

Arizona Center for Rural Health State Office of Rural Health Webinar Series

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PROGRAM



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THE UNIVERSITY OF ARIZONA
MEL & ENID ZUCKERMAN COLLEGE OF PUBLIC HEALTH

Center for Rural Health

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Audience is muted during the presentation.
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Please fill out the post-webinar survey.
Webinar is being recorded.

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AzCRH www.crh.arizona.edu



THE UNIVERSITY OF ARIZONA
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Center for Rural Health



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Arizona State University

Stories of Extreme Heat



THE UNIVERSITY OF ARIZONA
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Stories of Extreme Heat

April 2023

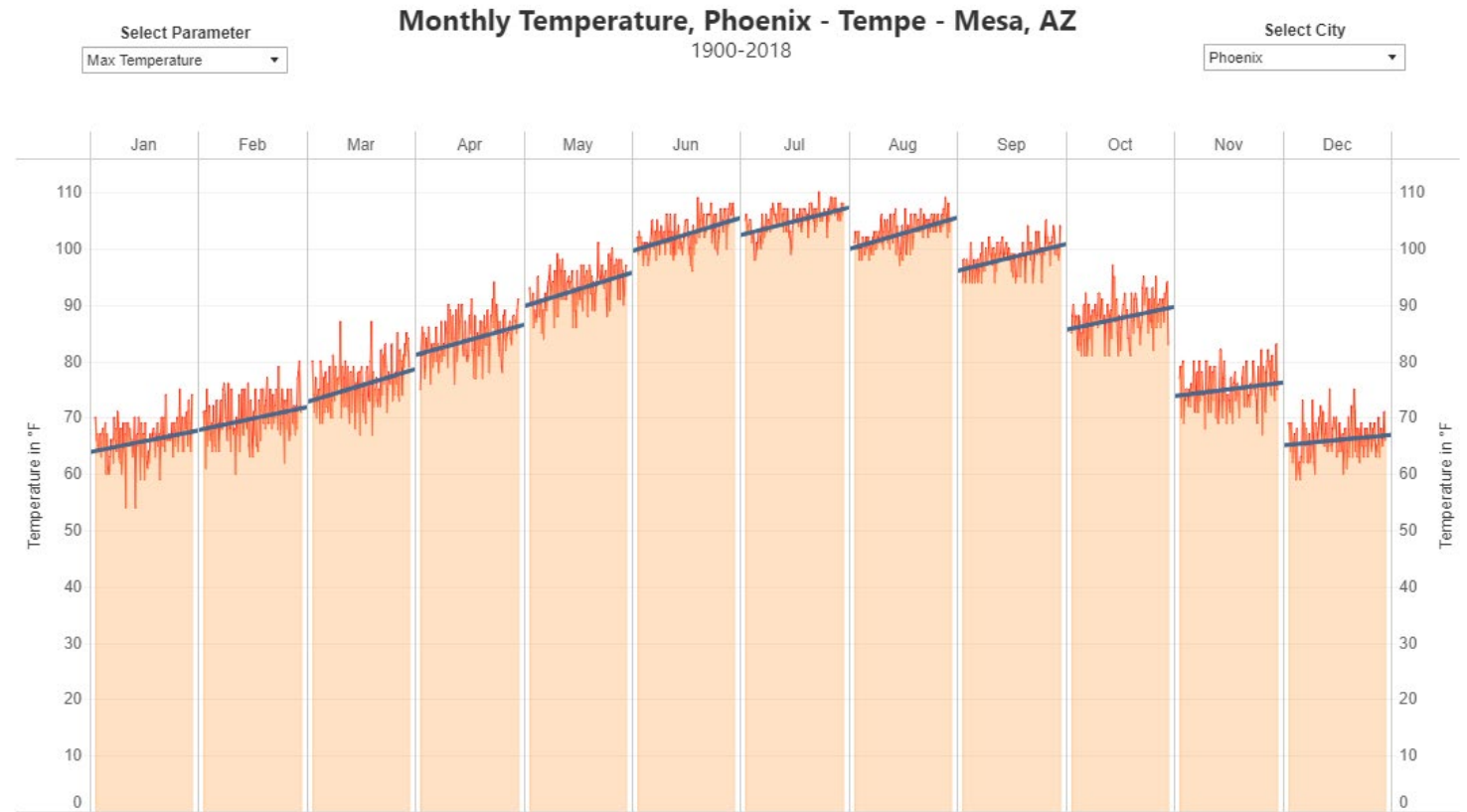
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School of Sustainability, Arizona State
University

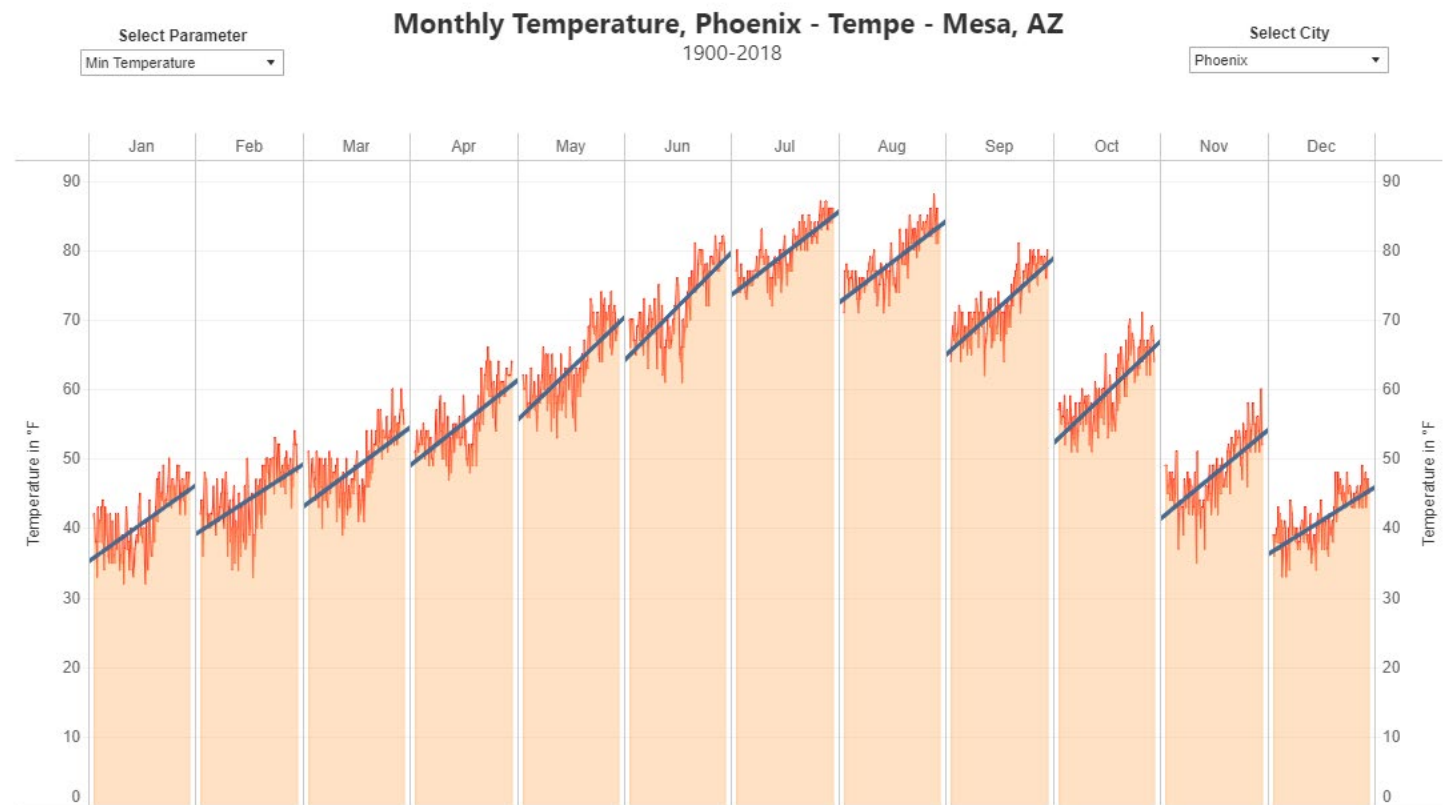


It is getting
hotter....



