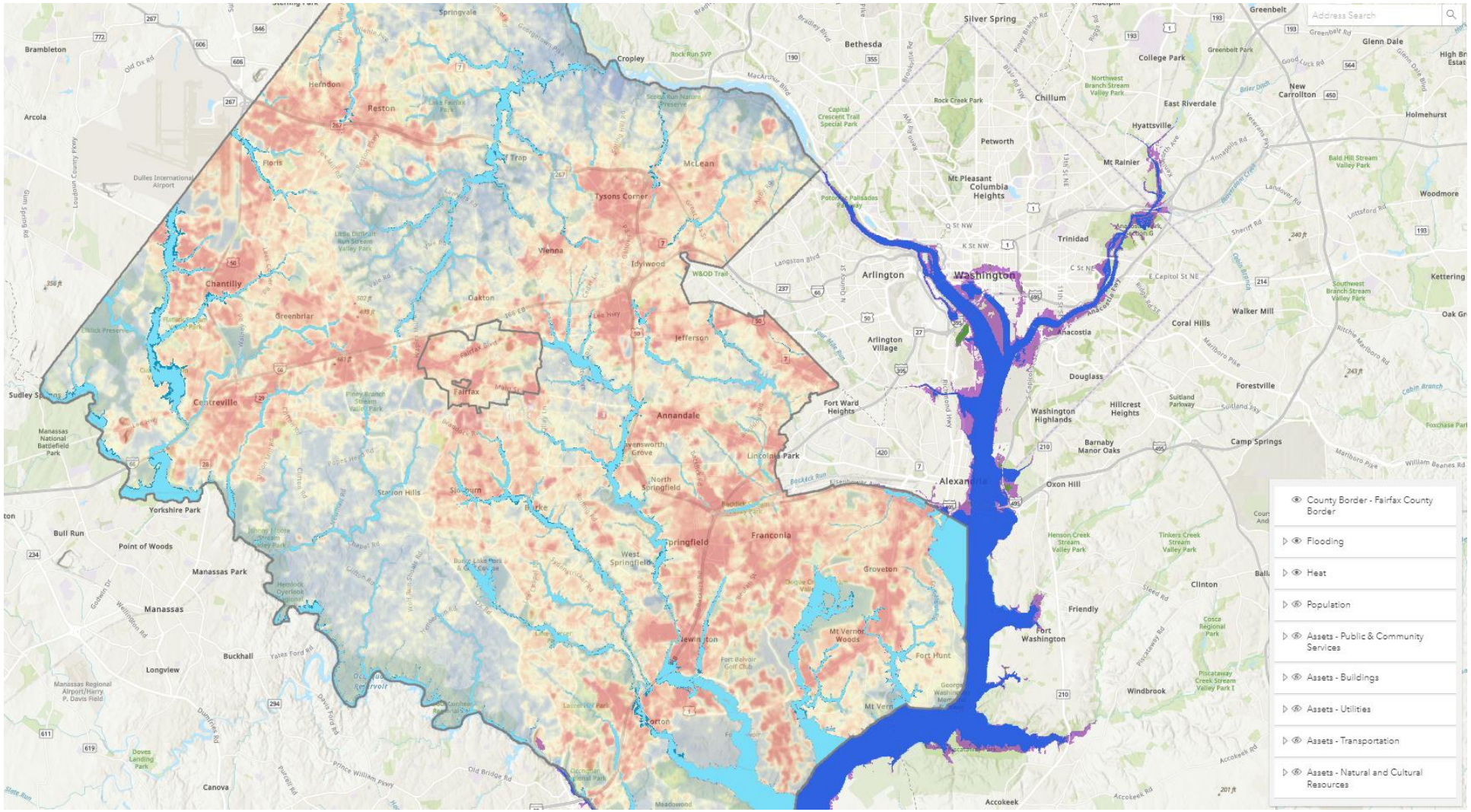
- Natural resource stress and reduced survival
- Crop viability and food production issues

- Excess electricity demand (air conditioning)
- Electricity brown-outs and black-outs

- Asphalt degradation & softening
- Increased repairs

- Rail track buckling
- Slower service for rail safety

Take a Look: Resilient Fairfax Interactive Climate Map Viewer

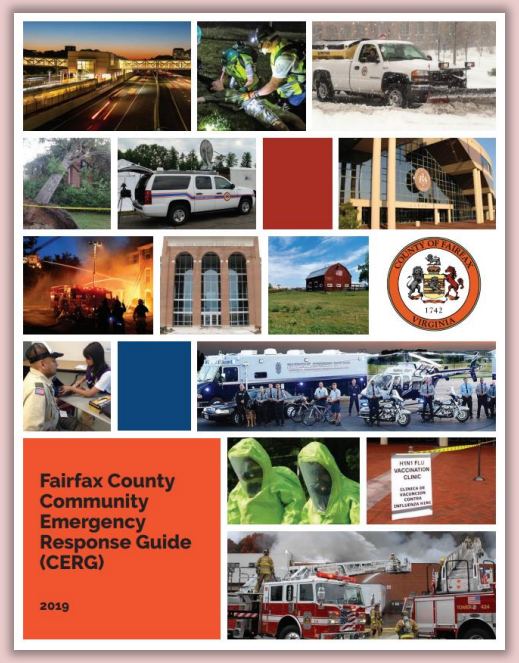


[Resilient Fairfax Interactive Map Viewer]

