



Heat Action Plan Toolkit

Guidance and resources to help North Carolina communities prepare for extreme heat

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NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**



Carolinas Collaborative on
Climate, Health, and Equity
A NOAA CAP/RISA team



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About the Toolkit

The Heat Action Plan Toolkit (“Toolkit”) provides resources for local decision makers, including health departments, local government staff and community partners. The document aims to help communities become more resilient to extreme heat during the day and at night. Designed for communities in North Carolina, this toolkit includes:

- Background on the importance of addressing extreme heat in your community.
- A heat action plan template with:
 - Actions to include in your plan for what to do throughout the heat season (p. 7), when an extreme heat event is forecasted (p. 226) and longer-term management strategies for coping with heat (p. 35)
 - Suggestions for how to measure the impact of your heat action plan (p. 46)
- [Supplemental Materials](#) (available using the link; materials are not included in this document)
 - Navigating North Carolina’s Rising Temperatures: Understanding and Addressing the Health Risks of Heat - a recorded webinar providing introductory information on heat and health
 - Sample checklists for cooling centers and heat relief supplies
 - Sample community surveys
 - Sample messaging, including a hotline script, press releases and social media posts
 - Sample graphics and infographics for communicating with residents and high-risk groups
- Appendices on how to identify groups with higher risk from extreme heat ([Appendix A](#), p. 48) and recommendations for when to activate different parts of your heat action plan ([Appendix B](#), p. 49)
 - Guidance on how to identify high-risk groups in your jurisdiction (p. 48)
 - Recommendations for when to activate your heat action plan locally (p. 49)

The Toolkit has a focus on mitigating heat-related health impacts to people. While heat affects more than people (e.g., pets, livestock, crops, infrastructure), these impacts are beyond the scope of this toolkit. Communities may wish to address other heat impacts within their heat action plans as needed.

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Acronyms

CDC	Centers for Disease Control and Prevention
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
LIEAP	Low Income Energy Assistance Program
NCDHHS	North Carolina Department of Health and Human Services
NCORR	North Carolina Office of Recovery and Resiliency
NIHHIS	National Integrated Heat Health Information System
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OSHA	Occupational Safety and Health Administration

Why Extreme Heat Preparedness Is Important

Heat is our number one weather-related killer and the most preventable.^{1,2} North Carolina summers are warming and becoming longer, with abnormally hot days and nights increasingly occurring in the spring and fall.³ Residents, especially those in the Piedmont and Coastal Plain regions, will likely experience higher heat index values as the climate changes.⁴ Many communities, both urban and rural, are already experiencing increases in the number of nights where temperatures remain high. In North Carolina's growing urban centers, temperatures are elevated in urban heat islands or in areas of the city or town with more development and less greenspace. Many of these urban areas are already experiencing longer summer heat waves.⁵ Rural communities can also experience urban heat islands in developed areas. In addition, rural communities sometimes have limited access to infrastructure or healthcare services, making them particularly vulnerable to extreme heat. Studies in North Carolina have revealed that heat-related illnesses are most common in rural locations, potentially due to rural residents engaging in more outdoor occupational labor and other factors.⁶

All regions of the state experience temperatures throughout the summer that may lead to adverse health effects (Figure 1), particularly among people who are at increased risk for heat related illness. For example, outdoor laborers (e.g., agricultural workers, construction workers) in both urban and rural settings may be exposed to unsafe heat conditions for extended periods of time. In addition, many North Carolina communities are tourist destinations. Seasonal residents and tourists may not be acclimated to the local climate, underestimate the intensity of heat or overexert themselves as they engage in physical activities to explore their new surroundings, putting them at increased risk from heat-related illnesses.

As temperatures continue to warm, both days and nights will continue to get hotter. These warmer days and nights, combined with increases in humidity and lack of access to sufficient cooling for all residents, are already presenting a public health risk. **This toolkit aims to help communities statewide prepare for the challenges of heat stress.**

¹ Centers for Disease Control and Prevention, Climate Change Indicators: Heat-Related Deaths, www.epa.gov/climate-indicators/climate-change-indicators-heat-related-deaths. Accessed February 24, 2024.

² National Weather Service, Weather Related Fatality and Injury Statistics, <https://www.weather.gov/hazstat/>. Accessed April 22, 2024.

³ North Carolina Climate Science Report, ncics.org/programs/nccsr/. Accessed June 29, 2023.

⁴ North Carolina Climate Science Report, ncics.org/programs/nccsr/. Accessed June 29, 2023.

⁵ North Carolina Climate Science Report, ncics.org/programs/nccsr/. Accessed June 29, 2023.

⁶ Kovach, M.M., Konrad II, C.E., Fuhrmann, C. M. (2015) Area-level risk factors for heat-related illness in rural and urban locations across North Carolina, USA. *Applied Geography*, 175-183. <https://doi.org/10.1016/j.apgeog.2015.03.012>.

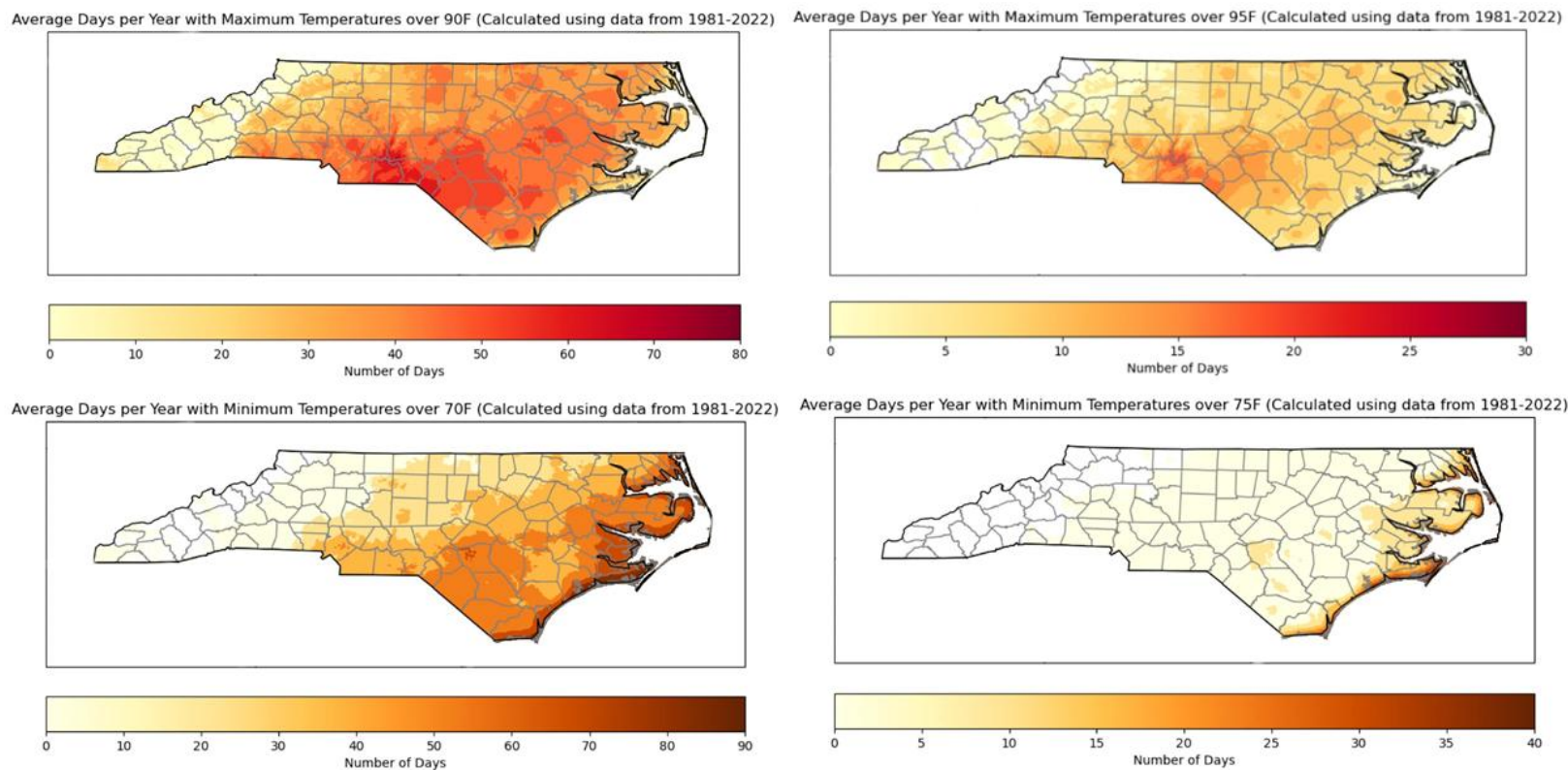


Figure 1. All parts of North Carolina experience extreme heat. Shown are the average number of days per year with maximum temperatures above 90 F (top left) and 95 F (top right) and the average number of nights per year with minimum temperatures above 70 F (bottom left) and 75 F (bottom right). Maps were generated by the State Climate Office of North Carolina using PRISM data⁷ for the period 1981-2022.

⁷ The PRISM Climate Group provides comprehensive spatial climate datasets using climate observations compiled from many different sources. prism.oregonstate.edu/

Understanding Extreme Heat

Extreme Heat	Extreme heat , also called excessive heat , is when summertime temperatures are much hotter and/or humid than average. The exact temperatures and temperature-based indices that would be considered extreme heat are typically determined using statistical analyses of historical weather and climate data or are based on physiological impacts of heat. Additionally, the environmental conditions that define extreme heat will vary depending on regional climate conditions and local considerations, such as the time of year or characteristics of the local population (e.g., people are less acclimated to hot temperatures earlier in the summer; places with high numbers of tourists may not be adapted to local high temperatures).
Extreme Heat Event	An extreme heat event is synonymous with a heat wave. Extreme heat events are short periods of time (typically two or more days) when temperatures and humidity levels pose serious health risks to people. In North Carolina, extreme heat events happen when an area of high pressure sits over the region for an extended period. This atmospheric pattern acts like a lid to trap heat in place, and for this reason, extreme heat events in North Carolina are typically associated with clear skies and fair weather. The environmental conditions (e.g., high or low temperatures and their duration) that define an extreme heat event vary based on regional climate conditions, time of year and local considerations. For example, an extreme heat event early in the summer, when fewer people are acclimated to high temperatures, may have a lower temperature threshold than an extreme heat event occurring later in the summer. Typically, statistical analyses of historical climate data are used to determine the thresholds for an extreme heat event, such as temperatures that are unusually high and have the potential to cause heat-related illnesses.
Heat Index	Heat index , also called the apparent temperature , is a measure of how hot it really feels when the relative humidity is considered along with the actual air temperature. Heat index is measured in the shade. Typically, heat index values are highest between June and September, but high heat index values can occur outside these months.
Heat Season	The heat season in North Carolina is defined as May 1 – September 30, ⁸ though it is possible to experience hot temperatures outside this period.

⁸ NC Department of Health and Human Services, *Epidemiology: Occupational and Environmental*, <https://epi.dph.ncdhhs.gov/oeep/programs/climate.html>. Accessed December 20, 2023.

Heat Threshold	A heat threshold⁹ refers to a specific temperature above which environmental conditions are considered extreme or hazardous. These thresholds can be based on air temperatures or other heat stress indicators such as the heat index or Wet Bulb Globe Temperature. Heat thresholds help us understand not just how hot it is, but how the heat might affect us, making it clear when we are facing extreme or hazardous conditions. At temperatures higher than established heat thresholds, negative health impacts begin to occur and days or periods with these temperatures are considered “extreme heat events.” The temperature at which humans begin to experience negative health impacts is different for everyone. That temperature can vary by what temperatures your body is used to, age, pre-existing health conditions, medications taken and more. Scientists and state and federal agencies typically identify heat thresholds for geographic areas with similar climates, ensuring guidelines are tailored to local conditions and residents’ needs. To establish a heat threshold, statistical analysis is performed on historical climate and health data, such as emergency department visits. This analysis accounts for the typical climate conditions of a region and relevant local factors, such as the proportion of the population engaged in outdoor work. Heat thresholds vary according to regional climates and populations. Identifying a heat threshold is critical for activating early warning systems and implementing protective interventions during extreme heat events.
Heat Wave	The term heat wave is synonymous with extreme heat event. Heat waves are short periods of time (typically two or more days) when temperatures and humidity levels pose serious health risks to people. In North Carolina, heat waves happen when an area of high pressure sits over the region for an extended period. This atmospheric pattern acts like a lid to trap heat in place, and for this reason, heat waves in North Carolina are typically associated with clear skies and fair weather. The environmental conditions (e.g., high or low temperatures and their duration) that define a heat wave vary based on regional climate conditions, time of year and local considerations. For example, a heat wave early in the summer, when fewer people are acclimated to high temperatures, may have a lower temperature threshold than a heat wave occurring later in the summer. Typically, statistical analyses of historical climate data are used to determine the thresholds for a heat wave, such as temperatures that are unusually high and have the potential to cause heat-related illnesses.

⁹ See [Appendix B](#) for information on identifying heat thresholds for your jurisdiction.

Wet Bulb Globe Temperature	The Wet Bulb Globe Temperature (WBGT) is a measure of how heat is experienced by humans in direct sunlight. Unlike the heat index, which is based on temperature and humidity and is measured in the shade, WBGT considers temperature, humidity, wind speed, sun angle and cloud cover. Military agencies, the Occupational Safety and Health Administration and schools use WBGT as a guide to manage activities in direct sunlight. Measuring WBGT requires a dedicated sensor, and many WBGT meters are affordable and easily obtainable by the public. Real-time WBGT estimates may be obtained from the State Climate Office of North Carolina, and prototype forecasts may be obtained from the National Weather Service. Learn more about WBGT on the Duke University Heat Policy Innovation Hub website.
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Heat Related Illnesses

Exposure to extreme heat can lead to heat-related illnesses. Our bodies naturally cool down by sweating: sweat releases heat and provides a source of moisture for evaporation and cooling the skin surface. During extreme heat, sweating might not be enough for a body to cool itself. When this happens, a person's body temperature rises faster than it can cool itself down. Additionally, when the humidity is high, as is common during extreme heat events in North Carolina, evaporative cooling through sweating becomes less effective. Air temperatures also do not cool as much at night when humidity is higher. This situation makes the impacts of an extreme heat event worse.

