Climate Change and Health Equity

CDR Kimberly Davids
February 2023

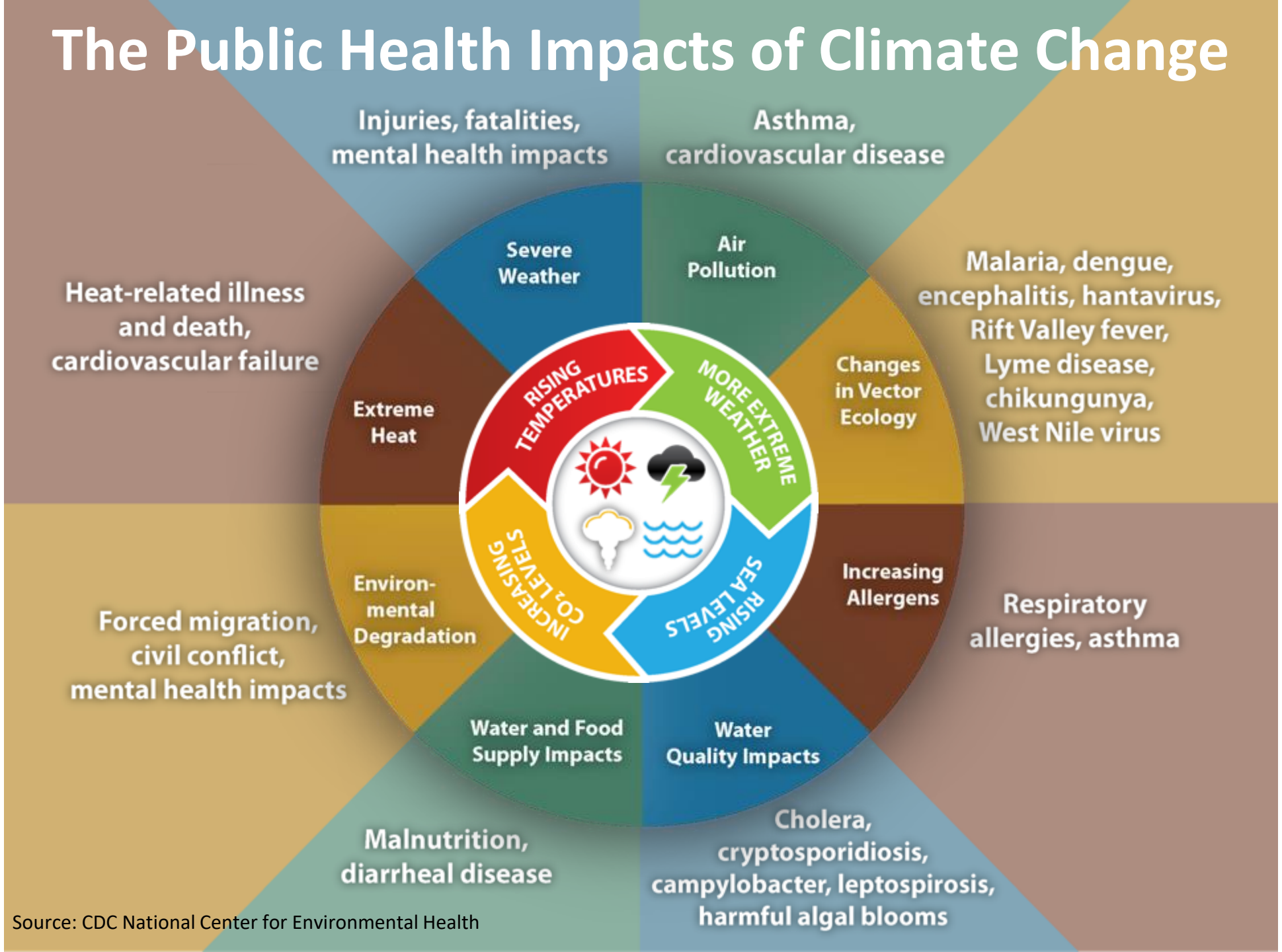
OASH | Office of Climate Change and Health Equity

Overview

- **Climate change and public health context**
- HHS and Office of Climate Change and Health Equity work and priorities
- Resources and supports for emissions reduction and resilience

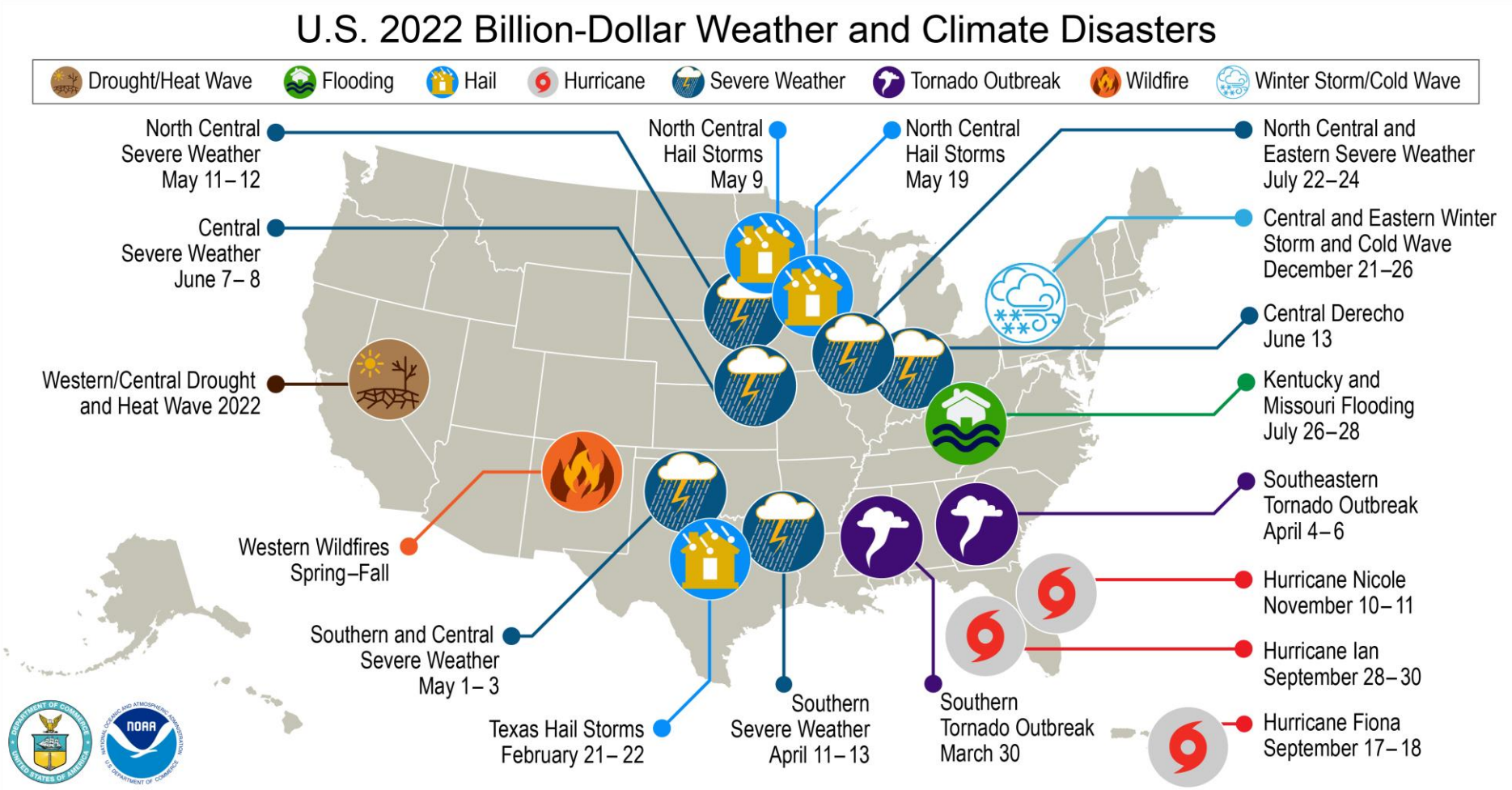
Ever-Increasing Urgency…

The Public Health Impacts of Climate Change



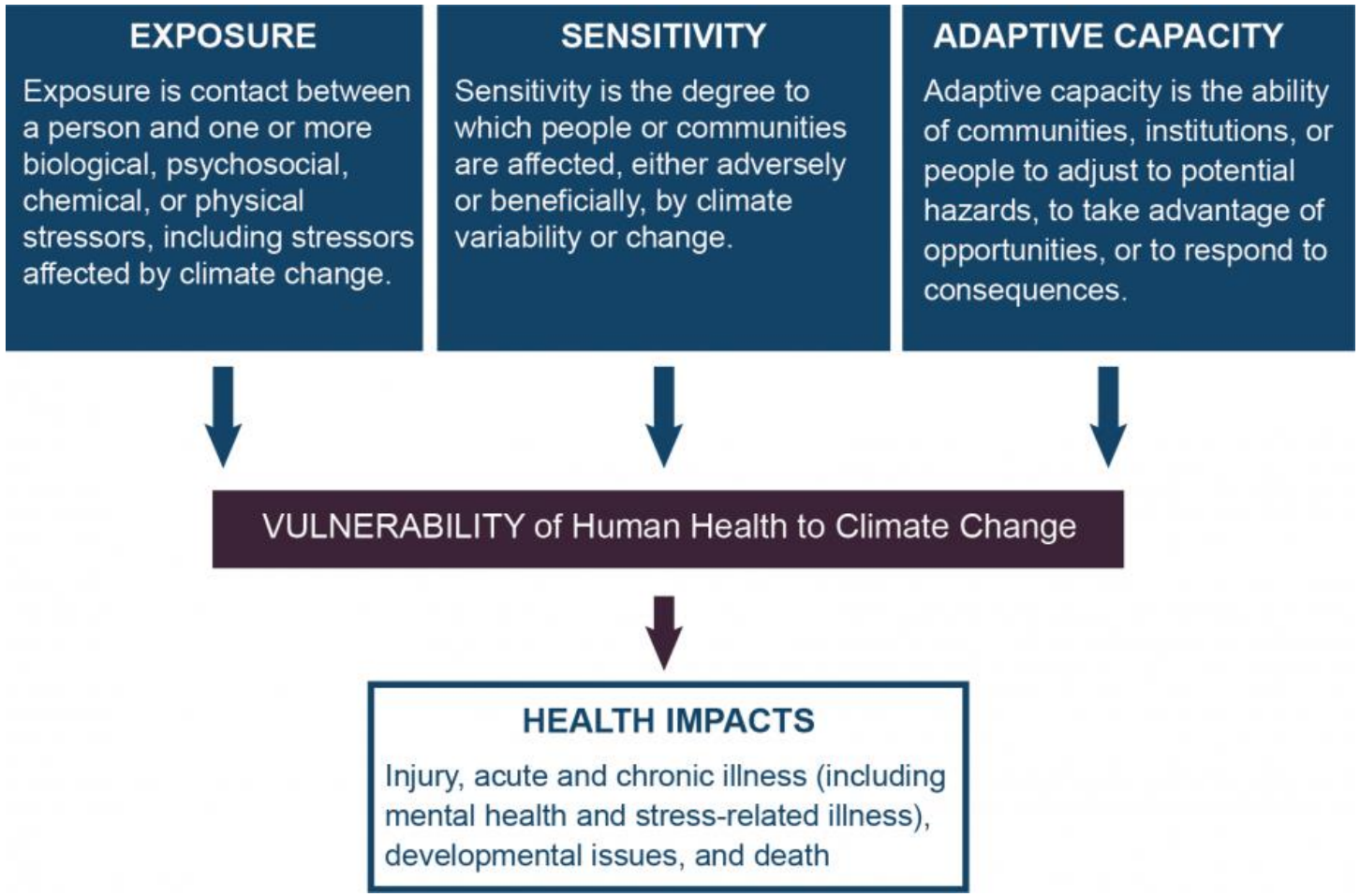
Source: CDC National Center for Environmental Health

Climate-related impacts are costly



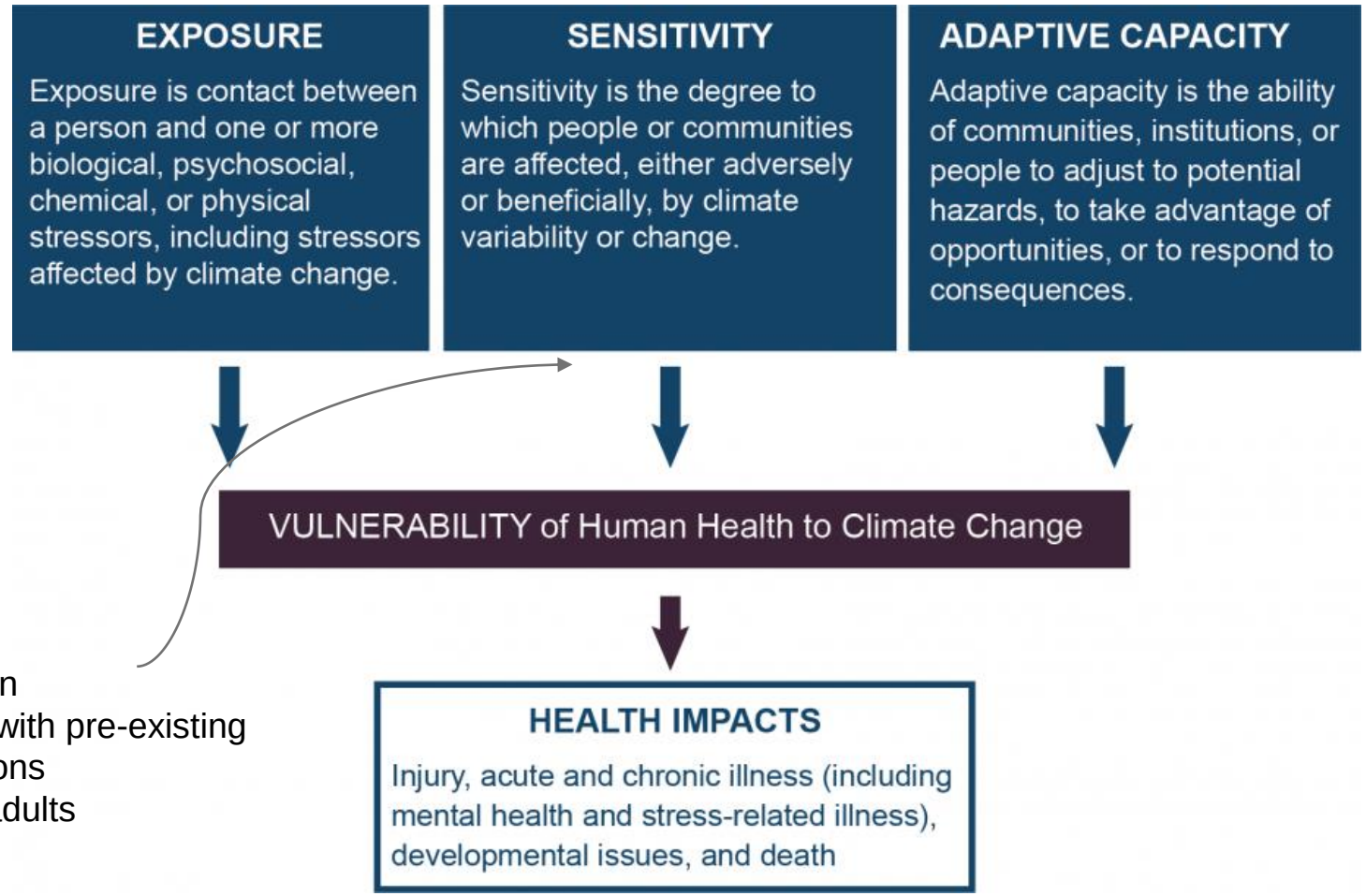
*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.***

