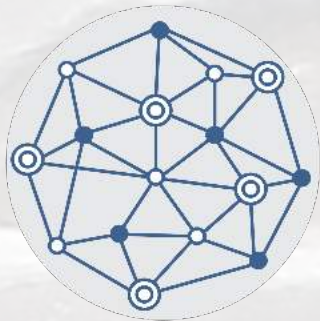


Killer Heat



ARCCA

Alliance of Regional Collaboratives
for Climate Adaptation

Learning Session Webinar

October 29, 2019 | 10:00 – 11:00 AM

Webinar Agenda

- Brief overview of ARCCA
- **Presentation: Killer Heat**
- Q&A Panel Discussion
- Closing Remarks

Webinar Logistics

Questions:

At any point during the webinar, you can submit a question through the Zoom control panel. All questions will be read aloud and answered during Q&A as long as time permits.

You can also use the 'hand raising' feature to be unmuted and ask a question during Q&A.

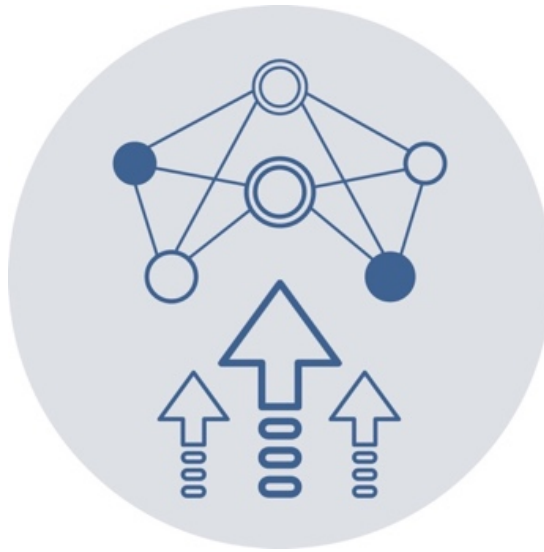


About ARCCA

A network of leading regional collaboratives from across California that work together to advance adaptation statewide and increase local capacity to build community resilience.



Knowledge Exchange



Collaborative Formation



State Engagement

ARCCA Members



Coordinator



Local Government Commission
Leaders for Livable Communities

State Liaison



Affiliates

**BUROHAPPOLD
ENGINEERING**



CSU The California State University
OFFICE OF THE CHANCELLOR



CADMUS

**GEORGETOWN
CLIMATE CENTER**



Harris & Associates

**GEOS
INSTITUTE**



**Union of
Concerned
Scientists**

Featured Presenters



Dr. Kristina Dahl
Union of Concerned Scientists



Jamesine Rogers Gibson
Union of Concerned Scientists

Moderator



Amber McGarvey
Local Government
Commission



Killer Heat in California

Kristy Dahl, Senior Climate Scientist (kdahl@ucsusa.org)

Jamesine Rogers Gibson, Senior Climate Analyst (jvrogers@ucsusa.org)

Union of Concerned Scientists

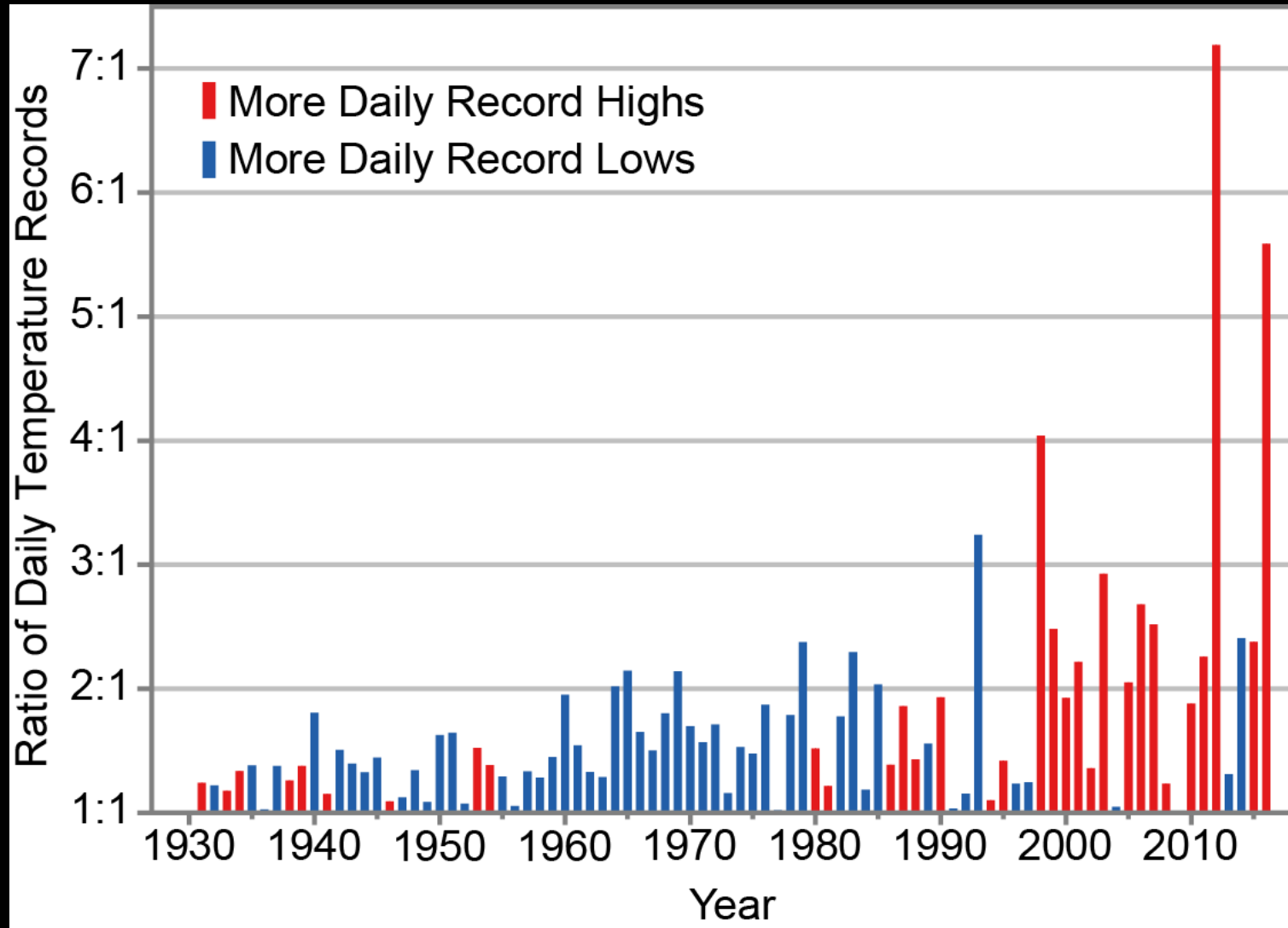
[Union of
Concerned Scientists]

Science for a
healthy planet
and safer world.