Heat-related illnesses (see boxes to the right) occur when the body overheats from exposure to high temperatures and in severe cases can cause damage to the brain and other vital organs¹⁰. Heat-related illnesses can also arise from moderate to vigorous physical activity in hot situations.

The effects of extreme heat on communities depend on a variety of factors, including:

- The length and intensity of the extreme heat event,
- Nighttime temperatures (e.g., high nighttime temperatures can make it more difficult for the body to recover from daytime heat and can be compounded by inadequate or suboptimal housing conditions with poor access to cooling systems such as air-conditioning, fans or shade),
- When it occurs during the heat season (e.g., the level at which a temperature or heat index is considered “extreme” is different early in the summer before people have adjusted to warmer temperatures)
- The demographic and social characteristics of a community (e.g., age, socioeconomic status, poverty, access to at-home air-conditioning)
- A community's ability to plan for, respond to and cope with hot temperatures and extreme heat events

Developing and implementing this toolkit for your jurisdiction is a way to improve your community's ability to plan for and respond to extreme heat.

Heat Cramps: Painful muscle cramps in the abdomen (belly), arms or legs following strenuous activity and typically caused by a loss of fluids and electrolytes from excessive sweating. Additional symptoms include moist and cool skin, dizziness, nausea or vomiting, tiredness or weakness, and heavy sweating.

Heat Exhaustion: Symptoms of this heat related illness include increased thirst, body cramps, fainting, rapid pulse, nausea, vomiting, heavy sweating, moist and cool skin, headache and a raised body temperature.

Heat Stroke: The body cannot regulate its own temperature and medical care is needed. Symptoms include a core temperature of at least 104°F, cessation of sweating, hot dry skin, severe headache and, in severe cases, collapse and convulsions or coma.

¹⁰ About Extreme Heat, Centers for Disease Control and Prevention, www.cdc.gov/disasters/extremeheat/heat_guide.html. Accessed June 6, 2023.

People Who Are at Higher Risk for Heat Related Illnesses

While everyone is impacted by extreme heat, certain groups have heightened vulnerability due to underlying health conditions or social or economic factors. Understanding local risk factors and which populations are more at risk from extreme heat is important to developing a heat action plan that effectively and equitably protects all members of your community¹¹.

Infants and children: Infants and children are not able to regulate their body temperature as effectively as adults. Additionally, infants and young children cannot, or cannot fully, communicate that they may be experiencing heat stress. Infants and children rely on others to keep them cool and hydrated when it's hot outside.

Pregnant persons: Pregnant persons are more likely to get heat exhaustion, heat stroke or other heat-related illness sooner than non-pregnant persons. This is because their bodies must work harder to cool down both the pregnant person's body and the developing baby. Pregnant persons are also more likely to become dehydrated, limiting their ability to cool themselves by sweating.

Persons taking certain medications: Some medications¹² may interfere with the body's ability to regulate its temperature, making individuals more susceptible to heat.

Older adults (65+): Older adults do not adjust as well as young people to sudden changes in temperature. In addition, they are more likely to have a chronic medical condition that changes normal body responses to heat. Older adults are also more likely to take prescription medicines that may affect the body's ability to regulate its temperature or sweat.

Outdoor Workers: People who work outdoors, such as construction workers, agricultural workers, landscape workers, roofers and HVAC technicians, are exposed to higher temperatures, and often for longer periods of time, putting them at increased risk from heat-related illnesses. Additionally, outdoor workers may have limited control over work conditions (e.g., no access to shade or air-conditioning, required clothing or uniforms made from fabrics that don't breathe). Potential language barriers to receiving heat-related information may also exist among some outdoor workers.

Low income: Individuals and families with low incomes are more likely to live in poorly ventilated apartments or mobile homes, lack access to air conditioners and be unable to afford the costs of cooling or the cost of transportation to cool places.

People with underlying health conditions: Those with underlying health conditions¹³ may be less likely to sense and respond to changes in temperature. In addition, they may be taking medications that can make the effects of extreme heat worse.

Athletes: People who exercise or spend time outdoors in extreme heat are more likely to become dehydrated and get a heat-related illness. This includes both adult and youth athletes.

¹¹ See [Appendix A](#) for more localized information about groups with higher risk from extreme heat.

¹² For descriptions of medications, see the article *Common medications may increase the dangers of heat waves*, from Yale Climate Connections. <https://yaleclimateconnections.org/2022/07/common-medications-may-increase-the-dangers-of-heat-waves/>. Accessed December 20, 2023.

¹³ Occupational Safety and Health Administration, *Heat: Personal Risk Factors*, <https://www.osha.gov/heat-exposure/personal-risk-factors>. Accessed December 20, 2023.

Occupational Heat Stress: Outdoor Workers

Working outdoors in extreme heat can lead to heat-related illnesses, injuries and death. Across the U.S., between 50% and 70% of outdoor fatalities taking place in the work environment occur in the first few days of working outdoors in extreme heat.¹⁴ Our bodies need time to gradually get used to extreme temperatures, and even then, heat-related health impacts can still occur. Health practitioners recommend that outdoor workers take extra precautions working in extreme heat during the first few days of a new job and during the first few extreme heat days of the year.

In North Carolina, farmworkers are an especially high-risk group. Their salaries are often contingent on harvest amounts and productivity, an incentive to try to work without breaks during extreme heat.¹⁵ In addition, farmworkers in our state are a heavily migrant population who often do not speak English or speak English as a second language. Many are also lower income, are unfamiliar with the local health care services available and do not have easy access to transportation. Furthermore, some farmworkers are scared to visit a doctor who might tell them they are unable to work.

Section 5 of the [Occupational Safety and Health Act of 1970](#) requires that employers provide a place of employment that is “free from recognized hazards that are likely to cause death or serious physical harm to employees.”¹⁶ The Occupational Health and Safety Administration (OSHA), the Centers for Disease Control and Prevention (CDC), and the NC Department of Labor (NCDOL) provide many resources to help employers prevent heat-related illnesses among their workers. Refer to p. 16 for employer guidelines on work schedule adjustments, hydration stations, shaded rest areas and other heat-illness prevention strategies and recommendations.

¹⁴ Overview: Working in Outdoor and Indoor Heat Environments. (n.d.) Occupational Safety and Health Administration. <https://www.osha.gov/heat-exposure>. Accessed March 11, 2024.

¹⁵ Brainerd, L., Ward, A. (2021) Developing and Early Warning System to Prevent Heat Illness. *US Climate Resilience Toolkit*. <https://toolkit.climate.gov/case-studies/developing-early-warning-system-prevent-heat-illness>. Accessed March 11, 2024.

¹⁶ S.2193 – 91st Congress (1969-70): Occupational Safety and Health Act of 1970. (1970, December 29). <https://www.congress.gov/bill/91st-congress/senate-bill/2193>, as shown on <https://www.osha.gov/laws-regs/oshact/completeoshact>. Accessed March 11, 2024.

Funding Extreme Heat Management Activities

Finding funding for a project can be overwhelming. The list below provides a few ideas to get you started in your funding research. Refer to the [NC Resilience Exchange Funding Database](#) for an up-to-date list of extreme heat project funding opportunities. From the Funding Database main page, click the “Extreme Heat” hazard checkbox in the left column and select “Apply.”

- The National Integrated Heat Health Information System (NIHHIS) lists open [Federal Funding Opportunities](#) that directly address heat or are relevant to funding activities that prevent heat-related illnesses.
- The National Oceanic and Atmospheric Administration (NOAA) NIHHIS [Urban Heat Island Mapping Campaign](#) program helps communities understand how summer temperatures vary across their city or town. Program partners first help volunteers collect data on temperature, humidity and other metrics. Later, NOAA and its partners convert the data to interactive maps.
- The North Carolina Urban Forest Council hosts the [Legacy Tree Fund](#), an annual grant program that helps urban and rural communities across the state implement tree-planting projects. Any local government, non-profit community group or public school can apply for a tree-planting grant. The application deadline is the end of May each year.
- The Federal Emergency Management Agency (FEMA) [Building Resilient Infrastructure and Communities](#) program helps communities manage the increased risk of impact from hazards, including extreme heat, among others. The grant supports natural hazard risk mitigation activities that promote climate adaptation and resilience to address both extreme weather events and ongoing problems that are expected to increase in intensity and frequency.

Using the Heat Action Plan Template

The rest of this document is the Heat Action Plan Template, a guidance document that includes fill-in-the-blank language designed to serve as a start to your own heat action plan. The template includes sample actions to include in your plan for what to do throughout the heat season (Part 1), when an extreme heat event is forecasted (Part 2) and to cope with heat long-term (Part 3). The text below, along with the remaining toolkit documents, is intended to make it easy for you to adapt and modify information to suit your community's needs and local contexts.

Best Practices for Developing a Heat Action Plan

The most important part of developing a heat action plan is to ensure that it responds to your community's needs. The sections below provide guidance on how to engage residents, community leaders and experts in the process. Visit the [NC Resilience Exchange](#) to find additional resources on preparing for and responding to extreme heat.

Assign Responsible Entity for Leading the Plan

A successful heat action plan often necessitates a single unit or group having responsibility over leading the effort. Before undertaking this, it's important to ensure that this group has the requisite capacity and expertise to successfully carry out this task. County health departments and regional councils of governments can serve as valuable resources for tailored guidance and support in developing heat action plans. Smaller local governments might also consider working with nearby cities and towns to create a multi-jurisdictional plan or with local or regional nonprofits that focus on public health. For assistance with identifying those organizations, contact your local health department or the NC Department of Health and Human Services (NCDHHS).

Implementing the plan will also require coordination and cooperation among various organizations and bodies, such as local emergency management and health departments. It is therefore essential to involve them from the beginning to ensure the resulting heat action plan aligns with local policies and governing structures. Early involvement of partners can also build support for action implementation once the plan is released. See next section for further details on developing a heat relief task force.

Establish a Heat Relief Task Force

Developing a heat action plan is complex and should ideally involve many partners with different expertise. We recommend that local jurisdictions establish a Heat Relief Task Force that includes diverse community members to help improve the usefulness of the plan. This group should meet at least once per year, ideally prior to the start of the heat season or soon after the heat season's end, to review the plan and areas for improvement. Members of a Heat Relief Task Force may include:

- Regional councils of governments staff
- Community members most at risk from the impacts of extreme heat (e.g., older adults, youth sports players and leaders, outdoor workers)
- Local emergency management staff
- Other emergency responders (e.g., fire fighters, police, paramedics)
- Local health department staff (e.g., preparedness coordinators, environmental health staff)
- Other health professionals (e.g., hospital administrators, veterinarians)
- Local colleges and universities (e.g., as community partners representing large student bodies or as local experts in heat response)

- School district staff
- Public utilities staff
- Parks and recreation staff
- Faith-based organization members
- City and regional planners
- Cooperative Extension
- Local leader or worker from agriculture industry
- Animal Services/Animal Control

Collect Community Input

To ensure that the right actions are included in your heat action plan, consider collecting community input on how heat impacts the lives of residents. A public survey, focus groups, and observations (for example, observing how residents are currently coping with heat, such as by tracking use of existing shade structures or requests for window air conditioning units) are all useful tools.

Example surveys are available for download from the [Toolkit's Supplemental Materials](#).

Understanding the Template's Format

- Headings in blue and text in black font is suggested text. Users may use, adapt or replace this text for their own purposes.
- [Blue](#), underlined font is used for links.
- Text inside of brackets should be replaced with jurisdiction-specific information. For example, "[County Name]" could be replaced with "Chatham County."
- Gold font provides instruction or suggestions for things that could be included. Users should delete gold font prior to publication.

The template, as well as the Toolkit overall, uses AP style for grammar and citations.

Each part of the heat action plan template contains sample actions for local jurisdictions to consider incorporating into their own tailored plans. We listed the actions in order by feasibility so that the most feasible actions (e.g., actions that require fewer resources or time to accomplish) appear first and actions that are likely to need more resources (e.g., additional time or grant funding) appear later in the list. By presenting a variety of actions, the aim is to spark ideas and offer numerous examples for local jurisdictions to potentially adopt. We do not expect users of this template to adopt all listed actions. Instead, we recommend users identify, select and adapt actions most suitable for their jurisdiction.

Each action included in this template has seven parts:

1. **Description:** Following a brief description of the action, the template includes optional space to contextualize the action for your jurisdiction. Use the optional space, for example, to specify details about the topics covered by a training, targeted audiences, financial costs, supply needs or how the action will be combined with other actions in the heat action plan. The description section sometimes includes gold font with tips on how to get started on implementation.
2. **Name of responsible department, unit or position:** Designating a responsible position, department or unit helps ensure there is adequate staffing for implementing the given action while promoting transparency and accountability.
3. **Timeline:** Describe the expected timeline for implementing the action. For example, something that is expected to take place in the near term may have a timeline of "0-2 years." By comparison, longer-term strategies with larger financial or capacity needs may have correspondingly longer

time frames, such as “3-5 years.”

4. **Implementation criteria and frequency:** Provide details about the criteria that will be used to implement each action, as well as how often you anticipate each action to occur. For example, actions may take place only once at the start of the heat season (e.g., a training given in May), periodically when temperatures are typically high (e.g., public awareness messaging sent every Saturday from May-October), only when certain heat thresholds are exceeded (e.g., reducing pool entrance fees when a heat index of 100 degrees Fahrenheit is forecasted to occur with the next three days or is currently being observed) or may not have a clearly defined criteria or frequency (e.g., identifying sunny pedestrian walkways to inform future tree planting).
5. **Community partners:** Include details about community partners and their role in the action. As an example, if a strategy in your heat action plan is to provide heat relief supplies to residents spending time outdoors, you might list partners who offer to donate supplies. For instance, “Walmart in [city or town]: will donate 300 cases of water for the 2024 heat season.”
6. **Metrics:** Consider collecting information or data to measure the success of a given action. Customize the examples listed in this heading to fit your local jurisdiction’s context and capacity. Note that some outcomes may be more difficult to measure than others, or it may take longer to have an observable effect (e.g., it may take a few years for newly planted trees to provide shade and cooling).

The information in the metrics section may also assist with your heat action plan’s evaluation (see [Evaluation](#)). For example, we recommend collecting information about the number of heat-health education events (e.g., workshops, information tables at community events), their target audiences (e.g., elderly, youth, tourists) and their attendance. This information will help with understanding which events or formats have the highest engagement and can be used to guide future educational campaigns and events (e.g., by putting more resources toward events with high attendances or discontinuing or changing tactics for events with lower attendances).

