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Environmental and  
Energy Study Institute

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**CONGRESSIONAL BRIEFING**  
**Living with Climate Change:**  
**Extreme Heat**  
**Policies to Anticipate Threats and**  
**Build Preparedness**

Friday, June 24, 2022

# About EESI



## **Non-partisan Educational Resources for Policymakers**

A bipartisan Congressional caucus founded EESI in 1984 to provide non-partisan information on environmental, energy, and climate policies



## **Direct Assistance for Equitable and Inclusive Financing Program**

In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs



## **Commitment to Diversity, Equity, Inclusion, and Justice**

We recognize that systemic barriers impede fair environmental, energy, and climate policies and limit the full participation of Black, Indigenous, people of color, and legacy and frontline communities in decision-making



## **Sustainable Solutions**

*Our mission is to advance science-based solutions for climate change, energy, and environmental challenges* in order to achieve *our vision of a sustainable, resilient, and equitable world.*

# Polycymaker Education

## Briefings and Webcasts



Live, in-person and online public briefings, archived webcasts, and written summaries

## Climate Change Solutions



Bi-weekly newsletter with everything policymakers and concerned citizens need to know, including a legislation and hearings tracker

## Fact Sheets and Issue Briefs



Timely, objective coverage of environmental, clean energy, and climate change topics

## Social Media (@EESIOnline)



Active engagement on Twitter, Facebook, LinkedIn, and YouTube



## Upcoming Briefings & Series



### **Living with Climate Change**

**Polar Vortex – April 13**

**Sea Level Rise – May 18**

**Wildfires – June 13**

**Extreme Heat – June 24**

### **Scaling Up Innovation to Drive Down Emissions**

**Green Hydrogen – April 27**

**Direct Air Capture – May 25**

**Electric Vehicle Charging – June 02**

**Offshore Wind Energy – June 29**



# Planning for Urban Heat Resilience

**Ladd Keith, Ph.D.**

Assistant Professor of Planning  
Chair of Sustainable Built Environments

EESI Living with Climate Change:  
Extreme Heat

June 24, 2022



[ladd@arizona.edu](mailto:ladd@arizona.edu)

 [@LaddKeith](https://twitter.com/LaddKeith)



# Planning for Urban Heat Resilience

Ladd Keith & Sara Meerow

**Chapter 1** | Urban Heat: A Growing Risk

**Chapter 2** | Understanding the Complexities of Urban Heat

**Chapter 3** | Equity and Urban Heat

**Chapter 4** | Urban Heat Resilience Planning Framework

**Chapter 5** | Heat Mitigation Strategies

**Chapter 6** | Heat Management Strategies

**Chapter 7** | Planning Tools for Urban Heat Resilience

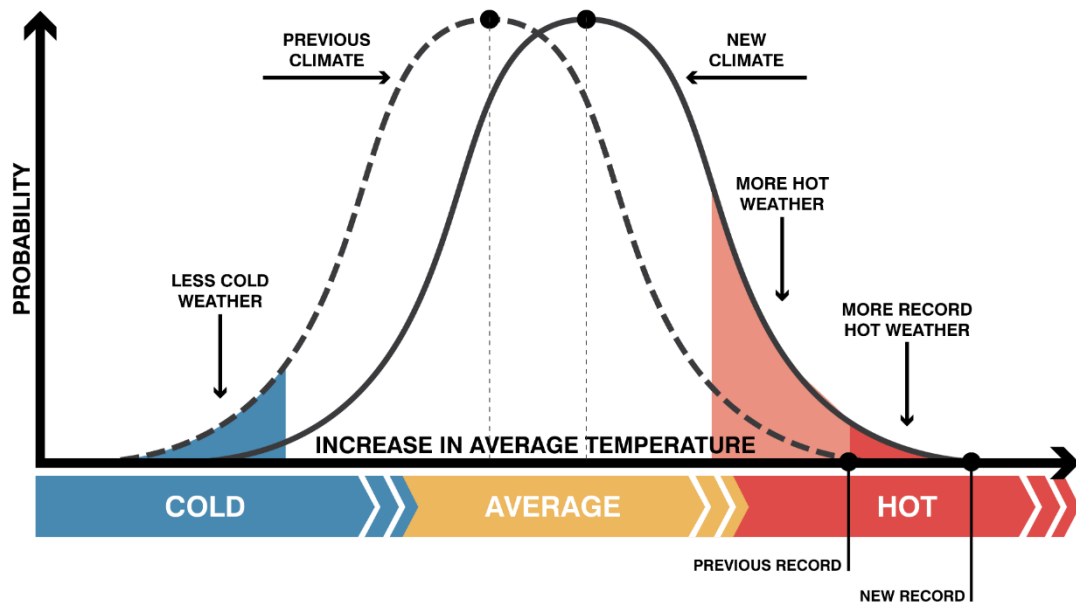
**Chapter 8** | Advancing Urban Heat Resilience

# Planning for Urban Heat Resilience

## Urban heat: A growing risk

Continued rise in average temperatures and increases in the intensity, duration, and frequency of extreme heat events

- Climate change
- Urban heat island (UHI) effect

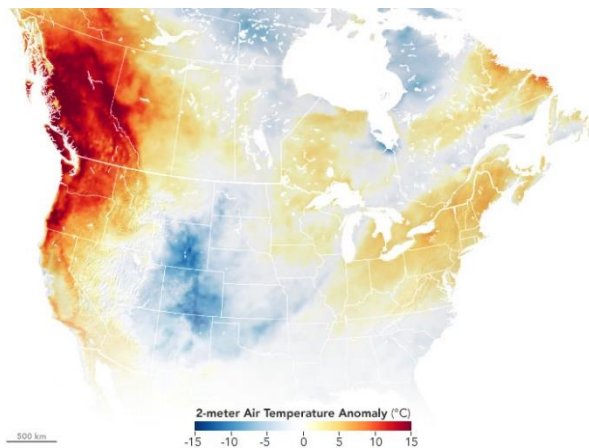


# Planning for Urban Heat Resilience

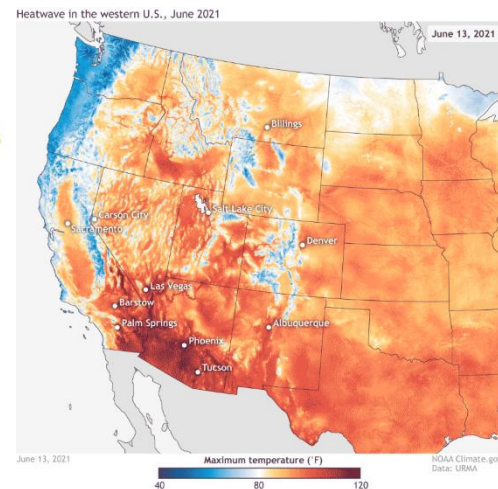
## Urban heat: A growing risk

- Social
  - Public health
  - Quality of life
- Economic
  - Labor
  - Economic productivity
- Environmental
  - Landscapes and ecology
- Infrastructure
  - Energy and water usage