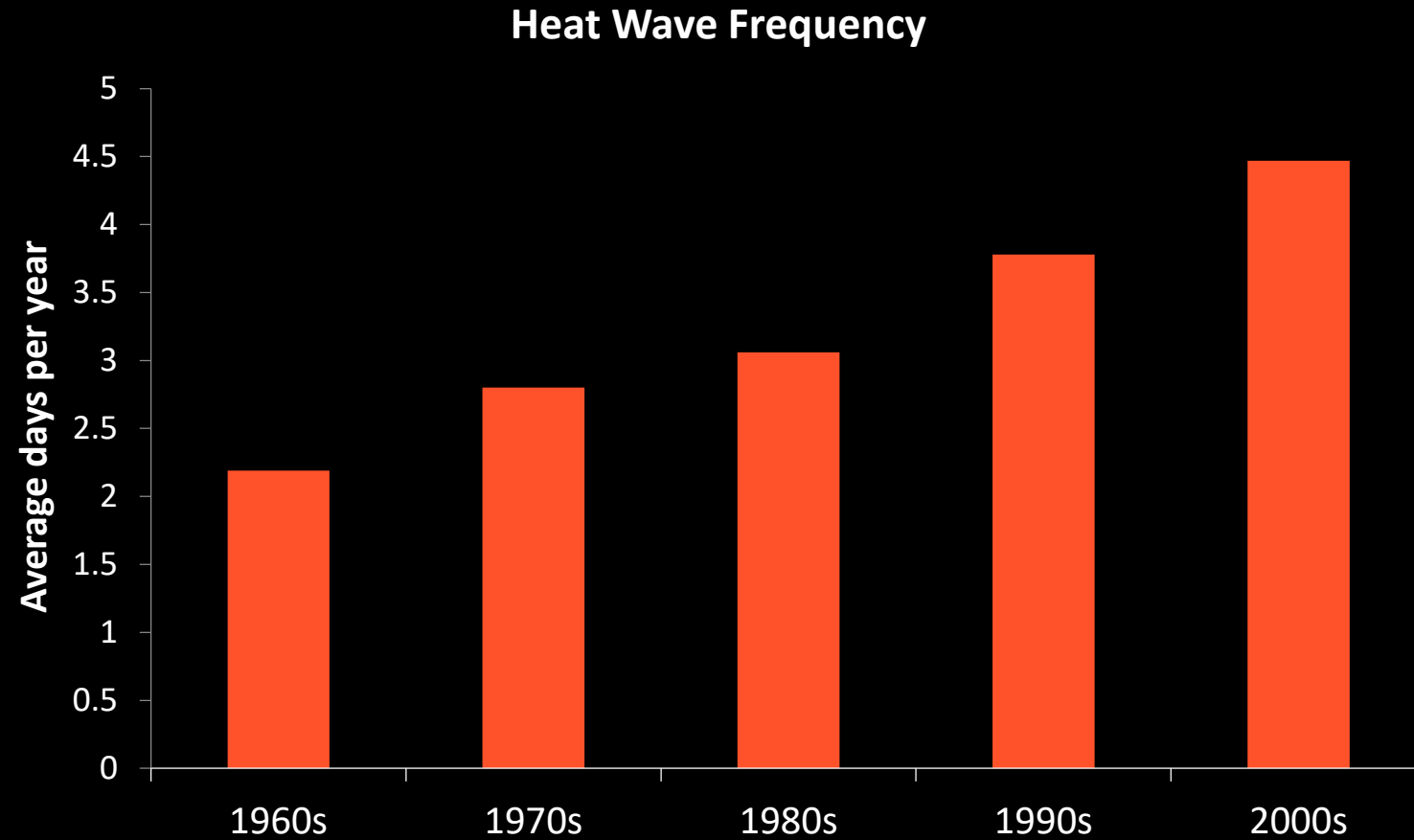




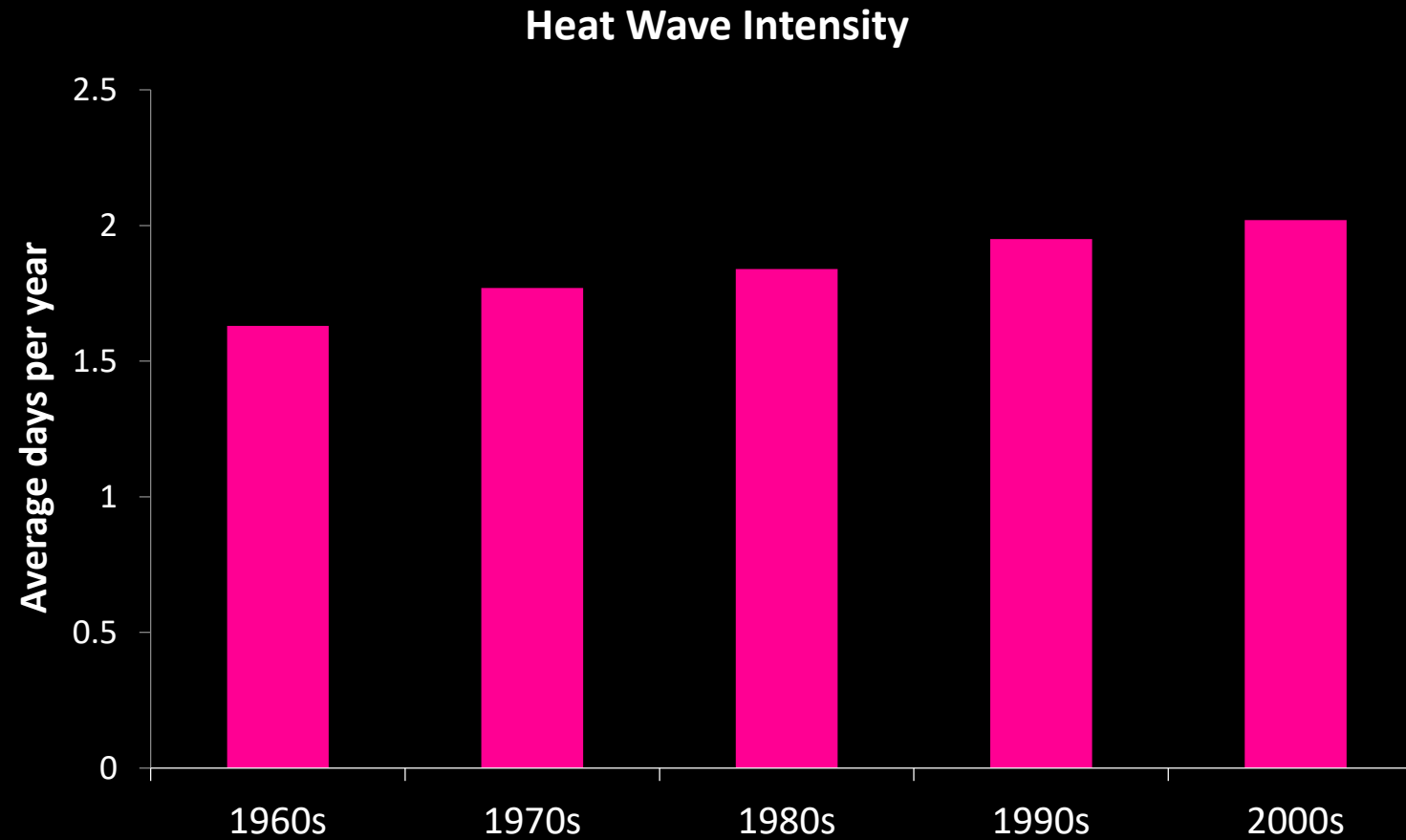
Extreme heat on the rise



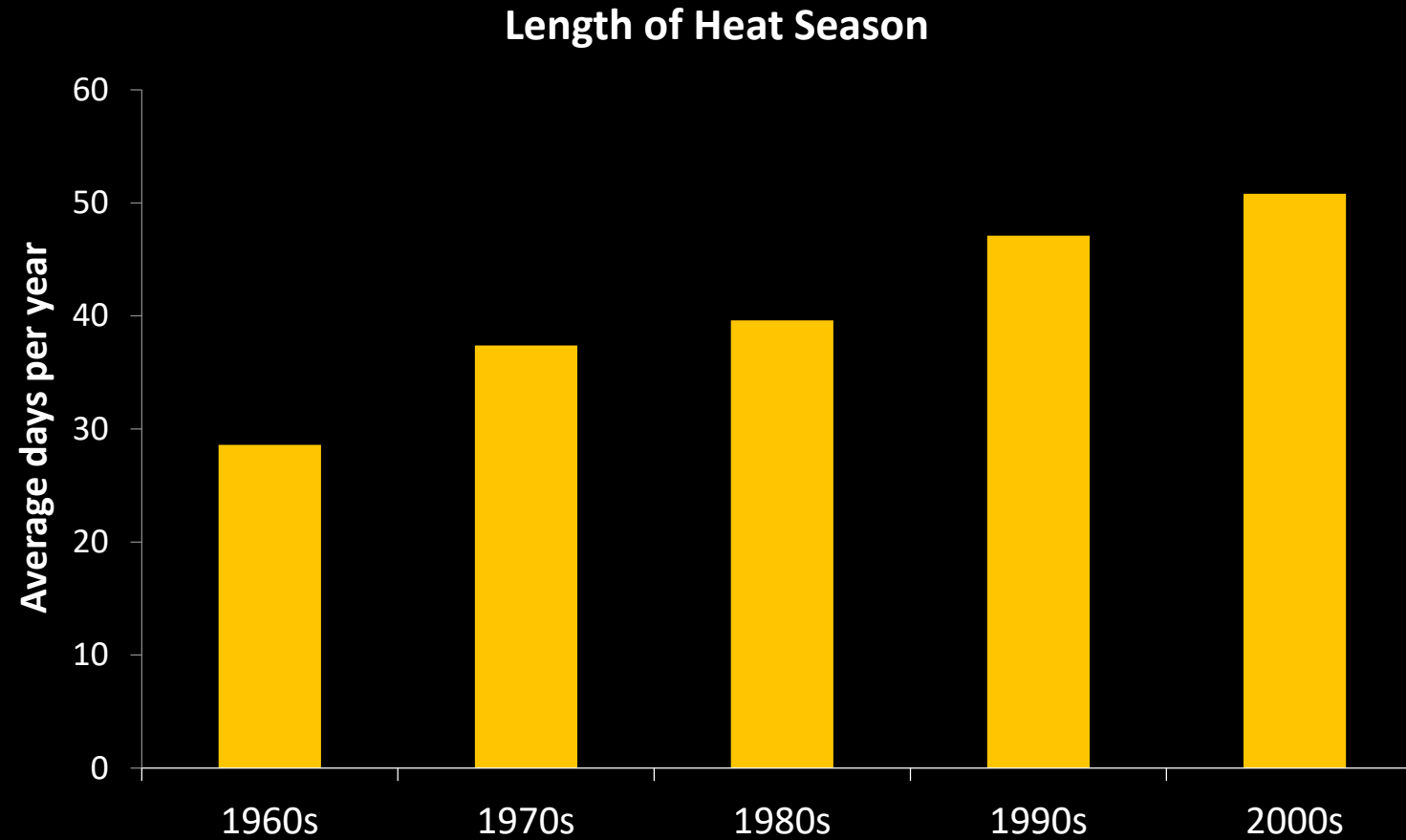
Extreme heat on the rise



Extreme heat on the rise



Extreme heat on the rise





“We have seen a huge spike in ER visits and admissions... We have been admitting people left and right.”