Similarly, we recommend tracking online interactions to understand which online communication channels are most effective. Suggestions include tracking the number of visits to jurisdictional heat information websites (such as a general heat information page or a page with cooling center locations) and tracking the number of social media engagements (e.g., views, likes, shares) on social media posts. This information can be obtained from online analytics (e.g., enabling Google analytics, downloading social media history). Tracking online interactions could be used to help refine websites or webpages devoted to heat-related information (e.g., by putting the most important information on pages that are visited more frequently). There are online tools to help with setting up analytics. See [this article](#), which compares different social media analytic tools.

To measure community outcomes from heat action projects, consider giving pre- and post-questionnaires to volunteers to measure their knowledge or skills before and after participation, as well as surveying community members to understand their perceptions of community heat action projects. These data can inform future heat action projects, including understanding who in the community might be more willing to volunteer for projects, what types of projects are seen as having the greatest or least benefit by the community and areas that community members think should be targeted for future projects.

7. **Examples and Resources:** Real-world examples and resources (e.g., sample graphics, potential sources for grant funding) are linked for additional context and help while developing your heat action plan.

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[Jurisdiction] Heat Action Plan

An action plan to prepare for extreme heat

Published [Month Year]

Acknowledgments

This [Jurisdiction] Heat Action Plan came together thanks to the contributions of many organizations, agencies, groups and individuals:

List local organizations, agencies, groups, individuals, etc. who assisted with the development of your heat action plan (for example, those groups involved in a Heat Relief Task Force).

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Table of Contents

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Introduction

Extreme heat has always posed a threat to human health in [jurisdiction], especially to residents who are at increased risk for heat related illnesses, people who live or work in settings that put them at increased risk of exposure to heat, migrant workers and visitors. However, recent and projected rising summer temperatures make identifying strategies to manage extreme heat more urgent. Warmer daytime temperatures make outdoor activities riskier, especially for those unaccustomed to heat, and can lead to unsafe indoor conditions for those who lack adequate air-conditioning. Cooling down overnight is an important way to cope with periods of extreme heat, but nighttime temperatures have been increasing, are projected to warm even more and are projected to warm at a greater rate than maximum temperatures. A comprehensive heat action plan is crucial for providing our community with a strategic framework to plan for and respond to extreme heat effectively.

The purpose of this **[Jurisdiction] Heat Action Plan** is to identify the steps our civil servants and community partners can take to prepare residents for excessive heat. Part 1 of the plan contains steps we can take during the heat season in general, Part 2 lists actions for when extreme heat is in the forecast and Part 3 provides long-term strategies our community can use to prepare for high daytime and nighttime temperatures. Other sections provide recommended steps for outlining the review and approval process of the plan, including strategies to evaluate the plan's various components.

Central to this plan are the following key objectives:

1. Increase community awareness about the local impacts of extreme heat in [jurisdiction]
2. Reduce the number of heat-associated deaths and heat-related illnesses
3. Reduce the number of calls for service related to heat
4. Evaluate education and outreach programs included in the plan
5. Outline programs and services intended to protect public health and quality of life from the threats posed by extreme heat

Add, delete or modify objectives as appropriate for your local jurisdiction. Ideally, objectives should be clear, concise and measurable.

Who Is Most at Risk?

Some of our residents, visitors and workers are at higher risk from extreme heat, such as older adults, children, people with underlying health conditions and outdoor workers. In addition, social vulnerability, which encompasses a wide range of factors including socioeconomic status, access to healthcare, housing conditions and cultural and linguistic diversity, influence how different segments of the population in our jurisdiction cope with periods of high temperatures and extreme heat events. Understanding who in our jurisdiction has a higher risk from heat, why their risk is higher and where they are located within our jurisdiction, enables us to develop a more comprehensive and effective heat action plan.

By considering and including these groups in the planning process for your heat action plan, interventions like cooling center locations and hours, public awareness campaigns and installation of cooling amenities can be geographically targeted to ensure the needs of people who are at higher risk for heat related illnesses are met.

The [maps, statistics, tables] below show the groups in [jurisdiction] that have higher risk from extreme heat.

At a minimum, we recommend including a map to show the locations of groups in your jurisdiction who may be more at risk from extreme heat. You could base this map on an aggregate index (e.g., the CDC's Social Vulnerability Index) or individual factors (e.g., age, income). Refer to [Appendix A](#) for instructions on obtaining this information using secondary data sources.

We also recommend you use this section to include information unique to your jurisdiction that may affect the risks from extreme heat. Examples include an annual event that draws large crowds of visitors during the summer, an ongoing road closure that may affect emergency response or a large agricultural industry that draws field workers each year.

What Other Problems Are Caused by Extreme Heat?

Extreme heat can have significant impacts that affect various sectors and aspects of our community, in addition to public health. Some key impacts include:

- **Energy Demand and Costs:** High temperatures often lead to higher energy demands for cooling, which can strain electrical grids. Increased use of air conditioning can result in higher energy costs for both households and businesses.
- **Infrastructure Stress:** Prolonged exposure to extreme heat can cause damage to critical infrastructure such as roads, bridges and railways. Heat-induced expansion and contraction of materials can lead to cracks, buckling and other structural issues, requiring costly repairs.
- **Impact on Agriculture:** Plants and animals are also impacted by extreme heat. Crops may experience stunted growth, poor harvests or death due to high temperatures, especially if combined with lack of rainfall. Livestock need adequate shade, water and ventilation to stay cool during periods of high daytime and nighttime temperatures.
- **Impact on Pets:** Extreme heat can pose serious risks to pets, including heatstroke, dehydration and burnt paw pads from walking on hot surfaces. It is essential to provide ample shade, water and protection (e.g., let pets indoors during extreme heat) from high temperatures for pets.
- **Disruption of Transportation:** High temperatures can impact transportation infrastructure, particularly air travel. Heat can affect the performance of aircraft and may lead to flight cancellations or delays.
- **Impact on Tourism:** Hotter temperatures can affect tourism patterns, with some destinations becoming less attractive due to extreme heat. This can have economic consequences for businesses dependent on tourism revenue.
- **Decreased Labor Productivity:** High temperatures can lead to reduced productivity among outdoor workers, affecting industries such as agriculture, construction and manufacturing. Heat-related illnesses can result in increased absenteeism and healthcare costs.

This toolkit has a focus on mitigating heat-related health impacts to people. You may wish to address other impacted groups or sectors within your heat action plan as needed.

Creating This Plan

To create this plan, [name of local government or coordinating entity] [explain the steps you took to create the plan].

Briefly describe the process you took to develop this plan, including who led the effort, was involved in developing the plan and gave feedback on the plan. For example, you may describe the establishment and membership of a heat relief task force or the process by which you collected and incorporated community feedback through surveys, interviews and focus groups.

Next Steps

This document includes a comprehensive set of strategies to help residents, especially those in our community who are at increased risk for health impacts from extreme heat, withstand the stress of high temperatures.

Describe the intended impacts of the actions included in your jurisdiction's heat action plan. Examples of impacts could include helping lower outdoor temperatures with greenery and shade, identifying which neighborhoods are most in need of cooling centers, communicating heat warnings, helping promote home cooling strategies, teaching people to recognize the signs of heat stress and more.

The actions will [summarize the impacts of the actions listed in your heat action plan].

As [jurisdiction]'s local government, we plan to implement as many of these actions as possible. However, we cannot do this work alone. We need help from residents, businesses and community partners. Please contact [insert name and contact information] if you would like to join the effort to protect residents from heat-related health impacts.

Approval and Implementation

Use this space to provide details on your heat action plan's approval processes, how frequently the plan will be updated and the process for approving plan amendments or revisions. We also recommend that you present your heat action plan for public input and feedback. This participatory approach enhances the plan's relevance and ensures that it aligns with the unique needs of the local population. Recommended text is included below.

The [Jurisdiction] Heat Action Plan was approved by the [insert appropriate entity, e.g., Town Council, City Council, Mayor] on [date].

[Jurisdiction staff] accepted public comments on the draft Heat Action Plan from [date range].

Regular reviews and updates will be conducted to adapt the [Jurisdiction] Heat Action Plan to evolving risks and community dynamics, maintaining its relevance and efficacy over time. Specifically, *Part 1: During the Heat Season* and *Part 2: When Extreme Heat Is in the Forecast* will be reviewed and updated [annually] and *Part 3: Long-Term Strategies to Prepare Residents for Heat* will be reviewed and updated every [three years]. Amendments or revisions to the plan will be presented to [insert appropriate entity, e.g., Town Council, City Council, Mayor] for approval and adoption during [insert details on future approval processes].

Copies of the [Jurisdiction] Heat Action Plan are available from [insert website URL or local government office where copies can be obtained].

Heat Action Plan Part 1: During the Heat Season

Temperatures are typically highest from May to September each year, a time referred to as the heat season in [jurisdiction] (see tables below). While the exact period when temperatures are warm enough to lead to heat-related health impacts will vary from year-to-year, the typical first and last dates where temperatures reach 85 degrees Fahrenheit or higher are [first date] and [last date], respectively.

- Use the NOAA National Centers for Environmental Information's [US Climate Normals](#) tool to fill out the table below. Refer to [Appendix B](#) for detailed instructions.

Average Monthly Maximum and Minimum Air Temperatures for [Location]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]	[Max]
Min	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]	[Min]

Note: The heat season is outlined in blue in the table above.

Another way to define the heat season is by examining when temperatures and heat indices typically reach thresholds that may lead to heat-related health impacts. The table below shows the typical first and last dates where air temperatures and heat indices exceed given thresholds.

Use the Climate Thresholds tool on the State Climate Office of North Carolina's [Station Scout](#) to fill out the table below. Refer to [Appendix B](#) for detailed instructions.

Average First or Last Date When Threshold is Exceeded for [Location]

	First Date					Last Date				
	85	90	95	100	105	85	90	95	100	105
Max Air Temperature	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]
Max Heat Index	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]	[Date]

All temperatures are in degrees Fahrenheit.

The actions included in Part 1 below are intended to help our residents prepare for, respond to and cope with the heat season generally. Part 1 of the [Jurisdiction] Heat Action Plan will be implemented [after the first date where the maximum air temperature reaches 85 degrees Fahrenheit or May 1, whichever is earlier] through [the last date when the maximum temperature reaches 85 degrees Fahrenheit or September 30, whichever is later].

The following pages contain example actions for you to consider including in Part 1 of your plan. We do not anticipate that you will opt to include all actions; instead, pick and choose the actions that will meet your goals and serve your community best. Fill in the details (Description; Responsible Department, Unit or Position, etc.) of actions you select. Delete the actions you do not wish to include in your plan.

The actions below are generally listed in order by easiest to implement, with the understanding that all jurisdictions have different capabilities. Local governments with limited capacity might consider focusing on the actions toward the beginning of the list to get started on addressing heat impacts.

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Promote Community Events Taking Place in Air-Conditioned Spaces

Description: [Department staff or responsible entity] will document community events taking place over the summer that occur in air-conditioned spaces or that deliberately offer a place for attendees to cool off (e.g., a primarily outdoor festival with an indoor, always-accessible, air-conditioned section). These events will be publicized via [list methods].

Getting Started on Implementation:

- Consider multiple ways of publicizing and promoting air-conditioned events, particularly how to reach groups with higher risk from extreme heat. For example, you could use a combination of a jurisdictional website listing upcoming events, hard copies of community calendars that are distributed to public spaces, such as public parks, libraries or community centers and notifications sent through social media posts and WhatsApp messages.
- *This action could be combined with other actions, such as “Reduce or Eliminate Entrance and Participation Fees for Summer Activities.” For example, an online calendar that includes air-conditioned events could use icons or text to indicate which events are also free or have reduced admission fees.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: Consider how to draw attention to these air-conditioned events during periods of extreme heat or when extreme heat is in the forecast. For example, when extreme heat is in the forecast, [jurisdiction or community partner] will schedule social media and WhatsApp messages that link to air-conditioned events, as well as cooling center locations and hours. [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of downloads or page visits to an online calendar listing air-conditioned community events; number of social media engagements on posts that highlight air-conditioned events [Add text.]

Examples and Resources: Local examples of events and activities specifically targeted for ‘beating the heat’:

- The Parks and Recreation Department in Zebulon, N.C., offered [Beat the Heat Bingo](#), a free, indoor, afternoon Bingo event for families of all ages (Facebook post from June 2022).
- The Bobby Andrews Recreation Center in Washington, N.C., offered [Beat the Heat #1](#), a program for fun activities that also help attendees stay cool (events held in July 2024).
- The City of Asheville, N.C., Parks and Recreation department hosted free, family-fun activities aimed at keeping families cool during the summer. Article: [Splash into Summer brings free family fun to city parks](#), with a list of event dates and locations (announcement from June 2023)

Create and Promote a Centralized Webpage for Local Heat Preparedness Information

Description: [Department staff or responsible entity] will create, maintain and regularly update a webpage ([URL]) with local extreme heat preparedness information, including:

- Definitions and descriptions of extreme heat and heat-related illness
- Individual safety information (e.g., infographics and instructions for staying cool)
- Local resources for heat relief (e.g., locations and hours for cooling centers)
- Current weather forecasts and outlooks for the area from the National Weather Service (NWS)

Getting Started on Implementation:

- We recommend incorporating this webpage into an existing local government website. For example, under a “Public Health and Safety” tab, a “Resident Resources” tab or even under “News” as a seasonal post to share resources.
- To include local weather forecasts, refer to [Appendix B](#) for instructions on finding local climate information about extreme heat. Forecast information can also be obtained from the NWS:
 - Embed forecasts onto websites using the [NWS API](#)
 - Link to the NWS forecast for your area by replacing the “[lat]” and “[lon]” in this URL: [forecast.weather.gov/MapClick.php?lat=\[lat\]&lon=\[lon\]](http://forecast.weather.gov/MapClick.php?lat=[lat]&lon=[lon]) with the appropriate latitude and longitude for your location or by typing in your ZIP code in the upper left corner of this [NWS webpage](#).
 - Access [statewide NWS maps of forecasted maximum and minimum temperatures](#) for the next seven days and maximum heat index values for the next three days.
 - [NWS Climate Prediction Center](#) shows hazard predictions
- Consider linking to or featuring resources from [ReadyNC.gov](#), a website with information on power outages, shelters, disaster assistance and more.

