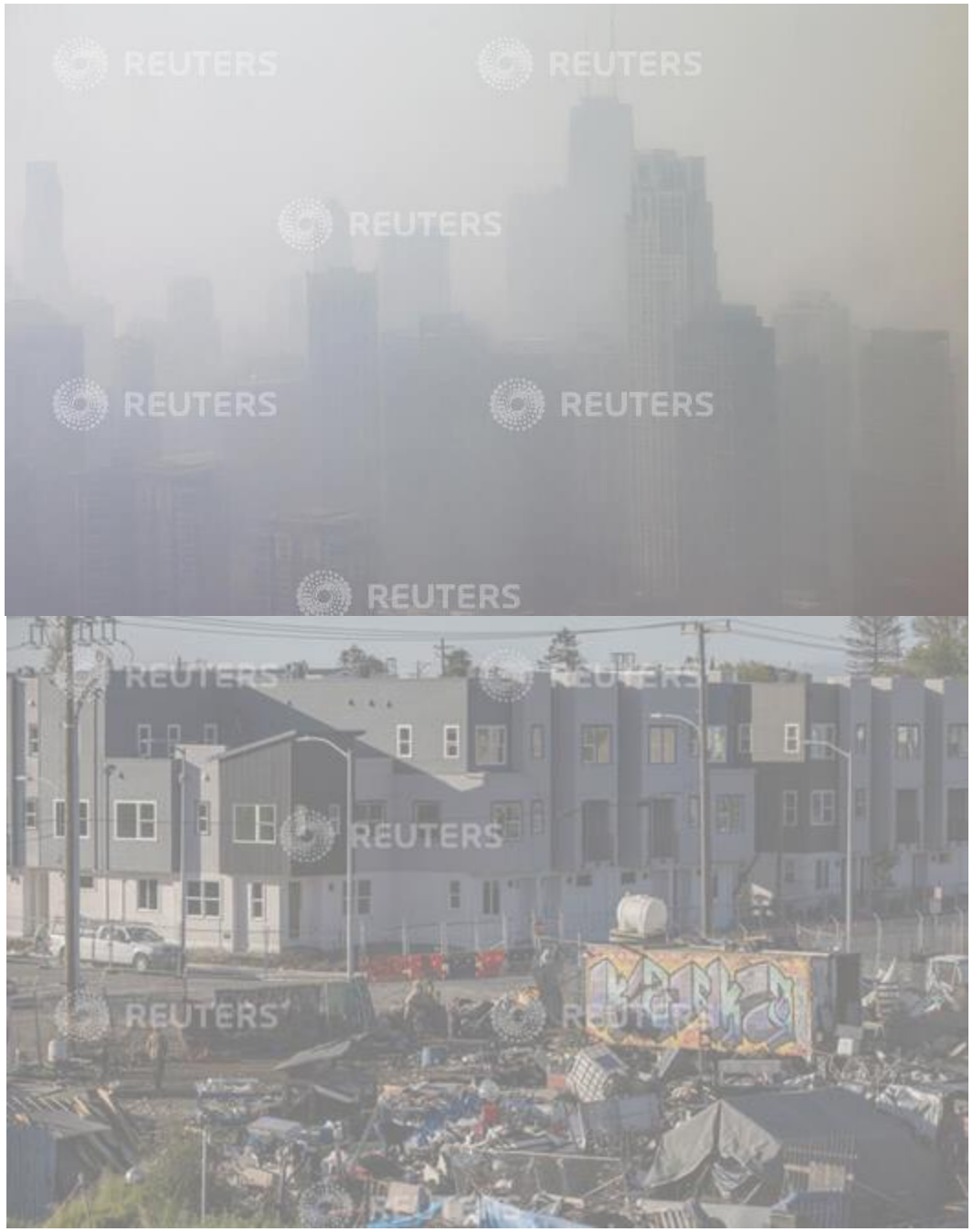
REUTERS / Leah Millils, Carlos Barria



Dual challenges: climate change and housing insecurity

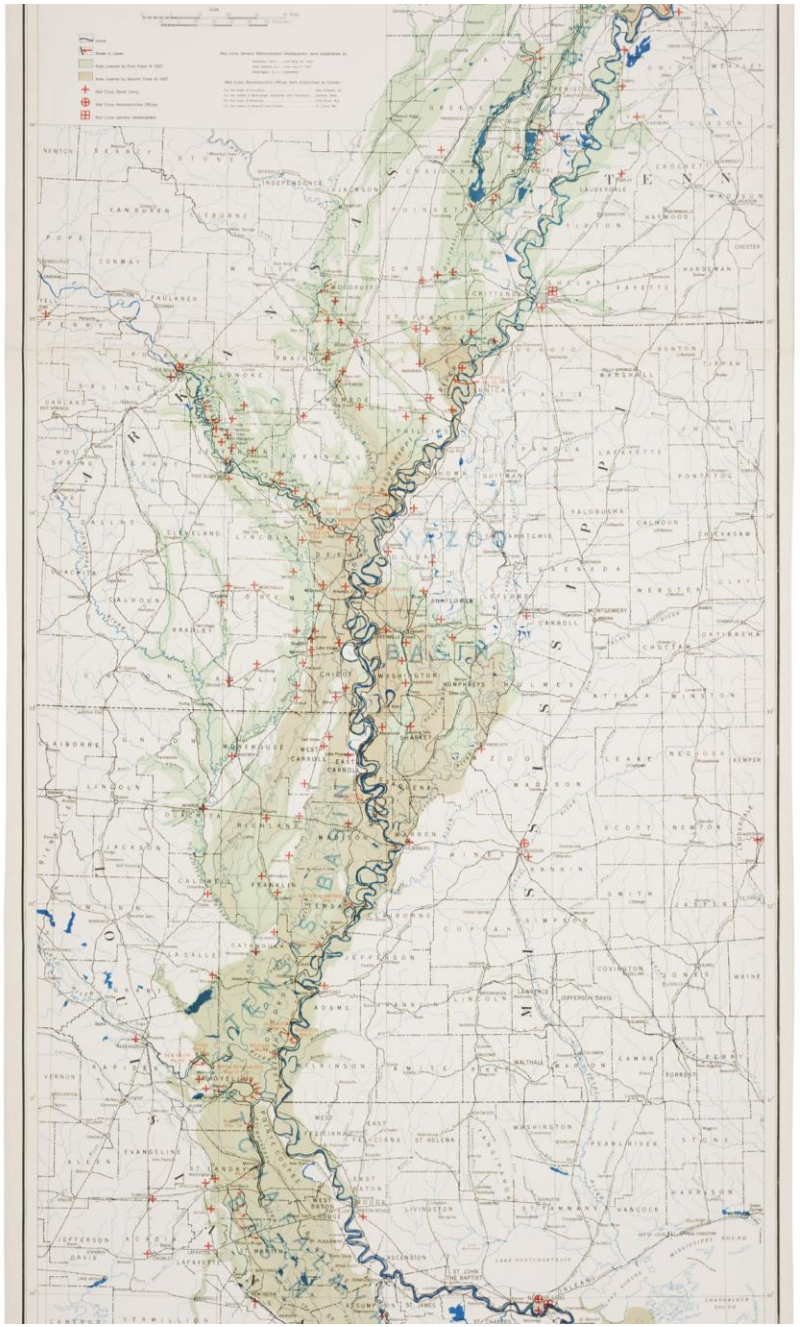
Roger Horner

Practical Law US, Government Practice

2023 IMLA Annual Conference

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Map of the Mississippi River Flood of 1927, National Archives and Records Administration



A lesson from history

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The Great Mississippi River Flood of 1927

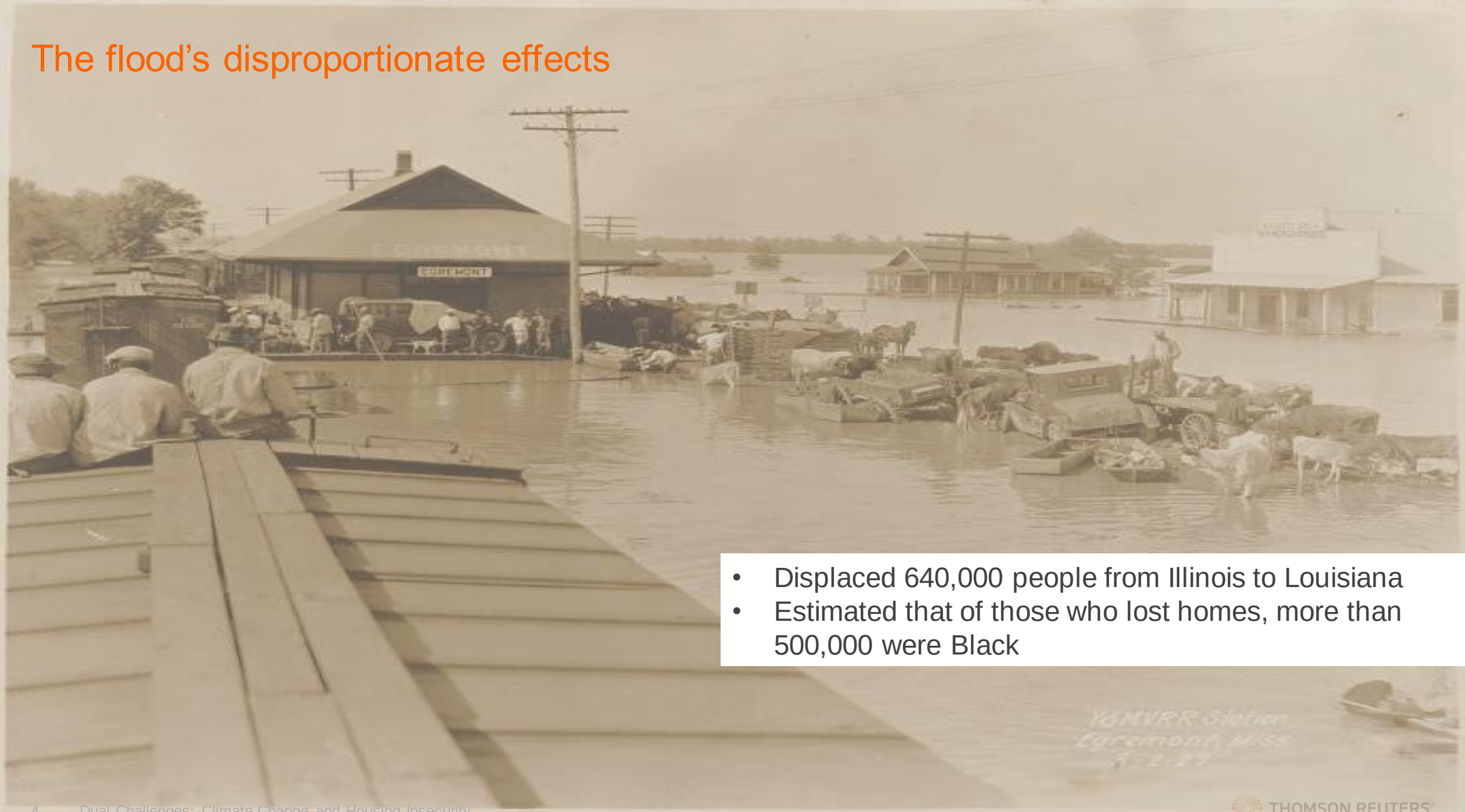


- Started in summer 1926, peaked in April 1927, finally subsided in August
- 16 million acres flooded
- River was 80 miles wide at Vicksburg, Mississippi

(Source: National Museum of African American History and Culture)

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The flood's disproportionate effects

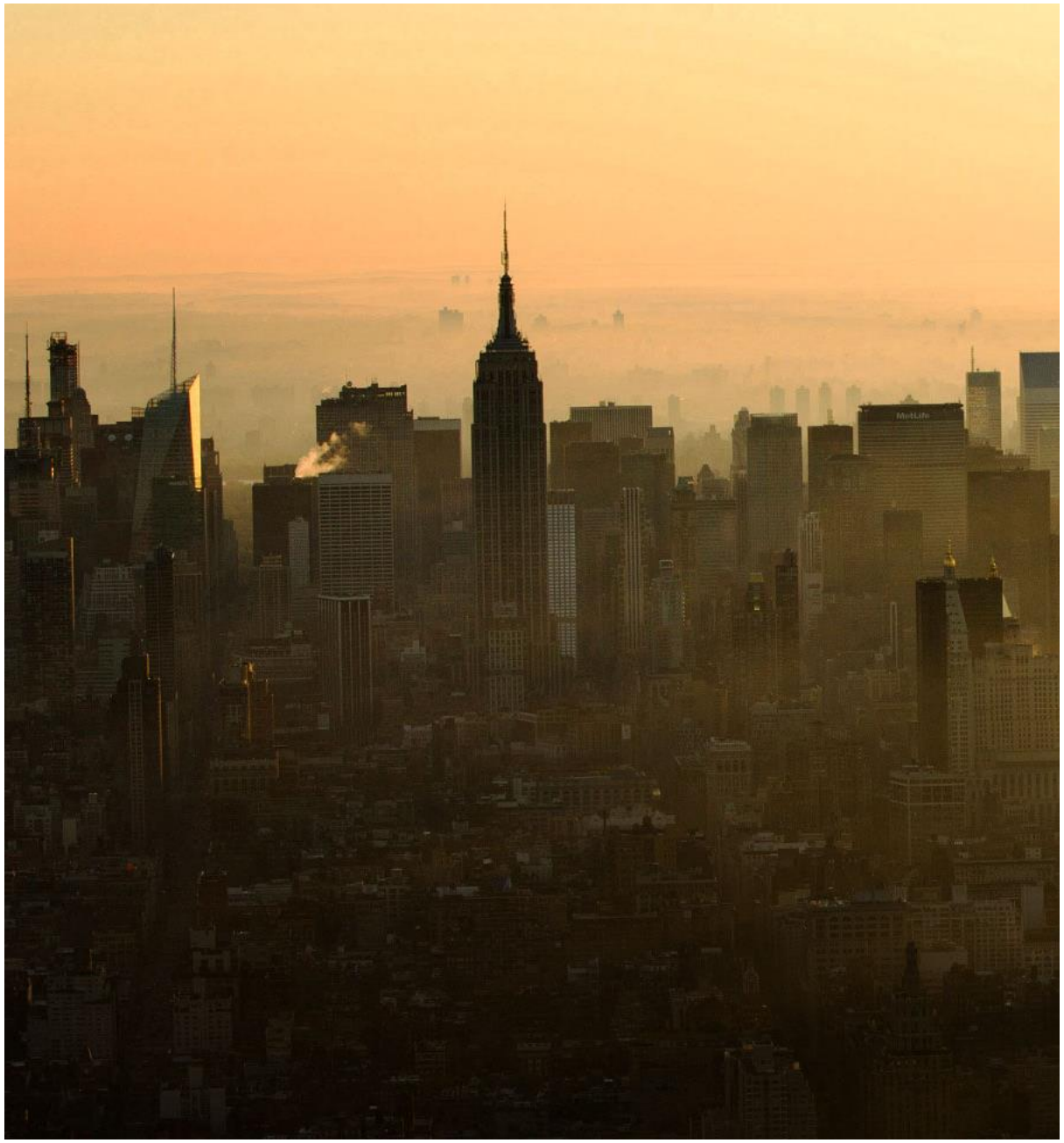


- Displaced 640,000 people from Illinois to Louisiana
- Estimated that of those who lost homes, more than 500,000 were Black

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How climate change affects states and cities

REUTERS / Lucas Jackson



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“Climate change is here, and it’s affecting the islands.”

