



Improving Urban Heat Planning and Media Coverage of Extreme Heat

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Extreme Heat

Impacts of extreme heat

- Public health
- Quality of life
- Economy
- Energy and water usage
- Infrastructure and urban systems
- Urban landscapes
- Agriculture
- Rural and natural lands

US heatwave sees hospitals use body-bag ice treatment

© 19 July



Climate change



REUTERS



LIVE, LOCAL, LATE BREAKING

HEAT IMPACTS ARIZONA AGRICULTURE

13 NEWS

HIGH TEMPERATURES TAKING TOLL ON VINEYARDS

100° | 5:14



HEADLINES: Astated as wildfires wreak havoc on Maui

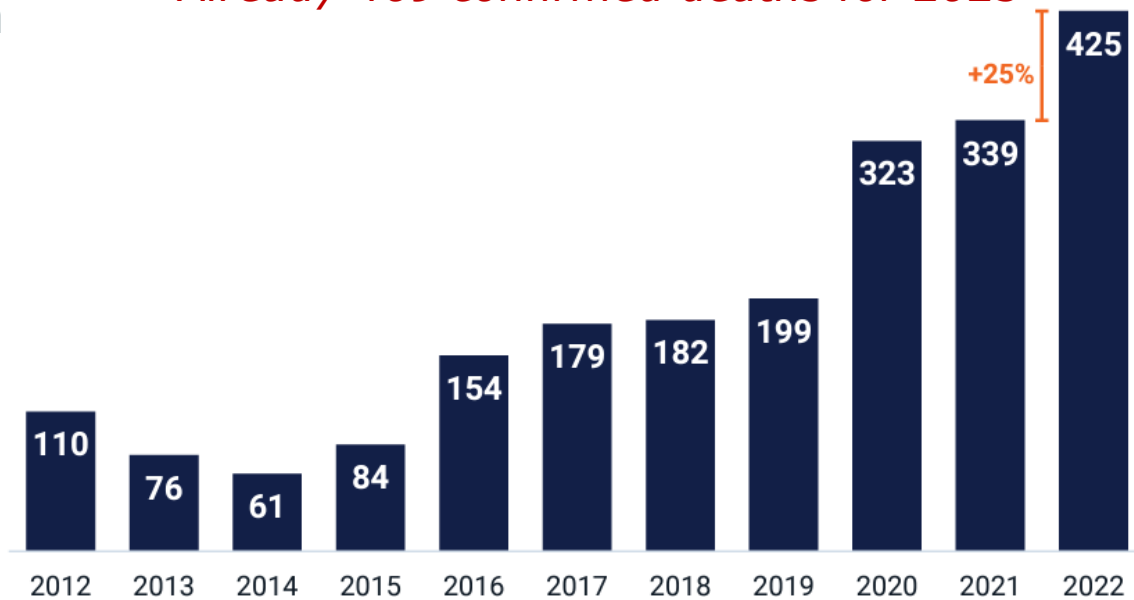
COCHISE | FLOOD ADVISORY

Extreme Heat

Public health impacts

- Heat is the #1 weather-related cause of death in the U.S.
- Heat illnesses and deaths are widely acknowledged to be underreported
- At least 3,200 heat deaths from heat exposure in Arizona from 2012-2022

Heat-Associated Deaths in Maricopa County
Already 469 confirmed deaths for 2023



(Maricopa County, 2023)

Extreme Heat

Pima County Heat-Related Deaths

- 163 confirmed heat-related deaths to date for 2023
 - 44 were undocumented border crossers (UBCs)
 - Out of the 119 non-UBCs, 39% indoor and 61% outdoor
 - 40 of those 119 were people experiencing homelessness
- Pima County had 54 non-UBC heat-related deaths in 2022, which was the record-high
- ***Pima County has seen heat-related deaths more than double this year***