Praharaj, Sarbeswar, Elizabeth A. Wentz, Yash Vakil, and Patricia Solis. (2021). "Visualization: Temperatures in Maricopa County." Resilience Data Dashboard Series, Knowledge Exchange for Resilience and Arizona State Climate Office, 1900-2018. Available from Arizona State University, <https://resilience.asu.edu/temperature>.

Especially at
night...



Extreme heat is a threat multiplier

Water Use



Zone 10

Economy



Ashley McKnight/GPCC

Public Health



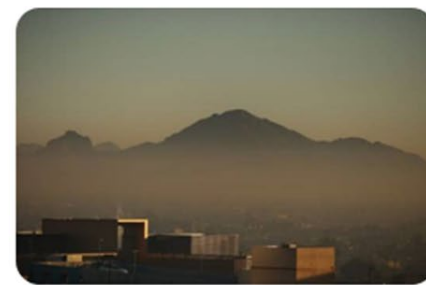
Phoenix Children's Hospital

Energy Demand



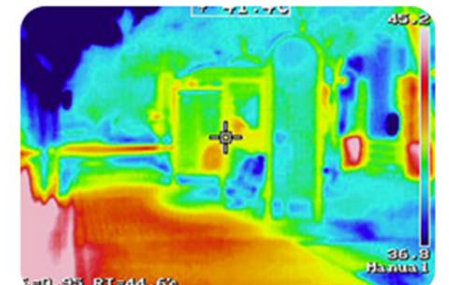
AZ Capital Times

Air Quality



Chad Bricks/12 News

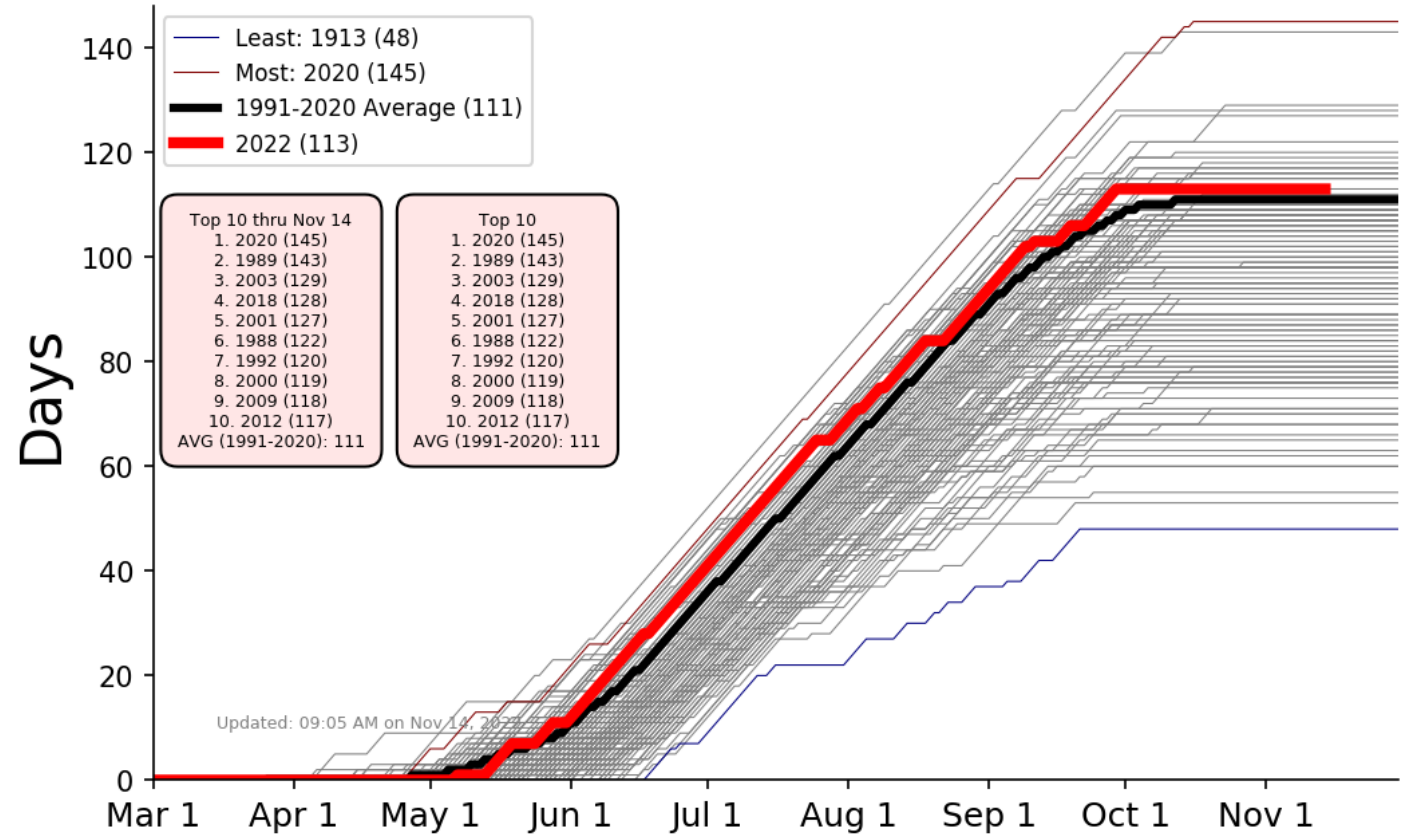
Thermal Comfort



Hondula et al

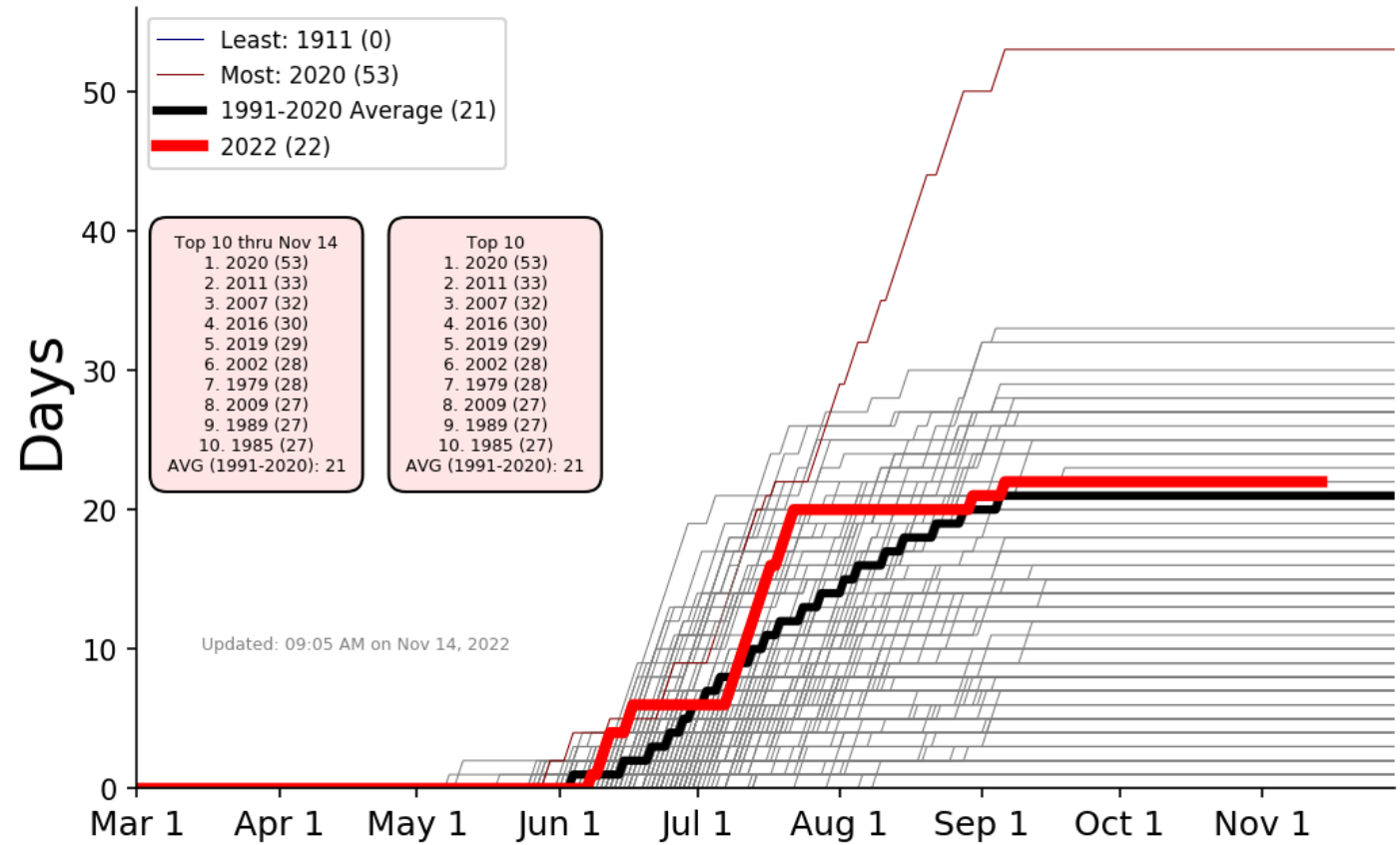
2022 Extreme Heat Frequency Comparison

Number Days w/Max Temps. of 100 ° F+ in Phoenix, AZ



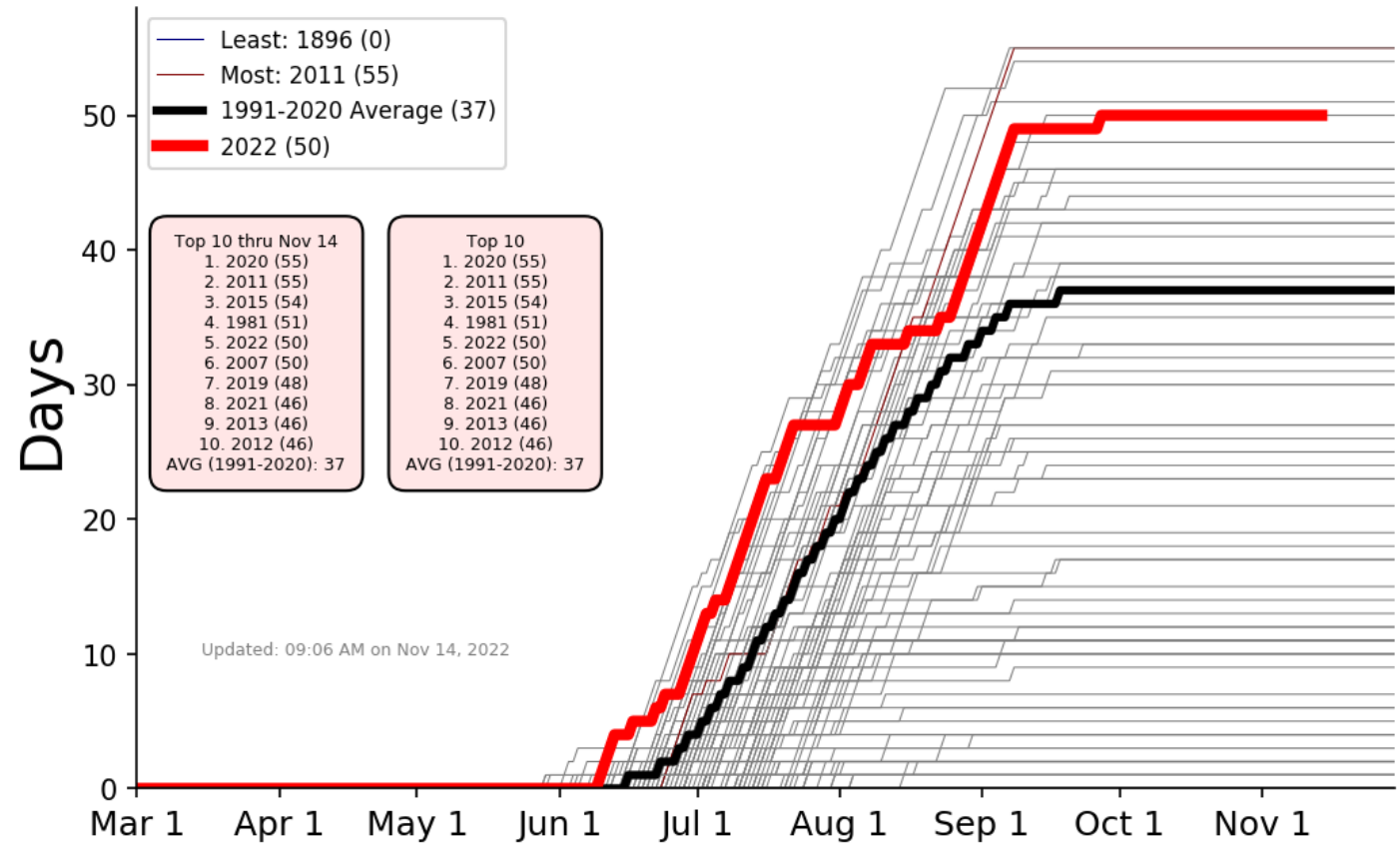
2022 Extreme Heat Frequency Comparison

Number Days w/Max Temps. of 110 ° F+ in Phoenix, AZ



2022 Extreme Heat Frequency Comparison

Number Days w/Min Temps. of 85 ° F+ in Phoenix, AZ



18 Heat Warning Days in 2022

2021

24

Heat Warning Days for
Phoenix in 2021

20

Avg. Days per Year
(2011-2020)

48

Most in a Year (2020)



April

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
						2
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

July

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
						2
						3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

August

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
						2
						3
						4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
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Young doctor dies from heat exhaustion during hike near Cave Creek; widow speaks out

