



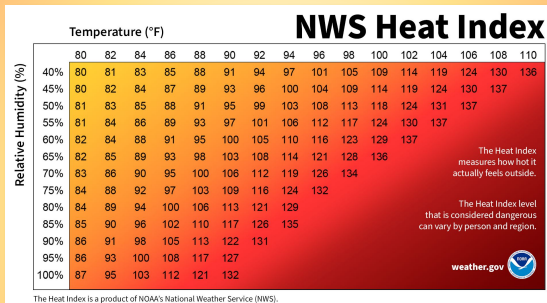
# NWS Heat Tools



U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Weather Service

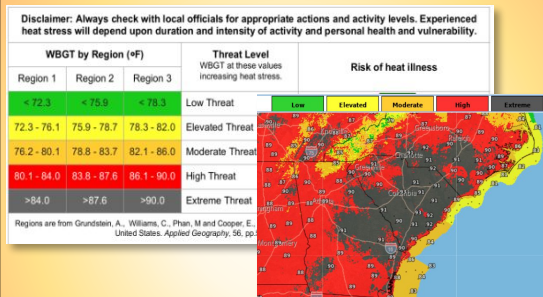
# NWS Heat Forecast Tools

## Heat Index



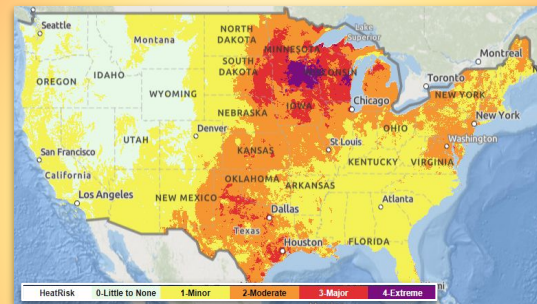
Heat in context for the **general public.**

## Wet Bulb Globe Temperature



Heat stress in context for **healthy, active outdoor communities.**

## HeatRisk (experimental)



Spectrum of heat-related impacts in **climatological context** with CDC heat-health information.

# Heat Index

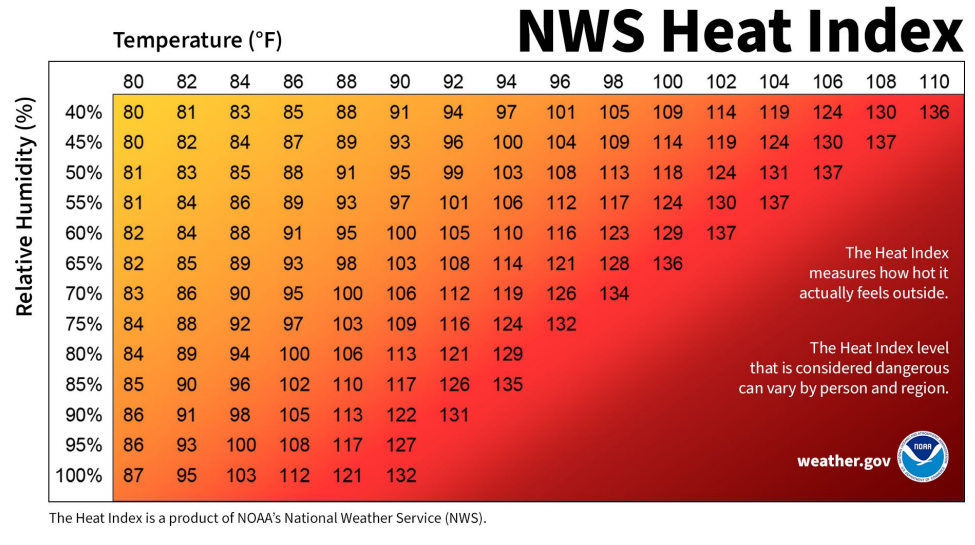
- NWS flagship heat stress indicator
- Provides a “feels like” temperature using relative humidity and temperature
- Calculated for shady areas with light winds and includes 21 other parameters and assumptions



5'7" adult, 147.7 lbs, walking outside at 3.1 mph, wearing trousers and short sleeved shirt