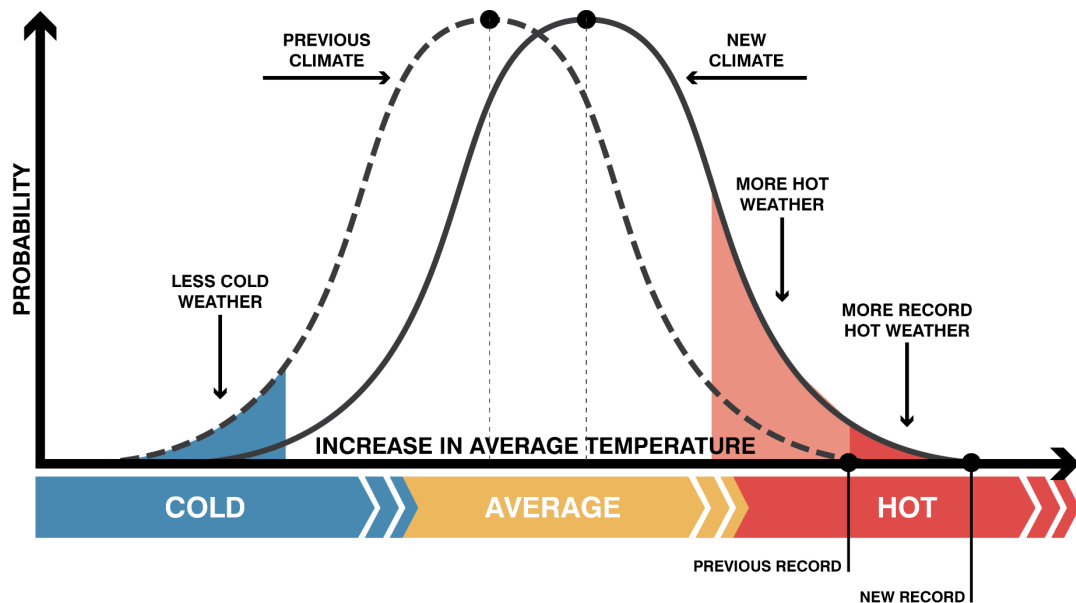


Extreme Heat

An increasing hazard

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

- Weather
- Climate change
- Urban heat island (UHI) effect

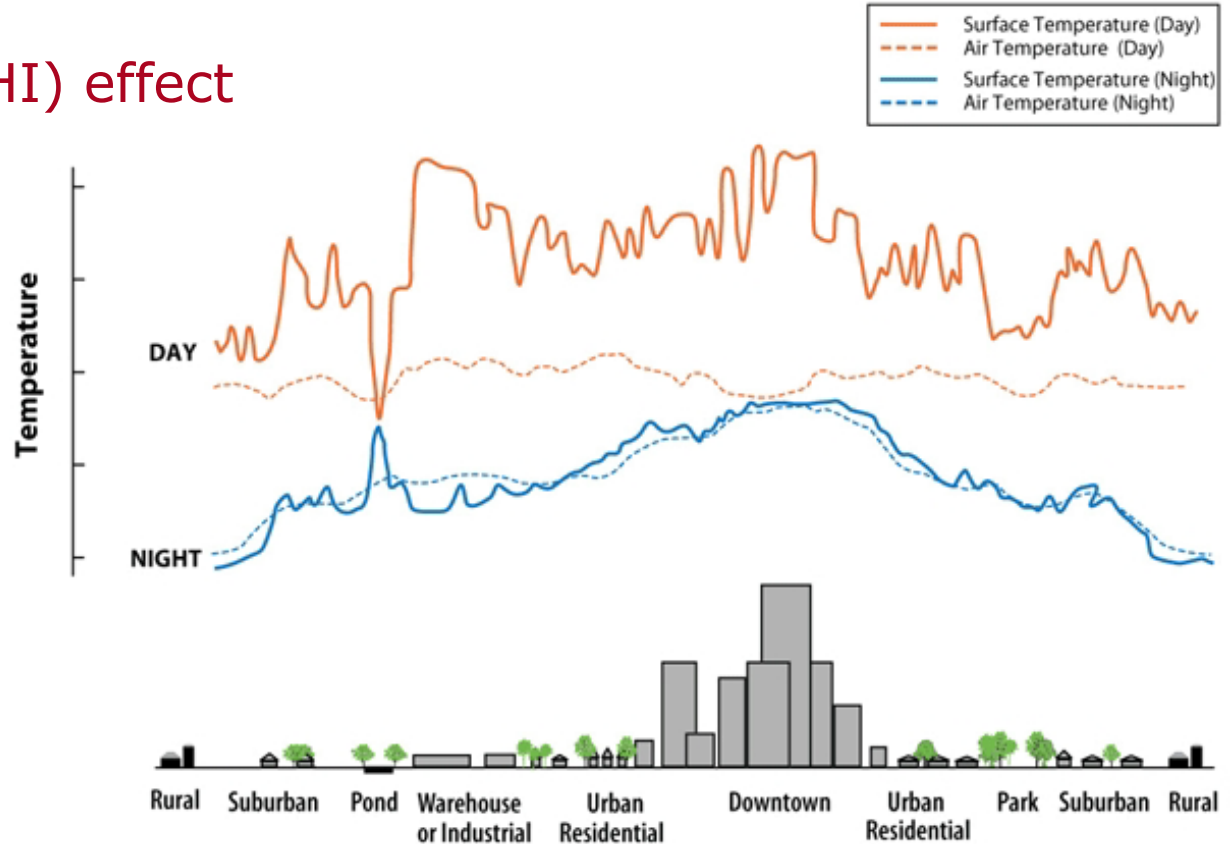


(Keith & Meerow, 2022, adapted from U.S. EPA)