What the county is doing

Preparing for emergencies

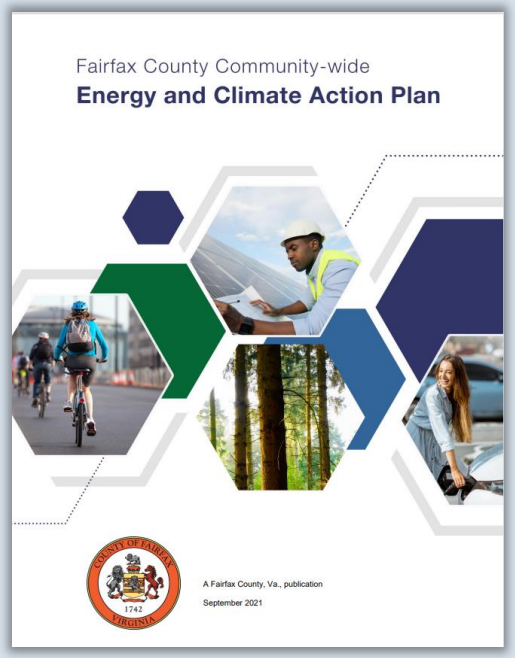
Emergency Plans



Department of Emergency Management & Security (DEMS)

Reducing emissions

CECAP



Office of Environmental & Energy Coordination (OEEC)

Boosting resilience

Resilient Fairfax

Office of Environmental & Energy Coordination (OEEC)

What the county is doing: for extreme heat emergencies

www.fairfaxcounty.gov/topics/extreme-heat-resources

BUSINESS GOVERNMENT FAIRFAX COUNTY VIRGINIA SERVICES CONNECT

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Extreme Heat Resources

During extremely hot days, there are many things to do to stay safe and cool. Resting for two hours indoors can significantly reduce heat-related illness. In addition to shopping malls, stores, or movie theaters, you may consider cooling off at one of our county facilities designated as "Cooling Centers".

COOLING CENTERS

Visit indoor locations during operating hours to stay cool. In addition to shopping malls, stores or movie theaters, you may consider cooling off at one of our **county facilities designated as Cooling Centers**, including:

1. Libraries
2. Community Centers
3. REC Centers
4. Human Services Regional Offices
5. Our homeless shelters are available for people experiencing homelessness

You are encouraged to first check that locations are open before you arrive.

Consider using the Fairfax Connector BusTracker to plan your visit.

View the Cooling Centers Map→

COOLING ASSISTANCE PROGRAM

The Cooling Assistance program helps keep Fairfax County residents cool during the summer months through:

- Payment of electric bills to operate cooling equipment.
- Payment of security deposits for electricity to operate cooling equipment for accounts in danger of being disconnected or when a deposit is needed to begin service.
- Repair of a central air conditioning system or heat pump.
- Purchase of a whole-house fan, including ceiling or attic fans.
- Purchase and installation, or self-pick-up, of one air conditioning unit (window or portable).

To be eligible, at least one household member must be: 60 or older; 5 or younger; or disabled according to Social Security, Medicaid or 100% Veteran's Administration.

Cooling Assistance Program→

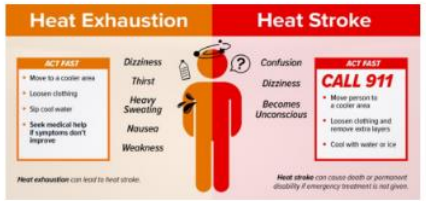
STAY INFORMED WITH FAIRFAX ALERTS

The Fairfax Alerts system delivers important emergency alerts, notifications and updates during a major crisis or emergency.

Watch: Fairfax Alerts Video

Sign up for emergency alerts that include: Heat Emergency; Public Safety, Traffic, Weather; Police Notifications; Emergency Preparedness Drills/Exercises.

Sign Up for Fairfax Alerts→



This flyer is available in multiple languages:

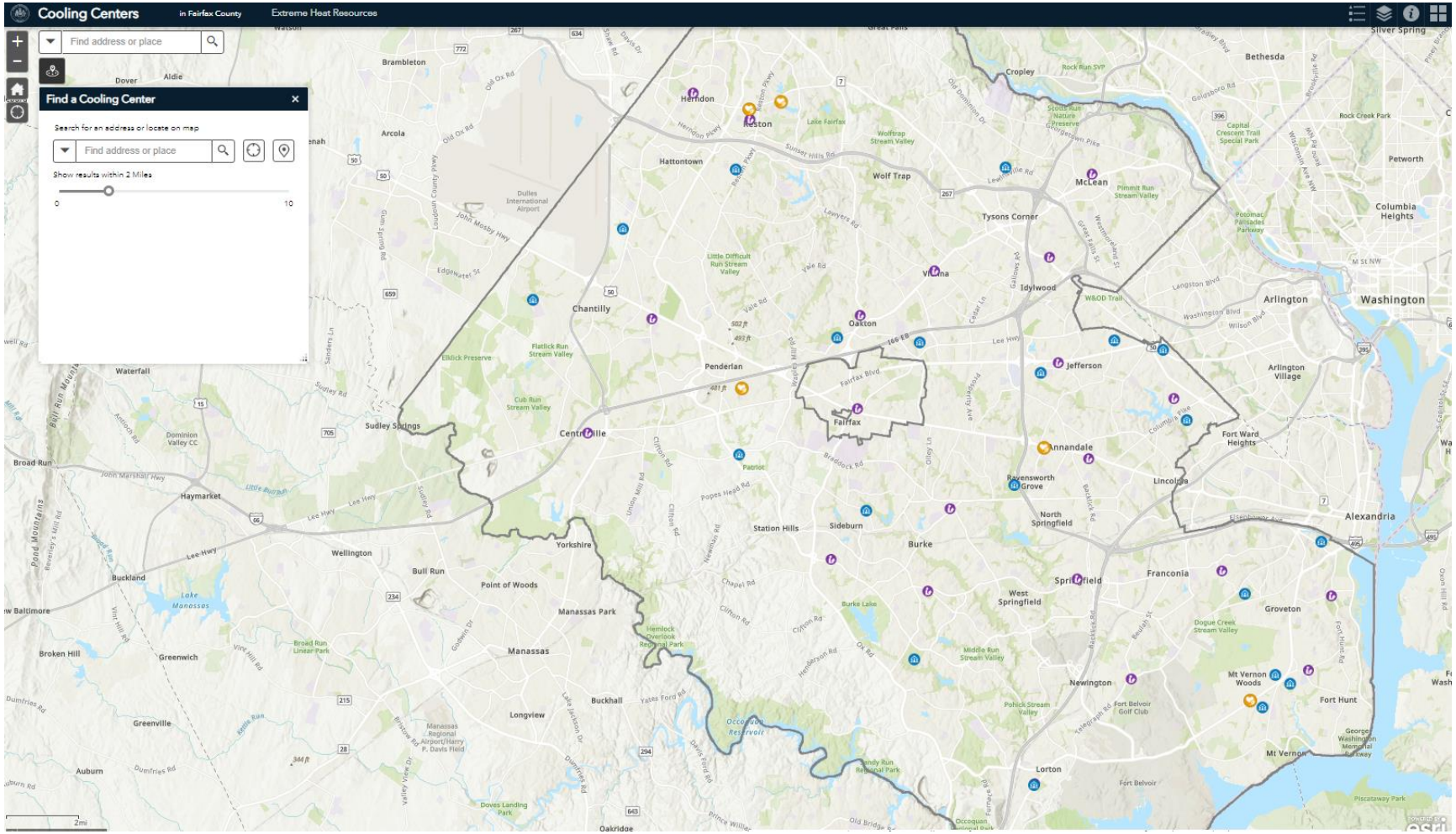
- English
- Español
- العربية
- 한국어
- Tiếng Việt
- 中文
- اردو
- አማርኛ

During hot days, here are eight tips to stay cool and look after others:

1. Drink plenty of water, even if you don't feel thirsty.
2. Stay inside and out of the heat if possible. Save the yard work for another day or time.
3. Visit indoor locations during operating hours to stay cool.
4. Know the symptoms of heat-related illness. Heat stroke is an emergency, so call or text 9-1-1.
5. Check on people with vulnerabilities in our community who may need help responding to the heat.
6. Never leave children, older adults, or pets alone in a car.
7. Fans create air flow but give a false sense of comfort and they do not reduce body temperature. Stay hydrated and take other steps to get cool.
8. Our Department of Emergency Management and Security has **more information about extreme heat, including important terms to know.**

What the county is doing: for extreme heat emergencies

www.fairfaxcounty.gov/topics/extreme-heat-resources

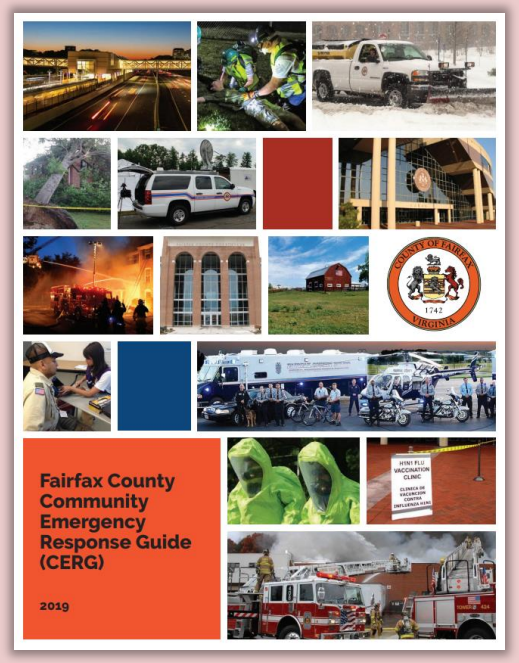


What YOU can do: before and during extreme heat

- ❑ Sign up for Fairfax Alerts
- ❑ Drink plenty of fluids
- ❑ Dress in loose-fitting, light-colored clothing
- ❑ Never leave children or pets alone in closed vehicles
- ❑ Stay indoors and reduce exposure to extreme heat
- ❑ Take frequent breaks
- ❑ Check on older neighbors and those without air conditioning
- ❑ If you feel woozy, overheated, or unwell, take action immediately:
  - ❑ Stop strenuous activity
  - ❑ Get somewhere cool
  - ❑ Drink fluids
  - ❑ Cool your skin
  - ❑ Call for help
  - ❑ Check on older neighbors and those without air conditioning

Preparing for emergencies

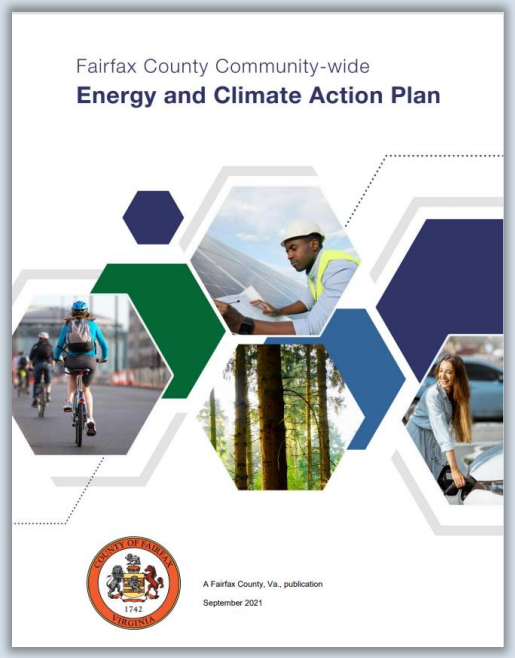
Emergency Plans



Department of Emergency Management & Security (DEMS)

Reducing emissions

CECAP



Office of Environmental & Energy Coordination (OEEC)

Boosting resilience

Resilient Fairfax

Office of Environmental & Energy Coordination (OEEC)

CECAP & OES: What the county is doing to reduce emissions

Buildings and Energy Efficiency

Strategy 1: Increase energy efficiency and conservation in existing buildings.
Strategy 2: Electrify existing buildings.
Strategy 3: Implement green building standards for new buildings.