Climate Change and health equity are closely intertwined



Climate Change and health equity are closely intertwined

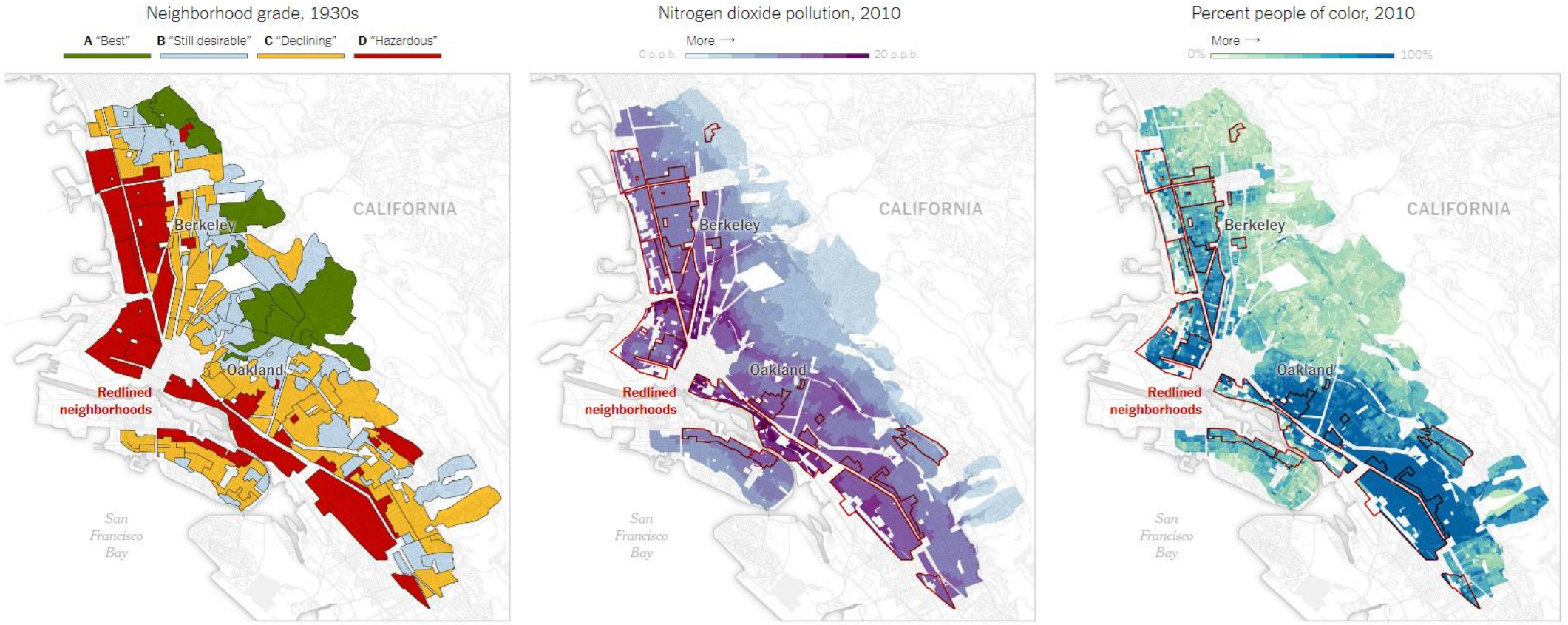
- Certain geographies
- Certain occupations
- Persons experiencing homelessness or those with unstable housing



- Marginalized communities
- Underserved communities

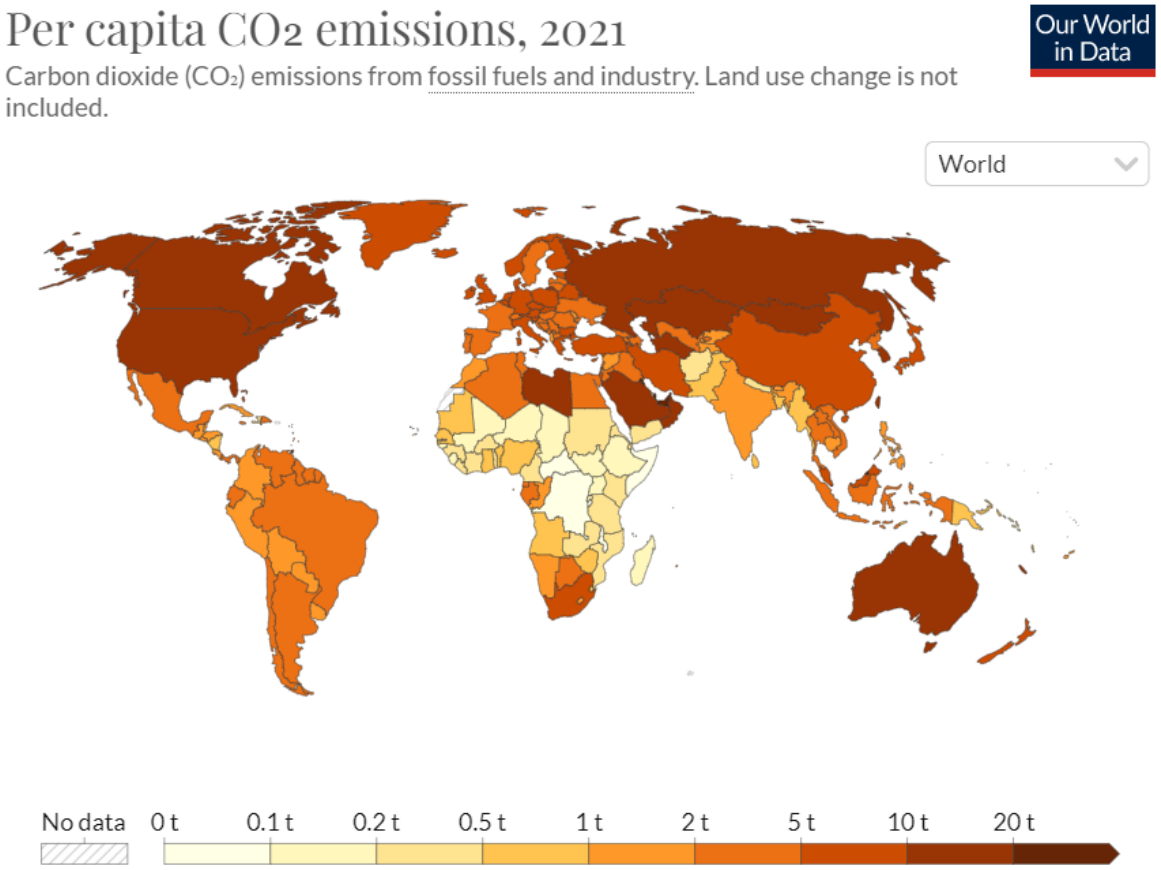
- Children
- Those with pre-existing conditions
- Older adults

Housing policy, race, and air pollution

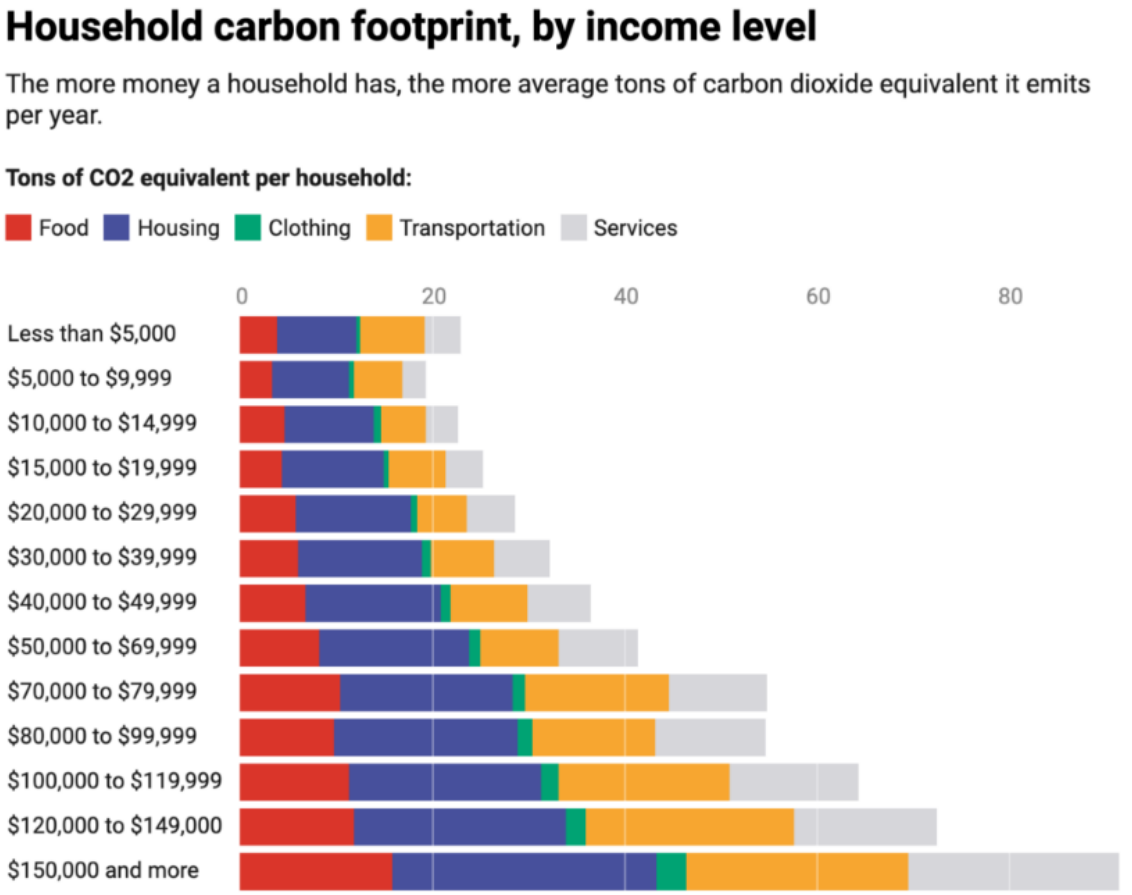


Source: Environmental Science & Technology Letters • By The New York Times

Globally and locally, those who are the least responsible for greenhouse gas emissions are the most likely to suffer from climate change



Source: Our World in Data based on the Global Carbon Project (2022)
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY



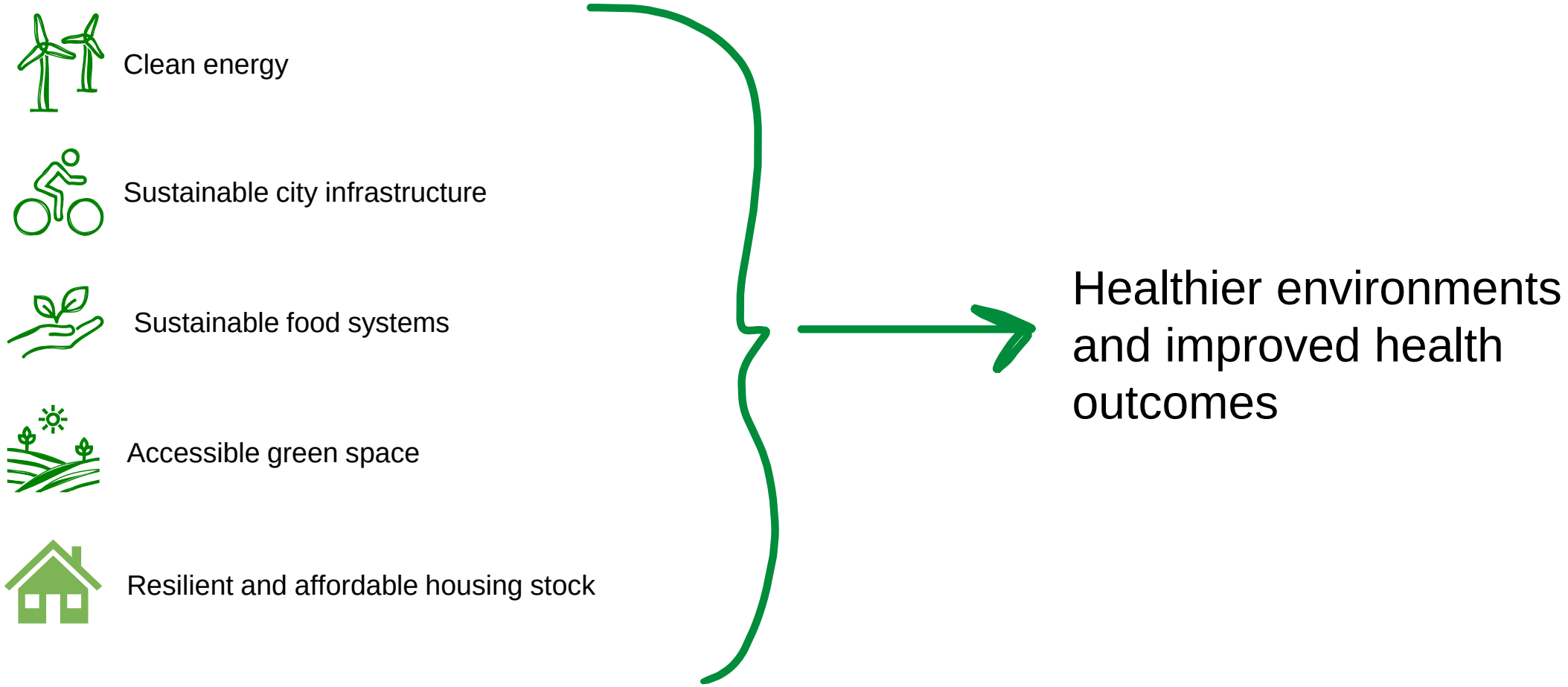
Source: PBS, https://doi.org/10.1016/j.envint.2019.105137

Climate change exacerbates existing health and social disparities

- Health disparities / social determinants of health
- Black people, Indigenous people, and people of color (BIPOC) are disproportionately impacted by the health effects of climate change
- Relation to community investments (transportation, health systems, green space, safe places to live and play)
- Access to health care

Link to COVID-19: disparities that existed prior to the pandemic were worsened by the economic and social impacts of COVID-19 and influenced the patterns of cases, hospitalizations, and death, as well as testing and vaccination throughout the pandemic.

Climate solutions are health solutions are equity solutions



Renewable energy investments in the Upper Midwest & Great Lakes have a high economic and public health ROI

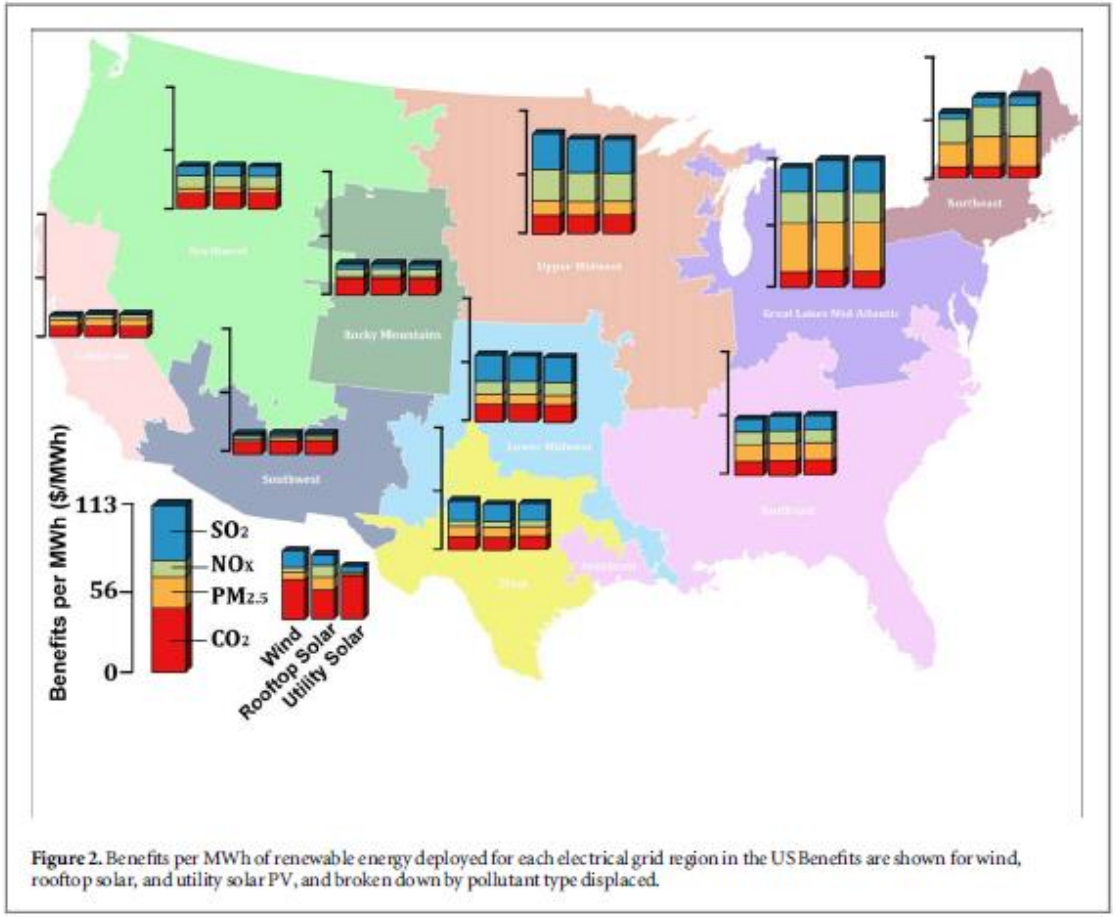


Figure 2. Benefits per MWh of renewable energy deployed for each electrical grid region in the US Benefits are shown for wind, rooftop solar, and utility solar PV, and broken down by pollutant type displaced.

