

# EXTREME HEAT TOOLKIT

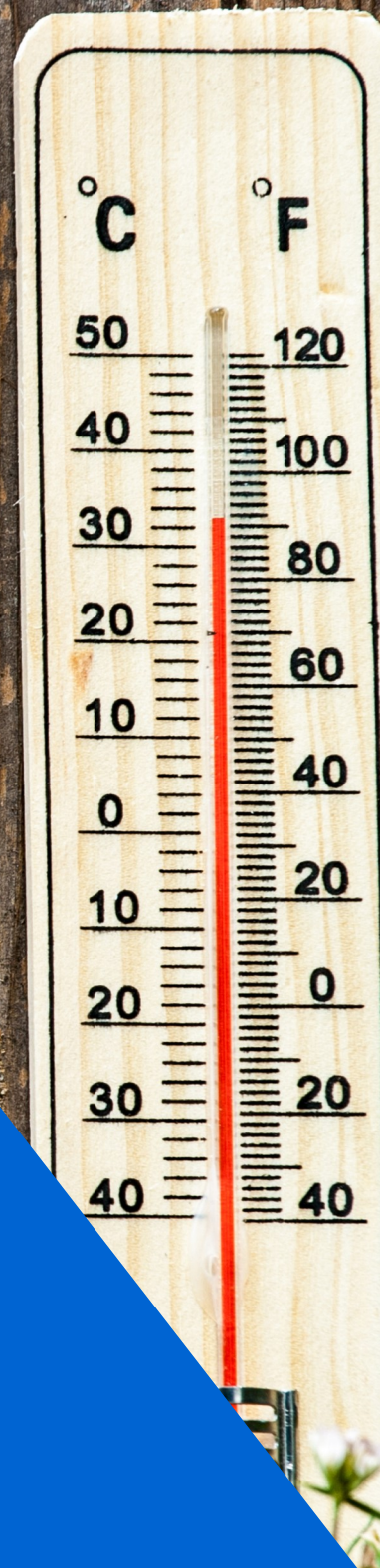
A planning guide for public health and  
emergency response professionals



**WISCONSIN CLIMATE AND HEALTH PROGRAM**  
Bureau of Environmental and Occupational Health

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State of Wisconsin | Department of Health Services | Division of Public Health | P00632 (Rev. 04/2019)



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# INTRODUCTION



## Purpose

The purpose of this Extreme Heat Toolkit is to provide information to local governments, health departments, and citizens about preparing for and responding to heat events. The toolkit focuses on providing background information, practical guidance, strategies, media releases, talking points, definitions, and useful reference materials on this topic. The documents in this toolkit may be copied onto agency letterhead for distribution to extreme heat-impacted residents. Additional resources may be found in Appendix B: Additional Resources.

## Background

The National Weather Service estimates 148 US residents die from extreme heat and humidity each year, “making heat the number one weather killer in this country.”<sup>1</sup> Wisconsin does not have a reputation of being a “warm climate” location. However, in 2012, Wisconsin experienced 24 heat-related fatalities. From 1982 to 2008, NWS data estimates there have been 116 direct heat-related fatalities in WI.<sup>2</sup> The most susceptible populations to heat include the elderly, the very young (under 5 years of age), socially isolated persons, and residents with low economic status (incomes near or below the poverty level). Heat fatality data indicate extreme heat events must remain a priority for Wisconsin governmental units, citizens, and businesses to prepare for.

**Heat-related deaths are the number one weather killer in the United States.<sup>1</sup>**

## Climate Trends

Long-term trend analysis of Wisconsin’s climate indicates the state is becoming warmer and wetter. After analyzing historical climate data from 1950 to 2006 and developing downscaled local climate models, University of Wisconsin climate scientists created potential climate projections based on historical trends and scientifically validated models.<sup>3</sup> Several of the modeled outcomes indicate extreme heat events will become more likely and longer lasting in the future.

## Health Impacts

These trends and projections suggest Wisconsin will need to prepare for more public health impacts due to extreme heat illnesses, including heat stress, respiratory disease and asthma aggravation, kidney failures, cardiovascular failure, and mental health issues. Emergency planning must consider heat-related needs, such as placement of cooling centers, transportation needs for residents, use of electrical appliances, excessive electrical power needs and potential power outages, and clear messages related to the dangers of extreme heat.