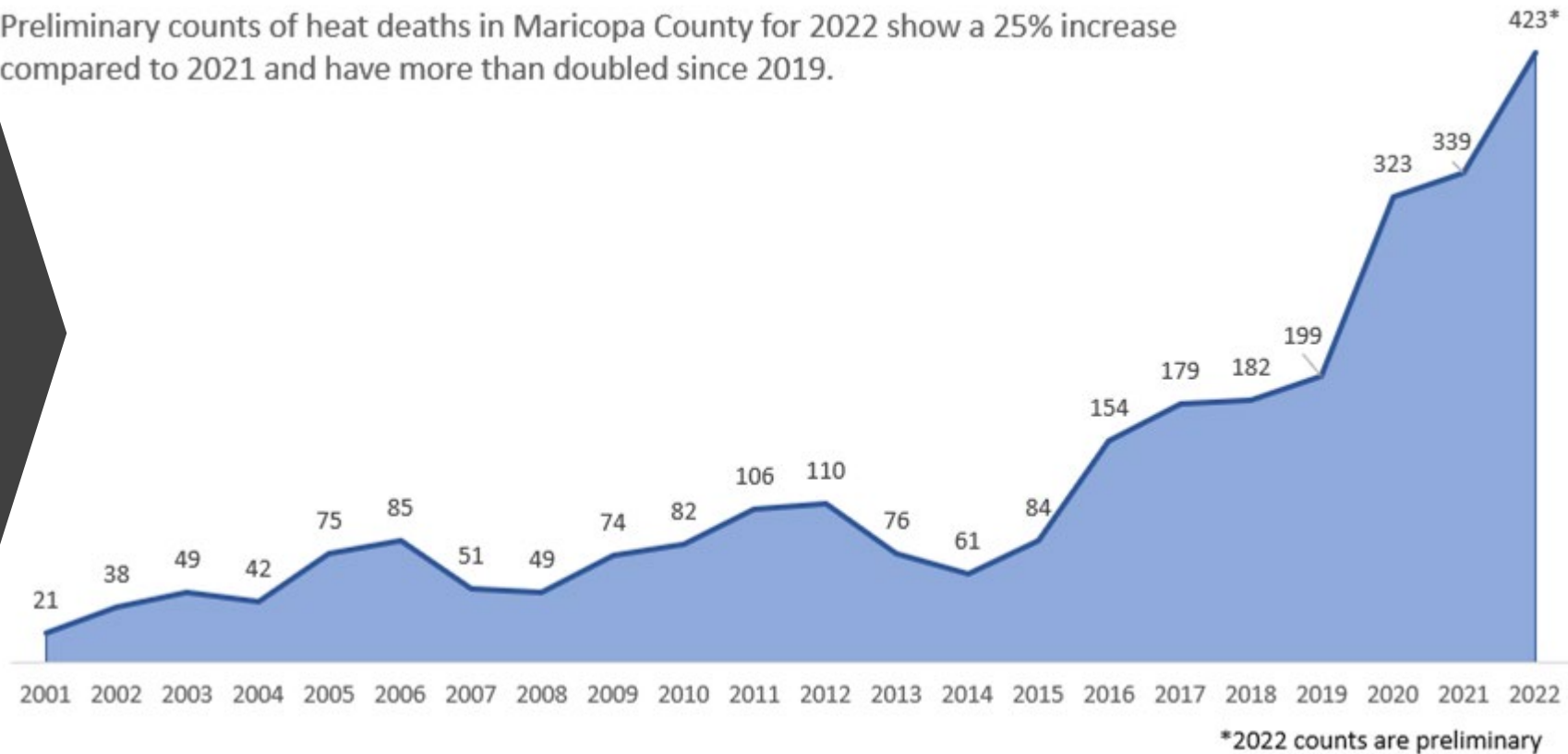
By Nicole Garcia , Stephanie Bennett and FOX 10 Staff | Published September 5, 2022 | Updated September 8, 2022 | Crime and Public Safety | FOX 10 Phoenix

<https://www.fox10phoenix.com/news/badly-injured-hiker-two-others-rescued-from-spur-cross-trail-near-cave-creek-mcso-says>

Impact of extreme heat

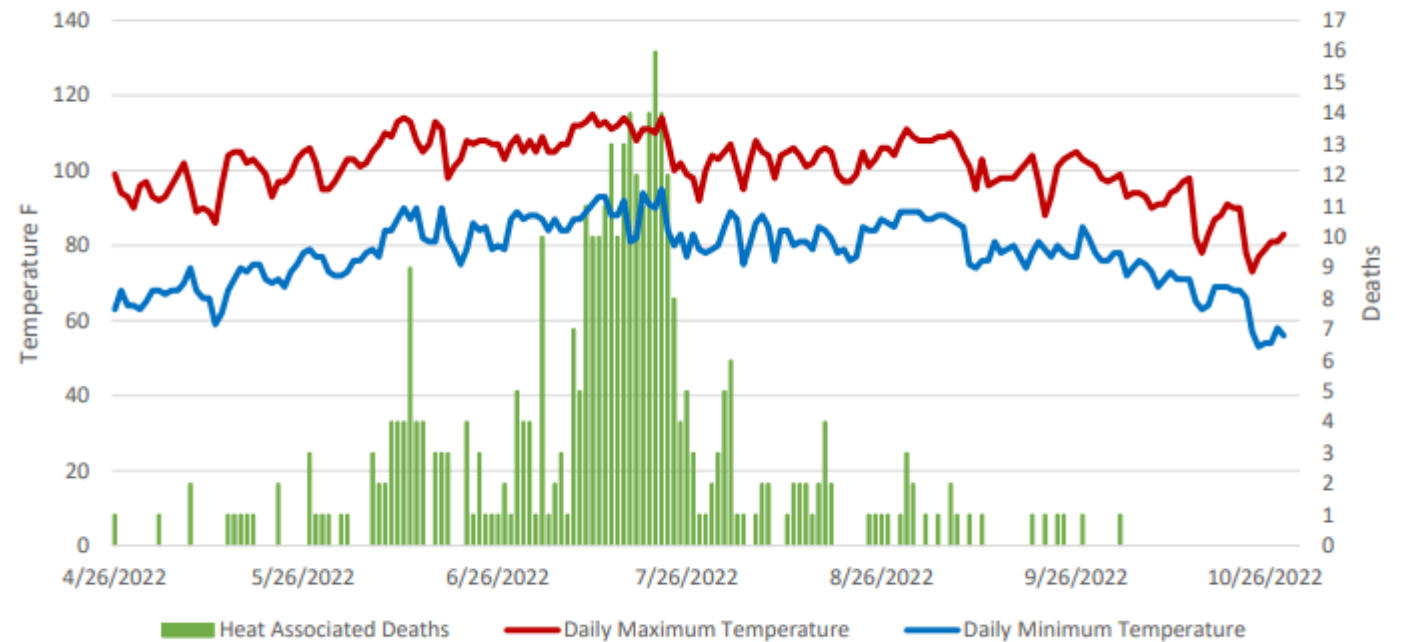
Heat Related Deaths Continue to Follow Increasing Trend in Arizona

Preliminary counts of heat deaths in Maricopa County for 2022 show a 25% increase compared to 2021 and have more than doubled since 2019.



Heat Associated Deaths

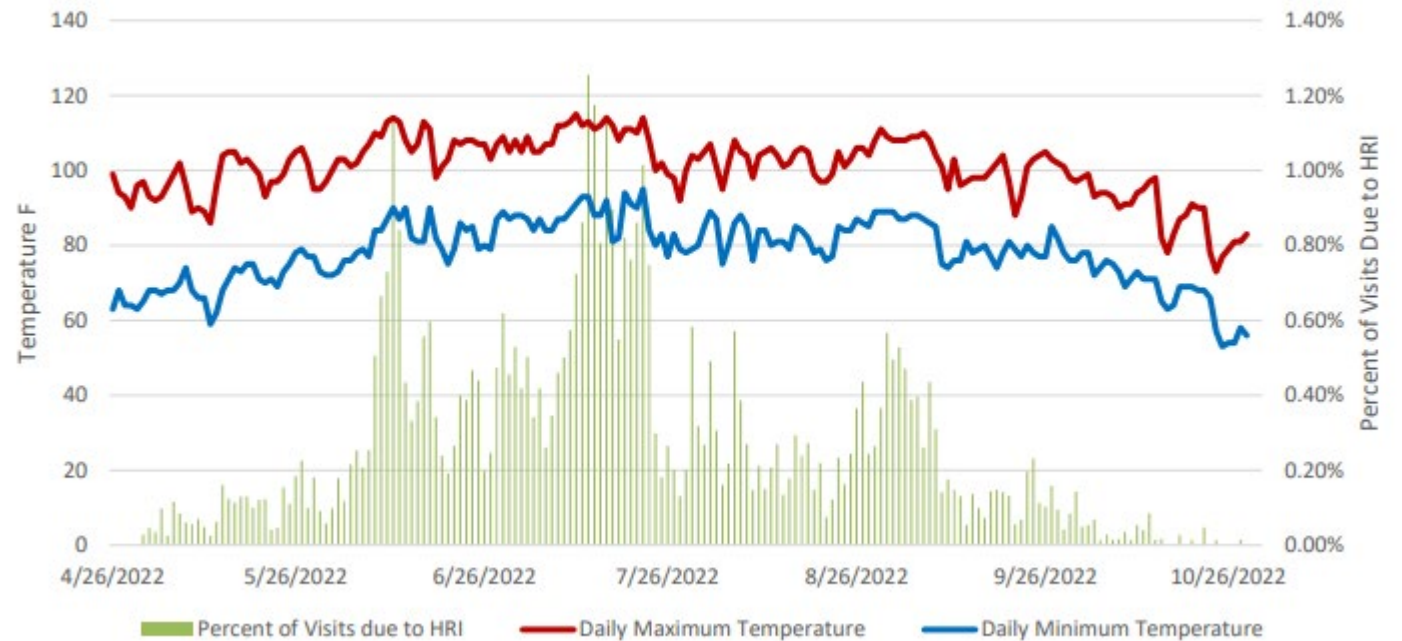
Graph 4. There have been 378 heat-associated deaths in Maricopa County as of 11/1/2022.