--Dr. Arash Armin, Trenton, MI. July 19, 2019

Killer Heat in the United States

*Climate Choices and the Future
of Dangerously Hot Days*

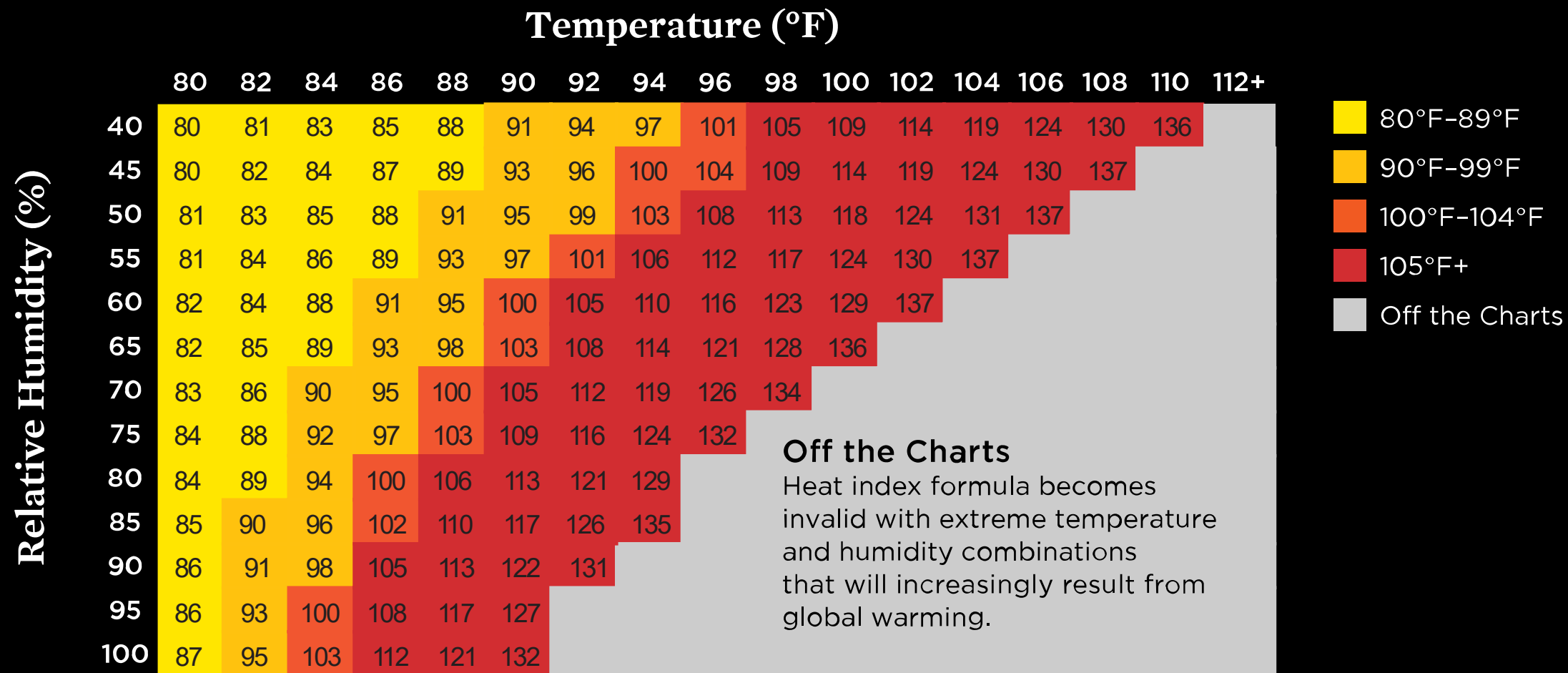


Union of
Concerned Scientists

About the Killer Heat analysis

- High-resolution climate models
- Use temperature and humidity to calculate **heat index**
- Three future emissions scenarios
- Data for every community in the lower 48

The Heat Index



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.

Head

- headache
- dizziness
- irritability
- loss of coordination
- confusion
- delirium
- anxiety
- loss of consciousness
- seizures
- stroke
- coma

Liver

- liver injury

Kidneys

- kidney disease
- kidney failure

Skin

- flushed and clammy skin
- profuse sweating
- heat rash

Mouth

- intense thirst
- dry mouth

Heart

- rapid heartbeat
- irregular heartbeat
- reduced bloodflow to the heart
- heart attack

Lungs

- increased breathing rate
- worsened allergies and asthma
- worsened chronic obstructive pulmonary disease

Arms and Legs

- heat cramps
- muscle spasms
- weakness

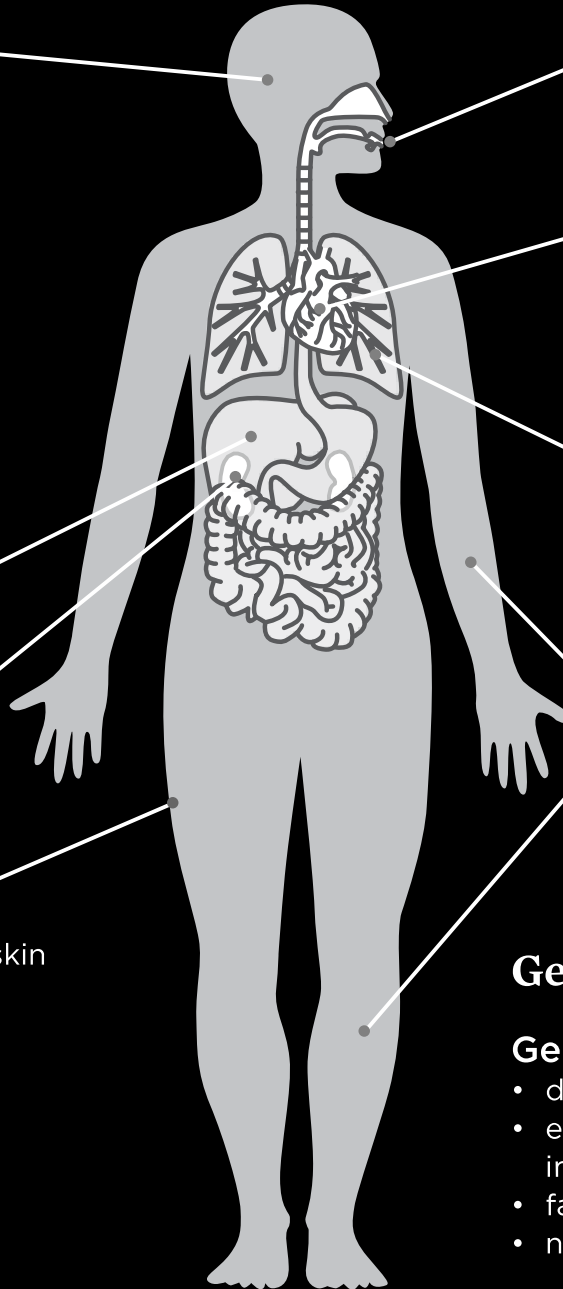
General Physiology and Unique Circumstances

General

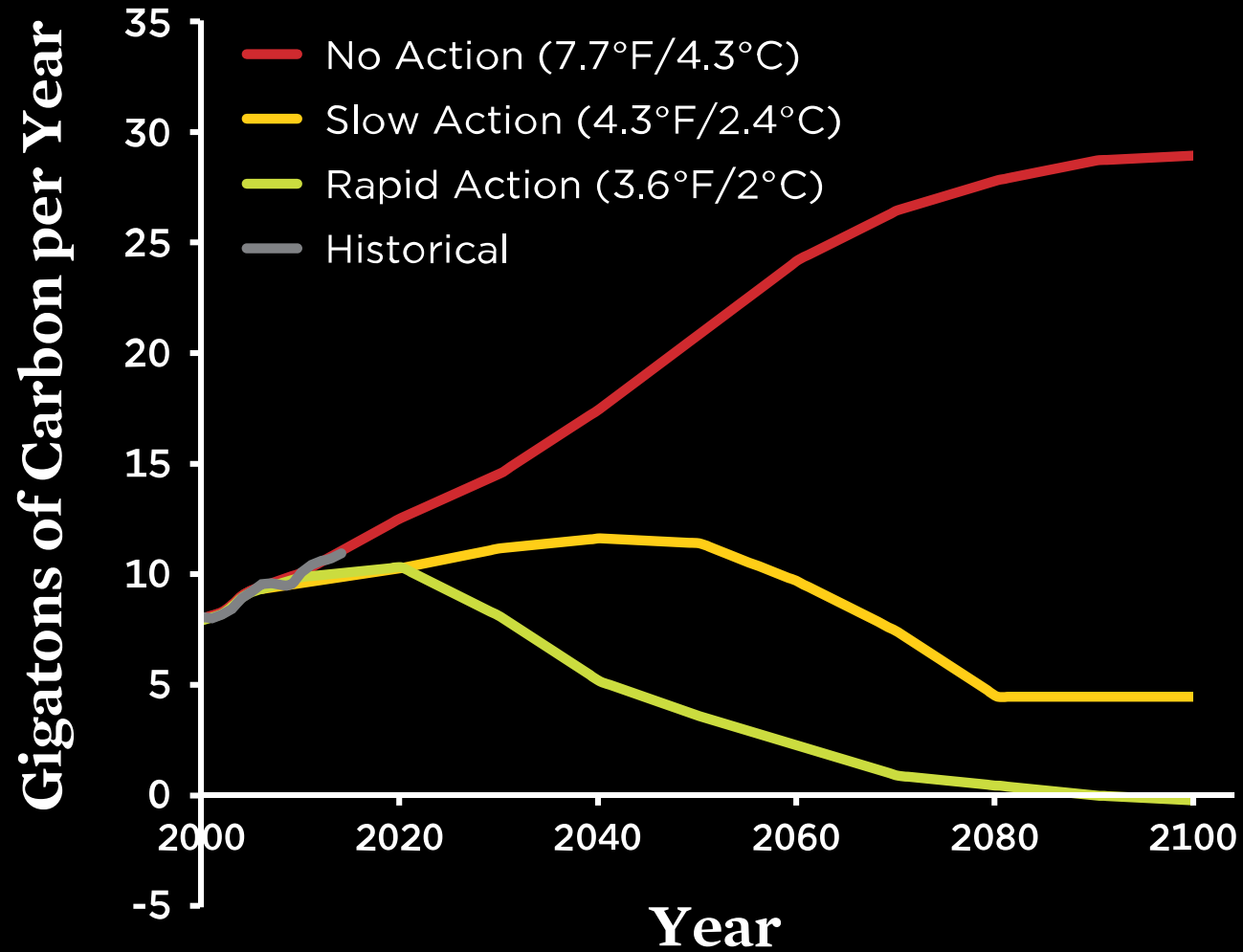
- dehydration
- electrolyte imbalance
- fatigue
- nausea
- vomiting
- drop in blood pressure
- fever