Extreme Heat

Urban heat island (UHI) effect

- Land use and cover change
- Urban form
Building height, density, and arrangement
- Building materials and reflectivity
- Vegetation and humidity
- Waste heat emissions
- Air pollution



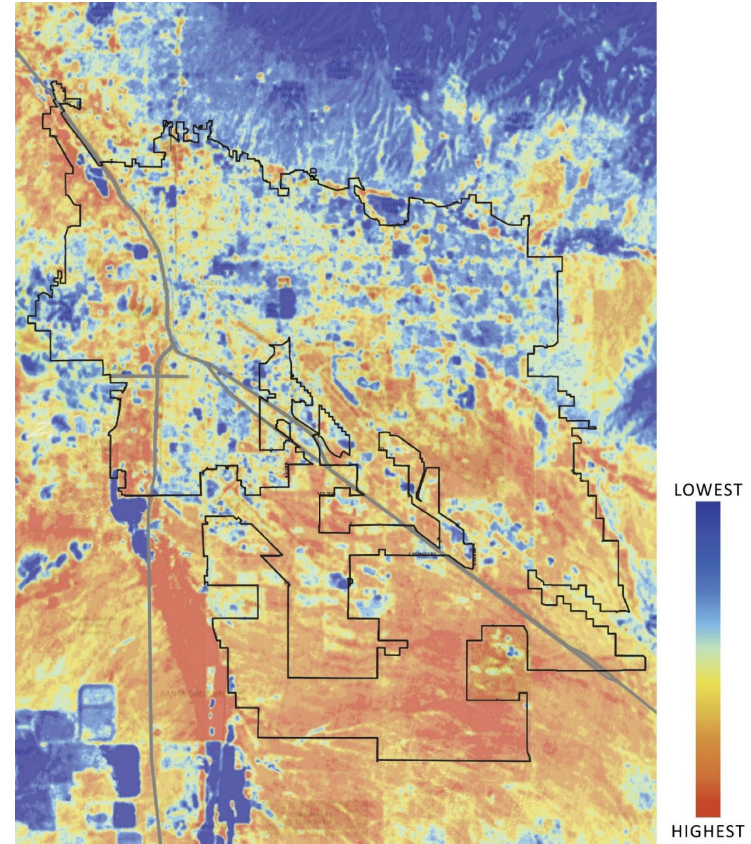
(U.S. EPA)

Extreme Heat

Pima Association of Governments' Resiliency Planning Maps

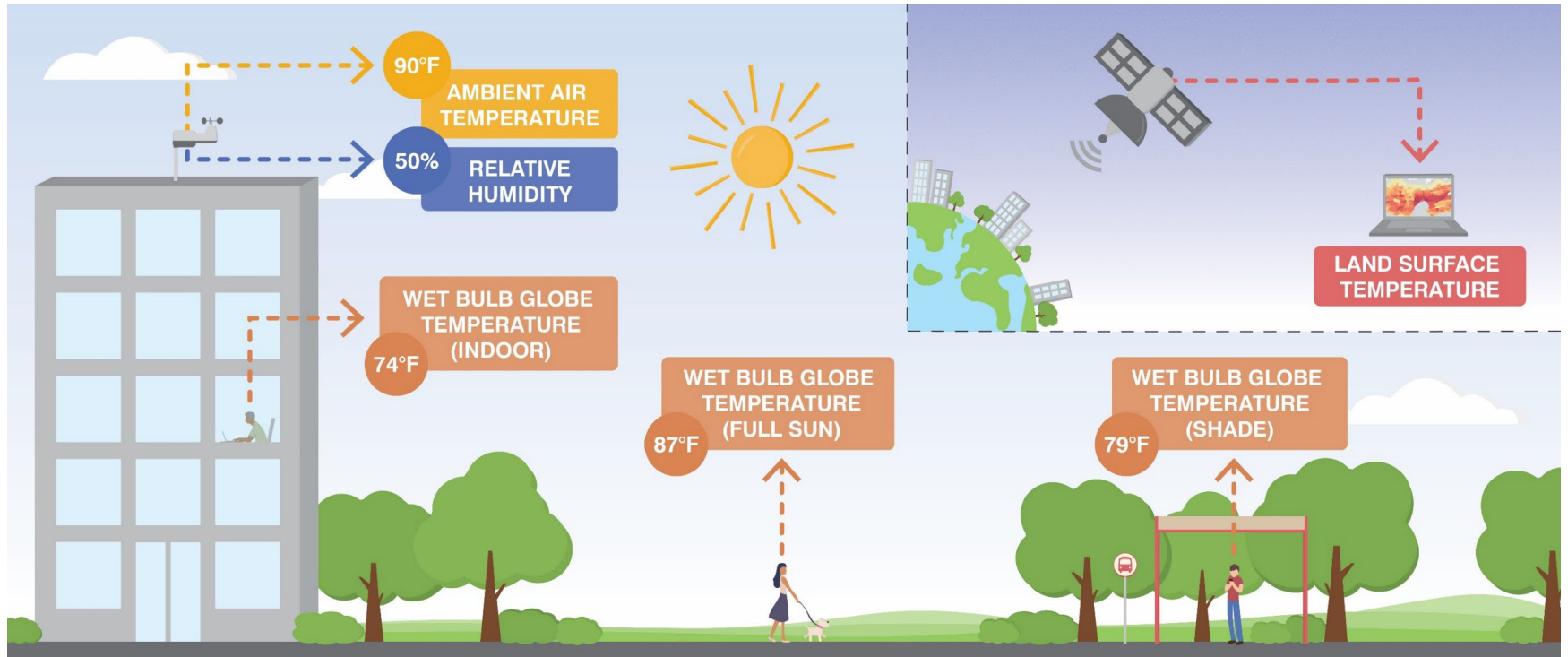
- Heat severity map
- CDC Social Vulnerability Index
- Cooling centers, hydration stations, and splash pads
- Urban forestry and green infrastructure priority areas