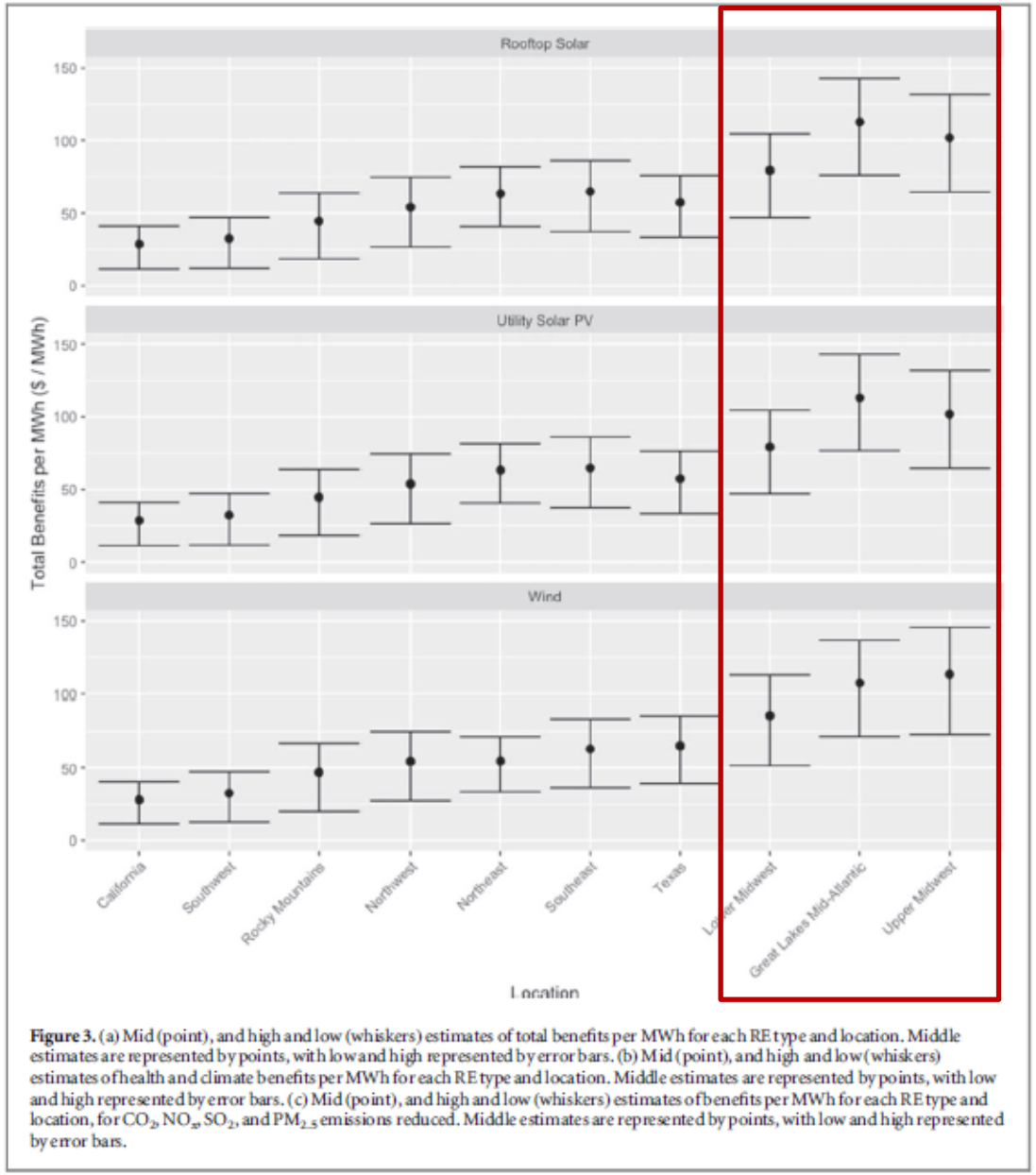


Figure 3. (a) Mid (point), and high and low (whiskers) estimates of total benefits per MWh for each RE type and location. Middle estimates are represented by points, with low and high represented by error bars. (b) Mid (point), and high and low (whiskers) estimates of health and climate benefits per MWh for each RE type and location. Middle estimates are represented by points, with low and high represented by error bars. (c) Mid (point), and high and low (whiskers) estimates of benefits per MWh for each RE type and location, for CO_2, NO_x, SO_2, and $PM_{2.5}$ emissions reduced. Middle estimates are represented by points, with low and high represented by error bars.

Overview

- Climate change and public health context
- **HHS and Office of Climate Change and Health Equity work and priorities**
- Resources and supports for emissions reduction and resilience

HHS' Mission is aligned with climate resilience and health equity

All people, regardless of who they are, where they live or were born, or their circumstances or identities, deserve opportunity and services to meet their needs

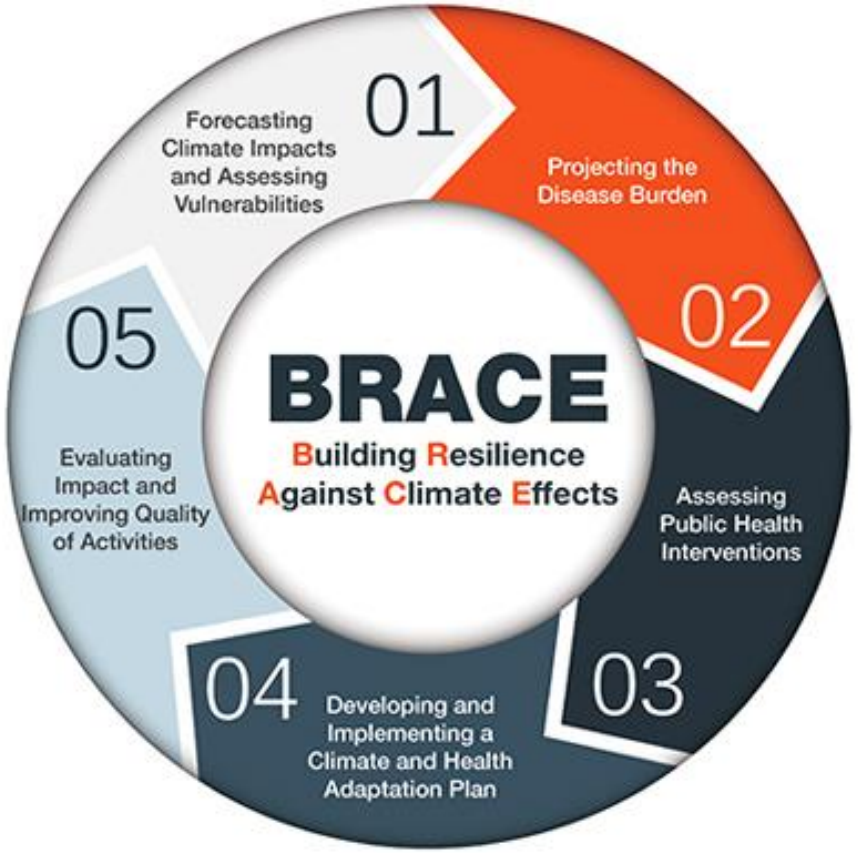
HHS Mission:
To enhance the health and well-being of all Americans, by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.

HHS works and can work toward equity in many ways, including by shaping when and how individuals and communities use, access, and influence HHS resources

Each operating division has something unique to contribute

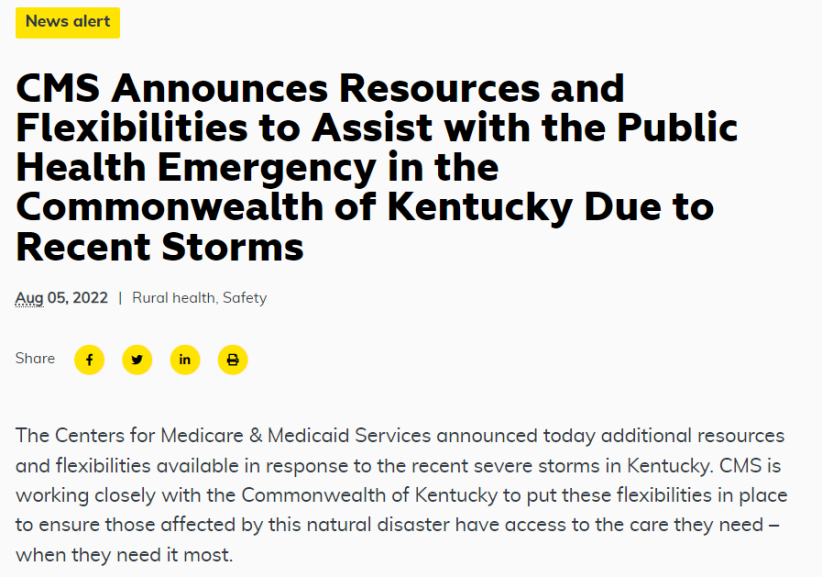
Recent and ongoing climate and health work at HHS: CDC

- The Building Resilience Against Climate Effects (BRACE) framework is a five-step process that allows health officials to develop strategies and programs to help communities prepare for the health effects of climate change
- CDC's Climate-Ready States and Cities Initiative is helping grant recipients from 11 jurisdictions use the BRACE framework to identify likely climate impacts in their communities, potential health effects associated with these impacts, and their most at-risk populations and locations
  - Jurisdictions include Wisconsin Department of Health Services



Recent and ongoing climate and health work at HHS: CMS

- Through waivers, flexibilities, and support, Medicare and Medicaid have helped protect beneficiary health in the face of climate threats



News alert

CMS Announces Resources and Flexibilities to Assist with the Public Health Emergency in the Commonwealth of Kentucky Due to Recent Storms

Aug 05, 2022 | Rural health, Safety

Share

The Centers for Medicare & Medicaid Services announced today additional resources and flexibilities available in response to the recent severe storms in Kentucky. CMS is working closely with the Commonwealth of Kentucky to put these flexibilities in place to ensure those affected by this natural disaster have access to the care they need – when they need it most.

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Home › Resources for States › Disaster Response Toolkit

Disaster Response Toolkit

Medicaid, Children's Health Insurance Program, and Basic Health Program services provide critical health coverage to millions of vulnerable Americans. Over the past several years, numerous states have been impacted by natural or man-made disasters, and these programs serve an important role as states respond to these disasters.

Oregon Health Plan Responds to Extreme Heat

The Centers for Medicare & Medicaid Services recently approved a Medicaid 1115 waiver from the Oregon Health Plan to allow coverage of medically necessary air conditioners, heaters, humidifiers, air filtration devices, generators, and refrigeration units when certain requirements are met. Oregon has increasingly struggled with climate change-related health threats. In 2021, record-breaking heat resulted in the loss of over 100 lives (see July Outlook discussion of the *Health Impacts During the Heat Dome of 2021*). Extreme heat and wildfires have a significant impact on the health and well-being of millions of people in Oregon each year, particularly low-income and historically marginalized groups. To respond to these threats, the Oregon Health Plan is working on establishing a dedicated Medicaid unit to address climate impact on public health. This waiver will allow Oregon to expand its volume and capacity to respond to climate emergencies with cooling and air filtration equipment. The waiver builds on previous state legislation (Senate Bills 1536 and 762), which funded the Oregon Health Authority to provide air conditions and other equipment to Medicaid recipients. During 2022, OHA and its partners identified qualifying individuals who could be at-risk using data like the Oregon Heat Hazard Report. Oregon Health Plan's goal through its waiver and other activities is to prevent injury, illness and/or death due to the extreme or prolonged heat exposure.

Recent and ongoing climate and health work at HHS: LIHEAP

- The Office of Community Services (OCS) at the Administration for Children and Families implement the Low-Income Home Energy Assistance Program, known as LIHEAP, to mitigate heat stress and ensure households can stay safe and cool in their homes
- LIHEAP assistance has been increasing in recent years to help Americans cope with extreme heat

Increasing Assistance for Americans to Cool Their Homes

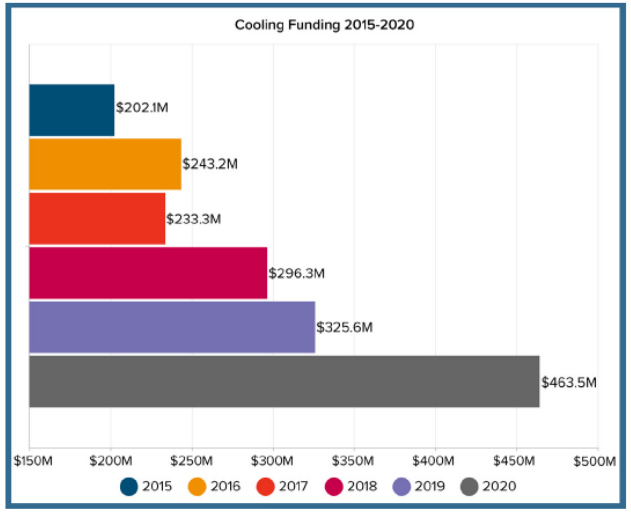


Figure. The Office of Community Services (OCS) at the Administration for Children and Families implement The Low-Income Home Energy Assistance Program, known as LIHEAP, to mitigate heat stress and ensure households can stay safe and cool in their homes. The above chart illustrates cooling and summer crisis spending from 2015 - 2020 from LIHEAP grant recipients (usually states).

On July 19, 2022, OCS issued updated guidance outlining all the ways grant recipients can use LIHEAP funding to mitigate heat stress. A total of 27 states and the District of Columbia provided cooling assistance benefits in Fiscal Year (FY) 2022; an increase of 4 states compared to FY 2021. Multiple grant recipients implemented cooling programs for the first time in FY 2022 including North Carolina, Washington, and the Pueblo of Laguna Tribe. Additionally, many grant recipients significantly expanded their cooling programs.

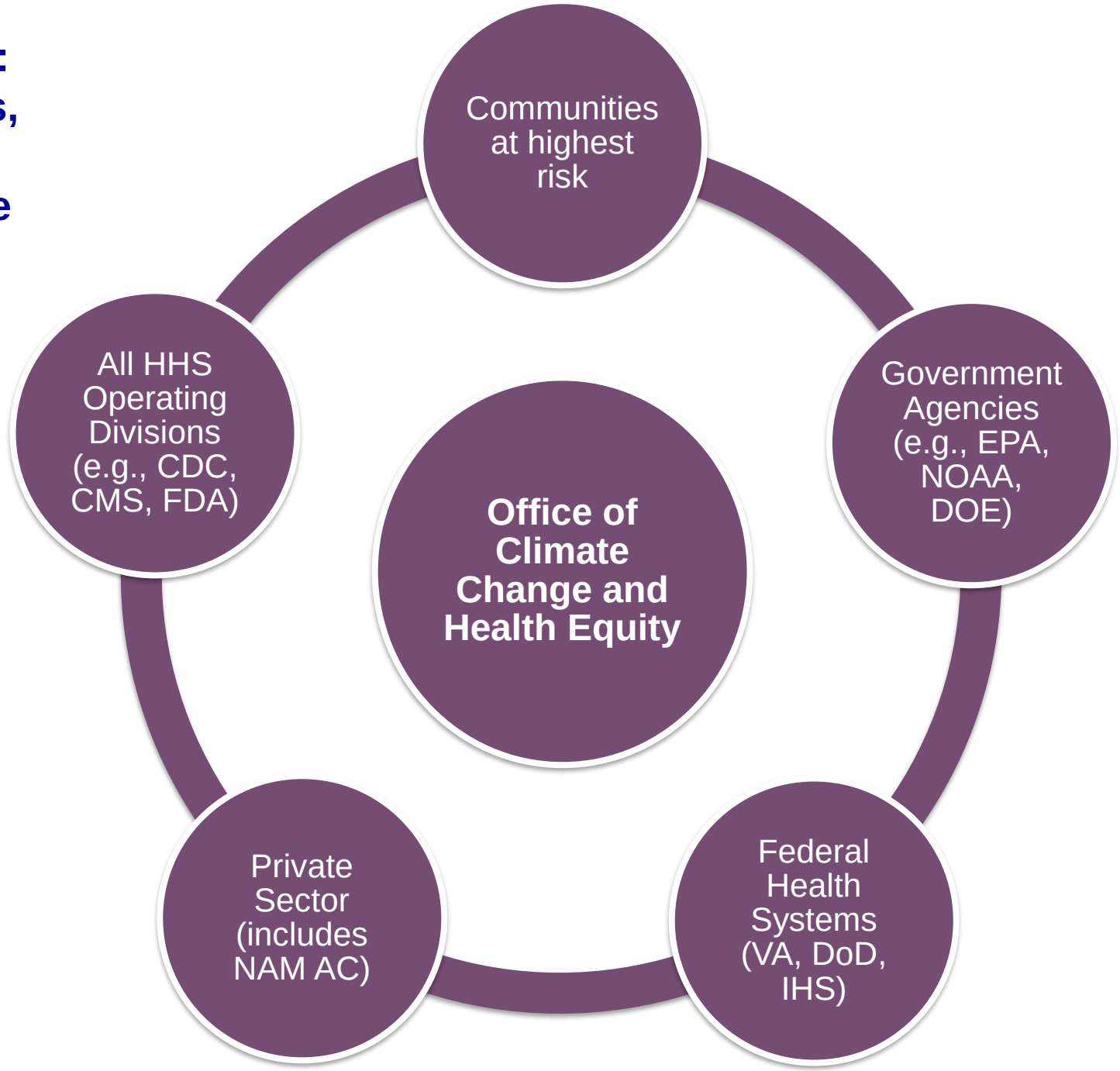
For example, New York (NY) has historically only provided cooling benefits to households with a medical need for an air conditioner and typically allocates approximately $3-9 million for cooling assistance each year. In FY 2022, NY allocated $23 million for cooling assistance and expanded eligibility to all LIHEAP eligible households, not just those with a medical need. Preliminary FY 2021 data indicates that 23 states and the District of Columbia provided an estimated $564 million for cooling assistance. OCS is committed to continuing to help LIHEAP grant recipients utilize program flexibilities to mitigate heat stress and provide cooling assistance to vulnerable households.

Origins of the Office of Climate Change and Health Equity (OCCHE)

E.O. 14008 - "Tackling the Climate Crisis"

- HHS mandates (Section 222(d))
  - ✓Office of Climate Change and Health Equity
  - ✓Interagency Working Group to Decrease Risk of Climate Change to Children, the Elderly, People with Disabilities, and the Vulnerable
  - ✓Biennial Health Care System Readiness Advisory Council

The OCCHE "Hub": Raising Awareness, Building Will and Supporting Change



White House/HHS Health Sector Climate Pledge

1. Reduce organizational emissions by 50% by 2030 and achieve net-zero by 2050, publicly accounting for progress on this goal.