Responsible Department, Unit or Position: [Add text.]

Timeline: This webpage will be developed during [month(s) year] for launch in [month year].

Implementation Criteria and Frequency: Planned updates and maintenance will take place in [month(s)] of each year, prior to the start of the heat season. [Name of local government] will update the webpage throughout the summer with pertinent details and information.

Community Partners: [Add text.]

Metrics: e.g., website analytics, such as page visits or downloads [Add text.]

Examples and Resources:

Websites:

- [The Heat is On, Here’s Where to Cool Off](#), by Wake County, N.C.
- [Heat Relief Network](#), by Maricopa Association of Governments, Ariz.
- [Heat Relief](#), by Linn County, Iowa
- [Beat the Heat](#), by Pima County, Ariz.

Heat safety information and infographics:

- Example infographics are available in the [Toolkit’s Supplemental Materials](#)
- [Beat the Heat 2-page resource guide](#), Boston, Mass.

Message the Public About Heat Education and Heat Illness Prevention

Description: Educational awareness messages will be developed to cover signs, symptoms and prevention strategies for heat-related illnesses. These awareness messages will be distributed via multiple channels, including [list], to increase residents' general awareness of heat, health impacts associated with hot temperatures and individual safety measures.

Getting Started on Implementation:

- Consider using multiple ways to share these awareness messages, such as posts on social media, WhatsApp messages, public service announcements on local radio or television stations and informational flyers or brochures placed at community gathering spaces.
- Materials may also target populations with higher risk from extreme heat, such as youth athletes or outdoor workers. [Appendix A](#) of the Heat Action Plan Toolkit provides instructions on identifying groups with higher risk from extreme heat using publicly available secondary data.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

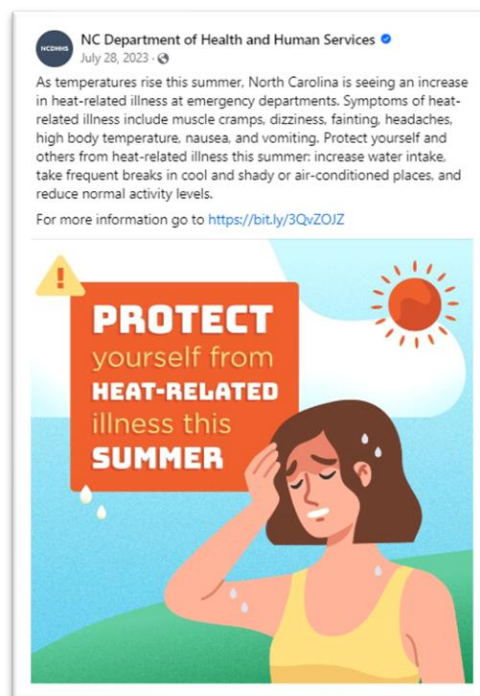
Implementation Criteria and Frequency: A social media campaign will begin in [May] with [insert number] posts, ramping up the frequency of posts to [insert number] posts in total in [June, July and August].

Community Partners: [Add text.]

Metrics: e.g., topics and content covered in materials, number of engagements with online materials (e.g., social media likes, page visits, downloads), number of brochure and flier hard copies taken [Add text.]

Examples and Resources:

- [Sample messaging in the Toolkit's Supplemental Materials](#)
- [NC Resilience Exchange case study about preventing heat-related illness in the Sandhills region](#), NCORR and NCDHHS
- [A Game Plan for Heat Stress: Policy Recommendations for High School Sports](#), Duke University Heat Policy Innovation Hub
- [Reducing Heat Illness in College and High School Sports](#), University of Connecticut
- [Extreme Heat Safety Checklist](#), Red Cross
- [Preventing Heat Illness at Work](#), OSHA
- [Who Is Most at Risk to Extreme Heat?](#), NIHHS
- [Social Media Campaign example](#), NIHHS
- [Safety Tips](#) (includes tips for indoor jobs with increased risk, such as bakeries, laundromats and factories), Connecticut Department of Public Health
- [CDC and NWS ready-to-post infographics and example social media messages](#)
- [Warm weather pet safety tips](#), American Veterinary Medical Association



Distribute Youth Heat Safety Workbooks

Description: Heat safety workbooks and educational materials targeting youth will be distributed to local organizations and public spaces in [April] prior to the start of the heat season. Distribution sites will be re-visited [monthly] during the heat season to count remaining workbooks and materials and to distribute additional ones as necessary. Remaining undistributed workbooks at the end of the heat season will be retained for distribution in subsequent years.

Getting Started on Implementation: Think about organizations where educational materials could be distributed. For example, public libraries, Little Free Libraries, community centers, children's museums and pediatric offices. Cooperative Extension, school districts and city parks and recreation departments should also be considered as partners to distribute physical materials. Electronic versions could be distributed through local government websites, community partners' websites and community social media groups (e.g., a community Facebook group).

Responsible Department, Unit or Position: [Add text.]

Timeline: Include details about when educational materials will initially be distributed and when or how often they will be checked. [Add text.]

Implementation Criteria and Frequency: For example, the number of educational materials and workbooks to be distributed [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of workbooks taken [Add text.]

Examples and Resources:

Ready-to-Print Workbooks:

- [Ready Wrigley Prepares for Extreme Heat](#), CDC
- [Extreme Heat Kids Activity Book](#), Polk County, Iowa

Additional educational resources with content that may be adapted into youth workbooks:

- [Ready Kids](#) tools and information for before, during and after disasters
- [What is a Heat Wave?](#), NOAA SciJinks

Educate the Public About Waste Heat

Description: Waste heat refers to the heat produced as a byproduct of various industrial, commercial and energy production processes. During periods when temperatures are already high (e.g., during an extreme heat event), waste heat can amplify the effects of extreme heat, contributing to the urban heat island effect and increasing the risk of heat-related illnesses. In addition, waste heat can exacerbate local air pollution (e.g., from automobile exhaust) by enhancing the formation of ground-level ozone and other air pollutants.

[Department staff or responsible entity] will explore opportunities to inform the public about the benefits of lowering energy use and the harmful impacts of waste heat and automobile exhaust on hot days.

Getting Started on Implementation:

- Engage with the local school district(s) to launch an awareness campaign aimed at reducing vehicle idling at school. Weather-proof signs describing the dangers of waste heat and idling cars will be created and printed. These signs could be placed at participating district school drop-off and pick-up zones prior to the start of the school year. Note that school boards may need to be approached separately for approval before launching this type of campaign.
- Consider using an outreach campaign targeting residents and businesses on ways to lower energy use. Pamphlets could be distributed to local businesses (e.g., coffee shops, home improvement stores). Consider connecting with your local economic development organization and chamber of commerce to assist.
- Consider maintaining a website where residents can obtain information about individual strategies to lower energy use during extreme heat.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of educational materials distributed and taken, number of website visits or social media engagements, surveys of participating public schools to track changes in the number of idling cars [Add text.]

Examples and Resources:

- [Idle Reduction Policy Templates](#), Louisville, Ky
- [Idle Free Schools Toolkit for a Healthy School Environment](#), Environmental Protection Agency (EPA)

Promote Home Cooling Strategies

Description: Home weatherization (e.g., sealing cracks around doors and windows) and energy efficiency strategies (e.g., closing blinds and curtains) can help residents keep their homes cooler and more comfortable during the summer heat. In addition to cooling indoor spaces, these actions reduce energy usage and lower cooling costs for residents.

Educational materials such as brochures and signage about home cooling strategies that residents can take during the summer, including during extreme heat events or days with extreme heat, will be developed by [department staff or responsible entity]. These will specifically focus on strategies that can help keep homes without air conditioning cool and that lower electricity bills (e.g., closing blinds or curtains, avoiding turning on ovens during the hottest times of the day).

To enhance community awareness during the heat season of home cooling strategies, the developed materials will be distributed at public centers (e.g., public libraries), places frequented by members of the public (e.g., coffee shops, rest areas or welcome centers, gas stations) and home improvement stores (e.g., Lowe's, Home Depot, garden shops).

Getting Started on Implementation: Consider the topics you would like to cover, groups that would be specifically targeted (e.g., renters, low-income families), formats (e.g., pamphlets, magnets, videos) and distribution channels (e.g., placed at the entrances to public buildings) of the educational materials. See the linked examples below for resources that may be easily adaptable or ready-to-print.

In addition, information will be provided to residents throughout the heat season about programs for home weatherization or energy assistance, including:

- [Low Income Energy Assistance Program \(LIEAP\)](#), a federally funded program that provides a one-time vendor payment to help eligible households pay their heating bills
- [Weatherization Assistance Program](#), a program, funded by the US Department of Energy and administered by the NC Department of Environmental Quality, that helps low-income North Carolinians save energy and reduce their utility bills
- [Energy Efficient Home Improvement Credits](#) from the Internal Revenue Service, where qualified energy-efficient home improvements may be eligible for a tax credit

*This action could be combined with "Educate the Public About Waste Heat."

Responsible Department, Unit or Position: [Add text.]

Timeline: Materials will be developed for the [year] heat season.

Implementation Criteria and Frequency: Materials will be printed prior to the start of the [year] year heat season and distributed to local organizations and businesses in [April, May].

Community Partners: [Add text.]

Metrics: e.g., number of signs, brochures and fliers that are distributed in the community; social media engagements on related posts; number of requests to LIEAP program [Add text.]

Examples and Resources:

- [Three steps to cost-effective home heat protection and Three steps to cost-effective apartment and condo heat protection](#), University of Waterloo
- [12 Ways to make your home more energy efficient](#), Save On Energy
- [11 Easy Ways to Lower Cooling Costs](#), Richmond's Air

Provide Educational Resources Targeting Outdoor Workers

Description: Outdoor workers' prolonged exposure to high temperatures puts them at increased risk from heat-related illnesses. Outdoor workers may also be low-income and members of marginalized communities, which further increases their vulnerability to heat. To increase awareness of heat-related health concerns and adoption of safe work practices during times of heat, [department staff or responsible entity] will:

- Develop and distribute educational materials that specifically target individuals who work outside.
Getting Started on Implementation: Consider the format (e.g., brochure, poster) and content (e.g., recognition and treatment of heat-related illnesses, safety protocols for hot workplaces) of materials and locations where they will be distributed (e.g., with employers of outdoor workers; businesses that serve outdoor workers, such as construction equipment rental companies or garden supply stores). Including images, in addition to text, will help make this content more accessible to individuals with different reading and literacy levels. Offering materials in more than one language can help the messages reach more residents. The [Toolkit's Supplemental Materials](#) contain examples that may be useful here.
- Offer educational training that focuses on the risks of extreme heat for outdoor workers and how they can protect themselves from extreme heat.
Getting Started on Implementation: Consider how this educational training will be provided, such as an online video or an in-person workshop. Also consider strategies for reaching non-English speaking communities, which may be more at-risk from extreme heat. See examples for resources and groups that may be able to assist with training, such as the NC Farmworker Health Program.
- Partner with community organizations to hold group meetings with leaders from industries that have outdoor workers (e.g., construction, agriculture). During these meetings, attendees could exchange information and learn from each other about how employers are protecting their workers, the barriers they face and what information or tools would be most helpful.
Getting Started on Implementation: Consider sharing details about how your local government is protecting its own outdoor workers as an example for attendees at these meetings.

The target audiences for these resources will be [list audiences, such as construction workers, agricultural workers, landscape workers, roofers, HVAC technicians and others].

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: Consider partners like OSHA, NCDOL, builders associations, construction unions, producers associations, Cooperative Extension and the NC Agromedicine Institute, which delivers heat stress education annually to farms. [Add text.]

Metrics: e.g., content and number of educational materials developed and distributed; surveying outdoor workers from different occupations to document their understanding of heat-related illnesses and the safety precautions they practice; number of trainings or engagements held and number of attendees; collection of follow-up information voluntarily supplied from employers, such as adoption and implementation of heat acclimatization protocols [Add text.]

Examples and Resources:

General workplace heat-safety information resources:

- NCDOL: [Heat Stress Hazard Alert handout](#)
- OSHA
 - [Overview: Working in Outdoor and Indoor Heat Environments](#)
 - [Heat Illness Prevention](#) website includes details on [employer responsibilities](#) and [information for workers](#)
 - [Heat Safety Tool](#), a free app for Android or iPhone for calculating the heat index at one's worksite and viewing a corresponding risk level for outdoor work
 - [Heat Illness prevention resources](#), including information on how to [protect new workers](#); [provide sufficient rest, shade and fluids](#); guidelines on [work schedule adjustments](#); and more.
- CDC
 - Extreme Heat page contains resources in [English](#) and [Spanish](#)
 - [Heat Stress Acclimatization](#) (tips for acclimatizing new outdoor workers) and [Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments](#)
- [Six Tips to Prepare for More Heat Waves](#), Grainger KnowHow

Agricultural workers:

- [NC Farmworker Health Program](#) is a resource for free trainings and health education, with many resources available in Spanish
- [Heat-related illness resources](#) is a list of resources, including factsheets and videos, about heat-safety in agricultural working conditions, NC Agromedicine Institute
- [Farmworker Health Facts](#), NC Farmworker Health Program, NCDHHS
- [Farm Workers and The Environment: Harvest of Justice 2020, Session 2: Heat Stress](#), National Farmworker Ministry
- The University of Washington Pacific Northwest Agricultural Safety and Health Center guides on heat illness prevention available in [English](#) and [Spanish](#)
- [Protect Yourself from Heat Stress Flipchart](#), Association of Farmworker Opportunity Programs
- Read this [NC Resilience Exchange case study about preventing heat-related illness in the Sandhills region](#), case study, North Carolina

Construction workers:

- [Beat The Heat - Stay Cool at The Construction Site](#), ConstructConnect
- [Heat Stress in Construction](#), Science Blog, CDC
- CDC Extreme Heat and Construction Falls factsheet in [English](#) and [Spanish](#)

HVAC technicians:

- [Hot Weather Safety Tips for HVAC Technicians](#), The Refrigeration School

Landscape workers:

- [Understanding Heat Stress Hazards Among Landscape & Lawn Care Workers](#), National Association of Landscape Professionals
- [Heat Related Illnesses and First Aid for the Landscape Worker](#), iScape

Roofers and roofing contractors:

- [Heat Stress Prevention for Roofers](#) brochure, Infrastructure Health and Safety Association
- [Beat the Heat: Summer Tips for Roofing Contractors](#), Roofing Contractor

Run a Heat Season Temperature Tracking and Extreme Heat Alert System

Description: A Heat Season Temperature Tracking and Extreme Heat Alert System (“Heat Alert System”) will be developed to track temperatures daily and inform the local community, including residents and visitors, government offices, schools, businesses and organizations that provide health services (e.g., hospitals), of imminent extreme heat events or forecasted periods with extreme heat. This Heat Alert System will include:

1. A directory of local organizations and partners who will receive heat alert notifications. These local organizations include ones that serve or provide support to populations with higher risk from extreme heat (e.g., religious institutions or places of worship that operate as cooling centers, schools that serve youth). This directory will contain contact information for each organization.

