



Extreme Heat Toolkit

A planning guide for health, climate, and emergency response professionals

Wisconsin Climate and Health Program



dhs.wi.gov/climate



dhsclimate@wi.gov



608-266-1120

Wisconsin Department of Health Services
Climate and Health Program
201 East Washington Avenue
Madison, WI 53703



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Introduction

Purpose

This Extreme Heat Toolkit provides critical information for local governments, health departments, and citizens to prepare for and respond to extreme heat events. It includes background information, practical guidance, strategies, news releases for media, talking points, definitions, and useful reference materials. These resources can be adapted and distributed to inform residents impacted by extreme heat. For additional tools and information, refer to the Additional Resources section.

Background

Extreme heat is a significant threat to public health. Over the past 15 years, an average of eight Wisconsinites died each year with 134 total deaths, according to data from the Environmental Public Health Tracking Program at the Department of Health Services (DHS). In 2012, there was a high of 26 fatalities during a deadly heat wave. Nationally, an average of 700 people died annually from heat in the past 15 years.

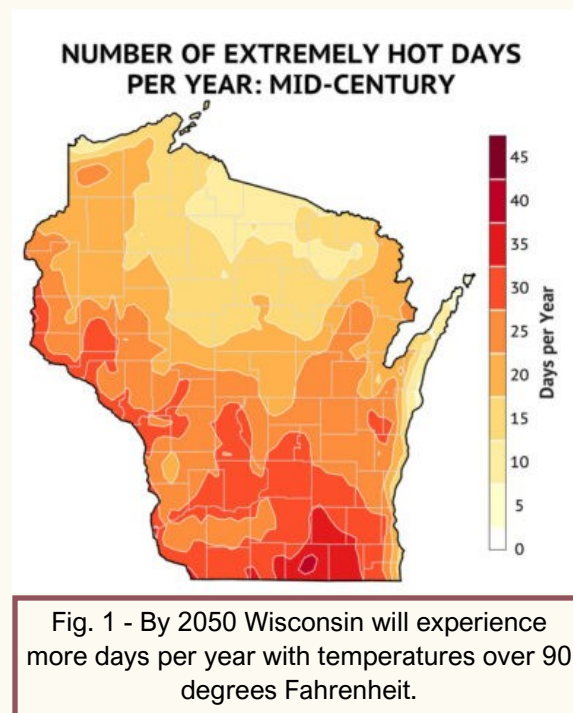
Older adults, young children under 5 years, socially isolated individuals, outdoor workers, people with chronic conditions, pregnant people, and residents with low economic status are most likely to be impacted by extreme heat. These statistics highlight the need for proactive heat planning for all communities.

Climate Trends



Wisconsin's climate is becoming warmer and wetter, causing hotter temperatures and more frequent heatwaves. The state's climate has warmed 3 degrees Fahrenheit since 1950 with winters warming the fastest. In addition, Wisconsin logged its hottest year on record in 2024. University of Wisconsin climate scientists created climate projections based on historical trends and scientifically validated models³, projecting more frequent and intense heat events and days above 90 degrees Fahrenheit, especially in southern and urban areas of the state.

Overnight temperatures are also increasing faster than daytime highs, which is especially dangerous for the health of people without access to cool spaces and air conditioning. Cooler nights are important to help people recover from daytime heat and prevent heat illnesses. People who live in urban areas without green spaces or trees are particularly affected by extreme heat because buildings and pavement trap extra heat, a phenomenon called the urban heat island effect.



**From 2009-2024¹,
134 Wisconsinites
died from heat-
related causes.**

Heat health impacts

The increasing prevalence of extreme heat in Wisconsin poses significant public health risks, including:

- Heat illnesses, from heat stress to heat stroke.
- Respiratory diseases, including asthma exacerbations.
- Kidney and cardiovascular failure.
- Mental health impacts.

Emergency planning must consider heat-related needs, such as placement of cooling centers, transportation services, energy demand management, potential power outages, and clear public messages on heat dangers.

Extreme heat recovery and response guidance

In Wisconsin, heat preparedness and response fall under the “Home Rule” principle, whereby local or county agencies—emergency management, health, police and fire, or first responders—serve as the lead agency during an extreme heat event. The state will also assist and support local response when requested.