GOV. JOSH GREEN, HAWAII

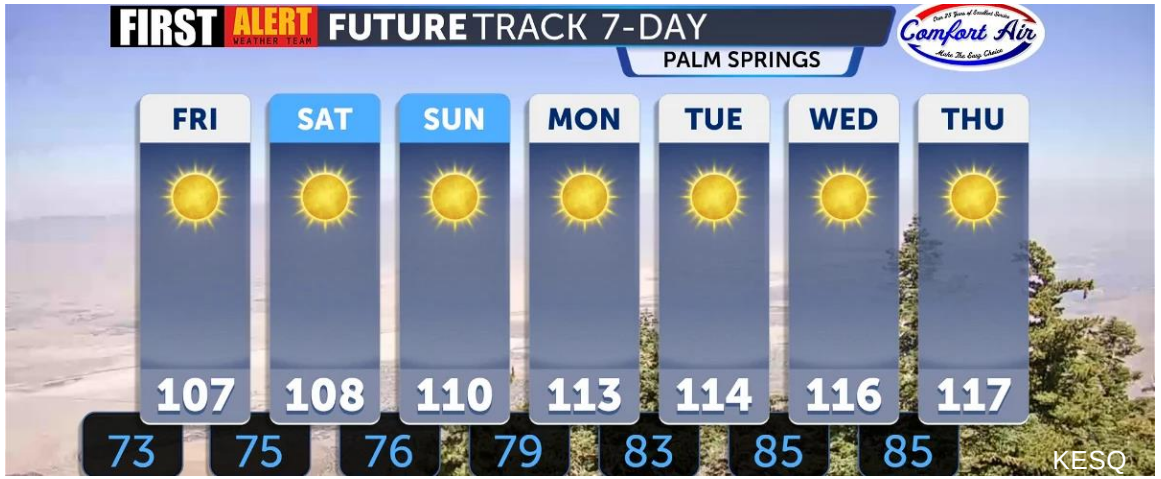
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Palm Springs

Summer 2023

July 2023:

- **Average high temperature for month – 112F**
- **July 21 temperature – 120F**



August 2023:

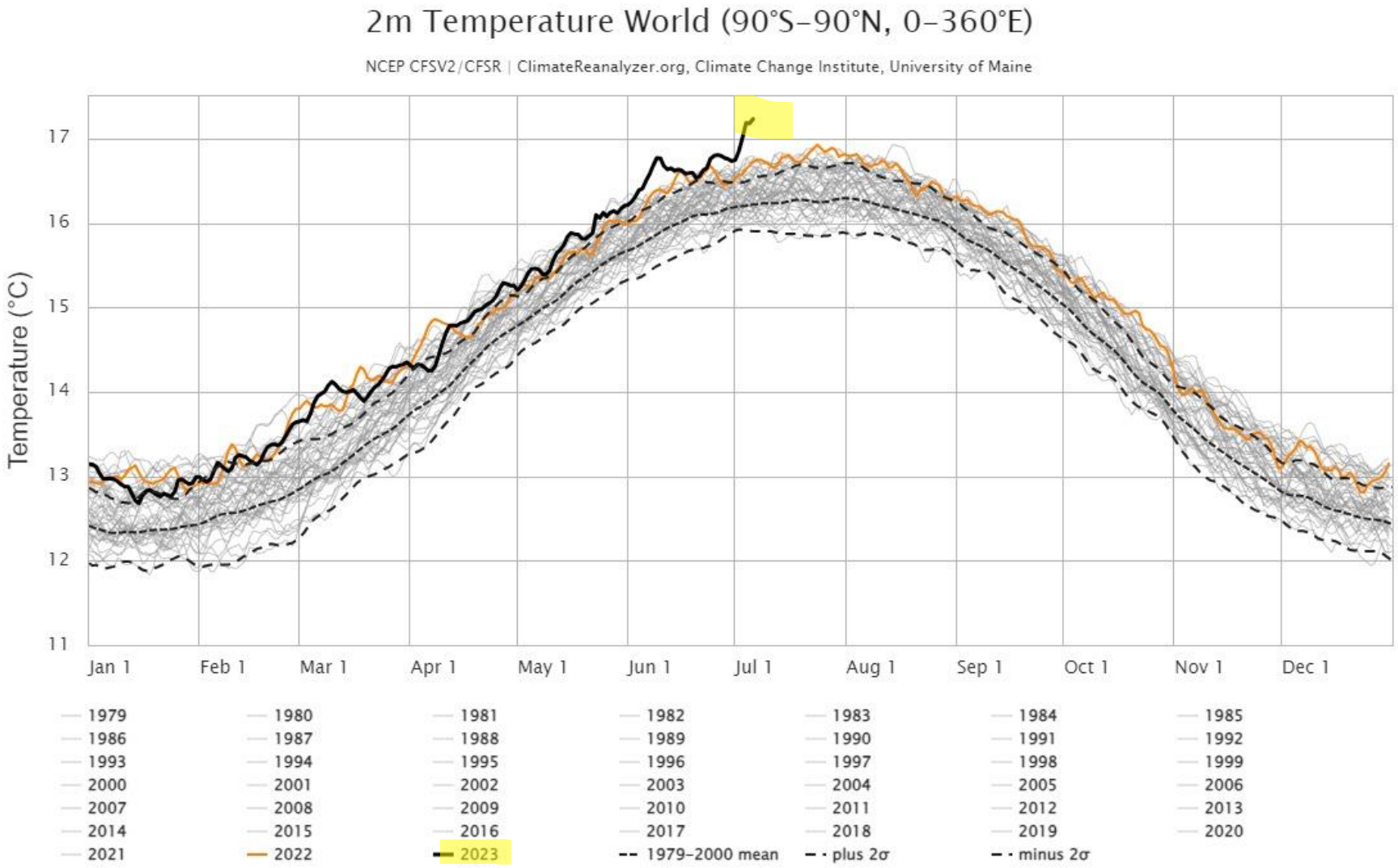
- **Tropical Storm Hilary**
- **First to make landfall in Southern California since 1939**



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Earth's hottest days

- July 3-5, 2023 – hottest days on record
- Global average temperature on July 5: 62.6F/17C



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Heat is the **leading weather-related killer** in the United States

(EPA: Climate Change Indicators: Heat-Related Deaths)

All-Time Temperature Records – US Cities		
Location	**Date**	**Temperature**
Palm Springs, CA	June 17, 2021*	123F/51C
Portland, OR	June 28, 2021	116F/47C
Seattle, WA	June 28, 2021	108F/42C
Abilene, TX	July 20, 2022	110F/43C
Sacramento, CA	Sept. 6, 2022	116F/47C
San Angelo, TX	June 21, 2023	114F/46C

*Tie w/previous record

Record-Setting Heat Waves in 2023	
Miami, FL	Most days at 95 or more
Austin, TX	31 days straight over 100
El Paso, TX	23 days straight over 100
Phoenix, AZ	31 days straight over 110
Las Vegas, NV	10 days straight over 110

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New records in Phoenix

Summer 2023:

- 31 consecutive days over 110 degrees F
- Previous record – 18 days
- Warmest “low” temperature on record – 97F, July 18
- Average July temperature – 102.8F

REUTERS / Liliana Salgado





REUTERS / Liliana Salgado

Phoenix population:

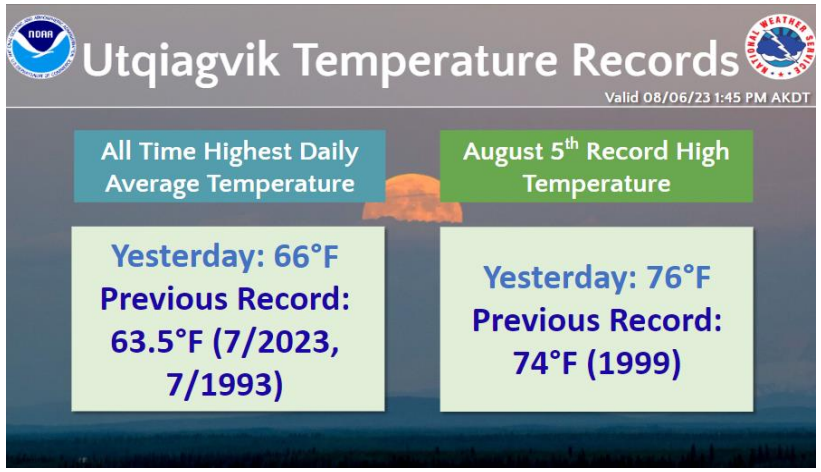
- 5 million + in metro area
- More than 800,000 new residents since 2012
- Maricopa County: largest-growing in the US (including more elderly than any other county)

(US Census Bureau)

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New records in northern Alaska

Photos from City of Utqiagvik website











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The chilling facts about heat

From *The Heat Will Kill Your First* by Jeff Goodell (Little, Brown and Company)

30 million	People who live in extreme heat today (above 85F mean annual temperature)	**2 billion**	People likely to live in extreme heat in 2070
2.5 miles per year	Average speed at which malaria-carrying mosquitoes are moving to higher, cooler latitudes	**489,000**	Annual worldwide deaths from extreme heat

Our food supply

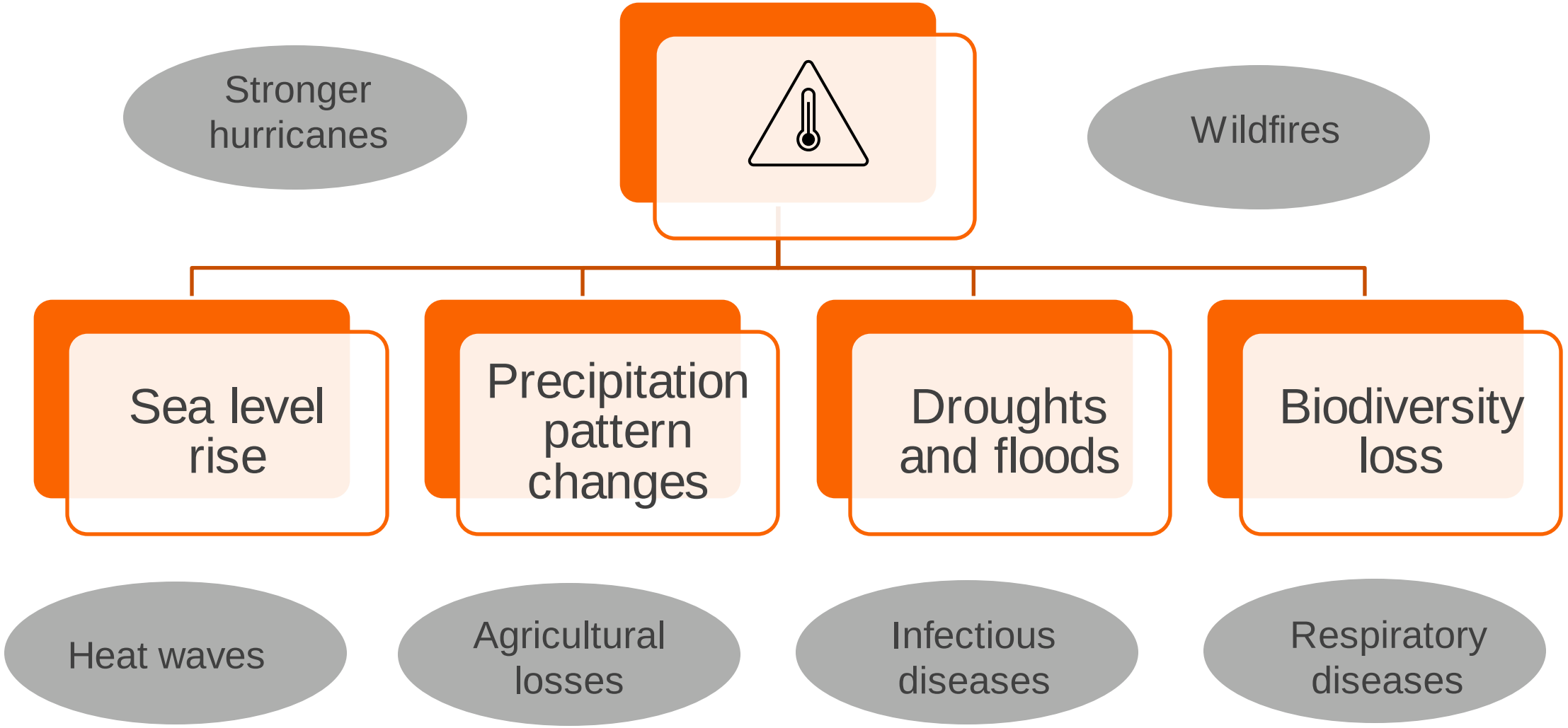
21 percent

Loss in global agricultural production in last 20 years

210 million

Increase in number of people facing acute food insecurity since 2019

The domino effect of rising temperatures



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Wildfires in Canada, smoke in the US

Summer 2023

- 20+ million acres burned in Canada
- Fires spread from Pacific to Atlantic
- Smoke drifted southward
- More than 100 million US residents in areas with air quality alerts

REUTERS / Quinn Glabicki

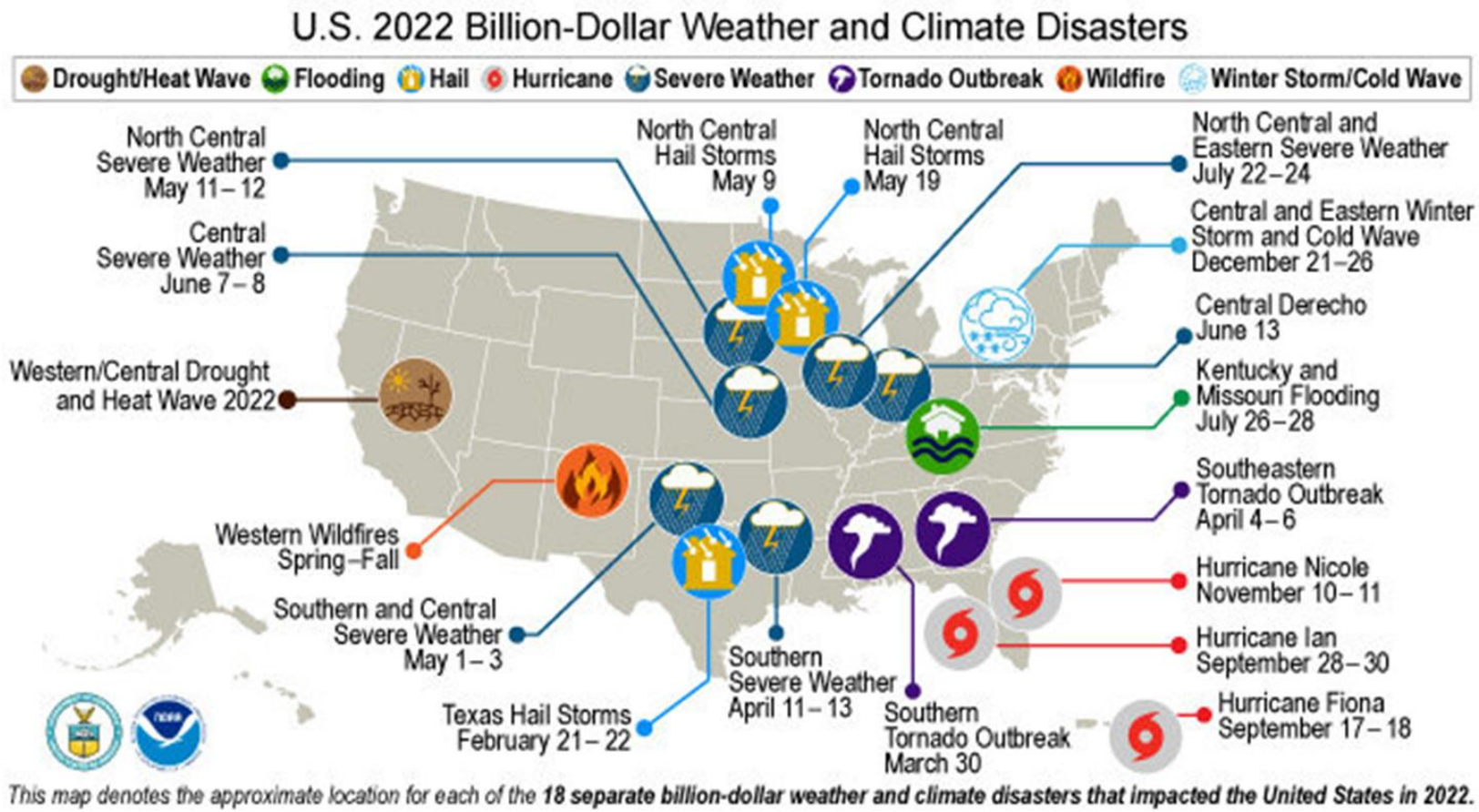


Billion-dollar disasters

2020 – 22 disasters

2021 – 20 disasters

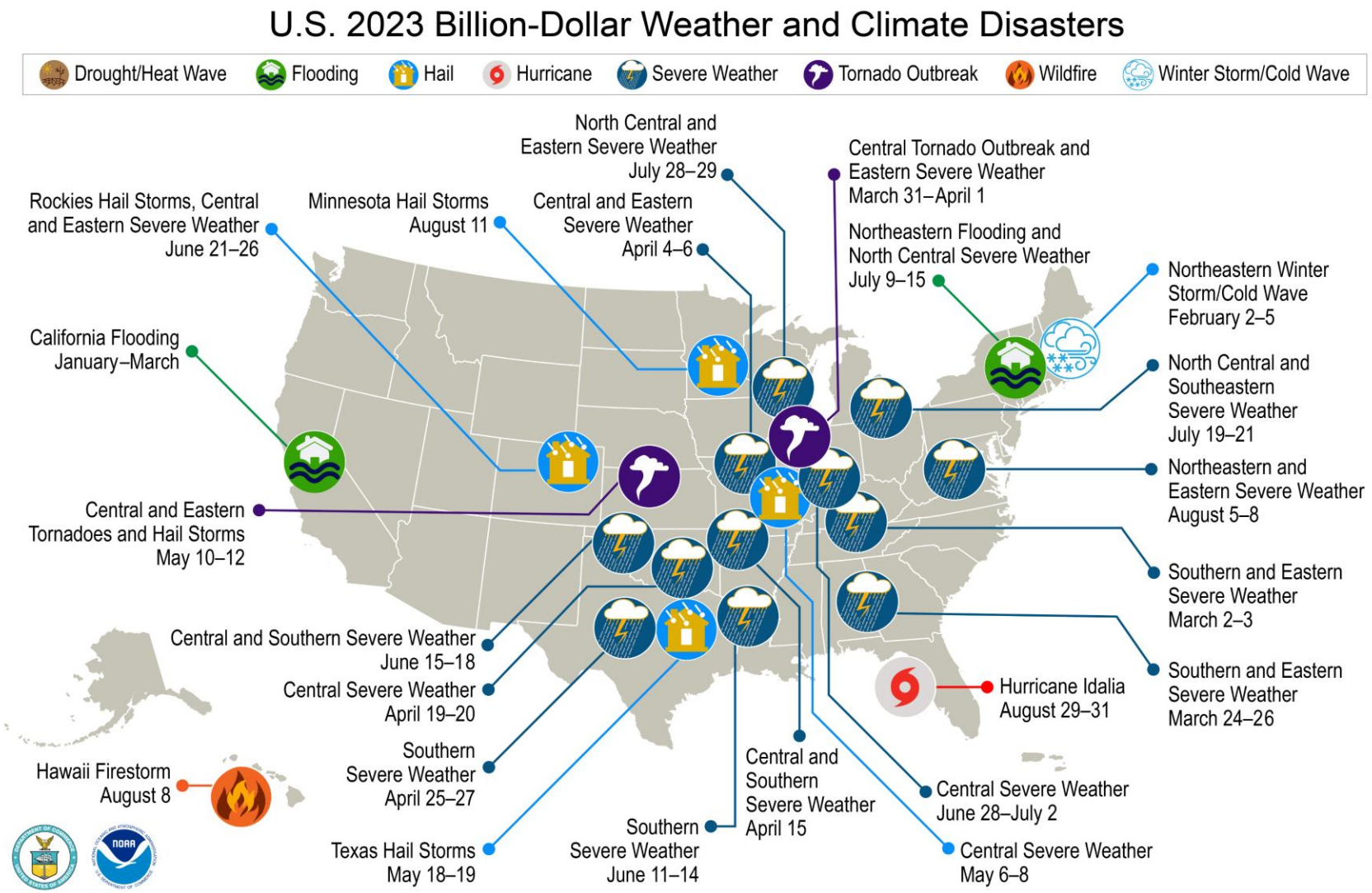
2022 – 18 disasters



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The records falls again

23 billion-dollar disasters in 2023 (through September 11)