2. Designate an executive-level lead for work on reducing emissions and conduct an inventory of Scope 3 (supply chain) emissions by the end of 2024.

3. Develop and release a climate resilience plan for continuous operations by the end of 2023, anticipating the needs of groups at disproportionate risk of climate-related harm.

June 30 White House Event

White House/HHS Health Sector Climate Pledge Signees At-a-Glance

102	Total Pledge Organizations	837	Private-Sector Hospitals Represented
20+	Academic Medical Centers	>15%	Hospitals in US (Combined Gov and Private-Sector)*
7	Fortune 500 Organizations	6	Pharmaceutical Companies

**Including federal health systems, over 1,080 hospitals have made the Pledge commitments*

Midwest Pledge Signatories Include:

Health Systems, Hospitals and Other Providers

AdventHealth, Advocate Aurora Health, *Advocate Children's Hospital,* Ascension, Aspirus Health, *Care Alliance Health Center*, CommonSpirit Health, Gillette Children's, *Gundersen Health System,* HealthPartners, Henry Ford Health, *OhioHealth,* Rush University System for Health, *SSM Health,* Steward Health Care System, *Western Wisconsin Health*

Other Industry Organizations

Cardinal Health, *Daniels Health*, Elevance Health (formerly Anthem), *GE HealthCare*

Associations, Nonprofits and Technical Assistance Organizations

Children's Hospital Association, The Joint Commission

NOTE: Organizations in italics signed after June 30th; unitalicized organizations signed before June 30th.

“Climate Health Resilience Hub”

Climate information, education, and civic engagement (esp. youth)

Clinical and/or public health services (or has direct links/referrals)

Linked to local hazard mitigation plan. Resources during disruptions, e.g.: power, broadband, heating/cooling, clean air, water

Place-based, trusted location(s)

Local control and locally-identified needs.

Year-round community benefits

Slide credit:
Michael Huff, Community Liaison, HUD - Region 9
Jason Wilken, Career Epidemiology Field Officer assigned to the California Department of Public Health, CDC

Federally Designated Promise Zones (22) and Finalists

Promise Zones Genesis:

- In 2014 USG designated 22 PZs to facilitate community development in vulnerable, high poverty urban, rural and tribal communities.
- The program is run through HUD with leadership and collaboration from community partners.
- Today, 2/3 of the 50 states have a PZ (designee or finalist).

Place-based & Collective Impact

- PZs represent a coalition aligned to:
  - Boost economic activity and job growth,
  - Improve educational opportunities,
  - Reduce crime,
  - Leverage private investment to improve the quality of life.

Pandemic Leadership

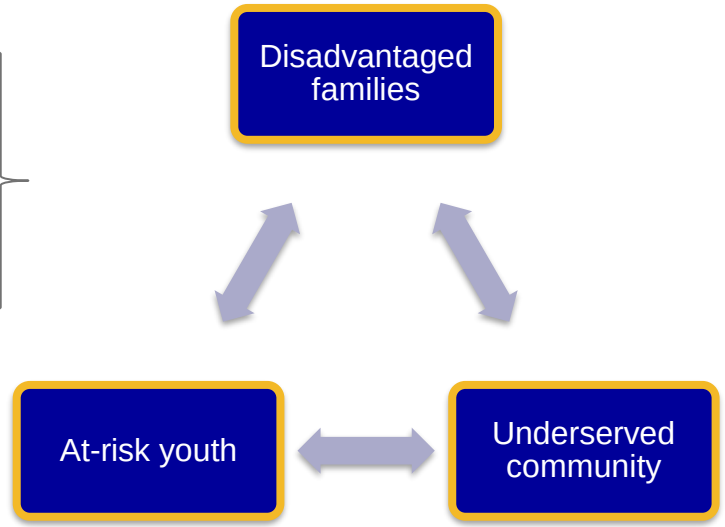
- During the pandemic, PZs demonstrated value as trusted messengers.
- PZs have continued since that time to play a strategic role in building community resilience to climate change!

Slide credit:
Michael Huff, Jason Wilken

Piloting a Climate Health Resilience Hub (CHRH) in Sacramento, CA

La Familia Counseling Center (Sacramento Promise Zone partner) – 40+ years of service

- Counseling
- Job training & placement
- Parenting
- Health services programs



Pivoted to respond to the COVID 19 pandemic shocks to the community – testing, vaccinations, food, etc.

Slide credit:
Michael Huff, Jason Wilken

Conveners, funders, advisors

- HUD Promise Zone, or State/Local Transformative Community Programs
- Technical assistance identifying, applying for, and braiding funding and resources
- Data-driven decision making

Emergency preparedness/ services

- Mass testing/vaccination sites
- Cooling and clean air shelter
- Resource distribution point

Public health and medical services

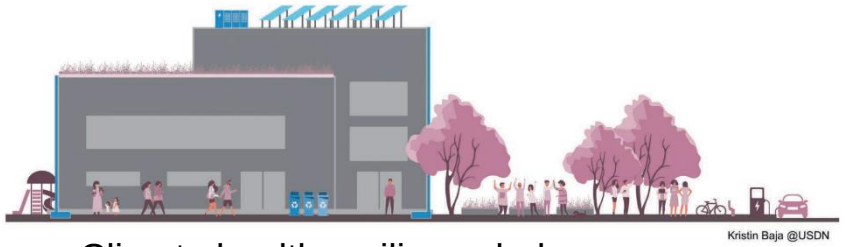
Co-locate clinical services (e.g. prev med, rapid referrals) and public health services (e.g., immunization, disease investigation, MCH)

State and local government & services

- Utilities prioritization/microgrid
- Social services
- Active transportation
- Housing/employment assistance

- Services and programming
- Communications
- Building and landscape
- Power systems
- Operations

Outputs



Climate health resilience hub

Inputs

Community-identified needs. Ex:

- Adult education
- Counseling services
- Job training/placement
- Meal services
- After-school programming

Community

Slide credit:
Michael Huff, Jason Wilken

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- **Resources and supports for emissions reduction and resilience**

Resources for Emissions Reduction and Resilience

Federal Resources to Support Emissions Reduction and Climate Resilience for Healthcare Stakeholders

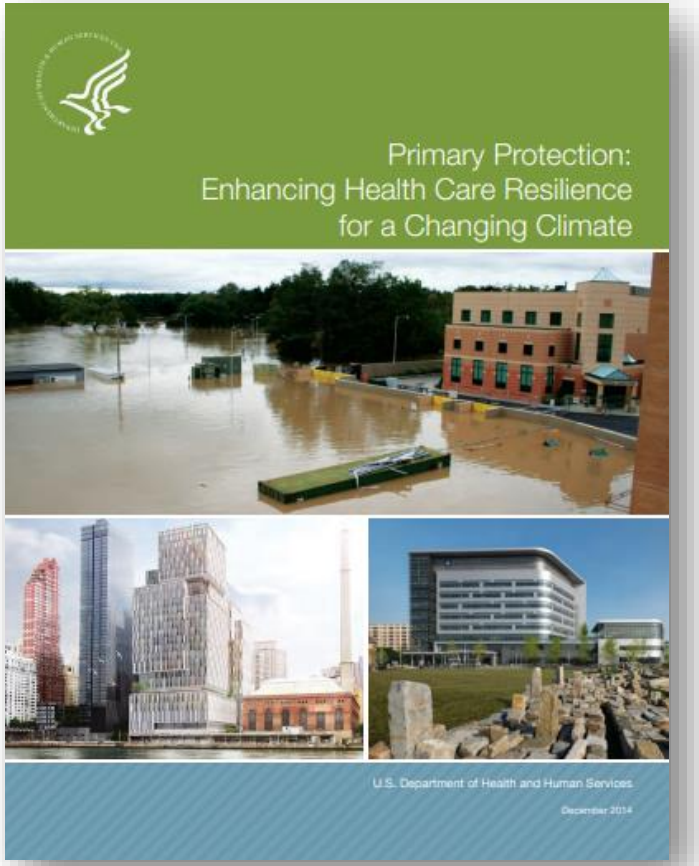
On Earth Day 2022, the White House and HHS launched the Healthcare Sector Climate Pledge initiative, creating an opportunity for healthcare stakeholders across the United States to make bold commitments to emissions reduction and resilience in response to the growing threats presented by climate change.

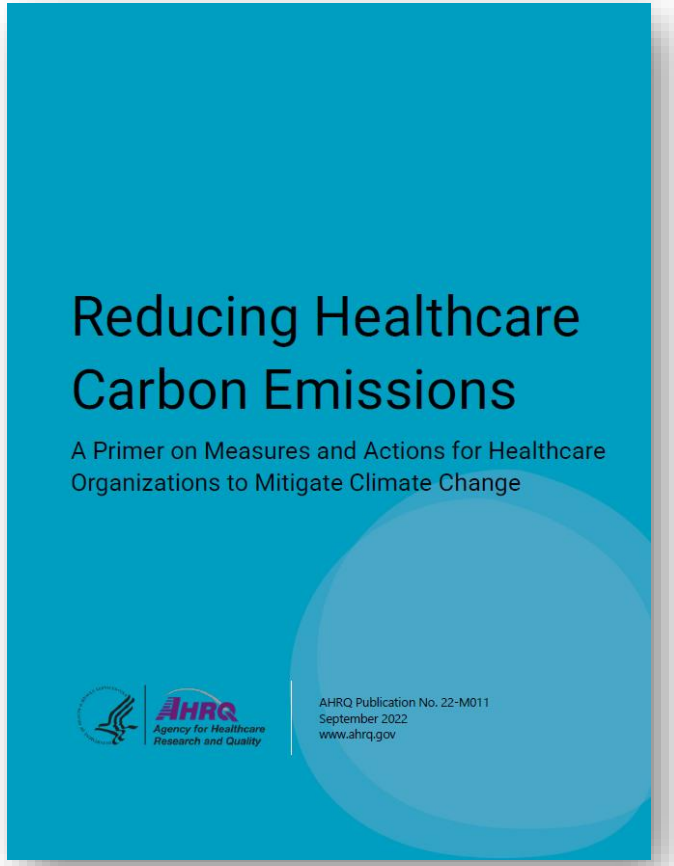
In conjunction with a June 2022 White House event to celebrate the organizations that made these commitments, the Office of Climate Change and Health Equity (OCCHE) produced this compendium of federal resources that may assist healthcare stakeholders in emissions reduction and climate change adaptation.

Financial Resources, Funding Opportunities, and In-Kind Supports

Broad Applicability

Better Buildings Financing Navigator, Healthcare Energy Financing Primer
Department of Energy
An online tool that helps public and private sector organizations find financing solutions for energy efficiency and renewable energy projects. Learn more at https://betterbuildingssolutioncenter.energy.gov/financing-navigator/primer/healthcare-energy-financing-primer.





“A Grand Tour” (Webinar Series)

Date	Name	Speakers
July 14 at 12:00 PM	Resilience, Emissions Reduction and Health Equity	Department of Energy, OCCHE
July 21 at 12:00 PM	Financial Supports for Climate Action (and Insights on Applying)	Department of Agriculture, Department of Housing and Urban Development, Department of Treasury
July 28 at 12:00 PM	Emergency Preparedness and Response Supports	Administration for Strategic Preparedness and Response, Federal Emergency Management Agency
	August Break	
Sept. 8 at 12:00 PM	EPA Tools and Incentives	Environmental Protection Agency
Sept. 22 at 12:30 PM	Introduction to AHRQ’s Decarbonization Toolkit	Agency for Healthcare Research Quality
Oct. 6 at 12:00 PM	International Perspectives on Resiliency and Decarbonization	United Nations Framework Convention on Climate Change, Race to Zero
Oct. 20 at 12:00 PM	Action Collaborative Tools and Supports	National Academy of Medicine Action Collaborative on Decarbonizing the U.S. Health Sector Leadership
Nov. 3 at 12:00 PM	Introduction to the Million Hearts Climate Change & Cardiovascular Disease Collaborative (CCC)	Centers for Disease Control and Prevention, Environmental Protection Agency, OCCHE
Nov. 17 at 12:00 PM	Federal Health Systems Learning Network Findings and Best Practices	Federal Health Systems Learning Network Findings and Best Practices

Inflation Reduction Act: Potentially Relevant Provisions

Mitigation (examples)

- Expansion of 179D Commercial Buildings Energy-Efficiency Tax Deduction
- Greenhouse Gas Reduction Fund which will include competitive grants to enable low-income and disadvantaged communities to deploy or benefit from zero-emission technologies
- Low Emissions Electricity Program (LEEP) to advance GHG reductions from electricity generation focused on consumers, low-income and disadvantaged communities, state/tribal/local governments and industry
- Incentives for state/local governments to implement updated building codes, including for commercial buildings that meet or exceed the ANSI/ASHRAE/IES Standard 90.1—2019

Resilience and Adaptation (examples)

- Funds for coastal communities, including for technical assistance to prepare for extreme storms and other changing climate conditions
- Appropriations for grants, contracts or financial assistance to address the impacts of drought in the Reclamation States (17 Western states)
- Support for activities addressing climate and health risks from urban heat islands, extreme heat, and wildfire

Updates available: https://cloud.connect.hhs.gov/oash-ocche

Guidebook: https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/

Midwest: Drought is favored to persist or develop in Missouri; persist or improve in Minnesota, Illinois, and Kentucky; improve in Michigan, Wisconsin, Indiana, and Ohio; and develop, persist, or improve in Iowa. Above normal wildland fire* potential is likely to continue for southern Missouri through November, before returning to normal in December.

Drought Hurricane Wildfire

OASH | Office of Climate Change and Health Equity

Climate and Health Outlook

ISSUED OCTOBER 2022

The first page of this Climate and Health Outlook includes **prospective forecasts** for November 2022 – January 2023. In the coming months, most of the contiguous U.S. will experience temperatures 0.9 – 3.6 °F (0.5 – 2 °C) warmer than normal. Warming winters can cause earlier and longer allergy seasons, aggravating respiratory and allergy conditions. Increasing winter temperatures can also contribute to to earlier onset of vector-borne diseases like Lyme disease. Additional regional and hazard-specific information is available on this Outlook's associated website.

The following pages detail **retrospective information** on how heat and drought affected the U.S. in the summer of 2022.

Northern Great Plains Drought is favored to persist or develop in Nebraska. Drought is also favored to persist in parts of Montana, North Dakota, South Dakota, and Wyoming. However, drought improvement and removal is favored in western Montana.

Northwest: Drought is favored to persist in parts of southern Idaho and Oregon. However, drought improvement and removal is favored in much of the region.

Southwest: Drought is favored to persist in California, Nevada, Utah, and parts of Arizona, New Mexico, and Colorado. However, drought improvement is favored in the northwestern corner of California. Above normal wildland fire* potential is forecast for parts of southern California into November, before returning to normal potential in December.

Southern Great Plains: Drought is favored to persist or develop in Kansas, Oklahoma, and Texas. Above normal wildland fire* potential is forecast for much of Oklahoma and Texas into December, before returning to normal potential in January.

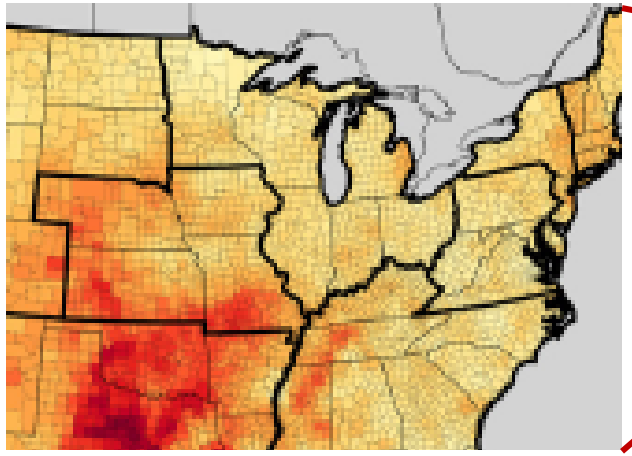
Midwest: Drought is favored to persist or develop in Missouri; persist or improve in Minnesota, Illinois, and Kentucky; improve in Michigan, Wisconsin, Indiana, and Ohio; and develop, persist, or improve in Iowa. Above normal wildland fire* potential is likely to continue for southern Missouri through November, before returning to normal in December.

Drought Hurricane Wildfire

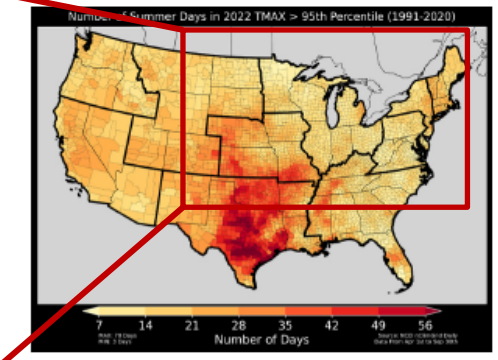
Southeast: The Atlantic basin is forecasted to have an above-average hurricane season with 14 – 20 named storms with winds of 39 mph or higher, with 6 –10 of those possibly becoming hurricanes with winds of 74 mph or higher, and 3 – 5 possibly becoming major hurricanes with winds of 111 mph or higher. Drought is favored to persist or develop in Alabama, Arkansas, Georgia, Louisiana, and Mississippi, and parts of Florida, South Carolina, and Tennessee. Above normal wildland fire* potential is forecast for much of Arkansas, Louisiana, Mississippi, Alabama, and western Tennessee through November, with above normal potential continuing in much of Louisiana and Mississippi into December. Above normal potential is also forecast in western Kentucky during November. The region is forecast to have near normal significant wildland fire* potential during January.