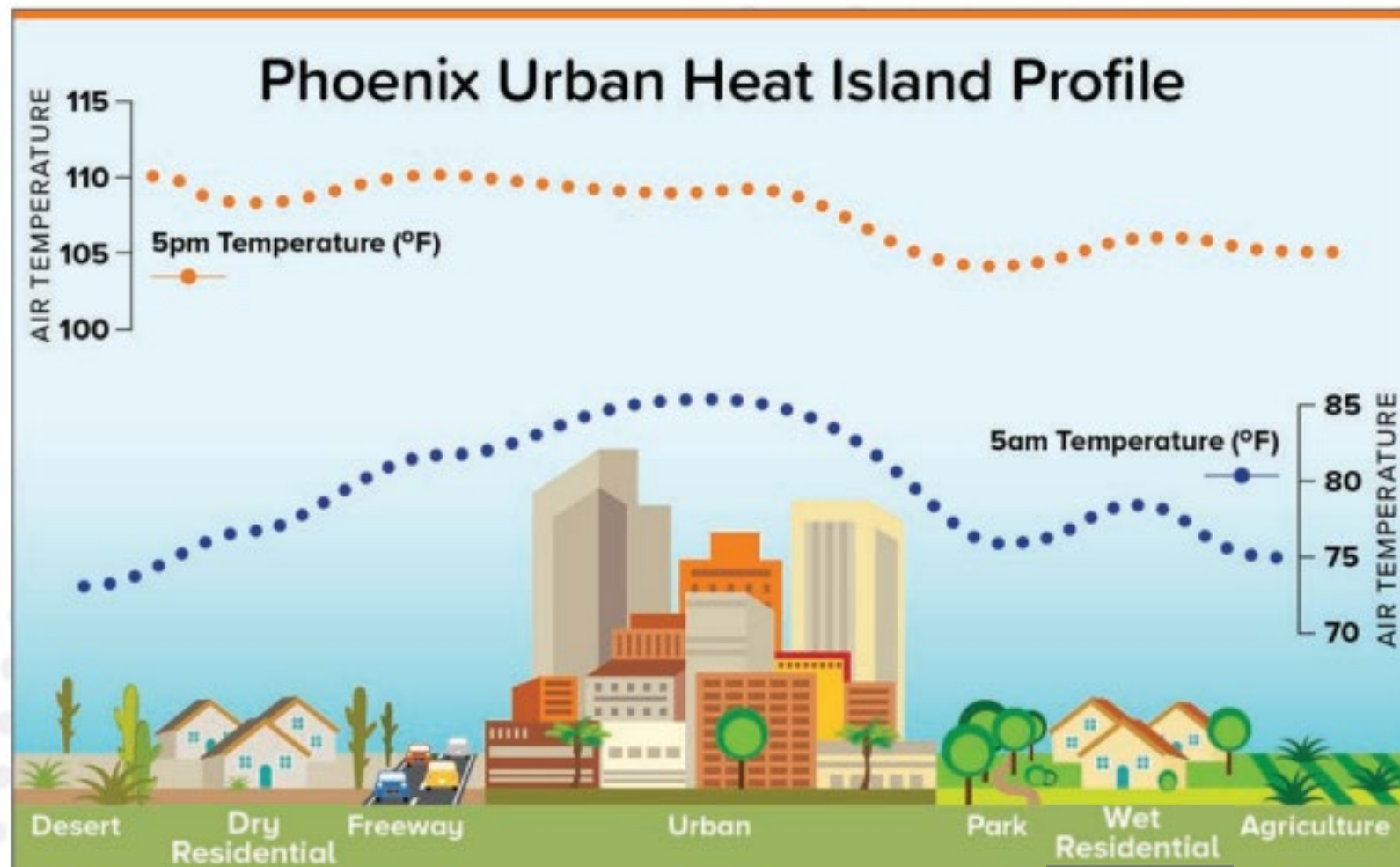
**One heat-caused death occurred in mid March and one heat-caused death occurred in early April*

Heat Associated Hospital Visits

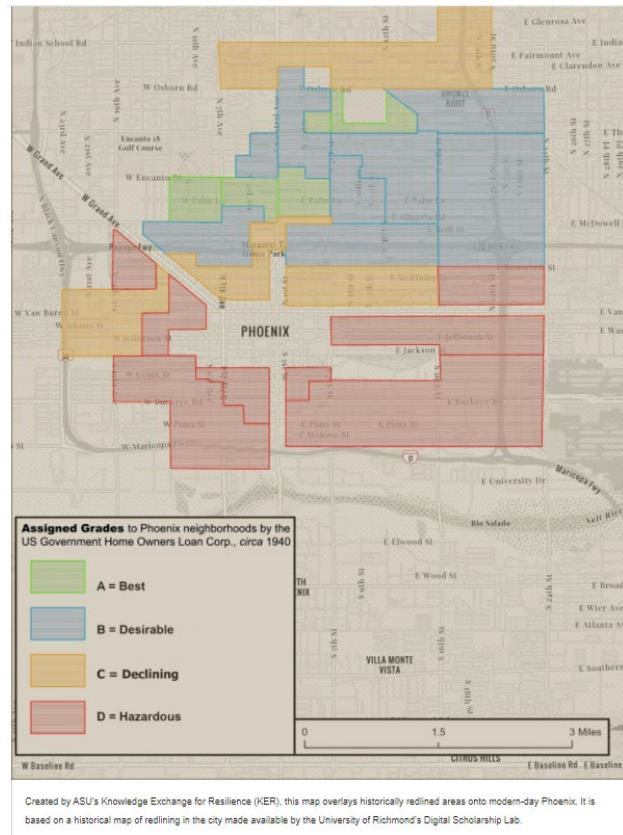
Graph 5. Daily Percentage of Hospital Visits due to Heat-Related Illness (HRI)