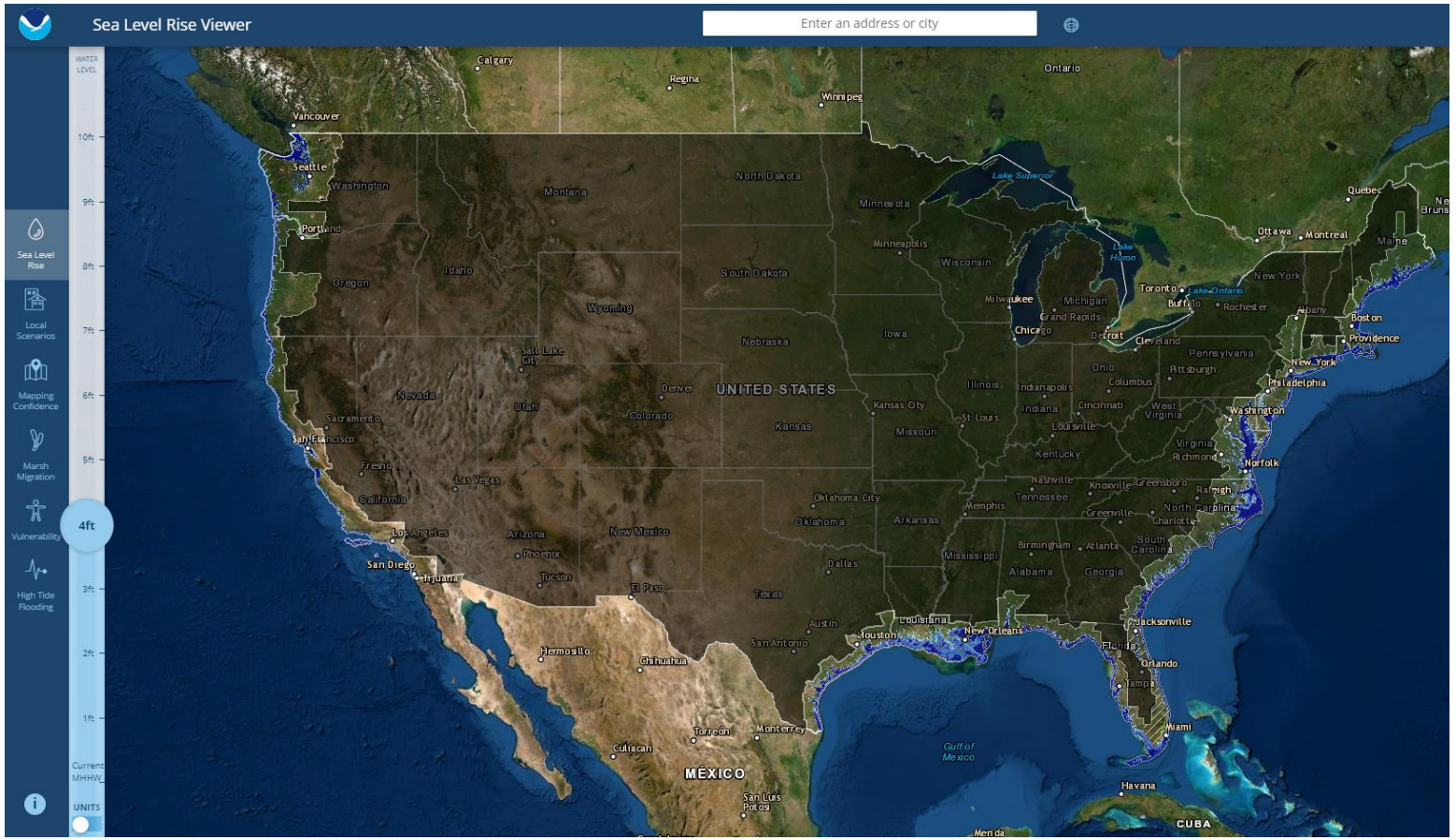
*This map denotes the approximate location for each of the **23 separate billion-dollar weather and climate disasters that impacted the United States through August 2023.***

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Impact of sea level rise

- Projected <u>average</u> sea level rise along US coastline, 2020 – 2050: 10 to 12 inches.
- Biggest sea level rise: Gulf coast – 14 to 18 inches
- High tides and storm surge heights increase and reach further inland
- By 2050, damaging floods expected to occur more than 10 times as often on average

(Source: NOAA)

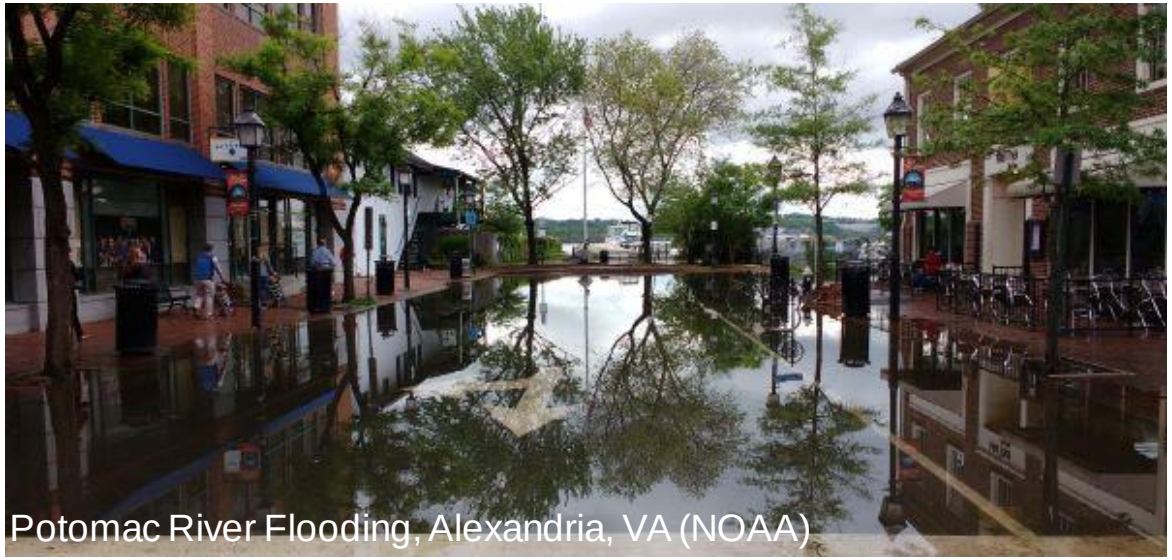


For more information, see NOAA's Sea Level Rise Viewer

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High tide flooding

- Typically 1.75 to 2 feet above daily average
- Water spills onto streets, bubbles up from storm drains
- Floods caused by storms in the past now happen more regularly



Potomac River Flooding, Alexandria, VA (NOAA)

Location	Flood Days 2022	Projected 2050
Boston, MA	13	50-80
Providence, RI	5	46-99
Philadelphia, PA	2	42-107
Baltimore, MD	5	67-162
Washington, DC	7	55-139
Charleston, SC	13	45-114
St. Petersburg, FL	1	19-108
Grand Isle, LA	**1**	**146-277**
Corpus Christi, TX	0	70-192
San Diego, CA	10	19-68
Los Angeles, CA	3	8-43
San Francisco, CA	0	3-33
Seattle, WA	10	7-24
Honolulu, HI	0	60-268

Source: NOAA: Annual High Tide Flooding Outlook

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The disproportionate effects of climate change

REUTERS / Lucas Jackson



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The disproportionate impact on minorities and lower-income populations

Hurricanes

- African American South

Extreme rainfall

- African American counties
- Working class counties
- Blue collar suburbs

Drought

- Rural Hispanic centers

Source: American Communities Project

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Disadvantages that put communities of color at higher risk

Higher rates of asthma, hypertension, diabetes, obesity

Limited access to health care

Heating and cooling costs as percentage of income

Proximity to industries and other pollution sources

More asphalt/fewer tree canopies

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Location, location, location

The most affordable housing is often in areas:

- Prone to natural disasters
- Close to sources of pollution
- Predominated by major highways
- Without adequate shade

REUTERS / Rebecca Cook



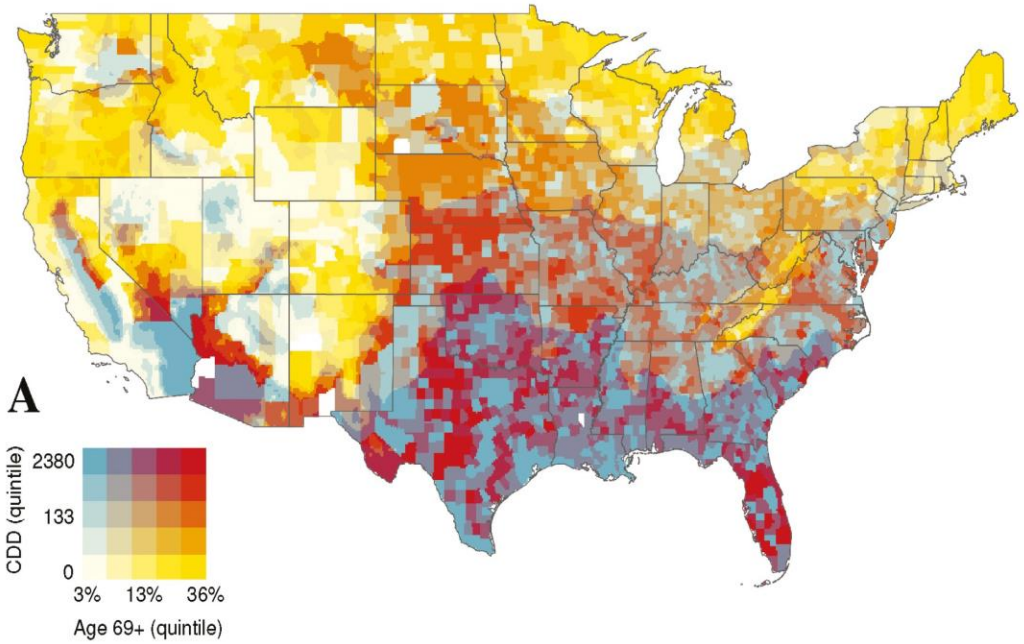
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Heat exposure and older people

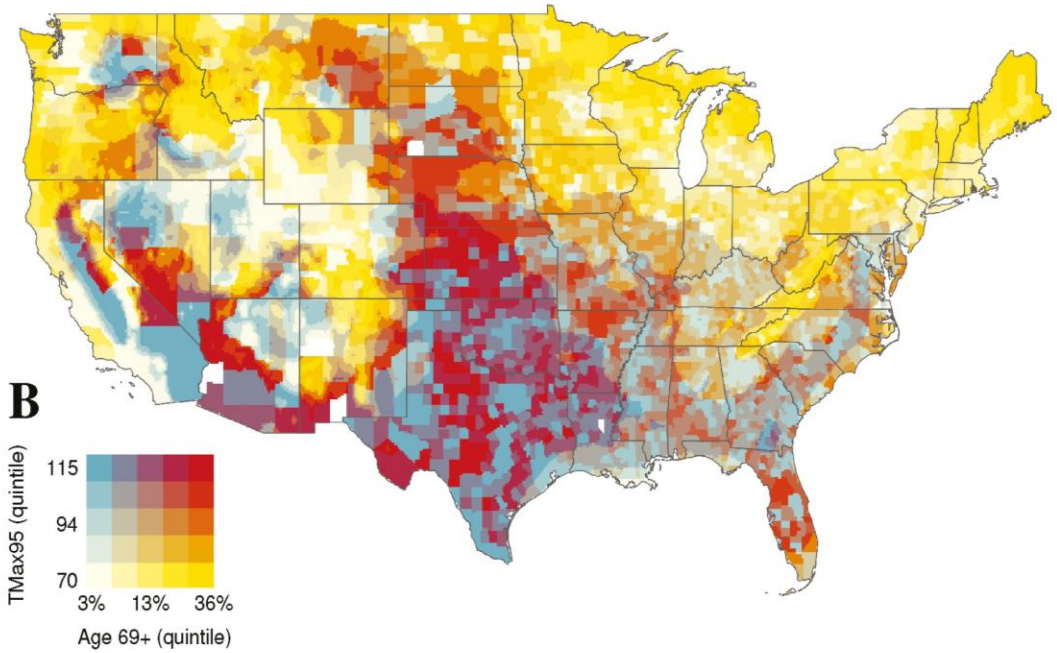
- US population age 69+ expected to grow from 11% today to 17% in 2050
- Historically warm areas will see most dramatic increases in 69+ population
- Demands for support/services in those areas will increase:
  - suitable housing
  - health care
  - heat exposure prevention/adaptations
- Increases in cooling demands and extreme temperatures in other areas intensified by:
  - older housing stock
  - lack of air conditioning/less efficient cooling

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High concentrations of older adults/highest heat exposure



69+ population percentage combined with annual cooling degree days



69+ population percentage combined with exposure to extreme heat

From The Gerontologist: Population Aging and Heat Exposure in the 21st Century: Which U.S. Regions Are at Greatest Risk and Why? © Deborah Carr, PhD, Giacomo Falchetta, PhD, and Ian Sue Wing, PhD, 2023. Published by Oxford University Press on behalf of The Gerontological Society of America.

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The impact on your community

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Climate scenarios and local impacts

Regional phenomena

- Sea level rise/high tide flooding
- Frequency of heatwaves, wildfires, storms, extreme rainfalls

Specific local impacts

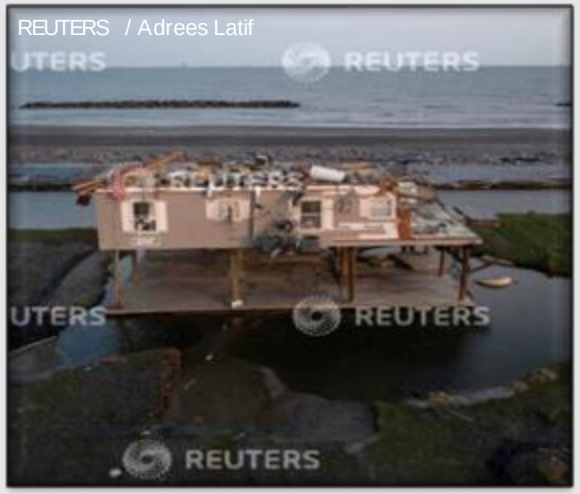
- Low-lying areas
- Neighborhoods with basement apartments
- Low-income neighborhoods

Climate migration

- Outbound
- Inbound

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The potential for climate migration



Permanent out-migrations



Temporary migrations/fluctuations



In-migration

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Vermont, July 2023

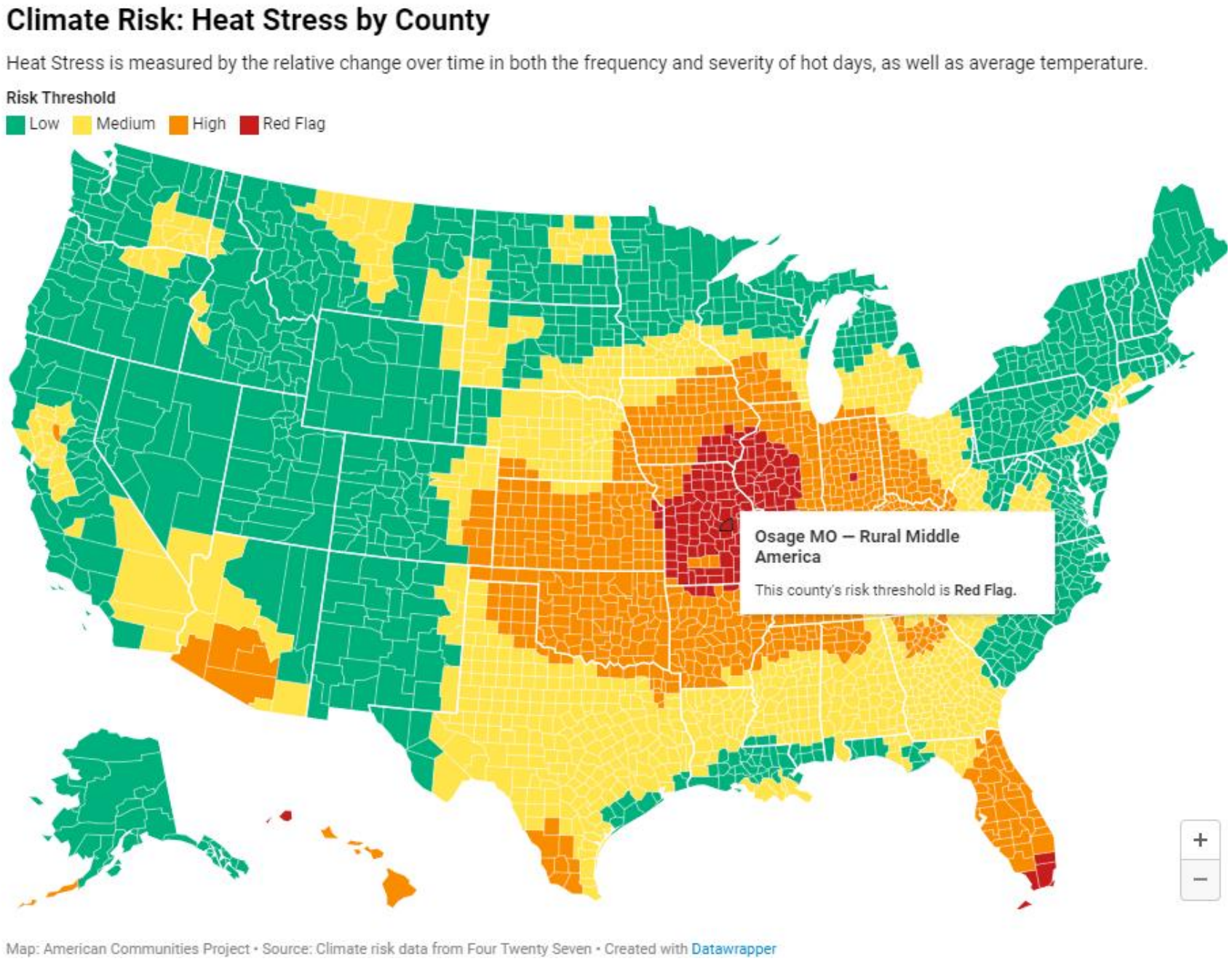
REUTERS / Brian Snyder



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American Communities Project maps