Definitions

Extreme heat event

A weather event with excessive temperature and/or humid conditions that have the potential to cause heat-related illnesses or fatalities. An extreme heat event occurs when:

- The National Weather Service issues an Extreme Heat Warning for 25% or more of the population.
- The State Emergency Operations Center (SEOC) is activated due to a predicted extreme heat event.
- DHS regional offices or local and Tribal public health agencies request assistance with confirmed or suspected heat-related fatalities during a heat emergency.

Heat-related illness

Physical symptoms that occur when the body can't cope with high temperatures and humidity, making it hard to cool down.

Heat-related fatality

A death directly caused by exposure to high temperatures or when high temperatures are a major contributing factor to the death.

Heat wave

A period of unusually hot, humid, and uncomfortable weather generally lasting more than two days.

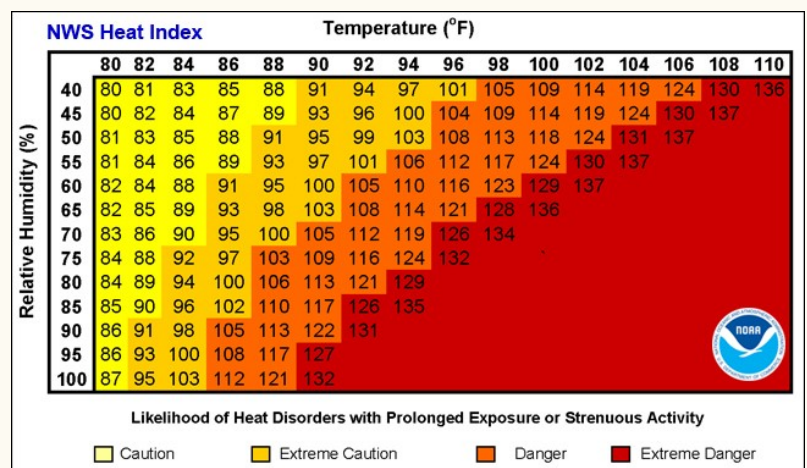


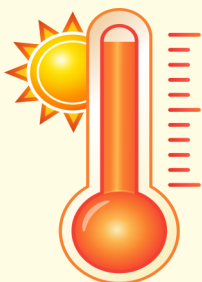
Fig. 2 -The heat index is a measure of how hot it really feels when relative humidity and actual air temperature are factored together.

National Weather Service heat alert definitions

Heat Advisory

Be aware!

Issued for dangerous heat conditions that are not expected to reach warning criteria.



Extreme Heat Watch

Be prepared!

Issued when conditions are favorable for an extreme heat event but its occurrence and timing is still uncertain.



Extreme Heat Warning

Take action!

Issued when extremely dangerous heat conditions are expected or occurring, typically when the maximum heat index temperature is:

- Expected to be 105°F or higher.
- Below 75°F heat index the morning prior or after the extreme heat event.
- Between 100-104°F for four days in a row.

People susceptible to heat-health impacts

Higher risk groups

Risk Factors⁸⁻¹⁶

Adults over 65	May be unaware of changing weather conditions and less adaptable to extreme heat.
People living alone	May not have people nearby to check on them or know who or when to call for help.
People with certain disabilities	May not be able to call for help or realize that they are in danger. May lack transportation to cool place.
Children under 5	Are sensitive to extreme heat and must rely on others to keep them cool and hydrated.
People with chronic health conditions	Can experience worse symptoms in extreme heat, especially those with mental illness, or heart and lung diseases, or taking certain medicines.
People who are unhoused	Are more likely to become dehydrated and overheated, and have limited access to cool spaces and protections.
Non-English Speakers	May not have easy access to information about heat advisories, cooling centers, and health risks.
People who work outdoors	Are more likely to become dehydrated and develop a heat illness. May be unable to take breaks or access air conditioning and shade.
People who are pregnant	May have higher core body temperature, increasing risk of heat illness that also affects the unborn baby.
People without air conditioning	May not have finances to use air conditioning or access to transportation to a cooling center.
Athletes	May be working hard in the heat and more likely to become dehydrated and get a heat illness.

Heat illness and symptoms

Heat rash caused by excessive sweating that blocks the sweat ducts.

