ARIZONA'S

EXTREME HEAT PREPAREDNESS PLAN

MARCH 1, 2024

OFFICE OF THE GOVERNOR
KATIE HOBBS

Extreme Heat Preparedness Plan

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Letter from the Governor

Arizonans have long thrived in our extended, hot summers. We know, however, that temperatures have been rising steadily from decade to decade, and each year brings an increase in heat-caused and heat-related deaths and illnesses from the year before. That's why we must take proactive steps to build a sustainable and resilient state.

The summer of 2023 was the hottest summer in Arizona ever recorded, and every day people in our state were put in harm's way because of it. What I heard time and again, from seniors, service providers, agricultural and construction workers, and the unhoused, was that our state's old approach was not enough. It was clear there was a disconnect between people's needs and the systems in place to serve them. We were facing a new and complex problem, and we needed new tools to solve it. As a social worker who has dedicated my life to protecting everyday people, I knew we had to take action.

What we experienced was a confluence of several factors: increased temperatures in duration and severity, people without affordable, safe housing, lack of data and coordination across service providers and jurisdictions, and a built environment that exacerbates high temperatures and their impacts.

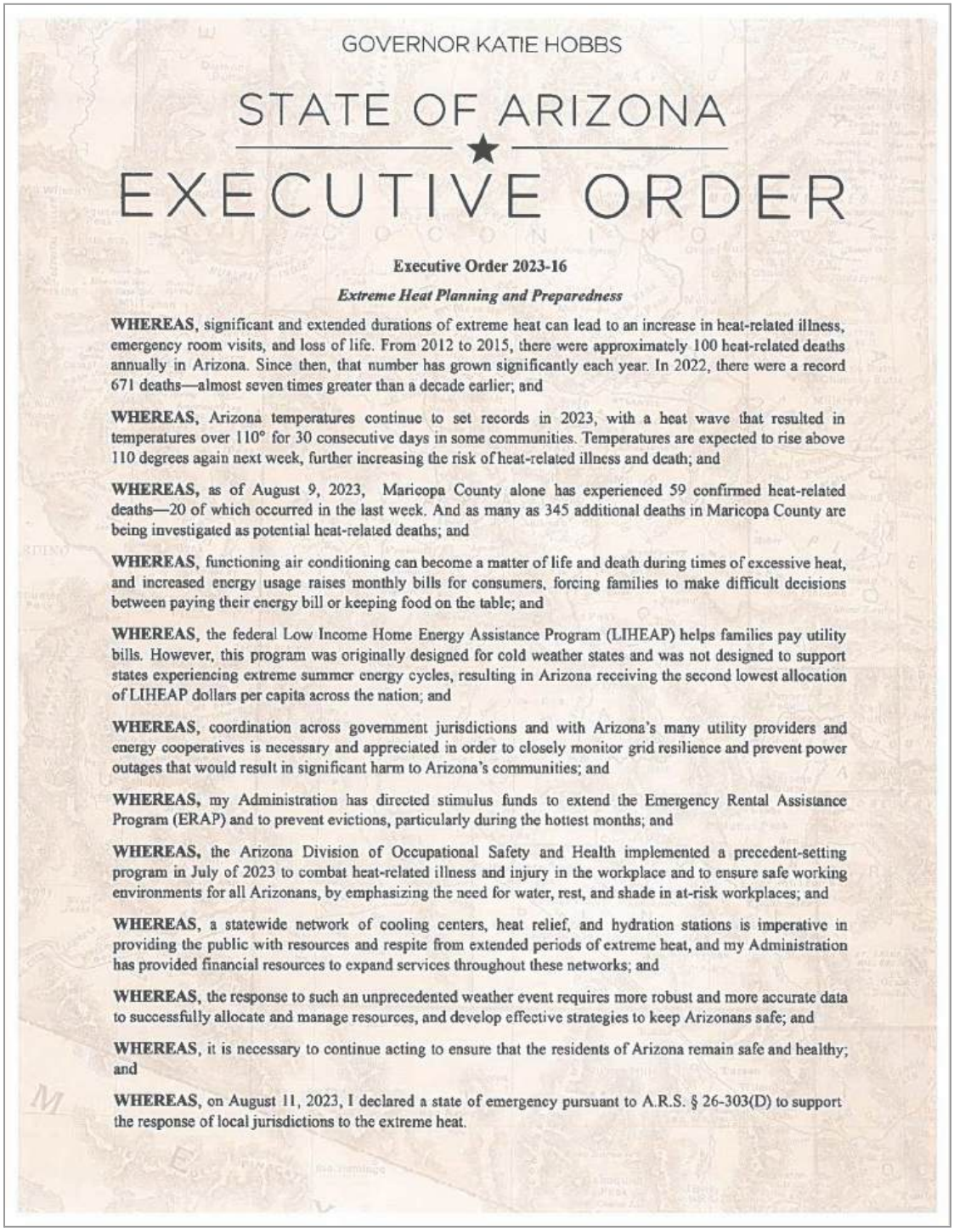
In my first summer as Governor of the great state of Arizona, I heard the call for action from stakeholders and issued Executive Order 2023-16, *Extreme Heat Planning and Preparedness*.

My Executive Order called on the Governor's Office of Resiliency and state agencies to review resources and outline a plan to prepare Arizona for future extreme heat events. With this Plan, we will ensure state agency services are deployed to best protect Arizonans from extreme heat. As part of my commitment to protecting Arizonans from extreme heat, I am also proud to announce the creation of the nation's first Chief Heat Officer position to coordinate the implementation of this Plan.

Arizona is no stranger to the heat, yet we have always risen to the challenge, protected our neighbors, and built a sustainable and thriving state. This time will be no different. As we implement this Plan, we will continue to improve our preparedness across state government and in partnership with the private sector and community-based organizations. Despite the challenge before us, I am proud to present the state of Arizona's first interagency Extreme Heat Preparedness Plan and share what we have learned and what we will do to protect all Arizonans.

Extreme Heat Planning & Preparedness Executive Order 2023-16

Click the link to view the full version here or visit azgovernor.gov



GOVERNOR KATIE HOBBS

STATE OF ARIZONA

EXECUTIVE ORDER

Executive Order 2023-16

Extreme Heat Planning and Preparedness

WHEREAS, significant and extended durations of extreme heat can lead to an increase in heat-related illness, emergency room visits, and loss of life. From 2012 to 2015, there were approximately 100 heat-related deaths annually in Arizona. Since then, that number has grown significantly each year. In 2022, there were a record 671 deaths—almost seven times greater than a decade earlier; and

WHEREAS, Arizona temperatures continue to set records in 2023, with a heat wave that resulted in temperatures over 110° for 30 consecutive days in some communities. Temperatures are expected to rise above 110 degrees again next week, further increasing the risk of heat-related illness and death; and

WHEREAS, as of August 9, 2023, Maricopa County alone has experienced 59 confirmed heat-related deaths—20 of which occurred in the last week. And as many as 345 additional deaths in Maricopa County are being investigated as potential heat-related deaths; and

WHEREAS, functioning air conditioning can become a matter of life and death during times of excessive heat, and increased energy usage raises monthly bills for consumers, forcing families to make difficult decisions between paying their energy bill or keeping food on the table; and

WHEREAS, the federal Low Income Home Energy Assistance Program (LIHEAP) helps families pay utility bills. However, this program was originally designed for cold weather states and was not designed to support states experiencing extreme summer energy cycles, resulting in Arizona receiving the second lowest allocation of LIHEAP dollars per capita across the nation; and

WHEREAS, coordination across government jurisdictions and with Arizona's many utility providers and energy cooperatives is necessary and appreciated in order to closely monitor grid resilience and prevent power outages that would result in significant harm to Arizona's communities; and

WHEREAS, my Administration has directed stimulus funds to extend the Emergency Rental Assistance Program (ERAP) and to prevent evictions, particularly during the hottest months; and

WHEREAS, the Arizona Division of Occupational Safety and Health implemented a precedent-setting program in July of 2023 to combat heat-related illness and injury in the workplace and to ensure safe working environments for all Arizonans, by emphasizing the need for water, rest, and shade in at-risk workplaces; and

WHEREAS, a statewide network of cooling centers, heat relief, and hydration stations is imperative in providing the public with resources and respite from extended periods of extreme heat, and my Administration has provided financial resources to expand services throughout these networks; and

WHEREAS, the response to such an unprecedented weather event requires more robust and more accurate data to successfully allocate and manage resources, and develop effective strategies to keep Arizonans safe; and

WHEREAS, it is necessary to continue acting to ensure that the residents of Arizona remain safe and healthy; and

WHEREAS, on August 11, 2023, I declared a state of emergency pursuant to A.R.S. § 26-303(D) to support the response of local jurisdictions to the extreme heat.

Executive Summary

In 2023, Arizona experienced its hottest summer since record keeping began more than 100 years ago. In Maricopa County alone, more than 500 people died,[1] and emergency rooms statewide recorded more than 4,000 heat-related visits. Cooling centers, which provide respite to people in need of safe shelter with consistent air conditioners and other cooling features, recorded more than 26,000 visits. Governor Hobbs issued Executive Order 2023-16 to galvanize partners, support emergency response, and implement new approaches to this growing challenge.

Extreme heat is a complex disaster that, left unchecked, impacts public health, economic productivity, quality of life, and the environment. This type of problem requires sustained attention and collaboration across jurisdictions, industries, and community partners.

With Governor Hobbs' leadership, Arizona will address the impacts of extreme heat, during both the upcoming summer and in the future. This Plan outlines how state agencies are preparing for another extreme heat event this year, and puts forth recommendations for how the state can prepare for future events. The development of this Plan is a significant step forward in protecting Arizonans from the impacts of extreme heat and weather events, and would not have been possible without the contributions of state agencies, researchers, local governments, and faith-based and community-based organizations.

Plan Development Process

EO 2023-16 instructed the Director of the Governor's Office of Resiliency (OOR) to lead development of an inter-agency extreme heat preparedness plan to be provided to the Governor by March 1, 2024. The EO identified several critical agencies to be engaged on the plan: Department of Emergency Management and Military Affairs (DEMA),

[1] Reporting for statewide deaths will be finalized in August 2024 after review by the National Centers for Health Statistics.

Department of Economic Security (DES), Department of Health Services (ADHS), Department of Administration (ADOA), Industrial Commission (IC), Department of Housing (DOH), Residential Utility Consumer Office (RUCO). Each agency engaged in drafting this Plan and shared actions being deployed in advance of the 2024 heat season as well as recommendations for medium and longer-term initiatives.

Heat relief and preparedness work is not new to Arizona, and this Plan builds on the foundation laid by local governments, universities, and organizations (See Spotlights for examples of innovative initiatives on heat preparedness and Appendix C for heat-preparedness milestones). OOR engaged extensively with subject-matter experts and organizations including Arizona State University's Knowledge Exchange for Resilience (KER), the Human Services Campus, the Arizona Faith Network, cities and towns, and utilities. OOR also invited the public to weigh in on heat-related issues during the planning process. In collaboration with KER, OOR held two state agency workshops to identify knowledge gaps, areas that require additional research, and opportunities for future collaboration and coordination. Agencies used this time to better understand how they can mitigate extreme heat risks throughout their daily operations and how they can better respond to extreme heat events.[2]

Additionally, ADHS held its first Heat Summit in October 2023 to generate health solutions around policy, data, communications, and multijurisdictional coordination (See Appendix B for more details). Not only has the Summit led to working groups regularly convening around these topics, but it also helped inform several recommendations and agency-specific actions related to heat preparedness.