Transportation

Strategy 7: Increase electric vehicles (EVs).
Strategy 8: Support sustainable land use, active & public transportation, & TDM.
Strategy 9: Increase fuel economy and use of low-carbon fuels for transportation.

Natural Resources

Strategy 12: Support preservation, restoration, and expansion of natural systems, green spaces, and soil quality.

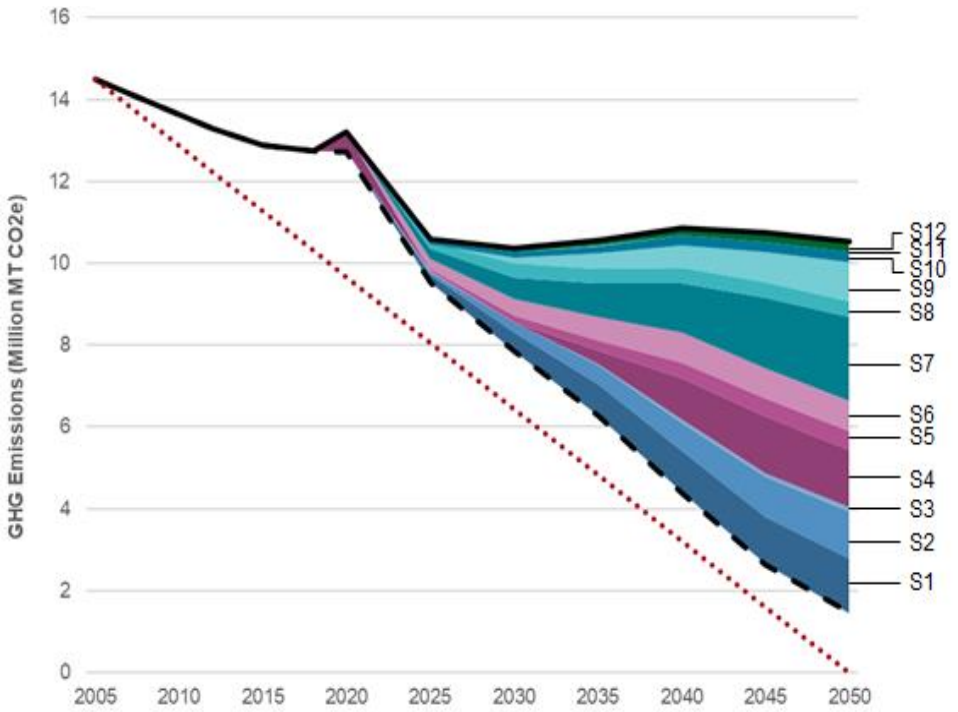
Energy Supply

Strategy 4: Increase renewable energy in electricity grid.
Strategy 5: Increase production of onsite renewable energy.
Strategy 6: Increase energy supply from resource-recovered gas, hydrogen, and power-to-gas.

Waste

Strategy 10: Reduce the amount of waste generated and divert waste from landfills and waste-to-energy facilities.
Strategy 11: Responsibly manage all waste generation, including collected residential and commercial waste, wastewater, and other items.

Greenhouse Gas Emissions Reductions Modeled by Strategy



What YOU can do to reduce emissions

Buildings and Energy Efficiency

- ❑ Check out a thermal camera from the library to find your air leaks
- ❑ Seal your air leaks and insulate to prevent lost air conditioning and wasted energy
- ❑ Switch to electric appliances if possible

Transportation

- ❑ Drive less
- ❑ Walk, bike, and take transit more
- ❑ If you are buying a car, consider an EV or hybrid (tax credits available)

Energy Supply

- ❑ If possible for you, install solar panels or other renewable energy systems (tax credits available)

Natural Resources

- ❑ Plant native trees to absorb emissions
- ❑ Remove invasive species

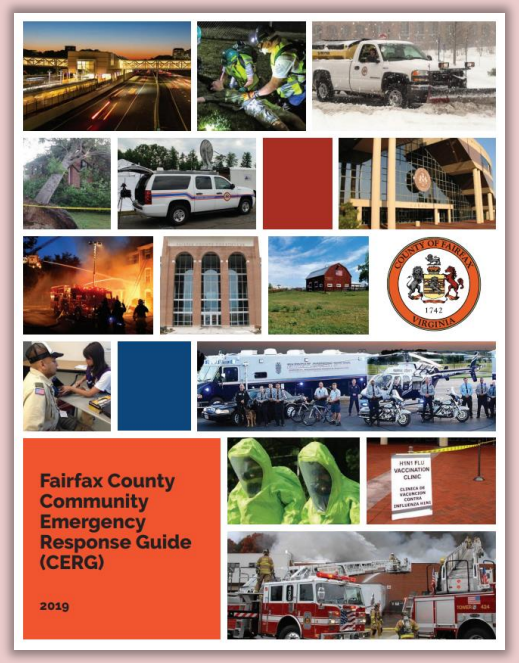
Waste

- ❑ Reduce your waste
- ❑ Avoid buying single-use plastics and products
- ❑ Reuse and recycle
- ❑ Compost your food scraps

This is a small sample of actions. For more actions and resources, please see the Climate Action Dashboard.

