

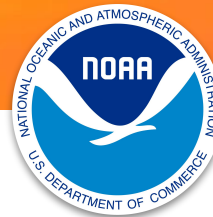


NWS-CDC Partners & Users Heat Webinar

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Reid Wolcott
Neil Muscatiello, Ph.D.



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

Webinar Logistics

- This webinar is being **recorded** and will be publicly posted along with the Presentation PDF after the webinar. *By attending this webinar, you consent to the recording of your likeness including voice and/or webcam images.*
 - <https://www.weather.gov/wrn/calendar>
- All lines will remain muted throughout the presentation.
- Please use the **Question Box** to ask questions, which will be answered at the end during the Q&A.

Opening Remarks



David Novak, Ph.D.

Director, NWS Weather Prediction Center

NWS Heat Communications Updates

Heat Safety Week

2026 Heat Safety Week

The National Integrated Heat Health Information System (NIHHIS) is hosting a heat safety social media week from May 18-22 to raise awareness about heat risk and safety. Throughout the week, NIHHIS will share content according to these themes.

Follow along by sharing NIHHIS posts and adding your own content with **#HeatSafety**. Encourage others in your community to help spread the word about heat!

#HeatSafety



5/18

What is Heat-related Illness?

5/19

Heat Safety Tips

5/20

Check on Family, Friends,
Teammates, & Colleagues

5/21

Outdoor Recreation & Heat
Safety

5/22

Stay Safe in the Sun (Don't
Fry Day)

Follow Along!
@HeatGov @NWS

New Heat Infographics



Early Season Heat

Early-season heat waves can be especially dangerous, even at lower temperatures. Your body has not had time to adjust to the warmer conditions.

WORKERS

AGE 65+

ATHLETES

CHILDREN

Heat Safety Tips

- Limit time outside
- Reschedule activities for cooler times of the day
- Take breaks often and hydrate frequently
- Wear lightweight and loose-fitting clothing

weather.gov



**Compounding Hazards
Heat & Wildfires**

Exposure to both smoke and extreme heat at the same time can pose a much greater health risk than either one alone.

WILDFIRE

HEAT

AIR QUALITY

Heat & Smoke Safety Tips

Stay Indoors: Remain in cool, filtered air

Limit Activity: Plan necessary tasks for cooler, clearer times

Hydrate: Drink water frequently

Mask Up: Use a well-fitting N95 outdoors

Monitor Health: If feeling unwell, move indoors and seek help

weather.gov



New Heat Safety Graphics



NWS Tools to Assess Heat

Overview

The NWS has three tools in addition to air temperature to assess hazardous heat events: **Heat Index**, **Wet Bulb Globe Temperature**, and **experimental HeatRisk**. There are unique benefits and important considerations for each tool.

Heat Index

A measure of how hot it feels to the human body when relative humidity and air temperature are combined. It is calculated for shady areas with light winds.

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)

A measure of heat stress on the body in direct sunlight, taking into account factors such as temperature, dewpoint, wind and sky cover.

Benefits & Considerations

- Useful for those who work, exercise, or recreate outdoors
- Can help inform activity modifications
- Values are typically lower than Heat Index, which may cause it to be perceived as a lower risk
- Could result in confusion if used without context and local guidance

National Weather Service

weather.gov

Updated Heat Tools Fact Sheet

New Outdoor Events Graphics

- New Outdoor Events Safety Graphics will roll out over the next month
- Additional graphics include Severe Storms, High Winds, and Floods



Beat the Heat 
during outdoor events

-  Drink plenty of water and encourage those with you to do the same.
-  Wear a hat and lightweight, loose-fitting, and light-colored clothing. Apply sunscreen.
-  Use an electric or handheld fan, cooling towels, or other cooling technology. Take breaks under shade, in cooling tents, or misting stations.
-  At the first signs of dizziness or weakness, look for medical assistance.

weather.gov  



Air Quality Safety
during outdoor events 

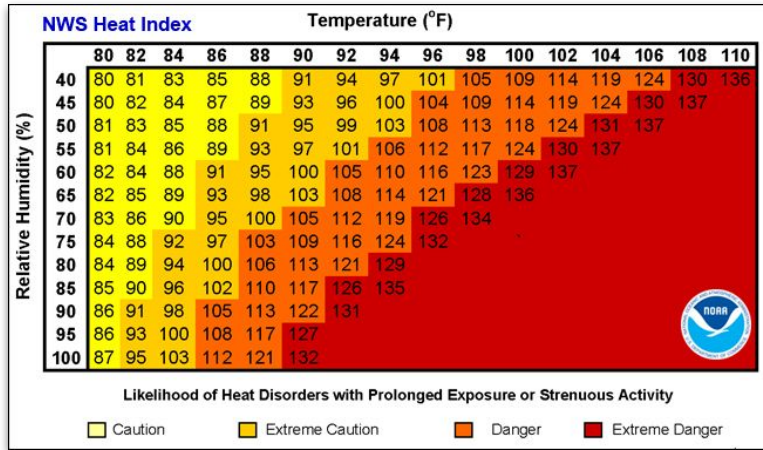
Poor air quality can put your health at risk during concerts, fairs, festivals, and sporting events. Planning ahead can keep you safe.

-  Check the Air Quality Index (AQI) at [AirNow.gov](https://www.airnow.gov). AQI over 100 can impact sensitive groups. Over 150 is unhealthy for everyone.
-  Limit outdoor activities in poor air quality. If feeling unwell, move indoors to air conditioning.
-  Properly-fitting N95 masks can help protect you from poor air quality.

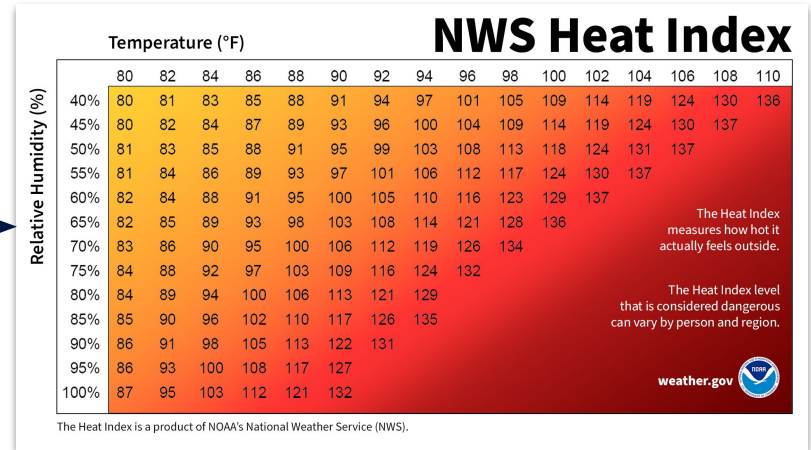
weather.gov  

Revamp of NWS Heat Index Table

Out with the old...



And in with the new!

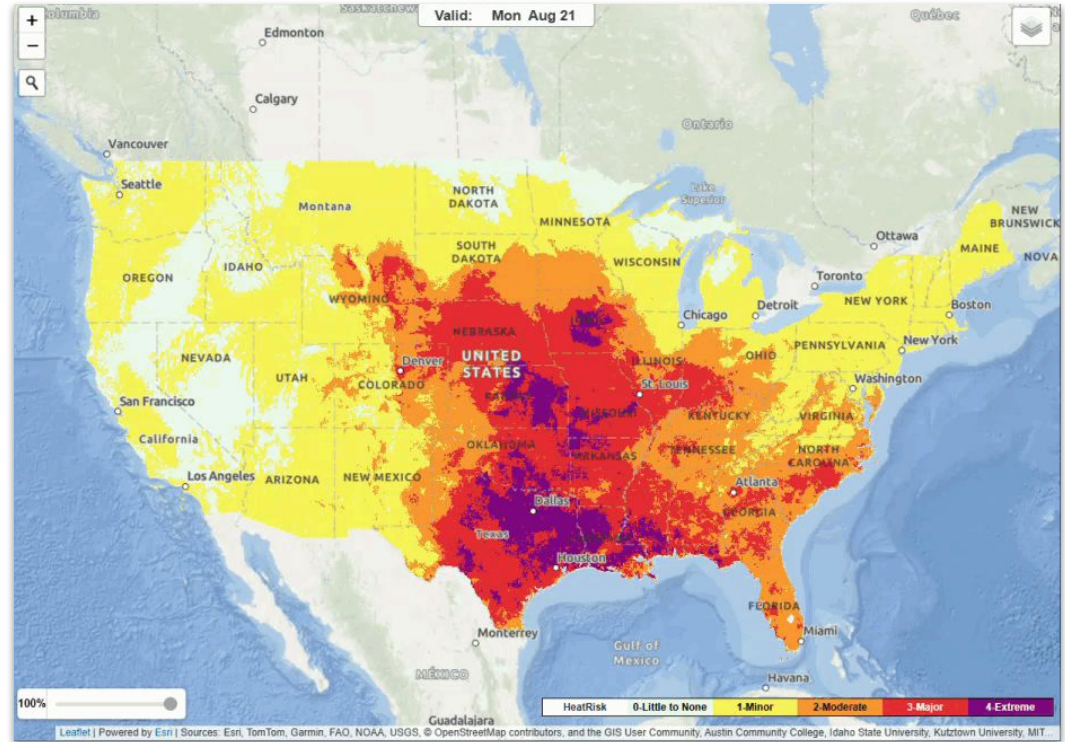


HeatRisk Review

What is HeatRisk?



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



HeatRisk Categories

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.

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.

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).

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.

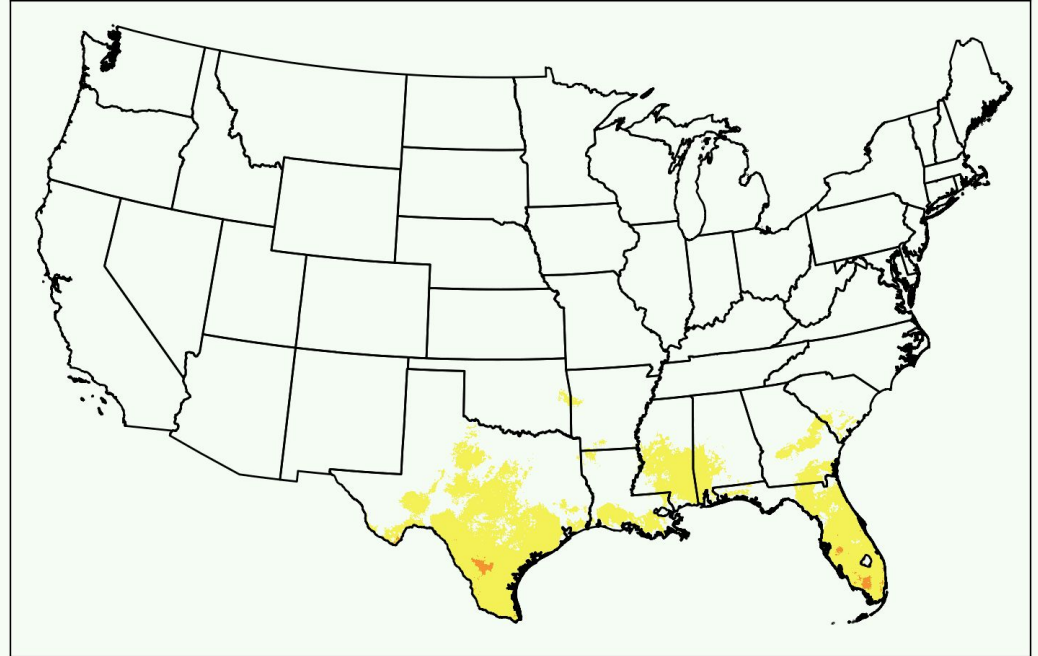
Temps above 95th percentile for 3+ days and/or near all-time records.