Pregnant People

- fetal nutrition deficits
- preterm delivery and birth
- stillbirth

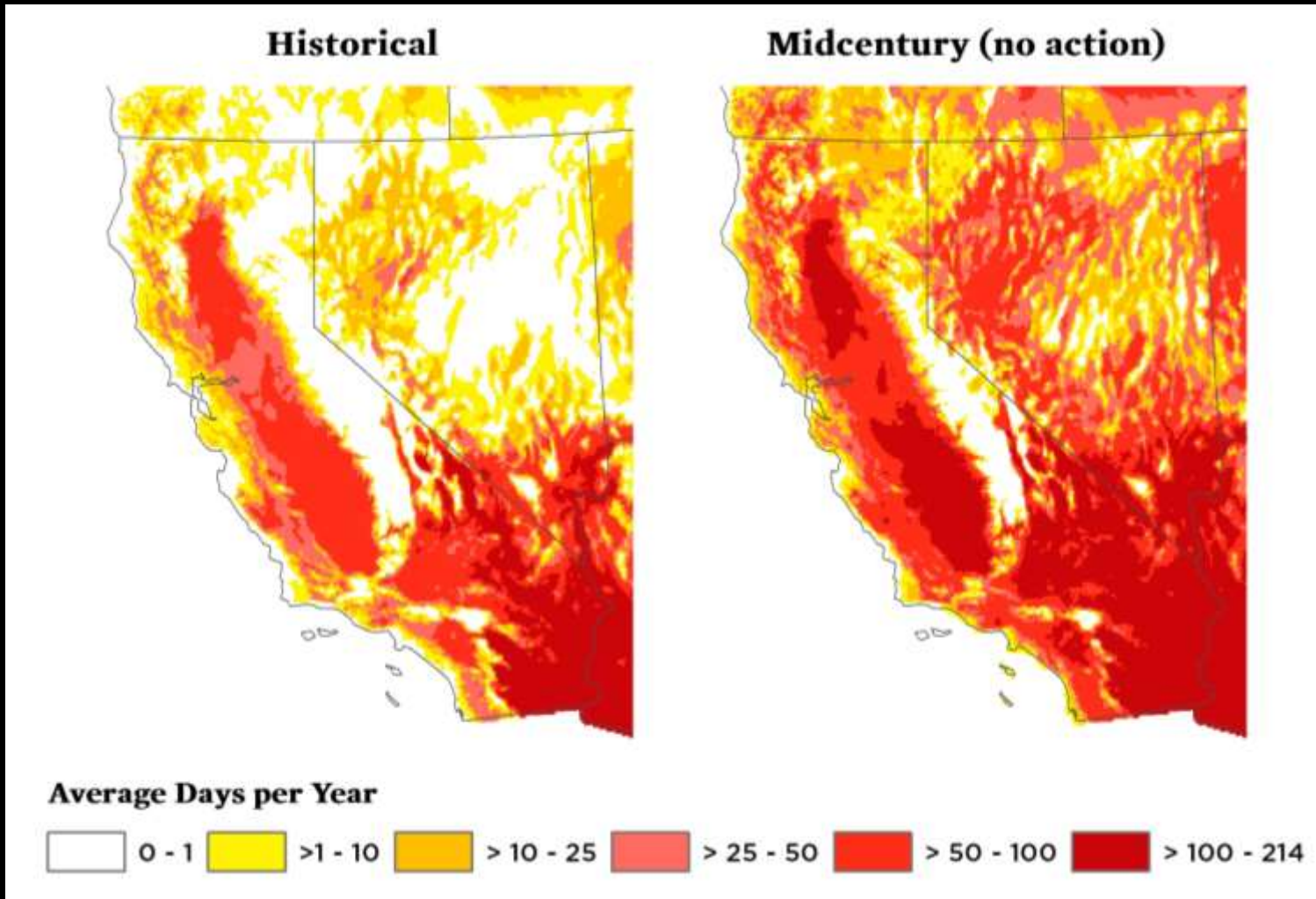


Three future scenarios



Midcentury: Steep increase in extreme heat

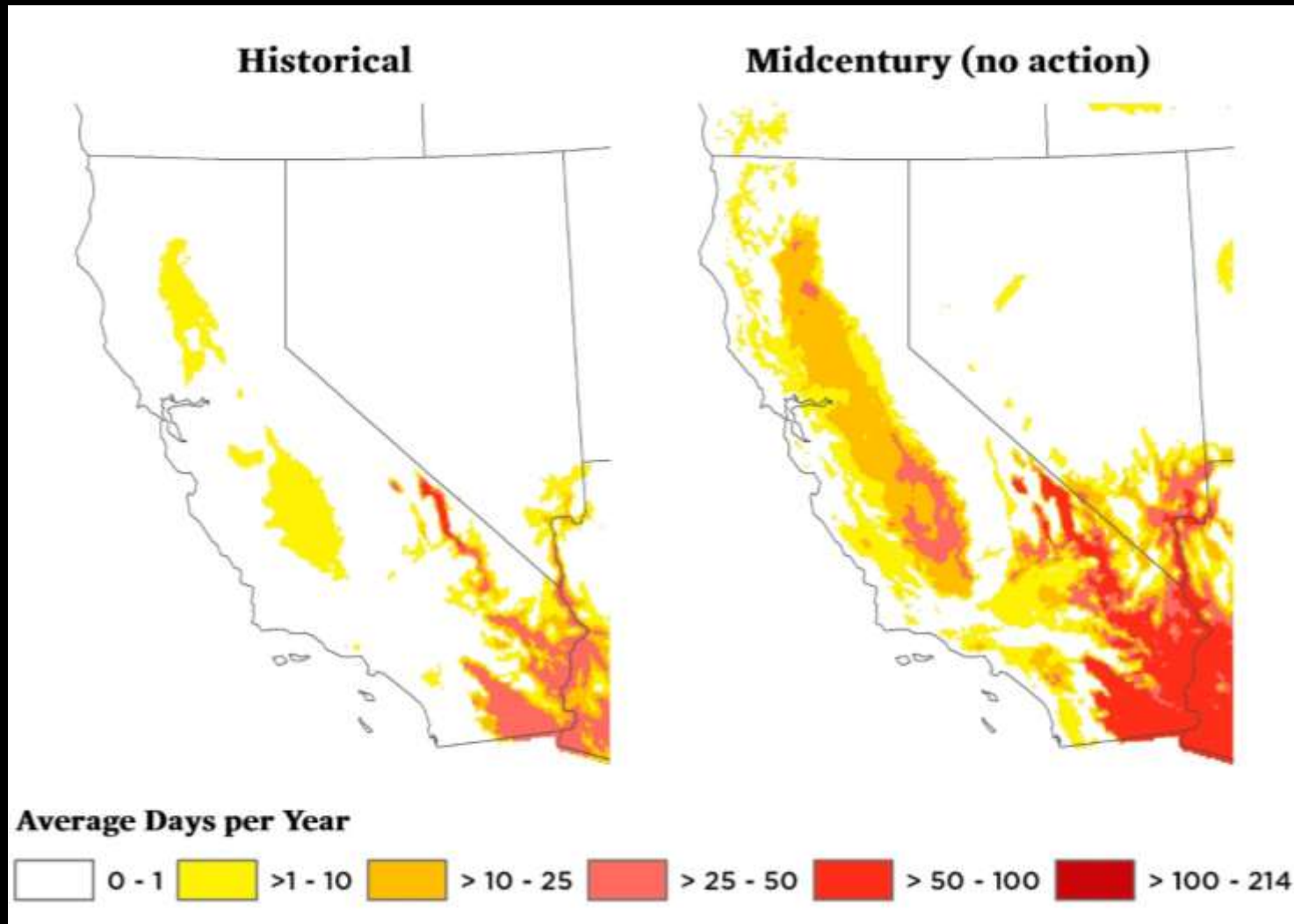
Days per year with heat index > 90°F



	Historical	Midcentury
Redding	71	108
Santa Rosa	8	31
Sacramento	47	94
Fresno	77	119
Los Angeles	20	56