*Smoke from wildfires can impact health hundreds of miles from site of the fire.

We want to hear from you! Please send your feedback on ways to improve the Climate and Health Outlook to ocche@hhs.gov.



Where Was Heat Abnormally High in 2022?



Region 1: CT, ME, MA, NE, RI, VT
Region 2: NJ, NY, PR, VI
Region 3: DE, DC, MD, PA, VA, WV
Region 4: AL, FL, GA, KY, MS, NC SC, TN
Region 5: IL, IN, MI, MN, OH, WI
Region 6: AR, LA, NM, OK, TX
Region 7: IA, KS, MO, NE
Region 8: CO, MT, ND, SD, UT, WY
Region 9: AZ, CA, HI, NV, AS, MP, FSM, GU, MH, PW
Region 10: AK, ID, OR, WA

* Thick lines indicate HHS regional boundaries.

Figure. Temperature is calculated from NOAA's nClimGrid-Daily v1-0-0, a 5km gridded dataset aggregated into counties for the contiguous US. For each day between April 1st to September 30th, a county's temperature in 2022 is compared against its climatological normal from 1991-2020. Temperatures above the 95th percentile are considered abnormally hot for the region.

This map depicts the number of summer days in 2022 (April 1st to September 30th) when a county's maximum temperature exceeded its 95th percentile, thus indicating an abnormally hot day. Much of the southern great plains, including Texas, Oklahoma, Arkansas, Missouri, Kansas and Nebraska experienced more than a month's worth of hot temperatures.

Is Heat Related Illness Worse In 2022 Compared to the Last Four Years?

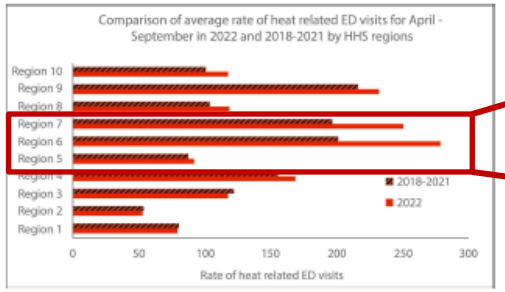


Figure. The CDC National Syndromic Surveillance Program (NSSP) provides daily rates of heat related illness (HRI) by HHS Regions. NSSP is a network comprising CDC representatives, state and local health departments, and academic and private sector health partners jointly collecting and sharing electronic patient encounter data.*

The graphic above compares the rate of HRI per 100,000 emergency department (ED) visits from April to September in 2022 with the rate observed in 2018-2021 for the same months. The average rate of HRI was calculated by HHS regions for April 1–September 30 for 2022 and 2018-2021 separately after quality control filters were applied to allow comparison across years. The average HRI rates in 2022 were higher in 7 out of 10 HHS regions when compared to the average rates in 2018-2021. Particularly noteworthy were the higher rates of HRI in HHS regions 6 and 7 in 2022.

* NSSP includes ED visit data from approximately 72% of non-federal U.S. EDs. Fewer than 50% of facilities in CA, Hawaii, Iowa, Minnesota, and Oklahoma report to NSSP. MO discharge data is incomplete.

Oregon Health Plan Responds to Extreme Heat

The Centers for Medicare & Medicaid Services recently approved a Medicaid 1115 waiver from the Oregon Health Plan to allow coverage of medically necessary air conditioners, heaters, humidifiers, air filtration devices, generators, and refrigeration units when certain requirements are met. Oregon has increasingly struggled with climate change-related health threats. In 2021, record-breaking heat resulted in the loss of over 100 lives (see July Outlook discussion of the *Health Impacts During the Heat Dome of 2021*). Extreme heat and wildfires have a significant impact on the health and well-being of millions of people in Oregon each year, particularly low-income and historically marginalized groups. To respond to these threats, the Oregon Health Plan is working on establishing a dedicated Medicaid unit to address climate impact on public health. This waiver will allow Oregon to expand its volume and capacity to respond to climate emergencies with cooling and air filtration equipment. The waiver builds on previous state legislation (Senate Bills 1536 and 762), which funded the Oregon Health Authority to provide air conditions and other equipment to Medicaid recipients. During 2022, OHA and its partners identified qualifying individuals who could be at-risk using data like the Oregon Heat Hazard Report. Oregon Health Plan's goal through its waiver and other activities is to prevent injury, illness and/or death due to the extreme or prolonged heat exposure.

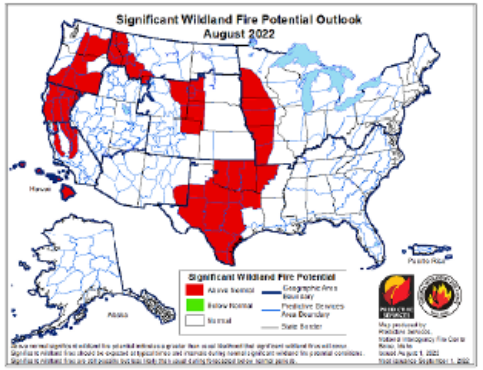


Figure. The National Significant Wildland Fire Potential Outlook identifies areas with above, below, and near normal significant fire potential using the most recent weather, climate, and fuels data available. These outlooks are designed to inform decision makers for proactive wildland fire management.

Year-to-date acres burned for the US is approximately 160% above the 10-year average, with over 90% of the total acres burned in the Alaska, Southwest, and Southern Areas. In August, above normal significant fire potential is forecast for much of Oklahoma and Texas into western Arkansas. Above normal potential is also likely in portions of the Missouri Valley and western Mississippi Valley and in eastern Wyoming, western South Dakota, and western Nebraska. Northern California, the Inland Northwest, and northern Rockies, along and west of the Divide, are expected to have above normal significant fire potential, with above normal potential also forecast in portions of the central and southern Sierra and just inland on the central California coast. Hawai'ian Islands, especially leeward sides, will have above normal potential as well.

Who is at high risk in the counties with above-normal wildland fire potential in August?

Wildland fires are occurring more frequently in the United States and present a health hazard for populations living close to a fire. As indicated in the map to the left, **684** counties across **19** states are projected to have above-normal wildfire potential in August. In these counties, the total population at risk is **58,588,799** people. Of these counties:

194 (28%) have a high number of people aged 65 or over, living alone.

300 (44%) have a high number of people without health insurance

317 (47%) have a high number of uninsured children.

133 (20%) have a high number of people with frequent mental distress.

85 (12%) have a high number of adults with asthma.

144 (21%) have a high number of adults with coronary heart disease.

140 (21%) have a high number of people living in poverty.

129 (19%) have a high number of people with electricity-dependent medical equipment and enrolled in the HHS emPOWER program.

122 (18%) have a high number of people in mobile homes.

163 (24%) have a high number of people with one or more disabilities.

170 (25%) are identified as highly vulnerable by CDC's Social Vulnerability Index.

**"A high number" indicates that these counties are in the top quartile for this indicator compared to other counties

Wildfires Affect Health in Many Ways

Wildland fire increases the risk for a diverse range of health outcomes. For example:

Due to the nature of their work, firefighters are at risk of developing severe heat-related illness (such as **heat stroke**) and rhabdomyolysis (**muscle breakdown**).

Wildfire can cause **burns** through contact with flames and hot surfaces as well as chemical and electrical burns.

Wildfire smoke can irritate the respiratory tract and lead to **reduced lung function**, **bronchitis**, exacerbation of **asthma**, and **heart failure**.

For pregnant people, smoke exposure can result in problems with a **baby's nervous system**, or can lead to **miscarriage** or **birth defects**.

Wildfire smoke can affect the immune system, leading to increased vulnerability to **lung infections** like COVID-19.

Smoke and ash from wildfires can travel downwind and affect air quality hundreds of miles away from the fire.

194 (28%) have a high number of people aged 65 or over, living alone.

300 (44%) have a high number of people without health insurance

317 (47%) have a high number of uninsured children.

133 (20%) have a high number of people with frequent mental distress.

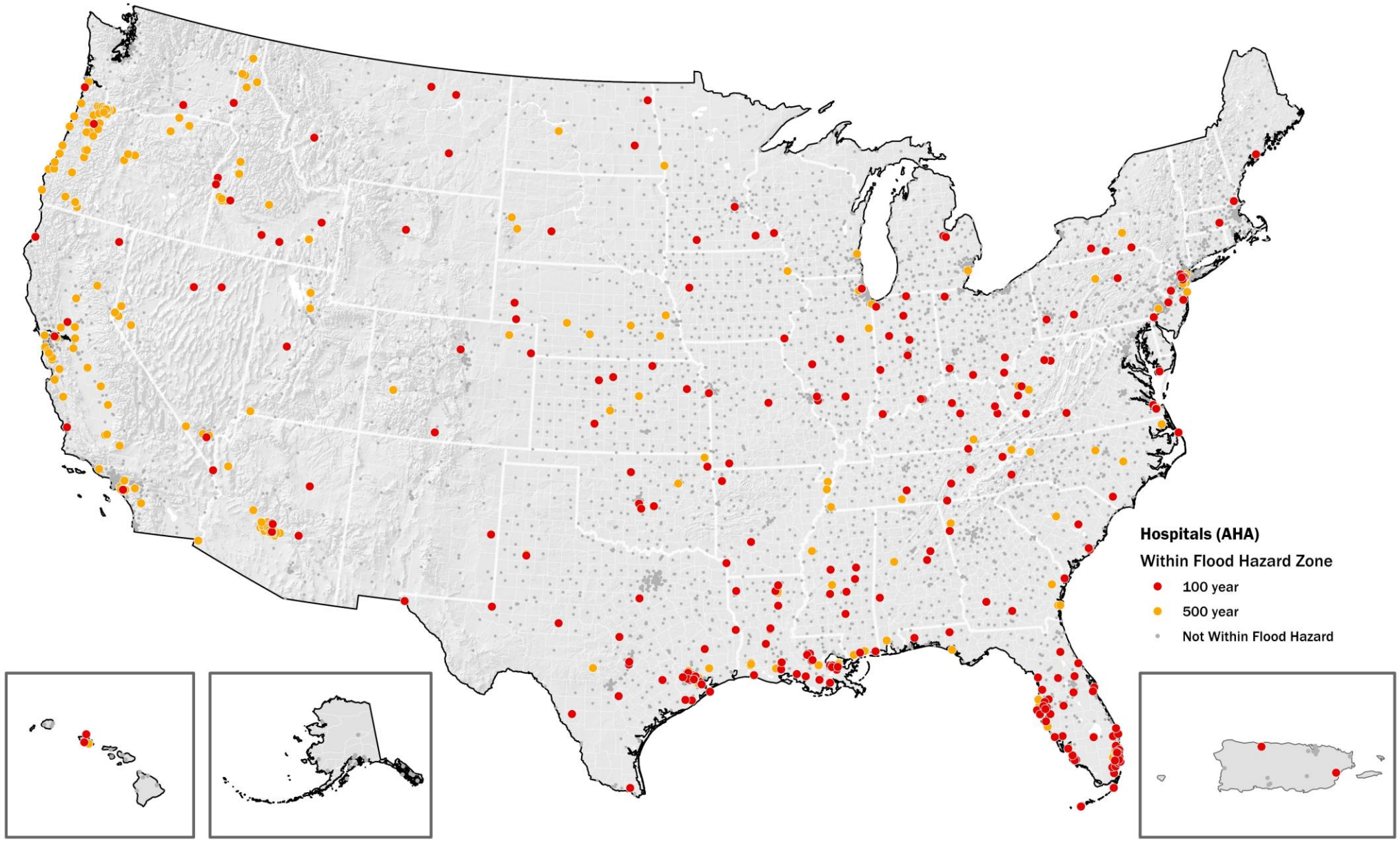
Facilities Within Flood Hazard Area (NFHL or EPA)

	Hospitals	Nursing Homes	Dialysis Clinics	Pharmacies
High or Moderate to Low Flood Risk (100-year or 500-year floodplain)	643	1,546	770	7605
Percent of Total	9.3%	10.2%	10.9%	12.1%
N	6881	15133	7047	62516

Manangan, et al., 2020. Flooding Risk to Medical Infrastructure. Work in progress.

Slide Courtesy of CDC NCEH

Flooding Risk to Medical Infrastructure – Hospitals



Slide Courtesy of CDC NCEH

The Million Hearts Climate Change & Cardiovascular Disease Collaborative (CCC)

Topic	Date
Problem framing and needs assessment	11/03/22
Clinical interventions to address particle pollution and heart disease (part A)	1/12/23
Interventions to address particle pollution and heart disease (part B)	2/9/23
Interventions to prepare for extreme heat	3/9/23
Leading on climate resilience and mitigation in your organization	4/13/23

For additional details and registration formation for future sessions: Climate Change and Cardiovascular Disease Collaborative (CCC) | Million Hearts® (hhs.gov)

Agency for Healthcare Research and Quality Grant Applications

- The Agency for Healthcare Research and Quality (AHRQ) recently announced an interest in receiving health services research grant applications that address the intersection of climate change and healthcare. Specifically, applications that address three primary areas:
  - Reducing the healthcare sector's greenhouse gas emissions and carbon footprint.
  - Creating resilient healthcare systems and communities that can plan, prepare, respond, and adapt to climate-related threats.
  - Addressing the inequitable impacts of climate change.
- *Notice Number: NOT-HS-23-006*

Conclusion

- The incredibly broad effects of climate change and the many ways it worsens existing inequities in the United States must be met with a swift and sustained public health response
- OCCHE strives to protect the health of the American people through partnerships and collaborations, the Health Sector Climate Pledge (signed by over 100 organizations), and resources and supports including the Climate and Health Outlook linking seasonal forecasting to health effects
- HHS and OCCHE are working to create new resources and improve current ones in order to support you – and wants to hear from you on what would be most useful
- Protecting the American people from the evolving threats of climate change is a journey we must take together

OASH | Office of Climate Change and Health Equity

Thank you!

Questions/Next Steps:

OCCHE@hhs.gov

Visit us online at www.hhs.gov/ocche

Climate Change & Health in MN

Dr. Heidi Roop
Assistant Professor & Extension Specialist, University of Minnesota
Director, University of Minnesota Climate Adaptation Partnership

University of Minnesota Extension
Driven to Discover℠

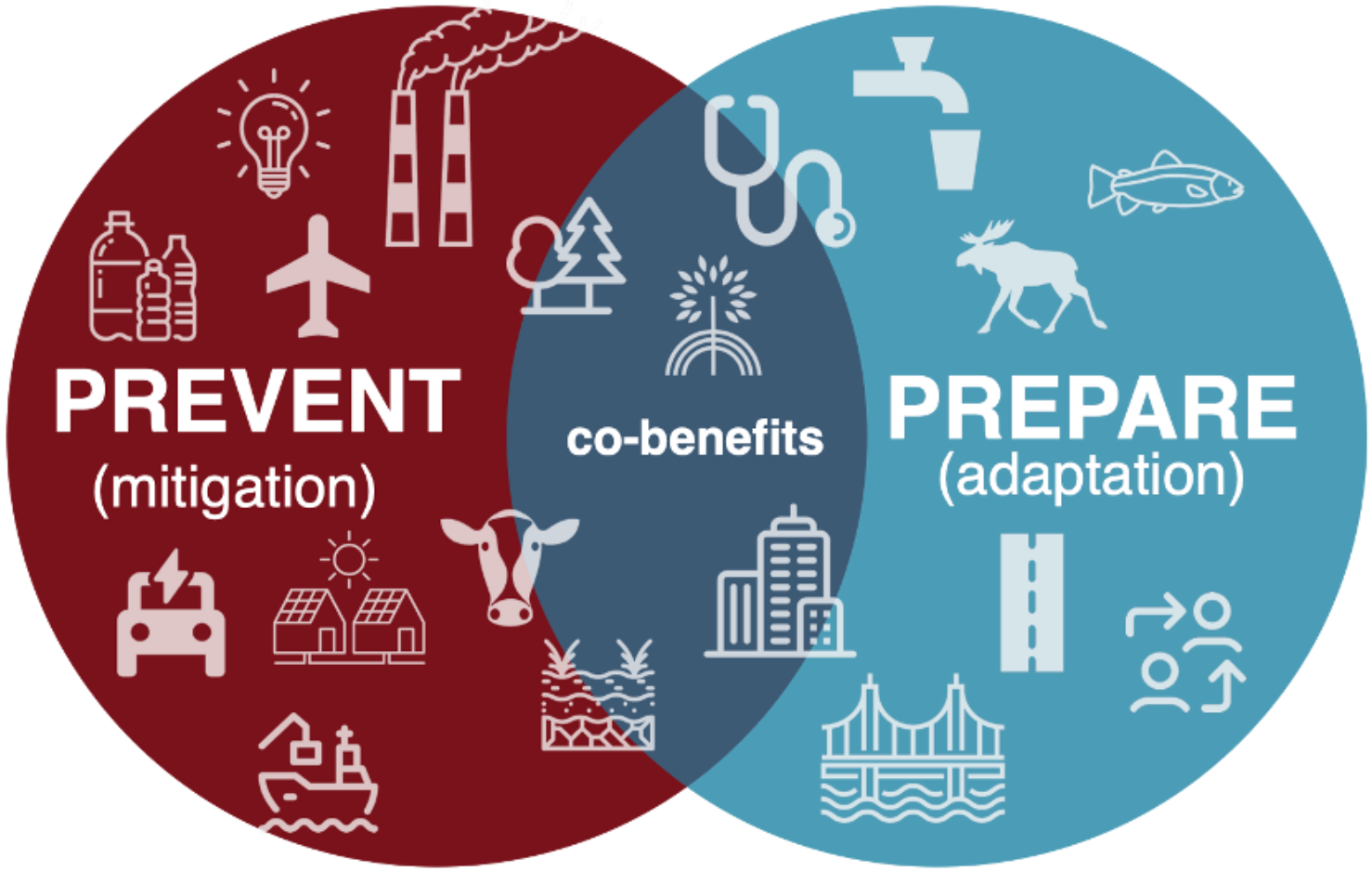
CFANS
College of Food, Agricultural and Natural Resource Sciences

University of Minnesota

Climate Adaptation Partnership

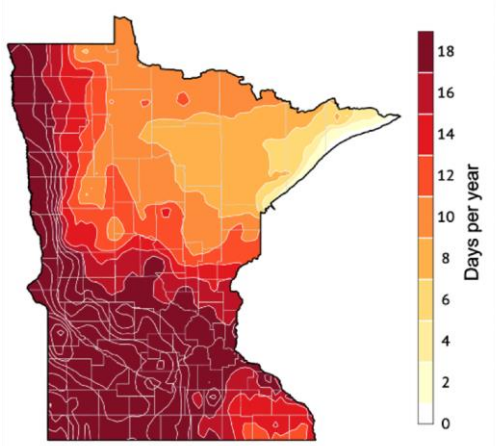
Supporting thriving communities and landscapes through collaboration, capacity-building and advancing climate-informed decision-making.