## Extreme Heat Response and Recovery Guidance

Under the Wisconsin “Home Rule” principle, heat preparedness and response is considered to be a local activity. The local or county Emergency Management office, health agency, or police/fire first responders will be the “Lead Agency” during an extreme heat event. However, when requested, state resources will be provided to assist and support the local response.

# DEFINITIONS

## Extreme Heat Event

A weather condition with excessive heat and/or humidity that has the potential to cause heat-related illnesses or fatalities.

An extreme heat event occurs when any of the following takes place:

- The National Weather Service issues an Excessive Heat Warning for at least 25% of Wisconsin's population
- The Wisconsin State Emergency Operations Center is activated due to the prediction of excessive heat
- Wisconsin Department of Public Health regional offices or local and tribal public health agencies request assistance in the event of a heat emergency with confirmed or suspected heat-related fatalities

## Heat Related Fatality

A death directly caused by exposure to high temperature or in which exposure to high temperature is a significant factor.

## Heat Related Illness

A group of physical symptoms caused when the human body is unable to compensate for high temperatures and humidity levels, and cannot properly cool.

## Heat Wave

A period of abnormally and uncomfortably hot, and unusually humid weather. Typically a heat wave lasts two or more days.

## Heat Index

A measure expressing the discomfort felt as a result of the combined effects of the temperature and humidity of the air.





# Definitions of Heat Alerts

## National Weather Service Heat Wave Program in Wisconsin

### Outlook Statement

Issued daily to highlight potential hazardous weather in the next 1 to 7 days. Periods when Heat Index will equal or exceed 95 are mentioned (could lead to Heat Advisory or Excessive Heat Warning conditions). Issued as a Hazardous Weather Outlook (HWO). Broadcasted on NOAA Weather Radio All Hazards, and posted on NWS web sites ([www.weather.gov](http://www.weather.gov)).

### Heat Advisory

Issued 6 to 36 hours in advance of a daytime period in which daytime heat index (HI)\* values of 100 degrees or more are expected. Additionally, if daytime HI values are expected to be 95 to 99 degrees for four consecutive days or more an Advisory should be issued.

### Excessive Heat Watch

Issued generally 12 to 48 hours in advance if Excessive Heat Warning conditions are expected.

### Heat Wave

A period of abnormally and uncomfortably hot, and unusually humid weather. Typically a heat wave lasts two or more days.

### Excessive Heat Warning

Issued 6 to 36 hours in advance of any occurrence of a 48-hour period in which daytime heat index (HI) values are expected to be 105 degrees or higher and nighttime HI values will be 75 degrees or higher for a 48 hour period. Additionally, if four consecutive days of daytime HI values of 100 or higher are expected, an Excessive Heat Warning will be issued.\*\*

\*The Heat Index (HI) or the "Apparent Temperature" is an accurate measure of how hot it really feels when the Relative Humidity (RH) is added to the actual air temperature.

\*\*For additional information about heat awareness, contact your local public health department, county emergency management director, or the National Weather Service.



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# Heat Illness Chart

## Heat Illnesses and Their Symptoms<sup>1,2,3</sup>

Medical Condition	Symptom(s)	Causes	Safety Tips
Heat rash	<ul style="list-style-type: none"><li>• Red cluster of pimples</li><li>• Blisters</li><li>• Itching</li><li>• Red rash on the skin that usually occur on the neck, chest, breast and/or groin</li></ul>	Excessive sweating that blocks sweat ducts	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 edema (swelling)	<ul style="list-style-type: none"><li>• Swelling in the ankles, feet and hands</li><li>• Body temperature normal or elevated core temperature up to 104° F</li></ul>	<ul style="list-style-type: none"><li>• Occurs in persons who are not used to heat</li><li>• Increased blood flow to the skin in limbs</li></ul>	Elevate and apply compressive stockings to the affected limbs.
Heat tetany (heat stress)	<ul style="list-style-type: none"><li>• Respiratory problems, such as breathing difficulty</li><li>• Muscular problems, including spasms or numbness or tingling of muscles</li><li>• Body temperature normal or elevated core temperature up to 104° F</li></ul>	<ul style="list-style-type: none"><li>• Hyperventilation</li><li>• Respiratory alkalosis – the blood becomes basic</li></ul>	Remove the affected person from the heat and advise the person to breathe slowly.