Midcentury: Steep increase in extreme heat

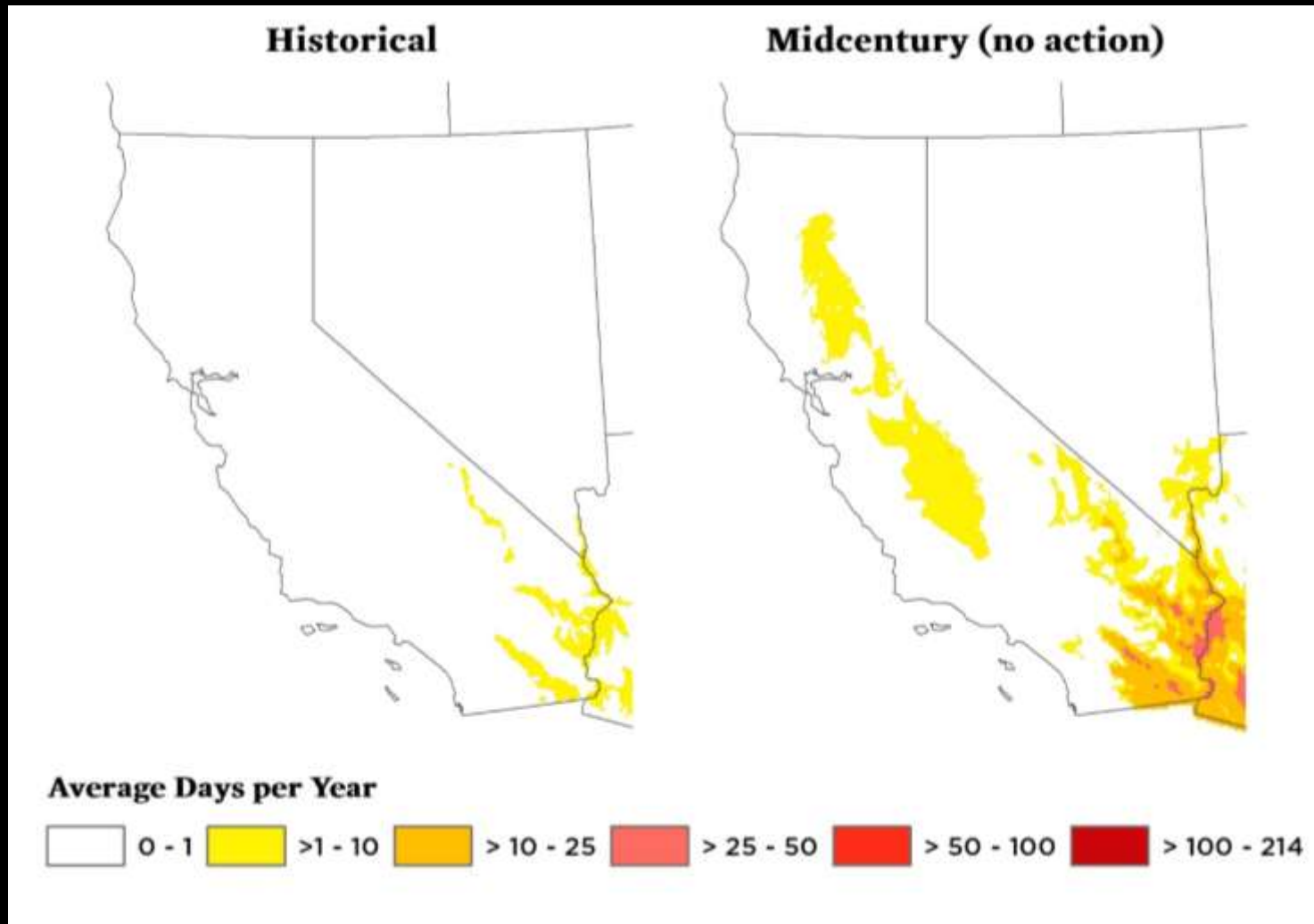
Days per year with heat index > 105°F



	Historical	Midcentury
Redding	2	24
Santa Rosa	0	1
Sacramento	1	13
Fresno	3	27
Los Angeles	0	3

Midcentury: Steep increase in extreme heat

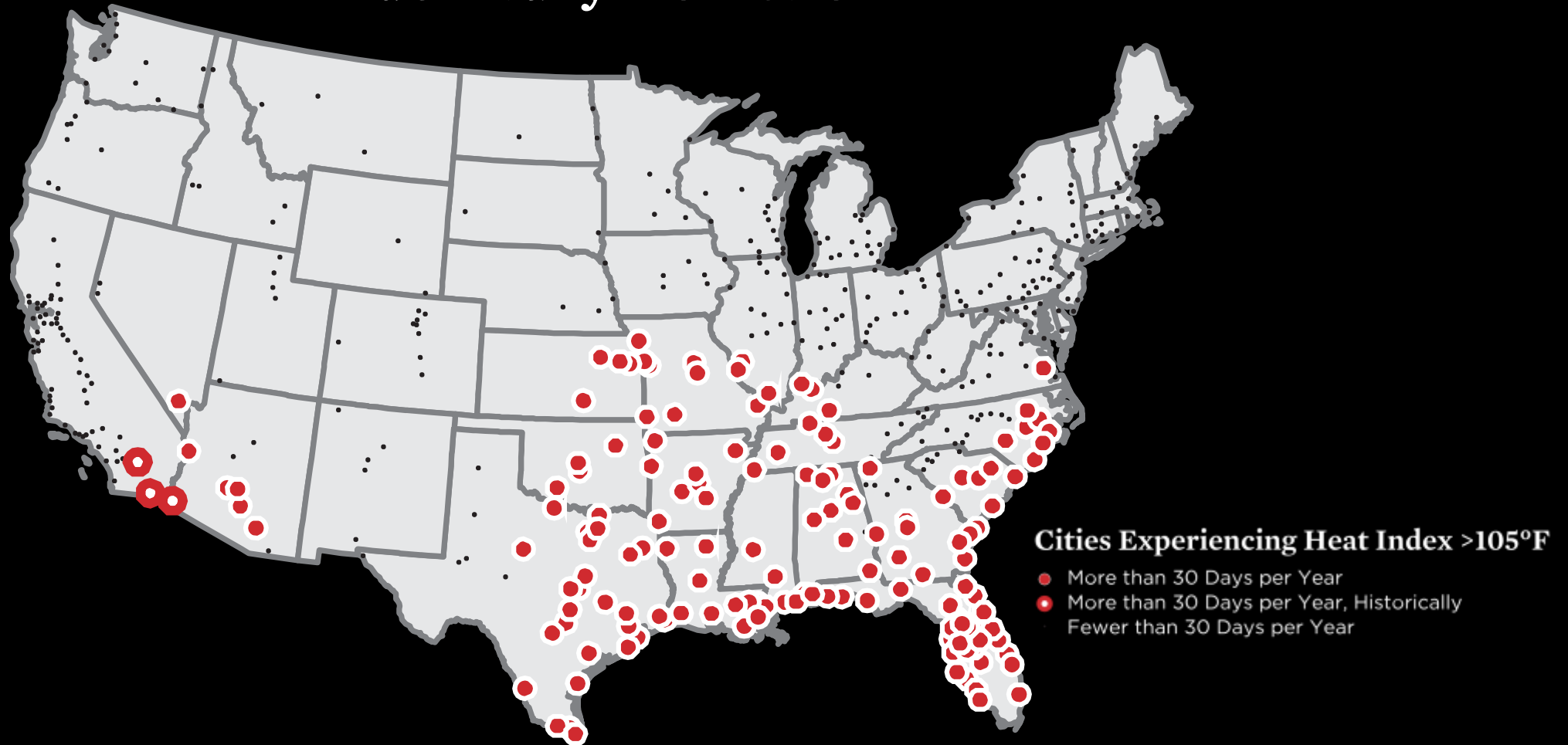
Days per year with off-the-charts conditions



	Historical	Midcentury
Redding	0	3
Santa Rosa	0	0
Sacramento	0	1
Fresno	0	4
Los Angeles	0	0