Preparing for emergencies

Emergency Plans



Department of Emergency Management & Security (DEMS)

Reducing emissions

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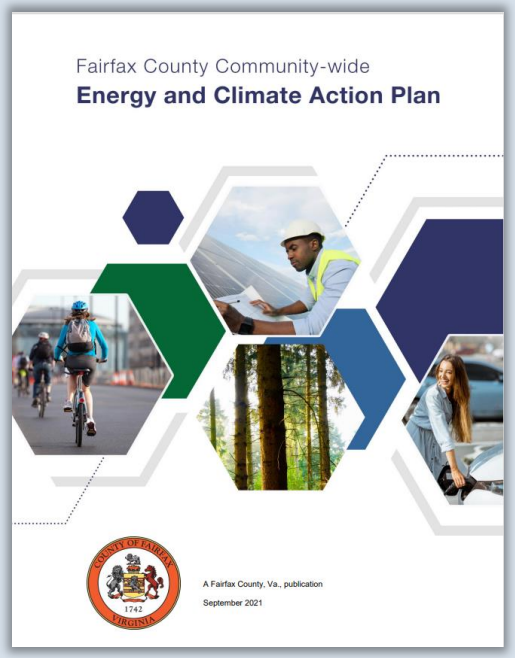


Office of Environmental & Energy Coordination (OEEC)

Boosting resilience

Resilient Fairfax

Office of Environmental & Energy Coordination (OEEC)

Resilient Fairfax: *Boosting resilience*

Integrated Action Planning (IAP)

- Resilience into county plans and policies
- Resilience data collection
- Resilience funding
- Interagency coordination

Climate Ready Communities (CRC)

- Network of safe & resilient spaces
- Community capacity to prepare for, withstand, and recover from events
- Climate-ready development

Resilient Infrastructure & Buildings (RIB)

- Resilience in major county infrastructure decisions
- County building & facility resiliency
- Advocacy for external infrastructure resiliency, i.e., energy grid & transit

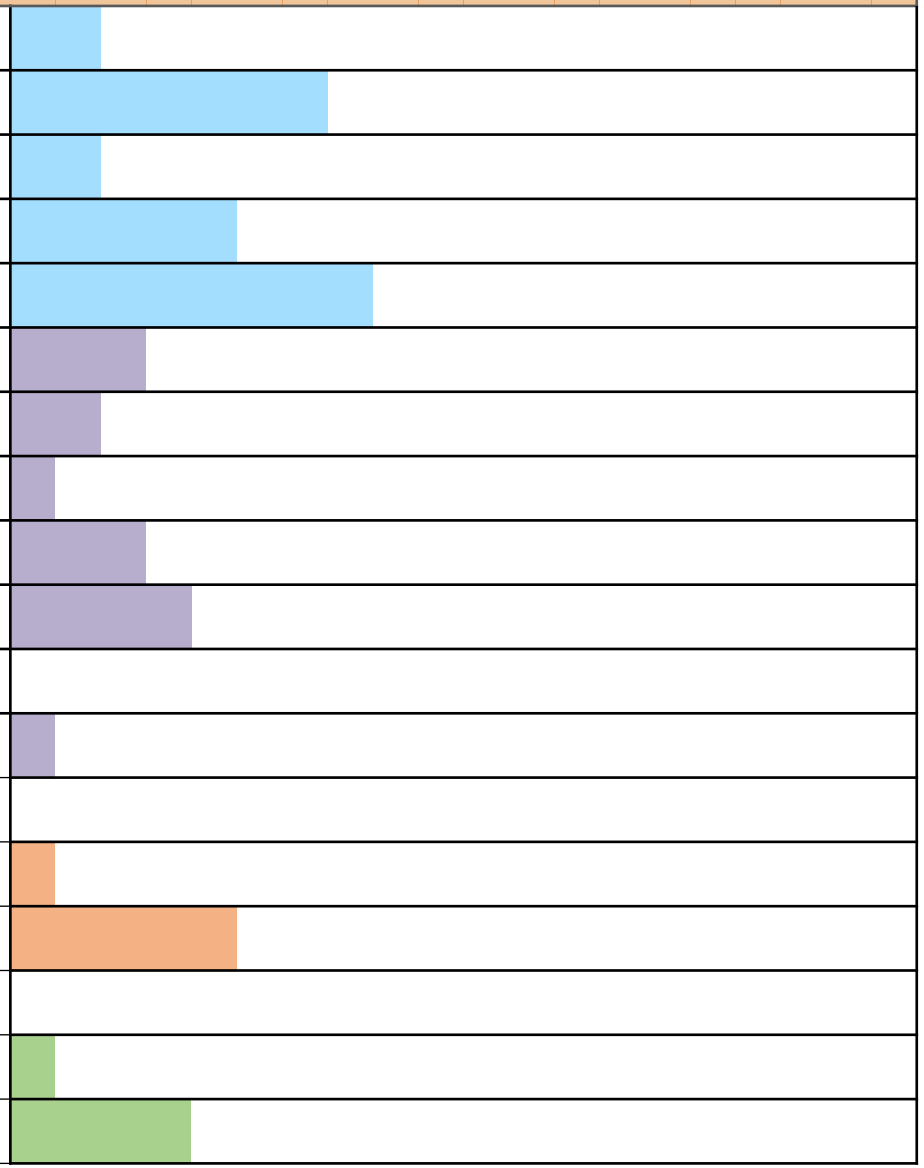
Adaptive Environments (AE)