Organization / Partner	Point of Contact	Phone	Email
Heateville Fire Department	John Smith	(123) 456-7890	j.smith@heateville.gov
Heateville Nursing Home	Wanda Johnson	(123) 456-8901	w.johnson@heatevillehome.org

2. When extreme heat is imminent, [department staff or responsible entity] will utilize this directory to alert local organizations and partners of the imminent extreme heat so they may prepare and implement their own heat relief and support efforts.
3. Additionally, when an extreme heat event is forecasted to occur, [department staff or responsible entity] will alert the public via [social media posts, WhatsApp messages, local television news or radio public service announcements and press releases]. These messages will contain information about forecasted temperatures or heat indices and the length of the forecasted heat event. Additional information, including signs, prevention and treatments for heat-related illnesses, local responses to the heat event (e.g., locations and operating hours of heat relief sites), will also be included. These alerts are important to increase community awareness of and preparation for anticipated extreme heat events and their impacts.

Getting Started on Implementation:

- Consider ways to leverage already established communication networks, such as local radio announcements and community-led notification networks, particularly in areas with limited digital communication access. Social media sample messages and templates are included in the [Supplemental Materials](#).
- Additionally, we recommend including ways that messaging may be targeted to people with higher risk from extreme heat, such as by providing bilingual messages or disseminating messages through channels that may be more likely to reach these groups (e.g., using WhatsApp to communicate with agricultural workers), as well as ways to offer additional learning, such as by including QR codes for further reference on handouts.

This public health program will be implemented in coordination with local emergency response during extreme heat events though [working together to assess potential risks and vulnerabilities; information sharing; coordinating the allocation of resources; collaborating and coordinating communication messaging].

Local governments may use the NCDHHS Heat Health Alert System to be notified when extreme heat conditions that may impact public health are forecasted to occur in their jurisdiction. This system monitors conditions at a regional level. Anyone can sign up to receive alerts. Learn more about the state's Heat Health Alert System and how to sign up in [Appendix B](#).

*Other actions in this heat action plan template may complement or be incorporated into this Heat Alert System. These include “Operate a Medical Advice Hotline” and “Develop a Neighbor Check-in Program” (from Part 2).

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: Prior to the start of each heat season, the directory of local organizations and partners will be updated. Social media and other messaging templates (e.g., public service announcements) will also be updated. The Heat Alert System will run throughout the heat season ([May to September]). Refer to [Appendix B](#) for suggested thresholds to use for sending alerts and public messages as part of the Heat Alert System.

Community Partners: [Add text.]

Metrics: e.g., how many community organizations or partners are alerted each heat season, tracking engagements with social media posts [Add text.]

Examples and Resources:

- Sample social media messages, infographics and press releases are available in the [Supplemental Materials](#) and at right.
- [Preventing heat-related illness in the Sandhills Region](#), case study, NC Resilience Exchange
- See social media posts from North Carolina-based organizations that frequently share heat-related information, such as [NCDHHS](#) or your local [NWS office](#).
- [Developing an Early Warning System to Prevent Heat Illness](#), case study, North Carolina, US Climate Resilience Toolkit



Offer Heat-related Illness Refresher Trainings for Healthcare Practitioners and Public Safety Staff

Description: Healthcare practitioners are trusted community messengers about information related to health impacts from heat. These professionals can play a critical role in heat illness prevention in the communities they serve. At the beginning of the heat season each year, [department staff or responsible entity] will design and offer trainings for local healthcare staff, including professionals in related fields like social services. The trainings will be for individuals who want to refresh their knowledge on:

- Understanding social determinants of health and vulnerability that lead to higher risk from extreme heat
- How to recognize and inform patients who have higher risk from extreme heat about heat-related illnesses
- How to recognize and prevent the physical and behavioral signs of heat-related illness
- How to treat heat-related illnesses

This approach aims to reduce the number of heat-related illnesses and deaths in the community.

Getting Started on Implementation:

- Consider whether you want to promote existing training resources or host local workshops.
- Consider ways to engage those (e.g., public-school nurses, health care professionals at assisted living communities) who serve people with higher risk from extreme heat.
- Providers in medical training do not regularly receive heat illness training. An effective way to engage and incentivize providers throughout the state is to offer free continuing medical education (CME) to licensed providers. CME is required for license renewal.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of individuals who are engaged and trained, number of trainings or other educational interventions, number of heat-related illnesses and deaths in the community over time (contact NCDHHS for instructions on obtaining this information) [Add text.]

Examples and Resources:

Synchronous and/or asynchronous professional development around heat-health for health professionals:

- [Courses and events related to heat](#) offered throughout the state, North Carolina Area Health Education Center (NC AHEC)
 - [Professional development for healthcare professionals](#), Southern Regional AHEC
 - [Online self-paced learning on heat-related illness](#), Eastern AHEC
- [Climate and Health Responder Course for Health Professionals](#), an 8-week virtual, free, online certificate program, Columbia University Mailman School of Public Health
- [Online learning courses on heat and extreme weather](#), Global Heat Health Information Network
- [Seminar Series on climate change and the threat against health](#), National Institutes of Health Climate and Health
- [Climate Resilience for Frontline Clinics Toolkit](#), contains resources (e.g., factsheets, guidance documents, checklists) in English and Spanish for healthcare providers, patients and administrators to help communicate about and plan for heat, AmeriCares

Offer Public Training Opportunities on Heat-related Illness Prevention

Description: Training will be offered to community members, with a focus on members of the community who have higher risk from extreme heat. This training will cover:

- The history and climate conditions around heat in [the jurisdiction, county or state]
- Signs, causes and treatment of heat-related illnesses
- Ways to prevent heat related illnesses in targeted groups (e.g., high school athletes, agricultural workers, pregnant persons)

Getting Started on Implementation: Consider what will be included in each training, its delivery format (e.g., a standalone workshop or outreach during an existing community event, such as a table at a festival) and the intended audience (e.g., community leaders, faith leaders, members of the community themselves).

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of trainings provided and attendance rates, heat related illnesses and deaths in the community over time (contact NCDHHS for instructions on obtaining this information). community surveys to document understanding of heat related illness and precautions community members are taking [Add text.]

Examples and Resources:

These training programs and resources target professionals in public health, but may be adaptable to the broader community:

- [Online learning courses on heat and extreme weather](#), Global Heat Health Information Network
- [Online self-paced learning on heat-related illness](#), Eastern AHEC
- [Seminar Series on climate change and the threat against health](#), National Institutes of Heat Climate and Health
- [Social Media Campaign example](#), NIHHS

Factsheets and Guides:

- The [Toolkit's Supplemental Materials](#) hosts a recorded webinar, infographics and factsheets about extreme heat and heat-related illness
- [A Game Plan for Heat Stress: Policy Recommendations for High School Sports](#), Duke University Heat Policy Innovation Hub
- [Climate Resilience for Frontline Clinics Toolkit](#), contains resources (e.g., factsheets, guidance documents, checklists) in English and Spanish for healthcare providers, patients and administrators to help communicate about and plan for heat, American Red Cross
- [Heat-health infographics in both English and Spanish](#), including the option to download and customize, University of North Carolina at Chapel Hill Convergence of Climate-Health-Vulnerabilities

Reduce or Eliminate Entrance and Participation Fees for Summer Activities

Description: [Department staff or responsible entity] will pursue partnerships with local organizations to reduce or eliminate fees or admission rates to events that may offer relief from the heat, especially for residents who have higher risk from extreme heat. Specifically, [department staff or responsible entity] will reach out to [list organizations] whose air-conditioned spaces may offer relief from the heat during the summer.

Getting Started on Implementation: Consider reaching out to movie theaters, summer camp providers, museums, children's centers, arcades and other local places with air-conditioned spaces that may offer relief from the heat during the summer.

*This action could be combined with "Promote Community Events Taking Place in Air-Conditioned Spaces."

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of organizations that participate in reduced fares and populations targeted; attendance rates on hot days with lowered fares [Add text.]

Examples and Resources:

Examples of existing opportunities for reduced entrances fees:

- Some movie theaters offer reduced summer rates (e.g., [Cinemark](#), [AMC](#), [Regal](#)); check with your local theatres to see if they offer or are willing to offer summertime or extreme heat discounts
- Reduced rates for Supplemental Nutrition Assistance Program (SNAP) benefit members via [Museums for All](#), museums throughout United States
- [Kids Bowl Free](#) at bowling alleys throughout the United States

Examples of local jurisdictions lowering entrance fees during periods of extreme heat:

- [Reduced pool fees during 2017 heat advisory](#), Allentown, Pa.
- [Waived pool fees during hot days](#) in 2006, Columbus, Ohio, Parks and Recreation

Develop a Hydration Station Program

Description: Hydration stations are locations where individuals can go to receive bottled water or have access to water fountains. These can be indoors or outdoors. [Department staff or responsible entity] will identify a local government unit or partner to open hydration stations throughout the summer.

Getting Started on Implementation:

- Consider what locations would work best for hydration stations for the upcoming heat season and think about what services each location could provide and the conditions for their activation or closure. Also think about how the public will be notified of hydration station operations, such as through websites, press releases, printed maps, local television and local radio.
- Consider partnering with your local water utility to provide hydration stations.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of visitors to hydration stations, amount of water drawn, number of single-use bottles distributed at hydration stations [Add text.]

Examples and Resources:

- [Interactive maps](#) of hydration stations for counties in Arizona
- [Louisville Water Company map](#) of “Pure Tap” stations around the city

Launch a Cooling Center Program

Description: Cooling centers are air-conditioned indoor locations intended to provide refuge to people (and pets, when possible) from the heat during the day. Drinking fountains or bottled water may be available at some of the locations. [Department staff or responsible entity] will identify public and private locations for cooling centers. The following cooling centers are already identified for the upcoming [year] heat season:

- [list locations and operating hours]

To publicize cooling centers, [department staff or responsible entity] will [print maps and distribute them in community centers, add information to the local government heat website and share information during local television and radio station broadcasts].

In addition, to assist local organizations willing to serve as cooling centers during periods of extreme heat, [department staff or responsible entity] will develop a brief “how to host a cooling center” guide. Once this guide is developed, [department staff or responsible entity] will share it with local organizations, such as local businesses, religious institutions and museums, about the community benefits of cooling centers.

This guide will include a checklist of information for local organizations to work through, such as:

- The weather conditions under which they should activate their cooling center
- How many people can reasonably be accommodated (e.g., 20-30 at a time)
- The services they will provide (e.g., bottled water, phone charging stations)
- The minimum number of staff that will be needed to operate the cooling center
- Eligibility to access the cooling center (e.g., open only to adults 65 and older; pets welcomed)

Getting Started on Implementation:

- Identify locations that already serve as a cooling center. Inventory what resources (e.g., free bottled water or access to water fountains; public restrooms) they offer.
- When publicizing shelters, include details about the specific services provided by cooling centers and the conditions for activation or closure.
- Consider creating and distributing maps with addresses of cooling centers for members of the community who may lack access to the internet or social media.
- Consider promoting the FEMA shelter location texting service. Residents can text SHELTER + your ZIP code to 43362 (4FEMA) to find the nearest shelter in their area. Residents can also visit nc211.org and type in “Extreme Heat Cooling Centers” into the search bar on the homepage. Note that the webpage might not produce results outside of an extreme heat event. Many communities do not promote their emergency shelters unless they are ready and able to accept visitors.
- Consider how the “how to host a cooling center” guide will be published (e.g., local website, mailer) and publicized (e.g., social media, phone calls, meetings with local organizations).

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: List community partners who will operate cooling centers and may provide feedback on the guidance. [Add text.]

Metrics: e.g., number of cooling center visitors, counts of supplies distributed (e.g., number of water bottles), operating expenditures, number of new cooling centers opened each heat season that use the guidance [Add text.]

Examples and Resources:

- [Cooling center checklist](#), Toolkit Supplemental Materials
- [Guidance for operating a cooling station](#), Multnomah County, Ore.
- [Cooling Center and Charging Stations Guidelines](#), Parks and Recreation, Calistoga, Calif.
- [Community Resiliency Community Hub Program](#), Baltimore, Md.
- [Alchemist CDC Neighborhood Empowerment Cooling Stations](#), Sacramento, Calif.

Offer Transportation to Cooling Centers

Description: To aid residents who lack access to transportation, [list organizations in your jurisdiction that will be providing transportation services] will provide transportation (including wheelchair accessible services) to and from cooling centers during periods of extreme heat. Details about the transportation services will be publicized via [social media posts, jurisdictional websites and press releases].

Getting Started on Implementation:

- Develop promotional language that includes information on how residents can take advantage of the transportation services. For example, “To use transportation services to and from cooling centers, residents will call [phone number] or fill out the online form at [website].”
- Evaluate the number of vehicles needed, their passenger capacity, costs and source of the vehicles. Consider if your local public transit agency, if you have one, could waive fees or extend hours during heat waves. You might also consider if a volunteer corps, religious institution or other local organization may be able to help transport residents to cooling centers, following practices that may be done during elections.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: Consider connecting with your Rural Planning Organization or Metropolitan Planning Organizations [Add text.]

Metrics: e.g., number of individuals who use transportation assistance during extreme heat events, number of volunteers mobilized to provide transportation assistance; average miles traveled, average response time following a request for transportation services [Add text.]

This information could help with future requests for volunteers (e.g., requesting more volunteers to reduce wait times) or allotment of services throughout the jurisdiction (e.g., making more vehicles available in areas that had higher demand during previous extreme heat events).