maps.pagregion.com/PAG-GIMap/



Extreme Heat

Complexities of urban heat



Extreme Heat

Inequities of urban heat

- Urban heat is not equally distributed, lower-income and minority neighborhoods are often the hottest areas in cities
- Affordability and accessibility of:
 - Healthcare
 - Housing and quality housing
 - Energy for indoor cooling
 - Transportation



Top: Sam Hughes, Tucson, AZ
Bottom: Southside, Tucson, AZ

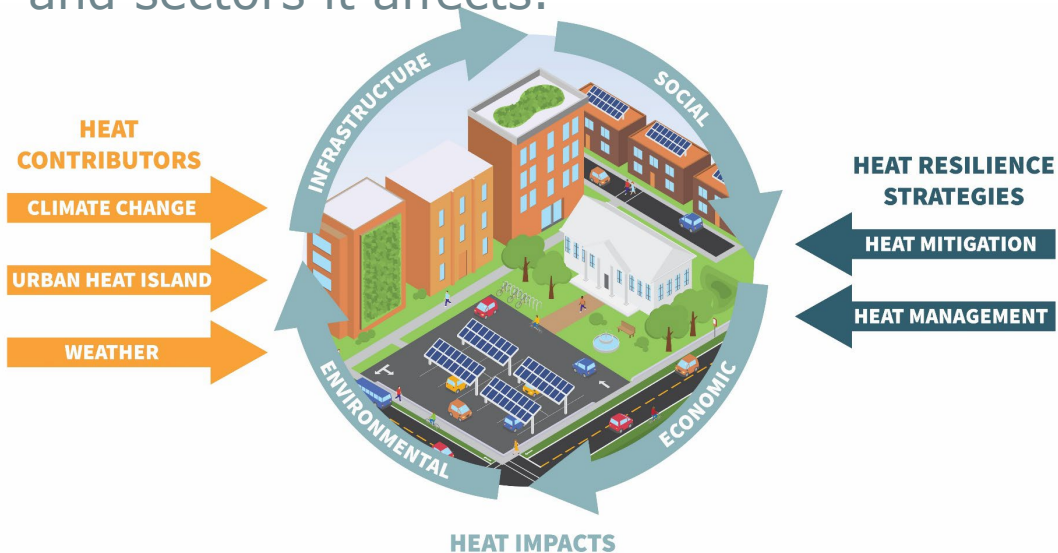


(Google)

Planning for Urban Heat Resilience

Urban heat resilience

“Proactively mitigating and managing urban heat across the many systems and sectors it affects.”