Chart courtesy of Minnesota Department of Health

<b>Medical Condition</b>	<b>Symptom(s)</b>	<b>Causes</b>	<b>Safety Tips</b>
<b>Heat cramps</b>	<ul style="list-style-type: none"> <li>• Muscle spasms</li> <li>• Muscles usually affected include the abdomen, calf, thighs and shoulder muscles</li> <li>• Body temperature normal or elevated core temperature up to 104° F</li> </ul>	<ul style="list-style-type: none"> <li>• Dehydration</li> <li>• Electrolyte deficiency</li> </ul>	<p>Stop all activities, relocate to a cool location, rest and drink Electrolyte-containing fluids (sports drinks). Seek medical attention if symptoms persist.</p>
<b>Heat exhaustion</b>	<ul style="list-style-type: none"> <li>• Profuse sweating</li> <li>• Weakness</li> <li>• Rapid breathing</li> <li>• Dizziness</li> <li>• Nausea/vomiting</li> <li>• Muscle cramps</li> <li>• Normal mentation</li> <li>• Body temperature normal or elevated core temperature up to 104° F</li> </ul>	<ul style="list-style-type: none"> <li>• Dehydration</li> <li>• Electrolyte deficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Stop all activities, relocate to a cool location, rest and drink electrolyte containing fluids.</li> <li>• It can be difficult to determine if someone has heat stroke and not exhaustion.</li> <li>• If symptoms do not quickly improve, or unable to oral rehydrate, seek medical attention.</li> </ul>
<p><b>Heat stroke</b></p> <p><i>This is a life threatening condition due to extreme heat, usually occurring when the body temperature is greater than 104F.</i></p>	<ul style="list-style-type: none"> <li>• Oral body temperature of 104F and above</li> <li>• Often sudden onset of symptoms</li> <li>• Confusion or loss of consciousness</li> <li>• Rapid and strong pulse</li> <li>• Hot, red and dry skin</li> <li>• Headache</li> <li>• Dizziness</li> <li>• Nausea/vomiting</li> </ul>	<ul style="list-style-type: none"> <li>• Profound dehydration</li> <li>• Profound electrolyte deficiency</li> <li>• Body is unable to maintain heat diffusion through the skin</li> <li>• Normal regulation of body temperature is no longer intact</li> <li>• Mortality can be as high as 50%</li> </ul>	<ul style="list-style-type: none"> <li>• Call 911 immediately if you see anyone with these symptoms and has a body temperature of 104F and above.</li> <li>• While waiting for first responders, the affected person should be taken to a cool shady area.</li> <li>• Cool the person with immersion in cool water, spraying the person with cool water while fanning the person vigorously, or placing ice packs on neck, underarm, and groin.</li> <li>• The person is unlikely to be able tolerate oral fluids.</li> </ul>

Chart courtesy of Minnesota Department of Health



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## Extreme Heat Tips

### **Never leave children, disabled persons, or pets in a parked car - even briefly.**

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

### **Keep your living space cool or seek shelter at a cooling center.**

If you have an air conditioner, use it! If you don't have an air conditioner and the temperature is above 95°F, you should go to a community cooling center because using a fan will no longer prevent heat related illnesses at this temperature.

### **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 instead drink plenty of water throughout the day. Avoid alcohol or caffeine and stay away from hot, heavy meals.

### **Wear lightweight, loose-fitting, 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.**

Take extra care to stay cool, and ask your doctor or pharmacist for any special heat advice.

### **Take a cool shower or bath to cool yourself down.**

A cool shower or bath will actually work faster at reducing your body temperature than an air conditioner. Apply cold, wet rags to your head and neck to quickly cool down.