- Protection of natural resources that enhance resilience
- Restoration of damaged areas with nature-based and natural solutions

48 Resilience Strategies within these 4 Pillars

Resilient Fairfax

	Status of 18 Prioritized Resilient Fairfax Strategies	% Complete*
1	IAP.1a: Comprehensive Plan Updates for Resilience	7%
2	IAP.2a: Resilience Metrics and Tracking System	33%
3	IAP.3a: County Climate Fund	10% **
4	IAP.3b: Pursue Federal and State Funding Opportunities	25%
5	IAP.4a: Long-term Interagency Collaboration System	40%
6	CRC.1a: Adaptation Action Areas	13%
7	CRC.1b: Resilience Hubs	8% **
8	CRC.2a: Community Aid and Services for Resilience Needs	6%
9	CRC.2b: Climate Resilience Guidance & Education	14%
10	CRC.3a: Flood Risk Reduction Plan	17%
11	CRC.3b: Heat-Resilient Design, Development, Practices	0%
12	CRC.3c: Zoning and Other County Code Amendments	5%
13	RIB.1a: Capital Improvement Program Process Updates	0%
14	RIB.1b: Flood Resilience for County-owned Buildings & Facilities	5%
15	RIB.2a: Advocate and Partner for Energy Resilience	25%
16	AE.1a: Consolidated Natural Resources Management Plan	0%
17	AE.1b: Survey and Protect Areas that Provide Natural Resilience	5%
18	AE.2a: Green Infrastructure Projects for Climate Resilience	20%



*Based on number of Implementation Actions complete out of total number **Staff recommend a potential change in approach based on new information and opportunities

Resilient Fairfax

Expand Community Aid and Services

Boost access to services from many agencies:

- Air conditioning/ cooling assistance during summer months
- Home Repair for the Elderly Program and Fan Care
- Places to stay cool
- Heat Alerts
- Aid for especially exposed populations, such as those experiencing homelessness
- Health and human services that enhance population resilience
- Heat emergency alerts
- Outdoor worker safety standards: water, breaks, uniforms
- Services for other climate hazards, such as flooding services

Resilient Fairfax

Resilience Hubs/ Solar Sanctuaries

- **Purpose:** boosting community resilience before, during, and after climate shocks & stressors
- **Sites upgraded for resilience:** solar & battery back-up in case of power outages, floodproofing and stormwater management, cool roofs and pavements, environmentally friendly sites, green infrastructure
- **Community training from many agencies**: How to handle heat-related illnesses, emergency preparedness, home upgrades, services and incentives available, financial resilience, and more
- **Access to critical services and basic needs**

<u>Progress Updates</u>

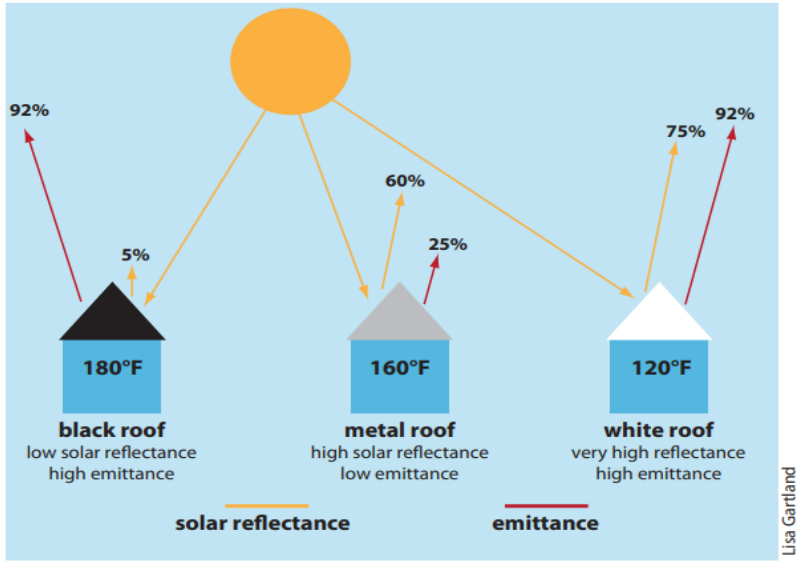
✓ 30+ potential sites evaluated

✓ Applied for $1 million EPA grant for pilot hubs

Resilient Fairfax

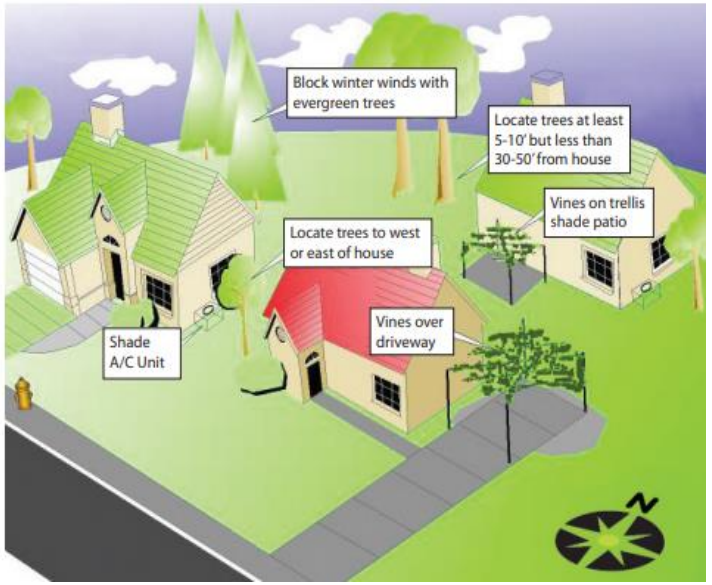
Heat-Resilient Development

- Cool roofs *(50-60°F cooler than traditional roofs)*
- Green roofs
- Cool pavements
- Building materials that stay cooler
- Better insulation
- Angle buildings to be cooler
- Landscaping with shade trees