Symptoms:

- ◇ Red cluster of pimples.
- ◇ Blisters.
- ◇ Itching.
- ◇ Red rash on the skin (usually occurs on the neck, chest, breast, and/or groin.)



Safety tips:

- ◆ Remove the affected person from heat.
- ◆ Minimize exposure of skin to sun. Keep the affected area dry.
- ◆ Seek medical attention if rash does not improve.

Heat cramps are muscle spasms caused by dehydration or electrolyte deficiency.

Symptoms:

- ◇ Muscle spasms, could be in the abdomen, calves, thighs, or shoulders.
- ◇ Body temperature up to 104° F.



Safety tips:

- ◆ Stop all activities.
- ◆ Remove affected person from heat and instruct them to breathe slowly.
- ◆ Relocate to a cool and shaded location.
- ◆ Rest and drink fluids that have electrolytes.
- ◆ Seek medical attention if symptoms persist.

Heat stress (called heat tetany) makes it hard for your body to cool down and causes heat illnesses.

Symptoms:

- ◇ Hyperventilation.
- ◇ Muscle spasms, tingling or numbness of muscles.
- ◇ Elevated body temperature up to 104° F.



Safety tips:

- ◆ Remove affected person from heat.
- ◆ Instruct affected person to remain calm and breathe slowly.
- ◆ Seek medical attention if experiencing difficulty breathing and if symptoms persist.

Heat illness and symptoms

Heat edema is swelling from heat exposure that causes blood vessels to expand.

Symptoms:

- ◇ Swelling in ankles, feet, and hands.
- ◇ Body temperature up to 104° F.
- ◇ Occurs in older people or people who are not used to prolonged exposure to heat.

Safety tips:

- ◆ Elevate affected limbs.
- ◆ Apply compression to affected areas.



Heat exhaustion is the body's response to loss of too much water and salt usually through sweating.

Symptoms:

- ◇ Muscle cramps.
- ◇ Profuse sweating and weakness.
- ◇ Rapid breathing and dizziness.
- ◇ Nausea and vomiting.
- ◇ Body temperature up to 104° F.



Safety tips:

- ◆ Stop all activities.
- ◆ Move to a cool location, rest, and drink fluids that have electrolytes.

Heat stroke is life threatening—seek medical attention immediately!

Symptoms:

- ◇ Oral body temperature of 104°F and above.
- ◇ Loss of consciousness or confusion.
- ◇ Rapid and strong pulse.
- ◇ Hot, red, and dry skin.
- ◇ Headache and dizziness.
- ◇ Nausea and/or vomiting.



Safety tips:

- ◆ Seek medical attention immediately! If symptoms do not quickly improve or if the affected person is unable to orally rehydrate.
- ◆ It is difficult to determine if someone is experiencing heat exhaustion or heat stroke.

Extreme heat safety tips

Never leave children, people unable to leave a vehicle independently, or pets in a parked car.

On an 80°F day, the temperature inside a car can reach 100°F in less than 10 minutes even with the windows cracked slightly.



Keep your living space cool or seek shelter at a cool public space.

Call 211 or visit 211.org to find a community cooling center (and transportation) if you don't have an air conditioner and the temperature is above 95°F. At that temperature, fans no longer prevent heat-related illnesses.

Slow down and limit physical activity.

Plan outings or exercise for the early morning, or after dark when temperatures are cooler.

Drink plenty of water and eat lightly.

Don't wait for thirst but do drink plenty of water throughout the day. Avoid alcohol or caffeine that can cause dehydration, and stay away from hot, heavy meals.



Wear lightweight, loose-fitting, and light-colored clothing.

Add a hat or umbrella to keep your head cool, and don't forget sunscreen.

Don't stop taking medication unless your doctor says you should.

Ask your doctor or pharmacist if your medication will affect how you will experience heat.

Take a cool shower or bath to cool yourself down.

A cool shower or bath will work faster at reducing your body temperature than an air conditioner. Apply cold, wet rags to your head and neck to quickly cool down. Splashing cold water on your arms or submerging them can also help to cool down quickly.

Check air quality when it's hot outside and stay indoors if possible.

Heat waves and poor air quality are a double whammy for your health. Certain types of air pollution that harm your health, like ground-level ozone, need heat and sunlight to form.