2021 Pacific Northwest Heatwave



2021 Southwest Heatwave

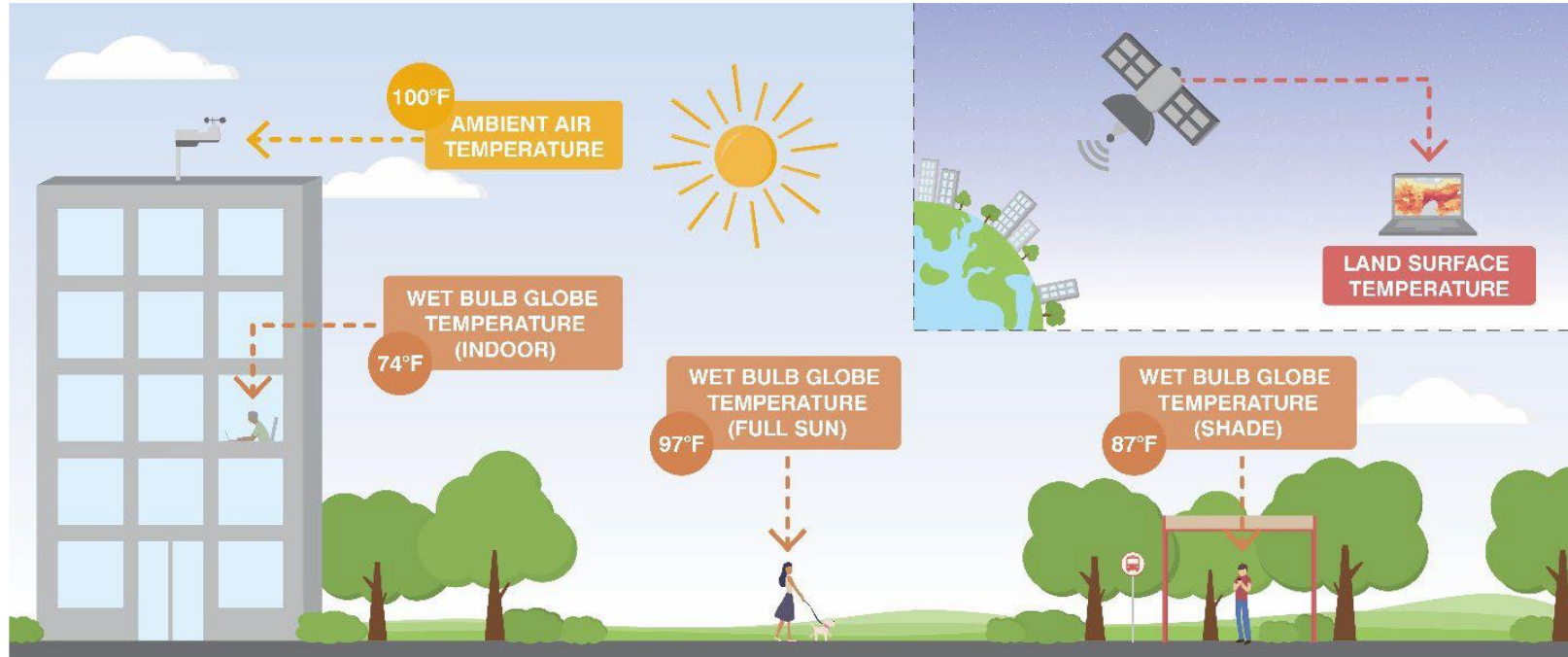


(U.S. NOAA)



# Planning for Urban Heat Resilience

Understanding the complexities of urban heat



(Keith & Meerow, 2022)

# Planning for Urban Heat Resilience

## Equity and urban heat

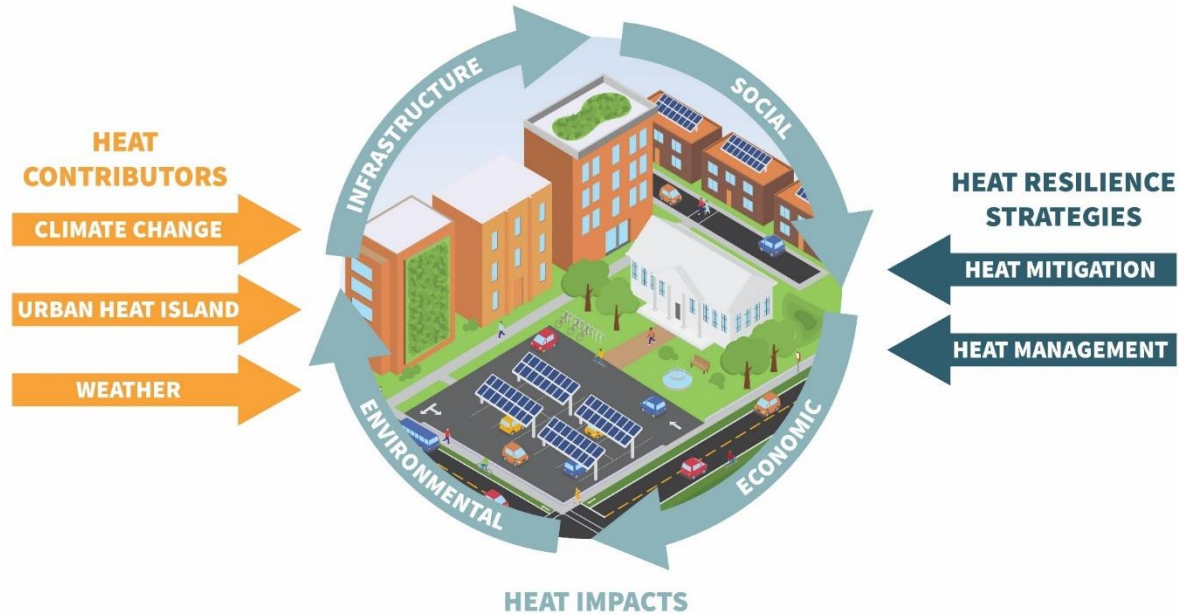
- Inequitable distribution of heat severity
  - Legacy of racist land use practices (redlining)
  - Continued community disinvestment
- Systematic inequities
  - Housing and indoor cooling
  - Workplace and school environments
  - Transportation
  - Healthcare
  - Exclusion from decision-making