[Climate risks by county and community]



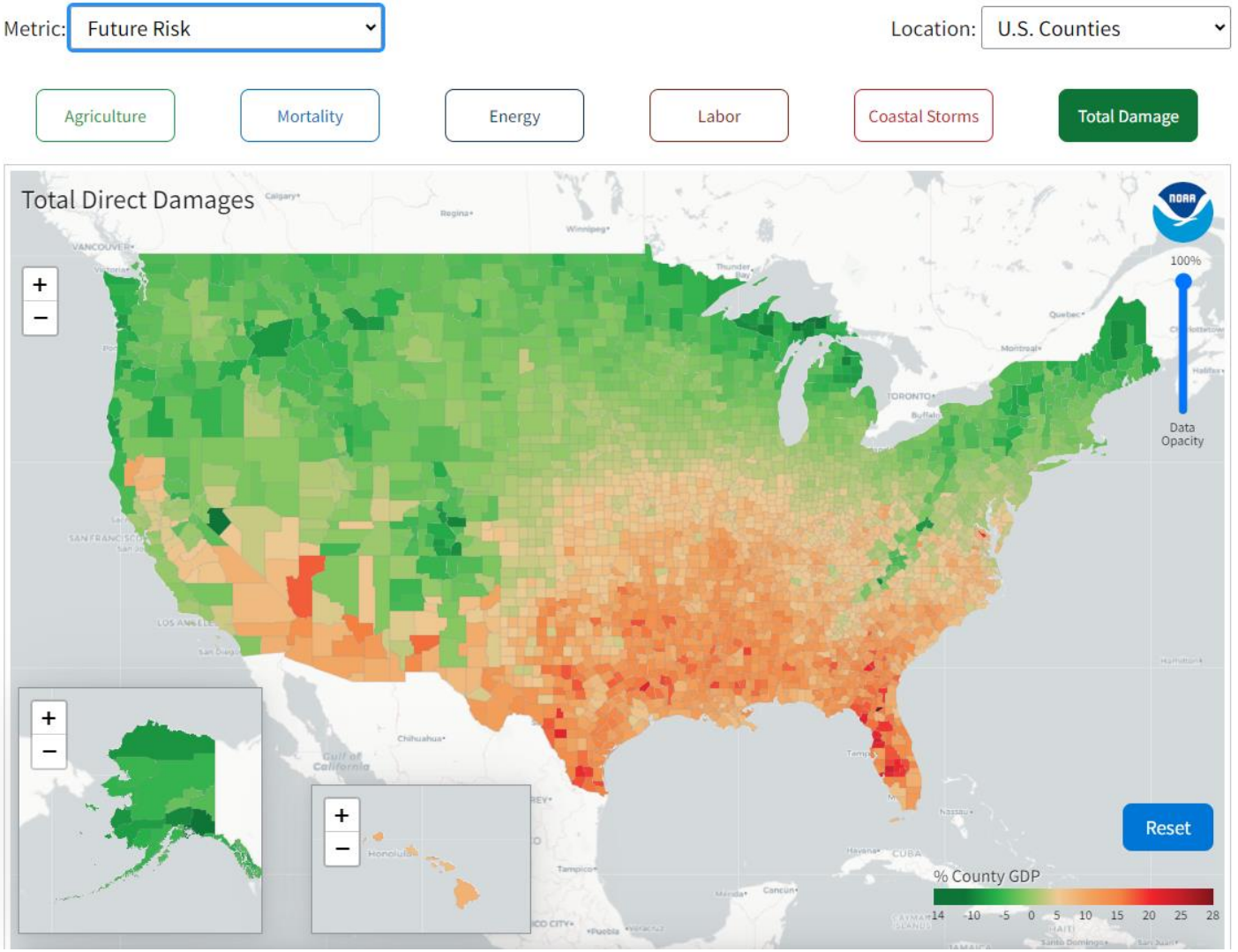
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NCEI's risk and vulnerability maps

National Centers for Environmental Information maps

Analysis by county or census tract of:

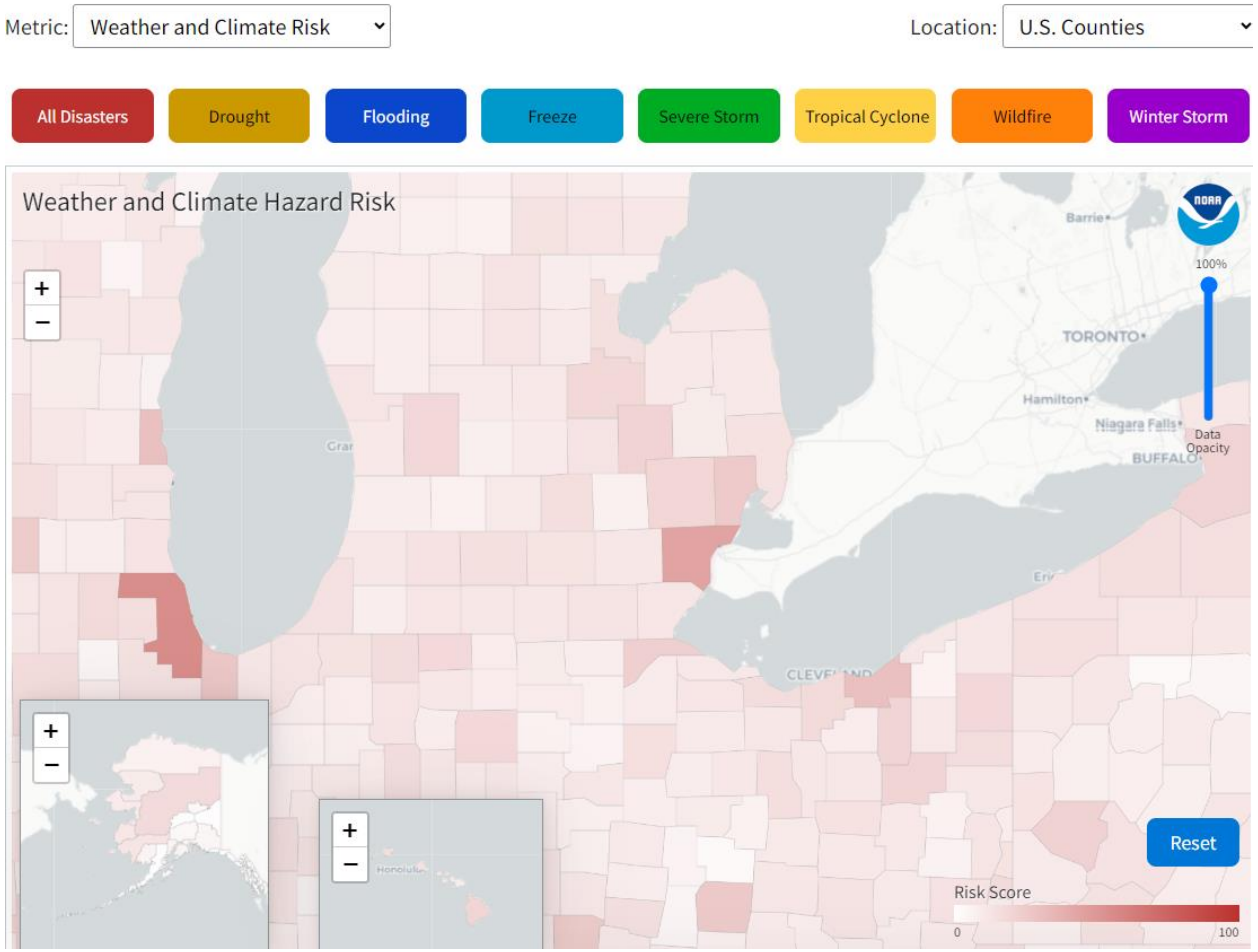
- Risks from weather and climate disasters
- Socioeconomic vulnerability by category (seniors, minorities, mobile home residents, etc.)
- Future risk predictions by category (agriculture, energy, labor, etc.)



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The risks in Wayne County, Michigan

From the [NCEI Risk and Vulnerability Maps]



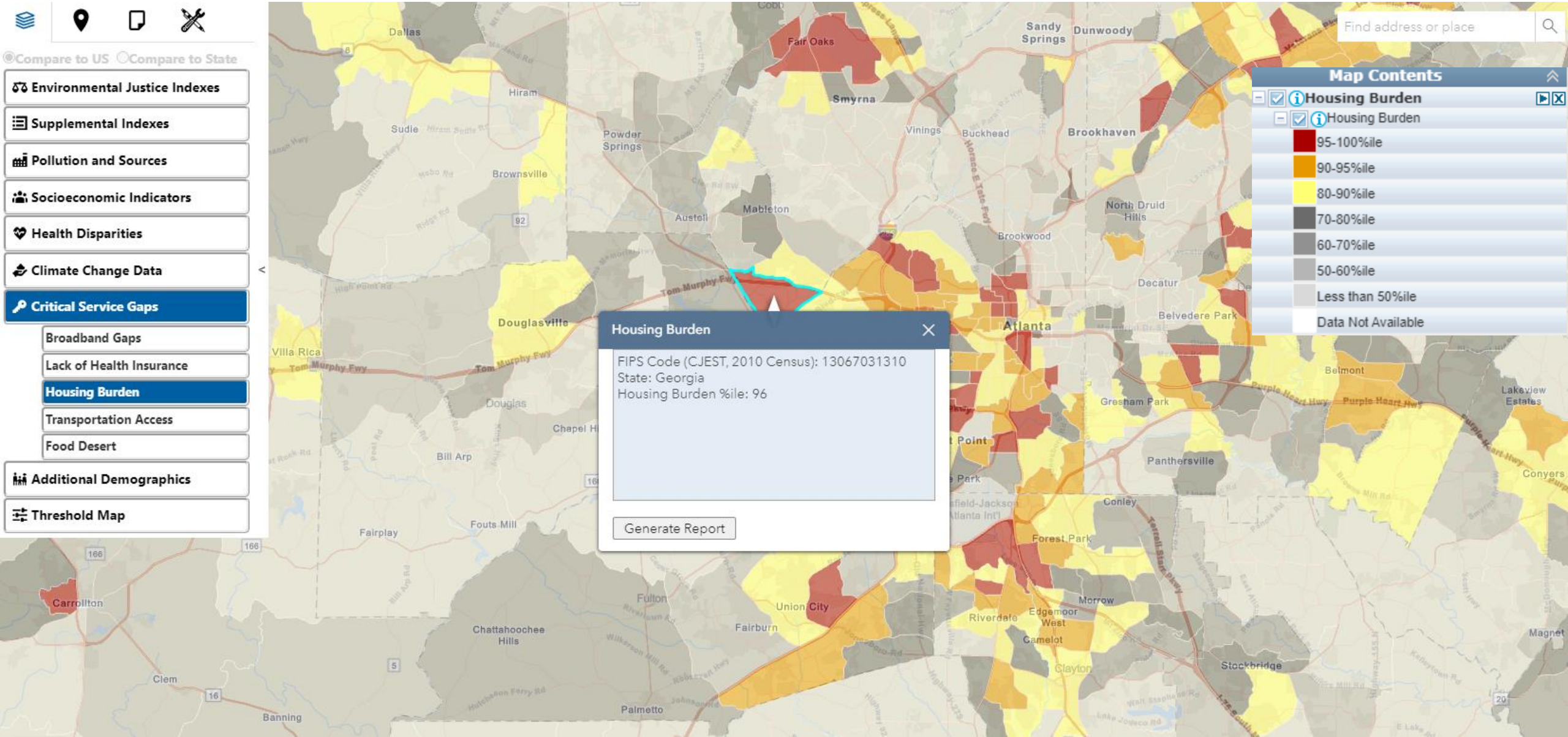
Risk and Vulnerability

Data Type	Wayne County	Michigan	U.S.
Weather and Climate Risk			
Drought Risk	37.26	4.77	11.61
Flooding Risk	49.59	6.05	9.13
Freeze Risk	43.93	19.24	15.72
Severe Storm Risk	54.14	16.75	16.99
Tropical Cyclone Risk	7.65	3.40	4.36
Wildfire Risk	1.20	3.69	6.30
Winter Storm Risk	30.77	17.20	13.71
Weather and Climate Combined Risk	44.02	10.44	13.30
Socioeconomic Vulnerability			
Age < 18	23.90%	20.07%	22.36%
Age 65+	14.70%	20.70%	18.37%

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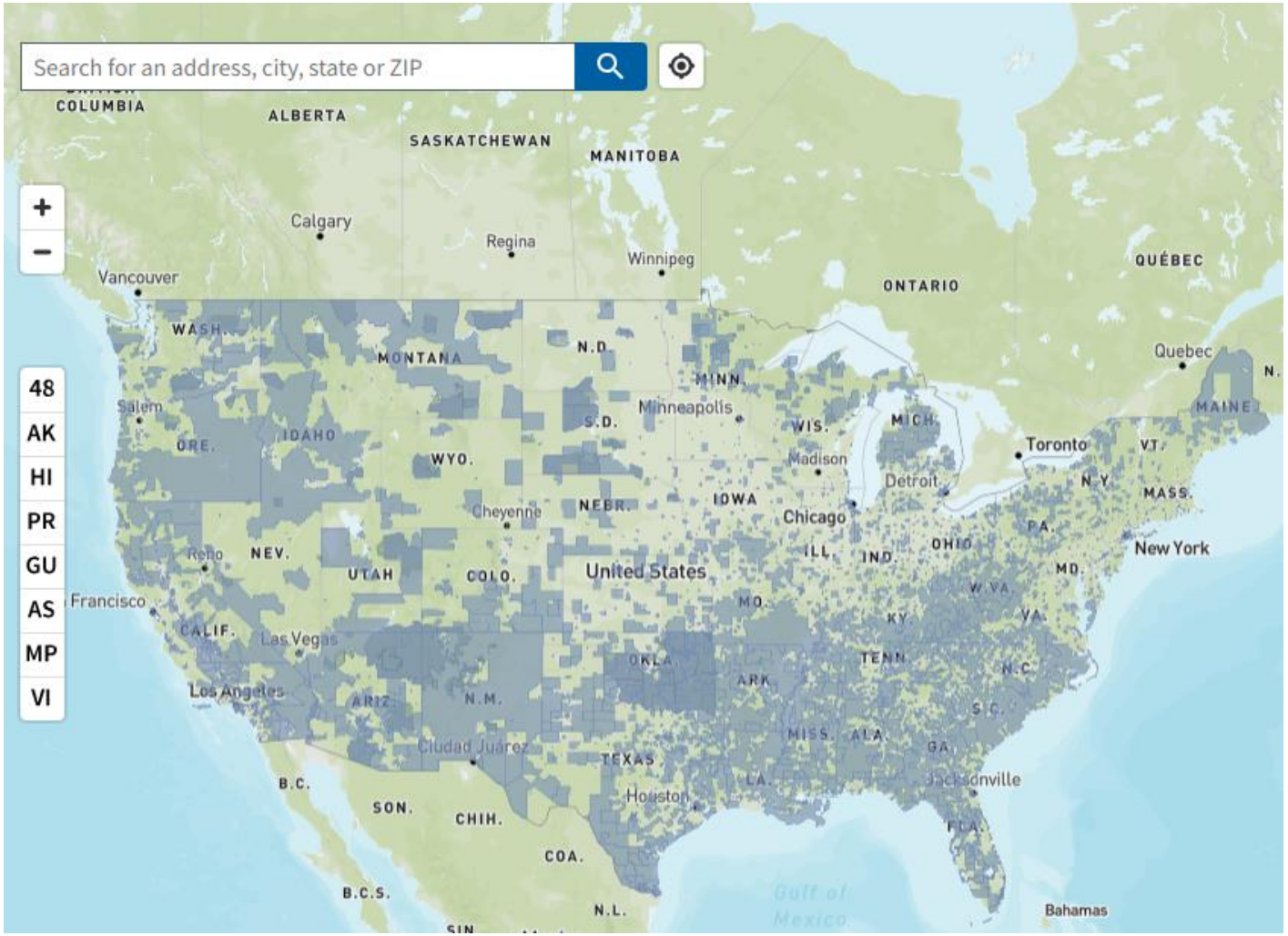
EJ Screen