# Heat Index - Benefits & Considerations

- Familiar to most and generally easy to understand
- Not the best indicator of heat impacts in areas with low humidity
- Not an accurate measure of heat impacts on active individuals
- Exposure to full sunshine can increase heat index values by up to 15°F



# Wet Bulb Globe Temperature (WBGT)

- Measures heat stress on the body, taking solar radiation into account
- Takes into account temperature, dewpoint, wind and sky cover
- Effects of solar radiation estimated with sun angle and forecast cloud cover



WBGT by Region (°F)			Threat Level WBGT at these values increasing heat stress.	Risk of heat illness
Region 1	Region 2	Region 3		
< 72.3	< 75.9	< 78.3	Low Threat	
72.3 - 76.1	75.9 - 78.7	78.3 - 82.0	Elevated Threat	
76.2 - 80.1	78.8 - 83.7	82.1 - 86.0	Moderate Threat	
80.1 - 84.0	83.8 - 87.6	86.1 - 90.0	High Threat	
>84.0	>87.6	>90.0	Extreme Threat	

# WBGT - Benefits & Considerations

- Useful for those who work, exercise, or recreate outdoors
- Can help inform activity modifications
- Values are typically lower than Heat Index and air temperature, which may cause it to be perceived as a lower risk
- Use WBGT with local guidance for specific activities