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
- Temperature-driven humidity detection
- If temperatures pose an elevated risk of heat-health impacts based on CDC input

2025 Observed HeatRisk

2025-04-01



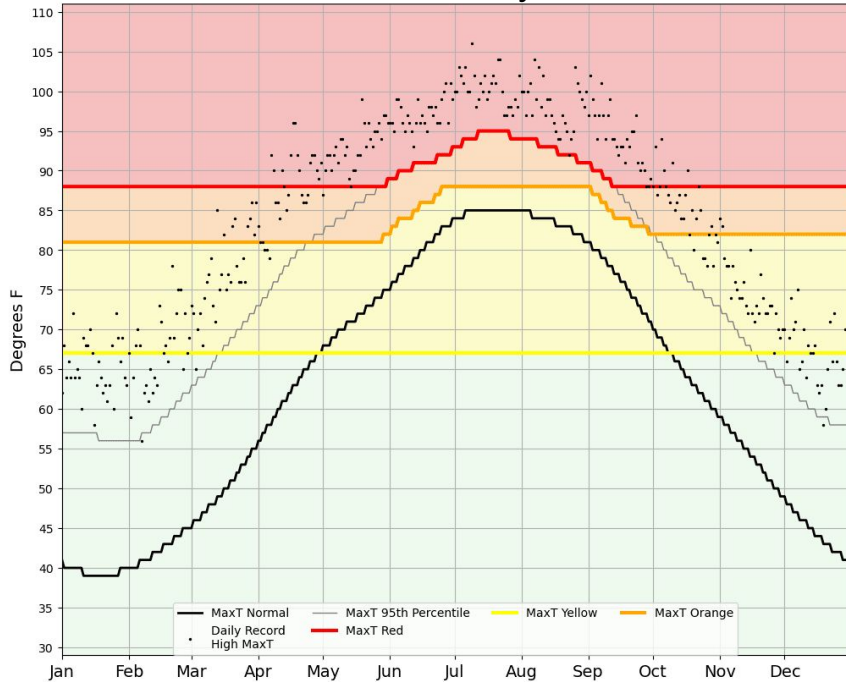
Generating Health-Based Thresholds: A Summary



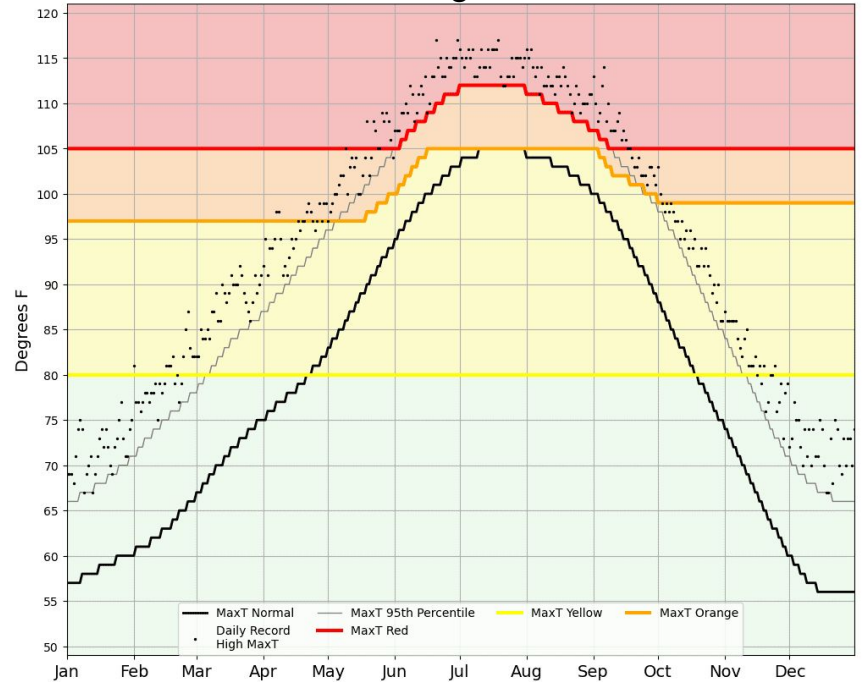
- **Health data:** Deaths from all-causes
- **Geographic coverage:** Contiguous United States
- **Time period:** 2004–2018
- **Spatial scale:** County
- **Temporal scale:** Daily
- **Modeling approach:** Statistical attribution (community time-series study design)
 - **Accounting for delayed effects of heat exposure:** Yes
 - **Accounting for non-linear effects of heat exposure:** Yes
 - **Accounting for within season variability and controlling for long-term time trends:** Yes
 - **Accounting for other factors (e.g. air pollution):** Yes (ozone and fine particulate matter)
- **Impact-based framework:** Yes (using percent of heat-attributable deaths [PHAD] to identify thresholds)

HeatRisk Threshold Example

Maximum Temperature Thresholds New York City, NY

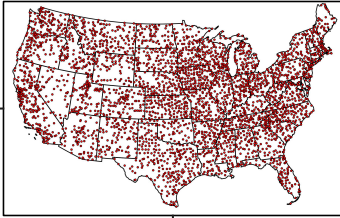


Maximum Temperature Thresholds Las Vegas, NV

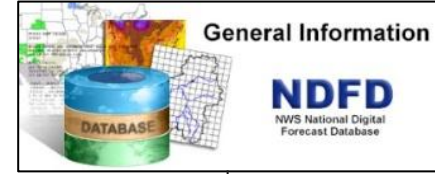
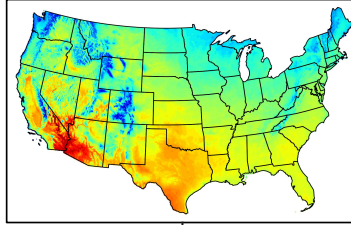


Process Overview

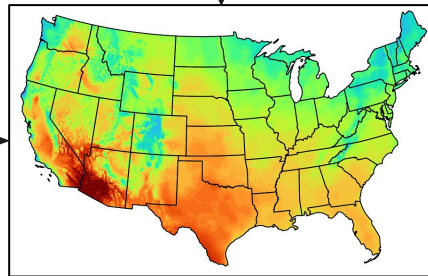
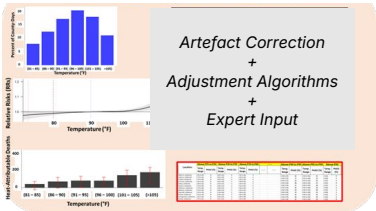
NCEI GHCNd



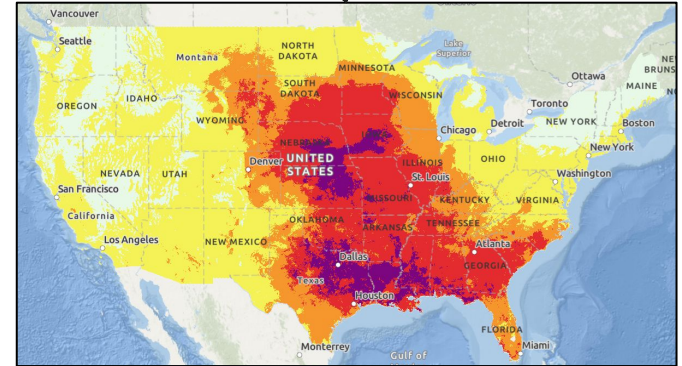
OSU PRISM Normals



Health-Based Thresholds



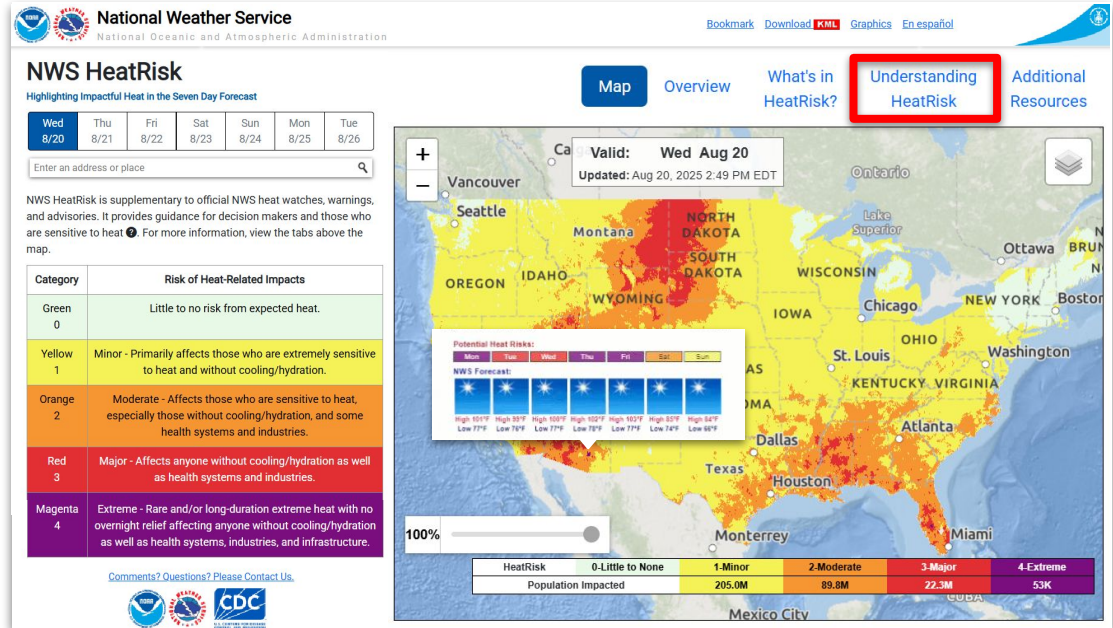
MaxT/MinT Heat Impact Level (HIL) Daily Thresholds



Experimental HeatRisk

NWS HeatRisk Viewer

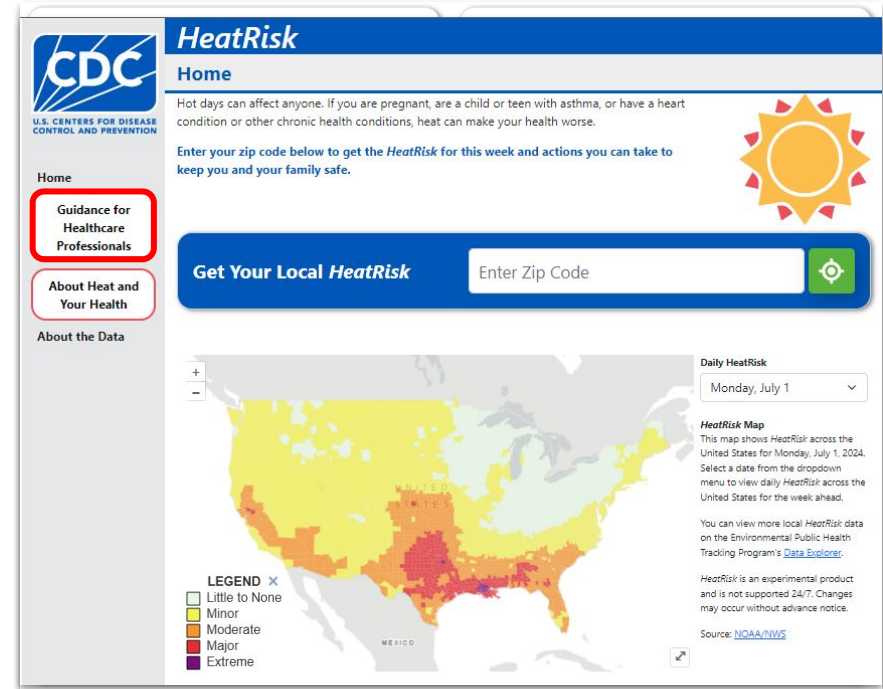
- Access daily interactive maps along with point-based forecasts
- Additional information available along the top
 - What is HeatRisk
 - Activity modification recommendations
 - Difference between Heat Index, WBGT, and HeatRisk



<https://www.wpc.ncep.noaa.gov/heatrisk/>

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- and census-tract-level HeatRisk forecasts with specific actions you can take to protect your health