Lisa Gartland

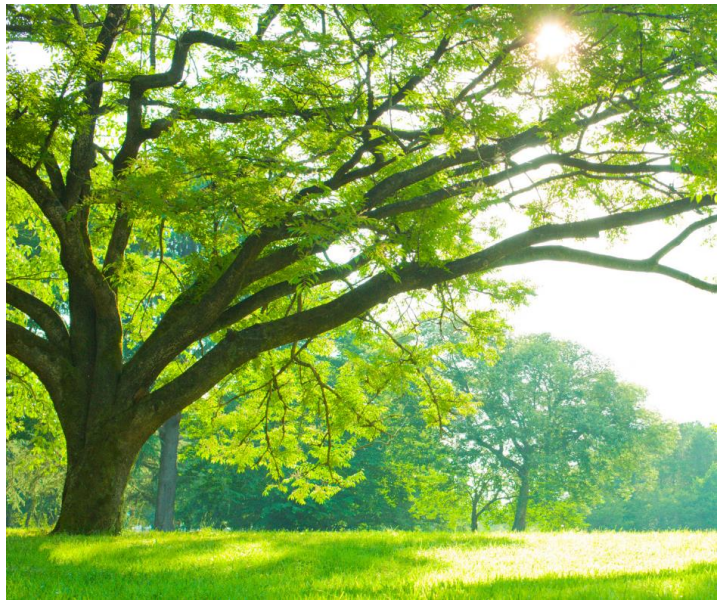

E.G. McPherson




Energy Coordinating Agency, Philadelphia

Resilient Fairfax

Tree Plantings and Urban Forestry



- **Trees reduce extreme heat impacts by 15-20 degrees**
- **19+ existing tree planting programs in Fairfax County**
  - **Government:** Alien Invaders Program, Buy Virginia Trees, NVSWCD Programs, Park Volunteer Programs, Tree Planting and Preservation Fund (TPPF), Tree Planting at Your School, Trees Please, Watch the Green Grow. We also enforce tree rules and protections, and conduct tree planting, maintenance, science, and education.
  - **Other**: Arbor Day Foundation, Earth Sangha, Fairfax ReLeaf, Falls Church Neighborhood Tree Program, McLean Trees Foundation, Plant NOVA Natives, Plant NOVA Trees, Fairfax County Master Gardeners Association, and Virginia Native Plant Society,
- **Streamlining and expanding these efforts through the new Fairfax County Tree Canopy Program**