[2] Building on these workshops and consultations, KER developed a draft Report that informed many of the recommendations in this Plan. The Report will be published in April.

Need for Action

Arizona is known for hot, dry summers, with temperatures regularly exceeding 100°F. However, the severity and frequency of high temperatures continues to increase, which poses risks to public health, infrastructure, and our economy. Nighttime temperatures, traditionally known for providing relief from the daytime heat, have been on the rise in all regions of the state. The Hobbs Administration is taking on this growing challenge with a coordinated, cross-agency approach.

Heat Vulnerability: Who and What is Impacted and How?

Extreme heat events amplify challenges across various sectors and exacerbate vulnerabilities. In particular, outcomes related to health, the environment, infrastructure, and the economy are directly affected by extreme heat events.

Anyone can be susceptible to heat-related illness, however, some populations are more sensitive, or vulnerable, to heat. Seniors, young children and infants, people who work outside or in non-climate controlled conditions, the unhoused and people with pre-existing medical conditions and those on certain medications all have increased vulnerability to extreme heat.

Additionally, a person's vulnerability to heat risk increases when they must navigate additional societal barriers, such as lack of affordable housing, high energy bills, inhospitable neighborhoods and buildings, inaccessible transportation, and precarious employment. Nearly 1 in 4 people living in the United States are socially vulnerable and have low resilience to extreme heat exposure.[3]

[3]Gurrentz, B. and Sawyer, C. New Community Resilience Estimates for Heat Identify Areas Socially Vulnerable to Extreme Heat. U.S. Census. https://www.census.gov/library/stories/2023/07/almost-a-quarter-of-population-vulnerable-to-rising-heat.html

Perhaps counterintuitively, living in Arizona for a significant length of time does not make someone immune to the summer heat. In fact, from 2012 to 2022, the most heat-related and heat-caused fatalities occurred among those who have been here the longest. Those who have lived in Arizona at least 20 years appear to be most likely to fall victim to desert heat. From 2012 to 2022, long-time Arizonans accounted for 933 heat-related deaths, or about 85 per year. Among those here less than 3 years, there were about 19 such fatalities each year.

Spotlight

TNC's The Urban Heat Leadership Academy

The Nature Conservancy and Phoenix Revitalization Corporation, in collaboration with nonprofit, local government, and academic partners offer the virtual Urban Heat Leadership Academy, which builds the capacity of Maricopa County residents so that they have the knowledge, resources, and skills to mobilize their communities and advocate for greener, cooler, and healthier neighborhoods. Academy participants learn about nature-based solutions that reduce urban heat and improve air fquality, and also gain hands-on experience. Now in its fourth year, the Academy has graduated more than 100 community leaders who have used concepts from the Academy to implement 12 heat mitigation projects in areas most affected by urban heat, ranging from tree plantings to advocating for green stormwater infrastructure interventions.

Heat and Impacts to Human Health

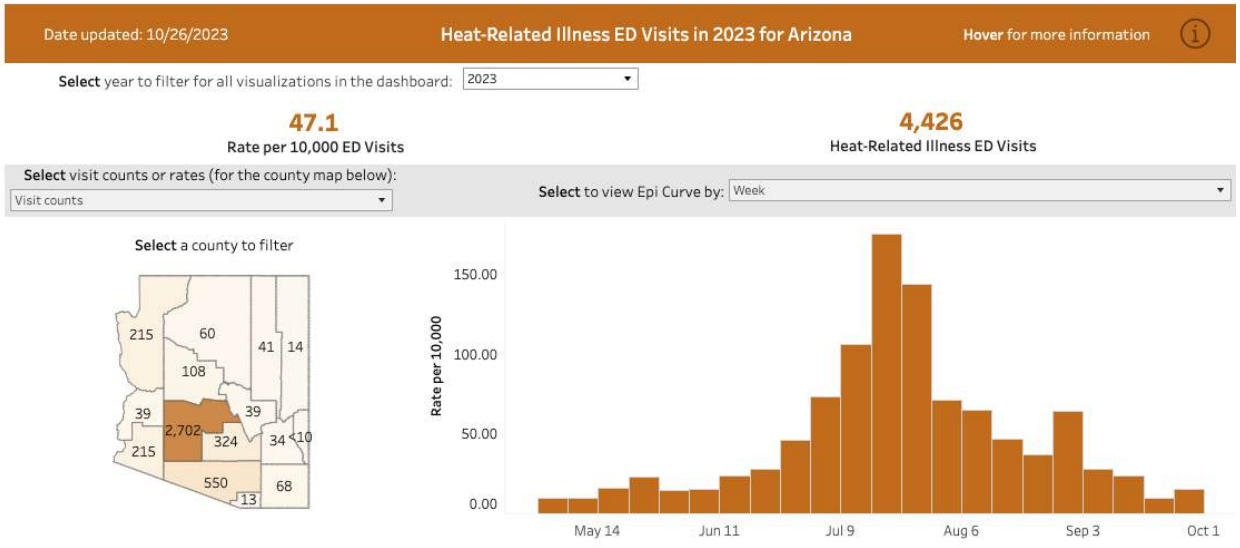
Without proper preparation and response, exposure to extreme heat can lead to symptoms of heat-related illness, which may include: dehydration, heat cramps, heat exhaustion, heat stroke, or death. An individual's response to extreme heat can vary based on a number of factors including pre-existing health conditions, such as cardiovascular disease and respiratory illness. Extreme heat also contributes to poor air quality by intensifying the formation of ground-level ozone, a key component of smog, and also increases the concentration of particulate matter. These pollutants pose serious risks to respiratory health, exacerbating conditions such as asthma and other respiratory diseases.

Extreme heat events can result in escalated health costs associated with emergency room and urgent care visits. According to ADHS, emergency department costs due to heat-related illnesses were six times higher in 2022 compared to 2008; hospitalizations

were eight times higher during that same timeframe. For hospitalizations, total charges increased from $11 million in 2008 to $87 million in 2022. Emergency room visits total charges increased from $4.7 million in 2008 to $28 million by 2022. During these events, hospitals across Arizona see an increase in emergency room visits and hospitalizations, stretching capacity across the system. Heat-related illness emergency department visits increased by 34.488% from summer 2022 to the summer 2023.

AZ Dept of Health Services

Extreme Weather and Public Health Heat-Related Illness Dashboard[4]



Urban and Rural Heat Impacts

Heat island effects are a particular concern for urban areas. Urban heat islands are caused by the uneven, inequitable spread of land covers in the urban landscape, leading to more heat-absorbing buildings and pavements and fewer cool spaces with trees and greenery. Residents of intra-urban heat islands are more likely to experience

[4] ADHS Extreme Weather and Public Health Heat-Related Illness Dashboard available at https://www.azdhs.gov/preparedness/epidemiology-disease-control/extreme-weather/heat-safety/index.php

heat-related illnesses and even death. The urban heat island effect makes low-income communities more vulnerable to heat.[5,6]

Rural and Tribal populations are also vulnerable to impacts from extreme heat events. Rural populations are often characterized by lower socioeconomic status, greater portions of older adults, greater portions of outdoor workers, less shaded structures, less health care, less access to media communications, and disadvantages in transportation. The factors contributing to urban and rural vulnerability may differ significantly. Most of the research, interventions, and real-world experience in responding to extreme heat events has revolved around urban settings. However, the interventions that are developed in an urban setting might not be feasible or have the same positive effect in a rural or Tribal setting. For example, a rural farmer may not be able to leave the farm and take advantage of a cooling center, because they need to tend to animals. An older adult may not be able to travel long distances to find a cooling center.

Spotlight

DFFM'S Urban Forest Grant Program

With funding provided by the US Department of Agriculture's US Forest Service, the Arizona Department of Forestry and Fire Management's Urban and Community Forestry (UCF) Program is one of the only statewide programs focused solely on the stewardship of urban natural resources. Over 80% of Arizonans live within urban areas and need access to healthy urban forests. These dynamic ecosystems provide critical benefits such as increased shade, reduced air pollution, increased carbon storage, and reduced energy use, all contributing to heat resilience. In the last five years, our program has awarded over 6 million dollars to communities in need for projects such as tree inventories, increased urban canopies and greenspace, rainwater harvesting, agroforestry, arboriculture workforce development, homeowner and teacher education, and more.

[5] https://www.epa.gov/heatislands/heat-islands-and-equity
[6] https://climas.arizona.edu/blog/understanding-urban-heat-vulnerability-and-need-resilient-design-practice

Defining Extreme Heat Events

There is no single definition of an extreme heat event shared by state agencies and jurisdictions, nor a specific threshold for an extreme heat disaster in state statute.

The U.S. Centers for Disease Control and Prevention (CDC) generally defines an extreme heat event as one or more days of unusually hot and/or humid weather. However, the definition of extreme heat varies based on many factors, such as location and average temperature. The Arizona Emergency Information Network has defined extreme heat as **a period of at least 2-3 days of high heat with temperatures above 90° Fahrenheit.**

DEMA uses the National Weather Service's excessive heat advisories, watches, and warnings, as well as its own risk assessments to direct efforts. In Summer 2024, the state will continue to use this advisory system as thresholds for communities to direct local resources to heat-related community needs. These notifications alert emergency responders and health and human service providers to the need for action: including the pre-deployment of cooling centers, preventative actions to weatherize critical infrastructure systems, community outreach to vulnerable populations, upstaffing of public safety resources, and healthcare system adjustments.

The National Weather Service has also created HeatRisk to help decision makers identify periods of high heat in the western U.S. The HeatRisk tool "is a color-coded index that provides a forecast risk of heat-related impacts to occur over a 24-hour period. HeatRisk takes into consideration:

- How unusual the heat is for the time of the year
- The duration of the heat including both daytime and nighttime temperatures
- If those temperatures pose an elevated risk of heat-related impacts based on data from the CDC."

HeatRisk was developed to support decision makers when faced with decisions to protect populations with heightened vulnerability to heat.

National Weather Service HeatRisk product:

HeatRisk Values When the HeatRisk Value is:	Risk of Heat Effects ...the risk of heat effects are:	Level of Heat Concern ...as symbolized by this color:
0	Little to None	Green
1	Minor	Yellow
2	Moderate	Orange
3	Major	Red
4	Extreme	Magenta

NOAA/NWS[21]

It's important to note that many heat deaths can and do happen outside of extreme heat periods. According to the Maricopa County 2022 Annual Final Heat Report, *"In 2022, the National Weather Service issued seven excessive heat warnings for a total of 17 days. Over the past 5 years, an average of 34% of deaths occurred on days with an excessive heat warning."*[7]

[7] Maricopa County Heat Report. 2022. Retrieved from https://www.maricopa.gov/1858/Heat-Surveillance.

Preparation for 2024 Heat Season

Effective and impactful heat preparedness requires state agencies to plan and implement on a variety of timelines. In addition to providing an interconnected, long-term vision and policy for heat response, agencies are also readying immediate interventions for Summer 2024 that build upon lessons learned during Summer 2023. These also introduce new, tactical approaches to providing heat relief and community support this upcoming season.

Prioritizing Extreme Heat Mitigation and Emergency Response in the Executive Budget

In the summer of 2023, Governor Hobbs directed the use of federal ARPA dollars to provide heat relief services, including reimbursing local heat relief efforts. The FY25 Executive Budget directs more money to hazard mitigation and emergency response efforts, allowing DEMA and other emergency response agencies to respond more nimbly to extreme heat events and other natural hazards. The Executive Budget includes funding for in-state deployment of mutual aid resources and covers the up-front costs of emergency response, allowing DEMA to better support emergency events that do not rise to the level of a state or federal emergency declaration. It also provides a state match to draw down $9 million from the Federal Emergency Management Agency (FEMA) through the Safeguarding Tomorrow Through Ongoing Risk Mitigation (STORM Act). This provides total state and federal funding of $10 million in a revolving loan fund that provides hazard mitigation assistance to local governments to reduce risks from natural hazards and disasters.