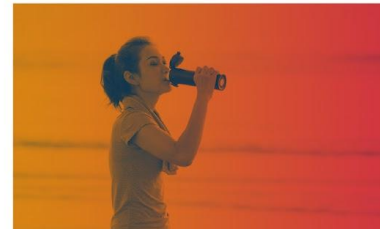
## Intended Audience



**Outdoor  
Workers**



**People Doing Strenuous  
Outdoor Activities**



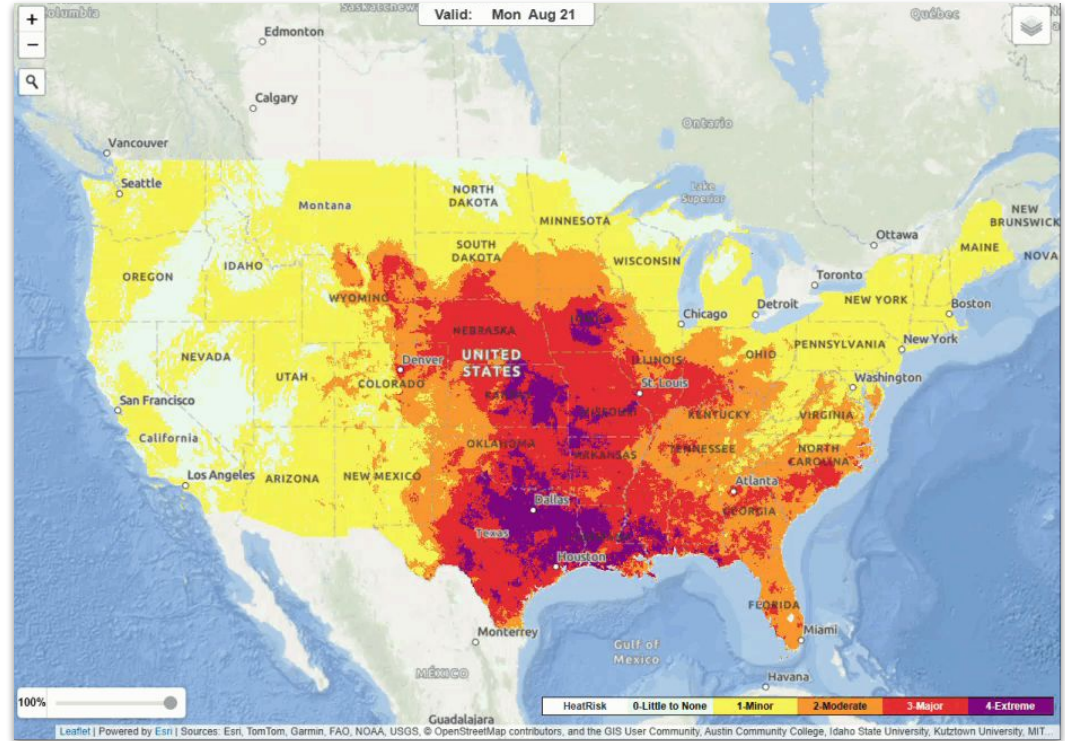
**Active  
People**



**Athletes and  
Marching Band**

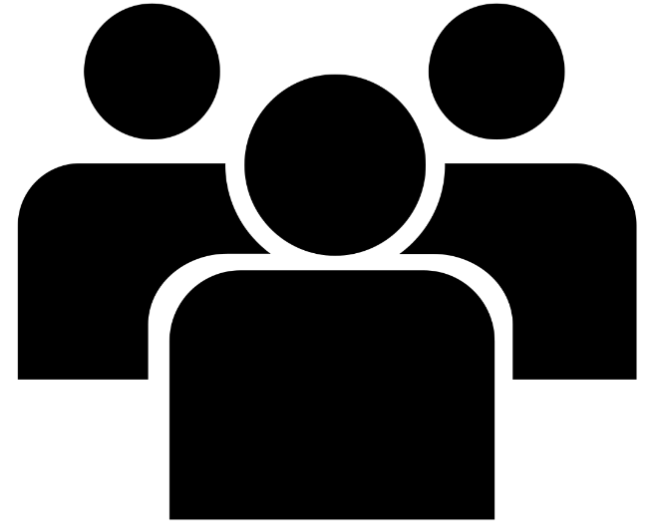
# HeatRisk

- Five level scale that provides a **forecast risk** of heat-related impacts
- **Dynamic thresholds** are informed by local climate and CDC mortality data
- Gives users and partners the **flexibility to act** when they need to



# Basic Tenets of HeatRisk

- Communities adapt to their *local climatology*
- *Acclimation* to heat is important
- There is some level where heat is dangerous, *no matter the time of year*
- Everyone has different heat tolerances – *no single threshold works*

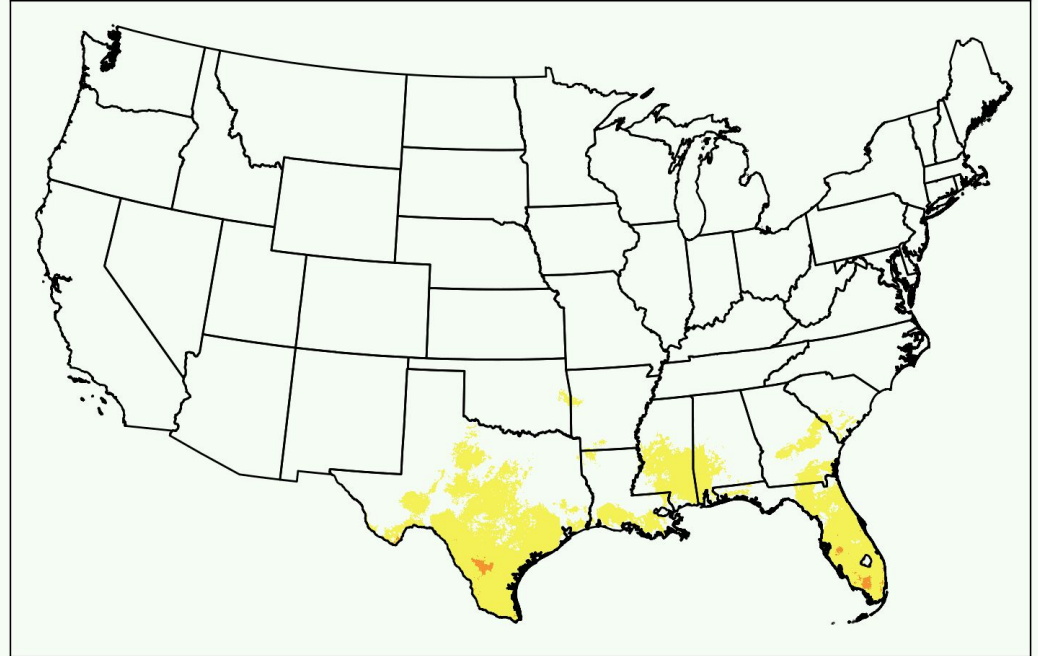


# HeatRisk Considers:

- How unusual the high and low temperatures are for a location
- Time of year and acclimatization
- Duration of the heat and if there is overnight relief
- Forecast-driven humidity detection
- If temperatures pose an elevated risk of heat-health impacts based on CDC data

2025 Observed HeatRisk

2025-04-01



# HeatRisk Categories

## Extreme (4)

***Rare and/or long duration extreme heat event.***

Extreme risk of widespread heat-related impacts for anyone without effective cooling and/or hydration. No overnight relief expected.