A Focus on Adaptation & Climate Risk Management



Adaptation comes in many forms and is needed across **human & natural systems**. We are responding to the **imperative to adapt** while we also seek to **mitigate** climate change.

Our Work - Partnering across sectors & scales



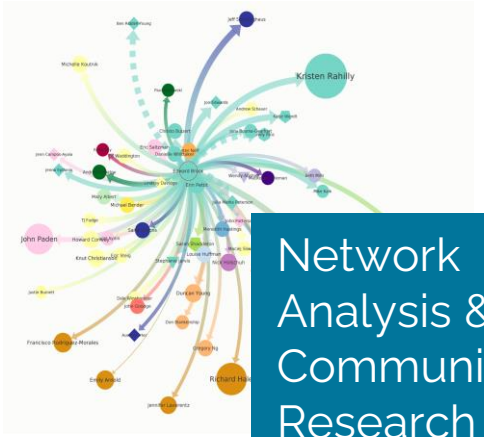
High-resolution climate projections

New climate records

Minnesota's Climate Action Framework

Adaptation indicators, metrics & monitoring

Dedicated Extension programs including adaptation & scenario planning



Network Analysis & Communication Research

Crew Capacity

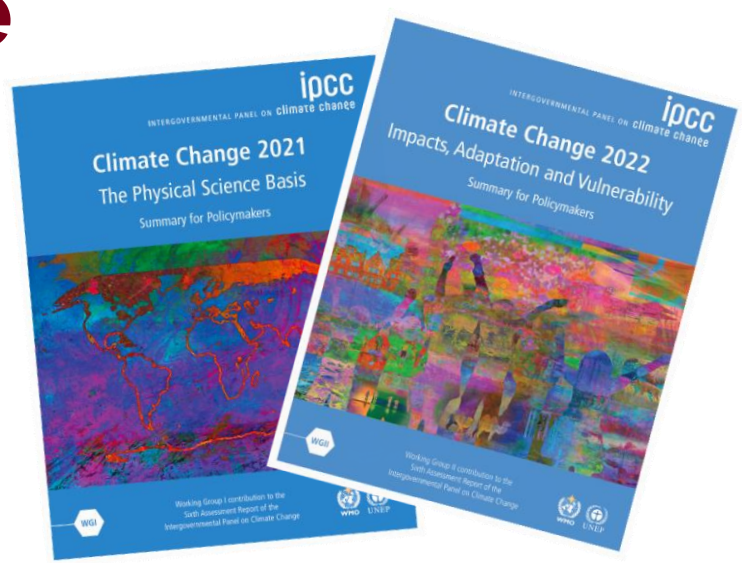
When asked what they need to respond to changing rainstorms, 70% of survey respondents indicated a need for increasing staff numbers. Interviews revealed a need to **retain** crew, not just hire more.

Public engagement & training

State & Federal Engagement

Adaptation leading practices across business lines & sectors

Climate Change - State of the Science



It's us.

It's here.

We've committed to change.

The more we emit, the worse it gets.

We must reduce risks through adaptation.

We still choose, but there's no time to waste.

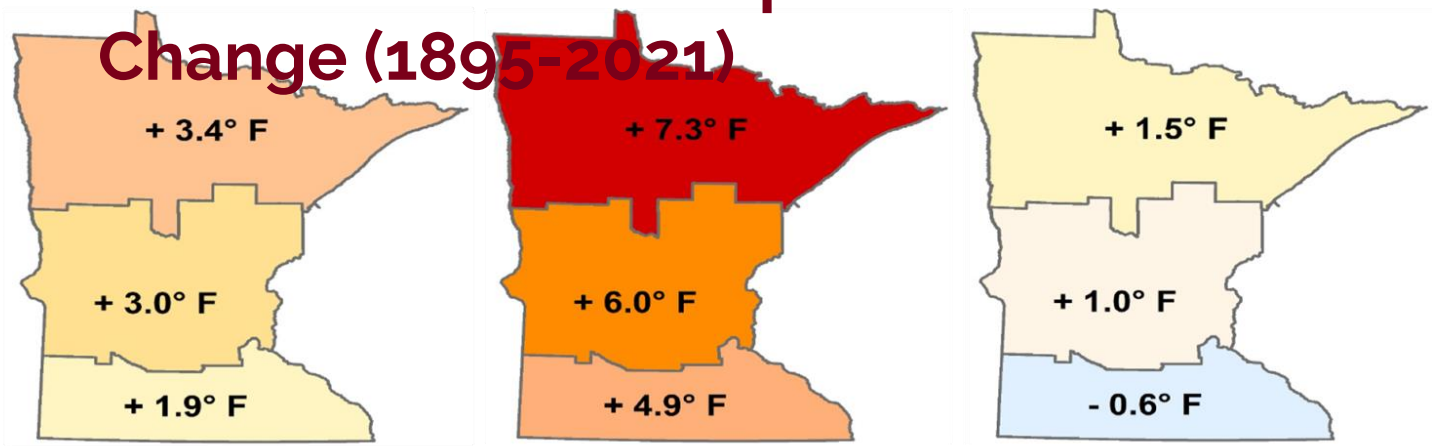
IPCC, 2021, 2022

It's here.

Average global temperature has increased over 2.0°F since the late 1800's

Here means Minnesota.

Total Observed Temperature Change (1895-2021)



Average Annual | Winter lows | Summer highs

Minnesota's average annual temperature has increased by nearly 3°F since 1895

Images: NASA; Data: NASA, 2021 & MN DNR, 2022

Minnesota is getting warmer & wetter

10 wettest & warmest years on record all occurred after 1997

Observed 13% increase in the heaviest rainfall of the year

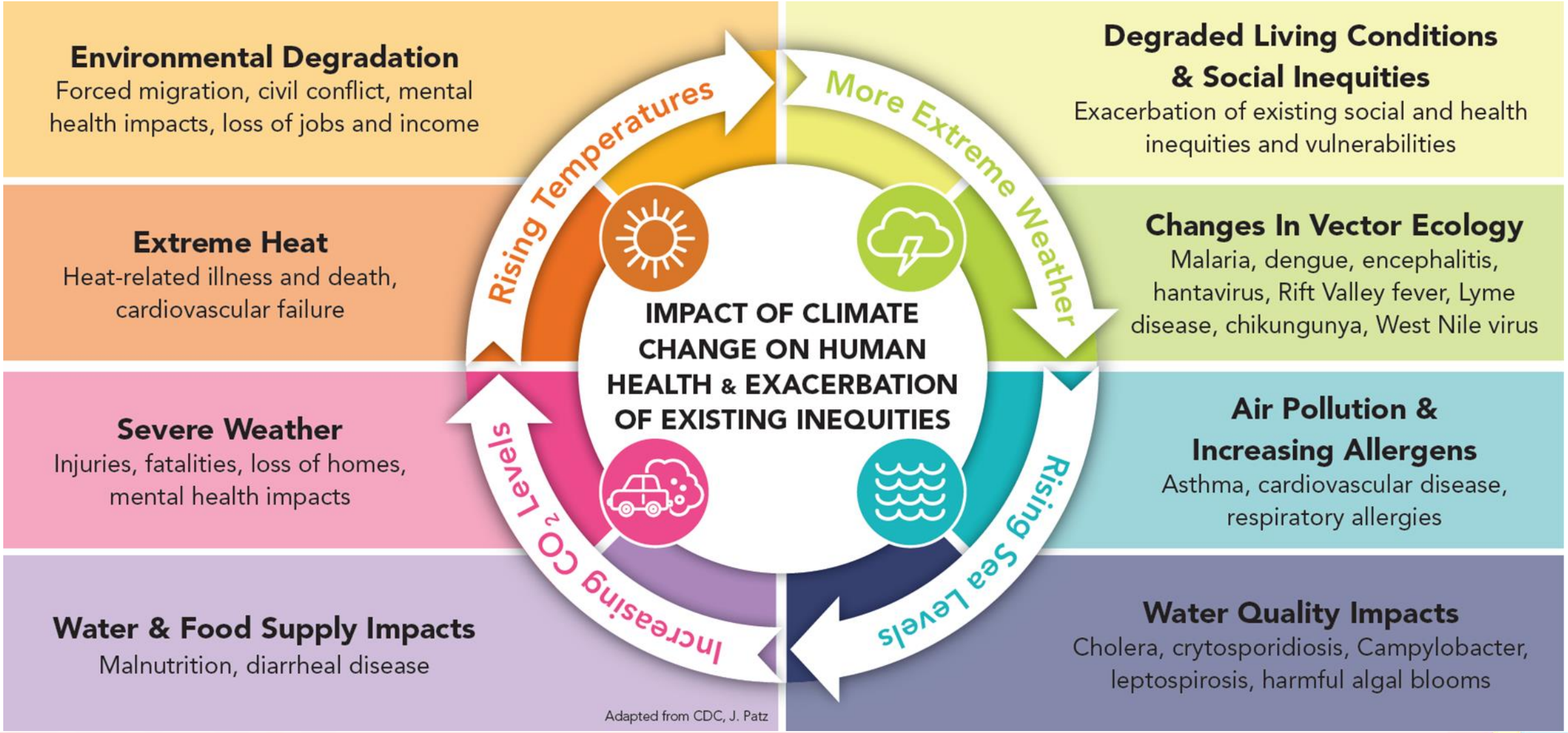
Growing season has lengthened by ~2 weeks since 1950

Data: MN DNR, NCA4 Midwest Chapter

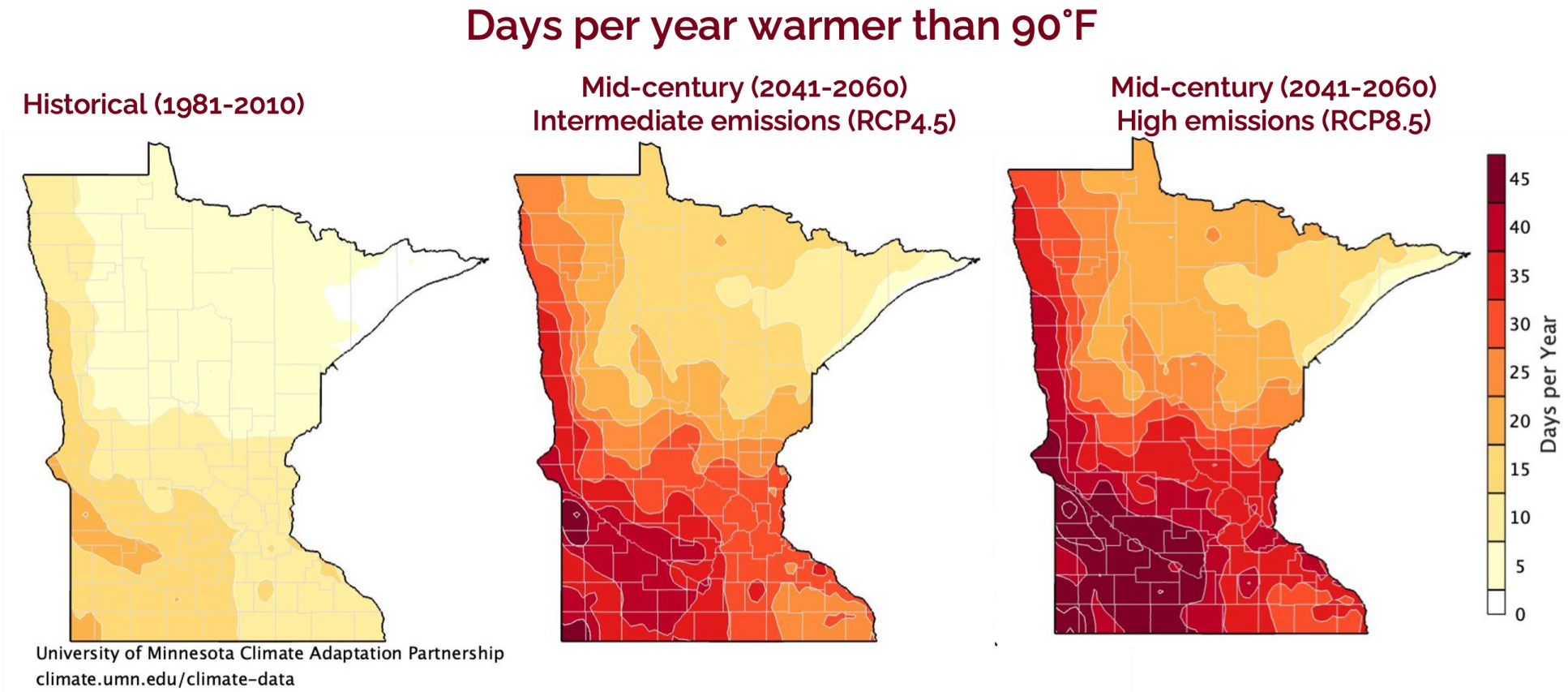
Climate impacts are not experienced equally.