EPA's environmental justice mapping and screening tool



Climate and Economic Justice Screening Tool

The Council on Environmental Quality's searchable map



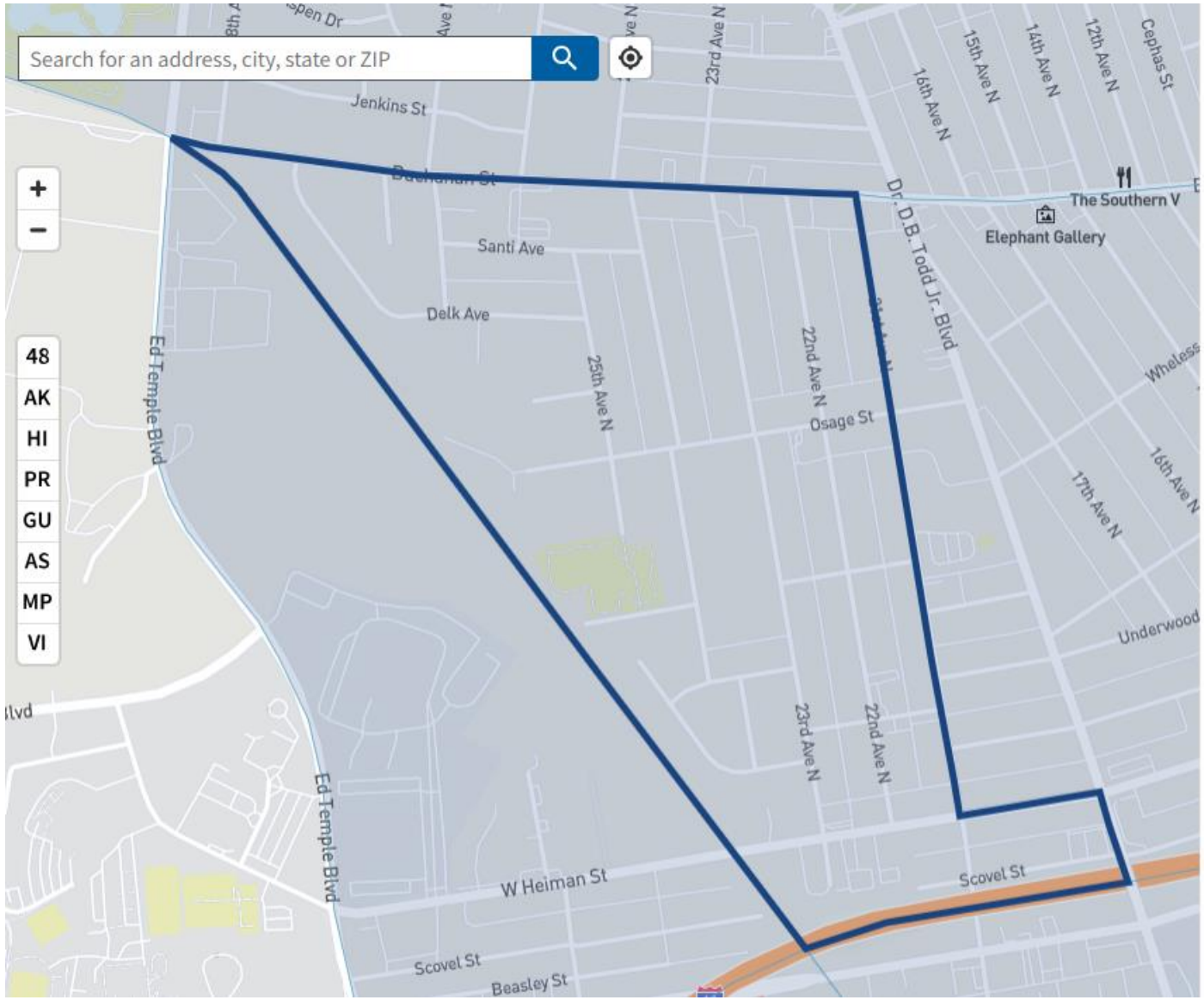
Zoom into census tracts to see community burdens due to:

- Climate change
- Energy
- Health
- Housing
- Legacy pollution
- Transportation
- Water and wastewater
- Workforce development

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What the Climate and Economic Justice Screening Tool shows

An example from a North Nashville neighborhood



Tract information
Number: 47037013800
County: Davidson County
State: Tennessee
Population: 2,099

Tract demographics

Race / Ethnicity (hide)

White	7%
Black or African American	87%
American Indian and Alaska Native	0%
Asian	0%
Native Hawaiian or Pacific Islander	0%
Other	0%
Two or more races	3%
Hispanic or Latino	2%

Age (hide)

Children under 10	6%
Ages 10 - 64	84%
Elderly over 65	9%

Identified as disadvantaged?

YES

This tract is considered disadvantaged because it meets more than 1 burden threshold **AND** the associated socioeconomic threshold.

Send feedback

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How is census tract 47037013800 burdened?

Socioeconomic	• Low-income households – 80th percentile • Adults w/o high school diploma – 17%
Climate change	• High flood risk – 91st percentile
Health	• Asthma/diabetes rates - 93rd/98th percentiles • Low life expectancy – 98th percentile
Housing	• Historic underinvestment (barriers to home loans)
Transportation	• Diesel exhaust in the air – 92nd percentile
Workforce	• High unemployment – 94th percentile

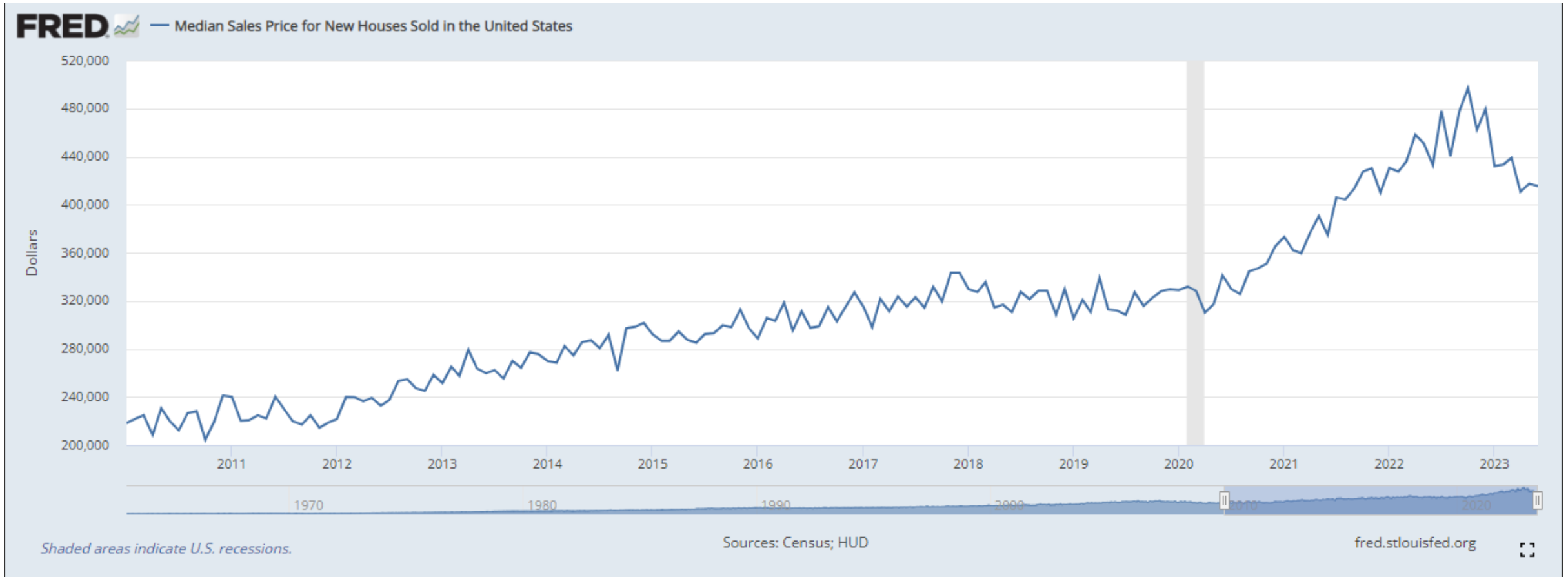
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REUTERS / Carlos Barria



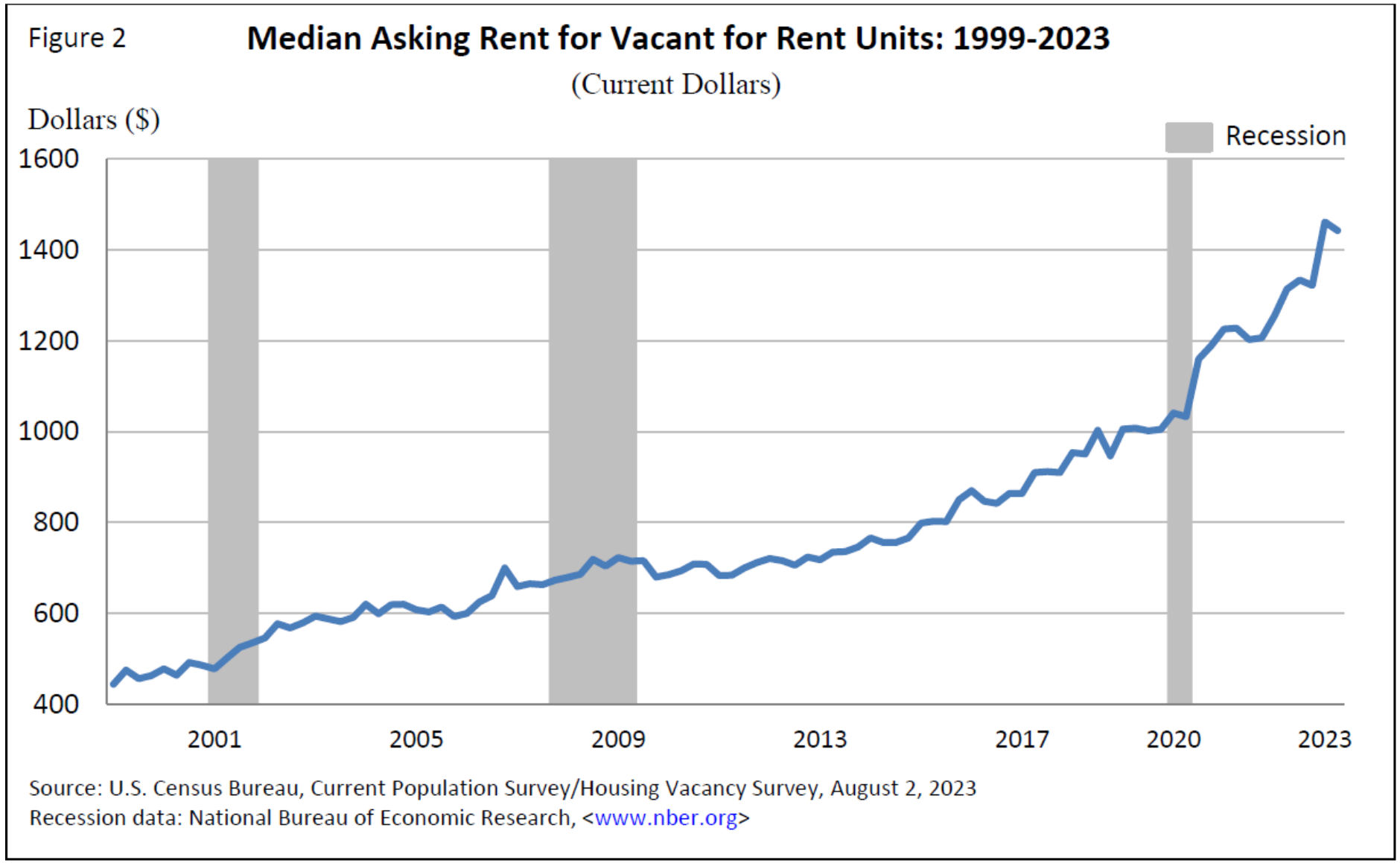
The affordable housing problem

The price of a new house in the US



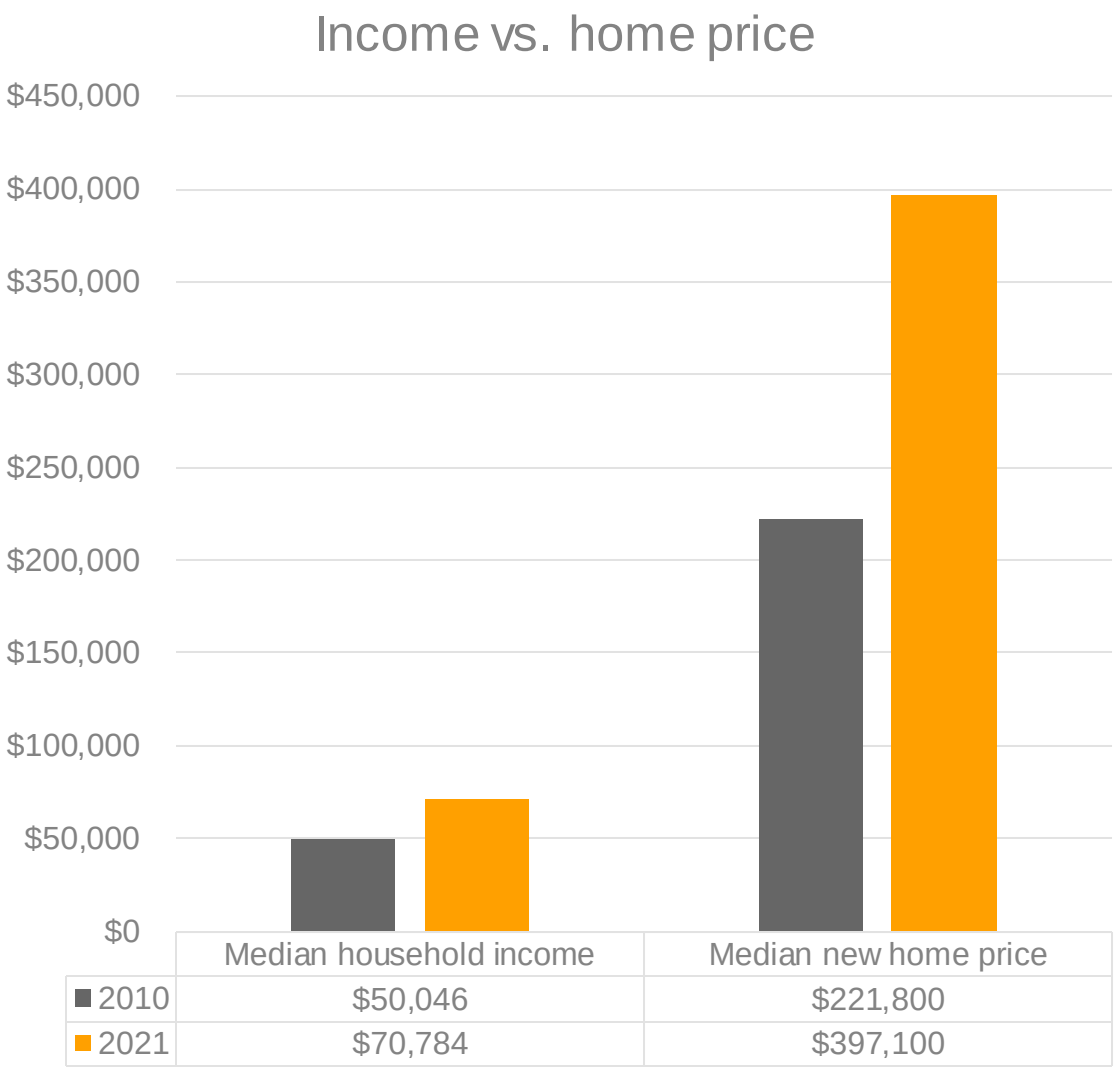
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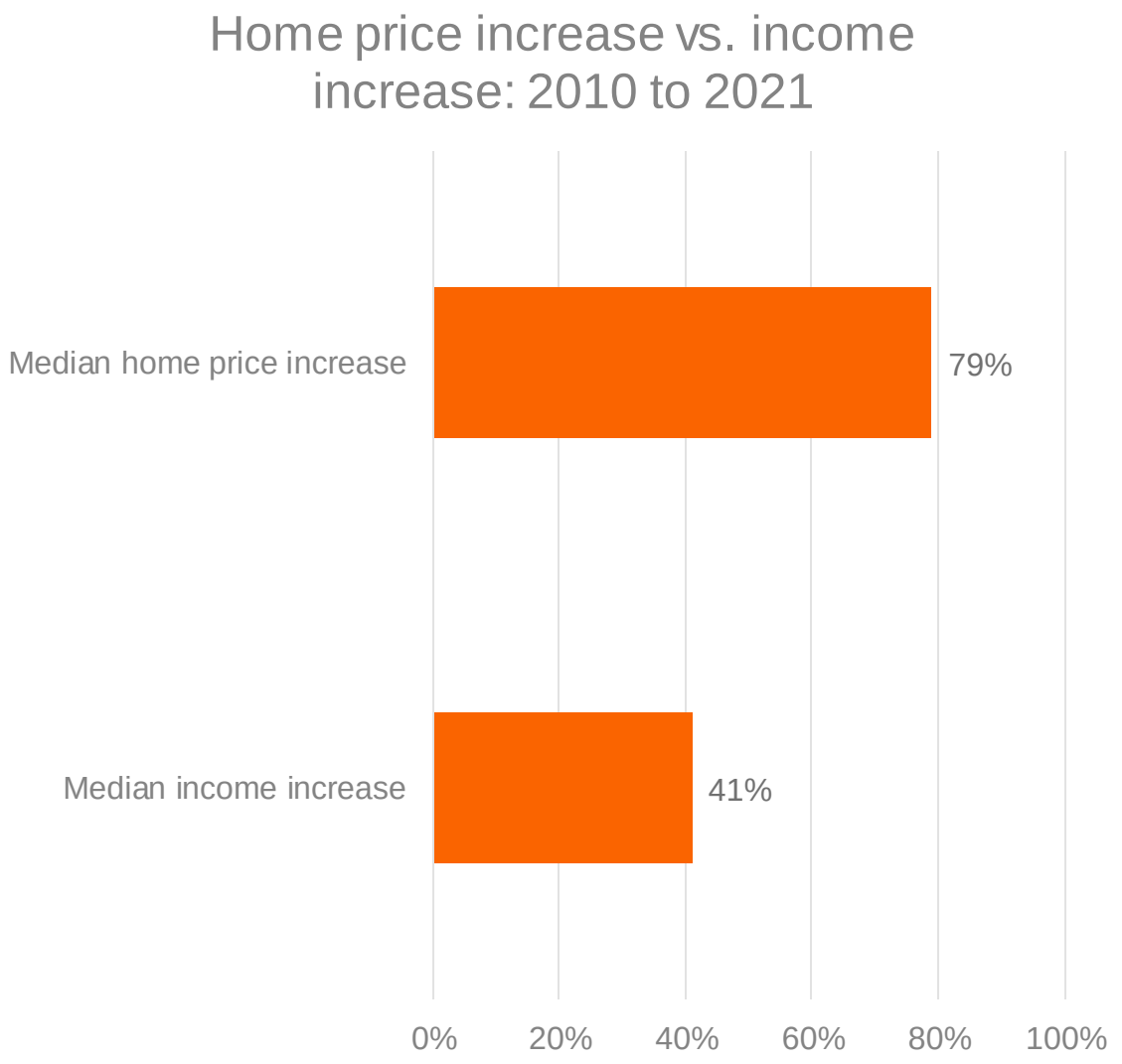
The rising cost of rent