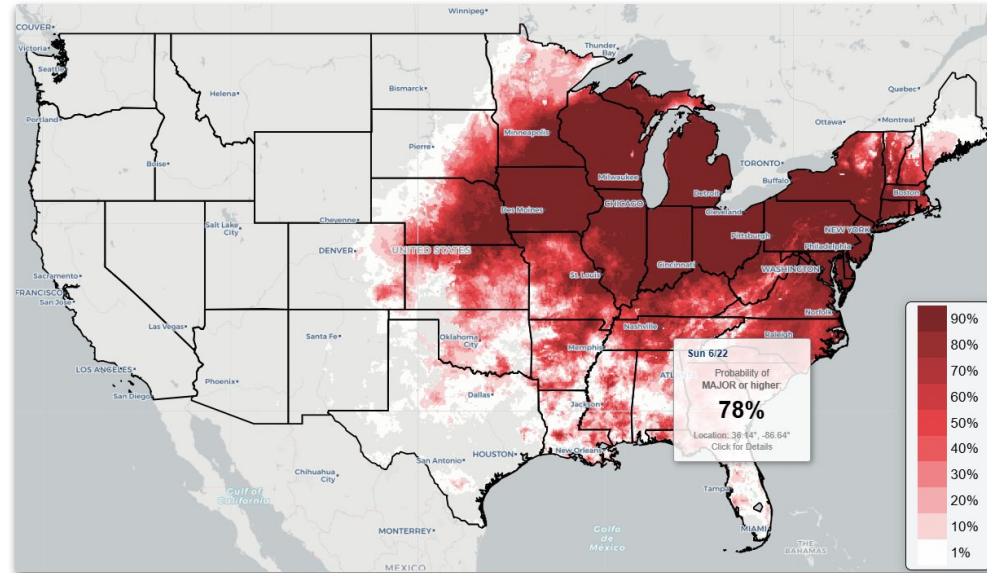


<https://www.cdc.gov/heatrisk>

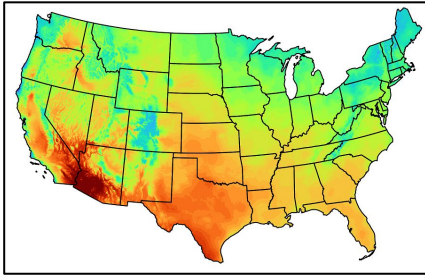
Probabilistic HeatRisk

Probabilistic HeatRisk Prototype

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



Probabilistic HeatRisk Process



MaxT/MinT Daily Thresholds

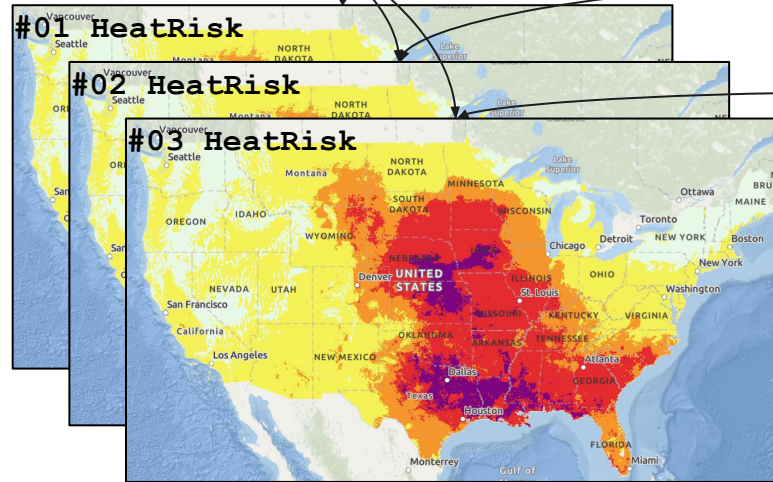
NWS National Blend of Models

100 Global Ensemble Members @ 00/06/12/18Z

#01 MaxT
& MinT

#02 MaxT
& MinT

#03 MaxT
& MinT

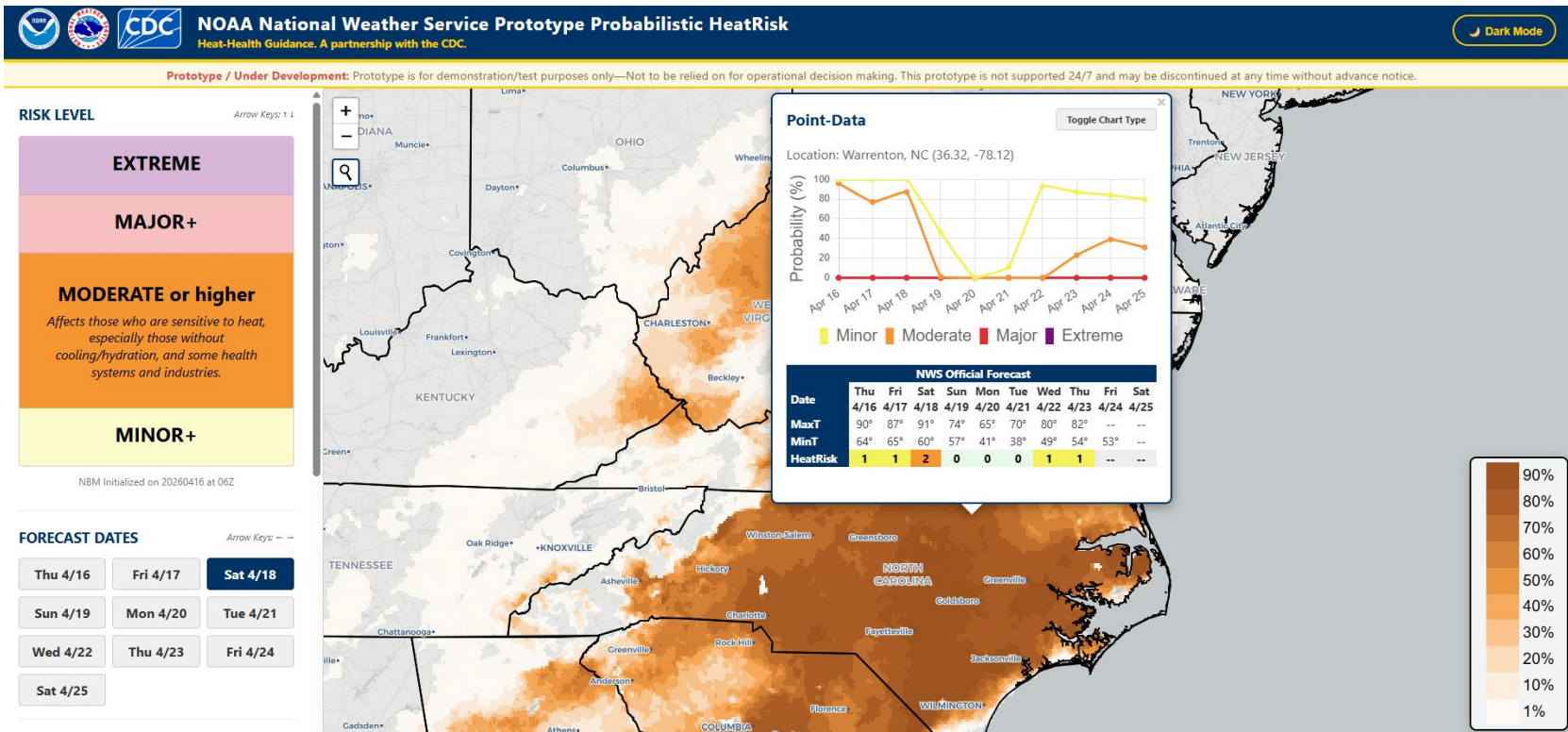


Experimental HeatRisk

Probabilistic
HeatRisk
(probHR)

10-Day
Forecast

Live Demo!



<https://www.wpc.ncep.noaa.gov/heatrisk/probs/>

HeatRisk Evaluation

Data Sources: Mortality Data

- National Vital Statistics System for decedent-level mortality data
 - Based on death certificates
 - Able to ascertain cause of death, comorbid conditions, and individual characteristics of the decedent
- The primary or underlying cause (and contributing factors) for death
- Heat-related deaths identified based on underlying and contributing causes
- Data available for all 50 states, District of Columbia, and U.S. Territories

U.S. Standard Certificate of Death

1. DECEDENT'S LEGAL NAME (include AKA's if any) (First, Middle, Last)		2. SEX	3. SOCIAL SECURITY NUMBER	
4a. AGE-Last Birthday (Years)	4b. UNDER 1 YEAR (Months Days)	4c. UNDER 1 DAY (Hours Minutes)	5. DATE OF BIRTH (Mo/Day/Yr)	6. BIRTHPLACE (City and State or Foreign Country)

Part I

CAUSE OF DEATH (See instructions and examples)

32. **PART I.** Enter the chain of events—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.

IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. _____ Due to (or as a consequence of):	Underlying cause information	Approximate interval: Onset to death
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. _____ Due to (or as a consequence of):		_____
	c. _____ Due to (or as a consequence of):		_____
	d. _____ Due to (or as a consequence of):		_____

Part II

PART II. Enter other significant conditions contributing to death but not resulting in the underlying cause given in PART I.

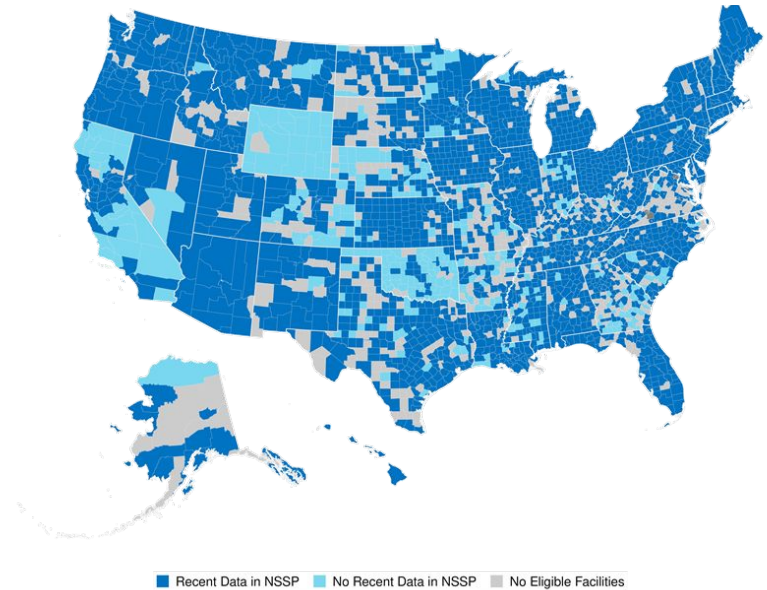
10. DO TOBACCO USE CONTRIBUTE TO DEATH?	11. IS FEMAL FERTILITY TREATMENT AVAILABLE TO DEATH?	Yes <input type="checkbox"/> No <input type="checkbox"/>
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<https://www.cdc.gov/nchs/data/dvs/DEATH11-03final-ACC.pdf>

Source: CDC

Data Sources: Syndromic Surveillance Information

- CDC's National Syndromic Surveillance Program (NSSP) collects information on emergency department (ED) visits due to heat-related illness (HRI) on a near real-time basis
- More than 7,500 health care facilities covering 50 states, the District of Columbia, and Guam contribute data to NSSP daily
- Within 24 hours of a patient's visit, data are available in NSSP for analysis
- 85% of U.S. emergency departments send data to NSSP, often within 24 hours



Source: CDC

Data Sources Summary

- **Health data:**

- **Deaths**

- All states in the conterminous United States, and District of Columbia.
 - Time period: 2005–2023
 - Mortality from all-causes & Heat-related mortality



Case definition based on ICD-10 codes for ascertaining Heat Deaths

- **ED visits**

- Midwest (MI, WI); Northeast (ME, NY, VT); Southeast (GA, NC, TN, VA); West (CO, NM, WA)
 - Time period: 2018–2025
 - Visits due to HRI (Heat Related Illness v2)



Case definition for HRI ED Visits

- **Exposure data**

- Station-level HeatRisk information from NWS
 - Creating county-level HeatRisk exposures using a spatial smoothing algorithm

- **Other covariates**

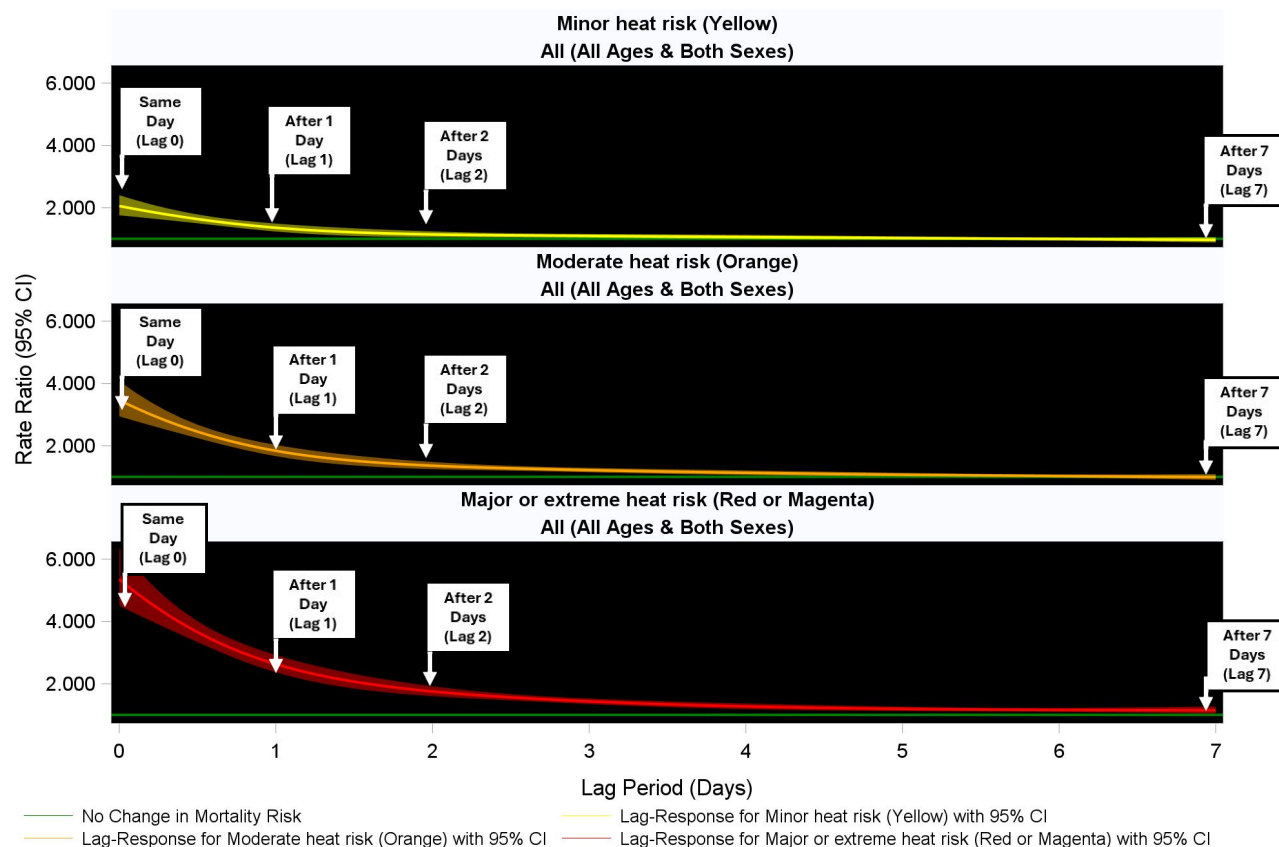
- Population data from U.S. Census Bureau
 - Federal holidays from U.S. Office of Personnel Management

Analytical Framework

- Creating a time-series dataset with aggregated counts of visits, HeatRisk levels, and other predictors
- Generating exposure-response (E-R) relationships
 - Conditional quasi-Poisson regression, using a distributed lag modeling framework, to explore associations between HeatRisk levels and adverse health outcomes
 - Heat-related deaths
 - Visits due to heat-related illness (Heat Related Illness v2)
 - Controlling for other confounders (e.g., seasonality, holidays, interannual trends)
 - Measuring health risks over a cumulative lag period
 - Estimating associations for sub-populations