Shelter

Cool, safe shelter is a critical need for Arizona families. In FY2024, DES distributed home energy bill assistance as part of the Low Income Home Energy Assistance Program (LIHEAP). Eligible families received up to $1,200 to pay for energy costs, with an additional $1,000 distributed to eligible recipients experiencing an energy bill crisis.

In 2023, the state also opened and staffed a cooling center as well as two mobile cooling units made of shipping containers, that provided showers and a place to rest in a climate-controlled environment for those without safe homes. ADHS shared maps of cooling center locations for those seeking respite and maps of donation centers for Arizonans to donate water and other needs.

In January, ADOH issued an Extreme Weather Notice of Funding Availability (NOFA) for entities statewide to expand existing emergency shelter response to severe weather conditions for individuals and/or families experiencing unsheltered homelessness. This includes activation for excessive heat, extreme cold, and poor air quality due to smoke from regional fires. Funds were awarded to the City of Tucson Housing and Community Development ($500K), Flagstaff Shelter Services ($370K), City of Phoenix Office of Homeless Solutions ($500K), and Verde Valley Homeless Coalition ($90K).

In response to requests for improved cooling center coordination at the state level, and separate from the Chief Heat Officer position, ADHS has hired a cooling center coordinator to serve as the statewide point-of-contact for county coordinators. The agency will also develop training for community navigators focused on improving access to human service providers. ADOA has identified several potential locations to support heat relief efforts this summer, and has developed a draft personnel process for State of Arizona employees to staff cooling centers and to provide heat relief to impacted communities, including allowing employees to receive regular duty pay when doing so. The Hobbs Administration will also create at least six new, solar-powered, cooling centers constructed with shipping containers. Those shipping containers will be mobile, and can be relocated around Arizona to augment the existing cooling center network in a way that can be agile and responsive to the needs of changing weather patterns.

In 2024 ADOH will also proactively address community impacts of extreme weather conditions by expanding existing community responses and partnerships that keep unhoused Arizonans safe. This includes providing funding to community partners to provide access to overnight heat respite in the metro-Phoenix area, staffed with

Navigators to connect individuals with access to local shelter options. ADOH also funded expanded heat relief efforts in Tucson through a regional approach to assist unhoused residents of Pima and Santa Cruz counties. In addition to the expanded heat respite, ADOH-funded community partners will also provide life-sustaining supplies such as free bottled water and water fountains, food, sunscreen, clothing, and navigational support to shelters and mental health care, and food banks. This may include expanding opening indoor spaces that meet ADHS's public health guidelines for social distancing, air quality and infectious diseases, including COVID-19 protocols.

Energy

Our growing state relies on our electric grid more than ever before. OOR and RUCO continue to work with electric and gas utility providers throughout the state on grid resilience and reliability. OOR is preparing to issue a Request for Proposals (RFP) for $13 million in grant funding to make necessary grid improvements in rural areas. In early 2024, RUCO and OOR convened electric and gas utility providers to discuss customer-centered initiatives. These include improving grid reliability measures, which are critical during summertime, such as: transmission line and system checks using helicopters and drones; site-specific interventions like vegetation control and smoke detectors in areas particularly vulnerable to wildfire; increased energy reserves to ensure electricity generation is available when customers need it the most; and equipment designed to withstand extreme heat. Utilities also discussed summertime customer protections such as transportation to cooling centers in outage areas. Additionally, they identified various employee protections from heat risk, which include baseline provisions like ample water, ice, sunscreen, earlier work schedules and encouraging breaks in the air-conditioned cabs of work trucks along with innovations such as cooling vests.[8]

[8] Regulated utilities also provide summer preparedness briefings to the Arizona Corporation Commission each spring.

Health

Agencies and partners are working together to improve health outcomes during this upcoming heat season. Through the IRF, ADHS, DEMA, and other agencies are developing thresholds for enhanced heat response activities (such as opening additional cooling centers) and are working to centralize state and county dashboards that display heat-related illness and death data (See Data Sets, Knowledge, and Workforce Development Recommendation #4).

The Industrial Commission will continue to invest resources in the execution of their Heat Stress Emphasis Program (SEP). Established in July 2023, the SEP is aimed at mitigating heat related illnesses and injuries in the workplace, collecting data and input from key stakeholders, and promoting best practices being implemented across the state. Since the SEP's implementation, the Commission has completed 73 inspections and issued one citation as of January 30, 2024. The Commission plans on conducting approximately 12 inspections per month in 2024.

ADCRR will protect inmate health through implementation of their Excessive Heat Safety and Relief Strategy, which was developed in the wake of the extreme heat event of 2023. This strategy governs temporary protocols that are triggered when excessive heat occurs. Additionally, ADCRR has a capital improvement plan to convert all housing units from evaporative cooling systems to modern and energy efficient HVAC systems by 2026.

Disaster Response

In December 2023, DEMA updated the State Emergency Response and Recovery Plan (SERRP), a multi-agency, broad stakeholder plan that is used regularly in all types of emergencies and community disruptions, including extreme heat events. The recent updates included lessons learned from recent disasters including the extreme heat emergency in the summer of 2023. The SERRP is a critical document for emergency and disaster response, providing roles and responsibilities for all state agencies. Using

the framework in the SERRP, agencies work collaboratively and coordinate to restore conditions from emergency or disaster conditions back to previous conditions.

All emergencies start and end locally. DEMA's approach to supporting communities is through local responses led by community partners, with subject matter expertise and technical assistance from state agencies, and through a common national framework. As local communities are overwhelmed, and through the close coordination with DEMA, requests for assistance flow from local jurisdictions to their respective county or tribe and then to the state. If the state is unable to provide the assistance through the Arizona Mutual Aid Compact, then requests are escalated to the federal government and/or the Emergency Management Assistance Compact, which enables DEMA to access interstate mutual aid. During extreme heat events the NWS alerts (advisory, watch, and warning) as well as the stratified risk levels with associated NWS assessed impacts drive DEMA's readiness posture. As the alert and risk level rises so does the level of partner engagement, coordination, state emergency operations center activation level, and resource response posture.

Private and non-profit organizations also play significant roles in emergency response and recovery and are included in the SERRP in a variety of ways, including as supporting partners within relevant emergency support functions as well as critical resource providers. Statewide volunteer organizations active in disasters (VOADs) and community organizations active in disasters (COADs) formally integrate public and private entities into emergency response.

DEMA is also currently evaluating how to better quantify the impacts of extreme heat events utilizing the national best practice framework of community lifelines. Community lifelines were developed as a result of a 2017 study by the Federal Emergency Management Agency (FEMA), which sought to identify core community and societal components that, if stabilized during disasters, would save lives and expedite recovery after a disaster or emergency. Focusing on community lifelines will enable DEMA to better allocate resources in an extreme heat event.

Next steps

The implementation of the Extreme Heat Preparedness Plan requires sustained cross-agency and cross-sector collaboration. To that end, the nation's first Chief Heat Officer position has been established, to coordinate heat-specific efforts between agencies on shelter, energy, health, and disaster response. Additionally, OOR will continue to convene the Interagency Resiliency Forum (IRF). The IRF, established in EO 2023-16, is comprised of agency leaders and private sector and community-based partners, with a focus on preparing for extreme heat events and other resiliency efforts. In addition to the state-level engagement of IRF members, an all-partner working group called the Arizona Heat Preparedness Network will be established as a component of the IRF. The Arizona Heat Preparedness Network will ensure statewide interests are incorporated into all activities, to build statewide capacity and ensure robust input from Tribal and local governments and cross-sector stakeholders

Extreme Heat Preparedness Longer-Term Recommendations

Safe, Affordable Housing Recommendations

Recommendation #1

TITLE: Grow Arizona's Weatherization and Energy Efficiency Workforce

RATIONALE: While extreme heat events pose challenges to our state, there are also many opportunities to ensure Arizona thrives into the future.

Throughout most of Arizona, there is a notable need for workers who are skilled in building performance standards and solutions, including weatherization and energy efficiency measures, as well as heat pump installation and HVAC repair. A dedicated and skilled workforce will be necessary to ensure homes are comfortable and safe to live in in the years to come.

With funding for the Inflation Reduction Act rebate programs and other funding opportunities, OOR and OEO will commission a study for future workforce needs in key industries to inform strategic workforce development initiatives. Additional studies could investigate workforce development opportunities for a manufacturing workforce for weatherization products and heat-safe manufactured housing at scale.

STATE AGENCY: OOR, OEO, with input from ADOH.

Recommendation #2

TITLE: Encourage heat mitigation design in affordable housing.

RATIONALE: Currently, the Arizona Department of Housing utilizes the Qualified Allocation Plan (QAP) to implement and incent affordable housing developers through the Low Income Housing Tax Credit program to carry out the Department of Housing's affordable housing priorities. This biannual guiding document allows the Department to embed priorities towards geography and population served, among other goals. For the past several years, the QAP has incentivized energy efficiencies in multifamily affordable housing development. Future QAP issuance should incorporate a critical lens of how the Arizona Department of Housing can further encourage design requirements that mitigate excessive heat and other extreme weather occurrences.

STATE AGENCY: ADOH

Recommendation #3

TITLE: Transfer permitting authority for manufactured home accessory installation to the Manufactured Housing and Building Division (MHBD) at ADOH.

RATIONALE: Within the Manufactured Housing and Building Division (MHBD) at ADOH, heat mitigation efforts are present during the manufacturing of manufactured homes and factory built buildings (FBB), and the installation of mobile homes, manufactured homes and FBBs as the inspection of HVAC and attached accessories is a prevalent function. Accessories often include porch and driveway awnings that provide essential shade and weather protection. Ultimately, it is at the discretion of the homebuyer to add these features when ordering a new home or installing a used home.

During the home installation process, MHBD inspectors are responsible for ensuring that these features are installed correctly and per the manufacturer's installation requirements. In some cases, existing homeowners or new occupants opt to add heat mitigation features after the home has been installed or occupied for a period of time. Currently, the permitting for the installation of these features, on a previously installed home, falls under the local jurisdiction having authority. As a potential change, and to gain better control of the installation process, safety requirements and timeliness of installation, there is potential legislation being proposed during the 2024 legislative session by the Manufactured Housing Industry of Arizona that will transition the permitting and inspection of these features to MHBD.

STATE AGENCY: ADOH

Recommendation #4

TITLE: Advocate for an equitable LIHEAP allocation for Arizona.

RATIONALE: Federal funding enables Arizona to serve approximately 5 percent of the eligible population. Additional resources are needed to ensure low income Arizonans have access to affordable energy, particularly in the heat. Historically, Arizona receives a much smaller allocation of funds compared to other states, in large part due to the use of LIHEAP's legacy 1981 funding formula that was created with a prime focus on meeting the heating needs of cold weather states in response to high heating oil prices in the 1970's. Under this legacy formula, Arizona receives an allotment of only 0.416 percent of total LIHEAP funds. Though this formula was updated in 1984 to better serve warmer states, Congress has limited the use of this new formula in appropriations language consistently since Federal Fiscal Year 2009. Use of this legacy funding formula results in Arizona being the 6th lowest funded State (#44/50), well below other states of comparative population and demographics; under the updated formula, Arizona would receive more median funding compared to other states (#30/50).