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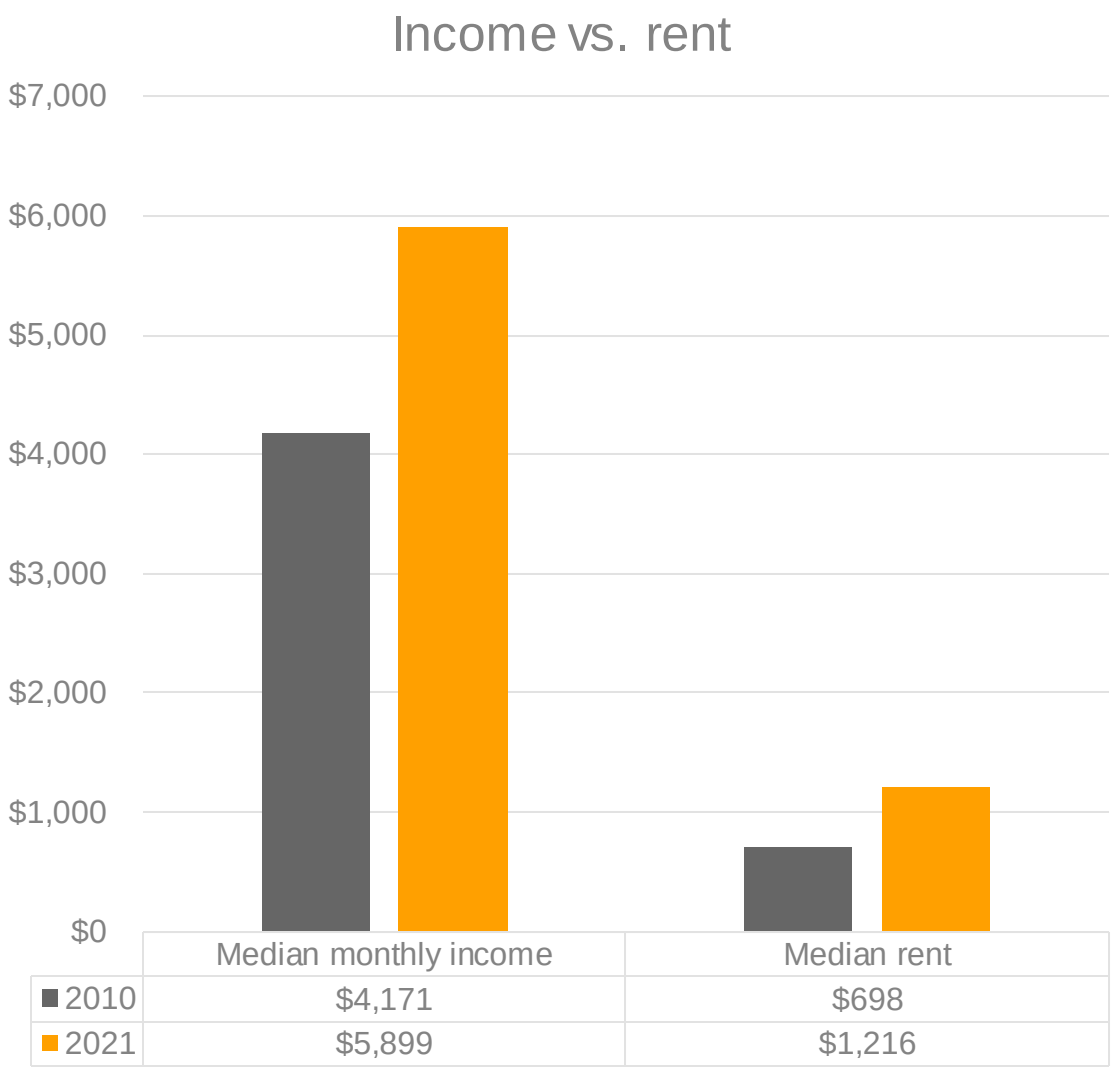
Median annual household income to new home prices

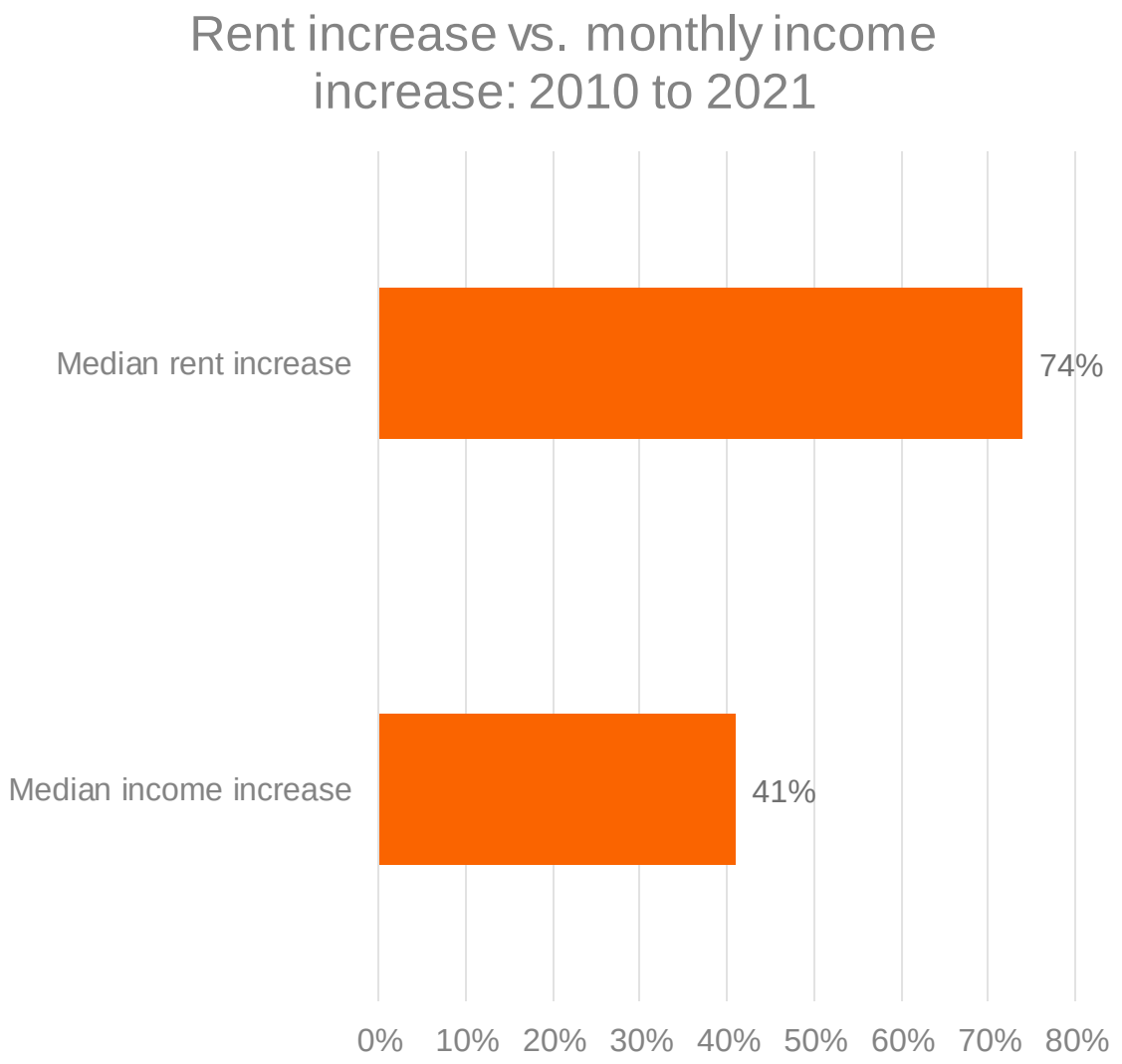




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Median monthly income vs. rent prices





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The new normal of homelessness



[HUD Annual Homeless Assessment Report:]

- On a single night in 2022, roughly 582,500 people in the US were experiencing homelessness
- 40% were unsheltered
- Not just in urban areas: 40% were in suburbs and rural areas
- 28% were in families with children
- 30,000 were unaccompanied youth

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Barriers to affordable housing

- Zoning
- Complex approval steps/permitting requirements/fees
- Budget priorities
- Confusing assortment of funding options
- State laws at odds with local efforts
- Demands for housing in general in growth areas
- NIMBYism
- Gentrification
- Short-term rentals
- Income levels not keeping pace with housing costs

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When government adds to the problem

How cities make things worse

And how good intentions can have unintended consequences

Low density zoning

- Drives up cost of all housing

Parking requirements

- Large expanses of asphalt

Pollutant-producers near low-income residential

- Poor health outcomes

Flood zone buyouts

- Can leave renters and some homeowners with nowhere else to go

Climate mitigation initiatives with costs to individuals and families

- Examples: green building requirements, stormwater fees that increase building and utility costs

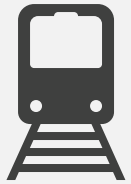
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The risks of too much single-family

- Less likely to be affordable
- Often not senior-friendly
- Often less walkable, more disconnected, more dependent on cars
- Loss of farmland, scenic vistas
- Environmental impact, including:
  - Wildlife habitat displacement
  - Stormwater management and drainage issues from grading, tree removal, changes in flows
  - Higher carbon footprints for residents

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Potential benefits of good density



Can rely on infrastructure already in place



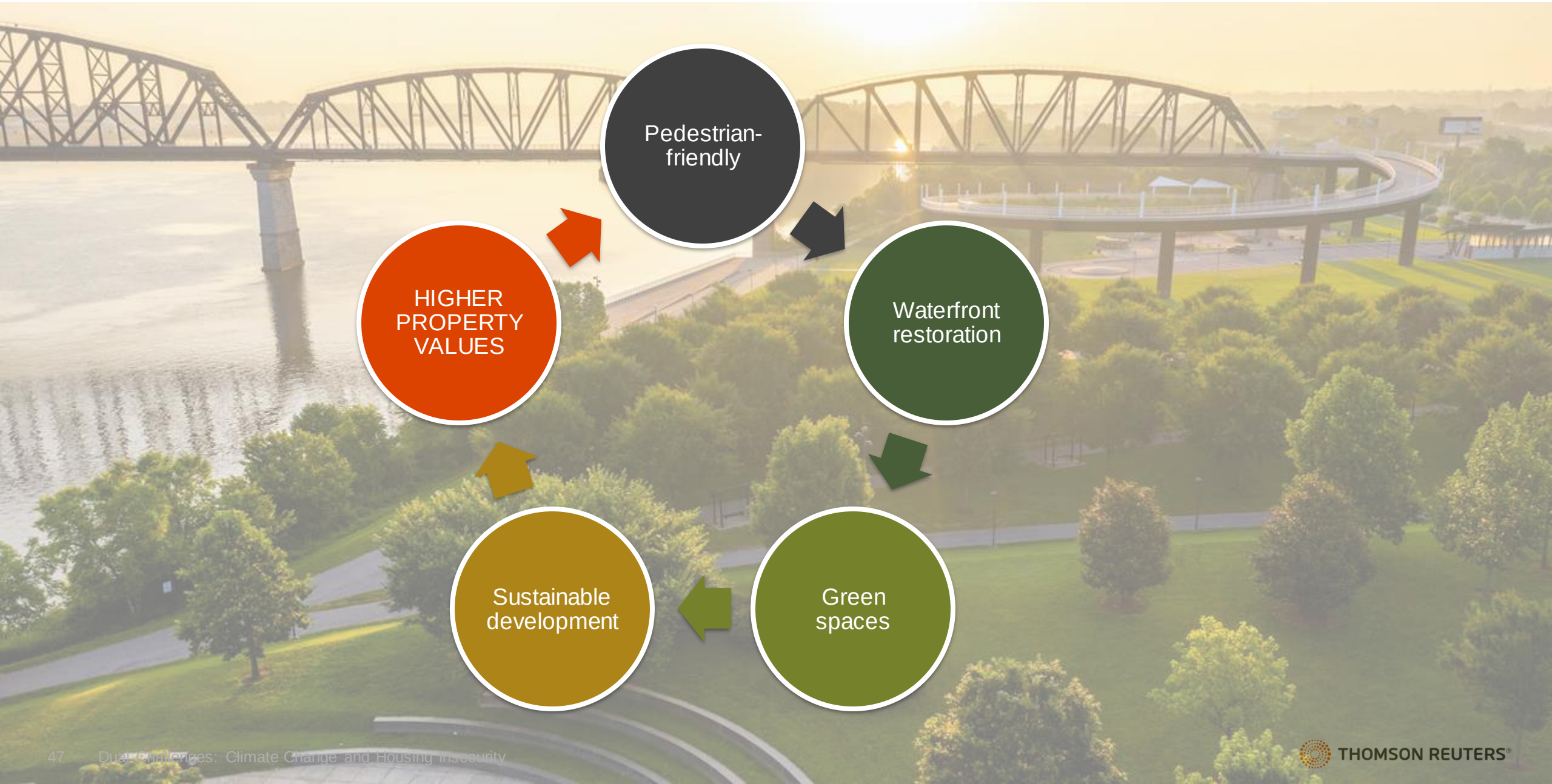
Property uses that are more efficient and less wasteful



More cohesive neighborhoods

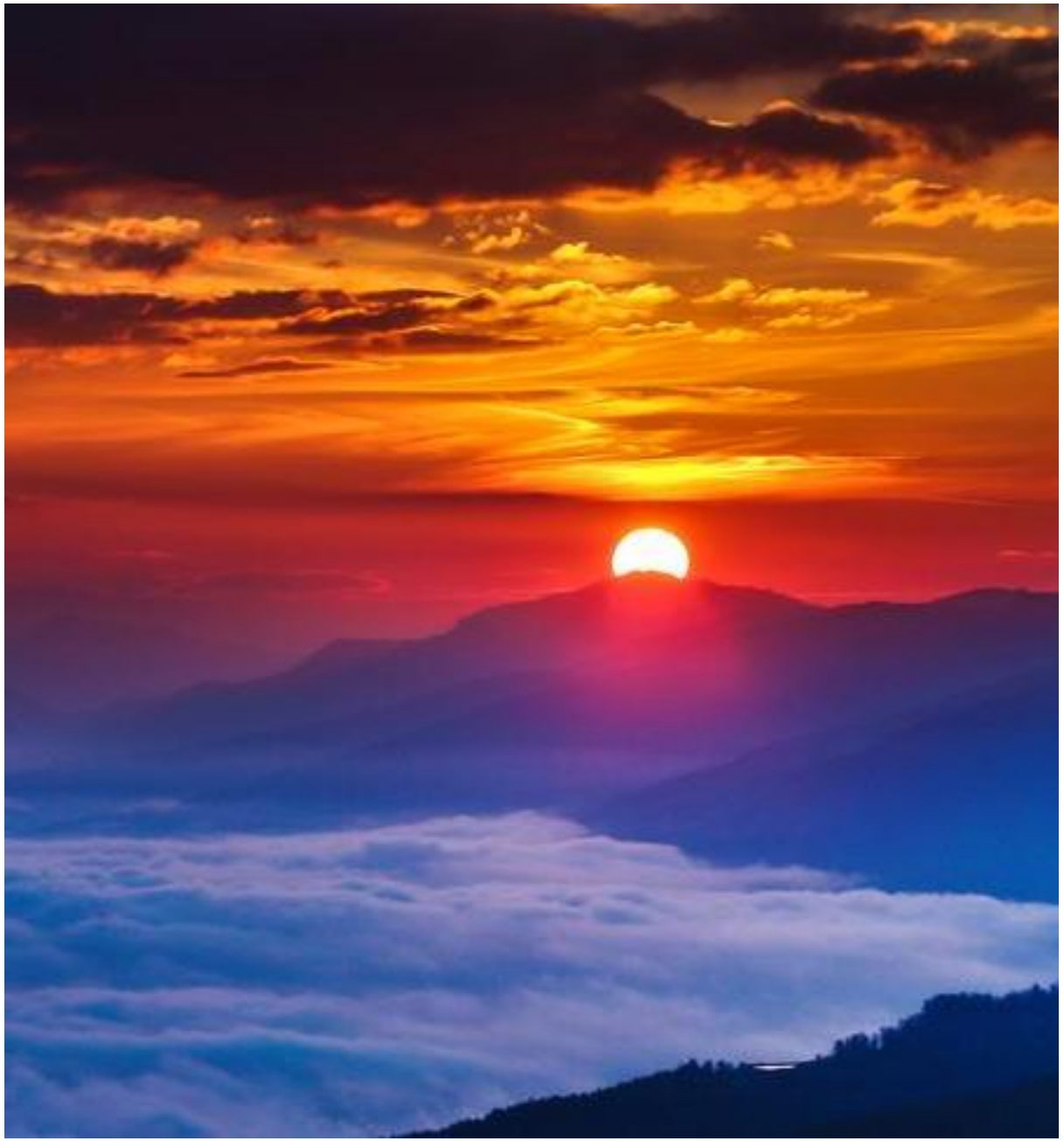
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The risk of climate gentrification