tinyurl.com/urbanheatresilience

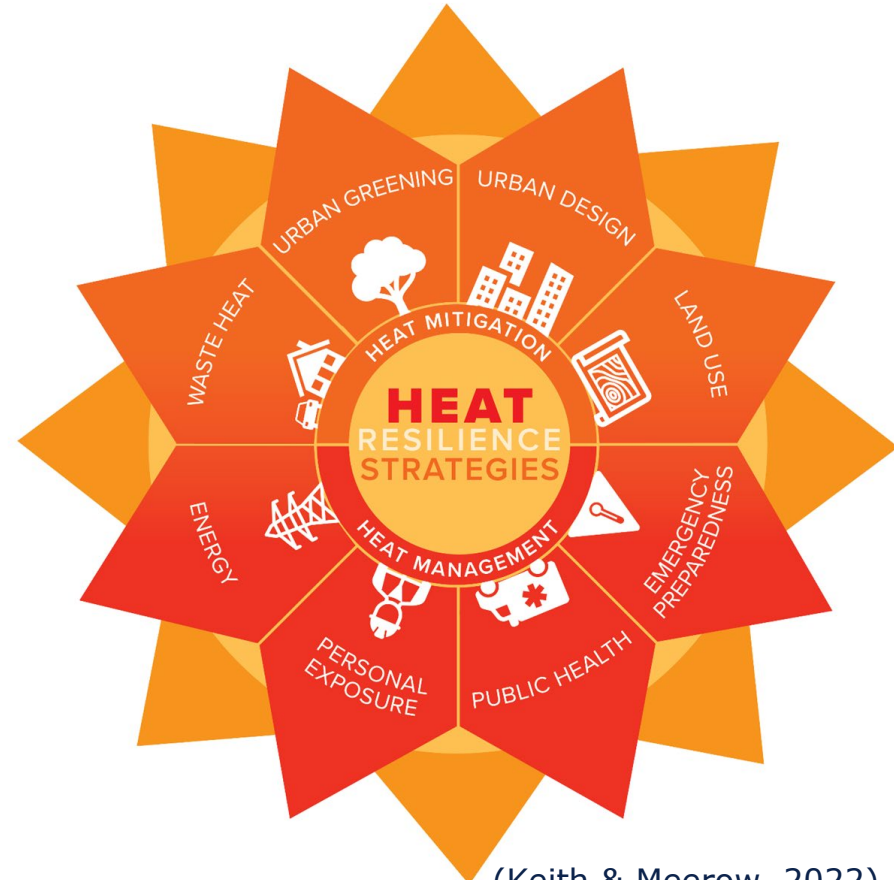
Planning for Urban Heat Resilience

Heat mitigation

Strategies that reduce the built environment's contribution to urban heat.

Heat management

Strategies that prepare and respond to chronic and acute heat risk.



(Keith & Meerow, 2022)

Planning for Urban Heat Resilience

Heat mitigation

- Land use (urban development, land conservation, transportation)
- Urban design (shade structures, cool materials)
- Urban greening (urban forestry, parks, green infrastructure)
- Waste heat (buildings, vehicles)



(Keith & Meerow, 2022)

Planning for Urban Heat Resilience

Heat management

- Cooling centers / resilience hubs
- Weatherization and energy assistance programs
- Early warning systems
- Heat education and awareness campaigns
- Occupational safety guidance and regulations
- Energy grid resilience

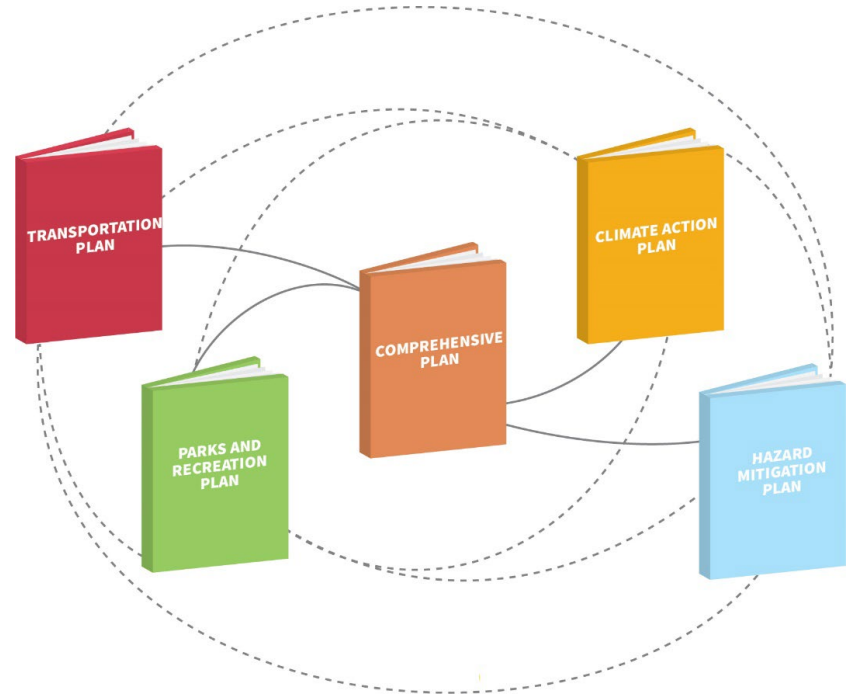


(Keith & Meerow, 2022)