STATE AGENCY: Governor Hobbs and DES.

Recommendation #5

TITLE: Develop a Power and Water Service Plan that addresses delays in energy and water service during emergency periods and promotes energy efficiency and utility bill assistance programs.

RATIONALE: Water is critical to life, and, increasingly, access to electricity can be a matter of life and death. However, too many Arizona families are unable to pay their electric and water utility bills each month and are accumulating more short and long-term debt as a result. Seniors and individuals on fixed incomes also report reluctance to turn on air conditioners, even in times of high temperatures, in order to save money.

Existing regulation prohibits electric service disconnections annually between June 1st-October 15th for households served by Arizona Public Service, Tucson Electric Power, Unisource Electric, and some rural electric cooperatives. Although many households may benefit from uninterrupted electric service during this period, data also suggests that many Arizona families unintentionally fall into prolonged debt cycles due to overdue bills accumulated during this same period. Moreover, as Arizona's heat season expands beyond the typical summer months and into the spring and late fall, we must create new plans and programs that support Arizonans for the full length of extreme weather periods, including extreme heat events.

RUCO will coordinate and partner with power and water utilities to develop a Power and Water Service Plan (PAWS Plan) that identifies causes of and strategies to prevent service disruptions, opportunities to bridge service disruptions that may happen during emergency periods, and promotes energy efficiency and utility bill assistance programs to prevent short and long term cycles of debt.

STATE AGENCY: RUCO

ADAPTING AND UPDATING EMERGENCY RESPONSE RECOMMENDATIONS

Recommendation #1

TITLE: Advocate for the passage of Stafford Act Reform and Federal Response Programs.

RATIONALE: Arizona should continue to be at the forefront in advocating for federal solutions and reform to existing emergency management legislation and programs related to all hazards, emergencies and heat response. Most notably, advocacy should focus on Stafford Act reforms that more comprehensively address the needs created by increased frequency and severity of natural disasters such as heat emergencies as well as programmatic changes to existing federal funding opportunities that reduce barriers faced by Arizona communities.

Draft legislation such as the Extreme Heat Emergency Act, SB 1528 Universal Application, legislation mandating revisions to the Public Assistance Program and Policy Guide (PAPPG) to address wildfire and extreme heat events benefit cost analysis models, the Facilitating Hazard Mitigation Projects Act, and the Building Resilient Infrastructure in Communities (BRIC) Capacity Building Act. These currently proposed federal legislative acts, if effectively supported and in some cases amended, would greatly assist the Office of Resiliency and DEMA with bringing the right resources to bear before, during, and after an extreme heat event.

In anticipation of these legislative changes, DEMA should continue to support cities, counties, and Tribal governments in updating their existing hazard mitigation plan and/or emergency preparedness plans. Most notably they should provide technical assistance in identifying impactful extreme heat related projects and strategies to address the extreme heat risks identified in the state and local hazard mitigation plan.

STATE AGENCY:
Governor Hobbs (for passage of federal legislative fixes).
DEMA (for hazard mitigation plan and/or emergency preparedness plan updates).

Recommendation #2

TITLE: Define extreme heat events across state agencies and establish state-specific, extreme heat-informed community lifelines.

RATIONALE:
The National Weather Service has established criteria to alert emergency responders, government officials, and the community to weather conditions likely to result in disruption or require local protective actions. The excessive heat advisory, watch, and warning are well adapted at helping communities posture local resources to be responsive to community needs related to heat. These notifications enable the pre-deployment of cooling centers, preventative actions to weatherize critical infrastructure systems, community outreach to vulnerable populations, upstaffing of public safety resources, and healthcare system adjustments. However, across state agencies or other jurisdictions in Arizona there is no single, shared definition of an extreme heat event. This hinders cross-agency and cross-jurisdictional action. A shared definition of an extreme heat event specific to Arizona, with threshold criteria, should be developed within the framework of the Governor's Interagency Resilience Forum.

FEMA's Community lifelines are essential infrastructures crucial for maintaining societal safety and function. In the event of extreme heat, it is vital to clearly identify and monitor these lifelines. This allows emergency response partners to effectively track their status, ensuring continuity and safety during and after such heat events. What is not immediately and readily apparent are the thresholds to indicate minor, moderate, and severe impact to these lifelines as well as the critical links between various community lifelines and how those interdependencies are impacted during a heat emergency.

DEMA has partnered with Arizona State University's School of Public Administration and commissioned several graduate students to collect and analyze data community lifeline thresholds and relevant reporting data. The initial data set is anticipated to be available at the end of the spring semester in May 2024. Additionally, DEMA is pursuing funding through the Arizona Board of Regents for applied research grants to fund lifeline analysis using artificial intelligence (AI). The AI analysis will enable a better understanding of codependencies and where to intervene to break the disruption cycle. DEMA will also work closely with ADHS to link with health and community partners for on-the-ground data collection and processing.

Through the combined efforts of refining actions based on National Weather Service forecasts, refined impact data, and predictive analysis DEMA and other state agencies will be positioned to better support the state's heat response efforts.

Additionally, these data sets and analyses should inform a study that clearly outlines levels of risk associated with extreme heat, maps these risks to the relevant FEMA community lifelines, and determines the types and scales of efforts required for restoration and mitigation. Additionally, the plan should establish specific metrics to evaluate the impact of heat on these lifelines, particularly focusing and linking to other efforts that assess the loss of life and property for extreme heat events. Such a targeted approach will ensure that communities are better prepared and more resilient in the face of increasing heat-related emergencies.

STATE AGENCY: DEMA, in partnership with ADHS.

Recommendation #3

TITLE: Long Term Disaster Recovery Task Force.

RATIONALE: The immediate impacts of extreme heat and all-hazard disasters subside when weather changes. However, recovery activities continue for years. Long Term Recovery Task Forces (LTRTF) are commonly used tools to create standing organizational structures that facilitate the coordination and collaboration of community-based recovery efforts.

A state managed LTRTF would provide the framework and technical expertise necessary to bring a wide range of partners together on a regular basis. These partners would address recovery, and by extension resilience efforts related to extreme heat and other all hazards' events in the state. The LTRTF would be housed in DEMA's Recovery Branch who already manages the state's recovery process from disasters and has the relevant organizational contacts to initiate this endeavor. As the LTRTF grows so too will its effectiveness and range of stakeholders. The LTRTF would synchronize public, private, and non-profit efforts to create operational efficiencies and make both public investment and charitable giving have the greatest impact on those in Arizona who need it most.

STATE AGENCY: DEMA, in partnership with other Recovery Support Function Primary Agencies, and OOR.

Recommendation #4

TITLE: Advance social connectivity through neighborhood Resilience Hubs.

RATIONALE: Resilience hubs are safe, trusted, gathering spaces for communities experiencing disruptive events, including periods of extreme heat. Resilience hubs should have back-up power (or micro-grids) that provide 14+ days of energy, refrigeration, clean water, and food service capabilities that provide shelter and services during disruptions. The resilience hubs would also serve points of distribution for state and federal aid, state level individual assistance centers, and federal disaster recovery centers depending on the level of event. as a centralized location for coordination of recovery efforts post disturbance.

The resilience hubs would operate as cooling centers during extreme heat and connect with a statewide network for better coordination of service, especially to high heat vulnerable populations. Extreme heat impacts vary across neighborhoods, with landscape level design and historic disinvestment resulting in as much as 15◦F difference in surface temperatures. Strong social connectivity prevents heat illness for vulnerable populations. This evidence-based preventative measure for extreme heat vulnerability is challenging to implement given the current lack of focal points for communities to gather and build cohesion around resilience. During disasters, neighbors helping neighbors can provide immediate response and support. Resilience Hubs would ideally operate year round as community centered focal points, incorporate renewable energy and back-up power, offer training and education in equity, and adopt a continuous improvement model. The State of Arizona can promote this mechanism and support ways to finance and/or find funding opportunities.

STATE AGENCY: ADHS and DEMA, in partnership with ADOH, DES, and OOR.

Recommendation #5

TITLE: Develop extreme heat-specific knowledge sets for improved cross-jurisdictional emergency response

RATIONALE: Essential datasets regarding extreme heat events have not yet been developed and/or are not available for all jurisdictions and partners. This lack of information critically impacts the ability of state agencies and partners to effectively engage in heat emergency planning and response.

Additionally, most jurisdictions in Arizona do not have established heat-specific response plans. Inter and intra-jurisdictional communication surrounding heat risks and response suffers without an established or practiced plan in place. Delays in communication can result in slower response times, ineffective decision-making, and inaction or distrust in the community.

Via a steering committee helmed by ADHS, DEMA, ADOH, and RUCO will work with stakeholders to develop a statewide heat communication plan; improve stakeholder access to essential data and information; develop a standardized heat risk communication tool; and create or improve standards for extreme heat emergency alerts. This steering committee will report its recommendations and activities to the IRF.

Existing response plans, guidance documents, and data sets have been developed by various organizations and jurisdictions throughout Arizona. These can be leveraged when developing a threshold for declaring an emergency or for activating response activities:

- All Hazards Emergency Response Plan: provides guidance for all types of public health emergencies and disasters. It describes roles, responsibilities and the all-hazards concept of operations for a public health response.
- Extreme Heat Index Annex: outlines and defines a coordinated response to a heat emergency in Arizona and supports the All Hazard Emergency Response Plan.
- Military limitations on outdoor activities when temperatures are greater than 110°F
- Tohono O'odham Nation's trigger point for opening cooling centers and coordination between cooling centers
- Data - Datasets previously discussed in the Data to Action, as well as, morgue capacity, energy outages, medical examiner data, and hospital capacity.

Heat emergency response efforts will focus on ensuring that all communities in Arizona are aware of heat events and emergencies, and that response efforts are effective depending on location. Improving knowledge of the Arizona Emergency Information Network statewide alert system and standards for deploying those alerts during extreme heat events will decrease communication barriers for vulnerable populations, such as older adults or homebound individuals.

STATE AGENCY: ADHS and DEMA.

COOLING CENTER NETWORK IMPROVEMENTS AND SUPPORT RECOMMENDATIONS

Cooling centers provide a welcome space for community members and pets during heat season. Many offer cooling facilities, water, snacks, meals, and access to wrap-around services with community partners. In Maricopa County in 2023, there was also one respite center that offered refuge from the heat 24 hours a day, 7 days a week. Cooling centers may not be feasible in many rural areas of Arizona, and rural-community specific solutions should be explored.

In Maricopa County, cooling centers operate continuously from May through September, whereas other counties launch cooling centers based upon extreme heat warnings from the National Weather Service.

In response to stakeholder input, ADHS has established a full-time cooling center network coordinator to create a more effective and efficient network. Cooling center coordination efforts currently take place through the Heat Relief Network, launched by the Maricopa Association of Governments in 2005. It is a regional partnership of local governments, faith-based organizations, businesses, and community organizations.

Recommendation #1

TITLE: Optimize the cooling center network, develop cooling center standards, and provide stable funding support.

RATIONALE:

Optimization

There is a need for statewide coordination of cooling centers in order to optimize operations and improve services.

Coordination currently occurs through the Arizona Cooling Center Workgroup, which was established in 2020 and seeks to address concerns, share best practices, and advocate for a sustainable funding stream to operate cooling centers. Though various evolutions of a cooling center network have been operating for many years, there are numerous gaps in coordination, funding, and communication.

