



**NATIONAL
WEATHER
SERVICE**

NWS Partners and Users Heat Webinar

April 20, 2023

NWS Public Weather Services Program



NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 1



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 until the open discussion at the end.
- Please use the **Question Box** or the **Hand-Raise Option** to ask questions.



Opening Remarks



Mike Coyne

Acting Chief Operations Officer
NOAA National Weather Service





Today's Speakers



Greg Carbin

WPC Chief of Forecast
Operations
NWS, NOAA



Kim McMahon

Public Weather Services
Program Manager
NWS, NOAA



Evan Oswald

Research Meteorologist
ERT/CPC, NWS, NOAA



Stephen Baxter

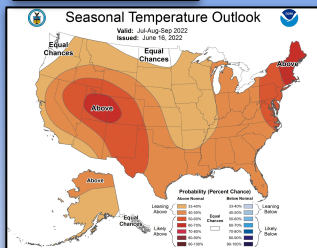
Climate Services Program
Manager
NWS, NOAA



National Weather Service

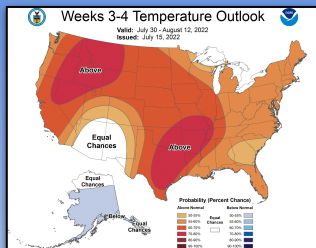
Impact-Based Decision Support Services and public messaging

Seasonal Outlooks



Monthly Outlooks

Weeks 3-4 Outlooks



Week 2 Outlooks

Day 1-7 Forecasts

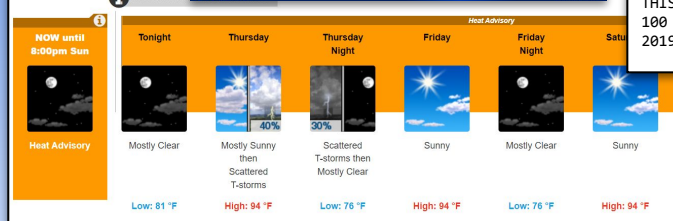
Watch,
Warning,
Advisory

Monitor,
Update,
Report

Monitor,
Update,
Report:
Validated
Observations &
After Action



Extended Forecast for Central Park NY



...RECORD HIGH TEMPERATURE SET AT ALBUQUERQUE NM...
A RECORD HIGH TEMPERATURE OF 102 WAS SET AT ALBUQUERQUE NM TODAY.
THIS BREAKS THE OLD RECORD OF 100 SET IN 2009, 2010 AND 2019.

Planning

Preparedness

Response

Recovery



NATIONAL WEATHER SERVICE



CPC = Climate Prediction Center

Mission: CPC delivers real-time products and information that predict and describe climate variations on timescales from weeks to years thereby promoting effective management of climate risk and a climate-resilient society.



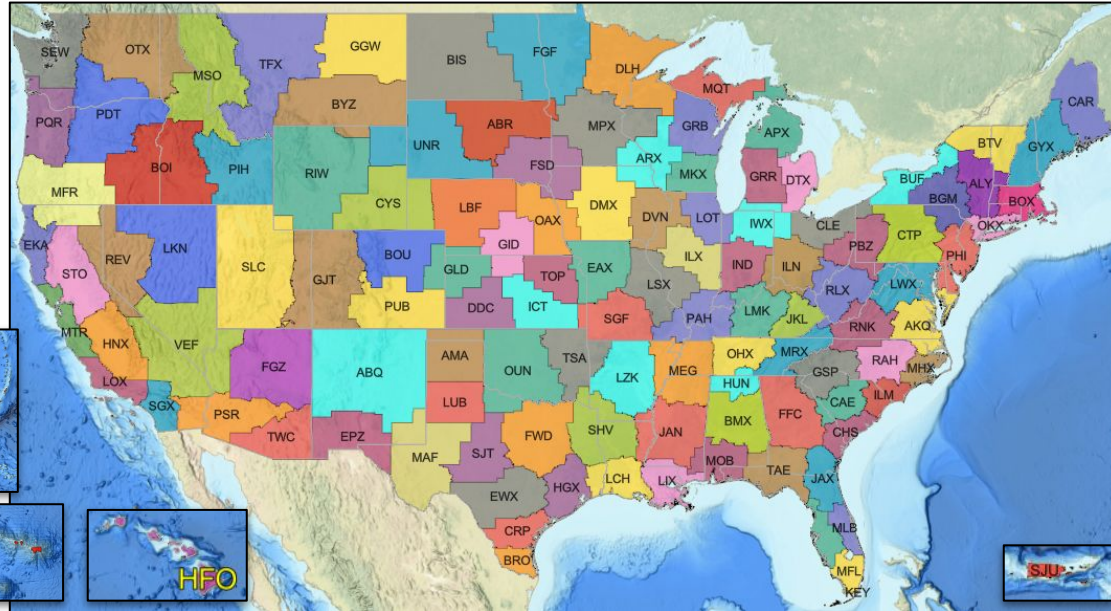
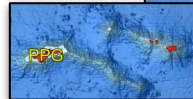
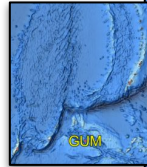
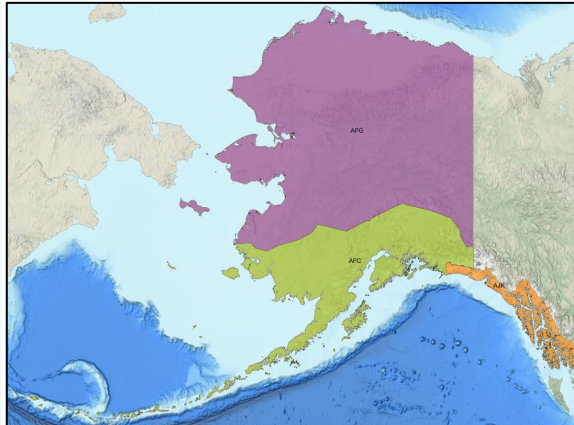
WPC = Weather Prediction Center

Mission: To synthesize the nation's daily weather story and champion the operational prediction of rain storms, winter storms, and extreme temperature events for the protection of life and property.