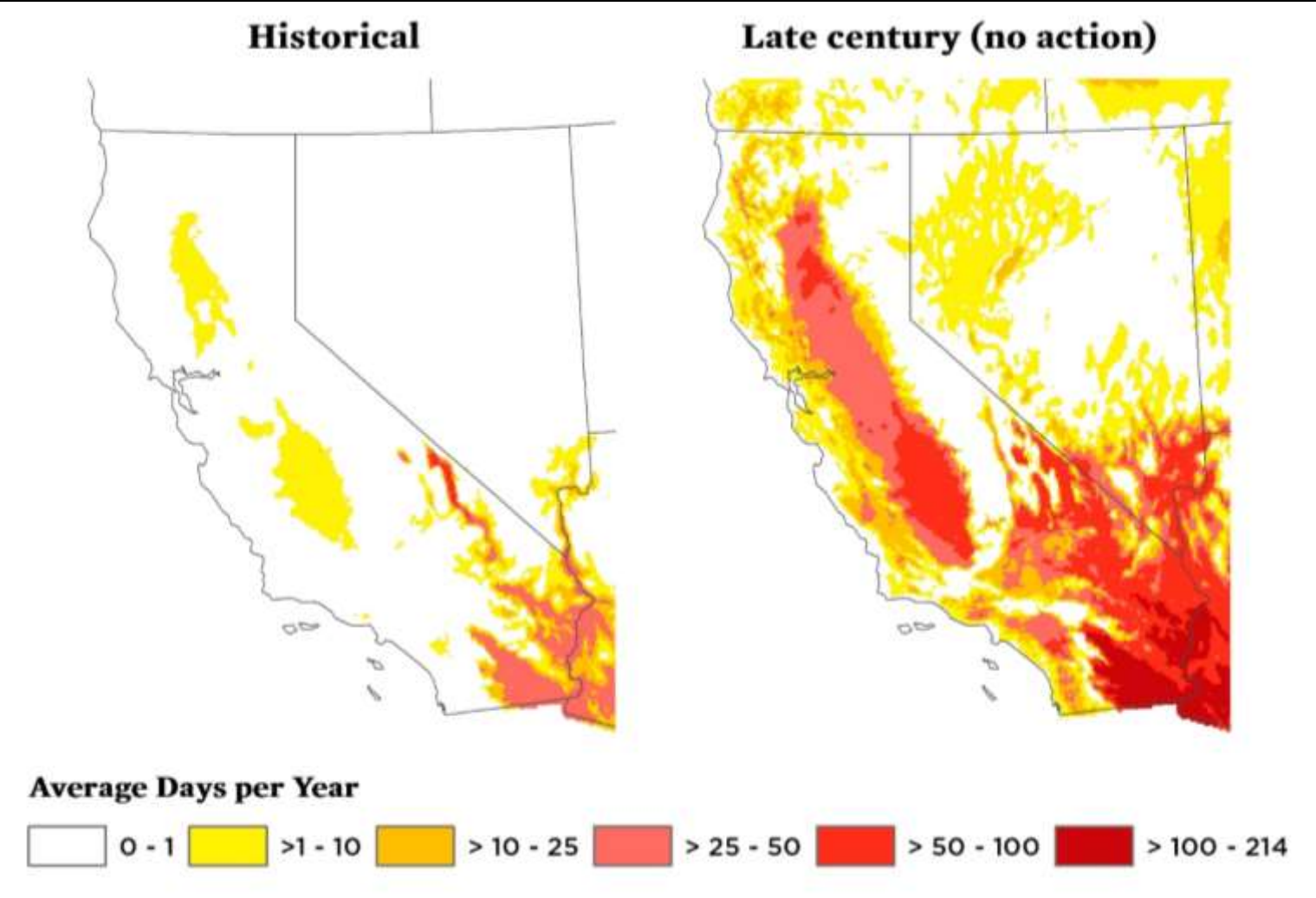
Cities with frequent, dangerous heat

Midcentury No Action



Late century: unprecedented heat

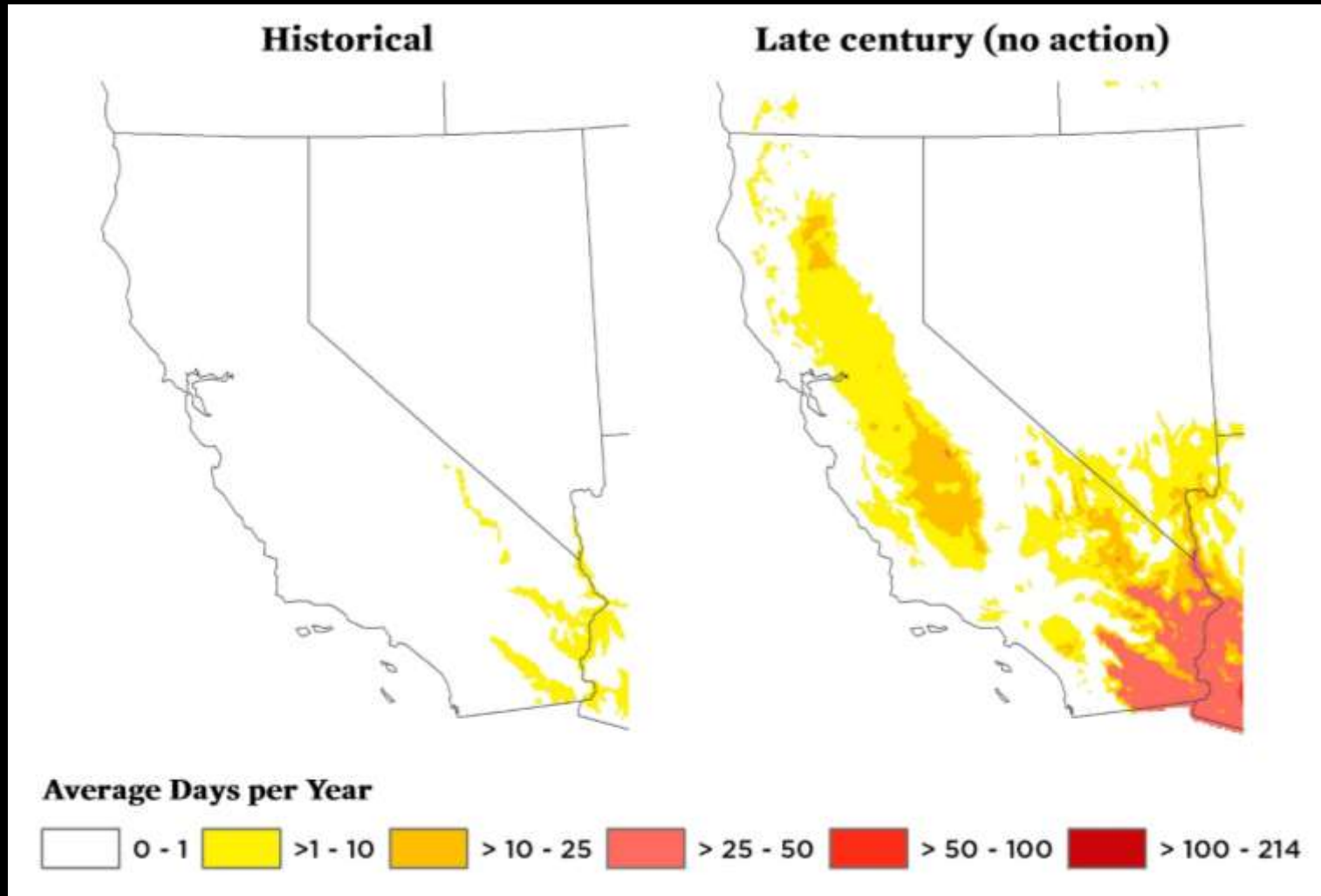
Days per year with heat index > 105°F



	Historical	Late century
Redding	2	52
Santa Rosa	0	5
Sacramento	1	37
Fresno	3	59
Los Angeles	0	15