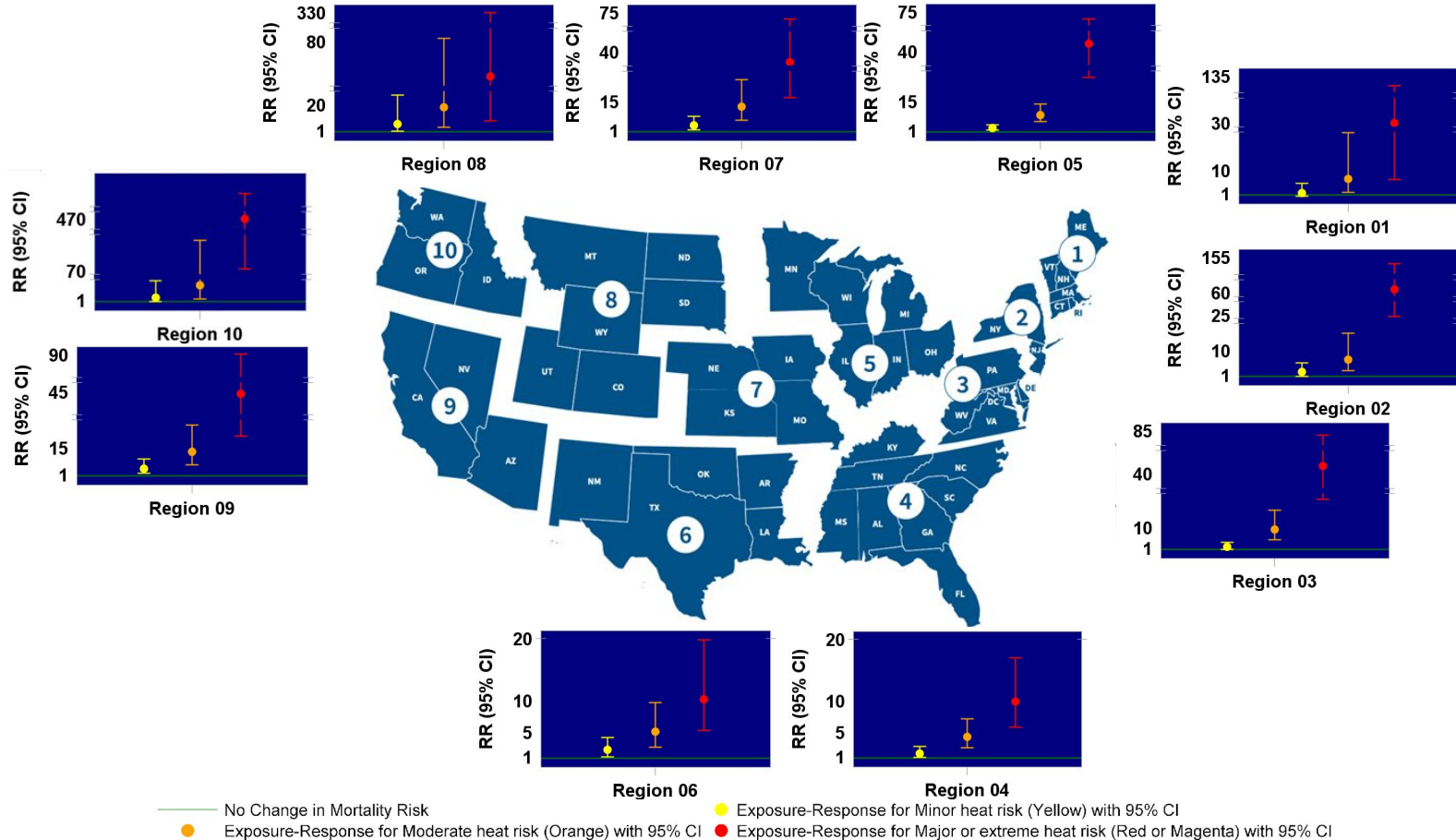
Delayed Effects of Heat Exposure: Heat Deaths (May – September)

Lag-Response patterns in Rate Ratios (RRs) for all ages and both sexes, by HeatRisk levels



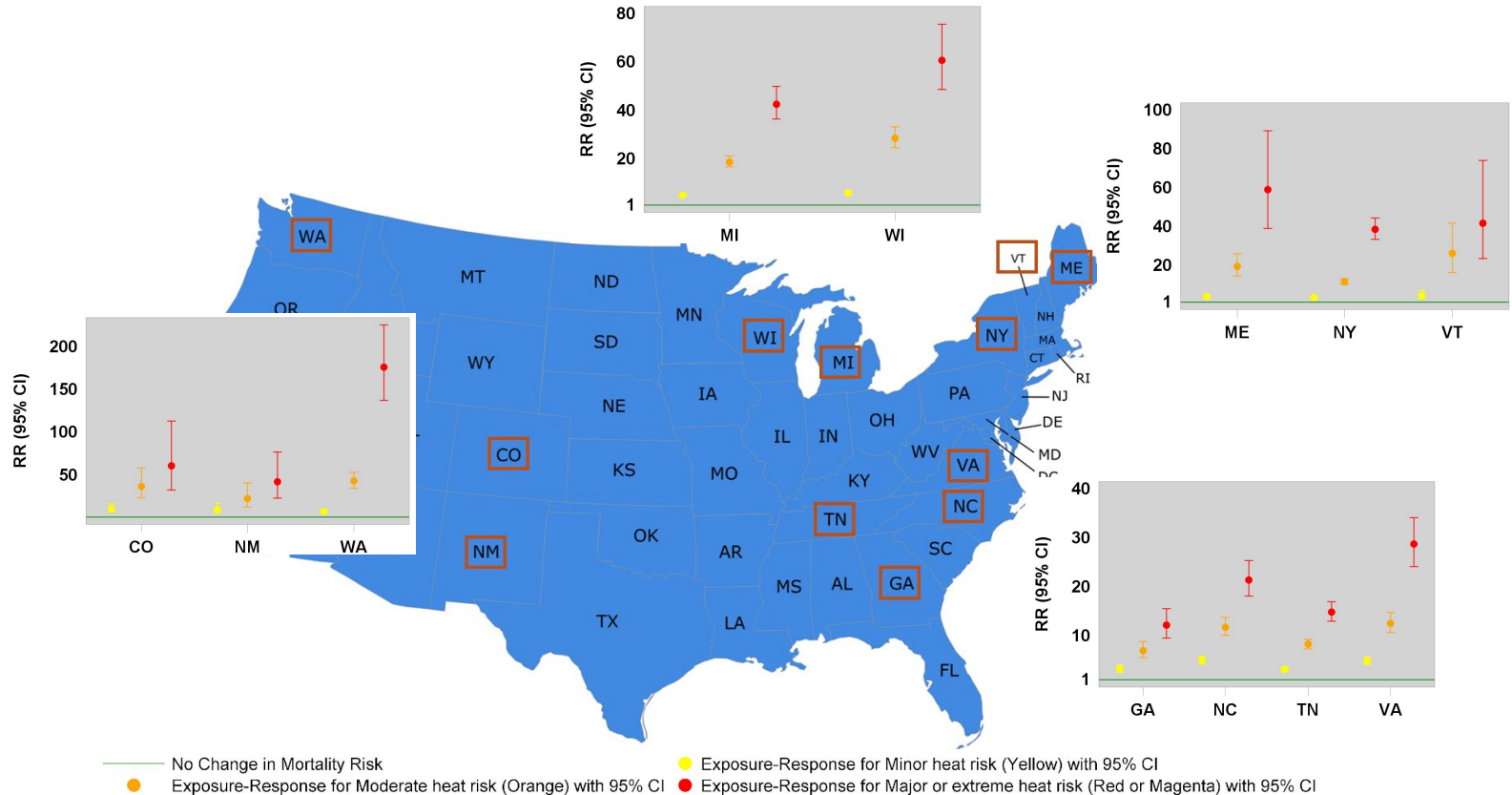
HeatRisk vs. Heat Deaths RR Comparison (May – September)

Comparison of Rate Ratios (RRs) for Heat Deaths by HeatRisk levels, by HHS regions



HeatRisk vs. HRI ED Visit RR Comparison

Comparison of Relative Risks (RRs) for HRI ED Visits by HeatRisk Levels (All Ages and Sexes)



Takeaways From Evaluating HeatRisk Forecasts

Notes from the Field: HeatRisk Forecasts and Emergency Department Visits for Heat-Related Illness — New York, May–September 2024

Weekly / May 22, 2025 / 74(18):302–304

[Print](#)

Neil A. Muscatello, PhD¹; Wanhsiang Hsu, PhD¹; Heather Aydin-Ghormoz, MS, MPA¹; Charlene Weng, MS¹; Vajeera Dorabawila, PhD¹; Kathleen F. Bush, PhD¹; Ambarish Vaidyanathan, PhD² [VIEW AUTHOR AFFILIATIONS](#)

[View suggested citation](#)

Summary

What is already known about this topic?

Exposure to heat is associated with adverse health outcomes including heat-related illness (HRI).

What is added by this report?

In this ecological analysis, the HeatRisk index, a color and number index developed by the National Weather Service in partnership with CDC to communicate heat-related health risk, was associated with higher rates of HRI emergency department visits in New York (outside of New York City), during May–September 2024.

What are the implications for public health practice?

The association between HeatRisk forecasts indicating higher levels of risk and higher HRI rates in New York (outside of New York City) supports the use of HeatRisk as a tool to increase awareness about heat exposure.

Source: CDC

Article Metrics

Altmetric:



[Figure](#)

- Good agreement observed between HeatRisk levels and heat-related adverse health outcomes
- Strengthening the ability to anticipate early-season heat-related health impacts
- HeatRisk framework underscores that heat-related effects manifest over a continuum of temperatures
- Additional state and local evaluation efforts can inform end-user needs



<https://www.cdc.gov/mmwr/volumes/74/wr/mm7418a2.htm>

HeatRisk Applications



Department
of Health

INTEGRATING *HEATRISK* IN NYS EXTREME HEAT PLANNING

NEIL MUSCATIELLO, PhD

May 18, 2026

NYS CLIMATE IMPACTS ASSESSMENT - HEAT

- Since 1901, average temperatures in NYS have increased by almost 2.6°F
 - New York is warming more quickly than the U.S. average
 - Temperatures in New York State since 2000 have been higher than in any period in recorded history
- Average temperatures are projected to increase in all regions of the state between about 5°F and 11°F by the end of the century.

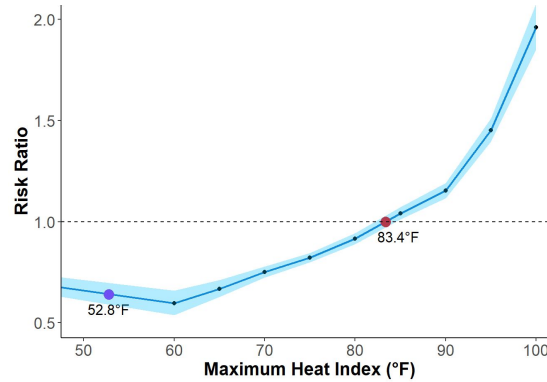


HEAT-HEALTH IMPACTS ON ED/HOSP

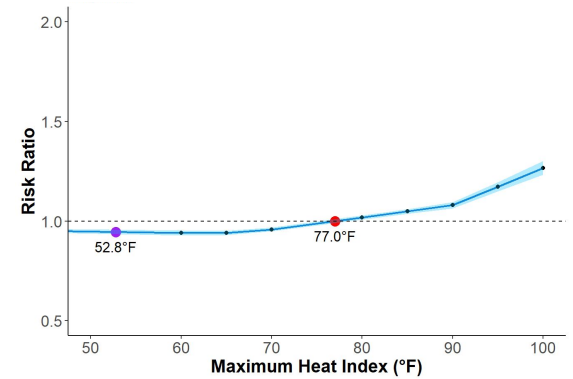


Department
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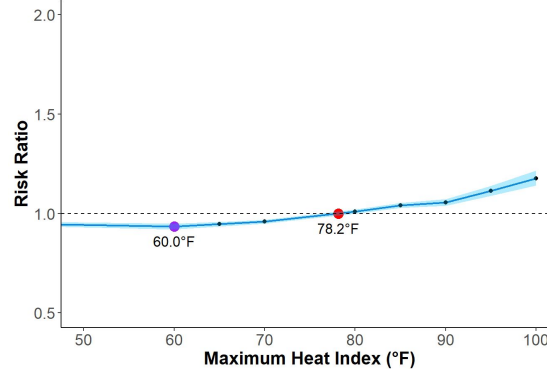
Heat Stress



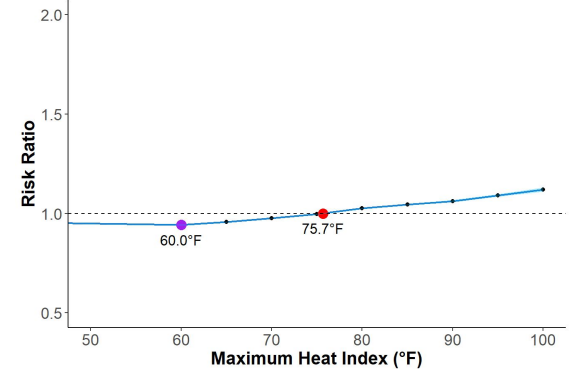
Dehydration



Acute Kidney Failure



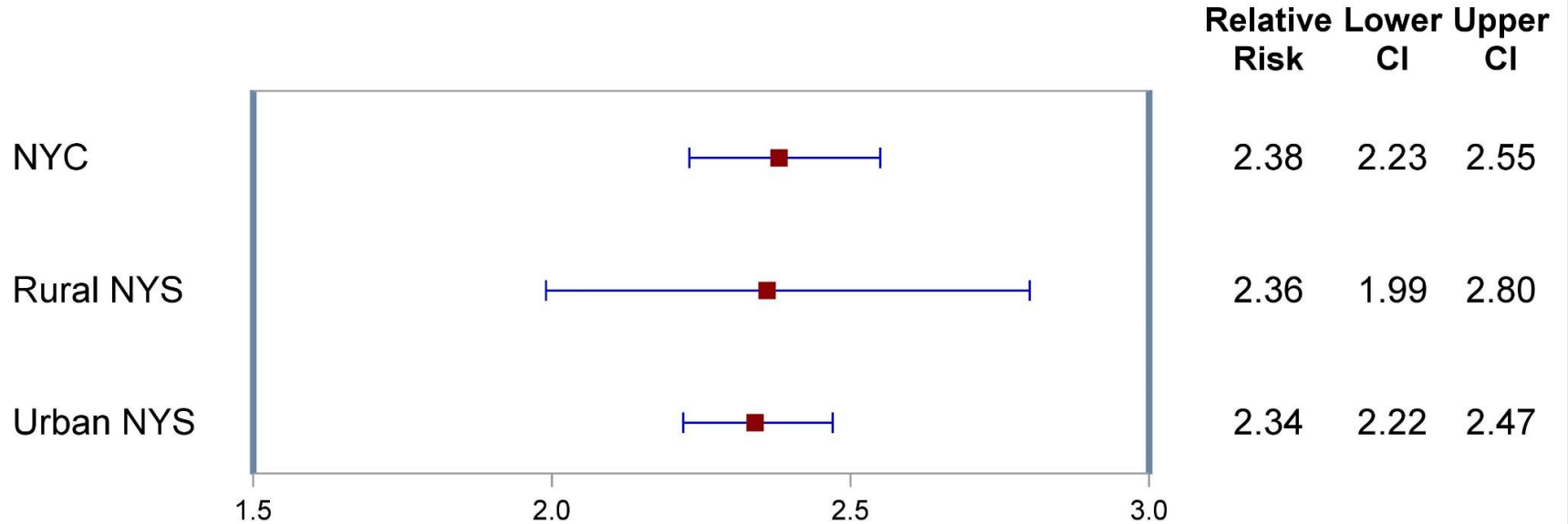
Cardiovascular Disease



Source: Adeyeye T, Insaf TZ**, Al-Hamdan M, Nayak S, Stuart N, Dirienzo S, Crosson W. Estimating policy relevant health effects of ambient heat exposures using spatially contiguous remote sensing reanalysis data. *Environmental Health*. 2019 18:35. (<https://doi.org/10.1186/s12940-019-0467-5>)