Temps above 95th percentile for 3+ days and/or near all-time records.

## Major (3)

Major risk of widespread heat-related impacts (illness *and* mortality) for anyone without effective cooling and/or hydration.

Excessively warm day and night (generally above 95th percentile).

## Moderate (2)

Moderate risk for impacts, mainly for those who are sensitive to heat, especially those without effective cooling and/or hydration.

Primarily heat-related illness, non-zero risk of heat mortality.

## Minor (1)

Minor risk for those who are extremely sensitive to heat and without effective cooling and/or hydration.

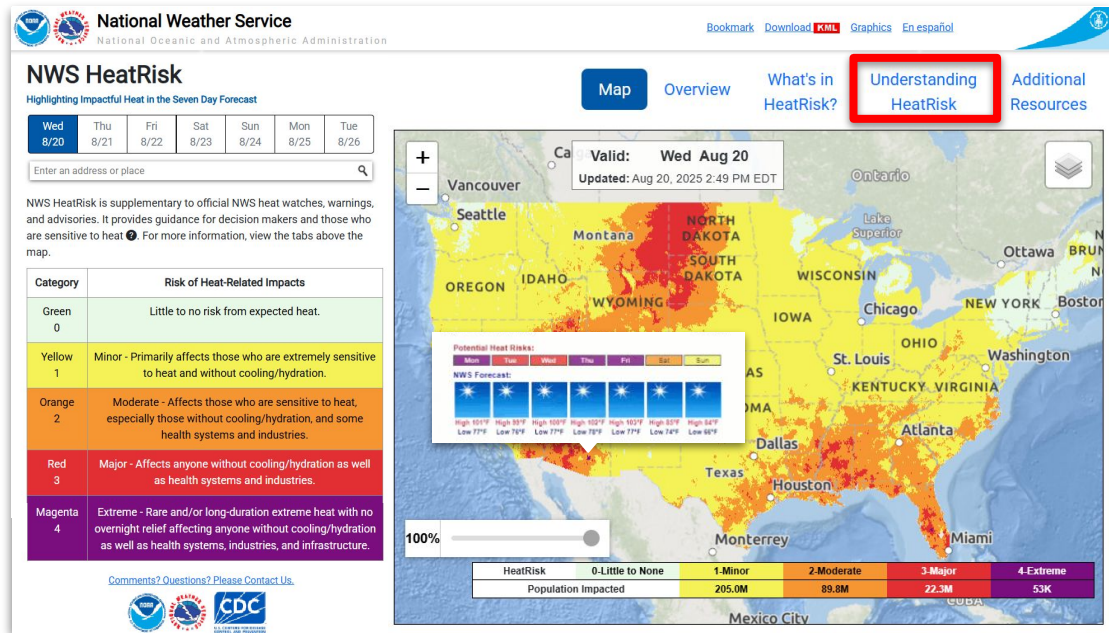
Non-zero risk of heat mortality.

## None (0)

Little to no risk expected from heat.

# NWS HeatRisk Dashboard

- Access daily interactive maps along with point-based forecasts
- Additional information available along the top
  - What is HeatRisk
  - Activity modification recommendations
  - Difference between Heat Index, WBGT, and HeatRisk



[wpc.ncep.noaa.gov/heatrisk](https://wpc.ncep.noaa.gov/heatrisk)