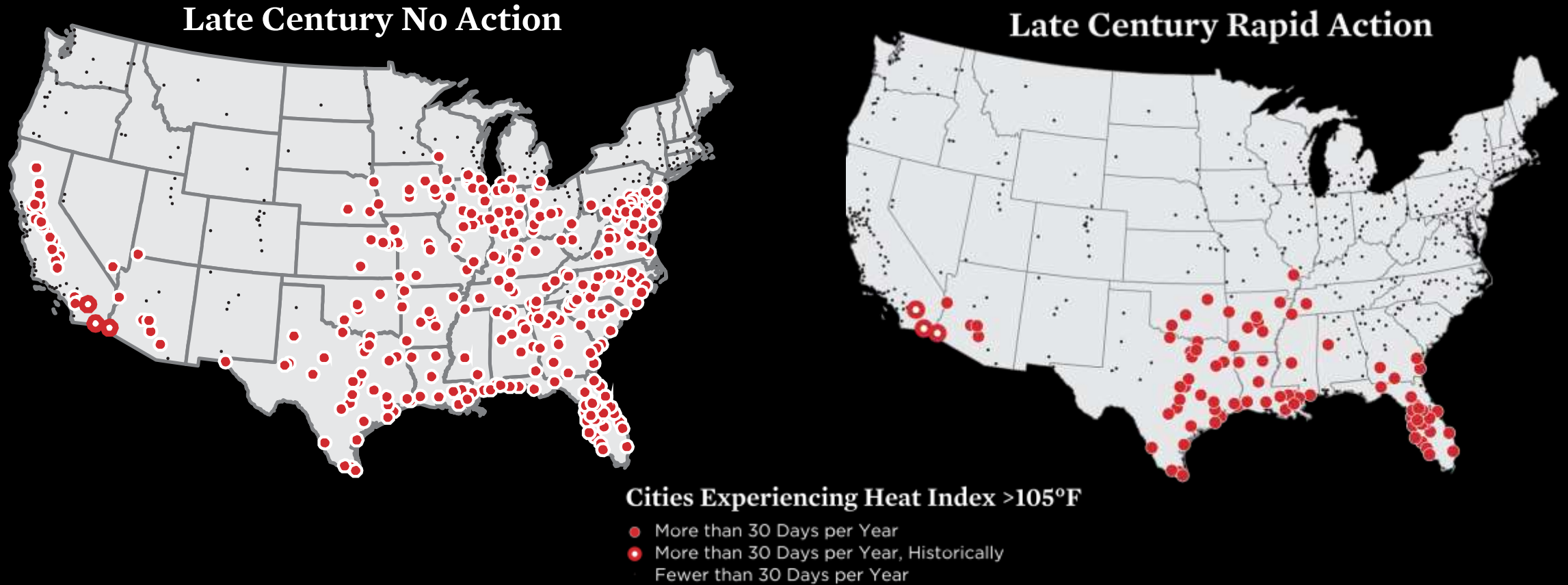
Late century: unprecedented heat

Days per year with off-the-charts conditions



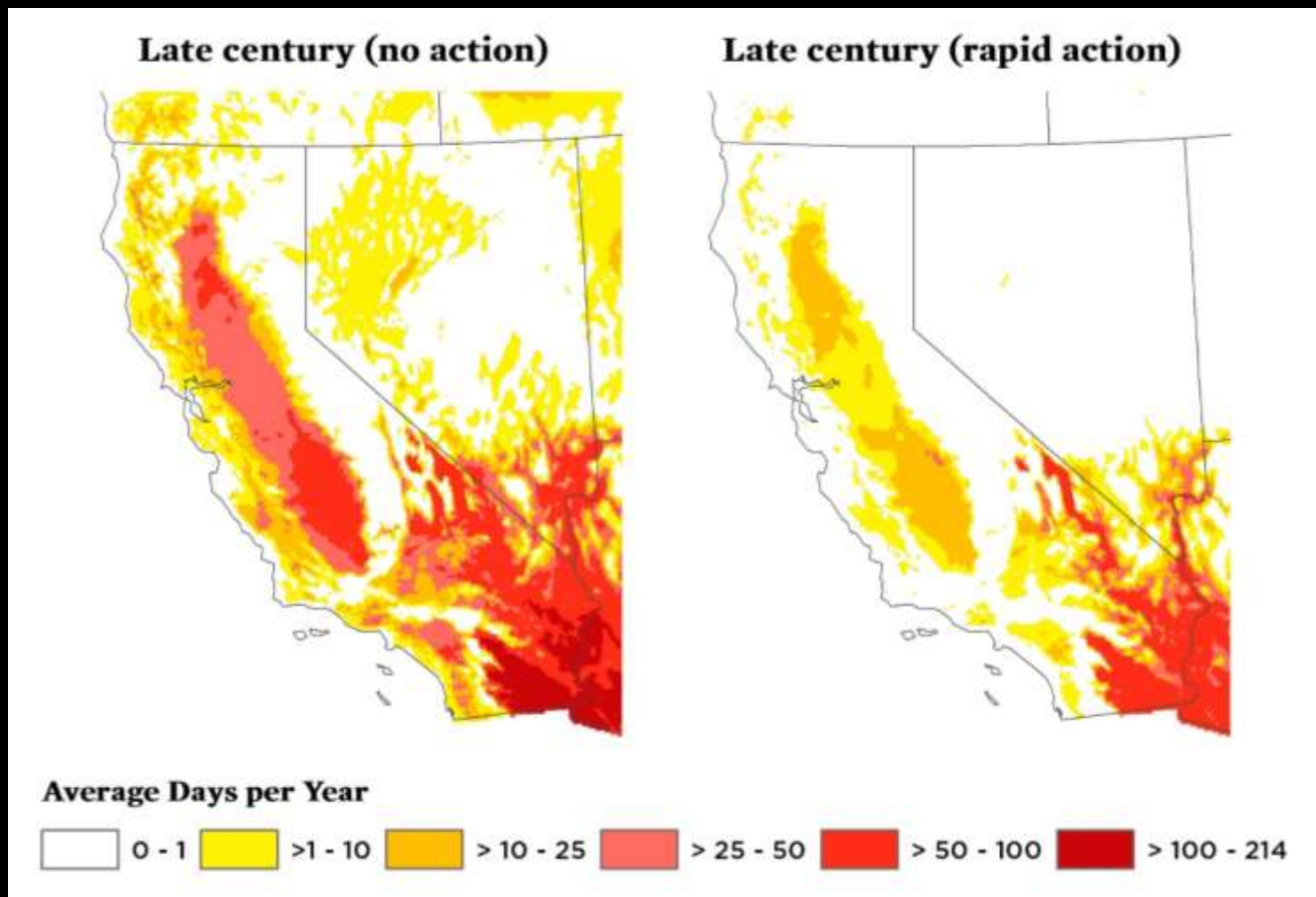
	Historical	Late century
Redding	0	13
Santa Rosa	0	0
Sacramento	0	6
Fresno	0	14
Los Angeles	0	1

Taking action now would limit expansion of heat



Taking action now limits future extreme heat

Days per year with heat index > 105°F



	No action	Rapid action
Redding	52	15
Santa Rosa	5	0
Sacramento	37	9
Fresno	59	18
Los Angeles	15	2

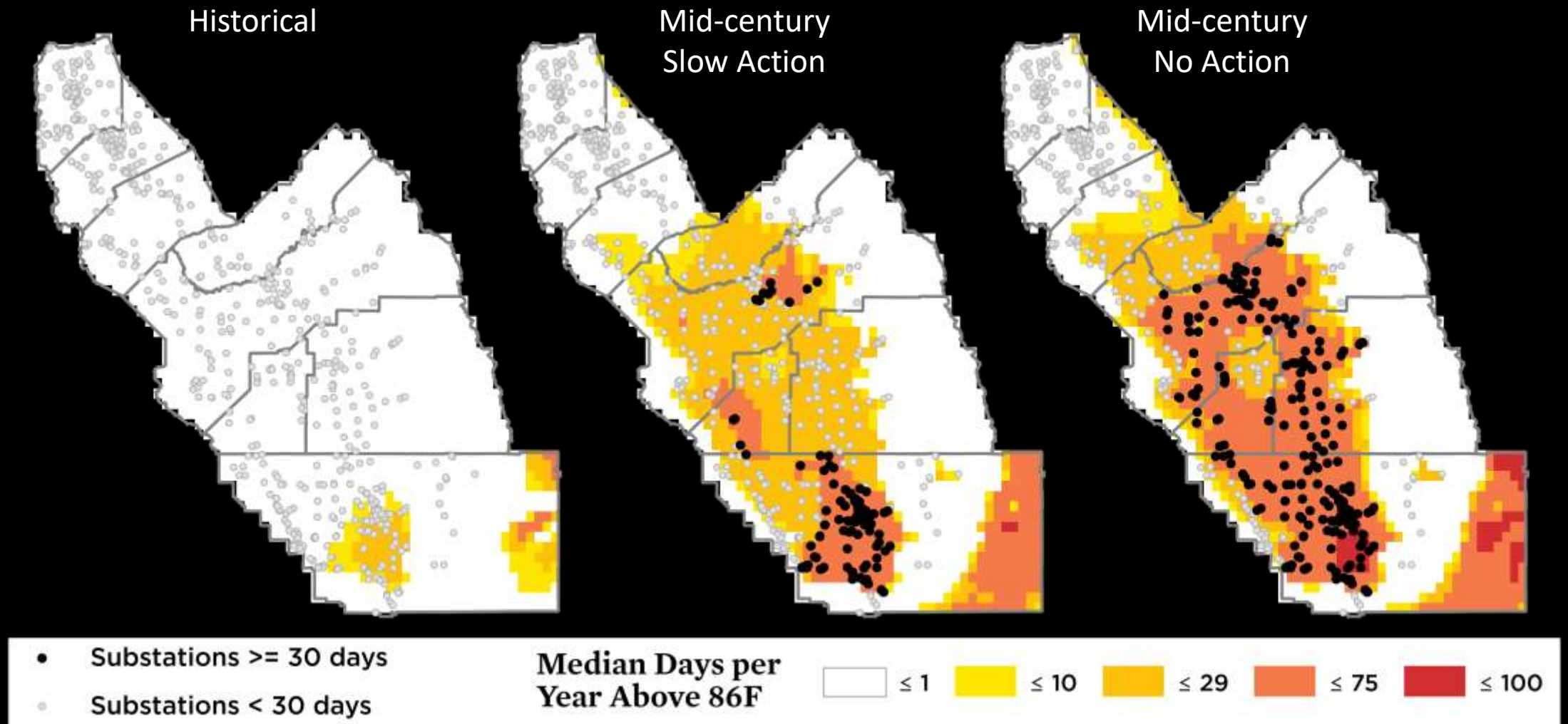
[Heat threatens critical infrastructure for cooling