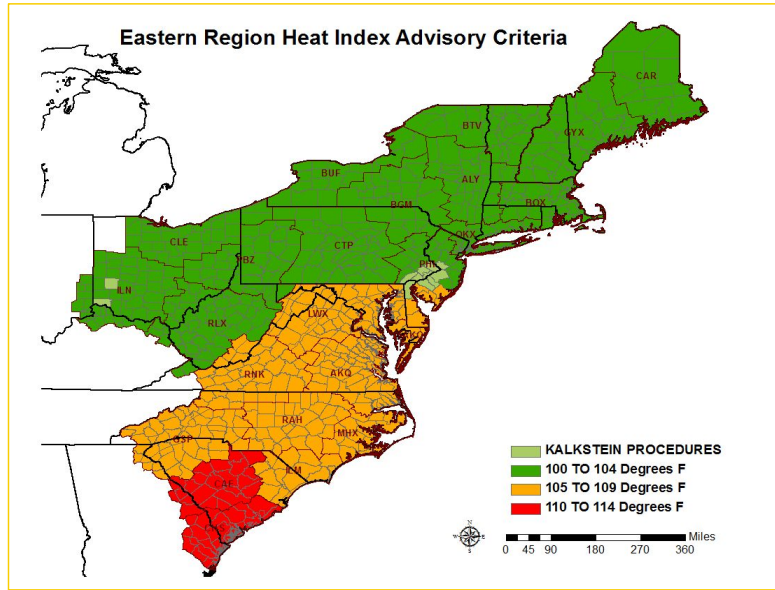
HEAT-RELATED ILLNESS BY URBAN/RURAL

Same Day Exposure and Risk of Heat Related Illnesses in New York State

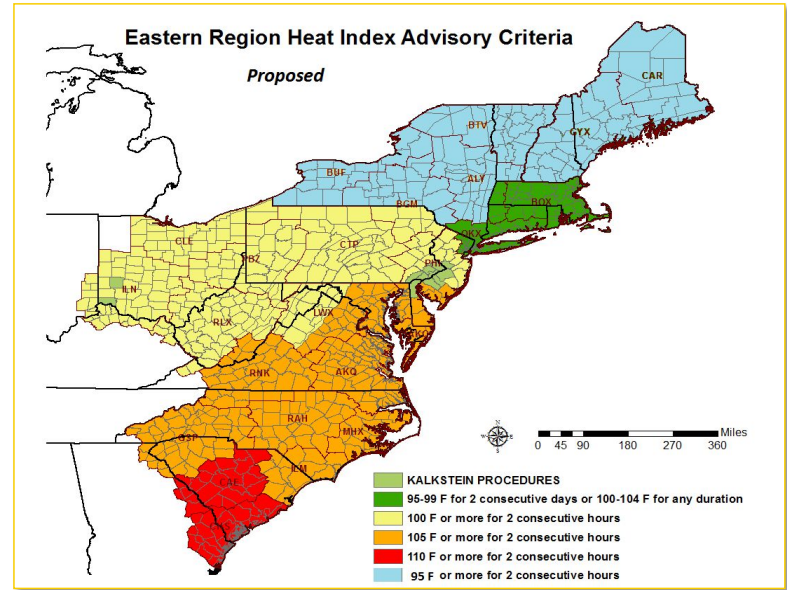


UPDATING NYS HEAT ADVISORY THRESHOLDS

Heat Advisory Thresholds – 2016



Heat Advisory Thresholds – Revised 2018



Department of Health

NWS HeatRisk

Highlighting Impactful Heat in the Seven Day Forecast

Fri 5/8	Sat 5/9	Sun 5/10	Mon 5/11	Tue 5/12	Wed 5/13	Thu 5/14
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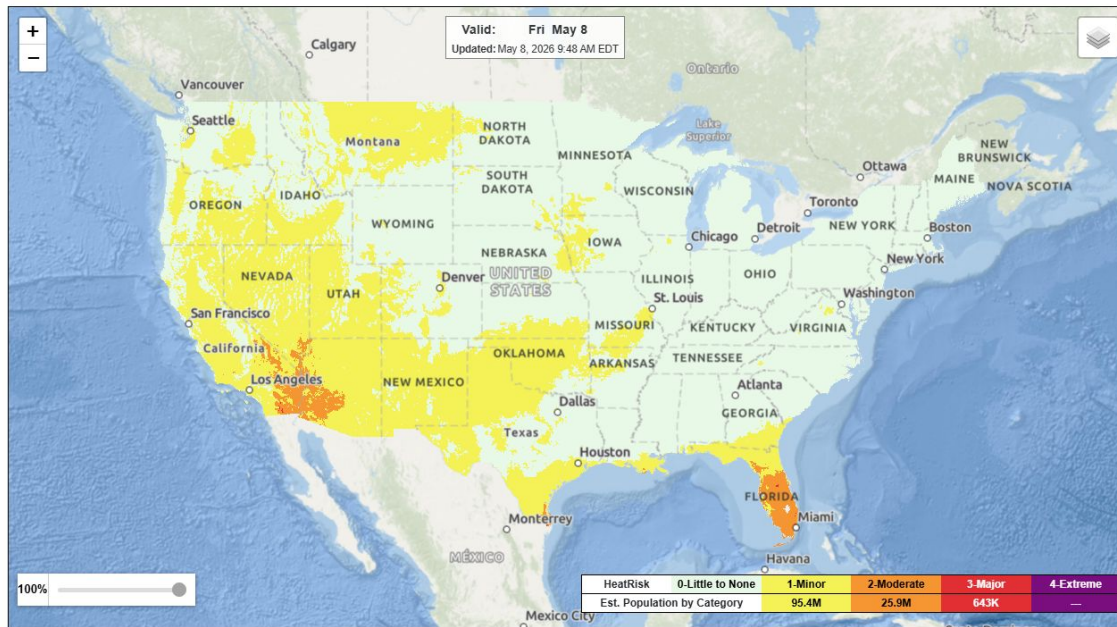
NWS HeatRisk is supplementary to official NWS heat watches, warnings, and advisories. It provides guidance for decision makers and those who are sensitive to heat. For more information, view the tabs above the map.

Category	Risk of Heat-Related Impacts
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - Primarily affects those who are extremely sensitive to heat and without cooling/hydration.
Orange 2	Moderate - Affects those who are sensitive to heat, especially those without cooling/hydration, and some health systems and industries.
Red 3	Major - Affects anyone without cooling/hydration as well as health systems and industries.
Magenta 4	Extreme - Rare and/or long-duration extreme heat with no overnight relief affecting anyone without cooling/hydration as well as health systems, industries, and infrastructure.

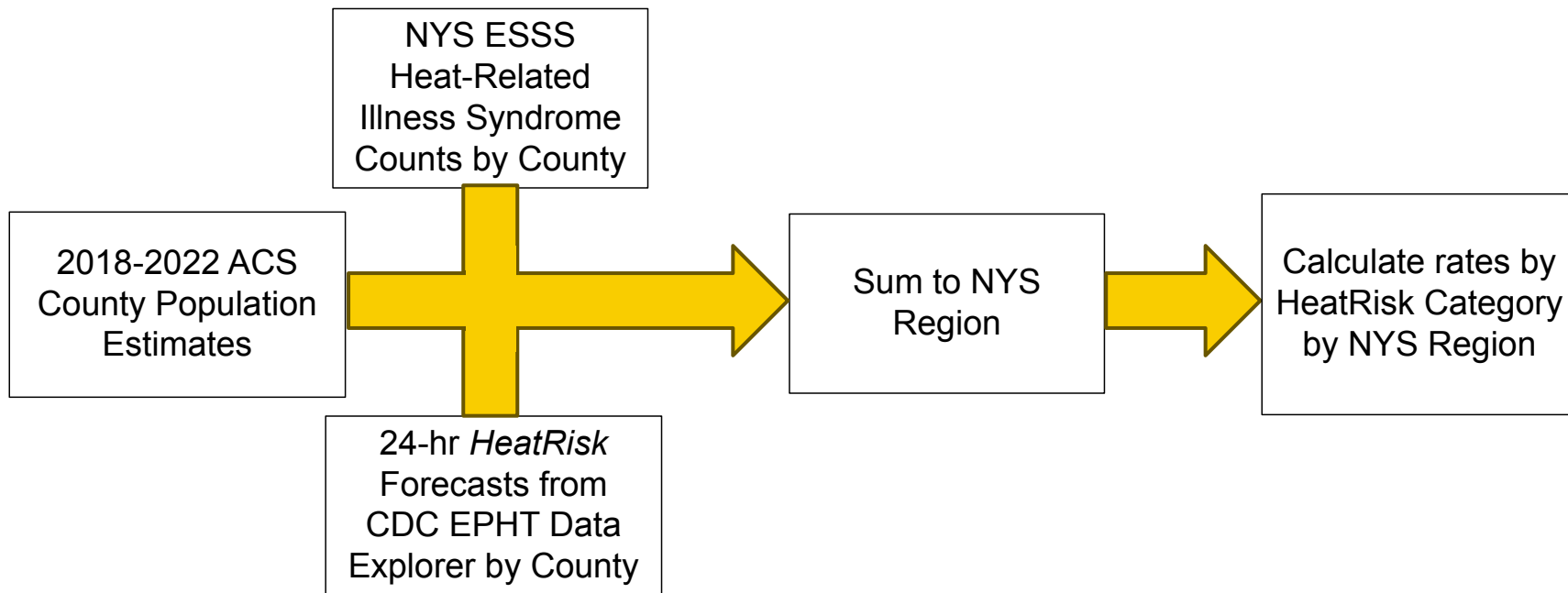
[Comments?](#) [Questions?](#) [Please Contact Us.](#)



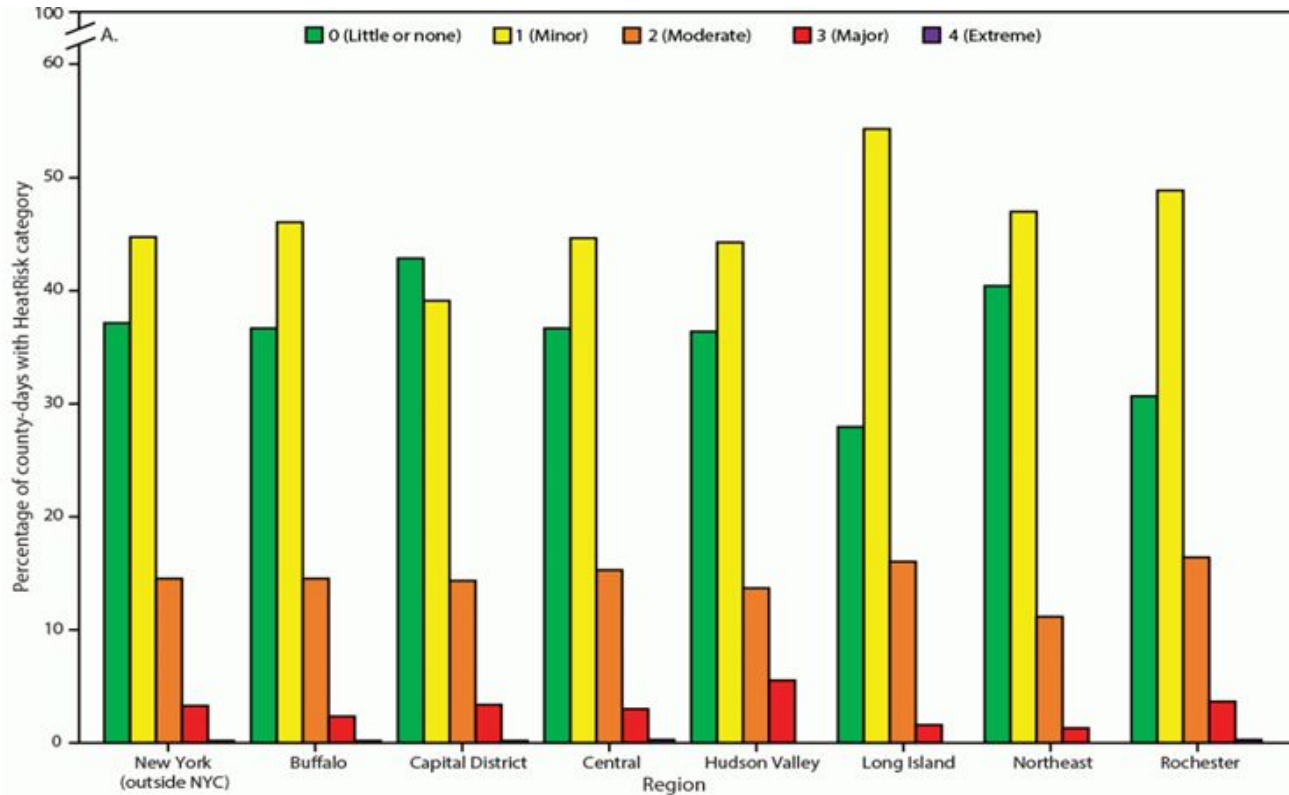
Map Overview What's in HeatRisk? Understanding HeatRisk CDC-NWS Collaboration Verification Additional Resources