Photo: UMN Extension; for more information visit www.drought.gov

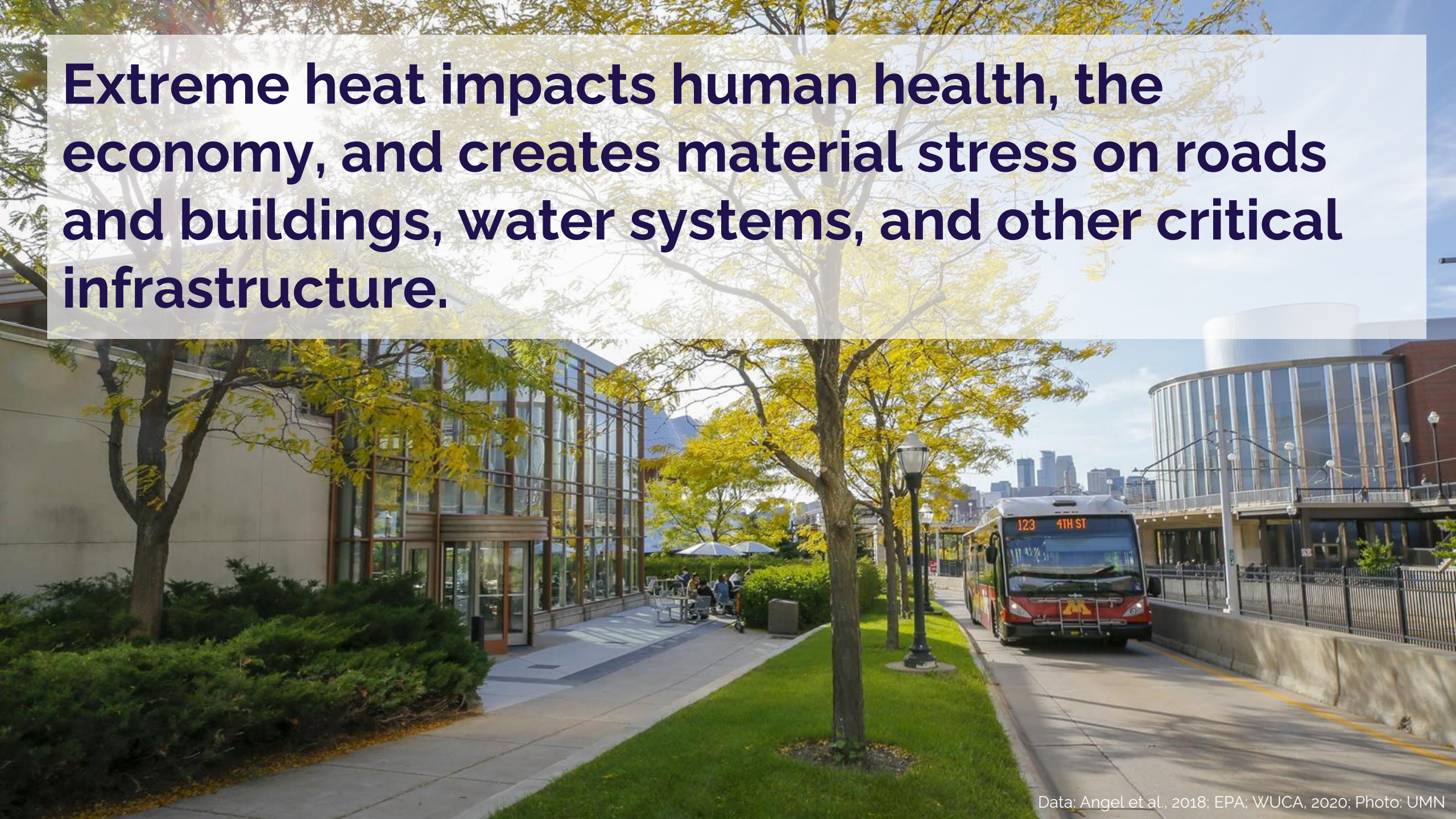
Health-Climate Connections



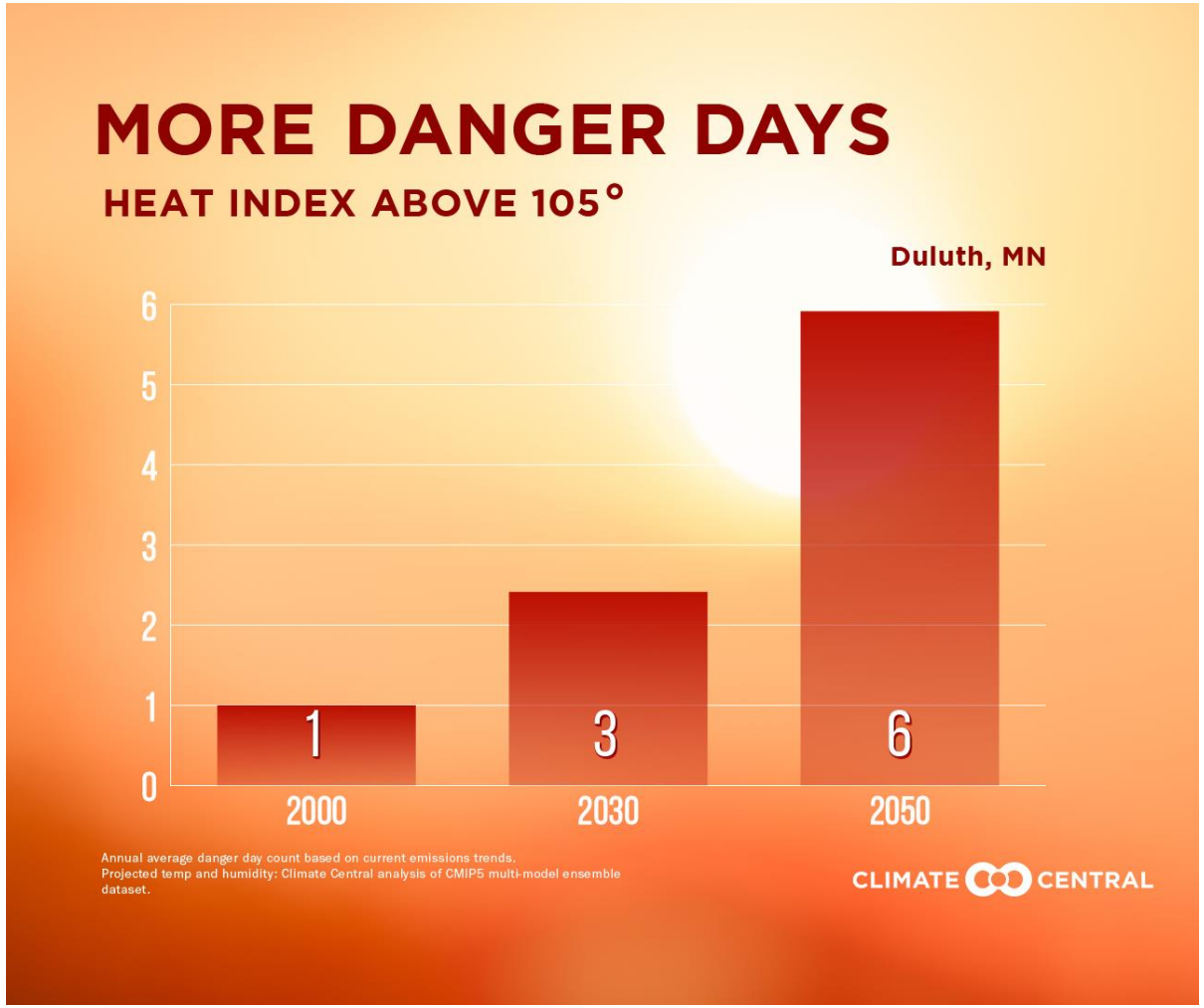
Minnesota is projected to experience 5 to 25 more days per summer with maximum temperatures above 90˚F by mid-century



Extreme heat impacts human health, the economy, and creates material stress on roads and buildings, water systems, and other critical infrastructure.



Data: Angel et al., 2018; EPA; WUCA, 2020; Photo: UMN



More than 110,000 people living in Minnesota are especially vulnerable to extreme heat.

Climate Central, 2023

Heat Vulnerability in Minnesota

This pilot tool is intended to help city/county planners, emergency managers, and public health professionals assess community vulnerability to extreme heat. The tool helps visualize datasets that contribute to a community's vulnerability, including sensitivity (i.e., demographic, socio-economic, health, and environmental variables) and exposure (i.e., temperature-related variables). Variables can be mapped individually or layered to develop a composite score.

Get started by exploring the pre-loaded data below and then look at the data of most interest to your community. Pre-loaded sensitivity data show the change in projected population from 2018 to 2050 for three age groups at highest risk for heat-related illness in Minnesota. A composite score of the variables is determined by dividing each variable into quartiles from 1 to 4 (1-lowest to 4-highest) and then summing the quartiles across the variables. For example, in this case, a score of 12 means that the county is at the highest ranking for each variable, suggesting an increased risk for health impacts related to heat compared to other counties. Pre-loaded exposure data shows projected number of cooling degree days for 2050, which is used as a proxy to estimate cooling needs for buildings.

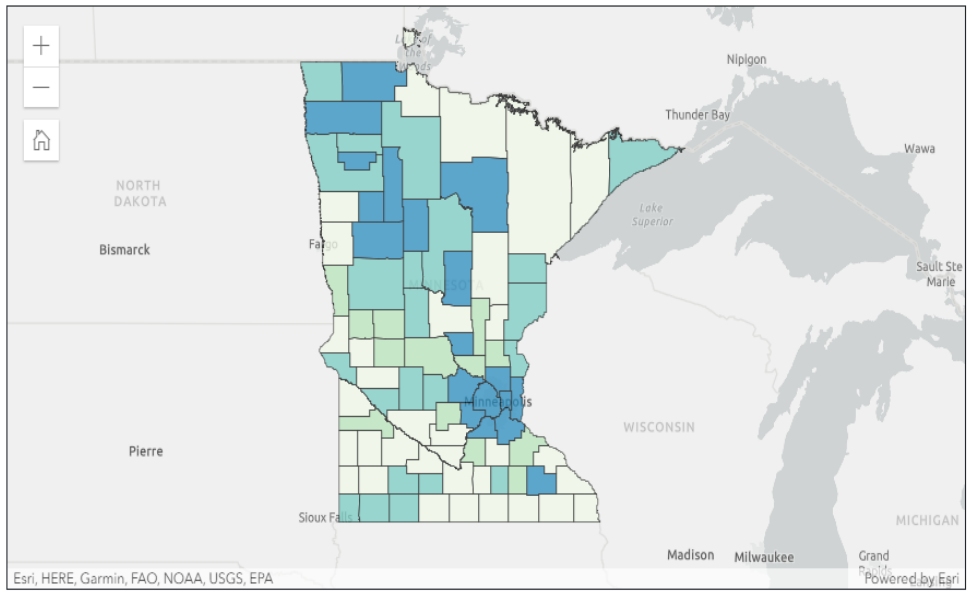
Many of the sensitivity variables come from the America Community Survey (ACS) and Esri. ACS and Esri use different methods for calculating their estimates, and thus, population estimates for each dataset are shown in the pop-up boxes. The data dictionary provides detailed information on the source of each variable and in some cases how it was calculated.

Interested in learning more? Read our User Guide, and check out our Model Heat Vulnerability Assessment for Ramsey County for an illustration of how to package the maps and data into a stakeholder report.

1) Select study area: Minnesota **2) Select spatial resolution:** Counties

Sensitivity

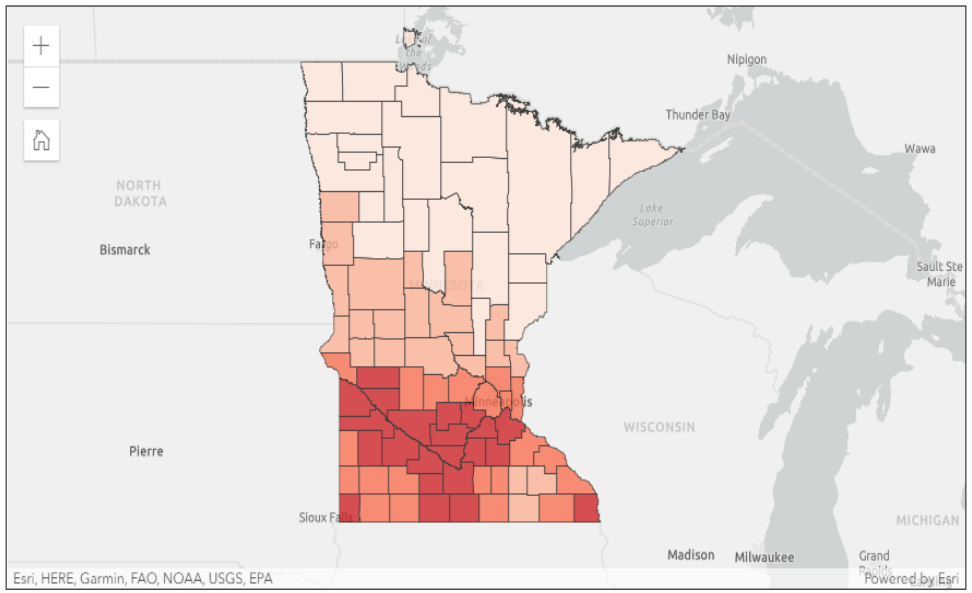
Select Variables



Composite Sensitivity Score

Exposure

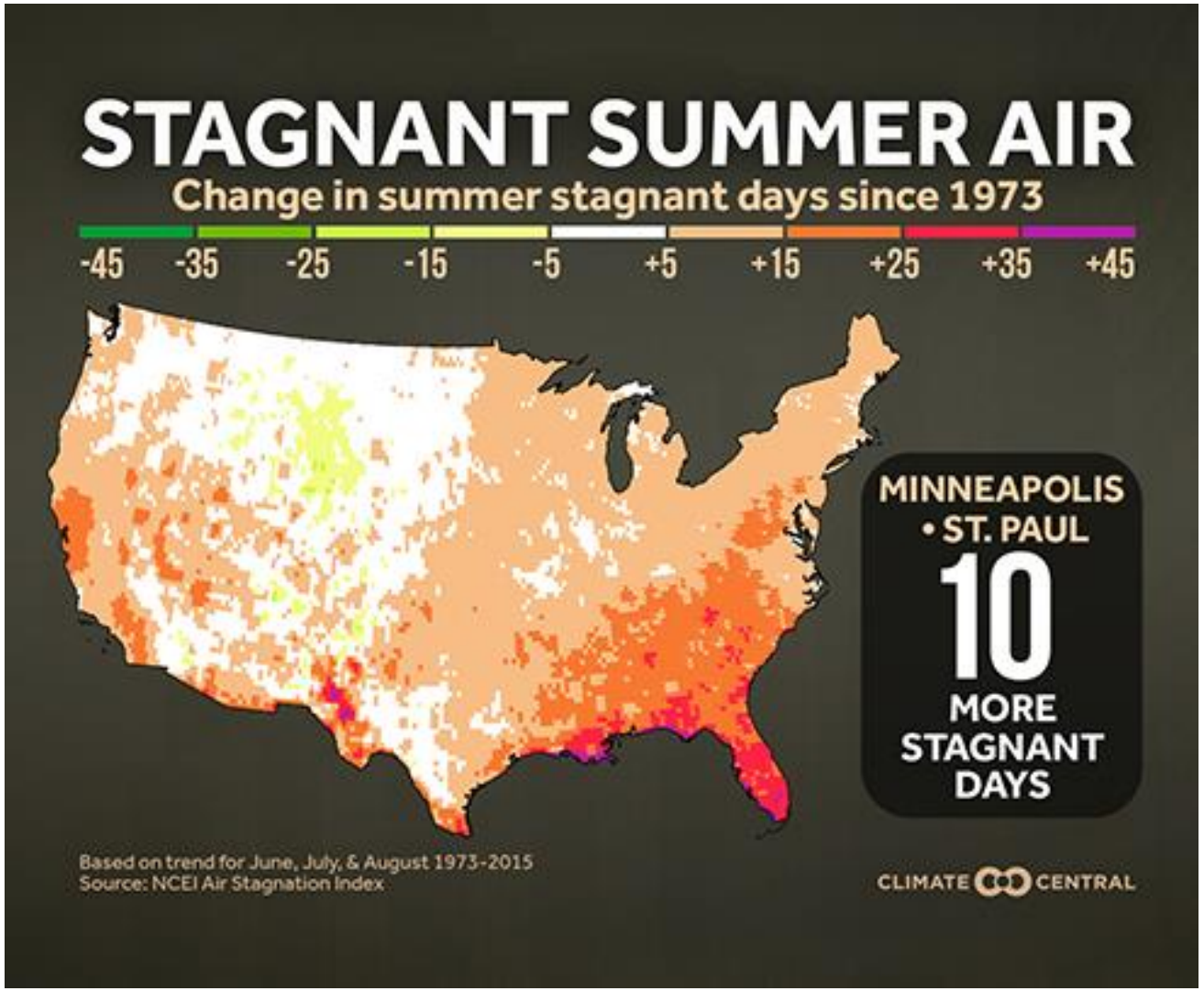
Select Variables

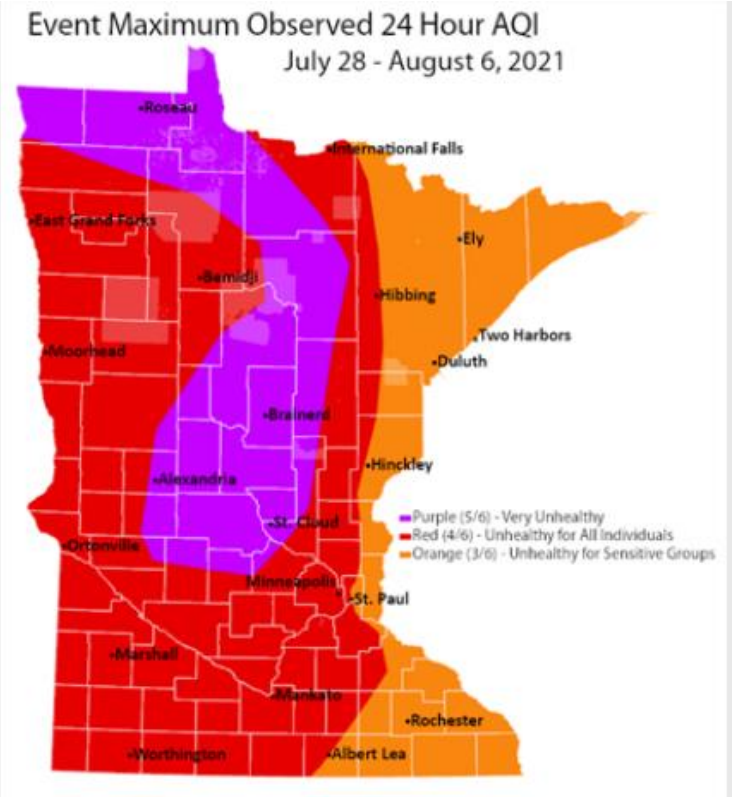


Composite Exposure Score

https://maps.umn.edu/climatehealthtool/

Changing Air Quality





Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	*..air quality conditions are:*	*...as symbolized by this color:*
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