WFO = local Weather Forecast Office

122 local offices across the country providing local forecasts, impact-based decision support, watch, warning, and advisories for the protection of life and property.

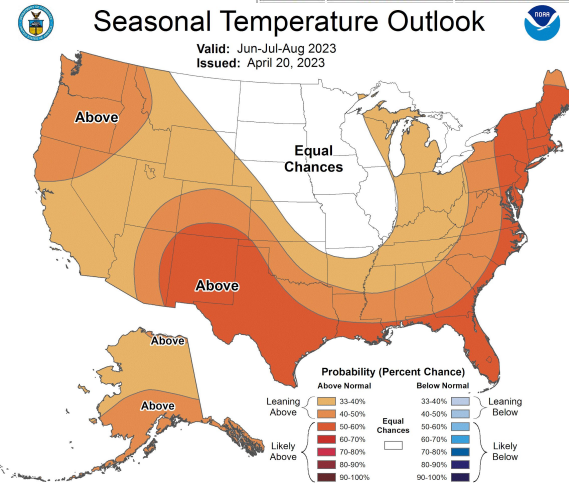
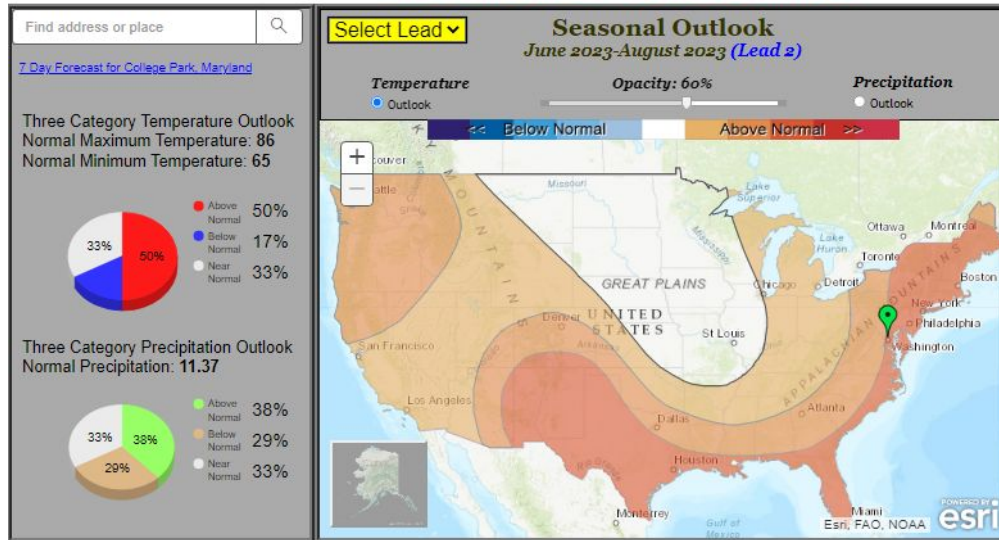


Seasonal Outlook

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/interactive/index.php

INTERACTIVE DISPLAY - UPDATED: 20 APR 2023



- Outlooks released every 3rd Thursday of the month (top right table) for the next 13 three-month seasons
- Forecasts available in interactive GIS tool (left figure) or static graphics (right figure)
- Forecasts can only **loosely** be interpreted as increased/decreased likelihood of hot days relative to normal

These forecasts show the probability of seasonal average temperatures being above, near, or below normal!