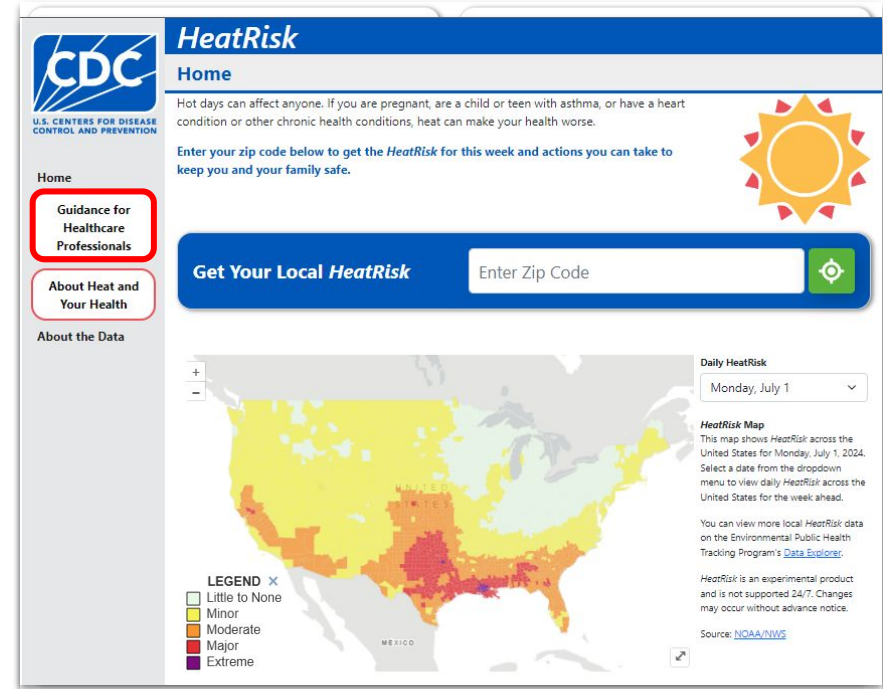
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Numerical Value	Meaning	Who/What is at Risk?	How Common is this Heat?	For those at risk, what actions can be taken?
2	<ul style="list-style-type: none"> <li>● Heat of this type is tolerated by many, however there is a moderate risk for members of heat-sensitive groups to experience negative heat-related health effects, including heat illness</li> <li>● Some risk for the general population who are exposed to the sun for longer periods of time</li> <li>● For those without air conditioning, living spaces can become uncomfortable during the afternoon and evening, but fans and leaving windows open at night will help</li> </ul>	<ul style="list-style-type: none"> <li>● Primarily heat-sensitive groups, especially those without effective cooling or hydration</li> <li>● Those not acclimated to this level of heat (i.e. visitors)</li> <li>● Otherwise healthy individuals exposed to longer duration heat, without effective cooling or hydration, such as in the sun at an outdoor venue</li> <li>● Some transportation and utilities sectors</li> <li>● Some health systems will see increased demand, with increases in ER visits</li> </ul>	<ul style="list-style-type: none"> <li>● Fairly common in most locations</li> <li>● Very common in southern regions of the country</li> </ul>	<ul style="list-style-type: none"> <li>● Reduce time in the sun during the warmest part of the day</li> <li>● Stay hydrated</li> <li>● Stay in a cool place during the heat of the day</li> <li>● Move outdoor activities to cooler times of the day</li> <li>● For those without a/c, use fans to keep air moving and open windows at night</li> </ul>
3	<ul style="list-style-type: none"> <li>● Heat of this type represents a major Risk to all individuals who are 1) exposed to the sun and active or 2) are in a heat-sensitive group</li> <li>● Dangerous to anyone without proper hydration or adequate cooling</li> <li>● For those without air conditioning, living spaces can become deadly during the afternoon and evening. Fans and open windows will not be as effective.</li> <li>● Poor air quality is possible</li> <li>● Power interruptions may occur as electrical demands increase</li> </ul>	<ul style="list-style-type: none"> <li>● Much of the population, especially anyone without effective cooling or hydration</li> <li>● Those exposed to the heat/sun at outdoor venues</li> <li>● Health systems likely to see increased demand with significant increases in ER visits</li> <li>● Most transportation and utilities sectors</li> </ul>	<ul style="list-style-type: none"> <li>● Uncommon most locations</li> <li>● Fairly common in southern regions of the country</li> </ul>	<ul style="list-style-type: none"> <li>● Consider canceling outdoor activities during the heat of the day, otherwise move activities to the coolest parts of the day</li> <li>● Stay hydrated</li> <li>● Stay in a cool place especially during the heat of the day and evening</li> <li>● If you have access to air conditioning, use it, or find a location that does. Even a few hours in a cool location can lower risk. Fans may not be adequate</li> </ul>
4	<ul style="list-style-type: none"> <li>● This is a rare level of heat leading to an Extreme Risk for the entire population</li> <li>● Very dangerous to anyone without proper hydration or adequate cooling.</li> <li>● This is a multi-day excessive heat event. A prolonged period of heat is dangerous for everyone not prepared.</li> <li>● Poor air quality is likely.</li> <li>● Power outages are increasingly likely as electrical demands may reach critical levels.</li> </ul>	<ul style="list-style-type: none"> <li>● Entire population exposed to the heat is at risk.</li> <li>● For people without effective cooling, especially heat-sensitive groups, this level of heat can be deadly.</li> <li>● Health systems highly likely to see increased demand with significant increases in ER visits</li> <li>● Most transportation and utilities sectors</li> </ul>	<ul style="list-style-type: none"> <li>● Rare most locations</li> <li>● Occurs up to a few times a year in southern regions of country, especially the Desert Southwest</li> </ul>	<ul style="list-style-type: none"> <li>● Strongly consider canceling outdoor activities</li> <li>● Stay hydrated</li> <li>● Stay in a cool place, including overnight</li> <li>● If you have access to air conditioning, use it, or find a location that does. Even a few hours in a cool location can lower risk. Fans will not be adequate</li> <li>● Check on your neighbors</li> </ul>