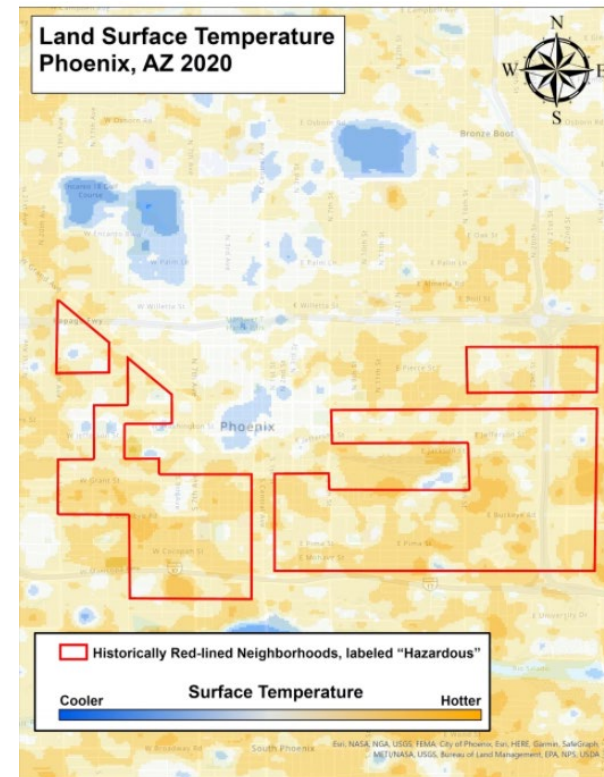
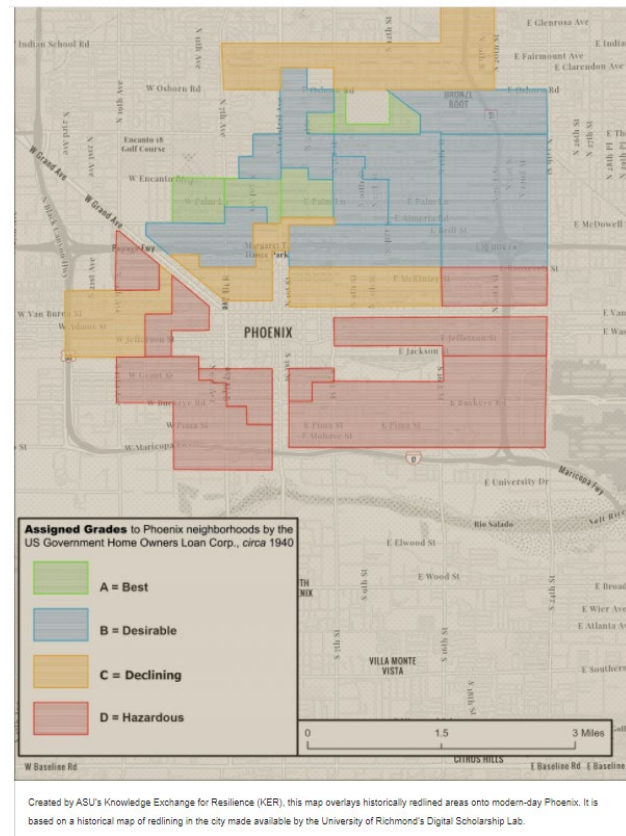
The Urban Heat Island



Heat is an environmental justice issue

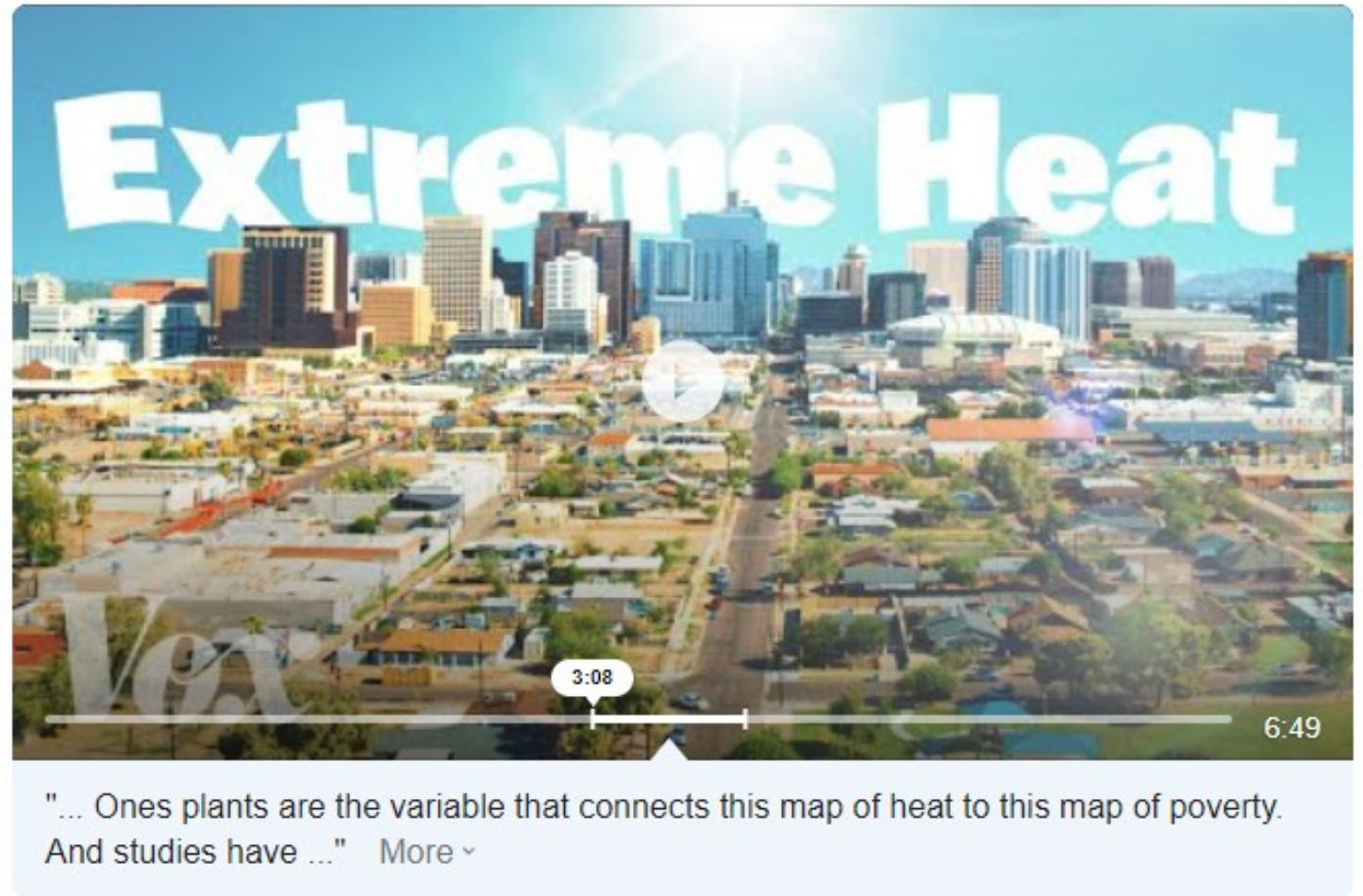


Heat is an environmental justice issue



Heat is an equity issue

- How America's Hottest City is Trying to Cool Down, Vox, September 20, 2021



YouTube · Vox

How America's hottest city is trying to cool down - YouTube

Differing Narratives of Extreme Heat

Heat is an Inconvenience

- Minimal outdoor exposure
- View dealing with heat as a game
- Confident city is managing program for others
- Pay for thermal comfort alternatives
- No difficult life altering choices

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Heat is a manageable problem

- Outdoor exposure and energy use managed carefully
- Not a feeling of panic about upcoming extreme heat period
- Reliance on networks and extended family during emergency situations