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How to be a resilient community



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US Climate Resilience Toolkit

- Website managed by NOAA's Climate Program Office
- One-stop shopping for tools and resources for building climate resilience
- Includes:
  - "Steps to Resilience" framework
  - Case studies



Video: Building Resilience: Getting Started

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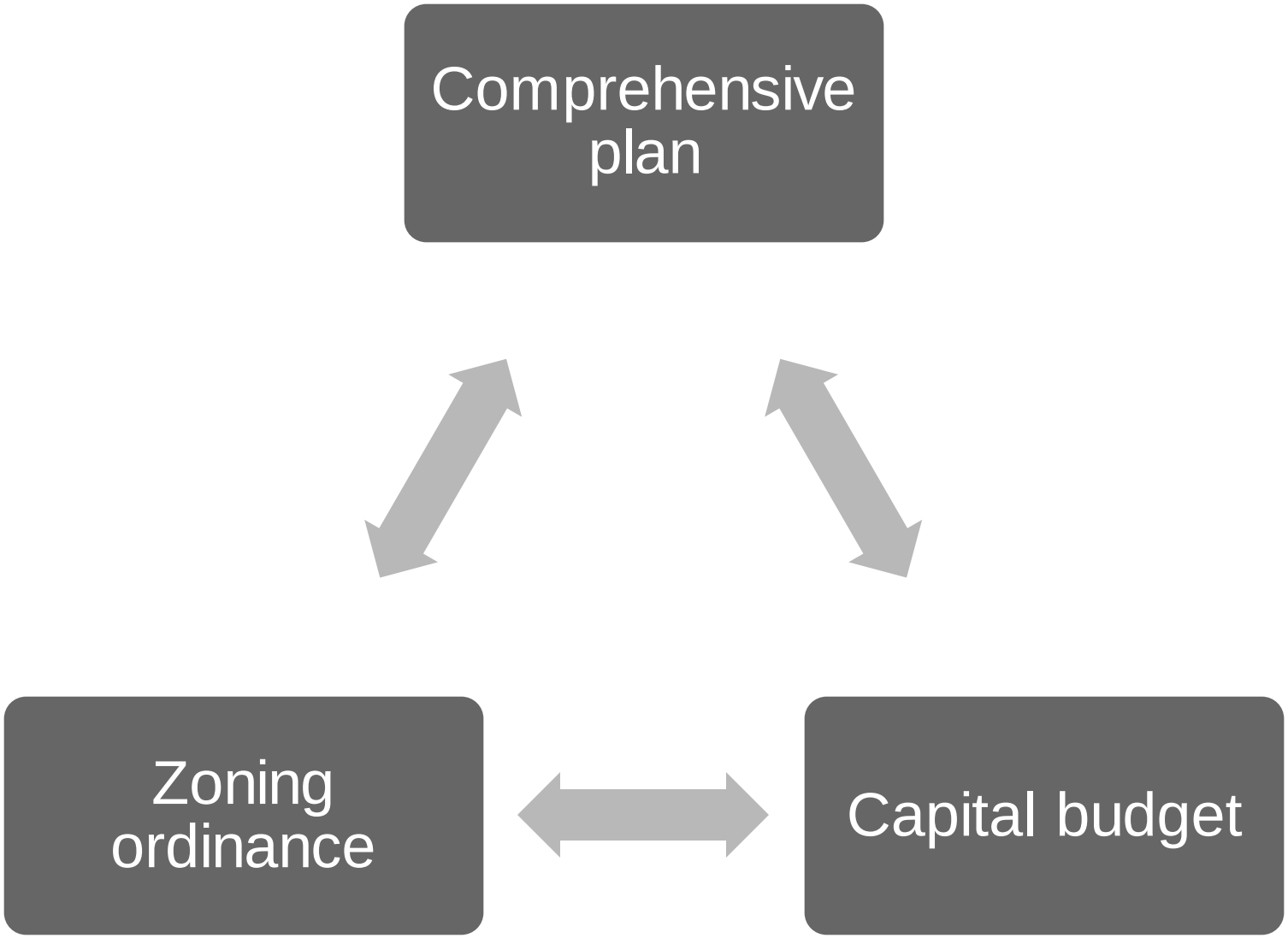
Steps to Resilience

From the US Climate Resilience Toolkit



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Planning and budgetary effects



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Climate action plans

Adopted by:

- Over 600 local governments in US (Brookings)
- 35 of the 50 largest cities in US (Ballotpedia)

Recent examples:

City/Name of Plan	Key Goals
Austin Climate Equity Plan	Net zero GHG emissions by 2040
Columbus Climate Action Plan	45% GHG reduction by 2030 (from 2013); carbon neutral by 2050
Memphis Area Climate Action Plan	51% GHG reduction by 2035 (from 2016); 71% by 2050
Miami Forever Carbon Neutral	60% GHG reduction by 2035 (from 2018); net zero by 2050
Raleigh Community Climate Action Plan	80% GHG reduction by 2050 (from 2007)
San Francisco's Climate Action Plan 2021	61% GHG reduction by 2030 (from 1990); net zero by 2040

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Climate action plans – not just for big cities

Beaverton, OR – pop. 98,567

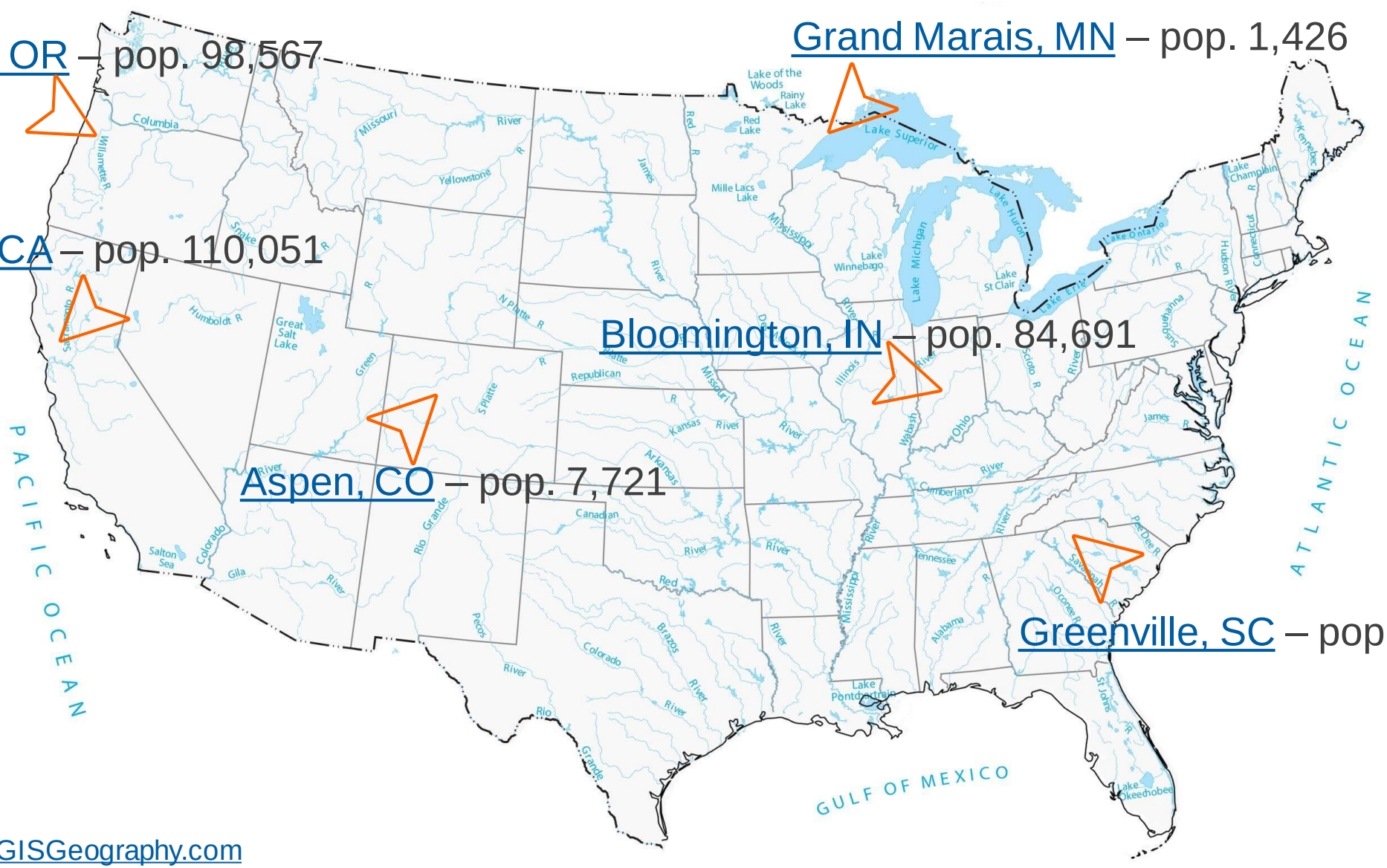
Grand Marais, MN – pop. 1,426

Richmond, CA – pop. 110,051

Bloomington, IN – pop. 84,691

Aspen, CO – pop. 7,721

Greenville, SC – pop. 69,648

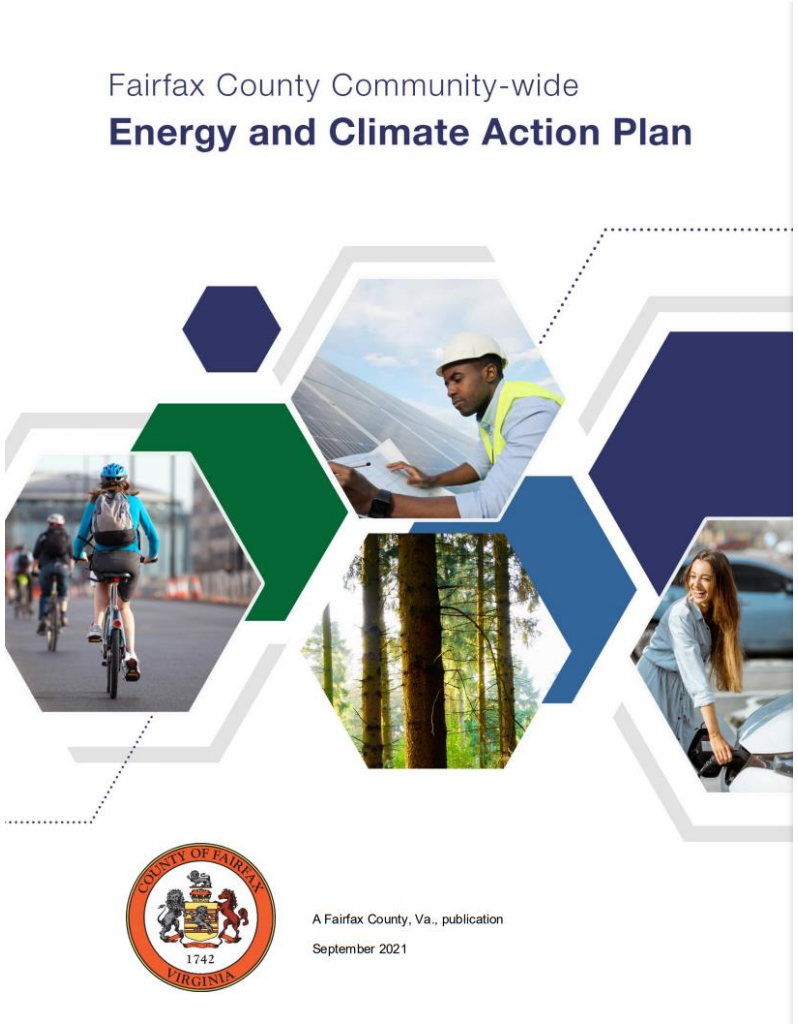


GISGeography.com

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A climate action plan example

Fairfax County, Virginia

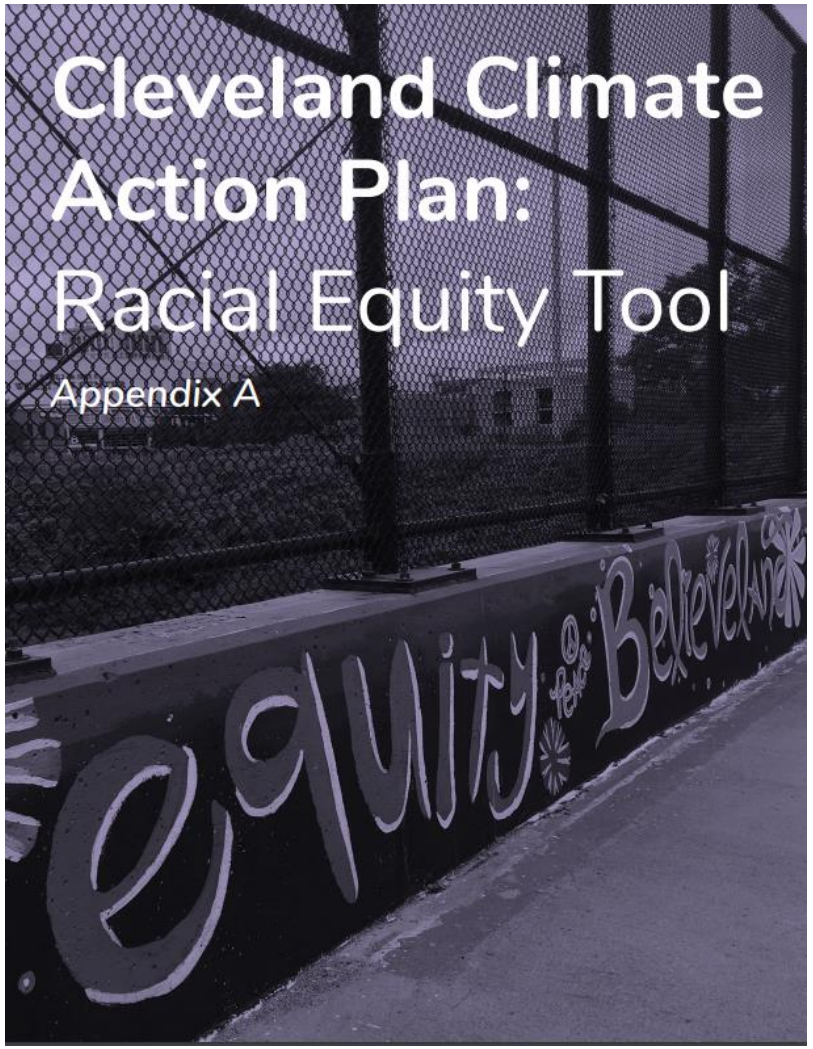


Goals include:

- By 2030:
  - retrofitting at least 100,000 housing units with energy efficiency measures
  - expanding tree canopies to 60%, with a minimum of 40% tree canopy coverage in every census block

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Cleveland's Racial Equity Tool



(Click above to link to online document.)

- Promotes equity in climate planning decisions
- Used to analyze each climate action objective and corresponding actions
- Goals include:
  - Shared economic prosperity and inclusion
  - Improved health
  - Resilient and vital neighborhoods
  - Engaging communities of color and under-represented populations

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Honolulu's big picture approach

[O'ahu Resilience Strategy]



PILLAR I.

Remaining Rooted

Ensuring an Affordable Future for Our Island

- Goal 1: Supporting Affordable Housing Development
- Goal 2: Reducing Additional Cost Burdens
- Goal 3: Improving Economic Opportunity



PILLAR II.

Bouncing Forward

Fostering Resilience in the Face of Natural Disasters

- Goal 1: Pre-Disaster Preparation
- Goal 2: Effective Disaster Response
- Goal 3: Successful Disaster Recovery



PILLAR III.

Climate Security

Tackling Climate Change by Reducing Emissions and Adapting to Impacts

- Goal 1: Clean Energy Economy
- Goal 2: Clean Ground Transportation
- Goal 3: Climate Resilient Future



PILLAR IV.