Examples and Resources:

- [Sunline Transit](#), Indio, Calif.
- [Via](#), San Antonio, Texas

Heat Action Plan Part 2:

When Extreme Heat Is in the Forecast

Consult with your local emergency management team members when developing this section. They may be able to suggest resources or existing policies that inform your action selections.

[Local government] will activate Part 2 of this Heat Action Plan when extreme heat is forecasted to occur in [jurisdiction]. The specific criteria for implementing these actions are based on thresholds for extreme heat. These thresholds are based on local climate conditions.

Refer to [Appendix B](#) for recommendations on obtaining heat thresholds for extreme heat and extreme heat events for your jurisdiction and include them here. Example text is below:

In [Jurisdiction], **Extreme Heat** is defined as:

- A heat index of [insert threshold] degrees Fahrenheit or higher.
- Extreme heat is considered imminent when extreme heat conditions are forecasted to occur anytime within the next [insert a length of time in hours or days, for example 48 hours]. NWS usually issues heat advisories within 36 hours (e.g., an early-morning or afternoon forecast issuance might have an advisory for the next day). However, each forecast office considers their own community's needs vulnerabilities, local guidelines and thresholds, forecast confidence, heat intensity and duration, occurrences during summer holidays or outdoor events and other factors to decide on a watch, warning or advisory. For example, extending the forecast lead-time to 72 hours for "extreme heat" coinciding with a significant event like July 4th could enhance preparedness for increased exposure risks. We recommend consulting with your local NWS office for guidance.

In [Jurisdiction], an **Extreme Heat Event** is defined as:

- A heat index of [insert threshold] degrees Fahrenheit or higher occurring for a duration of [insert number of days, using at least two or three] days. NWS recommends using at least two or three days since an early-season event lasting just a couple of days can have significant health impacts.
- An extreme heat event is considered imminent when extreme heat conditions are forecasted to occur within the next [insert a length of time in hours or days, for example 48 hours] and are forecasted to last for a duration of [insert the same number of days as in the previous bullet].

Refer to these definitions to explain the criteria for implementing each action in Part 2 of the plan (see the section "Implementation Criteria and Frequency" under each action). Alternatively, you may opt to list the conditions for implementing all the actions in this part of the plan here. For example:

Part 2 of [Jurisdiction's] Heat Action Plan will be activated when [conditions for activation, e.g., when the heat index reaches [insert threshold] degrees Fahrenheit]. When Part 2 is activated, the following actions will occur:

- A meeting of the Heat Relief Task Force at [insert location or if meeting will be held virtually] to review the heat action plan and response activities
- [Activate Cooling Stations]
- [Deploy rangers to parks and trail heads on hot days]
- [Increase staffing capacity at hospitals and health centers]
- [Implement regulations and recommendations to limit outdoor activities]
- [Additional actions]

These activities will be undertaken to respond proactively to the predicted extreme heat conditions as associated potential adverse health impacts.

You may also want to include additional criteria (e.g., a power outage in a community or communities in your jurisdiction, extreme weather in the forecast that puts access to power and other services at risk) that could coincide with periods of warmer temperatures and increase the risk from heat for activating Part 2 of the plan or specific actions within it.

The following pages contain example actions for you to consider including in Part 2 of your plan. We do not anticipate that you will opt to include all actions; instead, pick and choose the actions that meet your goals and serve your community best. Fill in the details (Description; Responsible Department, Unit or Position, etc.) of actions you select. Delete the actions you do not wish to include in your plan.

The actions below are generally listed in order by easiest to implement, with the understanding that all jurisdictions have different capabilities. Local governments with limited capacity might consider focusing on the actions toward the beginning of the list to get started on addressing heat impacts.

Actions for When Extreme Heat is in the Forecast

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Deploy Rangers to Parks and Trail Heads on Hot Days

Description: Outdoor recreationists are at higher risk from heat due to prolonged exposure and exertional activities. They may be unaware of the dangers of high temperatures and may not recognize the signs of heat related illnesses. During extreme heat events, park rangers, staff and volunteers will be deployed to park entrances, athletic parks, parking lots and trail heads to provide heat safety messaging and resources. These individuals will verbally inform park visitors about the dangers of high heat and precautions to take, or they may post signage (e.g., billboard signs, lawn signs at the entrances to trails) to alert visitors to the dangerous heat conditions and safety precautions they should take.

The US military has adopted a flag system to alert military personnel to extreme heat conditions (see [Heat Condition Flag Warning System](#) from the US Marines). This flag system is based on the Wet Bulb Globe Temperature (see [definitions](#) on p. xii). This system could also be adopted at local parks and trail heads to alert the public to current heat conditions, like the flag levels used at public beaches to notify visitors that conditions are unsafe for swimming. However, since Wet Bulb Globe Temperature and its categories may be an unfamiliar concept for visitors, provide additional information (e.g., via flyers, brochures, QR code) to help visitors understand the flags when there is not a ranger present to explain.

Additionally, flags will be posted at [park entrances, athletic parks and trail heads] to indicate the current heat conditions based on the Wet Bulb Globe Temperature. The Wet Bulb Globe Temperature (WBGT) is a measure of how heat is experienced by humans in direct sunlight. Unlike the heat index, which is based on temperature and humidity and is measured in the shade, WBGT considers temperature, humidity, wind speed, sun angle and cloud cover. We will adopt a flag system based on the US Military Heat Condition Flag Warning System, which is based on WBGT:

- Green Flag (WBGT Index values of 80 to 84.9 degrees Fahrenheit): Low
- Yellow Flag (WBGT Index values of 85 to 87.9 degrees Fahrenheit): Elevated
- Red Flag (WBGT Index values of 88 to 89.9 degrees Fahrenheit): Moderate
- Black Flag (WBGT Index values of 90 degrees Fahrenheit or above): High

WBGT will be obtained by [using a wet bulb globe temperature sensor, estimates from the [State Climate Office of North Carolina](#) or prototype forecasts from the [NWS](#)]. Additional signage ([brochures, posters]) will be posted at [list locations] to educate visitors on WBGT and interpreting the flags. Park rangers and staff will also be trained to communicate WBGT-related information.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of visitors engaged directly by park rangers, staff or volunteers; number of signs printed and posted at trail heads [Add text.]

Examples and Resources:

- [Heat Condition Flag Warning System](#), US Marines
- [Military Heat Flag Conditions infographic](#), Defense Visual Information Distribution Service
- [Wet Bulb Globe Temperature infographic](#), State Climate Office of North Carolina
- [Wet Bulb Globe Temperature information](#), Duke University Heat Policy Innovation Hub
- [“STOP Heat Kills” Signage](#), National Park Service
- [Sign warning of the dangerous heat conditions](#), City of Austin, Texas

Provide Heat Relief for People Spending Time Outdoors

Description: People who spend time outdoors (e.g., hikers, boaters, outdoor workers and athletes, including youth athletes) are more vulnerable to adverse health impacts associated with heat. [Department staff or responsible entity] will partner with local organizations and businesses to distribute heat relief supplies to help reduce the impacts of heat on these people as well as increase community awareness of the dangers of heat and how to stay safe.

The specific supplies that will be distributed are:

- Bottled water
- Electrolyte packets or drinks such as Gatorade
- Insulated water bottles
- Pet watering bowl
- Sunscreen (any size)
- Lip balm (+SPF preferred)
- Sun hats or baseball caps
- Sunglasses
- Umbrellas
- Small towel, cooling wrap or bandana
- Pair of socks
- Instant cold packs
- Aloe vera gel
- Hand-held fans
- Brochure or map showing locations of local heat relief sites and their hours of operation
- Handouts describing the symptoms and treatment for heat-related illnesses

Getting Started on Implementation: Consider when and where supplies will be distributed (e.g., at park entrances, outside grocery stores) and any eligibility requirements (e.g., if supplies will be limited to students, workers in specific occupations or individuals above or below certain age thresholds).

*This action could be combined with other, similar actions, such as "Provide Heat Relief for People Experiencing Housing Insecurity."

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: List partnering local organizations and business that will help obtain and distribute heat relief supplies. [Add text.]

Metrics: e.g., types, amounts, cost and locations of supplies distributed throughout the heat season; number of partnering organizations [Add text.]

Examples and Resources:

- [Heat Relief Supplies Checklist](#), Toolkit Supplemental Materials
- [A Game Plan for Heat Stress: Policy Recommendations for High School Sports](#), Duke University Heat Policy Innovation Hub
- [Operation Chill-Out](#), Salvation Army, Tucson, Ariz. (volunteers to go to local parks and provide water, hats, lip balm, sunscreen, umbrellas and light-colored t-shirts to individuals experiencing homelessness)

Provide Heat Relief for People Experiencing Housing Insecurity

Description: People experiencing housing insecurity are particularly vulnerable to extreme heat and extreme heat events. [Department staff or responsible entity] will partner with [list organizations] to distribute heat relief supplies to help reduce the impact of heat on these individuals.

The specific supplies that will be distributed are:

- Bottled water
- Electrolyte packets or drinks such as Gatorade
- Insulated water bottles
- Pet watering bowl
- Sunscreen (any size)
- Lip balm (+SPF preferred)
- Sun hats or baseball caps
- Sunglasses
- Umbrellas
- Small towel, cooling wrap or bandana
- Pair of socks
- Instant cold packs
- Aloe vera gel
- Hand-held fans
- Brochure or map showing locations of local heat relief sites and their hours of operation
- Handouts describing the symptoms and treatment for heat-related illnesses

Getting Started on Implementation: Consider when and where supplies will be distributed (e.g., at parks, shelters) and any eligibility requirements.

*This action could be combined with other, similar actions, such as "Provide Heat Relief for People Spending Time Outdoors."

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., types, amounts, cost and locations of supplies distributed throughout the heat season; number of individuals reached through the program [Add text.]

Examples and Resources:

- [Heat Relief Supplies Checklist](#), Toolkit Supplemental Materials
- [Operation Chill-Out](#), Salvation Army, Tucson, Ariz. (volunteers to go to local parks and provide water, hats, lip balm, sunscreen, umbrellas and light-colored t-shirts to individuals experiencing homelessness)

Develop a Neighbor Check-In Program

Description: Some individuals are more vulnerable to hot temperatures due to preexisting conditions, age or resource access. Checking on individuals with higher risk can help prevent heat-related illness and death. A Neighbor Check-In Program will be piloted to connect the friends and family members of isolated and vulnerable individuals with timely heat alerts, information and support on hot days.

Getting Started on Implementation:

- Check-ins may be done by volunteers, health professionals or a combination, and could be a partnership with another organization like Meals on Wheels. Check-ins may also take place over the phone or in-person, depending on needs and volunteer capacity.
- Consider what components you would like to include in the program. Examples include:
 - An online form or phone number to call for residents to sign up to participate in the check-in program, as either a volunteer or as an individual to be checked on
 - A volunteer guide that includes questions to ask when performing check-ins
 - An alert sent out to participating volunteers and individuals via WhatsApp, reverse-911 or a county-based text messaging system when extreme heat is imminent
 - Training volunteers to recognize the signs and symptoms of heat-related illnesses and proper treatment, including when to seek medical attention

*This action may complement or be incorporated into the “Run a Heat Season Temperature Tracking and Extreme Heat Alert System” (found in Part 1 of the heat action plan).

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of volunteers trained, number of check-ins performed, surveys or interviews with volunteers and participating individuals at the end of the heat season to understand the value of the program and areas for improvement [Add text.]

Examples and Resources:

- [How to Check in on Neighbors During a Heat Wave](#), New York City
- [Help Someone Stay Cool During Extreme Heat](#), American Association of Retired Persons

Increase Staffing Capacity in Hospitals and Health Centers

Description: [Name of Local Government or Community Partner] will work local hospitals and health centers to explore opportunities for increasing staffing when an extreme heat event is imminent. This increase in staff will increase preparedness for the expected rise in heat-related illnesses and injuries.

Getting Started on Implementation:

- Meet with local hospital and urgent care management staff to understand their current response to heat forecasts.
- Consider opportunities to provide trained volunteers or compensation to support hospital staff overtime.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., collect information about staffing changes and their impacts, such as monetary costs, numbers of excess staff called to duty and hospital or urgent care wait times [Add text.]

Examples and Resources:

- [Climate Resilience for Frontline Clinics Toolkit](#), contains resources (e.g., fillable PDFs for providers, patients and administrators to use to plan for weather-related emergencies, including extreme heat) in English and Spanish for healthcare providers, patients and administrators to help communicate about and plan for heat, American

Operate a Medical Advice Hotline

Description: A medical advice hotline will be operated during extreme heat events to quickly disseminate heat-related medical advice to [county or jurisdiction] residents. This hotline will be operated by [department staff or responsible entity] and will provide information about [forecasted extreme heat conditions; signs of heat related illnesses; treatment for heat related illnesses including when to seek medical treatment; locations of heat relief sites, such as cooling centers or hydration stations].

Getting Started on Implementation:

- Consider staffing level and operator training needs and if the hotline will be in operation year-round and 24-hours or if it is only needed during certain periods or times.
- Talk to local hospitals and health centers, which may already have triage nurse hotlines set up.

*This action could complement or be incorporated into the “Run a Heat Season Temperature Tracking and Extreme Heat Alert System” (found in Part 1).

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: This action could be done in partnership with emergency telecommunication centers (911) and local hospitals or health centers. [Add text.]

Metrics: e.g., number of calls to the hotline, number of staff or volunteer operators [Add text.]

Examples and Resources:

- [North Carolina 211](#), an information referral service, United Way of North Carolina
- [List of Hotlines](#), NCDHHS
- [Disaster Distress Helpline](#), ([Spanish version](#)), open to anyone experiencing emotional distress related to disasters, Substance Abuse and Mental Health Services Administration

Implement Regulations and Recommendations to Limit Outdoor Activities

Description: To limit the exposure of residents to dangerous heat, [jurisdiction] will implement regulations or recommendations to cancel, suspend, delay or change the timing of previously scheduled activities or events. Specific activities include:

- Closing schools early or reducing or eliminating outdoor activities (e.g., sports, outdoor playgrounds) to limit children's exposure to high temperatures (see note below)
- Mandating that youth sports practices and games will not take place outside the hottest hours of the day throughout the heat season and that no practices or games will occur during an extreme heat event
- Canceling outdoor concerts or delaying their start to avoid the hottest times of the day,
- Closing or delaying outdoor markets or requiring them to have a free and accessible cooling space, when temperatures exceed certain thresholds
- Encouraging businesses and organizations whose work takes place primarily outdoors to reduce activities during the hottest times of the day
- Heightening prevention activities during outdoor public events (e.g., increasing staffing, distributing additional water bottles, setting up more tents for shade)
- Requiring local government employees who work outside to work inside or only work outside during the early morning hours

Note: some children and families may not have access to air-conditioning at home and may benefit from staying in school or having access to other community spaces (e.g., community centers, public libraries) with air-conditioning. In these cases, closing schools may be more harmful than keeping them open.