Planning for Urban Heat Resilience

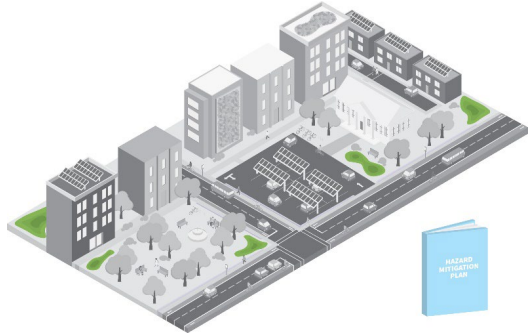
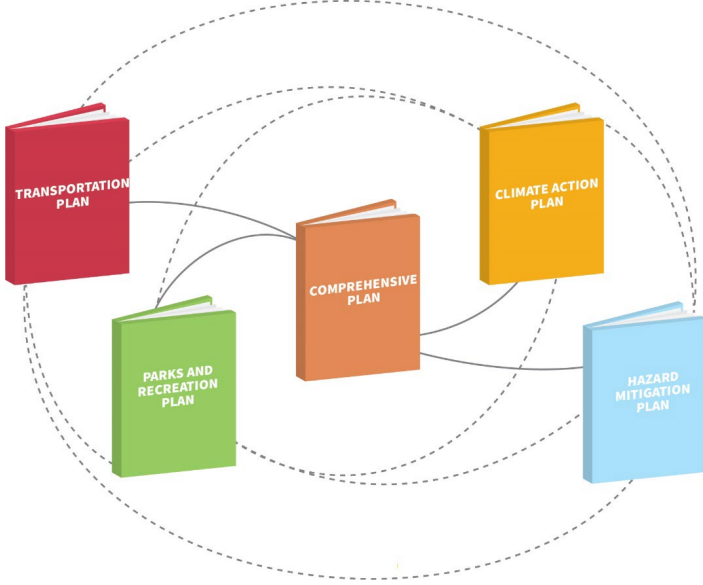
Network of plans

- Collection of community plans that shape the built environment (Berke et al., 2006)
- These plans are rarely coordinated (Berke et al., 2019; Woodruff et al., 2022):
 - Missed opportunities to reduce conflicting priorities
 - Reduced or even negative effects on hazard planning outcomes



(Keith & Meerow, 2022)