For more info visit: [readywisconsin.wi.gov/heat/](https://readywisconsin.wi.gov/heat/)





# Populations Vulnerable to Heat

<b>Vulnerable Population</b>	<b>Risk Factor<sup>8-16</sup></b>
<b>Adults over 65</b>	Less aware and adaptable to extreme heat
<b>People living alone and/or without air conditioning</b>	May not know when to call for help
<b>Individuals with disabilities</b>	May not know how to call for help or realize that they are in danger
<b>Children under 5</b>	Sensitive to effects of extreme heat and must rely on others to keep them cool and hydrated
<b>People with chronic medical conditions</b>	Medical conditions can include those with cardiovascular disease, mental illness, especially those taking medications (e.g., psychotropics) that can worsen the impact of extreme heat
<b>Homeless</b>	May be unaware of cooling centers and may have limited access to other cooling protections (e.g., cool showers)
<b>Pets</b>	Dependent on owner for adequate protection from heat
<b>Outdoor workers</b>	More likely to become dehydrated and more likely to get heat-related illness
<b>Non-English speakers</b>	May not have access to current information about heat advisories and health risks



# Talking Points about Extreme Heat

## Talking points and message maps for local health professionals

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 and easy to understand fashion.



CONCISE



CREDIBLE



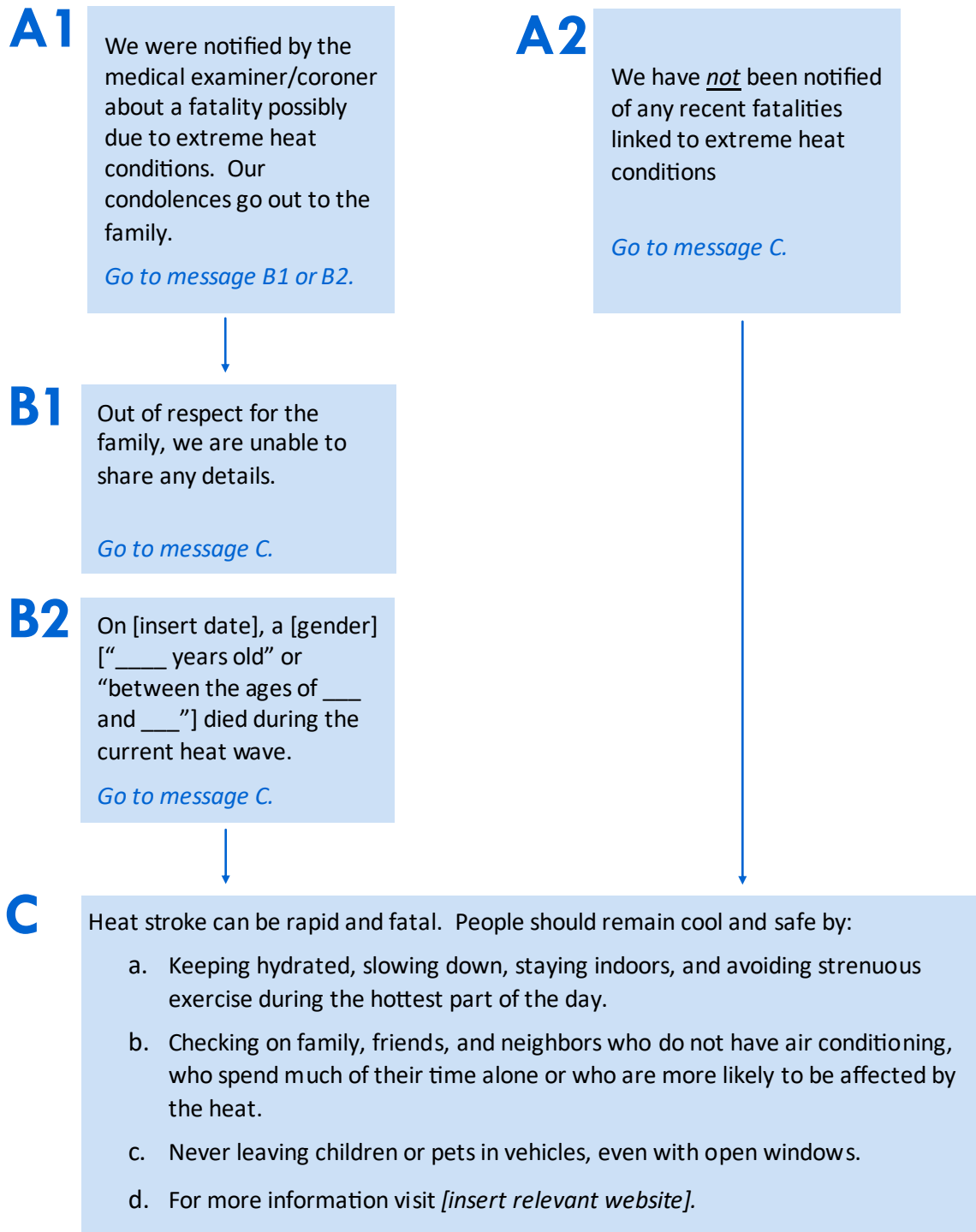
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### General Guidelines for Completing a Message Map