# Planning for Urban Heat Resilience

## Urban heat resilience planning framework

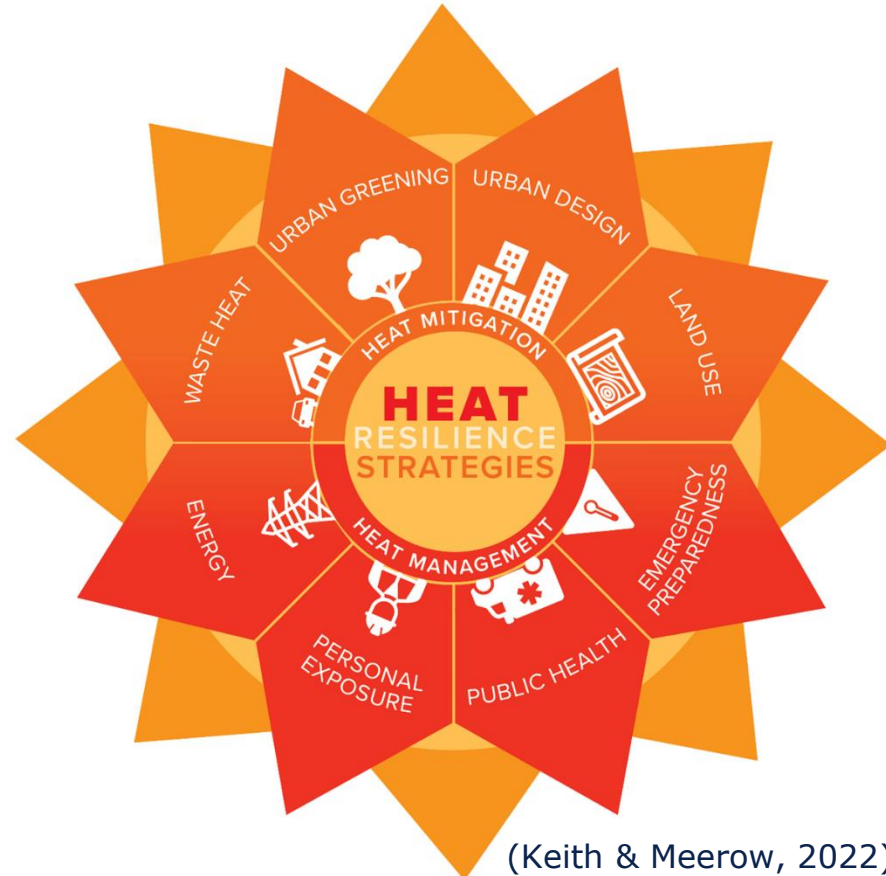
*"Proactively mitigating and managing urban heat across the many systems and sectors it affects."*



# Planning for Urban Heat Resilience

## Heat resilience strategies

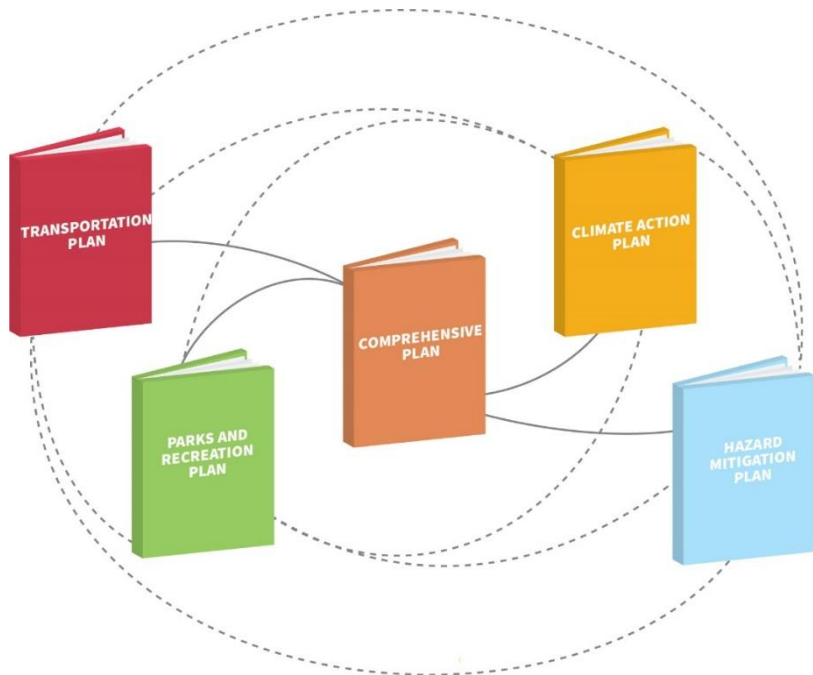
- Heat mitigation
  - Land use
  - Urban design
  - Urban greening
  - Waste heat
- Heat management
  - Energy systems
  - Personal exposure
  - Public health
  - Emergency preparedness



# Planning for Urban Heat Resilience

## Planning tools for heat mitigation

“Network of plans”



- Community visioning and engagement
- Plans and policies
  - Comprehensive plan
  - Hazard mitigation plan
  - Climate action plan
- Regulations and project review
  - Zoning and land use regulations
  - Streetscape design guidelines
  - Building codes
  - HOA regulations and CC&Rs
- Public investments
  - Parks, open space, and connections
  - Flood management infrastructure
  - Transportation and transit infrastructure
  - Public buildings

# Deploy Heat Officers, Policies and Metrics

Ladd Keith, Sara Meerow, David M. Hondula & James C. Arnott

## Heat governance

*"The actors, strategies, processes, and institutions that guide decision-making for mitigating and managing heat as a hazard."*

## Six guiding principles

- Advance heat equity
- Mitigate heat
- Manage heat
- Develop metrics
- Coordinate initiatives
- Build heat institutions

 @LaddKeith

nature

Setting the agenda in research

## Comment



In June, residents in Portland, Oregon, fill a cooling centre to escape record-breaking temperatures.

## Deploy heat officers, policies and metrics

Ladd Keith, Sara Meerow, David M. Hondula, V. Kelly Turner & James C. Arnott

# Thank You



**Ladd Keith, Ph.D.**

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 [@LaddKeith](https://twitter.com/LaddKeith)

Planning for Urban Heat Resilience  
[tinyurl.com/urbanheatresilience](https://tinyurl.com/urbanheatresilience)

Deploy heat officers, policies and metrics  
[tinyurl.com/heatgovernance](https://tinyurl.com/heatgovernance)

Planning for Urban Heat Resilience was supported by the U.S. NOAA Climate Program Office's Extreme Heat Risk Initiative, Cooperative Agreement NA21OAR4310148.



# EXTREME HEAT & PUBLIC HEALTH

**SONAL JESSEL, MPH  
DIRECTOR OF POLICY**







**HEAT WAVES ARE INCREASING IN**

**SEVERITY**

**FREQUENCY**

**DURATION**

# **...& WE HAVE THE URBAN HEAT ISLAND EFFECT**



## **Cooling Season**

New York City has set out to protect people — and the planet — from the deadliest disaster: heat.