To address these gaps, in early 2024 ADHS designated a full-time coordinator to optimize cooling center and heat respite center operations throughout the state. Additionally, the coordinator will work with local and community partners to identify

optimal locations, ensuring standards, and increasing access to and dissemination of supplies, collecting data for enhanced decision making and planning, and communicating for the network.

Future areas of focus will include development of a coordinated strategic plan, focusing on developing new, safe heat respite centers to serve the growing need for nighttime respite from extreme heat.

Standards

Cooling centers vary widely in their size and capacity to serve those seeking relief from heat. Many centers are only able to provide refuge during the peak heat period of the day, from 2-5 pm, and others are only able to serve a small number of people at a time.

Clear standards and guidelines should be developed and implemented based on population density in communities throughout Arizona. Facility size and capacity, as well as operational policies, procedures, and guidelines, should be established, including: minimum operating requirements, minimum operating hours, pet policies, safety, staff/volunteer training, and accessibility. Uniform cooling center requirements, as well as shared operating procedures and messaging will help improve data collection and will inform site selection in future years, increasing the network's understanding of visitors' needs, and ultimately improving services.

These standardization recommendations will also improve data collection and analysis, which is necessary to improve site selection in future years, increase the network's understanding of visitors' needs, and ultimately improve and tailor services to the population.

Funding

Additionally, cooling centers have been funded through monetary and in-kind donations, as well as ARPA funds, resulting in a critical lack of stable funding for centers providing safety to our most vulnerable populations during periods of extreme heat. Cooling center providers need a reliable and sustainable funding source in order to effectively deliver life-saving heat relief services. The Hobbs Administration will expand the cooling center network with at least 6 mobile, solar-powered, retrofitted shipping containers for cooling in the immediate future, and will continue to identify grant opportunities from the Infrastructure and Investment Jobs Act and the Inflation Reduction Act and other funding mechanisms used in cold-weather states for state-level funding to contribute to local cooling center operations in future years.

STATE AGENCY: GO, ADHS.

DATA SETS, KNOWLEDGE, AND WORKFORCE DEVELOPMENT RECOMMENDATIONS

Recommendation #1

TITLE: Quantify the costs of extreme heat as well as the benefits of statewide heat mitigation efforts to the Arizona economy.

RATIONALE: The context for developing a study to quantify the loss of life and property due to extreme heat arises from a current, significant gap in the FEMA's disaster management framework, which does not recognize extreme heat as a qualifying disaster in the Stafford Act (please see Advocate and Prepare for Passage of the Extreme Heat Emergency Act recommendation for more details). This recommended study would prepare the State of Arizona, pending the potential passage of the Extreme Heat Emergency Act, to be able to immediately answer and fill anticipated information gaps by providing comprehensive data on multifaceted impacts of heat. The study should be conducted by a multidisciplinary group (including agriculture, transportation, forestry, engineering, planning, actuarial science, market economy, geography) to clearly identify metrics to inform mitigation and preparedness projects.

Existing databases and indices should be utilized where relevant. The study should be comprised of two sections, one that focuses on how to quantify the loss of people and one on the impact for property. This includes a detailed assessment of the impacts on critical infrastructure in alignment with the FEMA Community Lifelines, such as the energy grid, public health resources, surface transportation, transit systems, rail networks, and aviation facilities under conditions of continual heat exposure. Parallels with cold weather communities should be included as reference for how to assess and manage the impacts of cold (i.e., salt and brine on infrastructure). Economic implications of extreme heat should distinguish between the impacts on businesses and individual households.

In addition to the data sets mentioned above, the following data which is already gathered by the Arizona Department of Insurance and Financial Institutions (DIFI), can be incorporated into the broad data set to help flesh out the effects of extreme heat on people and property in Arizona. These data sets include:

- Life and Health claims and analytics associated with extreme heat;
- Workers Compensation data focused on Employee Heat Related Claims.The state can collaborate with the National Council on Compensation Insurance

(NCCI) to provide statistics on potential impacts to Workers Compensation claim frequency and severity;
- Business Interruption coverage claim impact to determine if there is an increase in the frequency of business interruption claim activity due to brown out and other heat related outages or disruptions;
- Crop Insurance coverage data to determine if there is an increase in the frequency and severity for heat related crop claims; and
- The continued review of any impact of an increase in wildfire risk to determine if it is correlated to a potential increase in premiums and claims associated with an increase in an extreme heat event.

In addition to the cost analyses necessary to inform and prepare for the listing of extreme heat as a federally reimbursement disaster, meaningful cost-benefit analysis about the value of the impact of heat and heat emergencies would better prepare Arizona for future heat response. It is also recommended that this analysis align with existing FEMA benefit cost analysis models to streamline grant funding through existing federal programs. Access to that data will allow state agencies as well as private investment and non-profit service partners to be proactive in planning instead of mostly reactive to the cost of addressing heat. This will allow deeper understanding based on data which can also be used to support forecasting and scenario planning conducted in partnership with academic institutions. Data should be made available to experts in the academic sector at a level detailed enough to conduct further analyses at high spatial-temporal resolutions, blend with other datasets, and used for predictive analysis that enables scenario build to in turn support decision support systems for the Office of Resiliency, Interagency Resiliency Forum, and the Heat Preparedness Coordinator. Funding for this activity could be pursued through the Arizona Board of Regents as an applied research project and contribute to the proposed National Academies study as well as national strategic planning such as with NIHHIS.

STATE AGENCY: OOR lead, in partnership with DEMA, and DIFI.

Recommendation #2

TITLE: Grow the Clean Energy Economy

RATIONALE: Arizona's economy benefits from climate technology research and development and start-ups. Over 12,000 clean energy jobs have been created in Arizona since the passage of landmark federal legislation, the Infrastructure Investment and Jobs Act of 2021 and Inflation Reduction Act of 2022. Tax credits and other incentives have resulted in billions of dollars of investment opportunities.

While this is a global problem, requiring global solutions, Arizona stands to benefit greatly through consistent, ambitious policy and by continued investment in our clean energy and technology economy.

STATE AGENCY: OOR lead, in partnership with Governor's Office of Strategic Initiatives, OEO and ACA.

Recommendation #3

TITLE: Support research on heat impacts and solutions throughout the state.

RATIONALE: Arizona is a hotbed for innovative, applied research related to heat impacts and mitigation solutions. Arizona should continue to lead the way on the urban heat island effect and mitigation approaches, and impacts of heat on health, our economy, agriculture, and environment.

State government plays an important role supporting data collection and analysis for many issues facing our communities. State agencies can and should engage in heat-related research or partner with researchers to build a robust body of knowledge to better inform agency missions and improve government services.

The proposals highlighted below are just a few examples of innovative research and initiatives identified by state agencies:

- The Arizona State Climate Office proposes to create heat maps showing areas of excessive heat in several cities and towns in Arizona. While the consequences of the urban heat island are fairly well understood, what is less understood is how the urban heat island impacts vulnerable populations in smaller cities and towns in Arizona. This study can inform government services to vulnerable populations in areas where heat-relevant data is less developed.
- ADHS proposes to close gaps in heat-related awareness and resources available to community members and partners. Consultations with stakeholders have found that there is need in a variety of areas to improve Arizona's heat preparedness, including:
    - Increased expertise and capacity in undersourced jurisdictions,
    - Affordable, convenient public transportation to critical resources,
    - Improvements in power infrastructure in Tribal and rural areas, as well as at hospitals and medical clinics,
    - Re-greened public spaces with natural and artificial shade
    - Awareness and support for federal funding opportunities
    - Provision of heat prevention and relief resources to the public

  ADHS will conduct an infrastructure assessment, develop a volunteer management plan, identify associations between environmental conditions and comorbidities, identify and synthesize current heat research and solutions appropriate for Arizona, and informating cooling center coordination and placement with a network analysis.

STATE AGENCY: Arizona State Climatologist, ADHS, other state agencies.

Recommendation #4

TITLE: Develop multilingual tailored educational materials and utilize creative public outreach channels to reach vulnerable populations

RATIONALE: Heat-illness is preventable, in part through focused, sustained education and outreach regarding those most at risk - children, homebound seniors, agricultural and other outdoor workers, workers without access to climate controlled spaces, and speakers whose first language is not English.

Over the years, ADHS has held heat awareness campaigns and developed tool kits that promote heat awareness, educate the public on heat hazards, and provide resources to keep everyone safe. ADHS conducted social media campaigns, provided excessive heat warning and safety tips to the public and schools, developed a school-specific report for heat safety, and created multiple heat safety toolkits focused on older adults, outdoor workers, transportation, and school-aged children.

However, current outreach methods do not fully address inequities in health literacy, internet access, and mobility e.g. homebound individuals, resulting in some Arizonans not receiving the necessary information to protect themselves. ADHS's communications approach will focus on creating standardized messages around heat safety and translating to languages needed in the community; conducting comprehensive outreach to vulnerable populations and communities; and creating and updating population-specific toolkits (workplaces, schools, and congregate care facilities).

By partnering with other state agencies and community groups, ADHS can identify additional ways to share these tailored safety messages and alerts. The Arizona State Lottery, for instance, has identified the use of retailers as a creative channel to reach more Arizonans.

STATE AGENCY: ADHS

Recommendation #5

TITLE: Data to Action: Improve current data systems to ensure efficient resource management and data-driven decision-making.

RATIONALE:

State & County Illness & Death Data Dashboards & Reports

Currently, the following data and dashboards related to heat are available:

- Heat-Related Illness (HRI) Dashboard
- HRI Emergency Department (ED) Visits and HRI Mortality surveillance reports
- A statewide heat relief site map

National and local partners also provide accessible reports and dashboards. For example, the National Weather Service provides a Heat risk map, a color-numeric-based index providing a forecast risk of HRI to occur over a 24-hour period. County-level data dashboards, surveillance reports, cooling center surveys, and medical examiner reports also provide important information.

Data Availability and Coordination

In addition to the data dashboards and reports already published, state agencies and partners have datasets and sources that could be utilized to inform a broader array of future reports and decisions. However, in current heat response efforts throughout Arizona, there is a lack of coordination in data collection, sharing, and reporting. Governments and organizations use different approaches to define and collect data and often do not implement public health surveillance metrics. In some instances, governments and organizations are also not collecting the necessary data (See, “Develop a statewide alert system and extreme heat-specific knowledge sets for improved cross-jurisdictional emergency response” for recommendations related to this concern). For example, heat-related illness does not have a universal definition and is not a required reporting metric, leading to a lack of data reflecting the accurate number of illnesses (see the “Define extreme heat across state agencies and establish state-specific, extreme heat-informed community lifelines” for recommendations related to this concern.). Additionally, there is an insufficient amount of data showing the effects of declaring an emergency.

The State, along with local and national partners, should consider options to standardize data collection and analysis to support data-sharing and interpretation. The State can lead by prioritizing data sharing across agencies and centralizing statewide data for items like air quality and power outages. An initial step could include creating data-sharing agreements for heat-related data.

Expanding Heat-Related Data Collection

As data collection is centralized, data robustness should also be considered. Some groups, or populations, remain unaccounted for in current practices and datasets. The following are crucial missing populations and indicators for analyzing heat impacts:

- Air conditioning status and related heat impacts
- ADOSH Worker's compensation data
- Data indicating drugs that have the highest safety risks in heat
- Data qualifying and measuring the risks of heat using thresholds
- Heat mapping and natural shading
- Low income resource availability - access to drinking water, communications, indoor places
- Persons living with disabilities and HRI and heat deaths
- Persons who are homebound and HRI and heat deaths
- Tribal center heat emergency visits

The State will improve current data systems for the management of resources and data-driven decision-making by:

- Assessing and implementing data-sharing agreements across agencies,
- Identifying optimal locations to increase cooling center availability by using modeling to create maps,
- Identifying and using trigger points to step up heat response activities, e.g. Health Emergency Operations Center, opening of added cooling centers, etc., and
- Centralizing state & county data dashboards that display heat-related illness and death data to maximize data accessibility to stakeholders.