# CDC HeatRisk Dashboard

- **Guidance for Healthcare Professionals**
  - Heat and Health Risk Screening Questionnaire
  - Heat and Medications Guidance
  - Patient Management Steps
  - Clinical Overviews:
    - Heat and Children and Teens with Asthma
    - Heat and Pregnancy
    - Heat and Cardiovascular Disease
- County-level HeatRisk forecasts with specific actions you can take to protect your health



[cdc.gov/heatrisk](https://cdc.gov/heatrisk)

# HeatRisk Usage


**penNSYLVANIA**  
 DEPARTMENT OF HEALTH

PENNSYLVANIA DEPARTMENT OF HEALTH  
 2024-PAHAN-755-06-18-ADV  
 Week of Extreme Heat Forecasted for Pennsylvania – Practice Heat Safety

DATE:	June 18, 2024
TO:	Health Alert Network
FROM:	Debra L. Bogen, MD, FAAP, Acting Secretary of Health
SUBJECT:	Week of Extreme Heat Forecasted for Pennsylvania – Practice Heat Safety
DISTRIBUTION:	Statewide
LOCATION:	Statewide
STREET ADDRESS:	n/a
COUNTY:	n/a
MUNICIPALITY:	n/a
ZIP CODE:	n/a

This transmission is a "Health Advisory" that provides important information for a specific incident or situation; may not require immediate action.

**HOSPITALS:** PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, INFECTION CONTROL, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL  
**EMS COUNCILS:** PLEASE DISTRIBUTE AS APPROPRIATE  
**FQHCs:** PLEASE DISTRIBUTE AS APPROPRIATE  
**LOCAL HEALTH JURISDICTIONS:** PLEASE DISTRIBUTE AS APPROPRIATE  
**PROFESSIONAL ORGANIZATIONS:** PLEASE DISTRIBUTE TO YOUR MEMBERSHIP

Green	➔	No Activation
Yellow	➔	Tier 1 Activation
Orange	➔	Tier 2 Activation
Red	➔	Tier 3 Activation
Magenta	➔	Tier 3 Activation

**When the HeatRisk level is forecast to be “Extreme” (Magenta / Level 4):**

**Cancel** all outdoor and unconditioned indoor activities  
**AND**  
*(if feasible)*

**Reschedule** all outdoor activities and unconditioned indoor activities to a different day when the HeatRisk level is no longer “Extreme” (Magenta / Level 4) or “Major” (Red / Level 3)  
**OR**  
**Move** to alternative activities in an air-conditioned or cooled indoor environment