ASSESSING HEATRISK FOR NYS



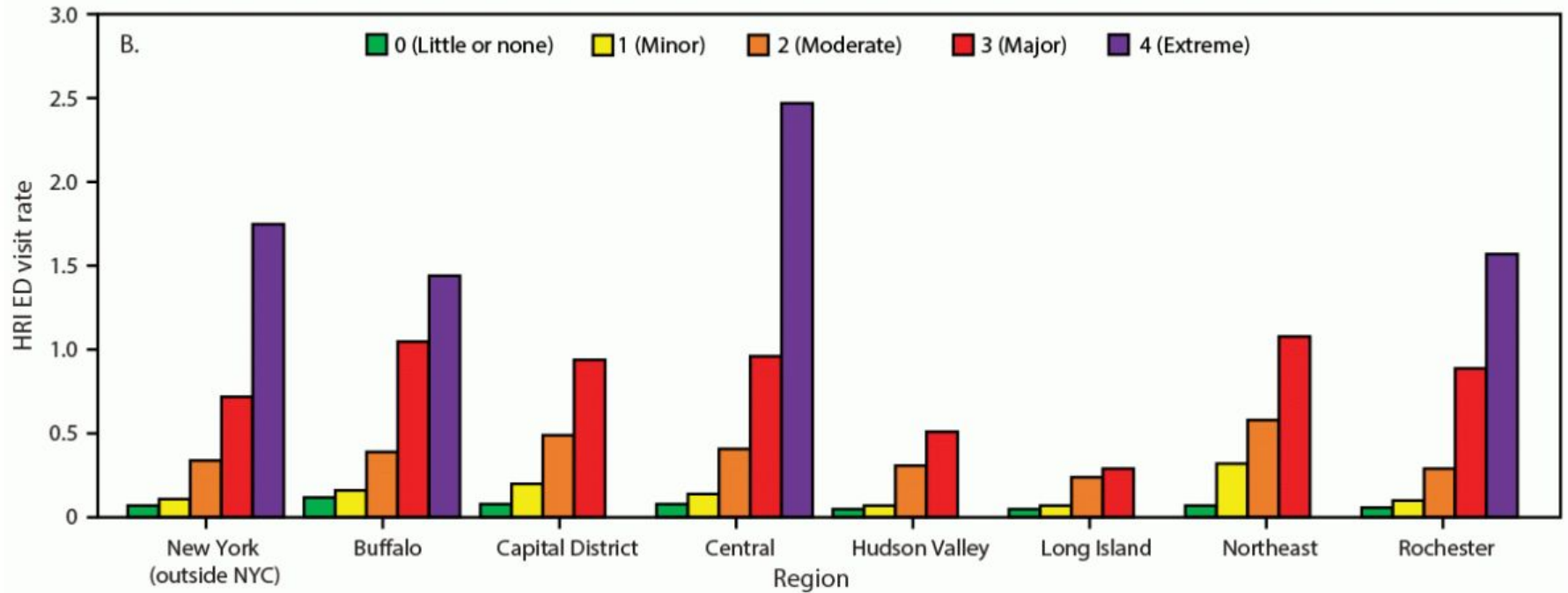
COUNTY DAYS BY *HEATRISK* LEVEL



Department of Health

Source: Muscatiello NA, Hsu W, Aydin-Ghormoz H, et al. Notes from the Field: HeatRisk Forecasts and Emergency Department Visits for Heat-Related Illness — New York, May–September 2024. *MMWR Morb Mortal Wkly Rep* 2025;74:302–304.

HEAT-RELATED ILLNESS RATES BY *HEATRISK* LEVEL



Department
of Health

Source: Muscatiello NA, Hsu W, Aydin-Ghormoz H, et al. Notes from the Field: HeatRisk Forecasts and Emergency Department Visits for Heat-Related Illness — New York, May–September 2024. *MMWR Morb Mortal Wkly Rep* 2025;74:302–304.

NYS HEAT RISK AND ILLNESS DASHBOARD

Extreme heat is the leading cause of weather-related deaths in the U.S and New York State. View outdoor weather heat conditions and heat-related illness in New York State excluding [New York City](#). Data are available May 1 - September 30 during hot weather.

The New York State Heat Risk and Illness Dashboard uses data from the [National Weather Service](#), and the [New York State Mesonet Early Warning Weather Detection System](#) (via the New York State Weather Risk Communication Center), and the New York State Department of Health.

State Dashboard

Go to County Dashboard

Heat Risk Forecast, New York State

Updated 9/2/2025

Heat-related illness can be dangerous. Heat stroke, heat stress, dehydration, and dizziness increase with temperature. Your age, overall health, activity level, and access to air conditioning also can put you at higher risk of getting sick from heat.

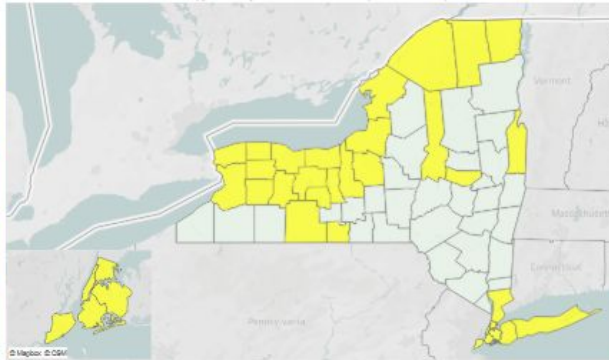
This map shows the risk of getting sick from heat. It considers temperature and humidity, duration of heat, and people's underlying health. Select a date from the dropdown menu and plan ahead to adjust your activities when it's hot.

Select Forecast Date

9/2/2025

Hover over a county for more information. Click on a county to see the county dashboard.

Risk of Heat-Related Illness	Who is at risk and what to do?
Little to no risk 0	Minimal elevated risk. Learn more about what to do when it gets hot .
Minor 1	People extremely sensitive to heat, such as older adults with underlying health conditions, should take breaks and drink plenty of fluids.
Moderate 2	People sensitive to heat and healthy individuals working or playing outdoors should take more frequent breaks and drink plenty of fluids.
Major 3	Everyone can be affected and should take breaks and drink plenty of fluids. People sensitive to heat should adjust activities.
Extreme 4	Dangerous for everyone. Everyone should adjust activities, monitor health symptoms, and spend more time in air conditioning.



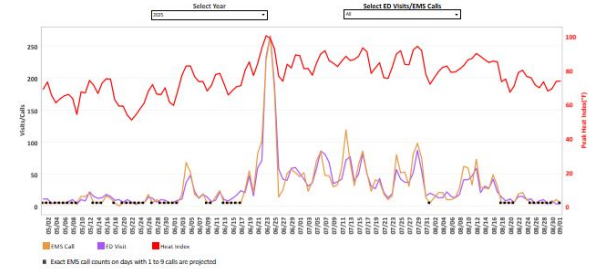
Note: Visit [NWS HeatRisk](#) for the most recent forecast



Heat-related Emergency Care and Heat Index, New York State excluding NYC

Updated 9/2/2025

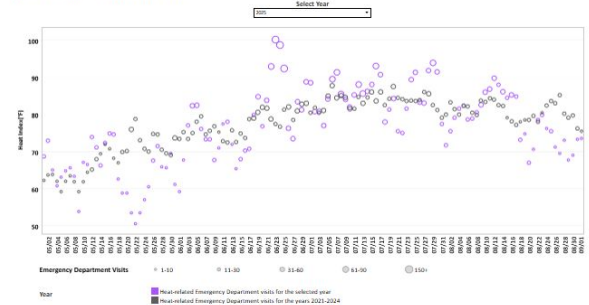
During extreme heat, more people are likely to seek emergency services due to heat-related illness. View daily emergency department (ED) visits, emergency medical services (EMS) calls and heat index in New York State excluding [New York City](#). Heat index (real-heat temperature) is hotter than temperature because it considers humidity.



Heat-related Emergency Department Visits and Peak Heat Index, New York State excluding NYC

Updated 9/2/2025

This chart shows how heat index influences the number of heat-related emergency department visits compared to historical data for the same day. Larger circles correspond to more emergency department visits.



Source: https://www.health.ny.gov/statistics/environmental/heat_dashboard/

INTEGRATION IN PLANNING

- Reference in several NYS Extreme Heat Action Plan recommendations
- Some county planning activation of cooling centers based upon the *HeatRisk* forecast
- “Major”/“Extreme” *HeatRisk* forecasts are signal for e-mail to local agency cooling center contacts requesting updates to available locations
- Promoted in Department extreme heat press releases and as part of extreme heat social media campaign
- Heat Risk and Illness Dashboard referenced as resource in updates to Extreme Weather Annex of the Department’s Health Emergency Preparedness and Response Plan



**Department
of Health**

NWS Seattle - Partner HeatRisk Applications

1. Overview of NWS HeatRisk Values:		Who/What is at Risk:	is this ree- King County
Merical Value	Meaning		
0	<ul style="list-style-type: none"> Level of heat poses little to no risk Heat of this type is tolerated by most; however, there is a low risk for sensitive groups to experience health effects 	<ul style="list-style-type: none"> No elevated risk Primarily those who are extremely sensitive to heat 	Very common
1	<ul style="list-style-type: none"> Moderate risk for members of heat sensitive groups to experience health effects Some risk for the general population who are exposed to the sun and are active For those without air conditioning, living spaces can become uncomfortable during the day, but should cool below dangerous levels at night 	<ul style="list-style-type: none"> Primarily heat sensitive groups, especially those without effective cooling or hydration Some transportation and utilities sectors 	Fairly common for most locations
2	<ul style="list-style-type: none"> High risk for much of the population who are 1) exposed to the sun and active, or 2) are in a heat sensitive group Dangerous to anyone without proper hydration or adequate cooling High mortality is possible 	<ul style="list-style-type: none"> Much of the population, especially those who are heat sensitive and anyone without effective cooling or hydration Most transportation and utilities sectors 	Uncommon for most locations

NWS HeatRisk Values	INITIATE EARLY WARNING, PUBLIC MESSAGING, AND RECOMMENDATIONS
2 Moderate	<ul style="list-style-type: none"> Recommend sharing information about available cooling locations with conditioning or cooling features such as water recreation facilities or other Recommend dissemination of key public health heat safety messaging, including those experiencing homelessness, older adults, children, and c Recommend reductions in strenuous outdoor children's activities Consider cancellation and/or rescheduling of outdoor activities Consider distribution of water and other cooling supplies for at-risk ci Consider activation of daytime cooling centers required to meet recom Consider undertaking preparation activities required to meet recom Monitor NWS HeatRisk forecast and alerts until forecast conditions yellow - or lower)
3 High	<ul style="list-style-type: none"> RECOMMEND ACTIVATION OF COOLING CENTERS & REDUC Continue outreach efforts to reach at-risk populations with risk Recommend activation of daytime cooling centers for unshelter Recommend temporary suspension of strenuous outdoor activ Recommend cancellation and/or rescheduling of outdoor activ Consider expanding hours of operation for cooling centers fo

Applied Lessons from the 2021 Pacific Northwest Heat Dome

2021 Pacific Northwest “Heat Dome”

New Washington All Time High Temperature

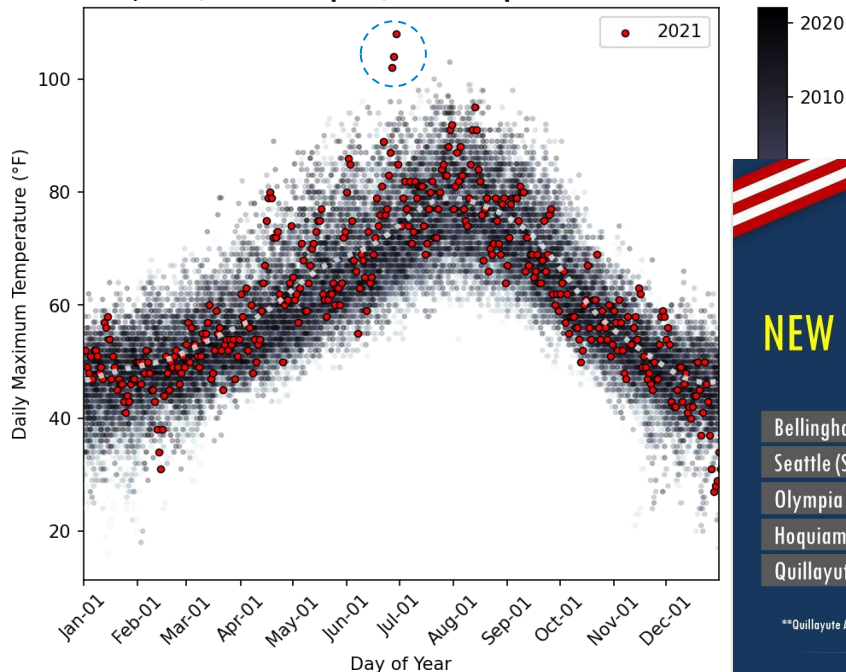
120°F

**Hanford, WA
June 29, 2021**

Beats the previous record of 118°F set at Wahluke, WA on July 24, 1928 and Ice Harbor Dam, WA on August 5, 1961.