STATE AGENCY: ADHS

Acronym List

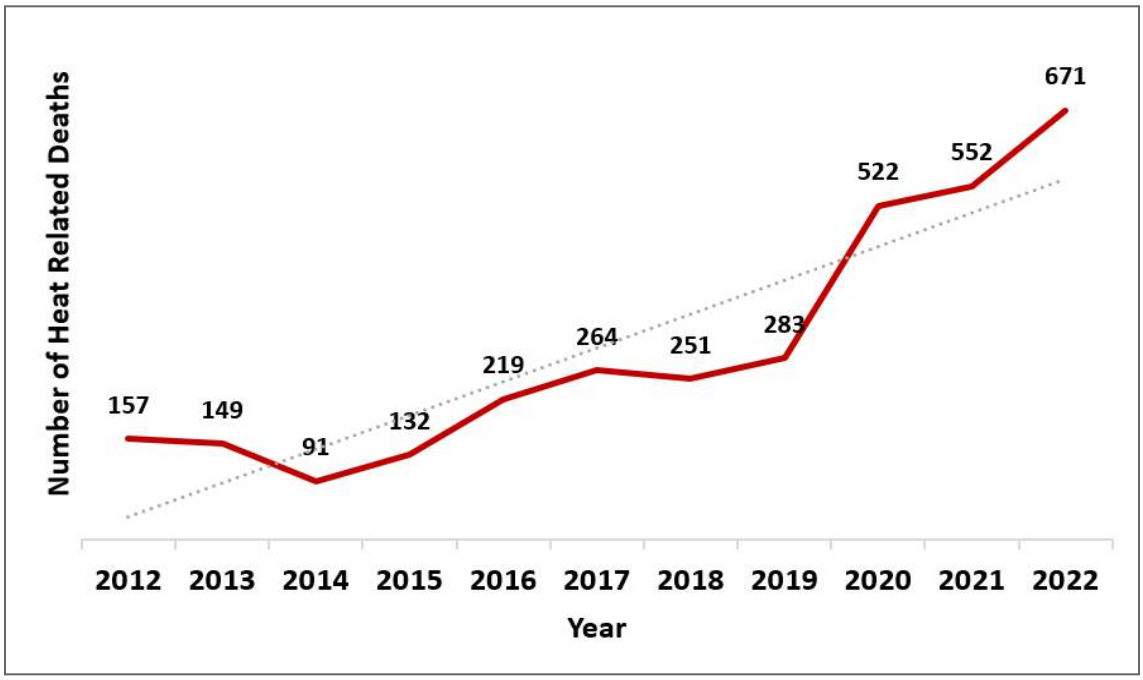
- ACA Arizona Commerce Authority
- ADCRR Arizona Department of Corrections, Rehabilitation, and Reentry
- ADES Arizona Department of Economic Security
- ADHS Arizona Department of Health Services
- ADOA Arizona Department of Administration
- ADOH Arizona Department of Housing
- ADOSH Arizona Division of Occupational Safety and Health
- ADOT Arizona Department of Transportation
- AFN Arizona Faith Network
- AHCCCS Arizona Health Care Cost Containment System
- ALHOA Arizona Local Health Officers Association
- ARPA American Rescue Plan Act
- ASU Arizona State University
- AZ Arizona
- AZEIN Arizona Emergency Information Network
- BRACE Building Resilience Against Climate Effects
- BRIC Building Resilient Infrastructure Communities Capacity Building Act
- CDC Centers for Disease Control and Prevention
- CLIMAS Climate Assessment for the Southwest
- COAD Community Organizations Active in Disaster
- DEMA Department of Emergency and Military Affairs
- DES Department of Economic Security
- DIFI Arizona Department of Insurance and Financial Institutions
- DOH Department of Housing
- DPS Department of Public Safety
- ED Emergency Department
- EM Emergency Management
- FBB Factory Built Buildings
- FEMA Federal Emergency Management Agency
- GIS Geographic Information System
- GO Governor's Office
- HOA HomeOwners Association
- HRI Heat-Related Illness
- HVAC Heating, Ventilation and Air Conditioning
- IC Industrial Commission
- IHS Indian Health Service
- IRF Interagency Resiliency Forum
- IT Information Technology
- KER Arizona State University's Knowledge Exchange for Resilienc
- LIHEAP Low Income Home Energy Assistance Program
- LTRTF Long Term Recovery Task Forces
- MAG Maricopa Association of Governments
- MCDPH Maricopa County Department of Public Health
- MHBD Manufactured Housing and Building Division of ADOH
- MOA Memorandum of Agreement
- MOU Memorandum of Understanding
- NGO Non-Governmental Organization

- NEMSIS National Emergency Medical Services Information System
- NIHHIS National Integrated Heat Health Information System
- NIOSH National Institute for Occupational Safety and Health
- NOFA Notice of Funding Availability
- NWS National Weather Service
- OEO Office of Economic Opportunity
- OOR Governor's Office of Resiliency
- OSPB Office of Strategic Planning and Budgeting
- OSHA Occupational Safety and Health Administration
- OTG Office of the Governor
- PAPPG Public Assistance Program and Policy Guide
- PAWS Power and Water Service Plan
- PIO Public Information Officer
- PHEP Public Health Emergency Preparedness
- POC Point of Contact
- PSA Public Service Announcement
- QAP Qualified Allocation Plan
- RMA Roadside Motorist Assist
- RUCO Residential Utility Consumer Office
- SEP Heat Stress Emphasis Program
- SERRP State Emergency Response and Recovery Plan
- SOP Standardized Operating Procedure
- STORM Safeguarding Tomorrow Through Ongoing Risk Mitigation Act
- SVI Social Vulnerability Index
- UA University of Arizona
- VOAD Voluntary Organizations Active in Disaster

Appendix A: Extreme Heat Data Summary[9]

[9] All charts include the most recent available data.

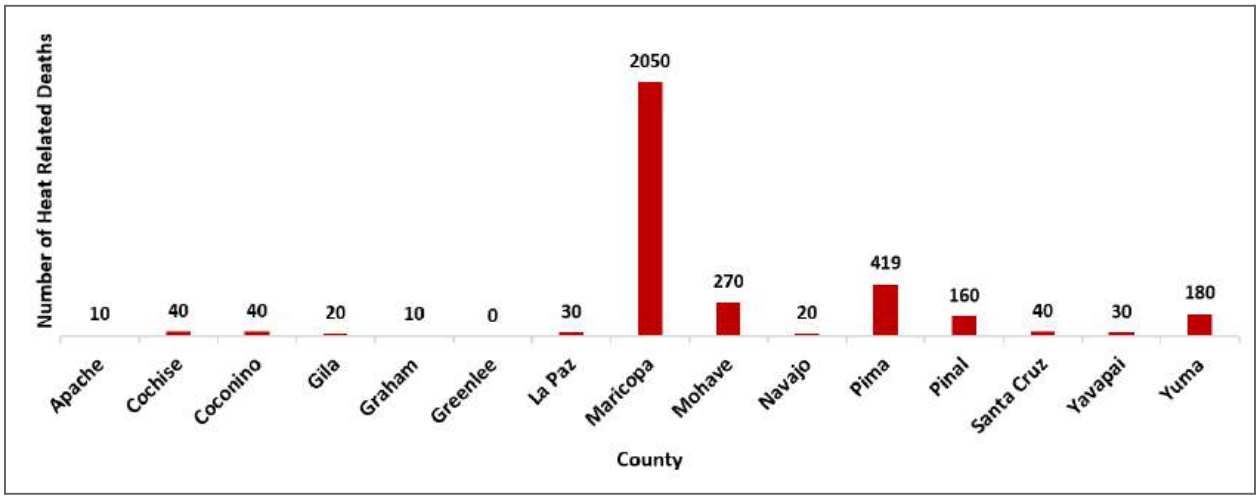
Figure 1. Arizona Heat-Related Deaths by Year (2012-2022)



YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
HEAT RELATED DEATHS	157	149	91	132	219	264	251	283	522	552	671

Source: Arizona Department of Health Services

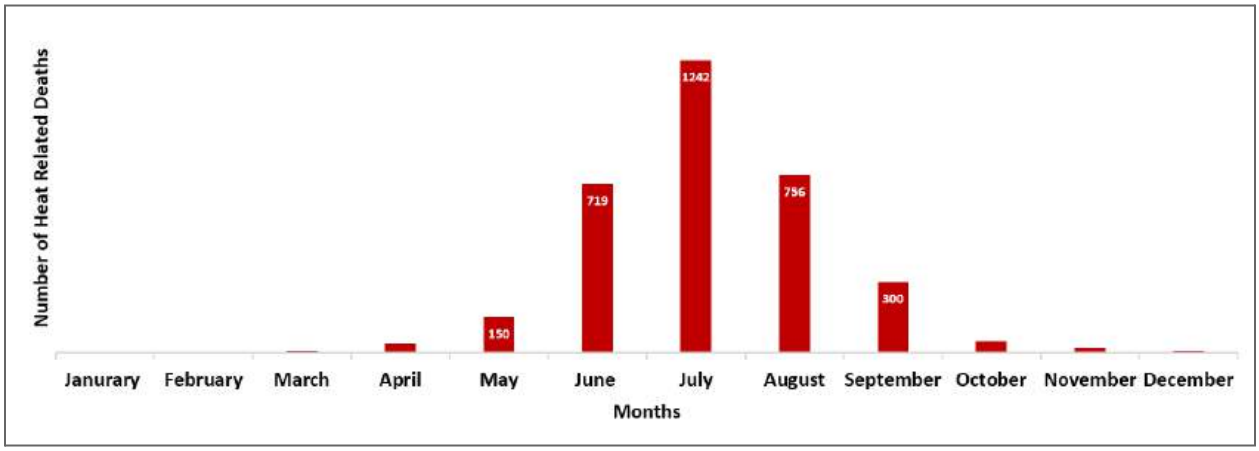
Figure 2. Arizona Heat-Related Deaths by Counties (2012-2022)



County	Apache	Cochise	Coconino	Gila	Graham	Greenlee	La Paz	Maricopa	Mohave	Navajo	Pima	Pinal	Santa Cruz	Yavapai	Yuma
Heat Related Deaths	10	40	40	20	10	0	30	2050	270	20	419	160	40	30	180