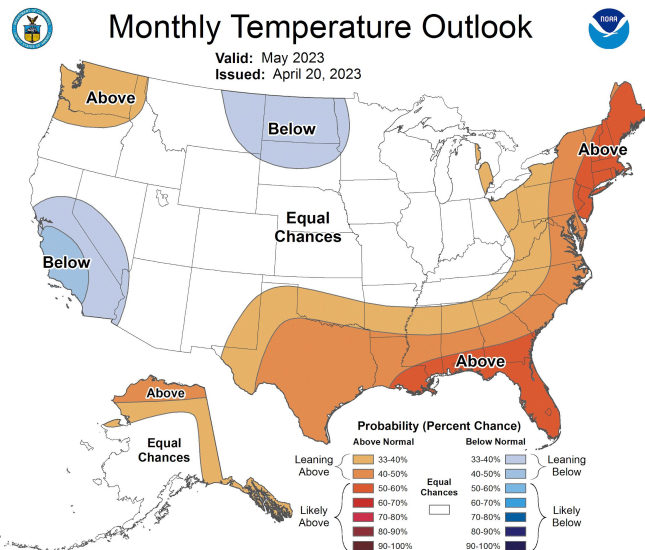
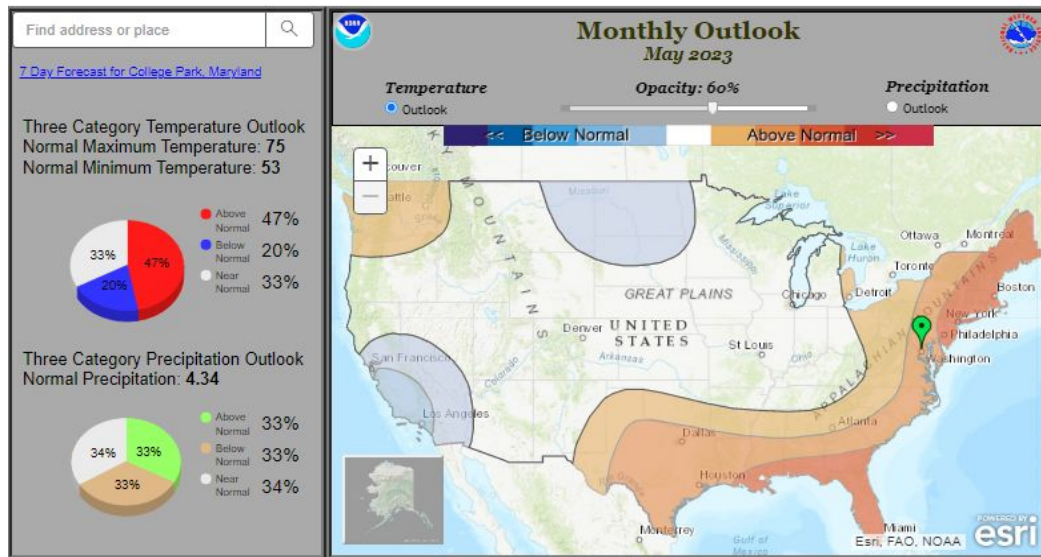
Monthly Outlook

<https://www.cpc.ncep.noaa.gov/products/predictions/30day/>

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/interactive/index.php



INTERACTIVE DISPLAY - UPDATED: 20 APR 2023



- Outlooks for next month are released **twice** a month (third Thursday and last day)
- Forecasts via interactive GIS tool (left) or static graphics (right)
- These can only **loosely** be interpreted as increased/decreased likelihood of hot days relative to normal

These forecasts show the probability of monthly average temperatures being above, near, or below normal!



NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 8



CDC Heat and Health Tracker



- Monthly Outlook of dangerous heat days (defined as county's 95% percentile value)



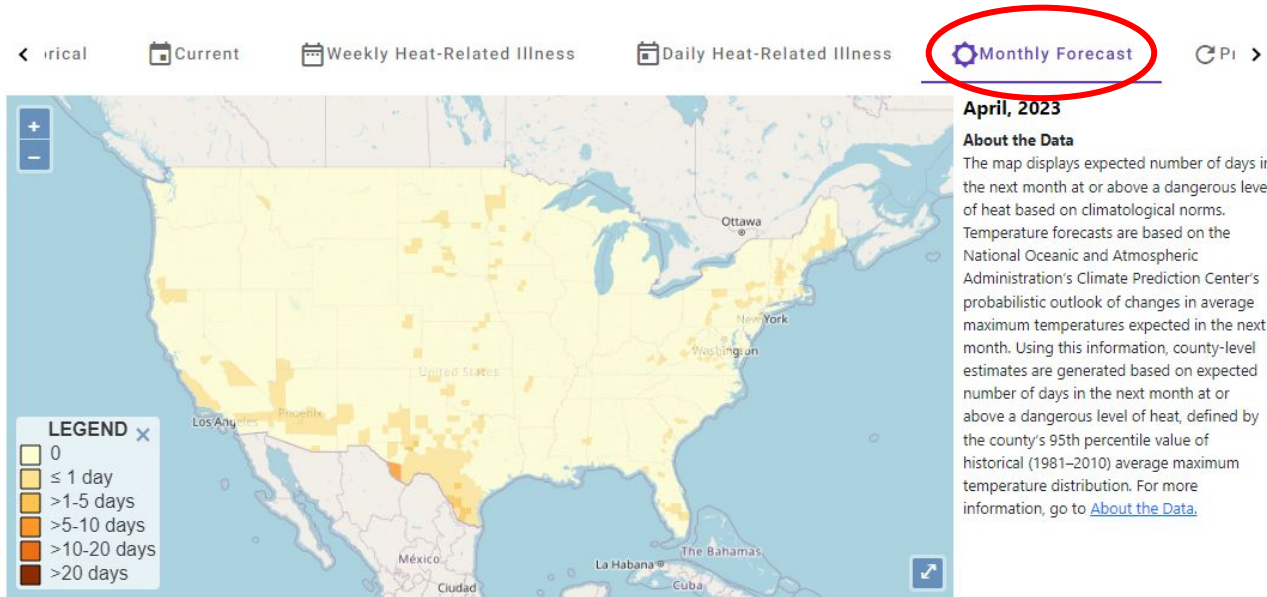
- Uses CPC Monthly Temperature Outlook



- Updates twice per month (third Thursday, and last day) with an outlook for the following month