Community heat tips

Community responses

- Involve community organizations and other stakeholders in the response planning process (include the medical examiner or coroner in this process.)
- Develop a database or list of facilities and organizations that serve at-risk populations to extreme heat (for example, social service agencies, senior living centers, daycare centers, long-term facilities, organized sports, construction companies) so that they can be immediately contacted of an impending extreme heat event.
- Work with news media to alert the public of extreme heat events and advise people on recognizing and preventing heat-related illnesses.
- Coordinate with relevant organizations to provide water to people experiencing homelessness and others in need.
- Work with community partners to develop a heat response plan, so you're ready when heat waves hit.



Call 211 for FREE access to local resources, including information about cooling centers and heat safety guidance.



Heat plan checklist

Long-term heat planning for health agencies and others

- Identify extreme heat event partners and define their roles and responsibilities.
- Develop a community-wide heat response plan, including but not limited to:
 - ♦ A cooling center plan and map of air-conditioned locations. Ensure that cooling center are evenly distributed throughout the jurisdiction.
 - ♦ Transportation options to cooling centers (for example free buses.)
 - ♦ Accessibility considerations to cooling centers (for example walkers, wheelchairs, and non-English speakers.)
 - ♦ Strategies for power outages.
 - ♦ Understand local and state rules in the reporting process for heat-related fatalities.
- Monitoring weather reports for summer months and heat health trends with the [Summer Health Hazard Dashboard](#) at DHS.
- Develop maps of vulnerable populations using the [Heat Vulnerability Index](#) at DHS.
- Join the Wisconsin Heat Health Network to collaborate on heat health planning.
- Ensure heat fact sheets and other materials are current.

Short-term heat response

- Notify local extreme heat event partners in advance of heat waves.
- Create a contact database or list of facilities and organizations that serve vulnerable populations during heat waves.
- Ensure your message map is current.
- Work with media to alert the public about heat waves and provide safety tips.
- Activate transportation assistance programs.
- Provide maps of locations of cooling center locations (with owner permission.)
- Consider extending hours at public pools and air-conditioned places.
- Consider suspending outdoor public events.
- Coordinate with medical examiner or coroner if heat fatality occurs.
- Activate cooling center plans.
- Continue promotion of cooling center hours and locations.
- Ensure outreach to vulnerable populations (for example, email to contacts in the facility's database.)
- Monitor weather and make appropriate media releases with safety tips.
- Consider canceling, rescheduling, or heightening mitigation protections for outdoor public events.

Media relations

Talking points and message maps for heat-related fatalities

Message mapping is one of the most important risk communication tools that public health agencies can employ. The goal of a message map is to convey important information in a concise, easy-to-understand, and credible manner.



General guidelines for completing a message map

- Stick to one to three key messages. Underlying concerns or specific questions can be highlighted in the messages.
- Keep key messages brief. The reader should spend less than 10 seconds per line.
- Develop messages that are easily understood by the target audience. Use a 5th- to 8th-grade readability level for communications with the general public.
- Place messages within a message set. The most important messages should occupy the first and last positions.
- Develop key messages that cite credible third parties.
- Use graphics and other visual aids to enhance key messages.
- Keep a positive tone. Messages should be solution-oriented and constructive.
- Avoid unnecessary uses of the words no, not, never, nothing, none.
- Plan for making messages accessible for people who don't speak English as a first language or those who have visual impairments.

Sample message map

If the media approaches you regarding a reported heat-related fatality in your jurisdiction, the following talking points may be used or adapted. Start with message A1 or A2, then follow the instructions within that box.

A1

"We were notified by the medical examiner/coroner about a fatality, possibly due to the extreme heat conditions. Our condolences go out to the family."

Go to message B1 or B2.

A2

"We have not been notified by any recent fatalities linked to extreme heat conditions."

Go to message C.

B1

"We are unable to share any details out of respect for the family."

Go to message C.

B2

"On (insert date), a (insert gender) (insert "_ years old" OR "between the ages of _ and _") died during the current heat wave."

Go to message C.

C

Heat stroke can be rapid and fatal. People should remain cool and safe by:

1. Staying hydrated, slowing down, staying indoors, and avoiding exercise during the hottest parts of the day (most of the time, this is in the middle of the day until early afternoon. Please double-check the forecast to make sure.)
2. Checking on family, friends, and neighbors who don't have air conditioning and spend most of their time alone.
3. Never leave children or pets in vehicles, even for a few minutes.
4. For more information, visit [name of relevant website] or call 211.