*This action could complement or be incorporated into the “Provide Educational Resources Targeting Outdoor Workers” (found in Part 1). For example, consider partnering with industry leaders who employ outdoor workers (e.g., agriculture, construction, landscaping) to provide and implement guidelines for employers on work schedule adjustments, hydration stations and shaded rest areas, including policies that protect workers from retaliation when taking necessary heat-related health precautions.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of heat-related illnesses before and after regulations, number of partners that adopt recommendations [Add text.]

Examples and Resources:

- [Helping People to Beat the Heat This Summer](#), contains useful tips for keeping parks and park visitors safe during extreme heat, National Recreation and Parks Association
- [HighSchoolOT Jamboree delayed due to heat](#), August 2023, Wake Forest, N.C.
- [Heat causes Salem Band to cancel concert](#) June 2022, Winston-Salem, N.C.

Heat Action Plan Part 3:

Long-Term Strategies to Prepare Residents for Heat

The following strategies are intended to increase the capacity of our residents to prepare for and cope with heat, including periods with high temperatures and extreme heat.

The following pages contain example actions for you to consider including in Part 3 of your plan. We do not anticipate that you will opt to include all actions; instead, pick and choose the actions that will meet your goals and serve your community best. Fill in the details (Description; Responsible Department, Unit or Position, etc.) of actions you select. Delete the actions you do not wish to include in your plan.

The actions below are generally listed in order by easiest to implement, with the understanding that all jurisdictions have different capabilities. Local governments with limited capacity might consider focusing on the actions toward the beginning of the list to get started on addressing heat impacts.

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Create Youth Learning and Volunteer Opportunities to Increase Community Resilience to Heat

Description: [Department staff or responsible entity] will partner with local schools and organizations to develop projects with youth that create learning and volunteer opportunities for young people to engage with smart design around heat, such as tree plantings or parking lot painting projects.

Getting Started on Implementation: Consider attendance goals, target ages, budget needs and areas targeted for projects or volunteer opportunities.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: Consider Cooperative Extension and 4-H, existing afterschool groups or camps, museums, science centers and other environmental education centers that provide programming for youth and faith-based youth groups. [Add text.]

Metrics: e.g., number of schools or youth engaged, ages of youth engaged, locations impacted by youth volunteer opportunities [Add text.]

Examples and Resources:

- [Youth Help Plant Trees](#), Hoke Community Forest, Hoke County, N.C.
- [Youth Tree Team](#), Boca Raton, Fla.

Expand Access to Water and Shade

Description: Cooling amenities, such as publicly accessible shade structures (e.g., shaded bus stops, sidewalks), hydration stations (e.g., water fountains, water bottle refill stations) and public access to cooling relief (e.g., splash pads, misting stations) can help keep residents spending time outdoors cool throughout the summer and during periods of extreme heat.

[Department staff or responsible entity] will identify cooling amenities to install across [jurisdiction] and complete the construction and planting projects.

Getting Started on Implementation:

- Consider amenity types, such as public drinking fountains, water bottle refill stations, misting stations, splash pads and shade structures. Talk to residents about what they would enjoy the most.
- Identify locations where people already spend time outdoors during hot weather. Examples might be local athletic and hiking parks, trails, bus stops and other areas where pedestrians are active.

*This action could complement “Promote Greenery in Public Spaces” or “Develop a Hydration Station Program” to further promote options for the public to stay cool when outdoors.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of newly installed amenities and their cost, estimates for the number of daily or seasonal visitors to public spaces for cooling (e.g., splash pads), feedback via community surveys about the value of new or existing water and shade amenities [Add text.]

Examples and Resources:

- [Raleigh Parks Splash Pads](#), City of Raleigh, N.C.
- [Interactive Map](#) showing locations of public water fountains, shadier areas and outdoor pools, New York City
- [Neat Streets program](#)

Promote Greenery in Public Spaces

Description: Plants can help keep temperatures cooler, particularly in spaces where there are hard surfaces such as brick, concrete or asphalt. Native plants also have co-benefits of providing habitat for many species of pollinators, birds and mammals.

[Department staff or responsible entity] will partner with [organizations, such as local County Extension or local garden suppliers or nurseries] to purchase and plant perennial plants (e.g. shrubs, trees) and annuals (e.g., flowering plants that complete their life cycle in one year) around [list locations, such as downtown areas, parks, public spaces, shopping centers].

Getting Started on Implementation:

- Once you identify locations in need of cooling greenery, identify specific plants that suit the space. Consider the species and numbers. Also consider other planting or equipment needs, such as garden soil or shovels and how these will be obtained or provided.
- Consider consulting with an [International Society of Arboriculture certified Arborist](#) for advice on where to plant trees.

*This action could be combined with "Host Tree Giveaways" or "Create Youth Learning and Volunteer Opportunities." Additionally, this action may complement "Expand Access to Water and Shade" to further promote options for the public to stay cool when outdoors.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: Volunteer groups, such as Master Gardeners or youth service organizations, may be excellent partners for organizing and carrying out this action. In addition, consider partnering with groups such as Cooperative Extension and local plant nurseries. [Add text.]

Metrics: e.g., number and cost of plants that are planted, number of volunteers engaged in planting opportunities [Add text.]

Examples and Resources:

- [East Durham Tree Giveaway](#), Durham, N.C.
- [Cool Block Challenge](#), Los Angeles, Calif.
- [Cool Corridors](#), Phoenix, Ariz.
- Native plants lists: [North Carolina Extension Gardener Plant Toolbox](#), [NC Biodiversity Project](#)
- [List of recommended vendors of native plants](#), North Carolina Botanical Garden

Host Tree Giveaways

Description: Trees provide many benefits, including shade during hot, sunny days, helping to keep temperatures cooler, reducing stormwater runoff, improving air quality and providing habitat for local wildlife. In addition, developed areas benefit from trees by reductions in the urban heat island effect.

[Department staff or responsible entity] will identify partners to offer tree seedling giveaways.

Getting Started on Implementation

- Identify partners, such as the Cooperative Extension or local plant nurseries, to obtain trees and host or co-host giveaways. Or seek out funding to purchase whips (unbranched tree seedlings) or larger sizes of young trees.
- Think about when the giveaways should take place, such as at certain times of the year or during specific community events.
- Consider eligibility requirements. Many communities limit recipients to those who are residential property owners and ask them to list their address and sign a form stating their intention to plant the tree. Other communities also include multi-family housing property owners, apartment companies and landlords and businesses that own land where trees could be planted.
- Consider only providing native trees and trees that are expected to be more resilient to the changing climate conditions in your area.
- Consider ways to reduce disparities in shade, such as by targeting areas of your community with lower existing tree canopies or by distributing trees to rental housing property owners (e.g., apartment complexes).
- Consider consulting with an [International Society of Arboriculture certified Arborist](#) for advice on program development and implementation.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: Consider groups such as Cooperative Extension, local plant nurseries and the North Carolina Urban Forest Council. [Add text.]

Metrics: e.g., number of trees given away, number of residents engaged, geographic locations of tree recipients to document success and target locations for future tree giveaways [Add text.]

Examples and Resources:

- [East Durham Tree Giveaway](#), Durham, N.C.
- [TreesLouisville](#), Louisville, Ky.
- [Louisville Grows](#), Louisville, Ky.
- [Los Angeles City Plants](#)
- [Urban and Community Forestry and Financial Assistance Program](#), designed to assist municipalities with sustainable urban and community forestry management, NC Forest Service
- [Community Canopy](#), a program designed to offer companies, cities, states and nonprofit organizations trees to provide to homeowners, Arbor Day Foundation

Invest in Cool Schools

Description: Schools have considerable available land for increasing the tree canopy. [Department staff or responsible entity] will pursue partnerships with [local organizations, businesses, schools, school districts] to provide and plant trees at local schools. By doing so, cooler outdoor spaces will be created for school children, a population that has a higher vulnerability to heat.

Getting Started on Implementation:

- Talk with the school board and individual schools to find out who might be interested. Consider targeting specific schools in need of tree canopy and shade.
- Consider planning and event or using volunteer groups to plant trees.
- Also consider other types of cooling support, such as shade structures around drop-off or pick-up areas, that could complement this action (e.g., see the action “Expand Access to Water and Shade” for more ideas for providing shade).

*This action could be combined with “Create Youth Learning and Volunteer opportunities to Increase Community Resilience to Heat.”

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of trees planted at schools, number of school partners, number of school children engaged in helping to plant trees [Add text.]

Examples and Resources:

- [Resolution to increase tree canopy at schools](#), Miami-Dade County, Fla.
- [TreeUtah, Planting Trees at School](#)
- [Heat-Ready Schools initiative](#), Ariz.
- [Tree Campus K-12 program](#), Arbor Day Foundation

Implement a Cool Pavements Program

Description: Specialized coatings applied to roadways can help them reflect heat, rather than absorb it, keeping the roadway and surrounding area relatively cooler. The type of coating used may also have other co-benefits, such as preserving pavement for longer periods of time and absorbing certain air pollutants.

[Department staff or responsible entity] will [conduct an assessment to identify roads or road segments that may be appropriate for implementing a cool pavements program; develop educational materials about cool pavements and distribute to local business and residential areas; apply for a grant to install cool pavement(s) in [list location(s)]].

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., square or linear miles of roadway covered with specialized coatings, environmental monitoring of average ambient air temperatures before and after applying coating to roadways, longer-term maintenance costs and timing for coated roadways in comparison to uncoated roadways [Add text.]

Examples and Resources:

- [Cool Streets program](#) with a titanium dioxide road covering, Raleigh, N.C.
 - Read this [NC Resilience Exchange case study](#) about the program
- [Cool Pavement Program](#), San Antonio, Texas
- [Using Cool Pavements to Reduce Heat Islands](#), EPA

Work with State and Local Partners to Help Low-Income Residents with Cooling Expenses and Home Weatherization

Description: [Department staff or responsible entity] will partner with [list state or local entities or existing local or state programs] to assist low-income residents with [cooling expenses, home weatherization]. Access to air-conditioned spaces, particularly home residences, is important for staying cool when it is hot outside. By implementing this action, we aim to increase residents' access to cool spaces, which increases the overall resilience of the community to periods of hot temperatures.

Getting Started on Implementation:

- Consider eligibility and how residents can apply for assistance. For example, consider basing eligibility, in part, on homes where a child, older adult or person with a disability is living without air conditioning. Also think about how to simplify the application process for the target audience. Perhaps it's easier for residents to obtain an application from the website or a physical location, or both.
- For programs that provide window units, consider that some individuals may be reluctant to install a window unit since they are easily stolen. Including anti-theft installation information or supplying additional equipment (such as window locks) could help overcome hesitancy. More information on installing window units properly to prevent theft can be found from [BrinksHome.com](https://www.brinkshome.com).
- To ensure your program does not replicate existing programs, review North Carolina services that provide utility bill assistance to low-income residents to avoid utility bill shutoffs. Review the following state and local resources for cooling and weatherization assistance:
 - NC Department of Environmental Quality State Energy Office provides funding to several organizations across the state through the [Weatherization Assistance Program](#). These organizations help low-income residents by performing weatherization services and repairing or replacing heating, ventilation and air conditioning units in homes.
 - The NCDHHS Division of Social Services Energy Assistance Programs provide assistance to individuals and families to help pay heating expenses ([LIEAP](#), [Piedmont Natural Gas Share the Warmth Program](#)), avoid heating or cooling related crises ([Crisis Intervention Program](#)) and provide heating and cooling assistance to families served by various energy provider customers ([Duke Energy Progress Share the Light Fund](#), [Wake Electric Operation RoundUp](#) and [WE Care grants](#), [Haywood Electric Company's Helping Each Member Cope Program](#)). Contact your [local Department of Social Services](#) for the application dates and for additional information on LIEAP.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., dollar amount and number of households that received assistance, number of fans and window units supplied each heat season, survey households that received assistance to document how the program benefited them [Add text.]

Examples and Resources:

- [Cool for Wake](#), Wake County, N.C.
- [Operation Fan and Heat Relief](#), NCDHHS

Integrate Extreme Heat Preparedness in your Hazard Mitigation Plan

Description: [Department staff or responsible entity] will partner with [list state and local partners] to integrate extreme heat preparedness into the next [insert appropriate jurisdiction] Hazard Mitigation Plan update. Heat is the leading cause of weather-related death in the United States. Receiving disaster declaration funds for a heat wave can be contingent on the listing of heat as a hazard in our local Hazard Mitigation Plan. Through this effort, we will define heat as a hazard by combining climate and health data, describe how our community and residents are vulnerable to extreme heat, incorporate climate change projections into extreme heat assessments, and develop appropriate and feasible heat preparedness strategies.

Getting Started on Implementation:

- Refer to [Defining Extreme Heat as a Hazard: A Review of Current State Hazard Mitigation Plans](#) from the Duke University Heat Policy Innovation Hub for guidance and recommendations on integrating extreme heat into your Hazard Mitigation Plan.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., number of goals included in the local Hazard Mitigation Plan that address extreme heat [Add text.]

Examples and Resources:

- [Hazard Mitigation Assistance Program and Policy Guide](#), FEMA – includes examples of nature-based solutions for heat mitigation
- [Mitigating the Risk of Extreme Temperatures with Hazard Mitigation Assistance Funds](#), FEMA
- [Preparing and Responding to Extreme Heat through Effective Local, State and Federal Action Planning](#), Federation of American Scientists
- [State Hazard Mitigation Plan](#), Wisconsin – links climate and health data to define warning thresholds

Install Cool Roofs on Public Buildings and Buses

Description: Just as wearing lighter colors can keep you cool on hot days, roofs in lighter-colored rooftop materials can help keep buildings and vehicles cool because they reflect heat instead of absorbing it.