**PA Dept. of Health:**  
 Use HeatRisk to issue Health Advisory

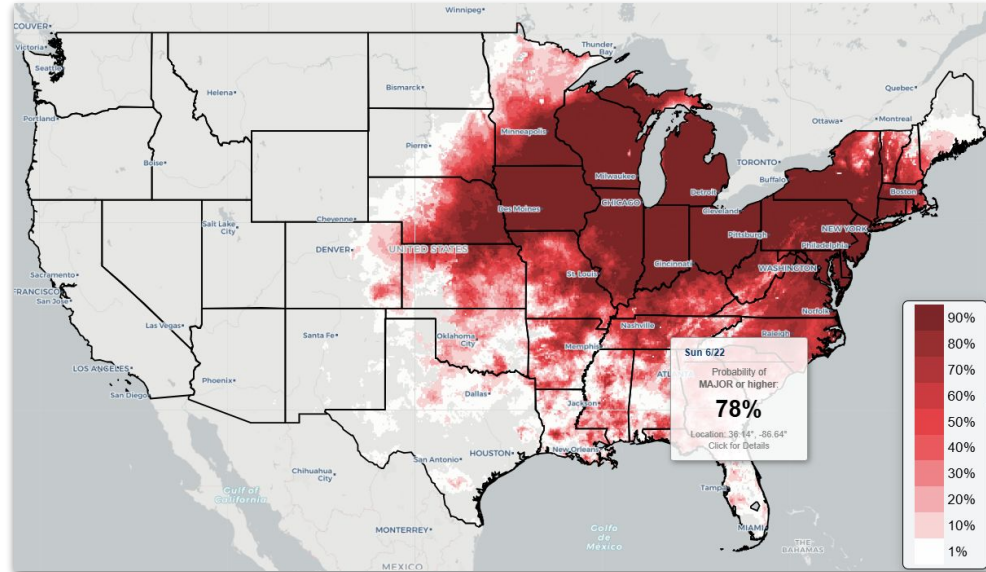
**King County Regional Homelessness Authority:**  
 HeatRisk-based activation thresholds

**CA Dept. of Health:**  
 HeatRisk guidance for school sports & activities

# Probabilistic HeatRisk Prototype

# Probabilistic HeatRisk Prototype

- Provides additional context to deterministic (single-value) forecasts
- Increases the understanding of potential heat events (e.g. onset/ending, intensity)
- Aids decision making processes surrounding potential heat impacts

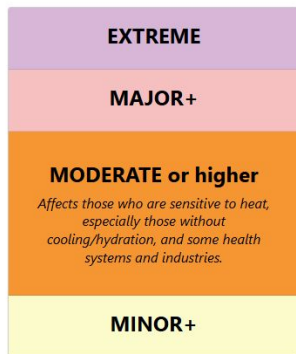


# Probabilistic HeatRisk Prototype

**Prototype / Under Development:** Prototype is for demonstration/test purposes only—Not to be relied on for operational decision making. This prototype is not supported 24/7 and may be discontinued at any time without advance notice.