Fairfax County TREE CANOPY PROGRAM

Resilient Fairfax

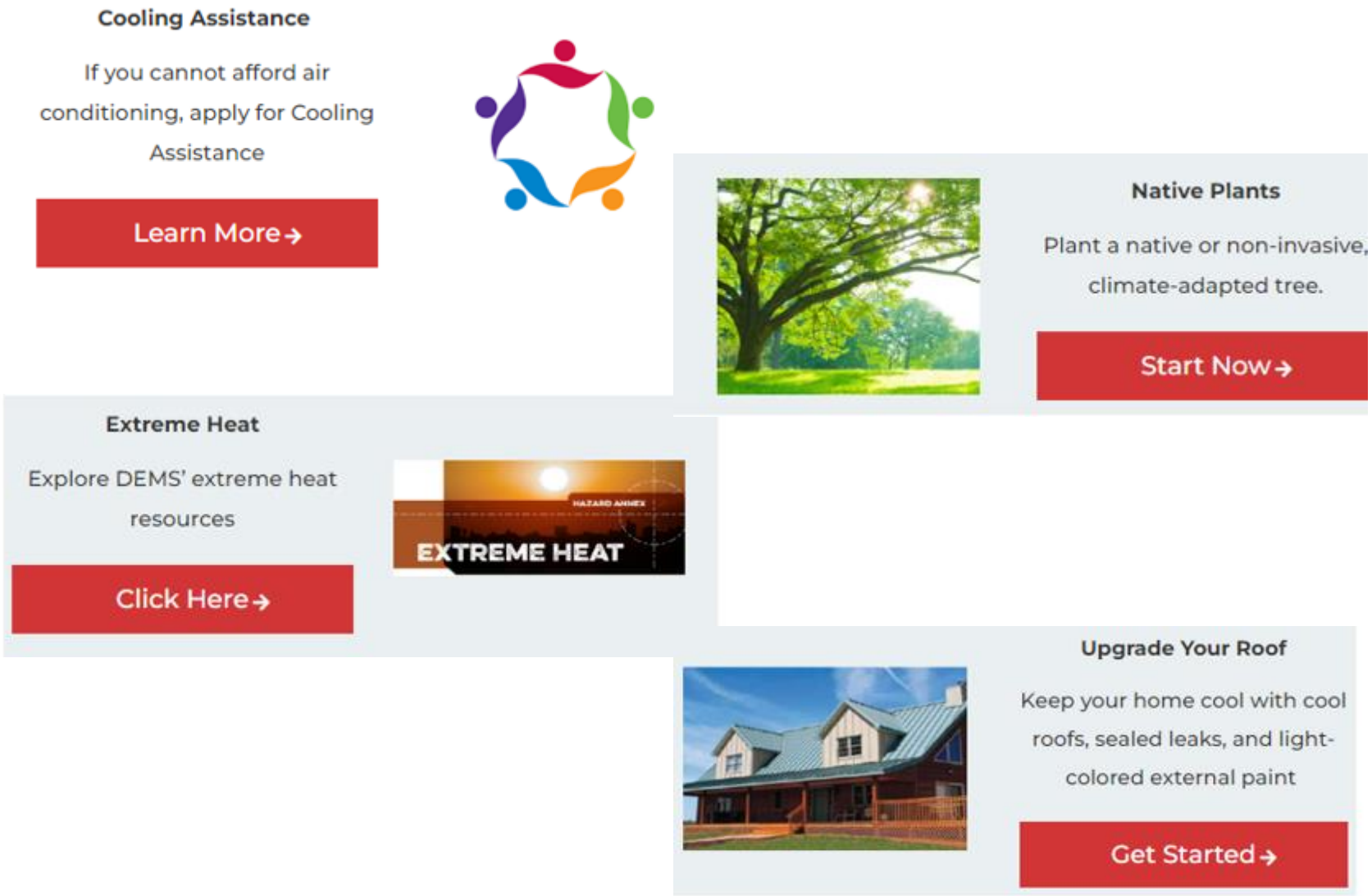
Green Infrastructure

- **Examples:**
  - Green roofs, bioswales, rain gardens
- **Benefits:**
  - Reduces Urban Heat Island effect
  - Other resilience benefits, especially absorbing stormwater
  - Habitat, pollination
  - Aesthetics
- **What the county and partners are doing:**
  - Green infrastructure projects
  - Encouraging green infrastructure in land development
  - Assistance to residents, businesses, HOAs, places of worship
  - Guidance and education

Resilient Fairfax

Climate Guidance and Education

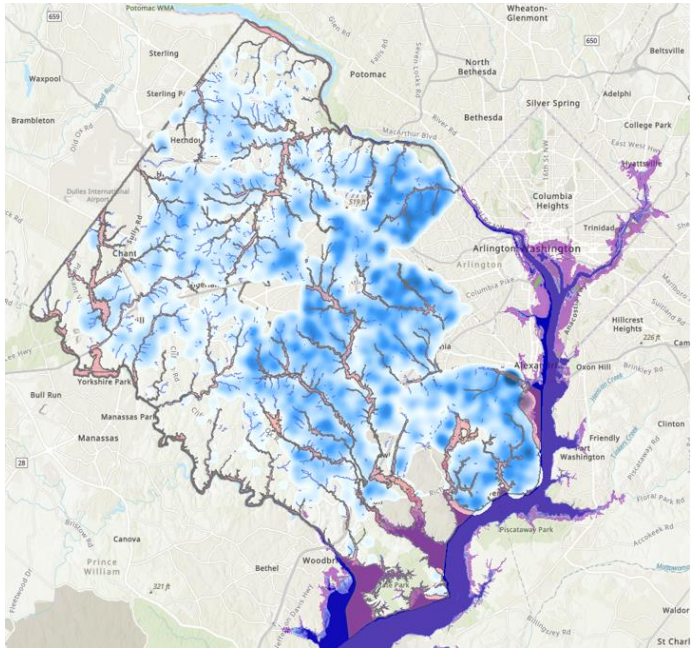
- **30+ agencies collaborating for community education, outreach, and guidance**
- [Climate Action Dashboard]: one-stop shop for information
- **Links to resources** from multiple agencies
- **Climate Checklist** for residents (in development)



Resilient Fairfax

Climate Research and Data

- **Fairfax County & GMU's Virginia Climate Center**
  - Vector-borne disease research
  - Digital Twin and other modeling
  - Resilience Hub Step-by-Step Guide Creation
- **Fairfax County & NVRC & MARISA**
  - Flooding and precipitation change
  - How stormwater design should change
- **Fairfax County & various tree partners**
  - Urban forestry and tree data updates
- **Adaptation Action Area Mapping**
  - Prioritizing areas on a map that are both climate-vulnerable and socioeconomically vulnerable.



What YOU can do to be more resilient to extreme heat

Extreme Heat Resilience Ideas

- ❑ Plant native shade trees in your neighborhood
- ❑ Switch to cool roofs and cool pavements (light-colored)
- ❑ Reduce dark-colored asphalt on your property
- ❑ Businesses with outdoor workers: Refined schedules and more breaks during extreme heat; invest in cooling vests and cooler, breathable uniforms
- ❑ Outdoor recreation (e.g., sports parents): update protocols for breaks and water intake
- ❑ Connect people vulnerable to extreme heat to county resources (e.g., DFS air conditioning assistance and cooling centers)
- ❑ Set up a system to check on neighbors during heat
- ❑ Spread awareness of DEMS' heat emergency resources

Resources

- Climate Resilience Dashboard
- Plant NOVA Natives
- Using Cool Roofs to Reduce Heat Islands | US EPA
- Financial Incentives - Cool Roof Rating Council (coolroofs.org)
- Cool Roof Calculator (ornl.gov)
- Extreme Heat | Emergency

County Plans & Resources

- **DEMS' Emergency Plans**
  (The County's plans for emergencies)

- **CECAP** - Community-Wide Climate and Energy Action Plan
  (Reducing emissions)

- **Resilient Fairfax** – Climate Adaptation & Resilience Plan
  (Boosting resilience and adapting to changing conditions)

- Fairfax Alerts
  (*Sign up to be notified when emergencies happen)*

- DEMS' extreme heat resources
  (Guidance on what to do in emergency situations)

- Cooling Assistance
  (*Help if you can't afford air conditioning)*

- Climate Action Dashboard
  (*One-stop shop for resources and information from all agencies)*