Seattle, WA (SeaTac Airport) Max Temperatures 1945-2022



RECORD SUMMARY — JUNE 2021

NEW & EXISTING RECORDS

	FRI 6/25	SAT 6/26	SUN 6/27	MON 6/28	ALL OF JUNE	ALL TIME
Bellingham	86° ⁽²⁰²¹⁾	95° ⁽²⁰²¹⁾	95° ⁽²⁰²¹⁾	99° ⁽²⁰²¹⁾	99° ^(6/28/2021)	99° ^(6/28/2021)
Seattle (Sea-Tac)	96° ⁽²⁰¹⁷⁾	102° ⁽²⁰²¹⁾	104° ⁽²⁰²¹⁾	108° ⁽²⁰²¹⁾	108° ^(6/28/2021)	108° ^(6/28/2021)
Olympia	98° ⁽²⁰¹⁷⁾	102° ⁽²⁰²¹⁾	105° ⁽²⁰²¹⁾	110° ⁽²⁰²¹⁾	110° ^(6/28/2021)	110° ^(6/28/2021)
Hoquiam	82° ⁽²⁰¹⁷⁾	87° ⁽²⁰²¹⁾	103° ⁽²⁰²¹⁾	95° ⁽²⁰²¹⁾	103° ^(6/27/2021)	103° ^(6/27/2021)
Quillayute	86° ⁽²⁰¹⁷⁾	90° ^{(2021)**}	90° ^{(2021)**}	110° ⁽²⁰²¹⁾	110° ^(6/28/2021)	110° ^(6/28/2021)

In some cases, records may have occurred multiple times, only the most recent date is shown in the table above.

**Quillayute ASOS experienced a data outage on 6/26-6/27. The highest temperature recorded both days was 90, which breaks/ties the existing records. However these observations may not be considered official due to the data outage.



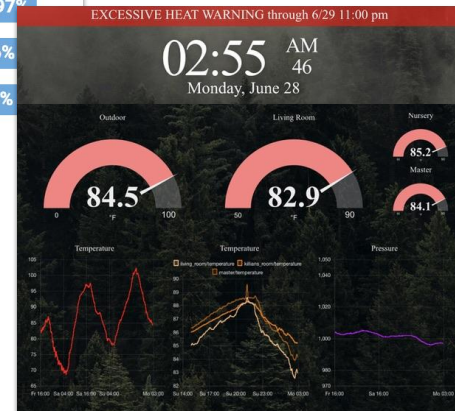
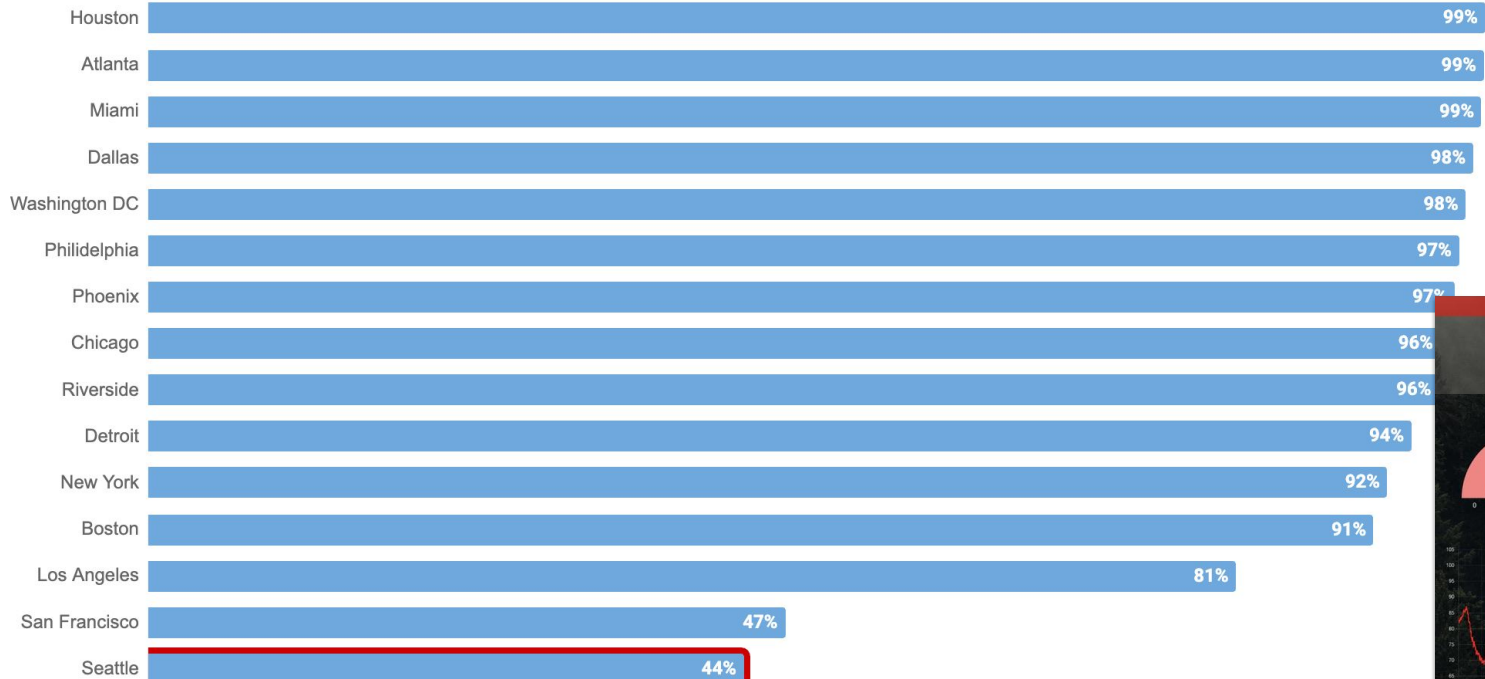
NATIONAL WEATHER SERVICE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Seattle, WA

7:50 AM — Tuesday, June 29, 2021

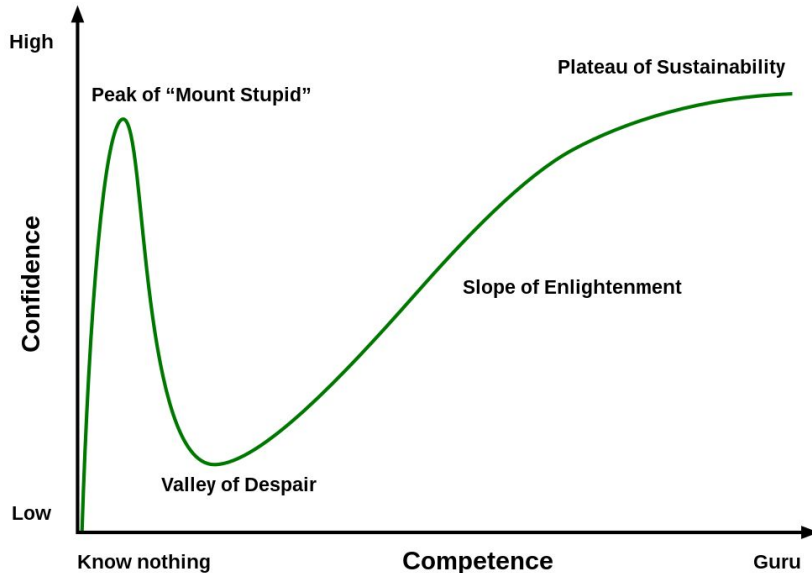
Heat in the PNW

Top 15 Metro Areas: % of Households with Primary Air Conditioning (2019 American Housing Survey)



Making the Connection

Dunning-Kruger Effect



NWS

- Extreme Heat Workshop
- Realized immediately “we can’t do it alone”
 - Extreme heat is a public health emergency, just as much as it is a weather emergency
- First connection → Public Health Seattle & King County

Public Health

- Thresholds and guidance
- Research methodology

NWS & PH

- The First Draft©

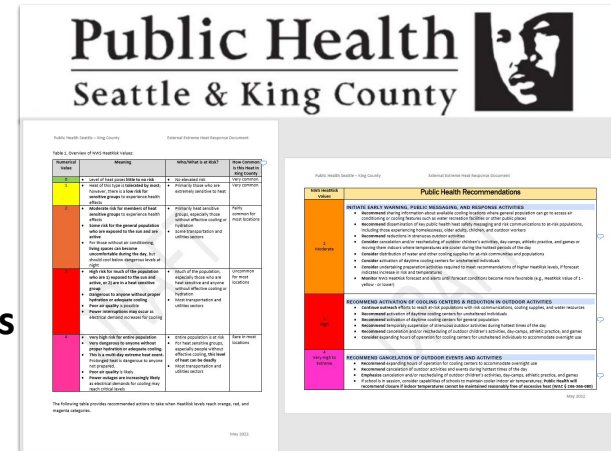
The Challenge

Challenge

- Lack of a consistent regional approach for implementation of heat response actions & messaging

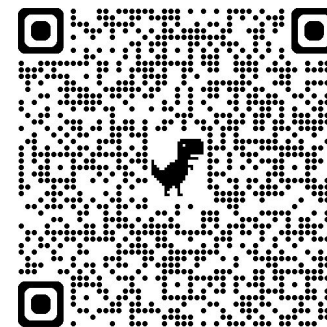
Solution

- Adoption of NWS HeatRisk as the metric that triggers response to create a science-based solution informed by both public health and meteorologic expertise
- **Response partners have a consistent guide to response actions - backed by science**



Public Health Recommended Heat Measures

NWS HeatRisk Values	Public Health Recommendations
<p style="text-align: center;">2 Moderate</p>	<p>INITIATE EARLY WARNING, PUBLIC MESSAGING, AND RESPONSE ACTIVITIES</p> <ul style="list-style-type: none"> • Recommend sharing information about available cooling locations where general population can go to access air conditioning or cooling features such as water recreation facilities or other public places • Recommend dissemination of key public health heat safety messaging and risk communications to at-risk populations, including those experiencing homelessness, older adults, children, and outdoor workers • Consider limiting strenuous outdoor activities during the hottest period of the day • Consider cancellation and/or rescheduling of outdoor children's activities, day-camps, athletic practice, and games taking place during the hottest period of the day or consider moving them indoors where temperatures are cooler • Consider distribution of water and other cooling supplies for at-risk communities and populations • Consider activation of daytime cooling centers for unsheltered individuals • Consider undertaking preparation activities required to meet recommendations of higher HeatRisk levels, if forecast indicates increase in risk and temperatures • Monitor NWS HeatRisk forecast and alerts until forecast conditions become more favorable (e.g., HeatRisk Value of 1 - yellow - or lower)
<p style="text-align: center;">3 Major</p>	<p>RECOMMEND ACTIVATION OF COOLING CENTERS & REDUCTION IN OUTDOOR ACTIVITIES</p> <ul style="list-style-type: none"> • Continue outreach efforts to reach at-risk populations with risk communications, cooling supplies, and water resources • Recommend activation of daytime cooling centers for unsheltered individuals • Recommend activation of daytime cooling centers for general population • Recommend temporary suspension of strenuous outdoor activities during hottest times of the day • Recommend cancellation and/or rescheduling of outdoor children's activities, day-camps, athletic practice, and games • Recommend conducting wellness checks on elders and people living with disabilities to ensure access to air conditioning or cooling centers • Consider expanding hours of operation for cooling centers for unsheltered individuals to accommodate overnight use • Consider capabilities of schools to maintain cooler indoor air temperatures if school is in session; Public Health will recommend closure if indoor temperatures cannot be maintained reasonably free of excessive heat (WAC § 246-366-080)
<p style="text-align: center;">4 Extreme</p>	<p>RECOMMEND CANCELATION OF OUTDOOR EVENTS AND ACTIVITIES</p> <ul style="list-style-type: none"> • Recommend expanding hours of operation for cooling centers to accommodate overnight use • Recommend cancellation of outdoor activities and events during hottest times of the day



[Public Health Seattle & King County Heat Recommendations](#)

Adoption & Feedback

- Framework has been adopted by Washington State Department of Health as well as numerous counties, cities, & tribes in Washington with word spreading beyond WA.
 - Regularly used for special event planning
- Overwhelmingly positive feedback.
 - Emergency Management in particular has provided feedback that this framework takes the guesswork out of the process
- Numerous Requests for ColdRisk and a similar product for extreme cold.
 - Research is underway - cold is very different from heat in many aspects.

Probabilistic HeatRisk Prototype

Now Available!

This will allow you to dissect the range of possible outcomes for heat events.