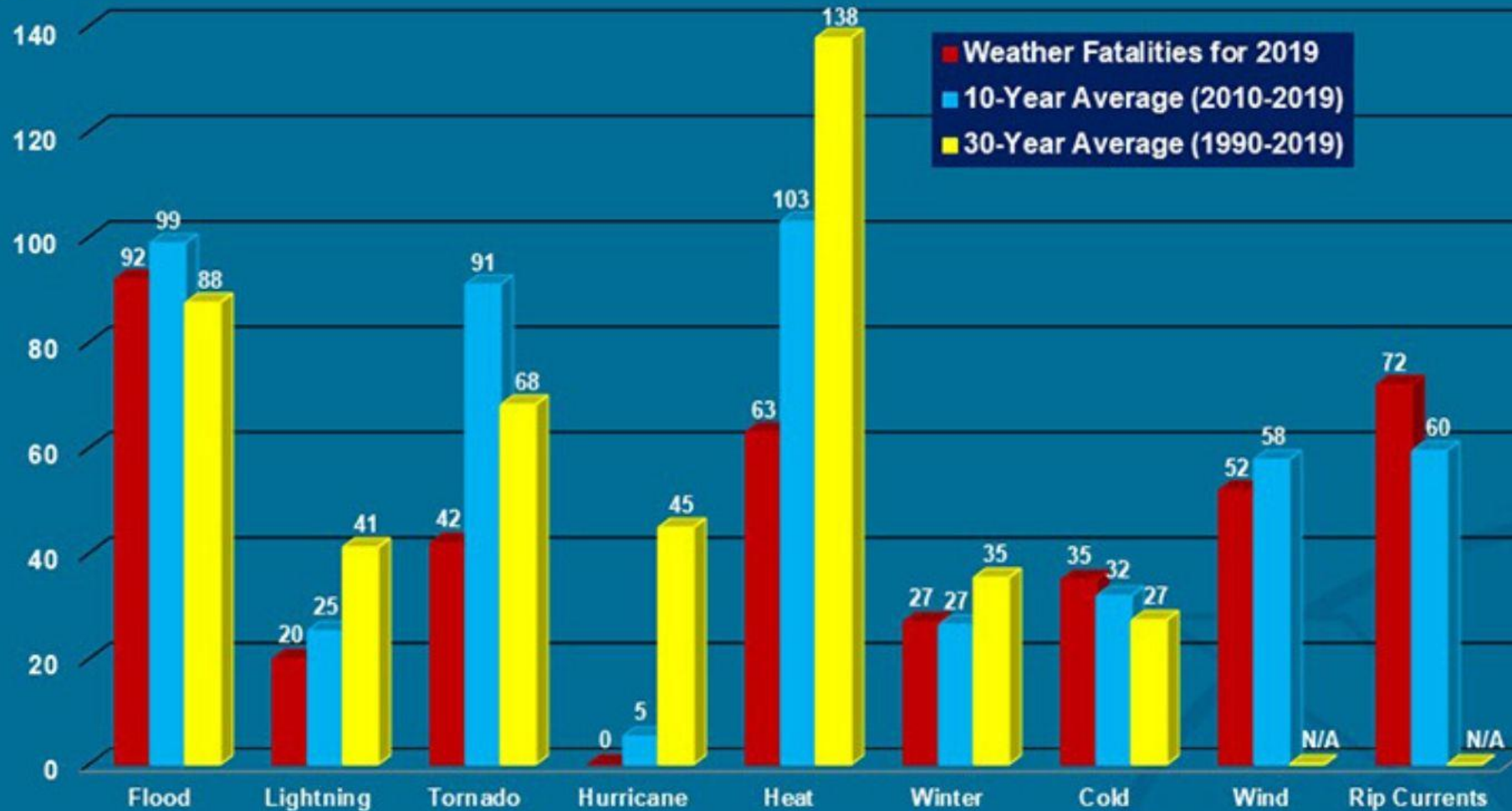
By [Kia Keabe](#) on Aug 13, 2019



**"THE ANNUAL MEAN AIR  
TEMPERATURE OF A CITY  
WITH 1 MILLION PEOPLE  
OR MORE CAN BE 1.8–  
5.4°F (1–3°C) WARMER  
THAN ITS  
SURROUNDINGS" (EPA)**



# Weather Fatalities 2019



**THIS GRAPH DOES  
NOT TELL THE  
WHOLE STORY!**

**"WE ARE IN THE SAME STORM, BUT NOT ALL IN THE SAME BOAT"**



# WHO'S ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

- Older adults
- Children
- People with chronic illness
- Pregnant people
- Outdoor workers





Image from: eclosh.com

# WHO'S ESPECIALLY AT-RISK TO EXTREME HEAT IMPACTS?

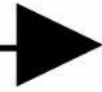
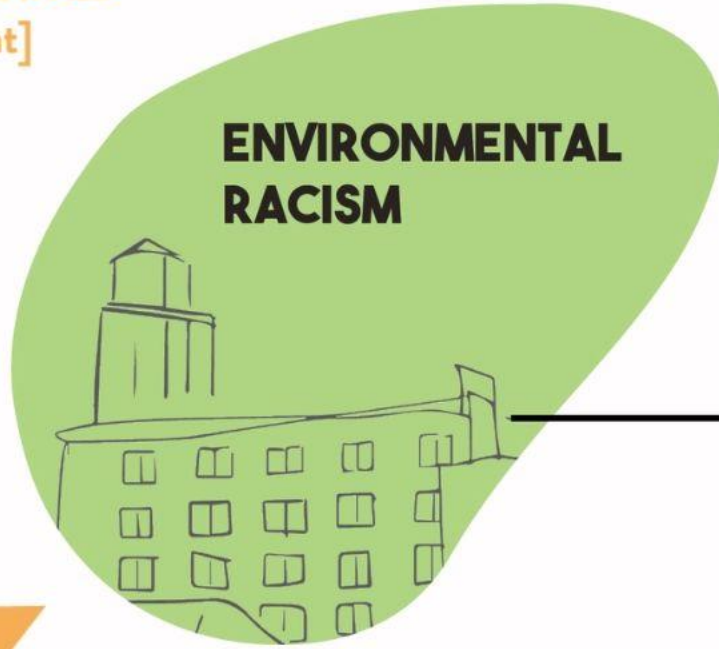
- Older adults
- Children
- People with chronic illness
- Outdoor workers

...but also people who

- live in older, poorly maintained apartment buildings;
  - live in crowded apartments with intergenerational living;
  - live in neighborhoods with less green space access,
  - live in neighborhoods with more air pollution from buildings and industrial sites; and
  - been exposed to air pollution across the lifespan
  - stretch their resilience and their means across many hardships, such as food, rent, chronic illness, immigration concerns, and more,
- ....and it is all due to historical and systematic (environmental) racism



**CLIMATE CHANGE**  
[Extreme heat]





**PEOPLE ARE STAYING AT HOME MORE THIS  
SUMMER.**

# Address energy insecurity

The inability to adequately meet basic household energy needs due to the interplay of physical conditions of housing, household energy costs and energy-related coping strategies.