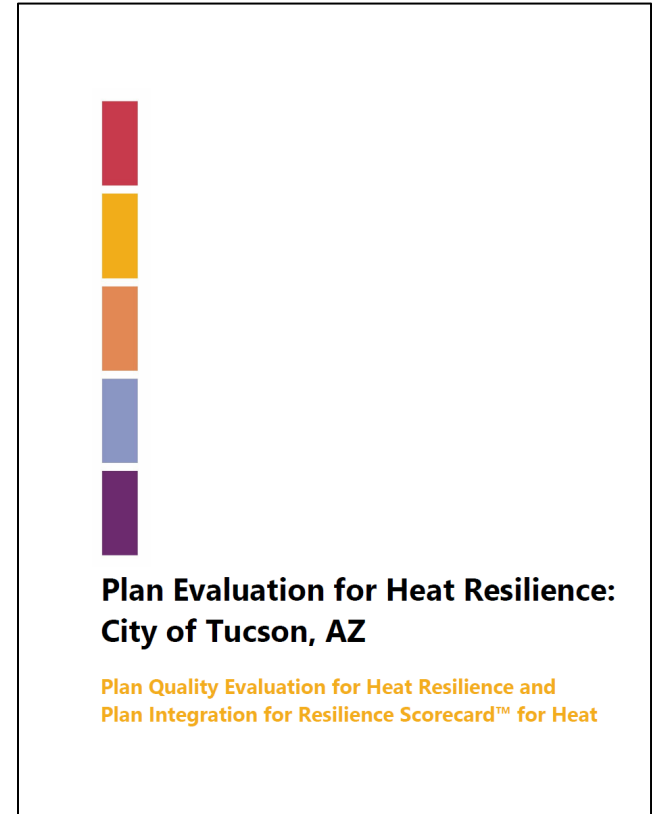
Network of plans



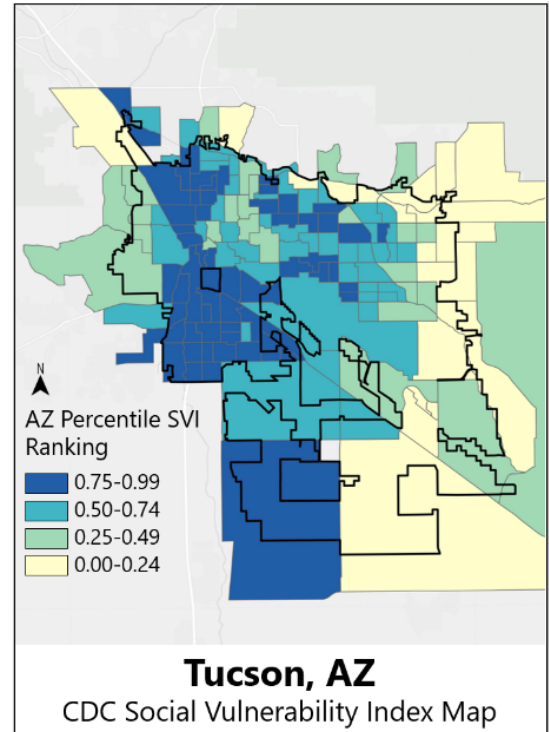
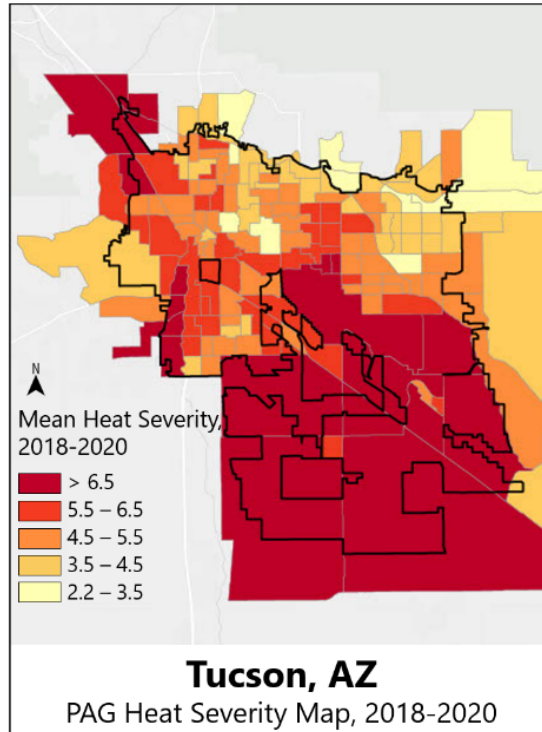
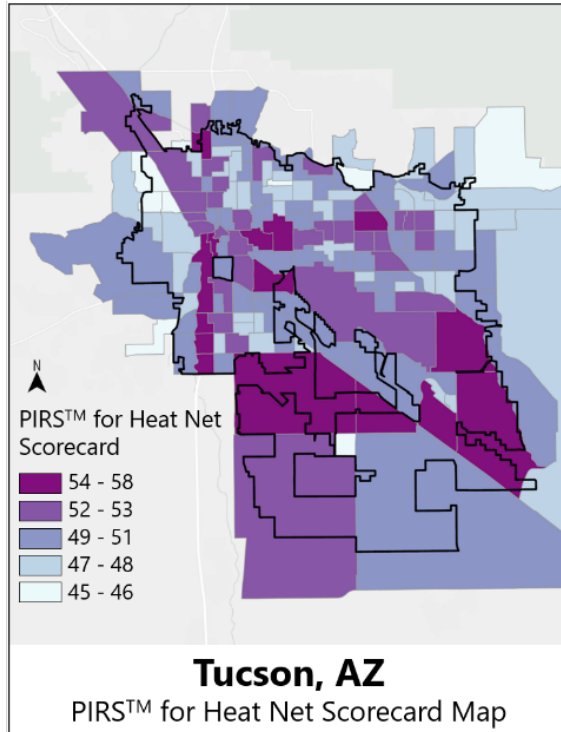
(Keith & Meerow, 2022)

Plan Evaluation for Heat Resilience: City of Tucson, AZ

- Project of the Southwest Urban Corridor Integrated Field Laboratory (SW-IFL)
- Completing plan analysis for heat resilience for cities across the Arizona urban corridor
- Assessing plans now and again in five years to see change over time
- Analyzing plans for both *plan integration*, *plan quality*, and *heat resilience strategies*



Plan Integration Results



Found a correlation between PIRS™ for Heat net score and heat severity, not for vulnerability (although vulnerability and heat are correlated)

Plan Quality Results

Criteria	City of Tucson General & Sustainability Plan	Pima County Multi-Jurisdictional Hazard Mitigation Plan	Tucson Resilient Together Climate Action and Adaptation Plan
Goals	50%	67%	100%
Fact Base	50%	67%	75%
Strategy Identification	40%	40%	60%
Implementation and Monitoring	64%	100%	91%
Coordination	88%	63%	63%
Public Participation	100%	57%	100%
Uncertainty	0%	57%	43%
Overall Plan Quality	57%	68%	77%

Newer plans are generally increasing in quality (not just in Tucson!)