- Stick to 3 key messages or 1 key message with 3 parts for each underlying concern or specific question.
- Keep key messages brief. The reader should ideally spend less than 10 seconds per line.
- Develop messages that are easily understood by the target audience. (For communications with the general public use a 6th to 8th grade readability level.)
- 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. Try to balance negative messages with positive ones.
- Avoid unnecessary uses of the words no, not, never, nothing, none.

## TALKING POINTS FOR HEAT-RELATED FATALITY

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



The following is a message map that could be used when addressing the general public regarding heat-related safety.

**Main Message:**

“Since June/July/August \_\_, there has/have been \_\_ heat-related fatalities in Wisconsin. To help you and your loved ones stay safe during this heat wave...”

<p><b>Key Messages</b></p> <p><i>Three key messages</i></p>	<p><b>Supporting Information</b></p> <p><i>Three pieces of supporting information for each key message</i></p>
<p><b>Message 1</b></p> <p>Check on your neighbors to make sure they are okay, especially the elderly and those living alone.</p>	<p><b>Supporting Info 1</b></p> <p>The elderly are less likely to sense and respond to high temperatures.</p> <p><b>Supporting Info 2</b></p> <p>Those living alone can be isolated and unaware of the dangers posed by extreme heat.</p> <p><b>Supporting Info 3</b></p> <p>When regularly checking with your neighbors, look for signs of heat-related illness.</p>
<p><b>Message 2</b></p> <p>If you must be out during the hottest time of the day, be alert for signs of heat illness.</p>	<p><b>Supporting Info 1</b></p> <p>Symptoms include feeling hot, weak, dizzy or faint, cramping/muscle spasms, nausea, or rapid pulse.</p> <p><b>Supporting Info 2</b></p> <p>Protect yourself by limiting physical activities, drinking plenty of water, and wearing light loose-fitting clothing.</p> <p><b>Supporting Info 3</b></p> <p>Call 911 or seek medical attention if you or someone you know develops heat illness.</p>
<p><b>Message 3</b></p> <p>Hundreds of cooling centers are available to the public across Wisconsin.</p>	<p><b>Supporting Info 1</b></p> <p>Cooling centers are designated building with air conditioning where the public can seek relief from the heat.</p> <p><b>Supporting Info 2</b></p> <p>Call 211 to find the cooling center closest to you.</p> <p><b>Supporting Info 3</b></p> <p>Ask 211 whether transportation is also available.</p>



A close-up photograph of a hand holding a silver and gold pen, writing on a checklist. The checklist has several checkboxes, some of which are marked with a blue checkmark. The background is blurred, showing more of the checklist and the hand.