# EVERYONE HAS A RIGHT TO A HEALTHY & COOL HOME

## WHAT MAKES A HOME ENERGY INSECURE?

Planned brown outs in low income communities of color

The wall insulation retains heat, so your home stays hot for days after a heat wave

Short periods of utility failures, due to increased usage from air conditioners

Your landlord does not address maintenance issues like holes, cracks, leaks

Choosing between turning your air conditioning on, or your oxygen machine

## WHAT MAKES A HOME ENERGY SECURE?

A home that is well cared for by the landlord

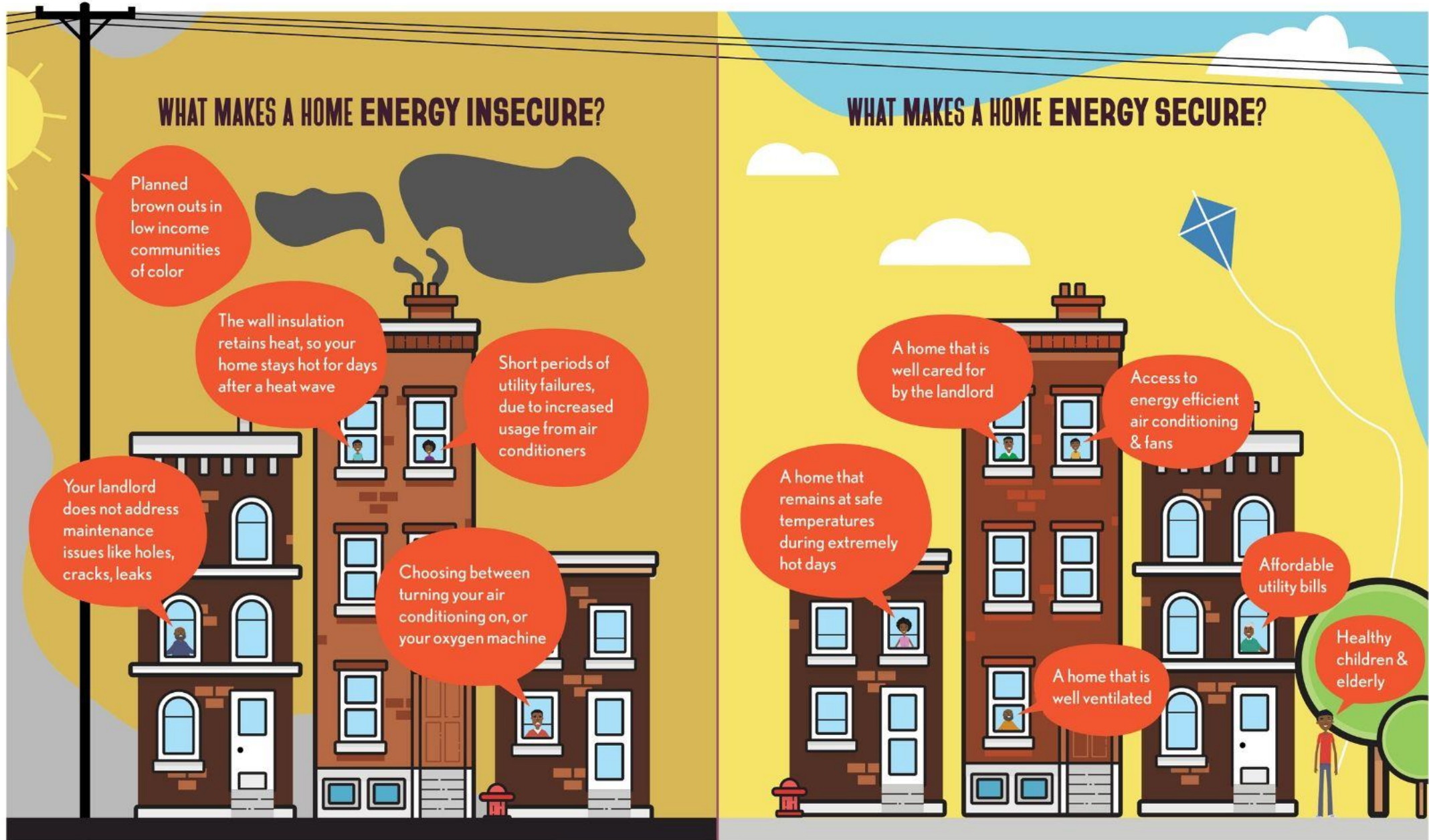
Access to energy efficient air conditioning & fans