Heat Strategies Evaluation

Criteria		City of Tucson General & Sustainability Plan	Pima County Multi-Jurisdictional Hazard Mitigation Plan	Tucson Resilient Together Climate Action and Adaptation Plan
Mitigation Strategies	Land Use			
	Ventilation corridors			
	Land conservation	✓ ✓	✓ ✓	✓
	Urban Development Patterns	✓ ✓		
	Roadways and parking lots	✓ ✓		✓ ✓
	Urban Design			
	Built shade structures			✓ ✓
	Cool pavements		✓ ✓	✓ ✓
	Building shape and massing			✓
	Building and street orientation			
	Urban Greening			
	Vegetated parks and open spaces	✓	✓ ✓	✓
	Green roofs and walls			✓ ✓
	Urban forestry	✓ ✓	✓ ✓	✓ ✓
	Water features			✓ ✓
	Green stormwater infrastructure	✓ ✓	✓ ✓	✓ ✓
	Waste Heat			
	Building waste heat reduction programs	✓ ✓		✓ ✓
	Vehicle waste heat reduction	✓		✓ ✓
	Cool roofs and walls			✓ ✓

Heat Strategies Evaluation

Criteria	City of Tucson General & Sustainability Plan	Pima County Multi-Jurisdictional Hazard Mitigation Plan	Tucson Resilient Together Climate Action and Adaptation Plan
Emergency Preparedness			
Early warning systems			
Heat response plan			✓ ✓
Cooling centers and resilience		✓ ✓	✓
Public Health			
Education and awareness	✓ ✓	✓ ✓	✓
Personal Heat Exposure			
Transit systems operations			✓ ✓
Parks and trails operations			
School operations			
Occupational safety regulations		✓ ✓	✓ ✓
Energy			
Indoor cooling			✓ ✓
Grid resilience			✓
Accessible and affordable energy			



Reporting on Heatwaves and the Health Impacts of Heat

Key Considerations

- Frame heat in the context of climate change
- Highlight actions and solutions
- Acknowledge the unequal impacts of heat
- Give attention to the indirect health impacts of heat



Reporting on Heatwaves and the Health Impacts of Heat
July 2023

At a Glance
Media representations of heatwaves and climate change plays an important role in how the public thinks about, perceives, prepares for and acts on risks to their health, and how decision and policy makers address the problem.

This brief was developed by the Global Heat Health Information Network and partners to provide journalists, editors and others working in the media and communications sector with guidance and perspectives on how extreme heat and heat health narratives and imagery can help save lives and drive action.

Key Considerations

Frame heat in the context of climate change

Every heatwave and extreme heat event in the world is now made stronger and more likely because of human-induced global climate change. There is robust evidence that climate change is increasing the frequency, intensity, and duration of heatwaves worldwide, and these trends are projected to continue for the foreseeable future. Rising average temperatures also lead to increasing chronic heat risk.

It is crucial that journalists and media frame stories about the impacts of rising heat within the context of climate change, both to connect the dots for the audience and to raise awareness that can help drive rapid climate action – addressing both mitigation and management options.

Tip: Consult your National Meteorological Service before attributing heat events to specific global phenomena like El Niño.

Expert Directory

Explore our [online expert directory](#) to identify sources by country, region and topic or connect with our global Network management team for global perspectives for other requests.

Highlight action and solutions

When covering ongoing extreme heat events, reference locally-relevant health advice and available resources. From how to access cooling or resilience centres to tips on low-cost cooling techniques, this information might just save lives.

Also consider highlighting resources that can help individuals and groups reduce their risk in the long-run, such as weatherization and home energy assistance programs or legal protections available to renters. Practical, peer-reviewed information from authentic and reputed sources – such as [The Lancet](#) – can facilitate evidence-based actions.

Specific guidance on actions to manage and adapt to heat at home, at work, in the environment, in the city, and in sports can also be found on our [website](#).

 GLOBAL HEAT HEALTH INFORMATION NETWORK

@hheathealth_info
www.ghhin.org

Reporting on Heatwaves and the Health Impacts of Heat

Practical recommendations, such as:

- Instead of waiting for an extreme heat event to begin or end before publishing coverage, create awareness in advance – both seasonally and before a projected heat event.
- Instead of focusing on heat only in outdoor settings, remember that indoors can be hotter than outdoors, and excess indoor heat is deadly.
- Instead of showing scenes of crowded beaches, swimming pools or fountains, show people struggling in the heat, and its negative and dangerous impacts.



State of Arizona's Extreme Heat Preparedness

Your participation is needed!

- On August 11, 2023, Governor Hobbs declared a State of Emergency due to the record heat and impacts
- The goal is to have a heat plan for the state to implement before next summer
- State is collecting input through a Request for Information on Extreme Heat Preparedness survey
- resilience.asu.edu/rfi-heat



Thank you

Current research programs



Building Resilience Against Climate Effects
(BRACE)



Climate Assessment for the Southwest
(CLIMAS)



Southwest Urban Corridor Integrated
Field Laboratory (SW-IFL)

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