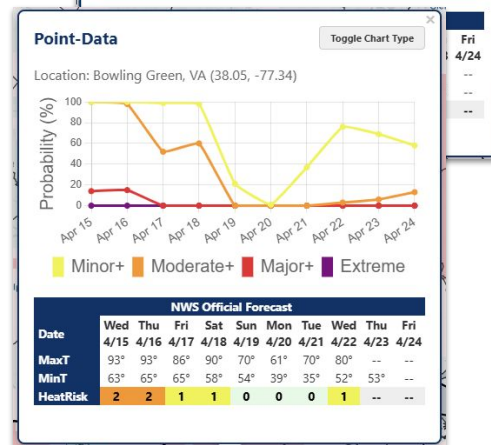
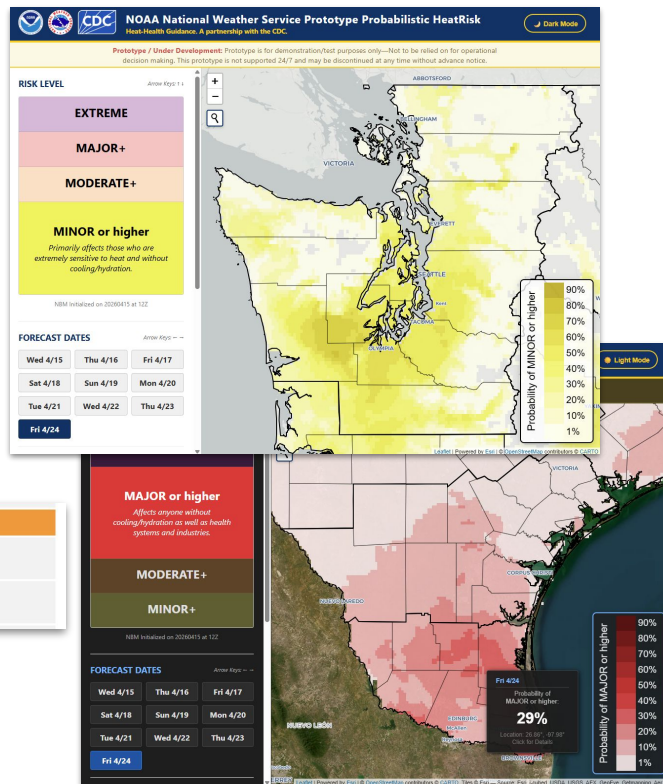
Probabilities will be based on the National Blend of Models (NBM) data.

NWS Seattle has already begun using this in partner briefings and will be using this tool for World Cup support this summer.

HeatRisk	Moderate (2)
Probability of Moderate HeatRisk	85%
Probability of Major HeatRisk	40%


If you find this page useful, please [submit feedback!](#)

Categorical Probability Maps



Distribution & Categorical Probability of Exceedance Point Charts

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

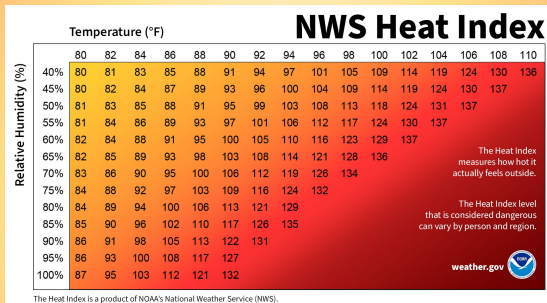
King County Regional Homelessness Authority:
 HeatRisk-based activation thresholds

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

Additional Heat Tools & Resources

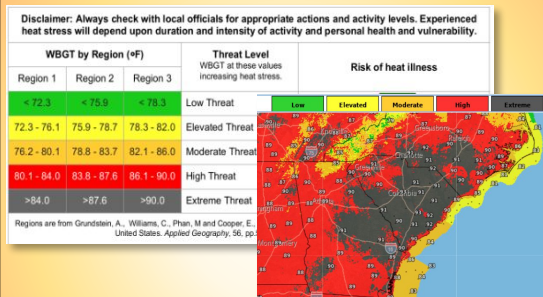
NWS Heat Forecast Tools

Heat Index



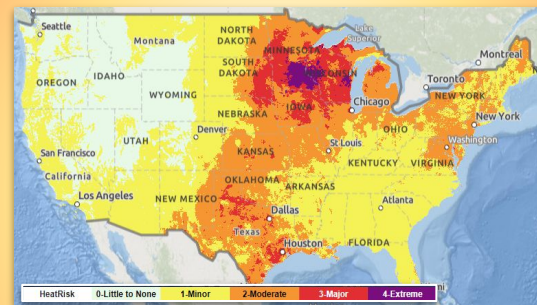
Heat in context for the **general public.**

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

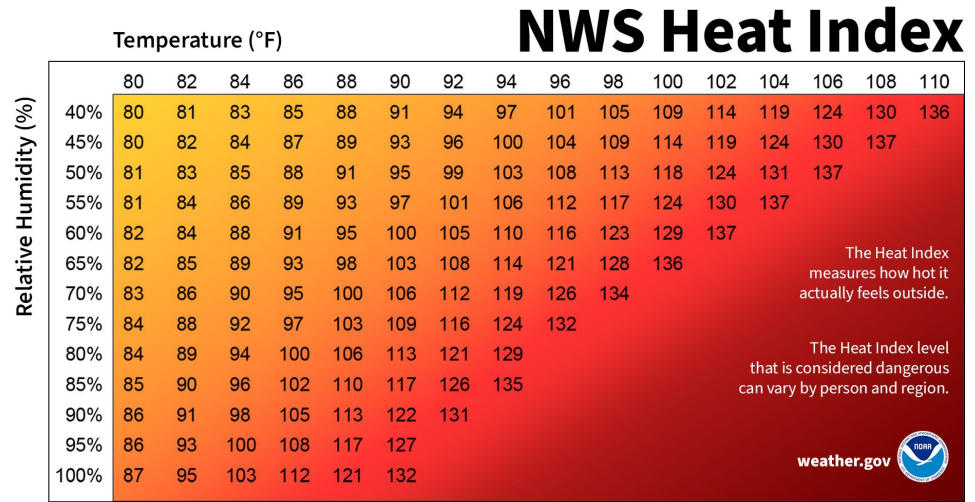
- NWS flagship heat stress indicator
- Provides a “feels like” temperature using relative humidity and temperature
- Calculated for shady areas with light winds and includes 21 other parameters and assumptions



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



The Heat Index is a product of NOAA's National Weather Service (NWS).

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	Increased risk for heat illness
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



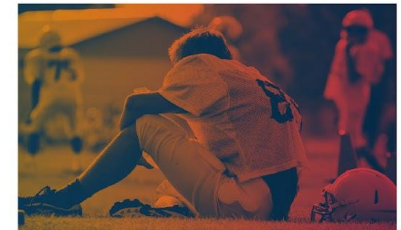
**Outdoor
Workers**



**People Doing Strenuous
Outdoor Activities**



**Active
People**



**Athletes and
Marching Band**

CDC's Heat-Health Tracker



U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

Home

Health Burden

Heat Exposure

Heat and Health Index

HeatRisk

About the Data

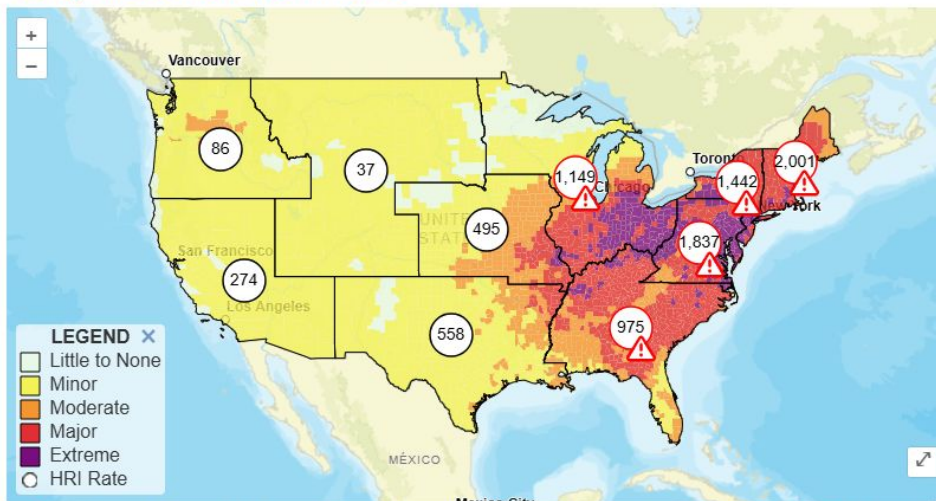
Learn More

Heat & Health Tracker

Health Burden

Understand the health impacts caused by heat across the nation. The following maps and charts show the current and historic burden of heat. Select different time frames to see the rates of emergency department visits associated with heat-related illness.

Daily Heat-Related Illness



Choose a date

6/24/2025



About the Data

This map shows the rate of emergency department (ED) visits associated with heat-related illness (HRI) per 100,000 ED visits by region. The regions are defined by [Health and Human Services](#) for the selected day using data available through the [National Syndromic Surveillance Program](#). Use the above dropdown to change the selected date. The colors on the map represent the [HeatRisk](#) category by county for the same day and year, using data from the National Weather Service.

<https://ephtracking.cdc.gov/Applications/heatTracker/>

CDC's Heat-Health Tracker



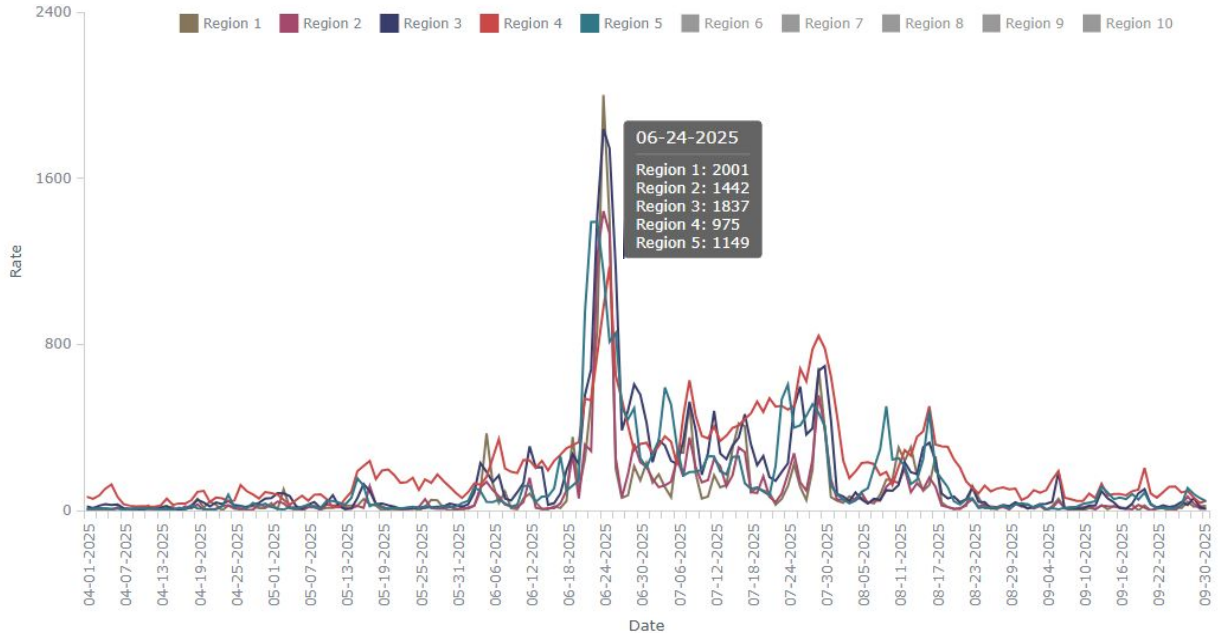
- Home
- Health Burden**
- Heat Exposure
- Heat and Health Index
- HeatRisk
- About the Data
- Learn More

Heat & Health Tracker

Health Burden

Daily Rates of Heat Related Emergency Department Visits by HHS Region

Choose a date range
4/1/2025 - 9/30/2025

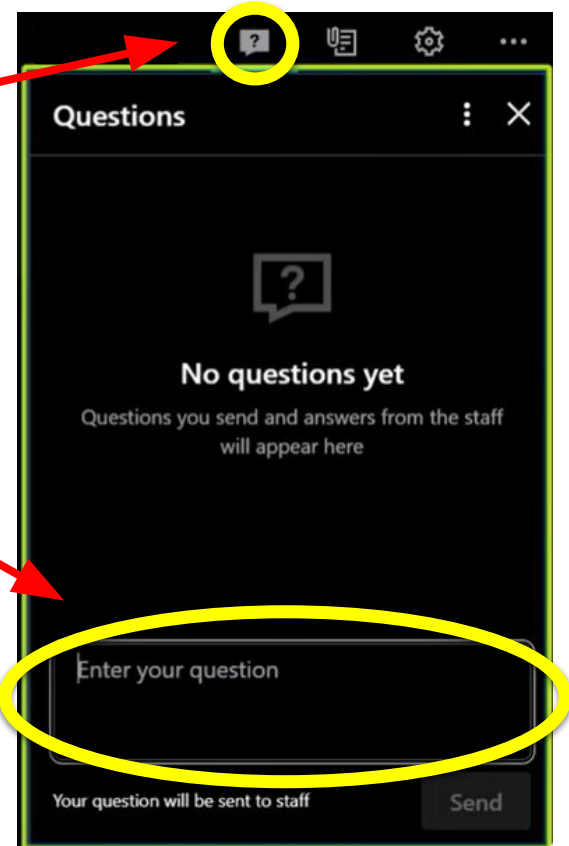


<https://ephtracking.cdc.gov/Applications/heatTracker/>

Questions?

To ask a question, open the Questions panel.

Type in your question and hit Send.



Contact us:



public.program@noaa.gov
nws.heatrisk@noaa.gov
ehnexus@cdc.gov

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the U. S. Centers for Disease Control and Prevention.