A home that remains at safe temperatures during extremely hot days

Affordable utility bills

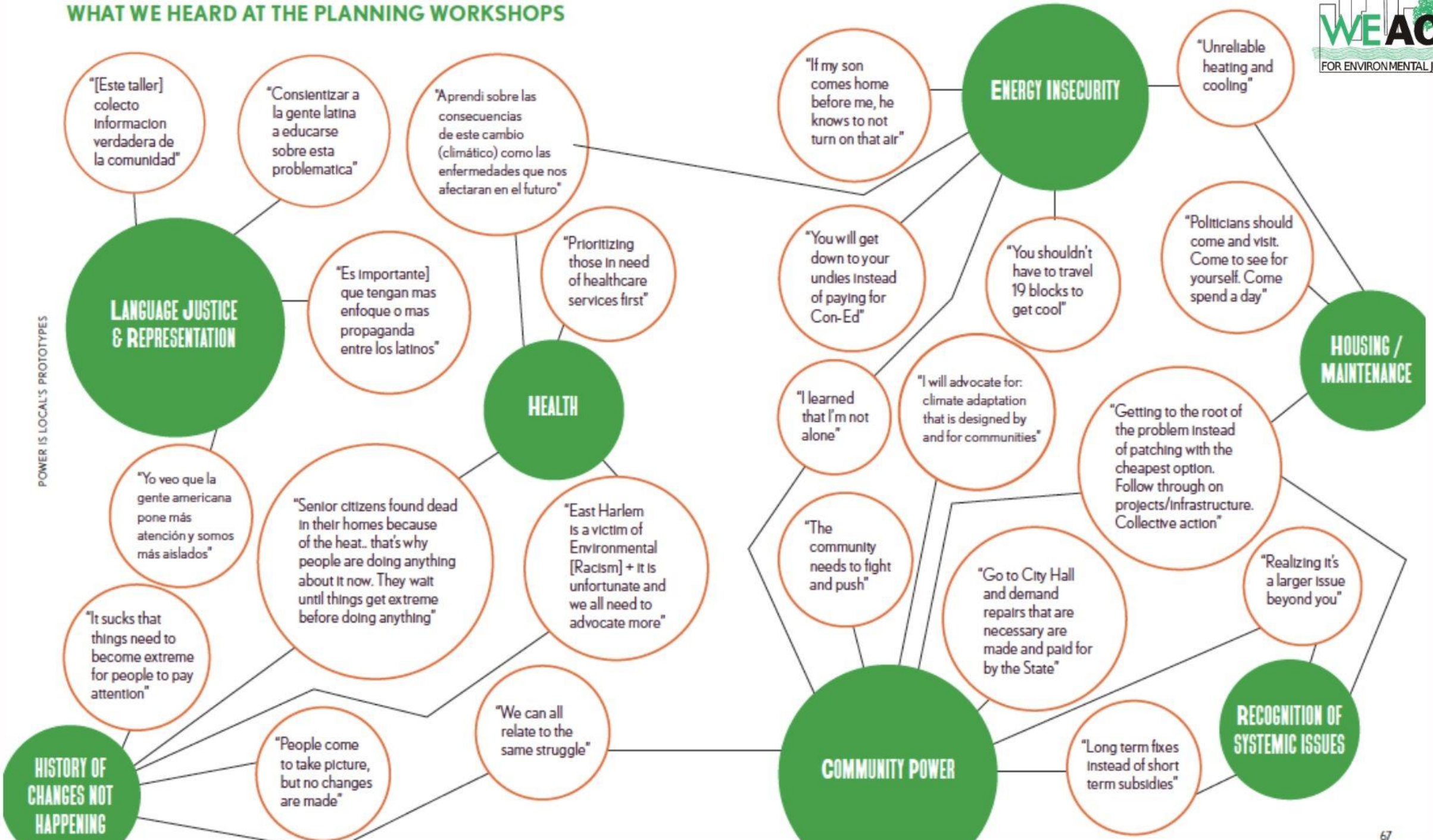
A home that is well ventilated

Healthy children & elderly



# WHAT WE HEARD AT THE PLANNING WORKSHOPS

POWER IS LOCAL'S PROTOTYPES



- 
- Long Term Solutions
  - Short Term Solutions & Emergency Response



# EXTREME HEAT POLICY AGENDA 2022

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ILLUSTRATION BY SEAN MCCABE



**@Sonal360\_**

**@weact4ej**

**[www.weact.org/heat](http://www.weact.org/heat)**

**THANK**

**YOU**

# Extreme heat impacts under a changed climate and opportunities for action

**Juan Declet-Barreto**  
Senior Social Scientist for Climate Vulnerability

## Killer Heat in the United States

*Climate Choices and the Future of Dangerously Hot Days*



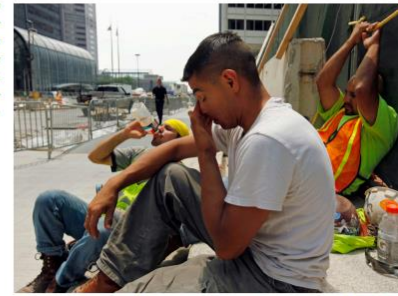
## Too Hot to Work

*Assessing the Threats Climate Change Poses to Outdoor Workers*

**HIGHLIGHTS**  
*Outdoor workers face severe risks from extreme heat—risks that will increasingly threaten the health and livelihood of tens of millions of outdoor workers in the United States as climate change makes dangerously hot days more frequent and intense. With economic and legal systems that routinely discount their lives and safety, workers who experience heat-related injuries or illnesses on the job have little to no recourse. By midcentury, with no action to reduce global warming emissions, an estimated \$5.4 billion in outdoor workers' earnings would be at risk annually due to extreme heat. Even with bold action to limit emissions, outdoor workers will face severe and rising risks from extreme heat. Policymakers and employers must take actions to protect outdoor workers.*

The COVID-19 pandemic underscored weaknesses and stark variations in the protections available to workers in the United States. Across the nation, millions of people lost their jobs or were furloughed, their financial present and futures suddenly cast into doubt. And while those in some types of jobs could reduce their exposure to COVID-19 by working from home, workers in many outdoor occupations were deemed essential. In planting and harvesting food to fill our plates, responding to community emergencies, caring for our roads and rails, and delivering supplies that shuttered stores could not provide, they risked infection, illness, and even death—their own, or their families'—as they performed their daily work.

Yet the novel coronavirus is only the latest addition to a long list of on-the-job hazards confronting outdoor workers. Each summer, the roughly 32 million outdoor workers across the United States—from construction workers to farmworkers to emergency responders—regularly face a brutal choice: risk their health by enduring dangerous exposure to heat or risk their jobs by staying home.



*Members of a road construction crew take a break from working during a heat wave in Chicago in June, 2012, as temperatures approached 90°F. Between now and midcentury, continued global warming will increasingly expose outdoor workers to dangerous conditions, necessitate schedule adjustments or reductions in work hours, and is projected to put workers' earnings at risk.*

# Climate Change has turned summer into a Danger Season

## Goodbye, carefree summers—hello, 'Danger Season'

The AMA has declared the warming climate 'a public health crisis that threatens the health and well-being of all people'

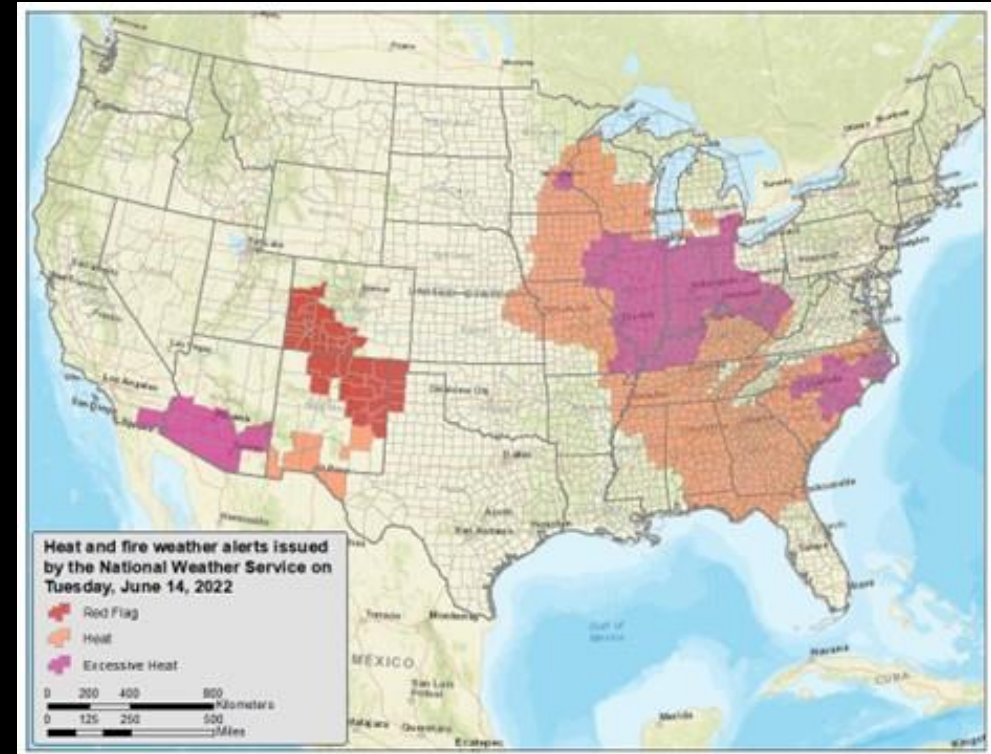
by Erika Spanger-Siegrfried — June 20, 2022 in Influencers