- Available at <https://ephtracking.cdc.gov/Applications/heatTracker/>



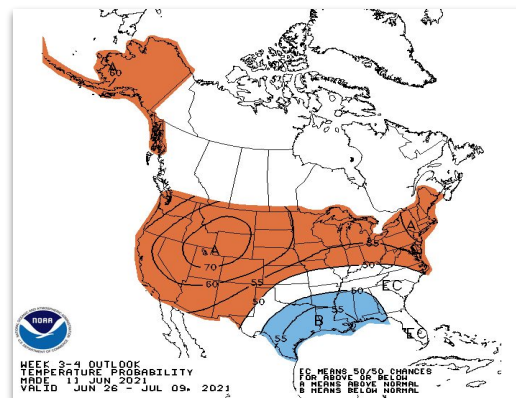
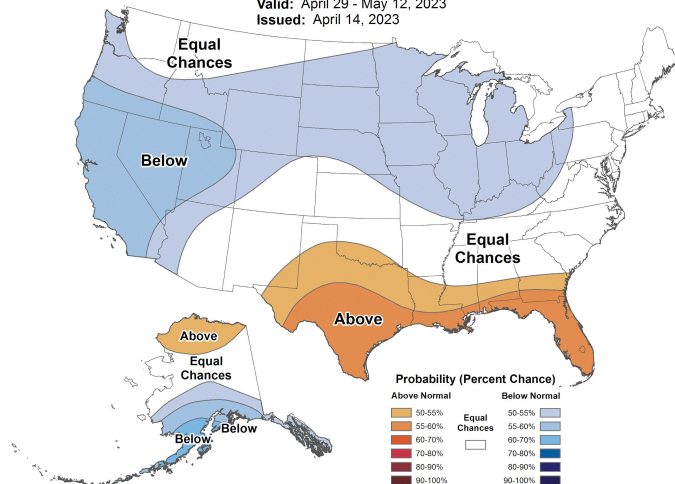
Weeks 3-4 Outlook

Front page: "Week 3-4 Outlooks"; <https://www.cpc.ncep.noaa.gov/products/predictions/WK34/>



Weeks 3-4 Temperature Outlook

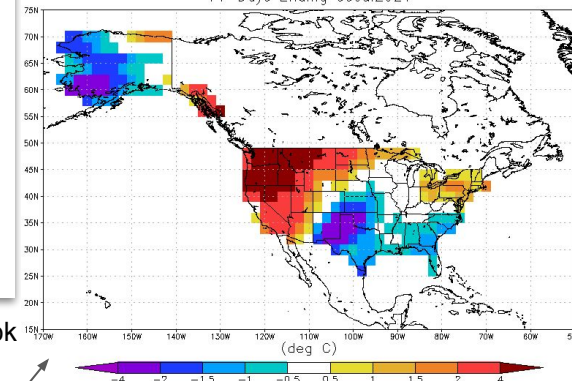
Valid: April 29 - May 12, 2023
Issued: April 14, 2023



Jun 11, 2021 Weeks 3-4 temperature outlook

2021 Heatwave of Pacific NW

Observed Temperature Anomalies
14-Days Ending 09Jul2021



Observed anomalies corresponding to Jun 11, 2021 outlook

- Forecasts are issued weekly (Friday at 3PM) as static graphics
- The maps can **more confidently** be interpreted as increased/decreased likelihood of hot days relative to normal

These forecasts show the probability of Weeks 3-4 average temperatures being above or below normal!

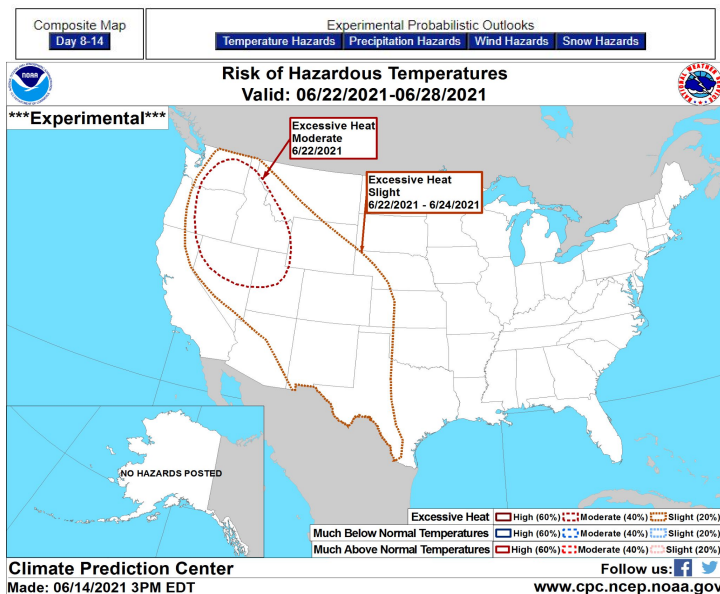
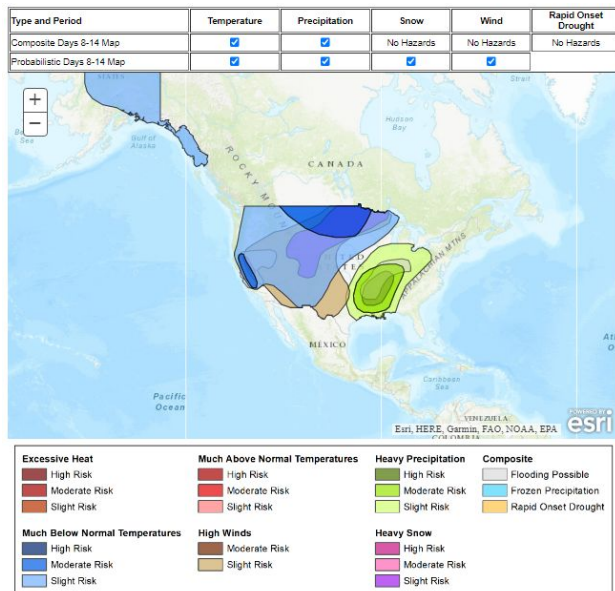


NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 10

Week 2 US Hazards outlook

Front page: “8-14 Day U.S. Hazards Outlook”; <https://www.cpc.ncep.noaa.gov/products/predictions/threats/threats.php>



Download Day 8-14 KML
Temperature
Precipitation
Snow
Wind
Rapid Onset Drought
Probabilistic Temperature
Probabilistic Excessive Heat
Probabilistic Precipitation
Probabilistic Snow
Probabilistic Wind
Hazards Forecast Archives
Model Guidance Tools
Probabilistic Extremes Tool

- Issued weekdays (M-F) at 3 PM in both interactive GIS interface (left) and as static graphics (middle)
- The temperature related hazards are ‘Excessive Heat’ and ‘Much Above Normal Temperatures’
- Probabilities in three levels: high, moderate, slight
- The associated forecast discussion provides additional information on context and impacts

These forecasts show the probability of extreme temperatures in Week 2!