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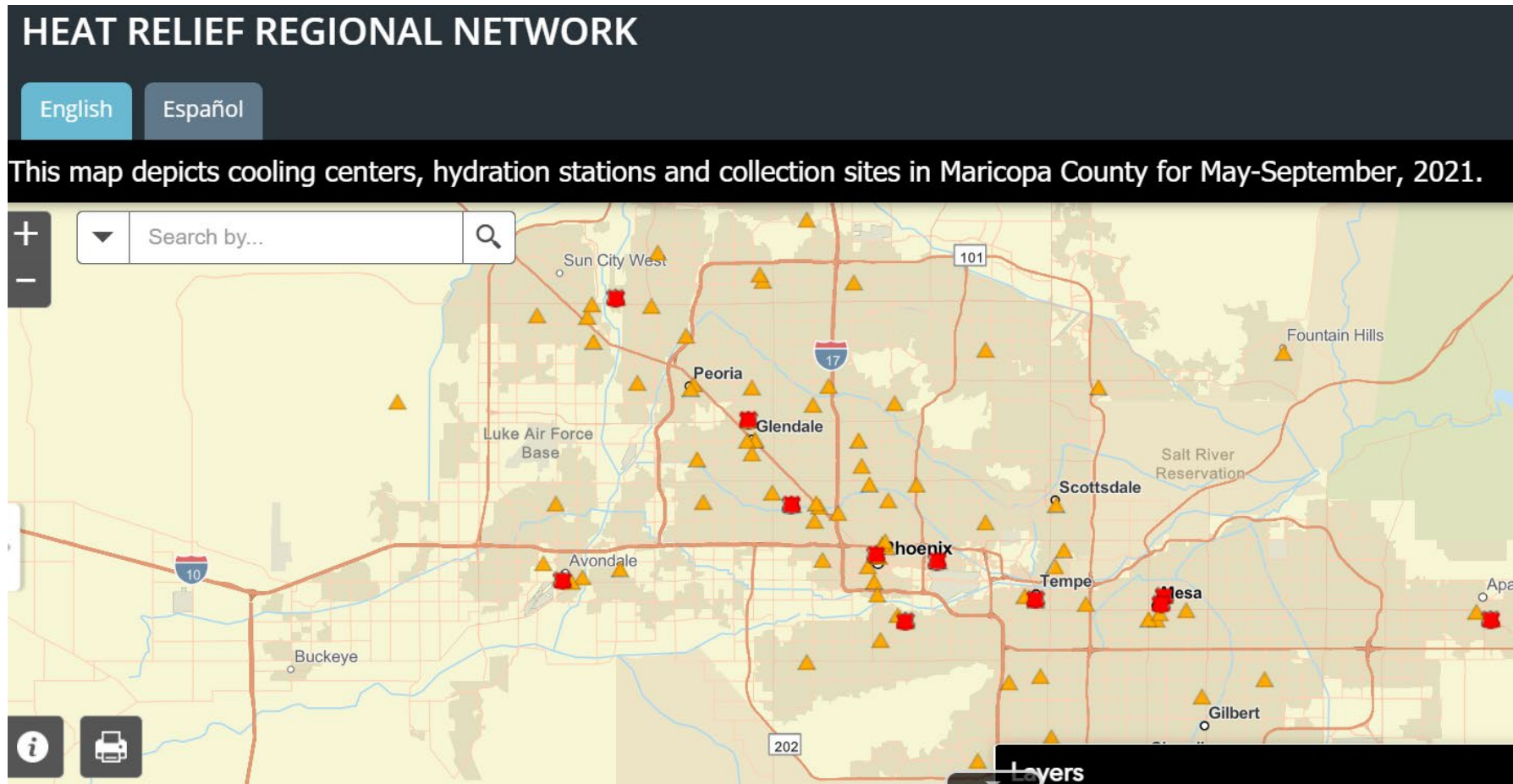
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Heat is a catastrophe

- Unavoidable outdoor exposure
- Can't afford to be thermally comfortable
- Feelings of desperation, overwhelmed
- High exposure rates due to compounding issues of infrastructure underspending
- Reliant on networks and extended family to assist with coping; mistrust of police

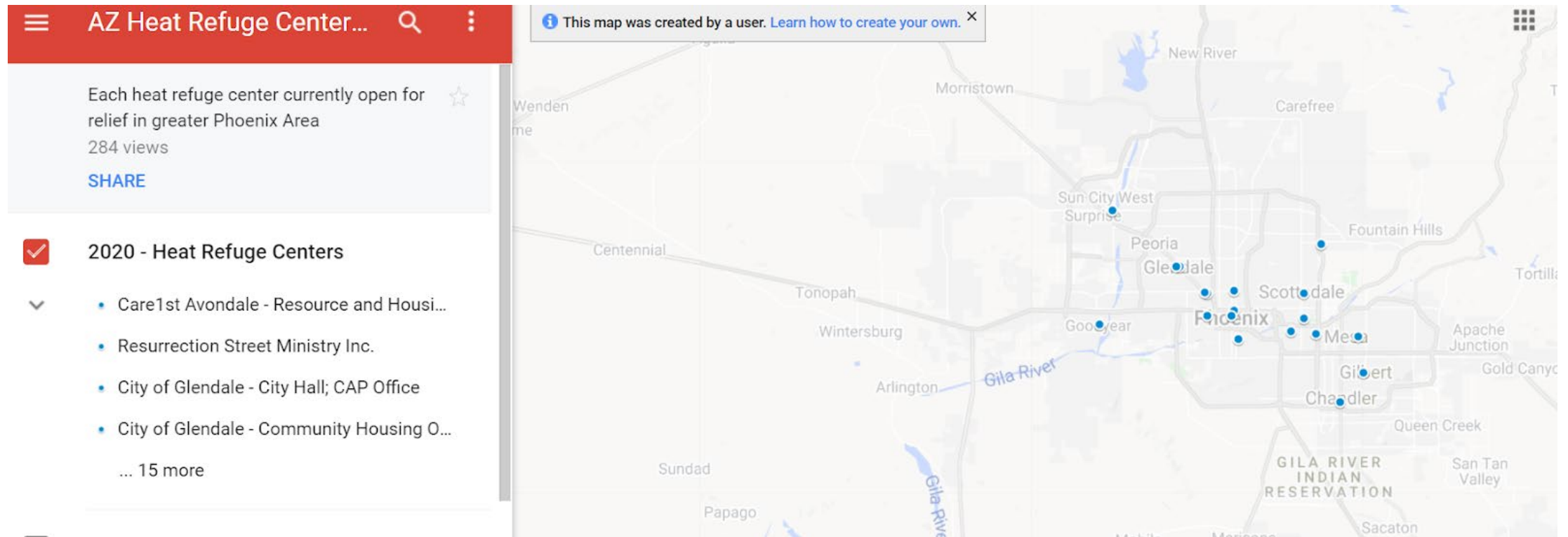
MAG's Heat Relief Network



<https://azmag.maps.arcgis.com/apps/MapSeries/index.html?appid=be7634cb523d4c048106890c98dc3a75&folderid=126f08d6351a4c3a8eb485a11caff1f8>

MAG's Heat Relief Network

82% Less Indoor, Air-Conditioned Cooling Centers from 2019



Operating Cooling Centers in Arizona Under COVID-19 and Record Heat Conditions:

Lessons Learned from Summer 2020

April 2021



Cooling Center Working Group

- Best Practices
 - Operating Cooling Centers in Arizona Under COVID-19 and Record Heat Conditions
 - <https://resilience.asu.edu/coolingcenters>

Optimized locations for Cooling Centers

Cooling centers optimization, Maricopa county, 2020

A Story Map    

Cooling centers optimization

Optimized cooling stations (regardless existing)