Juan Declet-Barreto  
@DecletBarreto

Dangerous heat index (108-112°F) forecast today for Mobile County, AL & nearby counties. @ClimateCentral says made 4 x more likely by #climatechange. More heat is in the forecast. Stay safe! #DangerSeason  
[weather.gov/mob](https://www.weather.gov/mob)  
[climatecentral.org/tools/climate-...](https://climatecentral.org/tools/climate-...)

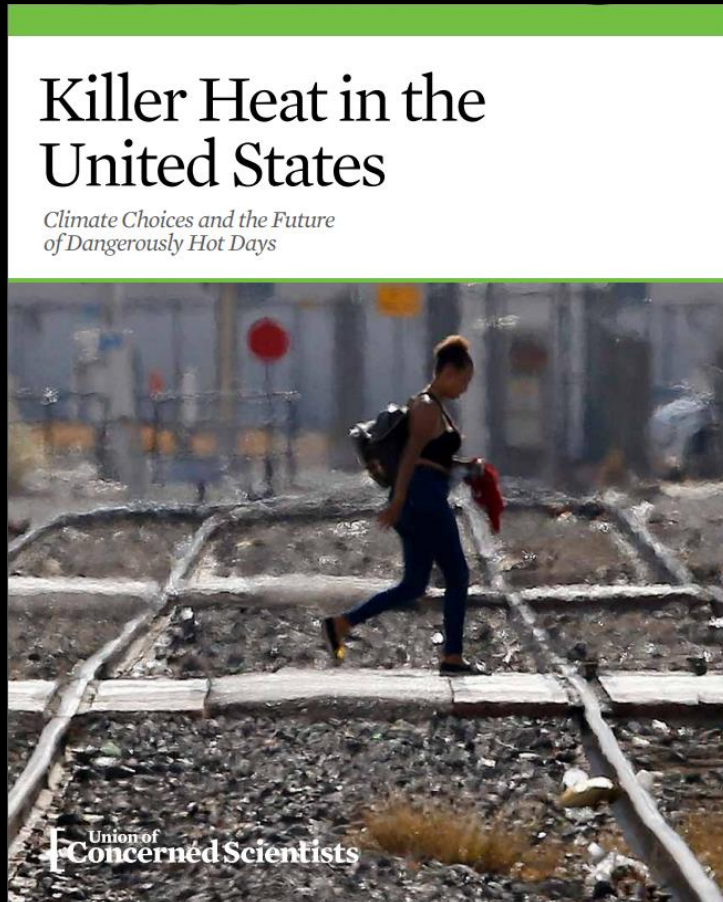
10:01 AM · Jun 23, 2022 · Twitter Web App



INDEPENDENT | The Independent

## Scientists warn of summer 'danger season' amid fires, floods and heatwaves

# Killer Heat in the United States





Heat Index  
Above 90°F



Outdoor workers become more susceptible to heat-related illness.

Heat Index  
Above 100°F



Children, elderly adults, pregnant women, and people with underlying conditions are at heightened risk of heat-related illness.

Heat Index  
Above 105°F



Anyone could be at risk of heat-related illness or even death as a result of prolonged exposure.

Heat Index  
Off the Charts

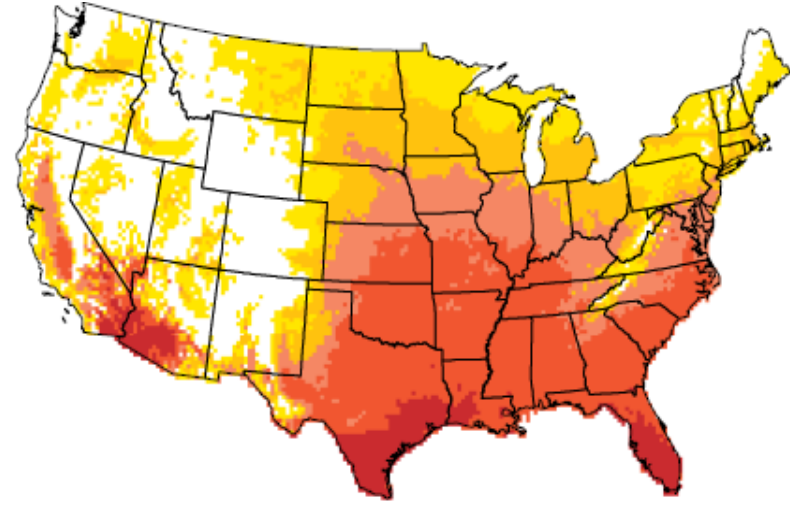
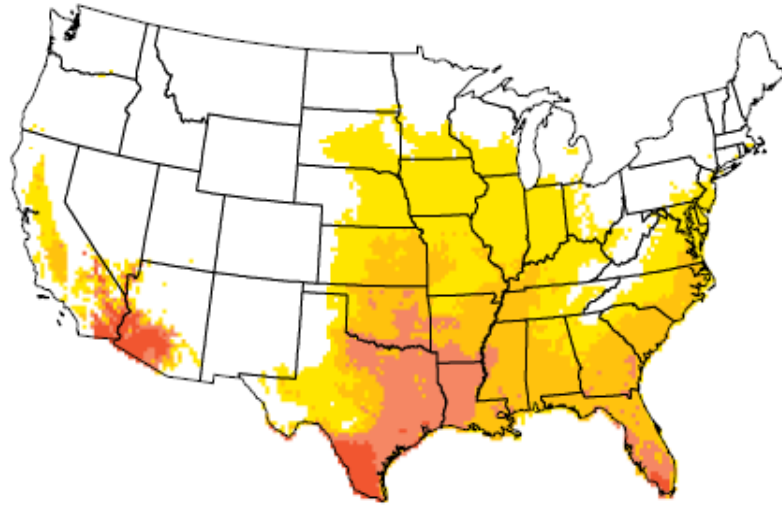


Undetermined: any level of exposure is presumed extremely dangerous for all people and likely to result in heat-related illness or even death