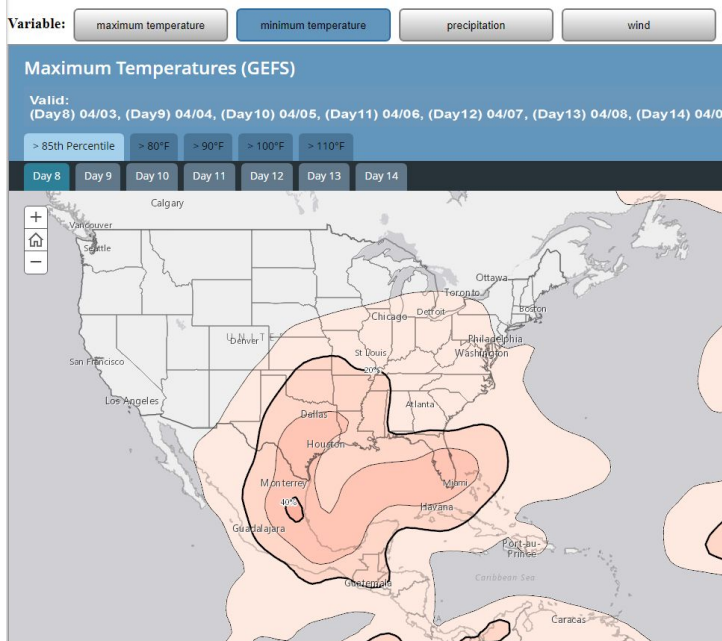
NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 11

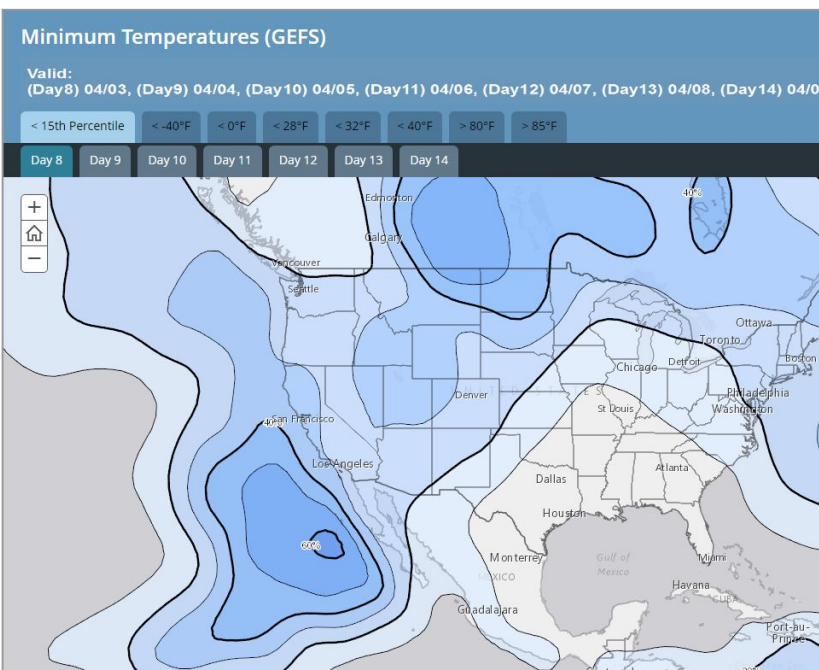


Week-2 Probabilistic Extremes tool

<https://www.cpc.ncep.noaa.gov/products/predictions/threats/extremesTool.php>



Feedback/questions send to: [Melissa Ou \(Melissa.Ou@noaa.gov\)](mailto:Melissa.Ou@noaa.gov) or [Adam Hartman \(Adam.Hartman@noaa.gov\)](mailto:Adam.Hartman@noaa.gov)



This is an interactive tool based on post-processed ensemble model output (GEFS). Probabilities are available by target date, maximum vs minimum temperatures and various thresholds. Thresholds both relative and absolute in nature.

These forecasts show the probability of individual days with extreme temperatures in Week-2!



NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 12

Climate Key Messages

Key Messages are provided on the CPC Home Page under “Climate News” (when active)



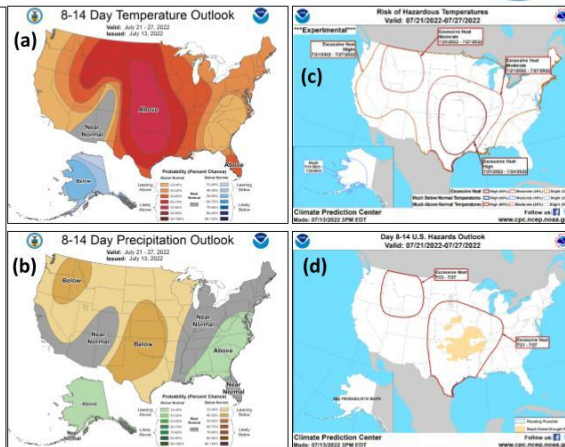
Extreme Heat to Continue to Impact the Central U.S. Next Week

Drought to Rapidly Develop in Some Areas



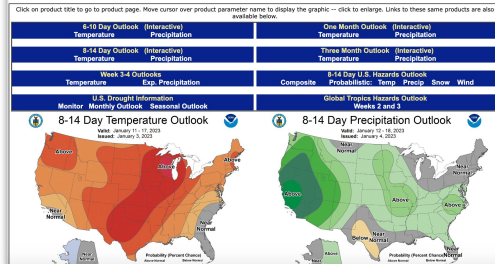
Key Messages

- ✓ Upper-level high pressure is forecast to expand over the central U.S. during week-2 resulting in hot and humid conditions coinciding with the hottest time of year climatologically (a).
- ✓ Temperatures are favored to range from the mid-90s to the mid-100s with heat index values ranging from 100 – 110 degrees.
- ✓ Greatest odds for the highest temperatures and impacts are for the central and southern Great Plains and Mississippi Valley (c).
- ✓ **Timing:** July 22 – July 28, but may persist through the remainder of July (into Week-3 time period).
- ✓ The excessive heat combined with current antecedent conditions and little rainfall forecast (b) is likely to lead to rapid development of drought conditions in the Central and Southern Plains and the Middle and Lower Mississippi Valley (d).
- ✓ Impacts to human health may be widespread and substantial agricultural impacts on crops and livestock are likely.



Climate News

- Hazardous Winds, Snow, and Rain Forecast to Continue over the West Coast, Possibly Exacerbating Flooding Risk
- La Niña is expected to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023. In February-April 2023, there is a 71% chance of ENSO-neutral (08 Dec 2022)
- NOAA Issues Winter Outlook (20 Oct 2022)
- 47th Climate Diagnostics and Prediction Workshop Announcement (15 Apr 2022)



- New product for **high confidence and high impact events**
- Provides shareable graphics, talking points and concise details surrounding event
- Similar to Key Messages that NHC and WPC issue for tropical storms and winter storms, respectively



NATIONAL WEATHER SERVICE



Key Messages - Future Evolution



- CPC and WPC are working together to define procedures for issuing **joint CPC/WPC key messages** for impactful extreme heat events that span the Week-1 and Week-2 interface
- This will ensure that our public, **impact-based** messaging is **event driven**, and that the NWS is providing our users with a **unified, actionable** message
- We plan to seek public comment on the current iteration of our Key Messages product; **stay tuned for this opportunity to provide your feedback!**

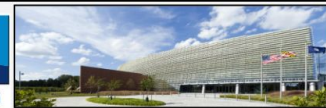


WPC Temp Forecasts & Resources



WEATHER PREDICTION CENTER

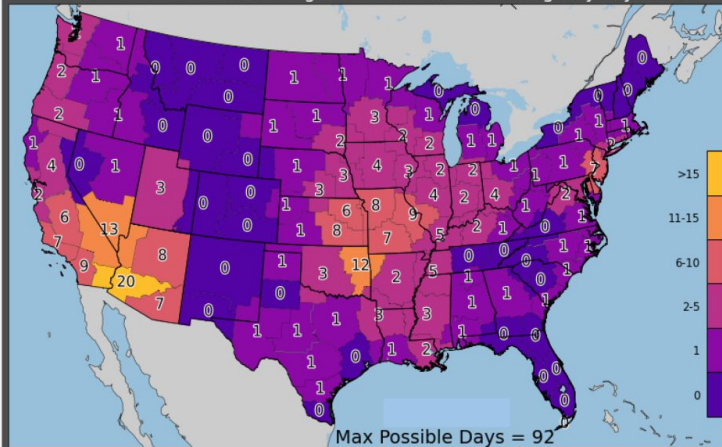
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



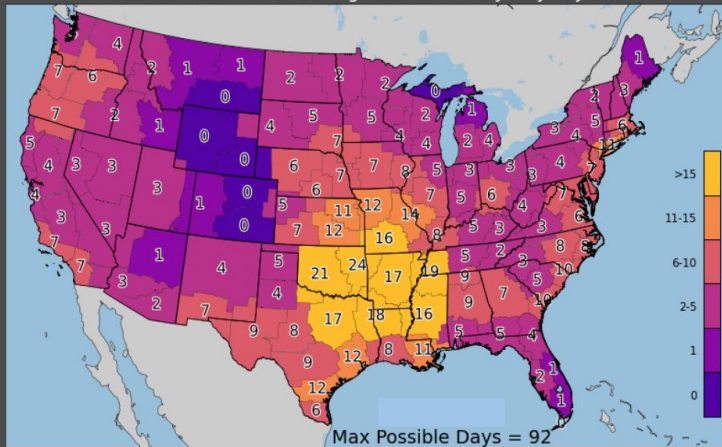
Heat is a Big Deal!

Expect Increasing Demand for NWS Forecasts and Services Related to Hot Weather

Summer 2010-2020 Average Excessive Heat Warning Days by CWA



Summer 2010-2020 Average Heat Advisory Days by CWA



How does NWS consistently deliver expertise to inform the public about the hazards associated with heat?
What can WPC do to better position the NWS in this important endeavour?



NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 15

WPC Temp Forecasts & Resources

https://www.wpc.ncep.noaa.gov/heat_index.shtml

WEATHER PREDICTION CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME **FORECASTS & ANALYSES** ARCHIVES VERIFICATION INTERNATIONAL DEVELOPMENT ABOUT SEARCH

Local Forecast Go

Forecast Table:
MAR 27: GHI, SIGHT, NO AREA
MAR 28: GHI, HIGH, NO AREA
MAR 29: GHI, HIGH, NO AREA

WPC'S MEDIUM RANGE HAZARDS FORECAST
WINTER STORM SEVERITY INDEX

Valid Mon Mar 27, 2023

WPC Top Stories:

Mesoscale Precipitation Discussion #0140 is currently in effect

Understanding WPC's Excessive Rainfall Risk Categories

Interactive National Forecast Chart + Additional Links

Tweets from @NWSWPC

NOAA NWS Weather Prediction Center

National Weather Service
Weather Prediction Center

Site Map News Organization

DOC NOAA NWS NCEP Centers: AWC CPC EMC NCO NHC OPC SPC SWPC WPC

Local forecast by "City, St" or Zip Code
City, St Go

Search WPC

HEAT INDEX FORECASTS (Days 3-7)

About These Products

- DAILY MAXIMUM Heat Index Forecasts
- DAILY MEAN Heat Index Forecasts
- DAILY MINIMUM Heat Index Forecasts
- GIS Formatted Heat Index Forecasts
- Preliminary (early) Deterministic Heat Index Forecasts
- Verification of Previous Summer Heat Index Forecasts
- HEAT: A Major Killer
- NOAA NWS Heat Index Chart

WPC Home
Analyses and Forecasts
National Forecast Charts
National High & Low
WPC Discussions
Surface Analysis
Days 1-2 CONUS
Days 3-7 CONUS
Days 4-8 Alaska
QPF
PQPF
Excessive Rainfall
Mesoscale Precip Discussion
Flood Outlook
Winter Weather
Storm Summaries
Heat Index

QR Code



NATIONAL WEATHER SERVICE

WPC Temp Forecasts & Resources

National Weather Service
Weather Prediction Center

Site Map News Organization

DOC NOAA NWS NCEP Centers: AWC CPC EMC NCO NHC OPC SPC SWPC WPC

Local forecast by "City, St" or Zip Code
City, St Go

Search WPC
Go

HEAT INDEX FORECASTS
(Days 3-7)

About These Products

DAILY MAXIMUM Heat Index Forecasts

DAILY MEAN Heat Index Forecasts

DAILY MINIMUM Heat Index Forecasts

GIS Formatted Heat Index Forecasts

Preliminary (early) Deterministic Heat Index Forecasts

Verification of Previous Summer Heat Index Forecasts

HEAT: A Major Killer

NOAA NWS Heat Index Chart

Local forecast by "City, St" or Zip Code
City, St Go

Search WPC
Go

WPC Home
Analyses and Forecasts
National Forecast Charts
National High & Low
WPC Discussions
Surface Analysis
Days 1-2 CONUS
Days 3-7 CONUS
Days 4-8 Alaska
QPF
PQPF
Excessive
Rainfall
Mesoscale Precip
Discussion
Flood Outlook
Winter Weather
Storm Summaries
Heat Index

MAXIMUM HEAT INDEX FORECASTS

[BACK TO THE MEAN, MINIMUM, MAXIMUM CHOICE PAGE](#)

[About These Products](#)

[Text of MAXIMUM Heat Index Probability Forecasts for Eastern US](#)

[Text of MAXIMUM Heat Index Probability Forecasts for Western US](#)

CLICK ON MAPS FOR MAXIMUM HEAT INDEX AND PROBABILITY FORECASTS FROM MON MAR 27 2023

MAXIMUM HEAT INDEX	95F THRESHOLD	100F THRESHOLD	105F THRESHOLD	110F THRESHOLD	115F THRESHOLD
THU MAR 30	THU MAR 30	THU MAR 30	THU MAR 30	THU MAR 30	THU MAR 30
FRI MAR 31	FRI MAR 31	FRI MAR 31	FRI MAR 31	FRI MAR 31	FRI MAR 31
SAT APR 01	SAT APR 01	SAT APR 01	SAT APR 01	SAT APR 01	SAT APR 01
SUN APR 02	SUN APR 02	SUN APR 02	SUN APR 02	SUN APR 02	SUN APR 02
MON APR 03	MON APR 03	MON APR 03	MON APR 03	MON APR 03	MON APR 03



WPC Temp Forecasts & Resources

MAXIMUM HEAT INDEX FORECASTS

[BACK TO THE MEAN, MINIMUM, MAXIMUM CHOICE PAGE](#)

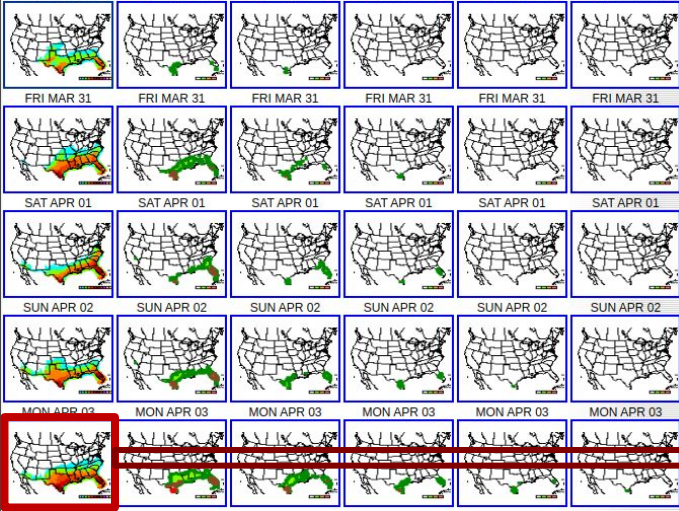
[About These Products](#)