Talking points for heat safety

Main message:

“Since June/July/August ____, there has/have been ____ heat-related fatalities in Wisconsin. To help you and your community stay safe during the heat wave...”

Three key messages

Message 1:

“Check on your neighbors to ensure they are okay, especially older adults and those living alone.”

Message 2:

“If you must be out during the hottest time of the day, be alert for signs of heat illness.”

Message 3:

“Hundreds of cooling centers are available to the public across Wisconsin. Call 211 to find out about cooling center resources.”

Supporting information:

Three supporting messages for each key message

- Older adults are less likely to sense and respond to high temperatures.
- Those living alone can be isolated and unaware of the dangers posed by extreme heat.
- When regularly checking with your neighbors, look for signs of heat-related illness.

- Symptoms include feeling hot, weak, dizzy or faint, cramping/muscle spasms, nausea, or rapid pulse.
- Protect yourself by limiting physical activities, drinking plenty of water, and wearing light loose-fitting clothing.
- Call 911 or seek medical attention if you or someone you know develops heat illness.

- Cooling centers are designated buildings with air conditioning where the public can get relief from the heat.
- Call 211 to find the cooling center closest to you.
- Ask 211 if transportation is also available.

Resources

1. Wisconsin Department of Health Services (DHS) – www.dhs.wisconsin.gov/climate/weather/heat.htm
2. DHS Summer Health Hazard Dashboard – <https://www.dhs.wisconsin.gov/climate/summer-hazards.htm>
3. DHS Heat Vulnerability Index – <https://www.dhs.wisconsin.gov/climate/wihvi.htm>
4. Wisconsin Emergency Management (WEM) – www.readywisconsin.wi.gov
5. American Red Cross – <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/extreme-heat-safety.html>
6. Heat Wave Safety Checklist – https://www.redcross.org/content/dam/redcross/get-help/pdfs/heat/EN_Extreme-Heat-Safety-Checklist.pdf
7. Federal Emergency Management Agency (FEMA) – www.fema.gov and www.fema.gov/es/ (Spanish)
8. Federal Centers for Disease Control and Prevention (CDC) – <https://www.cdc.gov/heat-health/about/index.html>
9. CDC Heat and Health Tracker – <https://ephtracking.cdc.gov/Applications/HeatRisk/>
10. National Integrated Heat Health Information System (NIHHIS) – <https://www.heat.gov/>
11. National Weather Service HeatRisk – <https://www.wpc.ncep.noaa.gov/heatrisk/>
12. Federal Environmental Protection Agency (EPA) – <https://www.epa.gov/natural-disasters/extreme-heat>
13. Occupational Safety and Health Administration – <https://www.osha.gov/heat>
14. List of Wisconsin Local Public Health Departments – <https://www.dhs.wisconsin.gov/lh-depts/index.htm>
15. Wisconsin Tribal Health Directors – <https://www.dhs.wisconsin.gov/lh-depts/tribal.htm>
16. List of County Building, Code, and Zoning Officials – www.wccadm.com/

Sample Heat Response Plan

Lincoln County Health Department has generously shared their extreme heat communications and response plan for other health departments to use as a sample. Download the zip file of the plan components by visiting <https://drive.google.com/drive/u/1/folders/1iK6cyRQXf-HYG2u55k2rvTCh9Qz1ZidE> and clicking the arrow at the top right of your screen to download. If you can't access Google Drive from your agency or have any trouble downloading the files, please email dhsclimate@wi.gov for assistance.

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11. Centers for Disease Control and Prevention. <https://www.cdc.gov/heat-health/risk-factors/infants-and-children.html>.
12. Centers for Disease Control and Prevention. <https://www.cdc.gov/niosh/heat-stress/about/illnesses.html>.
13. Minnesota Department of Health. <https://www.health.state.mn.us/communities/environment/climate/docs/mnextremeheattoolkit.pdf>.
14. Ready Wisconsin. <https://readywisconsin.wi.gov/extreme-heat/>.
15. Centers for Disease Control and Prevention. <https://www.cdc.gov/heat-health/risk-factors/heat-and-outdoor-workers.html>
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