Buildings' "cool roofs" have many benefits, including:

- Reducing energy consumption
- Reducing energy bills
- Keeping buildings cooler
- Improving indoor conditions for spaces that lack air conditioning
- Decreasing the temperature of the roof, which could make the roof last longer

Importantly, the costs of materials for such cool roofs are comparable to existing building materials and come in a variety that are suitable for both high- and low-sloped roofs.

Likewise, school buses with white roofs have been shown to reduce temperatures inside the bus by an average of 10 degrees and as much as 17 degrees during the hottest part of the day.

[Department staff or responsible entity] will [conduct an assessment to identify buildings with roofs that may be appropriate for cool roof installation; develop educational materials about cool roofs and distribute to local businesses; apply for a grant to install a cool roof on [list building]]. [Department staff or responsible entity] will work with the with school system to explore opportunities for converting the fleet to white-topped buses.

Getting Started on Implementation: Assess the local governments' portfolio of buildings to identify potential locations for white roofs or cool shingles and assess the number of buses that already have white tops and those that need white tops. Contact other local governments that have installed white roofs and other communities that have white-topped buses to get a copy of their RFPs. Also consider talking with industry professionals to understand installation costs and payback periods.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., document information (e.g., location, building purpose, cost) about which buildings have white roofs installed or have been identified for future white roof installation; survey community members about their perceptions of white roofs; county the number and percentage of buses with white tops [Add text.]

Examples and Resources:

For more information on cool roofs, including building materials, see:

- [Cool Roofs and Purchasing Cool Roof Products](#), Energy.gov
- [What Are Cool Roofs?](#), New Jersey Green Building Manual, Rutgers University
- [Cool Roof Rating Council](#)

Examples of cool roofs:

- [Cool Roof Program](#), New York City
- [Cool Roof Incentive Program](#), Louisville, Ky.

Install Green Roofs on Public Buildings and Promote Green Roofs Community-wide

Description: The temperatures of green roofs, or rooftop gardens, can be 30–40 degrees Fahrenheit lower than those of conventional roofs and can reduce area ambient temperatures by up to 5 degrees Fahrenheit. Green roofs offer many long-term benefits in addition to the immediate shade and interior cooling effect, including:

- Stormwater management
- Reduced energy costs and use
- Reduction of heat in urban heat islands
- Increased longevity of the roof

Installing a green roof is a long-term investment. It can be costly and must often be done by trained professionals. However, many green roof owners experience a strong return on investment from the building's reduced energy costs alone.

[Department staff or responsible entity] will [conduct an assessment to identify buildings that may be appropriate for installing a green roof; develop educational materials about green roofs and distribute them to local businesses; apply for a grant to install a green roof on [list building]].

Getting Started on Implementation: Assess the local governments' portfolio of buildings to identify potential locations for green roofs, contact other local governments that have installed green roofs to get a copy of their RFP and talk with industry professionals to understand installation costs and payback periods.

Responsible Department, Unit or Position: [Add text.]

Timeline: [Add text.]

Implementation Criteria and Frequency: [Add text.]

Community Partners: [Add text.]

Metrics: e.g., document information (e.g., location, building purpose, cost) about which buildings have green roofs installed or have been identified for green roof installation; survey community members about perceptions of green roofs and locations to prioritize for green roof installation [Add text.]

Examples and Resources:

North Carolina-based examples of green roofs:

- [Green Roof at Union Station](#), Raleigh, N.C.
- [UNC Chapel Hill Green Roofs Project and interactive map](#), Chapel Hill, N.C.

More information about green roofs and their environmental and economic benefits:

- [4 Reasons Green Roofs Do A Building Good](#), NC State University
- [Stormwater Design Manual section on Green Roofs](#), NC Department of Environmental Quality
- [Using Green Roofs to Reduce Heat Islands](#), EPA
- [How to Install a Green Roof](#), This Old House

Evaluation

Key to the success of this heat action plan is a regular assessment of relevant data and metrics to understand how programs and activities are, or are not, being successful and to identify opportunities for improvement. [Department staff or responsible entity] will collect and analyze data to assess the effectiveness of the [Jurisdiction] Heat Action Plan. This evaluation will include the following activities.

Evaluating the impact of the heat action plan will help you understand which actions are working and which actions could be improved. Ideally, an evaluation would be carried out annually, but a less frequent timeline (e.g., every 3 years) may be appropriate for communities with less capacity or depending on the nature of evaluation (e.g., tracking data over longer periods of time to better discern trends).

The two activities below suggest how to evaluate the effectiveness of your heat action plan overall. The evaluation mechanism(s) you select should align with the objectives outlined at the start of your heat action plan and should also connect with the actions listed in Parts 1, 2 and 3.

1. Using Health Data During and After the Heat Season

While the incidence of heat-related illness will vary, including weather conditions during the heat season and tracking heat-related illnesses and deaths in your jurisdiction over time can help you understand the impact of extreme heat on the health of your community. It can also help you decide when you need to revise your heat action plan.

Your local health department may have access to heat-related illness data through the North Carolina Disease Event Tracking and Epidemiologic Collection Tool ([NCDETECT](#)), North Carolina's statewide syndromic surveillance system. If they are not able to provide this support, the NCDHHS Division of Public Health (DPH) serves as the lead technical agency for the state during excessive heat. DPH reaches out to local health departments, conducts public health outreach and education prior to and during heat events and conducts health surveillance for heat related illness and injury. Local jurisdictions may reach out to DPH's Climate and Health Program for technical assistance with using and interpreting heat-related illness data as needed: oeeb@dhhs.nc.gov or Sarah.Hatcher@dhhs.nc.gov.

[Department staff or responsible entity] will work with local and state partners to access, analyze and interpret heat-related illness data. This data can help local leaders understand the health effects of extreme heat in [jurisdiction] and inform revision of the [Jurisdiction] Heat Action Plan, as needed.

2. Evaluate Interventions

For each action you chose to include in your heat action plan, you likely identified metrics. You can use these metrics to evaluate each action and identify opportunities for improving your heat action plan. For example, you might have documented how many participants were reached as part of various educational activities (e.g., youth workshops, volunteer activities, outreach to health professionals) or how many residents made use of heat relief opportunities (e.g., number of visitors to cooling centers, number of residents who used transportation services to access cooling centers, number of water bottles distributed). The metrics you choose should be related to what you are interested in learning about the action. For example, the information you collect could help you understand how many individuals or groups were directly reached through your heat action plan. It can also help you understand if there are any populations that you are not reaching and identify opportunities for improvement.

Depending on the actions included in your plan and the metrics associated with each action, you may find it easier to evaluate each action separately or to combine them into an overall assessment. When you

compile and summarize your metrics data, we recommend comparing it to previous years and using this comparison to make recommendations for future changes, if any.

At the end of the heat season, during [months], [department staff or responsible entity] will collect and aggregate the metrics data for each action in the heat action plan. We will analyze these data by [making comparisons with previous years' data, making comparisons with targets].

To ensure transparency, consider making evaluation information easily accessible to the public (e.g., post it on your website) so that it is accessible to your community. Consider producing an annual report, fact sheet, a presentation with the recording posted online or slides shared via your community's website.

We will publish the results of these evaluations as [a report, an online presentation, a factsheet] on [jurisdictional websites, annual reports] so that they are accessible to the wider community.

This is the end of the Heat Action Plan Template.

The remaining pages in this document are appendices with information on how to identify groups in your jurisdiction with higher risk from extreme heat ([Appendix A](#)) and how to determine local thresholds for implementing different parts of your jurisdiction's heat action plan ([Appendix B](#)).

Appendix A: Identifying Groups with Higher Risk from Extreme Heat

Considering populations that have higher risk from extreme heat is important when developing a heat action plan. Understanding who in your jurisdiction has a higher risk from heat, why their risk is higher and where they are located within your jurisdiction enables the development of a more comprehensive and effective heat action plan.

We recommend you include figures, maps, tables and statistics as appropriate about people in your jurisdiction who have higher risk from extreme heat. Regional councils of governments may be able to assist local governments with obtaining this information. Space has been allotted for these metrics in the [Who is Most at Risk?](#) section of the Heat Action Plan Template.

Many online tools exist for exploring and downloading statistics and visuals of social vulnerability within counties and local jurisdictions. We recommend using at least one of the examples below to explore data for your jurisdiction. Most of these tools enable statistics, maps, graphs and tables to be exported and included in your heat action plan:

- [NC Resilience Exchange Vulnerability Map](#)
- [NC Social Determinants of Health by Regions](#)
- [NC Environmental Health Data Dashboard](#)
 - Email inbox where people can send questions, concerns or feedback:
ncepht_support@dhhs.nc.gov
- CDC/Agency for Toxic Substances and Disease Registry:
 - [Environmental Justice Index](#): a tool designed to measure the cumulative impacts of environmental burden through the lenses of human health and health equity
 - [Social Vulnerability Index](#): a tool that uses data from the U.S. Census to determine the social vulnerability of every census tract
- [EPA's Environmental Justice Screening and Mapping Tool](#)
- [Headwater Economics' Neighborhoods at Risk](#)

Additionally, consider reviewing the American Public Health Association's [Climate Change and Health Playbook](#) and accompanying webinar, which contain resources for local jurisdictions to center justice, equity, diversity and inclusion in health adaptation to climate change.

Appendix B: Determining Heat Thresholds

Defining Thresholds for Extreme Heat

Extreme heat and extreme heat events occur when temperatures or heat indices surpass specific thresholds. A **heat threshold** refers to a specific temperature above which environmental conditions are considered extreme or hazardous. These thresholds can be based on air temperatures or other heat stress indicators such as the heat index or Wet Bulb Globe Temperature. Heat thresholds help us understand not just how hot it is, but how the heat might affect us, making it clear when we are facing extreme or hazardous conditions. At temperatures higher than established heat thresholds, negative health impacts begin to occur, and days or periods with these temperatures are considered “extreme heat events.”

The temperature at which humans begin to experience negative health impacts is different for everyone. That temperature can vary by what temperatures your body is used to, age, pre-existing health conditions, medications taken and more. Scientists and state and federal agencies typically identify heat thresholds for geographic areas with similar climates, ensuring guidelines are tailored to local conditions and residents' needs.

To obtain heat thresholds for your jurisdiction, visit the “Thresholds for Extreme Heat” page from the [State Climate Office of North Carolina Heat Action Plan Toolkit page](#). The instructions on this page will help you identify locally relevant heat thresholds.

The thresholds on the “Thresholds for Extreme Heat” page were developed based on daily maximum heat index and heat-related emergency department visits in North Carolina over the period 2007-2016. Specifically, heat index thresholds were calculated by correlating the maximum heat index of any given day with the corresponding number of heat-related emergency department visits for that day. This analysis was then organized into groups of counties, which were formed based on the history of emergency responses across multiple counties. The groups of counties align with what the North Carolina Disease Event Tracking and Epidemiological Collection Tool ([NCDETECT](#)) identifies as ‘historical regional surveillance teams.’

North Carolina’s heat thresholds were developed through a partnership between the State Climate Office of North Carolina, Duke University’s Nicholas Institute for Energy, Environment and Sustainability and the North Carolina Department of Health and Human Services. Partners will update the thresholds on the website as more data become available, ensuring local governments have the most up-to-date thresholds to safeguard their communities against extreme heat. Thresholds are not expected to change more often than every two to three years. Sign up for the [State Climate Office Blog](#) or [NCORR’s Spotlight on Resilience monthly e-newsletter](#) to receive a notification when heat thresholds are updated.

Defining The Heat Season

In North Carolina, temperatures are typically highest during the months of May – September each year. Use the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information’s [US Climate Normals](#) tool to obtain climatological information about average temperatures in your area during these months and throughout the year. Note that there may not be a historical weather station in every jurisdiction, but there will likely be one in a nearby city or town or within the same county. Additionally, note that some stations only have precipitation data, but it is likely that a nearby station will have temperature data.

To use the US Climate Normals tool, select your state and your jurisdiction (or a nearby jurisdiction if yours isn't listed). Use the temperatures in the "Max Temp" and "Min Temp" columns to fill out the first table in Part 1 of the template Heat Action Plan.

Another way to define the heat season is by examining when temperatures and heat indices typically reach thresholds that would lead to heat-related health impacts. To identify the typical first and last dates where air temperatures and heat indices exceed the extreme heat thresholds for your area, type in your jurisdiction on the State Climate Office of North Carolina's [Station Scout](#) tool and click "search." Select a station near your location, ideally one with a period of record that has recent data. Click on the "Thresholds" button to obtain data for your area. Select a maximum air temperature greater than or equal to your identified extreme heat threshold. See the section below for instructions on identifying this temperature. Note that some stations will have heat indexes and other will not. Select a station that will work best for your community's needs. Contact the State Climate Office of North Carolina at climate-office@ncsu.edu for assistance.

Additional Resources for Forecasting Extreme Heat

National Weather Service Forecasts for Extreme Heat

The NOAA National Weather Service (NWS) provides weather, water and climate data; forecasts, watches and warnings; and impact-based decision support services for the protection of life and property. NWS also provides these services to enhance the national economy. The NWS issues extreme heat outlooks, advisories, watches and warnings when conditions are expected to pose health risks to the population.

There are seven NWS weather forecast offices that cover North Carolina, and their regions can be viewed by visiting [ReadyNC.gov](#). Each of these NWS weather forecast office lists locally used criteria used for issuing heat advisories:

- [Raleigh](#)
- [Wilmington](#)
- [Morehead City](#)
- [Wakefield](#)
- [Greenville-Spartanburg](#)
- [Morristown](#)
- [Blacksburg](#)

Additionally, the NWS provides:

- A [Forecast RSS Feed Listing](#) to view active alerts for your area
- Outlooks of heat index values and probabilities of exceedance for [days 3 through 7](#)
- [Longer range 8–14-day outlooks](#) (from the NWS's Climate Prediction Center)

NCDHHS Heat Health Alert System

To aid in determining when extreme heat conditions that cause impacts to human health are likely to occur, the NC Department of Health and Human Services (NCDHHS) created the Heat Health Alert System. During the heat season, the system sends alerts to participating jurisdictions and the public when their county's forecasted conditions will be above the heat thresholds. NCDHHS uses the thresholds provided by the State Climate Office of North Carolina and Duke University Nicholas Institute's Heat Policy Innovation Hub, as described in the first section of this appendix.

Anyone may sign up for Heat Health Alert System alerts by visiting:
epi.dph.ncdhhs.gov/ooo/climate/heat.html.