[Infrastructure design increases heat exposure

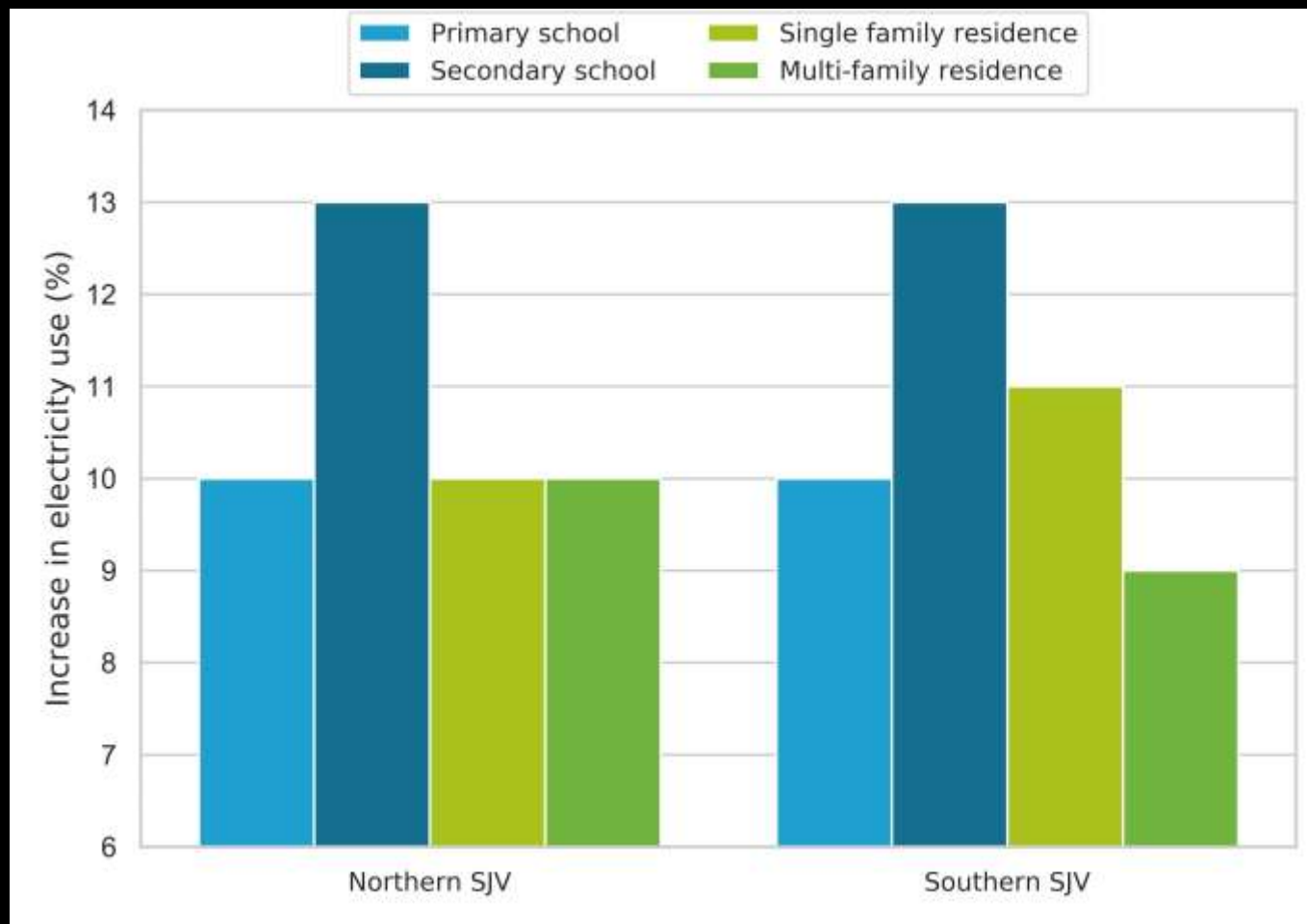


More extremely hot days will increase stress on the grid



Note: 86F is a 24-hour average value

[Higher electricity use, growing energy burdens



Increased monthly electricity use for September 2050

Adaptation:
Keeping People Safe



AP/David Goldman



Mitigation:
Reaching net zero emissions by 2045



Credit: Ellysa Ho, iStock

[Keeping people safe

- State/local heat adaptation and emergency response plans
- Better enforcement of CalOSHA occupational standards
- Bill assistance programs for low-income households
- Robust heat stress thresholds for children
- Investments in community cooling infrastructure, trees, shading, cool roofs, cooling centers
- Investments in heat- and climate-smart infrastructure

[Update extreme heat policies to protect families



[Invest in climate-smart infrastructure



[Transitioning away from fossil fuels



[Got examples?

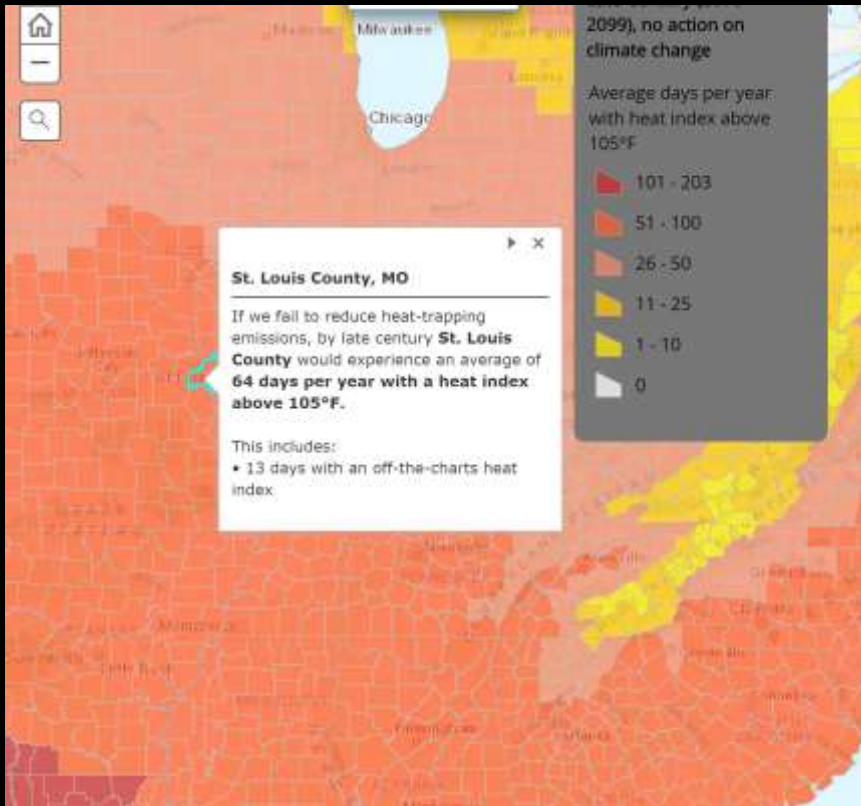
- Heat-safe policies and operational practices
- Heat stress metrics
- Climate-smart infrastructure projects
- Updated standards and codes
- Other?

Send to *jvrogers@ucsusa.org* and *kdahl@ucsusa.org*

Resources

www.ucsusa.org/killer-heat

Interactive maps



Interactive data widget

Extreme Heat & Climate Change

HOW OFTEN WILL YOU ENDURE EXTREME HEAT WHERE YOU LIVE?

This tool shows the rapid increases in extreme heat projected to occur in locations across the US due to climate change. Results show the average number of days per year above a selected heat index, or “feels like” temperature, for three different time periods: historical, midcentury, and late century.

The results highlight a stark choice: We can continue along our current path, where we fail to reduce heat-trapping emissions and extreme heat soars, or we can act decisively now and stop the worst from becoming reality.

TYPE IN YOUR LOCATION (CITY OR COUNTY) ⓘ



CHOOSE HOW HOT ⓘ

Above 100°

GO

- + Spreadsheets with all the data
- + Spanish language webpage and materials

Congressional district fact sheets

www.ucsusa.org/killer-heat

Killer Heat in the United States, by Congressional District: The Future of Dang by the Union of Concerned Scientists

English

Español

The Future of Extreme Heat, by Congressional District

This interactive map allows you to download district-specific fact sheets for all 433 Congressional districts in the contiguous United States. (Fact



Union of Concerned Scientists

FACT SHEET

KILLER HEAT

Extreme Heat in Florida's 14th District

Extreme heat is among the deadliest weather hazards in the United States. When temperatures spike, so do heat-related deaths and hospital admissions for illnesses such as heat exhaustion. People who are elderly, young children, those experiencing poverty, and other vulnerable groups are particularly susceptible to these effects. New analysis from the Union of Concerned Scientists (UCS) points to a future in which such dangers, even deadly heat, will occur regularly throughout most of the country. As global temperatures rise, driven by heat-trapping emissions, people will experience more frequent and more intense episodes of extreme heat.

UCS has analyzed climate projections to find out where and how often in the contiguous United States the heat index (the National Weather Service's "feels like" temperature) could top 90°F, 100°F, and 105°F during future warm seasons—April through October—if no action is taken to reduce carbon emissions, or with rapid and aggressive emissions reductions.

The choices we make today will determine how often we experience extreme heat in the future. Aggressively cutting US carbon emissions by investing in low-carbon energy sources, energy efficiency, and other solutions, alongside robust global climate action, will help limit future warming and the frequency of days with extreme heat.

Extreme Heat across the United States

The National Weather Service generally recommends issuing a heat advisory when the heat index reaches 100°F, and issuing an excessive heat warning when it reaches 105°F. At those heat index levels, people—particularly vulnerable groups, such as children and elderly adults—are susceptible to heat-related illness and death. Outdoor workers are susceptible to the same effects with a heat index around 90°F.

By midcentury, across the United States, with no action to reduce heat-trapping emissions, in an average year there would be (compared with average conditions from 1971 to 2000):

- a 70 percent increase in the number of days with a heat index above 90°F;
- more than twice as many days with a heat index above 100°F; and
- more than five times as many days with a heat index above 105°F.

By late century, under the same scenario, in an average year there would be (compared with average conditions from 1971 to 2000):

Annual Days of Extreme Heat Per Year in Florida's 14th District

Heat index above	Historical	By midcentury	By late century	By late century, if we limit warming to 2°C
90°F	138 days per year	177 days per year	194 days per year	173 days per year
100°F	27 days per year	119 days per year	154 days per year	101 days per year
105°F	3 days per year	74 days per year	125 days per year	48 days per year

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.

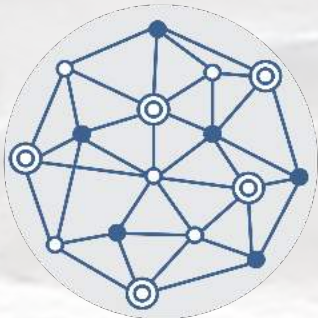
[Thank you

Kristy Dahl - kdahl@ucsusa.org

Jamesine Rogers Gibson - jvrogers@ucsusa.org

Learn more: www.ucsusa.org/killer-heat

Thank you!



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