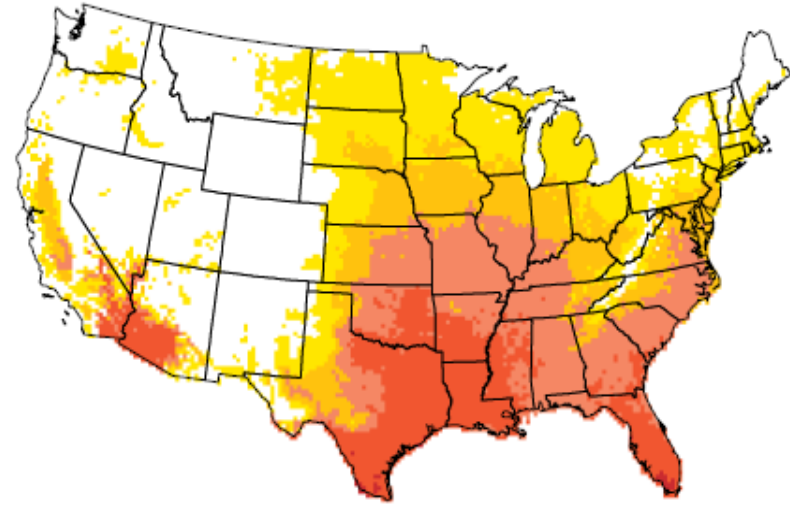
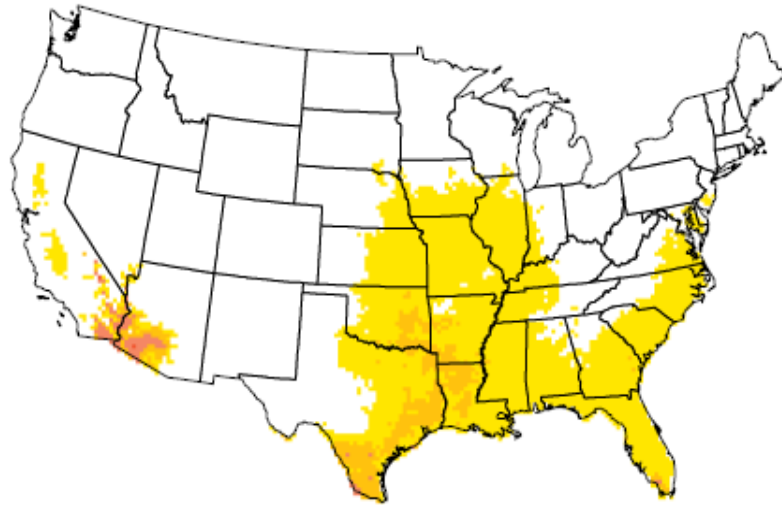
## Historical

## Midcentury No Action

100°F+



105°F+



Average Days per Year

□ 0-1

■ >1-10

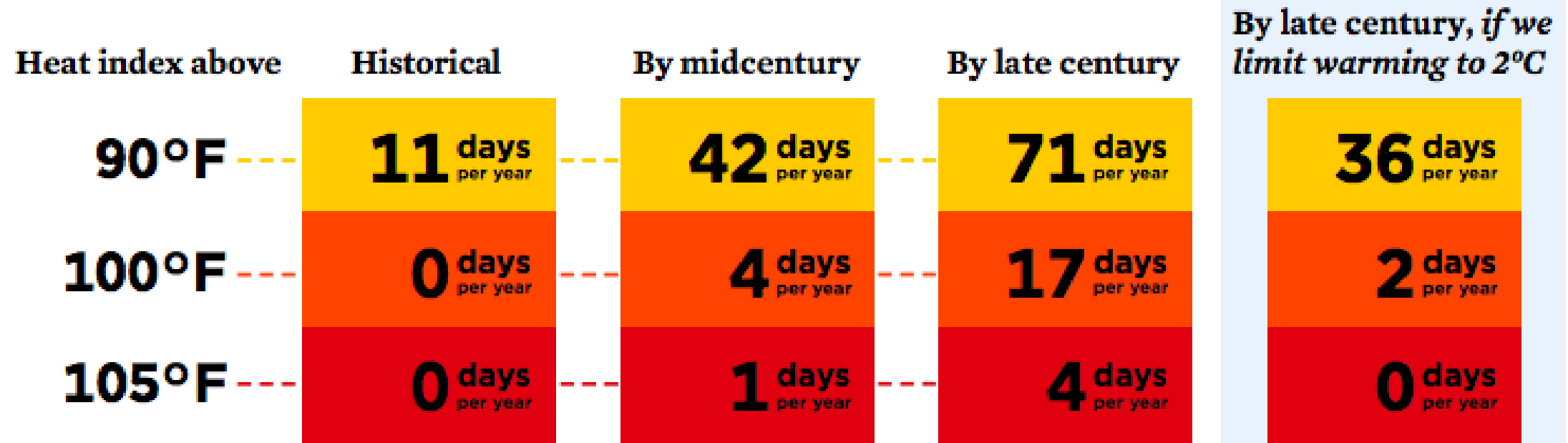
■ >10-25

■ >25-50

■ >50-100

■ >100-200

## Annual Days of Extreme Heat Per Year in Utah's 2nd District



*With no action to reduce global heat-trapping emissions, the average frequency of extreme heat in this district would rise as shown here. Taking rapid action to reduce emissions and cap future global warming at 2°C (3.6°F) would limit the increase in extreme heat days. For more information and detailed data, visit [www.ucsusa.org/killer-heat](http://www.ucsusa.org/killer-heat).*

# Too Hot to Work



# Extreme heat puts outdoor workers' earnings at risk

- By midcentury, outdoor workers' exposure to extreme heat would quadruple, risking \$55.4 billion in annual earnings nationwide.
- Disproportionate impacts on outdoor workers of color
- The average outdoor worker risks losing more than **\$1,700** in annual earnings, though workers in the 10 hardest-hit counties risk losing nearly \$7,000 per year on average.
- Outdoor workers in **construction** and **extraction** occupations are projected to face the highest total earnings at risk at about \$14.4 billion annually, followed by those in installation, maintenance, and repair occupations at nearly \$10.8 billion annually.



# National Occupational Safety Standards for Heat

*H.R.3668 - Asuncion Valdivia Heat Illness and Fatality Prevention Act of 2019*



# Federal and local action to create heat protections

- OSHA/DOL National Emphasis Program on heat illness
- Sen. Markey's (D-MA) Preventing Health Emergencies And Temperature-related (HEAT) Illness and Deaths Act
- Congresswoman Coleman's (NJ-12) Stay Cool Act
- Grijalva's (AZ-3) Asunción Valdivia Heat Illness and Fatality Prevention Act

Questions?

Learn more:

[www.ucsusa.org/killer-heat](http://www.ucsusa.org/killer-heat)

<https://www.ucsusa.org/resources/too-hot-to-work>





# What did you think of the briefing?

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[www.eesi.org/062422climatechange](http://www.eesi.org/062422climatechange)

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