Source: Arizona Department of Health Services

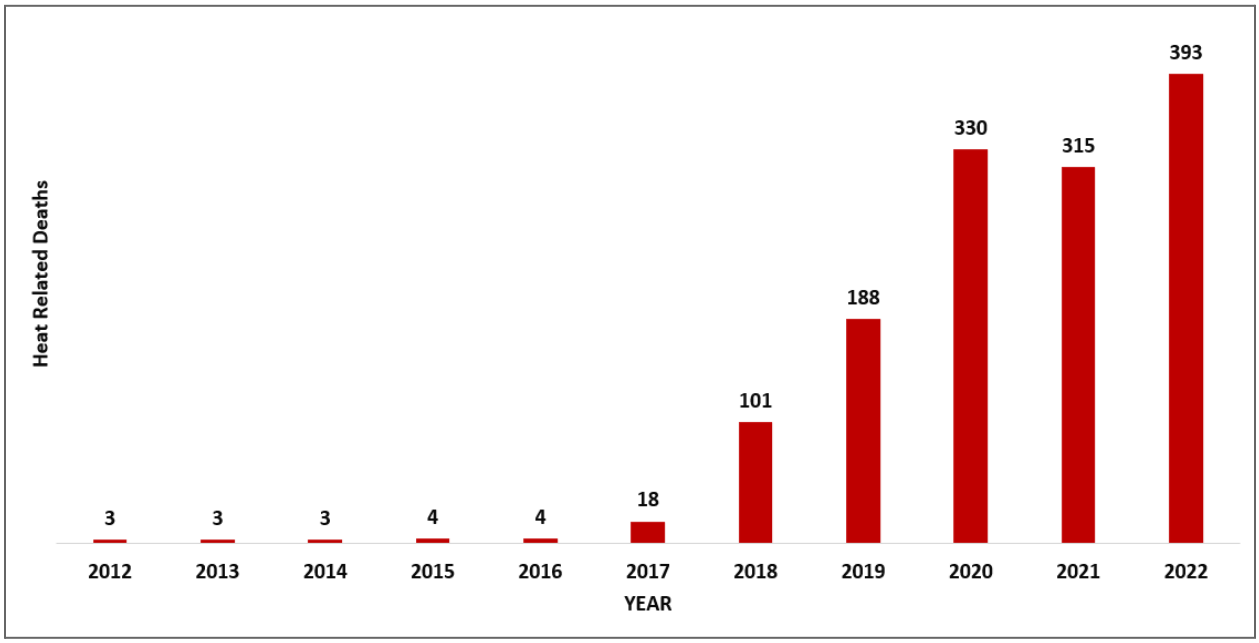
Figure 3. Arizona Heat-Related Deaths by Months (2012-2022)



Year	Janurary	February	March	April	May	June	July	August	September	October	November	December
Heat Related Deaths	0	0	10	40	150	719	1242	756	300	50	20	10

Source: Arizona Department of Health Services

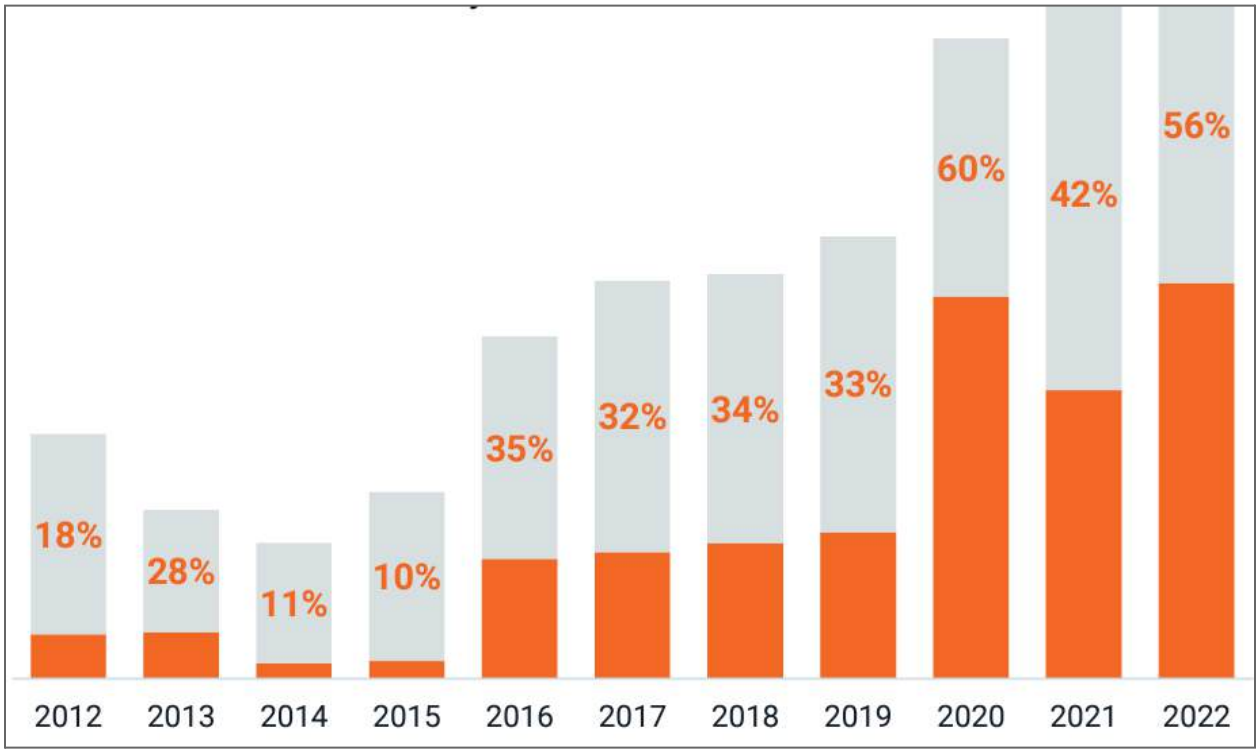
Figure 4. Arizona Heat-Related Deaths by Place of Injury (2012-2022)



YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
OUTDOOR WORKERS	3	3	3	4	4	18	101	188	330	315	393

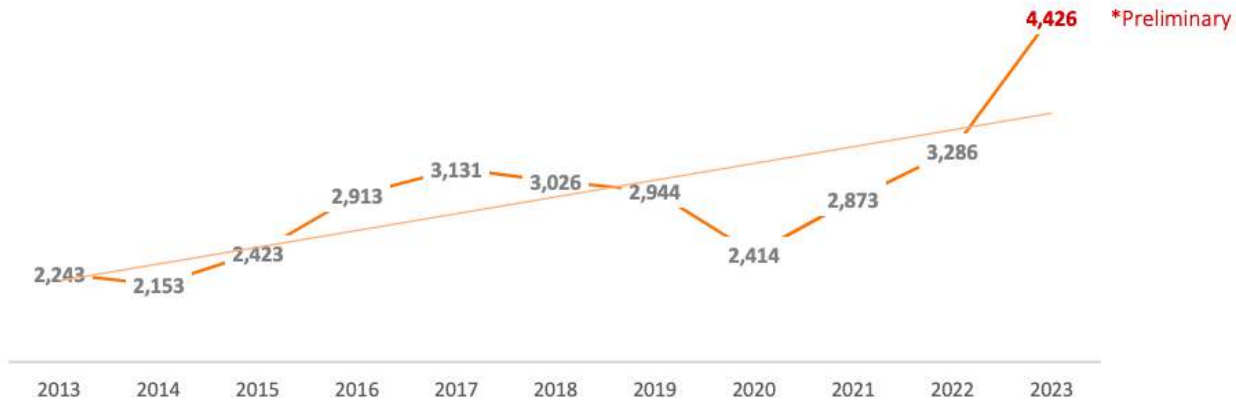
Source: Arizona Department of Health Services

Figure 5. Maricopa County Heat Related Death in the Unhoused Population (2012-2022)



Source: Arizona Department of Health Services

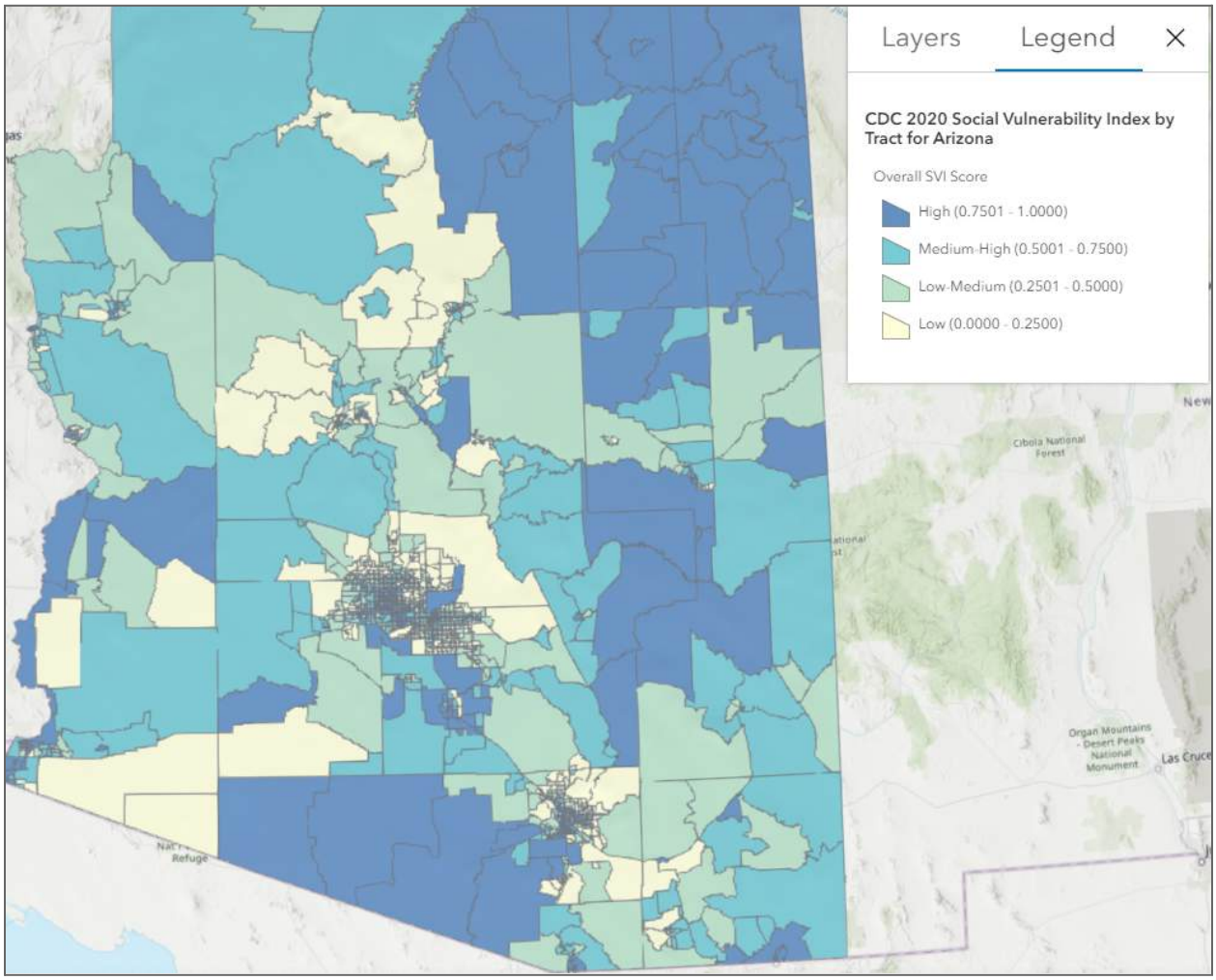
Figure 6. Arizona Heat Related ED Visits (2013-2023)



2013-2022 Data Source: ADHS Hospital Discharge Data
*Preliminary 2023 Data Source: https://www.azdhs.gov/preparedness/epidemiology-disease-control/extreme-weather/heat-safety/index.php#heat-dashboard

Source: Arizona Department of Health Services

Figure 7. Arizona SVI by Census Tract (2020)



Source: Arizona Department of Health Services

Figure 8. Arizona Durable Medical and Assistive Equipment (DME) Dependence (2023)

All Power Dependent	Power Dependent Devices and DME									
# Electricity-Dependent Devices and DME	# Cardiac Devices (5 years)	# Ventilators (13 months)	# BiPAPs (13 months)	# O2 Concentrators (36 months)	# Enteral Feeding (13 months)	# IV Infusion Pumps (13 months)	# Suction Pumps (13 months)	# At-Home ESRD Dialysis (3 months)	# Motorized Wheelchairs or Scooters (13 months)	# Electric Beds (13 months)
70,166	1,014	1,655	3,980	56,716	1,408	2,723	462	972	2,187	3,805

Source: Arizona Department of Health Services

Appendix B: Extreme Heat Planning Summit

The Arizona Department of Health Services hosted the *Extreme Heat Planning Summit* to engage stakeholders throughout Arizona in response to EO2023-16. The Summit was held October 30, 2023 at the Arizona State University's Memorial Union with nearly 150 people in attendance.