0.5 mile buffer zone



Existing cooling stations

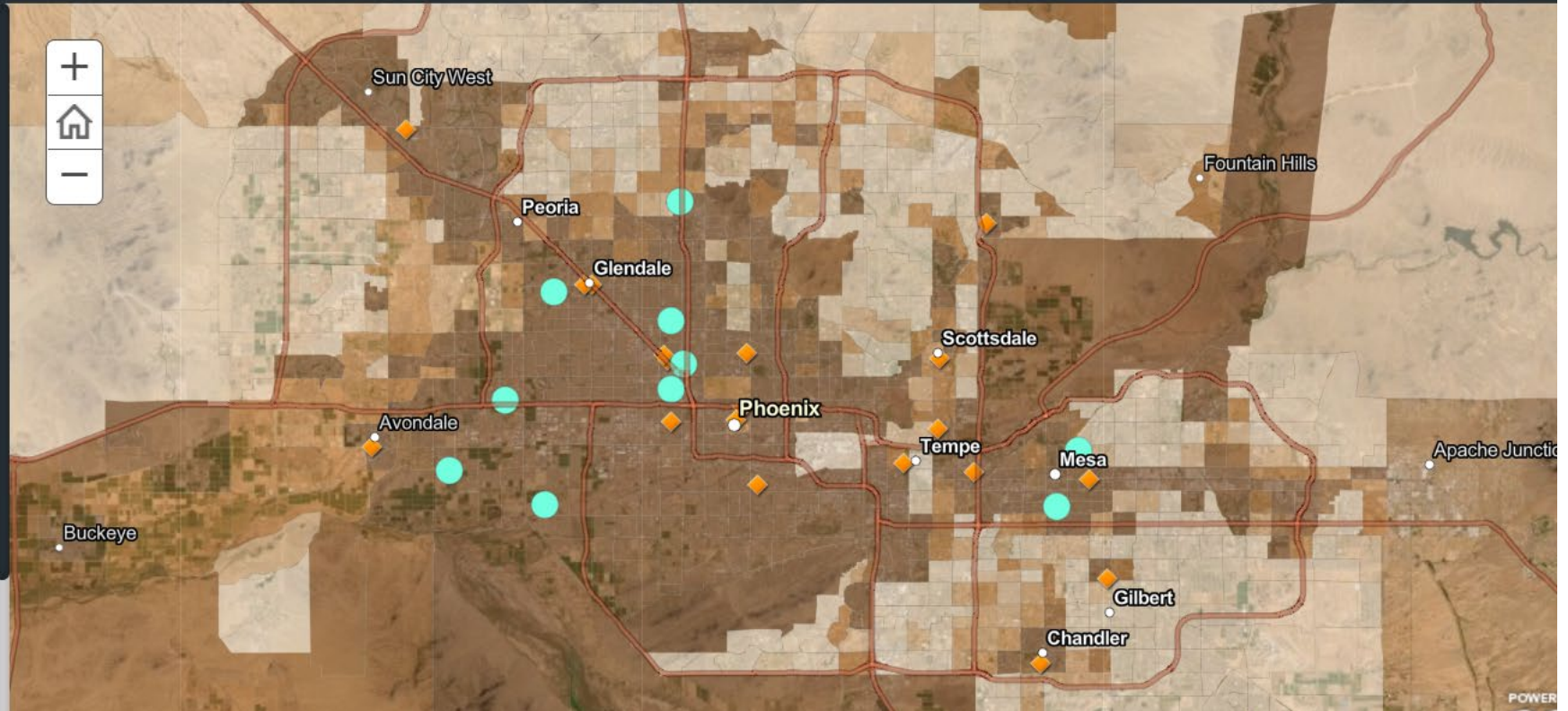


Social Vulnerability Index (SOVI)



SUMM

> 90



Cooling Center Support Network

- Utilities support
- Americorp/Vista
- Volunteer organizations: Hands On Phoenix, Just Serve
- 211
- Phoenix Toolbank & Trees Matter ReLeaf truck
- Lyft
- AZ Lottery Grant
- MAG Heat Relief Network
- Salvation Army & Arizona Faith Network/City Support




What is a Resilience Hub?



Urban Sustainability Directors' Network

Definition of Resilience Hubs

Resilience Hubs are community-serving facilities augmented to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life.



Hubs provide an opportunity to effectively work at the **nexus of community resilience, emergency management, climate change mitigation, and social equity** while providing opportunities for communities to become more self-determining, socially connected, and successful **before, during, and after disruptions**.

<http://resilience-hub.org/>

What is a Resilience Hub?

WHAT IS A RESILIENCE HUB?

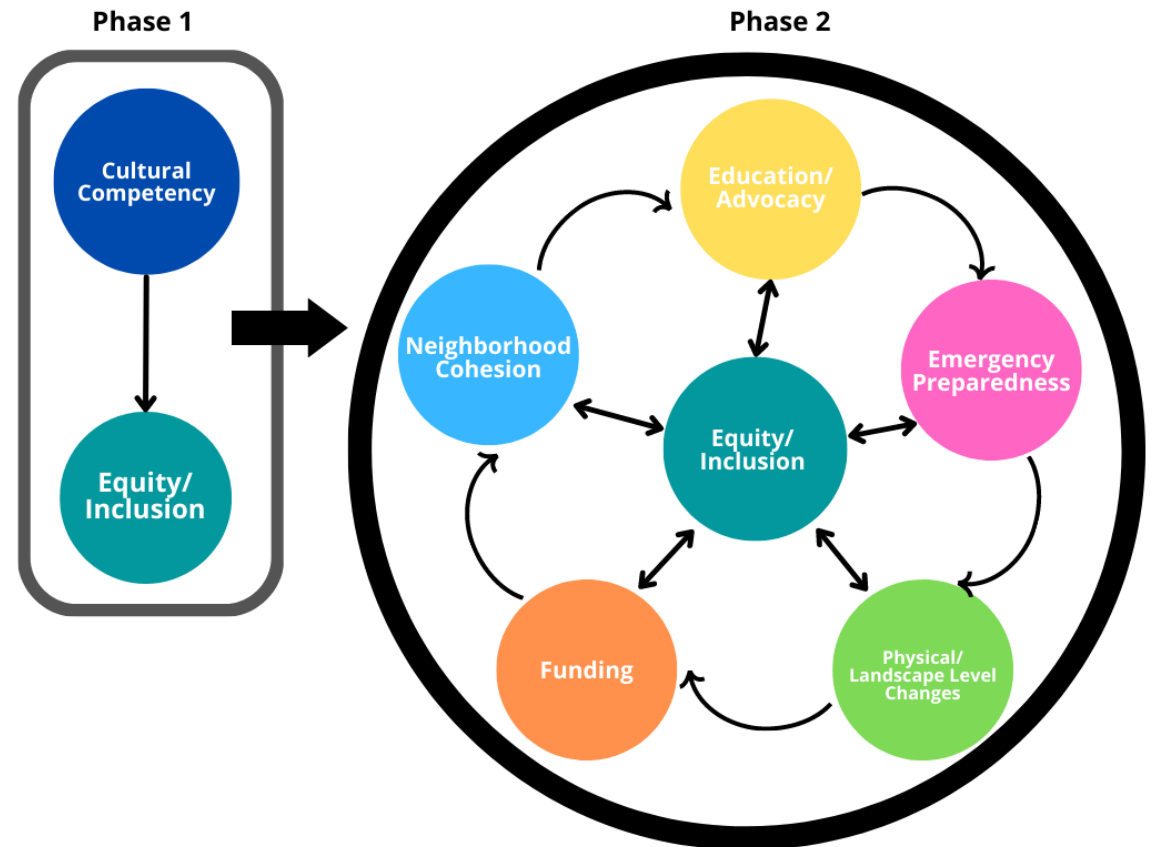


Who needs a resilience hub

- “Nurture and highlight the leadership that exists but is rarely seen in our local community.”
 - Pamela Slim, Widest Net
- Community space by the community, for the community
 - Grassroots ownership
- Mutual aid network
- Centralized community funding
- First responders may not be able to help you for days after a major disaster

HeatReady Neighborhoods

- Equity/Inclusion
- Neighborhood Cohesion
- Education/Activism
- Emergency Preparedness
- Landscape Interventions



Heat mitigation and adaptation in the region

Heat action planning

Climate Action planning

Tree and Shade programs

LIHEAP for summer months

Cool Pavements

Cool Corridors

Heat Ready Cities,
Schools, Neighborhoods

Dedicated staff to tackle
heat issues: COP

Social infrastructure

- AZ Heat Preparedness working group
- AZ Cooling Center working group
- Tempe Cool Kids program

Resilience Hubs – ready
for anything

Thank you!

Melissa.Guardaro@asu.edu