Community Cohesion

Leveraging the Strength and Leadership of Local Communities

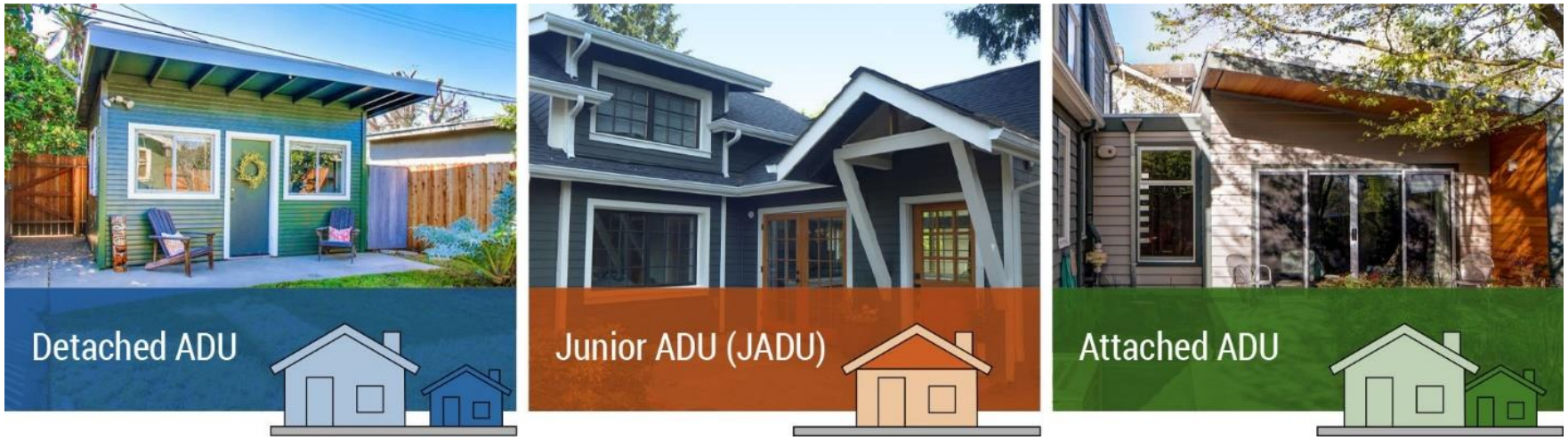
- Goal 1: Empower Grassroots Resilience Champions
- Goal 2: Communicate and Affirm Island Values
- Goal 3: Island-Wide Alignment

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New approaches to planning and zoning

Addressing the effects of single-family large-lot zoning

- Some state laws and local zoning allow for two or more homes on lots previously limited to single family
- Aimed primarily at affordability but has overlapping environmental benefits
- States requiring cities to allow accessory dwelling units (to varying extents):
  - California, New Hampshire, Oregon, Washington, Vermont



(Town of Truckee: Town of Truckee Accessory Dwelling Unit Program)

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Cities taking on the challenge of higher density

Three examples

- Minneapolis 2040 Plan - Allows up to 3 units on lots previously limited to SFRs
- Portland's Residential Infill Project - "Deep affordability bonus" allows up to 6 units on a site when half are affordable for low-income households
- Lexington, Massachusetts:
  - New state law requires 177 communities to allow multifamily near transit stops
  - Lexington is first in the state to comply
  - Approved changes to allow multifamily on 227 acres near public transit
  - Nearly triple the 80 acres required by law

(See Massachusetts Municipal Association: Lexington OK's MBTA communities zoning well ahead of schedule.)

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Holistic solutions from Canada

From Tamarack Institute: The Intersection of Housing Affordability and Climate Action

Converting vacant buildings	• See Obsolescence as an Opportunity: The Role of Adaptive Reuse in Calgary's Office Market (University of Calgary)
Retrofitting	• See Green Municipal Fund: Sustainable Affordable Housing
Passive houses	• See Housing Observer: Passive Approaches to Low-Energy Affordable Housing
Inclusionary zoning	• See City of Toronto: Inclusionary Zoning Policy
Backyard homes	• See City of Victoria: Garden Suites

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Stretch codes (a/k/a reach codes)



Go beyond other building code standards



Emphasize higher energy savings (see New Buildings Institute: Stretch Codes)



States that encourage cities to adopt stretch codes:

- Massachusetts
- Maine
- New York
- Vermont
- Oregon



Other cities have been proactive (see Santa Monica: Climate Friendly Buildings)

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Stretch code costs vs. benefits

- Builders and homeowners may qualify for rebates or incentives (for example, see Massachusetts Energy Rebates & Incentives)
- Homeowners/residents save money on utility costs (see Massachusetts: Residential Stretch Code Costs and Benefits Case Studies)
- New York's analysis:

NYStretch–Average Residential Savings, Costs, and Payback

Building Type	Annual Energy Cost Savings ($/home)*	Incremental Cost of Construction ($/home)*	Simple Payback (years)*
Single Family Home	$348	$2,057	5.9
Multifamily Unit	$171	$1,591	9.3
Weighted Average NY State	**$278**	**$1,795**	**6.4**

*Results will vary depending on building and construction type and location in NY State.

From New York: NYStretch Energy Code – Frequently Asked Questions

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Tacoma's Priority Review Program

- Priority permit review for projects that:
  - have ≥10 housing units with 20% reserved as affordable
  - incorporate sustainable development features
- Eligible green building programs:
  - BuiltGreen
  - Passive Hours Institute US
  - LEED
  - Living Building Challenge
  - Green Globes



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Providence's Smith Hill neighborhood



- Economically disadvantaged neighborhood
- Challenged by:
  - affordable housing shortage;
  - poor health outcomes;
  - safety and quality of life outcomes
- Bisected by busy arterial
- Located near four major highways
- Susceptible to climate change due to:
  - impervious pavement;
  - limited tree canopy;
  - brownfield sites;
  - flooding potential

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Smith Street Revitalization Plan

- Published in 2020
- Selected as Thriving Communities Program recipient in 2023
- Will help identify opportunities for safer streets, affordable housing, community resilience





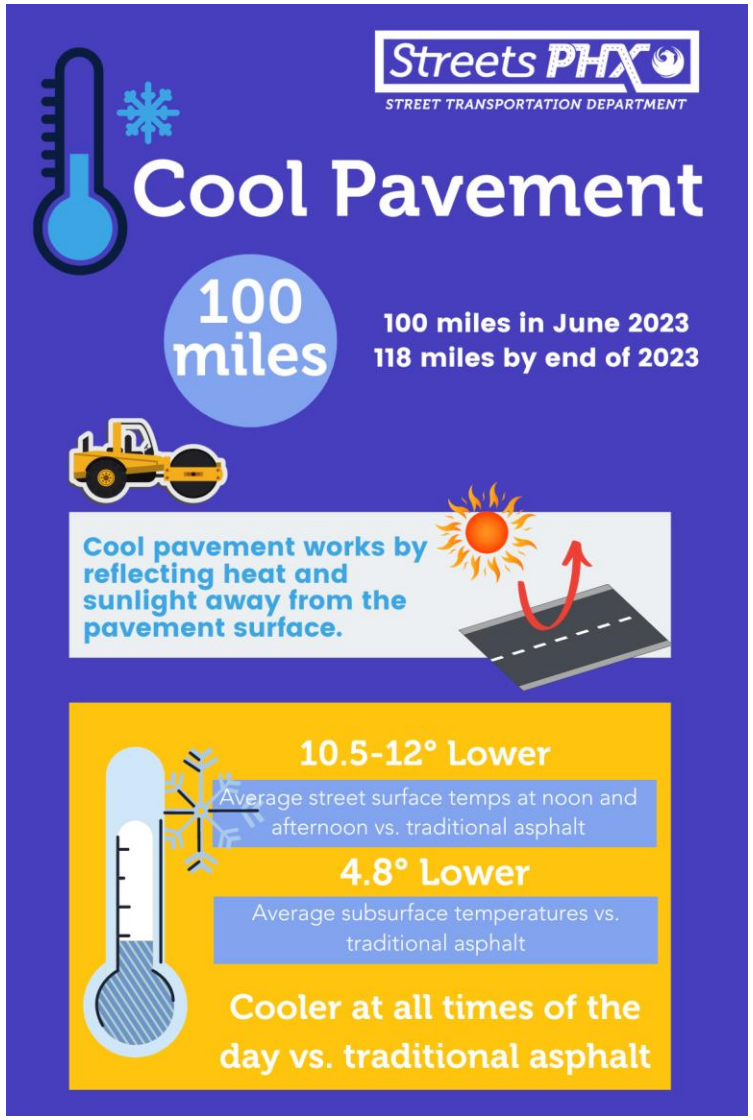
Community priorities include:

- Mixed-income housing on key sites
- Redevelopment of vacant properties as parks, plazas, and community gardens
- Road safety and connectivity improvements

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Cool pavement programs

Using paving materials that reflect rather than absorb sunlight



- Surface temps lowered up to 12°F in Phoenix
- Other cities with pilot programs:
  - San Antonio
  - Nashville
- Permeable pavements can also reduce stormwater runoff
- More information - EPA: Using Cool Pavements to Reduce Heat Islands

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Funding your community's solutions

Affordable housing funding

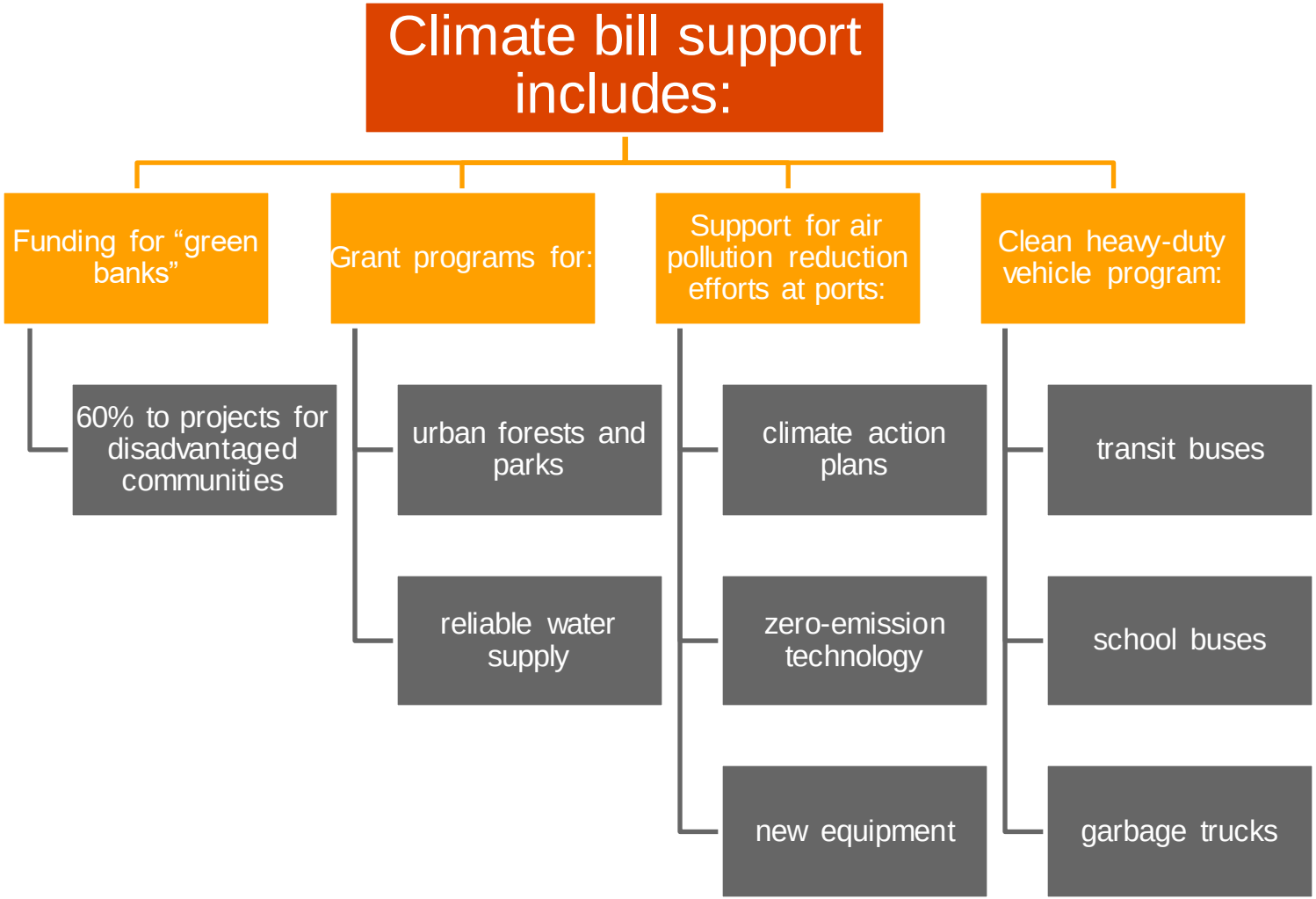
Federal, state, local, and private programs provide funding for:

- Developing new affordable housing
- Rehabilitating and preserving existing affordable housing
- Assisting persons in need of housing

More information: Practice Note, Affordable Housing Issues for Local Government: Sources of Funding (included with IMLA Conference materials)

Climate provisions in the Inflation Reduction Act

Help for state, local, and tribal governments



Source: Governing Magazine; see also Columbia Law School: Cities & The Inflation Reduction Act

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Bipartisan Infrastructure Law funding

Thriving Communities Program

- Administered by US Department of Transportation
- Assists disadvantaged and under-resourced communities
- Provides planning, technical assistance, and capacity building support
- Advances infrastructure projects that will:
  - increase mobility
  - reduce pollution
  - expand affordable transportation options
  - strengthen resilience





EPA funding for:

- Combatting the climate crisis
- Advancing environmental justice

More information: EPA: Bipartisan Infrastructure Law

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Justice40 Initiative

- Commitment by federal government to allocate 40% of certain programs to disadvantaged communities
- Categories of investments:
  - climate change
  - clean energy and energy efficiency
  - clean transit
  - affordable and sustainable housing
  - training and workforce development
  - remediation and reduction of legacy pollution
  - clean water and wastewater infrastructure
- Federal agencies use Climate and Economic Justice Screening Tool to assess needs
- More information: White House: Justice40

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Knowing your role

The municipal attorney's role

- Know the scope and limits of your city's authority
  - what state law allows and what it preempts
- Prepare/review legal documents
  - ordinances and resolutions
  - contracts
  - policies and procedures
  - rules and regulations
- Ensure compliance with grant requirements
- Provide legal perspective and analysis for new initiatives
- Keep up with changes in federal and state law
- Prosecute code violations



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Legal implications of local government climate action

Where the city attorney's assistance may be needed

- Acquiring property/eminent domain
- Intergovernmental agreements
- Grant funding
- Affordable housing/environmental justice
- Zoning regulations/building codes

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REUTERS / Kim Kyung-Hoon

Climate change and legal ethics

Attorney's role as advisor

ABA Model Rules of Professional Conduct, Rule 2.1:

> *In representing a client, a lawyer shall exercise independent professional judgment and render candid advice. In rendering advice, a lawyer may refer not only to law but to other considerations such as moral, economic, social, and political factors that may be relevant to the client's situation.*

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Practical Law Resources

- Addressing Climate Change Effects in State and Local Government Toolkit
- Climate Change Laws and Legal Updates Toolkit
- Practice Note, Climate Change Mitigation in Local Government
- Practice Note, Financing US Infrastructure Projects: Federal Grant Programs
- Practice Note, Green Bonds and Local Infrastructure Projects
- Practice Note, Affordable Housing Issues for Local Government
- Article, Local Governments and the Inflation Reduction Act
- Standard Document, State and Local Government Emergency Proclamation: Flooding
- Standard Document, State and Local Government Emergency Proclamation: Drought
- Glossary of Decarbonization Terms (October 2022)

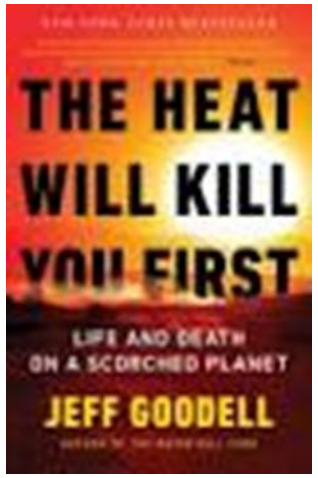


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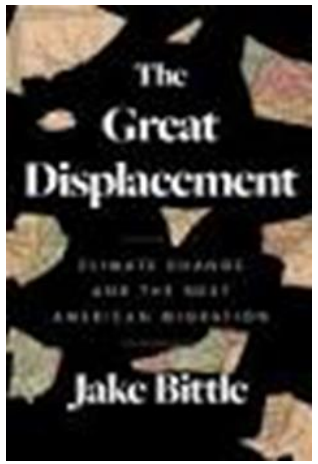
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Other suggested reading and viewing



The Heat Will Kill You First: Life and Death on a Scorched Planet
Jeff Goodell (Little, Brown & Company)



The Great Displacement: Climate Change and the Next American Generation
Jake Bittle (Simon & Schuster)



Rebuilding Paradise
(documentary by Ron Howard, available on Hulu, YouTube)



PBS Terra: Weathered
(video series)



Climate Town
(video series)

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One last thought

Dinosaurs vs. humans

Dinosaurs:

- **Lived on Earth 165 million years**
- **Died out after an asteroid struck Earth**
- **There was nothing that they:**
  - **did to make that happen; or**
  - **could have done to stop it**

REUTERS / Djordje Kojadinovic





Humans:

- **Have lived on Earth about 200,000 years**
- **Climate change threatens our existence**
- **There are lots of things that we:**
  - **did to make it happen; and**
  - **can do to slow it down**

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