## RISK LEVEL

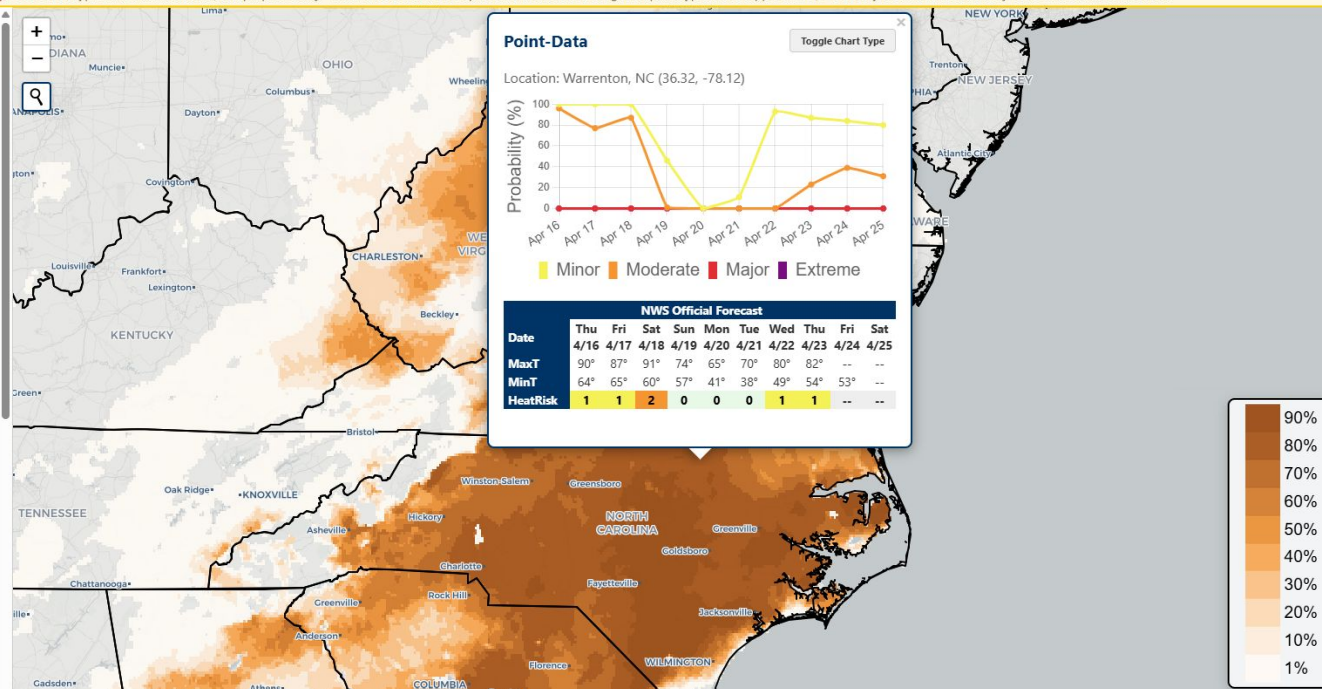
Arrow Keys: ↑ ↓



NBM Initialized on 20260416 at 06Z

## FORECAST DATES

Arrow Keys: ← →



# Example Usage

**Emergency Manager:** We have a very large outdoor event and are closely monitoring the forecast. The latest HeatRisk forecast indicates Minor conditions are expected the next few days. However, the Probabilistic HeatRisk shows the potential for Moderate conditions is 40%. Based on our sensitivity to heat, we will invoke our heat plan.



# Heat Safety Resources

**Heat Safety Tips and Resources**  
[Weather.gov > Safety > Heat Safety Tips and Resources](#)

Safety National Program

Heat Safety | Watches and Warnings | Heat Forecast Tools | During a Heat Wave | Heat Related Illnesses

**Practice HEAT SAFETY Wherever You Are**

Heat related deaths are preventable. Protect yourself and others from the impacts of heat waves.

**Job Sites**  
Stay hydrated and take breaks in the shade as often as possible.

**Indoors**  
Check up on the elderly, sick and those without AC.

**Vehicles**  
Never leave kids or pets unattended - LOOK before you LOCK

**Outdoors**  
Limit strenuous outdoor activities, find shade, and stay hydrated.

[weather.gov/heat](#)

**Heat Safety Resources**

- Heat gov
- Children, Pets and Vehicles
- Seasonal Safety Campaign
- Ultraviolet (UV) Safety
- Games and Activities for Kids
- Survivor Stories
- Education and Outreach
- Links and Partners

**Heat Safety Website:**  
[weather.gov/heat](https://www.weather.gov/heat)

**Weather Safety for All Hazards**  
[Weather.gov > Safety](#)

Safety National Program

**Heat Safety**  
**Weather Safety Message of the Week**  
*Heat is the leading weather-related killer in the United States, resulting in hundreds of fatalities each year. Heat can be very taxing on the body and can lead to heat related illnesses or make existing health conditions worse.*  
[Learn More →](#)

**NEWS FROM NOAA**

**Preparedness**

**Materials For Use**

**Today's Forecast**

**Weather Hazards**

- Hurricane
- Heat
- Flood
- Wildfire

**Drought**

- Forecast Information
- Safety Information
- Materials For Use

**Dust**

- Forecast Information
- Safety Information
- Materials For Use

**Fog**

- Forecast Information
- Safety Information
- Materials For Use

**Heat**

- Forecast Information
- Safety Information
- Materials For Use

**Floods**

- Forecast Information
- Safety Information
- Materials For Use

**Hurricanes**

- Forecast Information
- Safety Information
- Materials For Use

**Safety Materials & Information:**  
[weather.gov/safety](https://www.weather.gov/safety)