# Checklists for Extreme Heat

Long-term, imminent, and response to extreme heat events

## LONG-TERM PREPARATION CHECKLIST

- Identify extreme heat event partners and define their roles and responsibilities.
- Involve community organizations and other stakeholders in the response planning process (include medical examiner/coroner in this process).
- Develop a response plan, including but not limited to the following:
  - Develop a cooling center plan that identifies and maps air conditioned locations for cooling centers. Ensure that cooling centers are evenly distributed throughout jurisdiction.
  - Consider transportation options to cooling centers (e.g., free buses). Consider the accessibility of cooling centers (e.g., for walkers and wheel chairs).
  - Develop strategies that can be used if there is a power outage.
- Understand local and state roles in the reporting process for heat-related fatalities.
- Develop a database/list of facilities and organizations that serve at-risk populations to extreme heat (e.g., social service agencies, senior living centers, daycare centers, long-term care facilities, organized sports, construction companies, etc.) so that they can be immediately contacted of an impending extreme heat event.
- Monitor weather reports for summer months.
- Develop maps of vulnerable populations, if feasible.
- Ensure that heat fact sheets are current.

## ANTICIPATION OF IMMINENT HEAT EVENT CHECKLIST

- Notify local extreme heat partners
- Alert contacts in database/list of facilities and organizations that serve vulnerable populations
- Ensure that message map is current
- Work with media to alert public of the extreme heat event and advise people on recognizing and preventing heat-related illnesses
- Activate transportation assistance program
- Provide maps of locations of cooling centers and cool places (after permission from owner is received)
- Consider extension of hours at public pools and other public air conditioned places
- Consider suspending outdoor public events
- Coordinate with relevant organizations to provide water to homeless people

## EXTREME HEAT EVENT RESPONSE CHECKLIST

- Notify local extreme heat event partners
- Coordinate with medical examiner/coroner if heat fatality occurs
- Continue to monitor weather and make appropriate media release with safety tips
- Activate cooling center plans
- Continue promotion of cooling centers hours and locations
- Ensure outreach to vulnerable populations (e.g., e-mail to contacts in facilities database)
- Consider canceling, rescheduling or heightening mitigation protections for outdoor public events



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# RESOURCES



## **Wisconsin Department of Health Services (DHS)**

[www.dhs.wisconsin.gov/climate/weather/heat.htm](http://www.dhs.wisconsin.gov/climate/weather/heat.htm)

608-258-0099

## **Wisconsin Emergency Management (WEM)**

[www.readywisconsin.wi.gov](http://www.readywisconsin.wi.gov)

608-242-3232

## **American Red Cross**

[www.redcross.org/prepare/disaster/heat-wave](http://www.redcross.org/prepare/disaster/heat-wave)

1-877-618-6628

### **American Red Cross Heat Information in Other Languages**

[www.redcross.org/prepare/disaster-safety-library](http://www.redcross.org/prepare/disaster-safety-library)

### **American Red Cross Heat Wave Safety Checklist**

[www.redcross.org/heatwavechecklist](http://www.redcross.org/heatwavechecklist)

## **Federal Emergency Management Agency (FEMA)**

[www.fema.gov](http://www.fema.gov)

### **FEMA Spanish Language Portal**

[www.fema.gov/es/](http://www.fema.gov/es/)

## **Federal Centers for Disease Control and Prevention (CDC)**

[www.cdc.gov/extremeheat/](http://www.cdc.gov/extremeheat/)

## **Federal Environmental Protection Agency (EPA)**

[www.epa.gov/emergency/naturalevents/extremeheat.html](http://www.epa.gov/emergency/naturalevents/extremeheat.html)

## **List of Wisconsin Local Public Health Departments**

[www.dhs.wisconsin.gov/lh-depts/counties.htm](http://www.dhs.wisconsin.gov/lh-depts/counties.htm)

## **List of Wisconsin Tribal Health Directors**

[www.dhs.wisconsin.gov/lh-depts/contacts/tribal-health-directors.pdf](http://www.dhs.wisconsin.gov/lh-depts/contacts/tribal-health-directors.pdf)

## **List of County Building, Code, and Zoning Officials**

[www.wccadm.com/staff\\_directory.htm](http://www.wccadm.com/staff_directory.htm)

## **Refugee Health Information Network (RHIN)**

[www.healthreach.nlm.nih.gov/AZIndex.aspx](http://www.healthreach.nlm.nih.gov/AZIndex.aspx)



# RESPONSE PLAN



## 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 [bit.ly/heatplansample](https://bit.ly/heatplansample) (Google Drive) 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](mailto:dhsclimate@wi.gov) for assistance.