MPCA, 2021

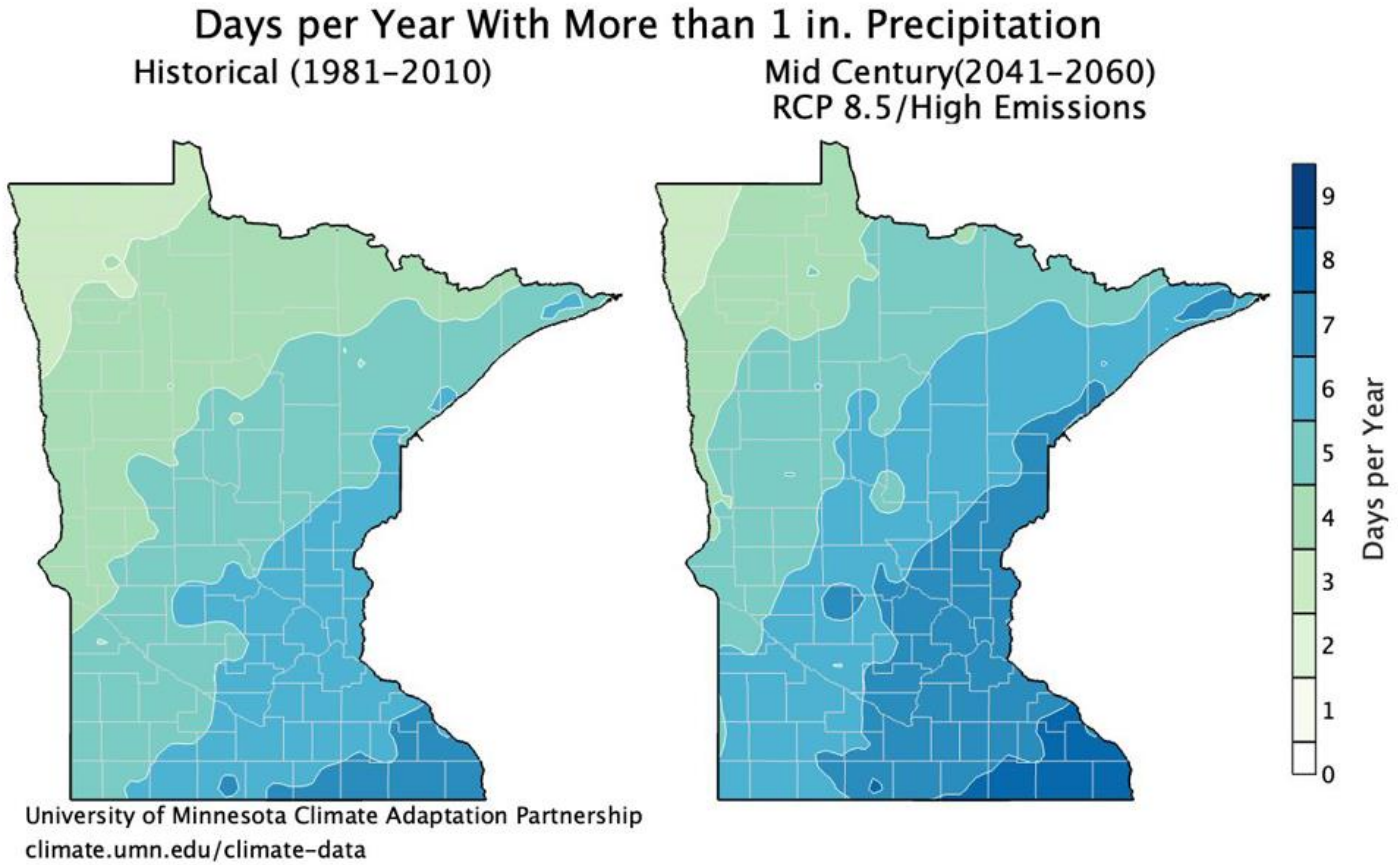
In the Midwest, **transitions from wet to dry extremes** are happening **more quickly** and **more frequently.**

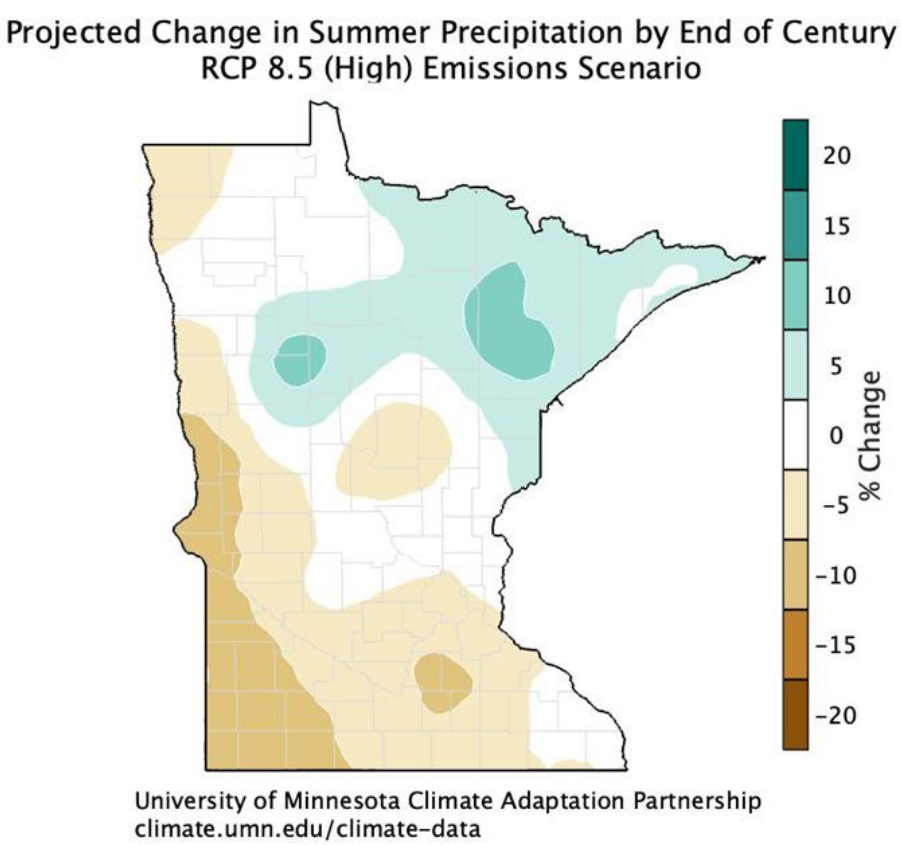
Photo: UMN Extension; for more information visit www.drought.gov

Increasing precipitation has elevated overall flood risk, causing disruption to transportation and damage to property and infrastructure. Flooding also brings risks to health.

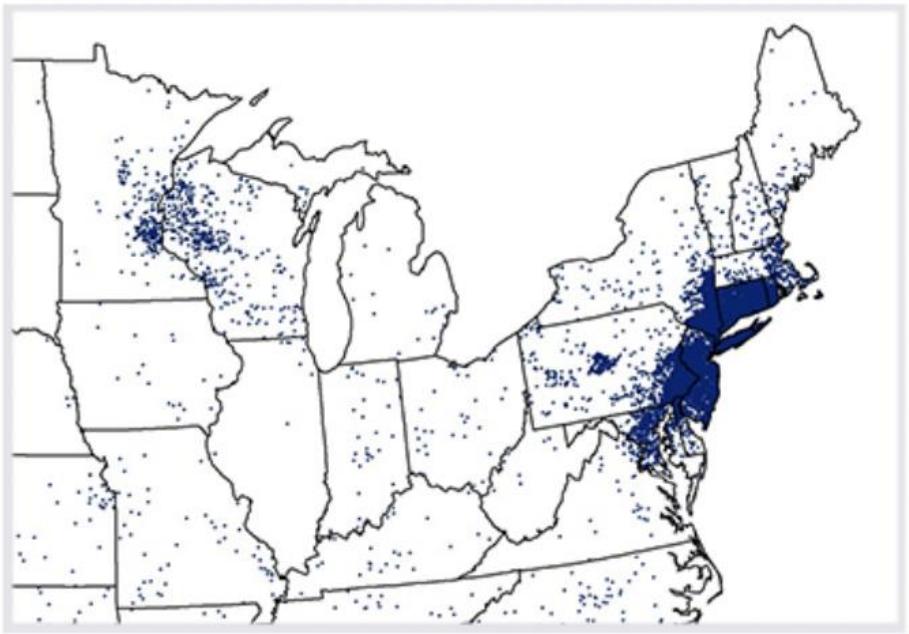
Source: Angel et al., 2018; Winters et al., 2015; Photo UMN Extension

Minnesota's changing precipitation – managing extremes

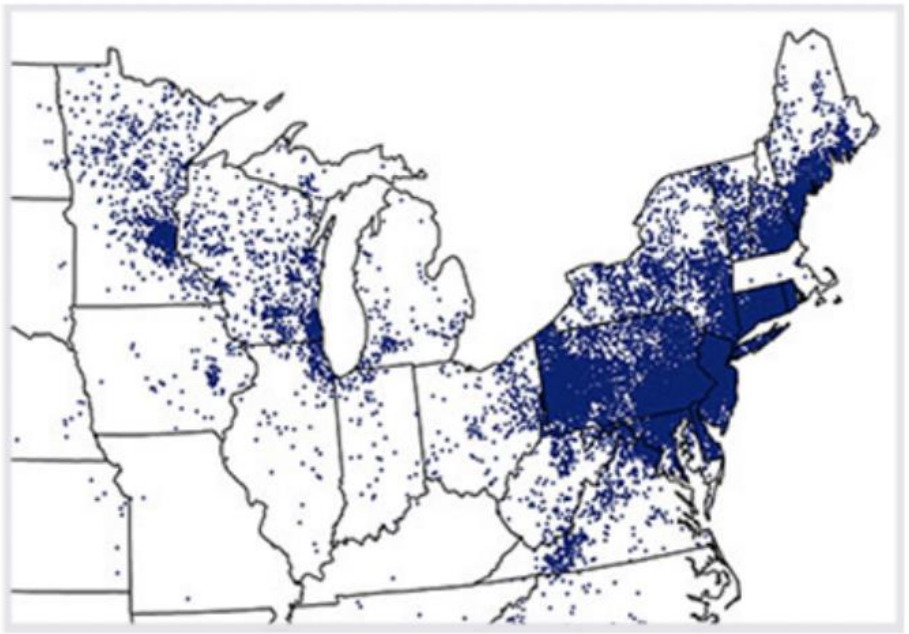




Changing Disease Pressure



1996



2018

The distribution of Lyme disease cases in the United States, which is reported to CDC in 1996 and 2018. Each dot represents an individual case placed according to the patients' county of residence, which may be different from the county of exposure. These maps focus on the parts of the U.S. where Lyme disease is most common.

Climate Change Needs No Passport

"Nearly all of the Mississippi River basin has seen below-normal rainfall since late August…**The timing is bad because barges are busy carrying recently harvested corn and soybeans up and down the river.**"

- Associated Press, October 6th, 2022

Weather and climate extremes are causing economic and societal impacts across national [and state] boundaries through **supply-chains, markets, and natural resource flows**…across the **water, energy and food sectors**.

IPCC, 2022, Photo: AP, Thomas Berner

Needs & Opportunities for Action

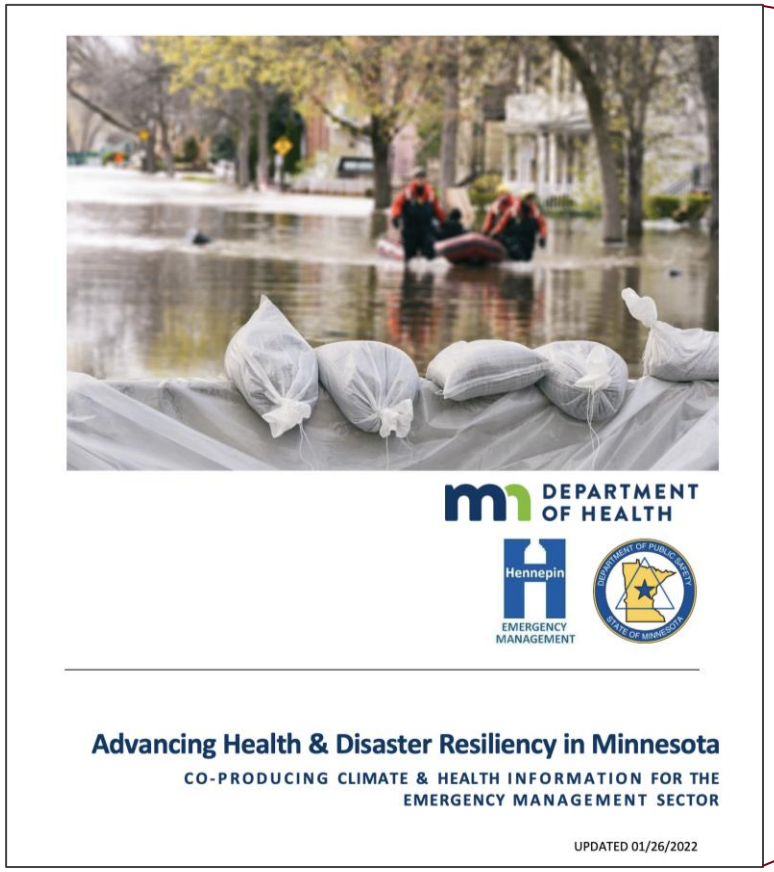
in U.S. cities **discuss health and equity/justice concurrently** when considering climate adaptation.*

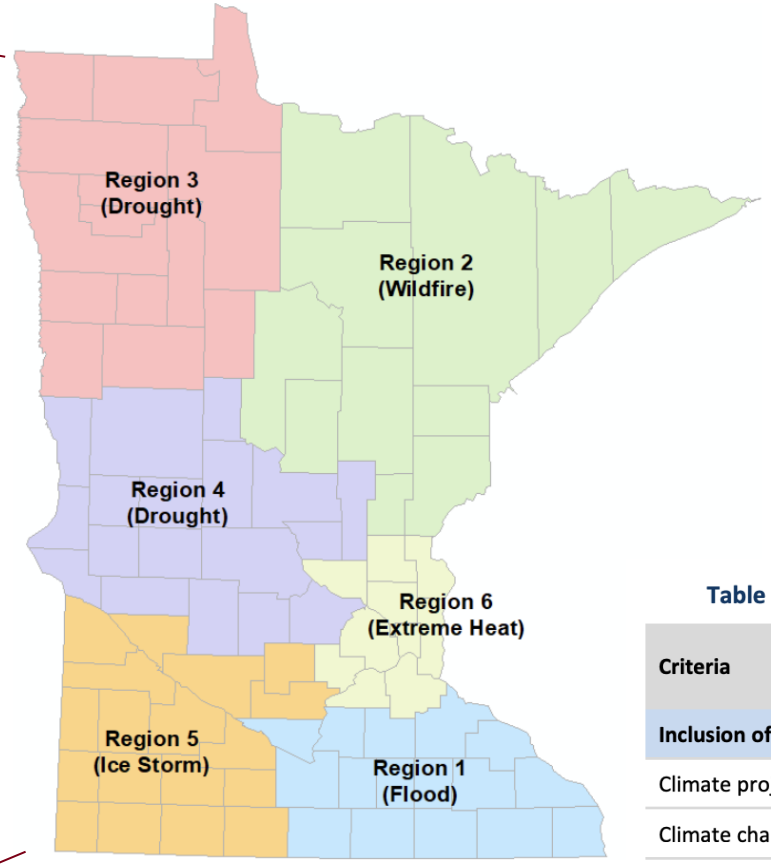
report experiencing climate anxiety. Gen Z reports higher levels of climate anxiety than the general Minnesota population.

think **local, state and municipal governments are responsible** for addressing climate change in the state.

Source: *Mullenbach and Stanis, 2022; UMN MCAP, CFANS, Caravan Climate Opinion Poll, Sept. 2022

Health & Disaster Resiliency in MN





100% of MN emergency managers surveyed

intend to use climate projections

Table 5. Comparison of Climate Change Incorporation in 2019-20 vs 2010-13 Plans

Criteria	2019-20 Plans (n=18)	2010-13 Plans (n=18)
Inclusion of the Program resource as an appendix	**12 (67%)**	**NA**
Climate projections discussed in body	9 (50%)	2 (11%)
Climate change section included in body	12 (67%)	5 (28%)
Climate trends discussed in body	13 (72%)	2 (11%)
Climate change discussed for every hazard	14 (78%)	0 (0%)

https://www.health.state.mn.us/communities/environment/climate

We must reduce risks through adaptation.

Adaptation can bring multiple benefits:
improved agricultural productivity, innovation, health, food security, livelihood, biodiversity conservation, and reduction of risks & damages.

Long-term planning and accelerated implementation, particularly in the next decade, is important to close adaptation gaps.
In Minnesota, we need to better understand where risks are greatest and identify place-specific responses.

IPCC, 2022

We've committed to change.

Our exposure to climate impacts is dependent upon how well we **prevent** and **manage** them.

Will we embrace a reactive or proactive stance?

Photos: UMN Extension, H. Roop, M. Stone

Minnesota's Climate Action Framework

The climate vision for our state

The vision for our state embodied in this framework is:

Carbon-neutral

By 2050, Minnesota substantially reduces greenhouse gas (GHG) emissions and balances any GHG emissions with carbon storage, especially in our landscapes.

Resilient

Minnesota communities, businesses, and the natural environment can prepare, respond to, and recover from the impacts of climate change so all Minnesotans can thrive in the face of these challenges.

Equitable

Minnesotans acknowledge and address inequitable and inaccessible systems that contribute to some communities experiencing disproportionate climate change impacts; ensure fair distribution of the costs and benefits of action now and to future generations; and ensure meaningful participation in planning.

Source: climate.state.mn.us/minnesotas-climate-action-framework

Climate Adaptation Partnership

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