Participating Organizations		
AHCCCS American Lung Association Arizona State University ASA AZ Dept. of Corrections AZ Dept. of Education AZ Dept. of Emergency and Military Affairs AZ Dept. of Health Services AZ Dept. of Veteran Affairs AZ Faith Network AZ Health Care Association AZ PIRG Education Fund AZ Statewide Independent Living Council AZCHER AZHEALTHTXT AZHHA	Banner Plans & Network BORR City of Glendale City of Phoenix City of Surprise City of Tempe Coconino County Copa Health Coyote Crisis Collaborative Gila County Gila River Indian Community HonorHealth Maricopa Association of Governments Maricopa County National Weather Service	Pascua Yaqui Tribe Phoenix Fire Department Pima County Pinal County Salt River Pima Maricopa Indian Community Salt River Project Santa Cruz County Tenet Healthcare The Salvation Army Tohono O'odham Nation Town of Youngtown University of Arizona Valley of the Sun United Way Wildfire Yavapai County

The day included presentations from leading and emerging heat experts:

- Jennifer Cunico, Arizona Department of Health Services - *AZ Heat Planning Summit 2023*
- Maren Mahoney, Office of Resiliency, Office of Governor Katie Hobbs - *Welcome*
- Margaret Hinrichs, Arizona State University - *Heat Data in Arizona*
- Fátima Luna, City of Tucson - *Heat Resilience Strategy*
- Jessica Bell, Maricopa County Department of Public Health - *2023 Cooling Center Evaluation: Preliminary Results*
- Mona Aurora, University of Arizona - *Collaborations to Address Extreme Heat Risk & Build Health Equity in Arizona Communities*
- Rev. Katie Sexton-Wood, Arizona Faith Network - *Call to action, AFN Heat Relief Video*

Facilitated workshops brought together diverse groups of stakeholders in both the morning and afternoon. The following aims were used to develop the facilitated sessions:

Summit Rational Aim
To identify what statewide cross-sector collaborative work needs to be done to keep Arizonans safe from heat.

Summit Experiential Aim
For all participants to contribute their expertise and feel represented in Arizona's response to heat.

Participants self-selected their breakout topic at the time of registration. Breakout rooms were organized and described as outlined below but conversations were allowed to flow freely and respond to who was present in the room:

- ➔ **Sustainability, Policy, and Innovation**: Discussed innovative approaches to ensure sustainability. Topics included built environment, legislative changes, funding, emergency declaration threshold.
- ➔ **Data to Enhance Heat Resiliency:** Discussed questions that data can answer. Topics included available data, data needs, recommended indicators, data approaches, data management and sharing, threshold for outdoor workers, heat vulnerability index, explore non-traditional surveillance approaches, update data dashboard.
- ➔ **Communicating to Promote Heat Resiliency:** Discussed approaches to promote heat awareness in Arizona and reduce heat burden among vulnerable populations. Topics included marketing, PIO/media, standardized language, vulnerable populations.
- ➔ **Heat Relief Coordination:** Discussed heat relief coordination of cooling centers, hydration stations, and respite centers. Topics included optimization of locations, training & education for workers/volunteers of cooling centers, and network.
- ➔ **Building a Strong Infrastructure:** Discussed the network and infrastructure to ensure smooth operations. Topics included supplies, logistics, transportation, network communication (partners, HC, responders), intersections with other areas/agencies.

By the end of the Summit, each breakout topic had a set of prioritized strategies, along with a list of potential activities, for the virtual workgroups to take and build out into the action plans included herein.

APPENDIX C:
Extreme Heat Effort timeline

The following list includes key milestones for extreme heat efforts.

- 2005 Maricopa Association of Governments launches Heat Relief Network
- 2006 Maricopa County Department of Public Health initiates heat surveillance
- 2010 Tucson launches annual urban heat island workshops
- 2010 ADHS Extreme Weather & Public Health Program established
- 2011 ADHS launches Heat Safety Toolkit for Outdoor Workers
- 2013 ADHS convenes first statewide heat-related illness meeting
- 2014 ADHS publishes Arizona Heat Safety Resource Guide
- 2014 ADHS, MCDPH, ASU, and MAG conduct cooling center evaluation
- 2014 Maricopa County Attorney's Office launches heat safety awareness campaign
- 2015 ADHS, MCDPH, and ASU conduct CASPER household survey on heat
- 2015 ADHS publishes first Arizona Climate and Health Profile
- 2015 MCDPH launches Bridging Climate Change and Public Health initiative
- 2016 ADHS, MCDPH authoring to CSTE national heat syndrome definition
- 2016 MCDPH publishes Accessing the Cooling Needs of Homebound Individuals in Maricopa County
- 2017 ADHS publishes Trends in Morbidity & Mortality From Exposure to Excessive Natural Heat in AZ
- 2017 ADHS publishes first Arizona Climate and Health Adaptation Plan
- 2017 ADHS, NWS, ASU, and UA begin annual Extreme Heat Planning Workshops
- 2017 Nature Conservancy launches Nature's Cooling Systems program
- 2018 Cooling center evaluation efforts begin in Yuma County
- 2018 ADHS publishes Addendum to the Arizona Climate and Health Adaptation Plan
- 2018 Enhanced heat surveillance study in Pinal County
- 2020 MCDPH launches Energy Insecurity workgroup
- 2020 ADHS, ASU publishes Operating Cooling Centers in Arizona Under COVID-19 and Record Heat Conditions
- 2020 Arizona Heat Resilience Workgroup launched
- 2021 ADHS publishes Managing Extreme Heat Recommendations for Schools: Pilot Version
- 2022 ADHS launches Heat Related Illness Data Dashboard
- 2023 Governor Hobbs issues EO 2023-16 directing the creation of interagency Extreme Heat Preparedness Plan; declares heat emergency to reimburse localities and CBOs for heat event costs
- 2023 Governor Hobbs holds utility roundtable to discuss extreme heat preparedness
- 2023 Governor's Office of Resiliency, ASU, hold two interagency workshops on extreme heat preparedness and response
- 2023 ADHS convenes statewide summit to inform heat preparedness plan
- 2024 Governor's Office of Resiliency develops first interagency Extreme Heat Preparedness Plan under Governor Hobbs

Appendix D:
Protocol for Hypothetical Emergency Response Scenario

The following hypothetical scenario and associated timeline is generally illustrative of the response actions taken by various organizations as a heat emergency unfolds. For the purposes of this scenario "local jurisdictions" includes Tribal, county, and municipal governments. This scenario is not all inclusive of every action or decision point but is intended to provide a general outline of how an extreme heat emergency could unfold and the types of impacts and some of the response activities that would occur.

Pre-Event

Conditions:

NWS is forecasting several days to weeks of sustained major to extreme heat risk. Additionally NWS has issued a heat advisory and watch for many parts of the state beginning in the next few days. All community lifelines are "green" and experiencing minor to no impact. The State Emergency Operations Center would be activated at a level 3, "normal operations".

Actions:

State - DEMA is sharing relevant NWS reporting and populating the crisis information system with relevant reporting. The Arizona Emergency Information Network (AzEIN) is sharing relevant public information related to the developing heat event and actions the public can take to protect themselves. Stakeholders are contacted to ensure awareness of potentially hazardous conditions requiring action. State agencies are assessing available resources and capacity to fill and support resource requests. State agencies also conduct final preparedness actions to minimize negative impacts and ensure responsiveness to requests.

Local - Local jurisdictions are sharing risk and preparedness information with local partners and the public within their community. Community stakeholders would conduct final preparedness actions to minimize negative impacts and ensure responsiveness to requests.

Initial Onset:

Conditions:

NWS has issued extreme heat warnings for multiple counties in Arizona anticipated to persist for several days to weeks. The next 7 days are forecasted to rise to an extreme heat risk level. All community lifelines are “green” and experiencing minor to no impact.

Actions:

State - DEMA will continue to share risk and crisis information via established networks and systems as well as public information on AzEIN. The State Emergency Operations Center would be activated at a level 3, “normal operations”. State agencies will initiate agency specific heat response plans and are standing by to fill resource requests.

Local - Local jurisdictions are closely monitoring impacts on the community lifelines, are opening local cooling centers and preparing to respond to community disruption.

Sustained Extreme Heat:

Conditions:

NWS continues to forecast sustained extreme heat and persistent extreme heat warnings for multiple counties in Arizona. The safety and security, health and medical, and energy lifelines are “yellow” beginning to experience moderate impacts. Local jurisdictions are reporting increased 911 call volume, increased ER usage, increased morgue census, and intermittent short duration / localized power outage.

Actions:

State - DEMA has escalated the State Emergency Operations Center activation level to level 2 “enhanced readiness”. Cooperator, coordination, and operational planning meetings are occurring with state and local partners. State agencies have increased monitoring of impacted conditions and are standing by to fill resource requests and coordinate resource sharing between local jurisdictions.

Public information is being shared via AzEIN and the Joint Information Center is meeting regularly to develop a unified message across stakeholder public information officers statewide.

Local - Local jurisdictions are responding to the needs of their community and have increased public outreach and engagement. They are also focused on the core response capabilities of: operational coordination, communication, mass care and sheltering, and EMS.

Catastrophic Impacts:

Conditions:

The NWS continues to forecast sustained extreme heat risk levels and issue extreme heat warnings across Arizona. The safety and security, health and medical, water and wastewater, hydration and shelter, and energy lifelines are "yellow" or "red", experiencing severe impacts. Local jurisdictions are reporting sustained priority 911 calls for service holding despite allocating local reserve resources. ERs and the healthcare system are reporting significant increases in patients requiring the use of crisis care standards to preserve limited resources. Morgues are overwhelmed and at or beyond capacity. Water infrastructure in multiple communities has failed and public works resources are unable to keep up with main breaks. Rolling blackouts are occurring and sustained power outages for more than 500,000 customers has persisted for more than 5 days. Private power companies have activated the national utility mutual aid system to assist in restoring power.

Actions:

State - DEMA has escalated the State Emergency Operations Center activation level to level 1, "Full Activation". Regular planning and coordination meetings are occuring, a state disaster declaration has been requested through the governor's office, and public information is being shared via AzEIN. The Joint Information Center is fully activated and coordinating public information messaging and addressing statewide rumor control. Interstate mutual requests are being filled

for mass care and sheltering, law enforcement, EMS, mass fatality, and disaster medical resources. Damage and impact assessments are occurring to determine if federal disaster thresholds have been met in order to request a federal emergency or major disaster declaration. State agencies are providing resources based on local jurisdictional requests and coordinating responses within their assigned emergency support function.

Local - Local jurisdictions have activated their local Emergency Operations Centers and are coordinating with local stakeholders to address impacts within their jurisdiction. Depending on the severity of the local impact local jurisdictions are declaring emergencies and requesting resources. Resource and assistance requests are being sent to DEMA. Public information is being shared within locally impacted communities.