[Text of MAXIMUM Heat Index Probability Forecasts for Eastern US](#)

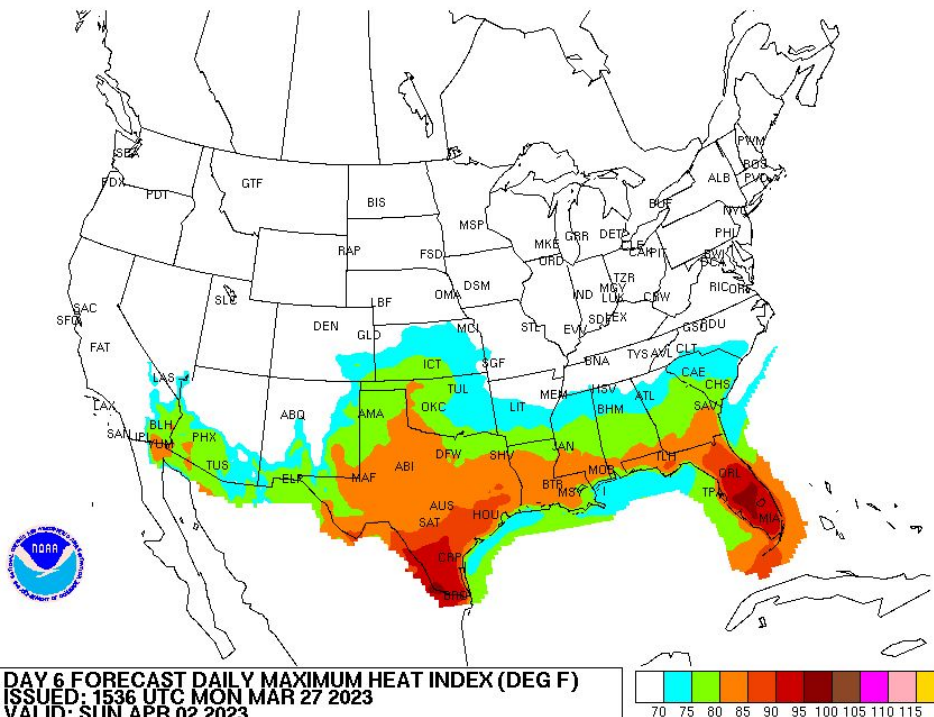
[Text of MAXIMUM Heat Index Probability Forecasts for Western US](#)

CLICK ON MAPS FOR MAXIMUM HEAT INDEX AND PROBABILITY FORECASTS FROM MON MAR 27 2023

MAXIMUM HEAT INDEX THU MAR 30 95F THRESHOLD THU MAR 30 100F THRESHOLD THU MAR 30 105F THRESHOLD THU MAR 30 110F THRESHOLD THU MAR 30 115F THRESHOLD



CLICK ON A CITY CODE FOR A TABLE OF FORECAST VALUES



NATIONAL WEATHER SERVICE

WPC Temp Forecasts & Resources

MAXIMUM HEAT INDEX FORECASTS

[BACK TO THE MEAN, MINIMUM, MAXIMUM CHOICE PAGE](#)

[About These Products](#)

[Text of MAXIMUM Heat Index Probability Forecasts for Eastern US](#)

[Text of MAXIMUM Heat Index Probability Forecasts for Western US](#)

CLICK ON MAPS FOR MAXIMUM HEAT INDEX AND PROBABILITY FORECASTS FROM MON MAR 27 2023

MAXIMUM HEAT INDEX THU MAR 30 THU MAR 30 THU MAR 30 THU MAR 30 THU MAR 30 THU MAR 30

95F THRESHOLD 100F THRESHOLD 105F THRESHOLD 110F THRESHOLD 115F THRE

FRI MAR 31 FRI MAR 31 FRI MAR 31 FRI MAR 31 FRI MAR 31 FRI MAR 31

SAT APR 01 SAT APR 01 SAT APR 01 SAT APR 01 SAT APR 01 SAT APR 01

SUN APR 02 SUN APR 02 SUN APR 02 SUN APR 02 SUN APR 02 SUN APR 02

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03 MON APR 03

CLICK ON A CITY CODE FOR A TABLE OF FORECAST VALUES

MAXIMUM HEAT INDEX
PROBABILITY OF MAXIMUM HEAT INDEX EXCEEDING:

115 F

110 F

105 F

100 F

95 F

90 F

85 F

80 F

THU

MAR 30

83 F

FRI

MAR 31

87 F

SAT

APR 01

94 F

SUN

APR 02

93 F

MON

APR 03

93 F

0 %

0 %

0 %

1 %

1 %

0 %

0 %

1 %

3 %

3 %

0 %

0 %

6 %

8 %

10 %

0 %

1 %

20 %

20 %

22 %

0 %

5 %

44 %

39 %

41 %

1 %

26 %

71 %

61 %

62 %

24 %

63 %

90 %

80 %

80 %

79 %

90 %

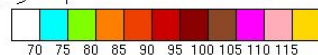
97 %

92 %

91 %



DAY 6 FORECAST DAILY MAXIMUM HEAT INDEX (DEG F)
ISSUED: 1536 UTC MON MAR 27 2023
VALID: SUN APR 02 2023
DOC/NOAA/NWS/NCEP
WEATHER PREDICTION CENTER



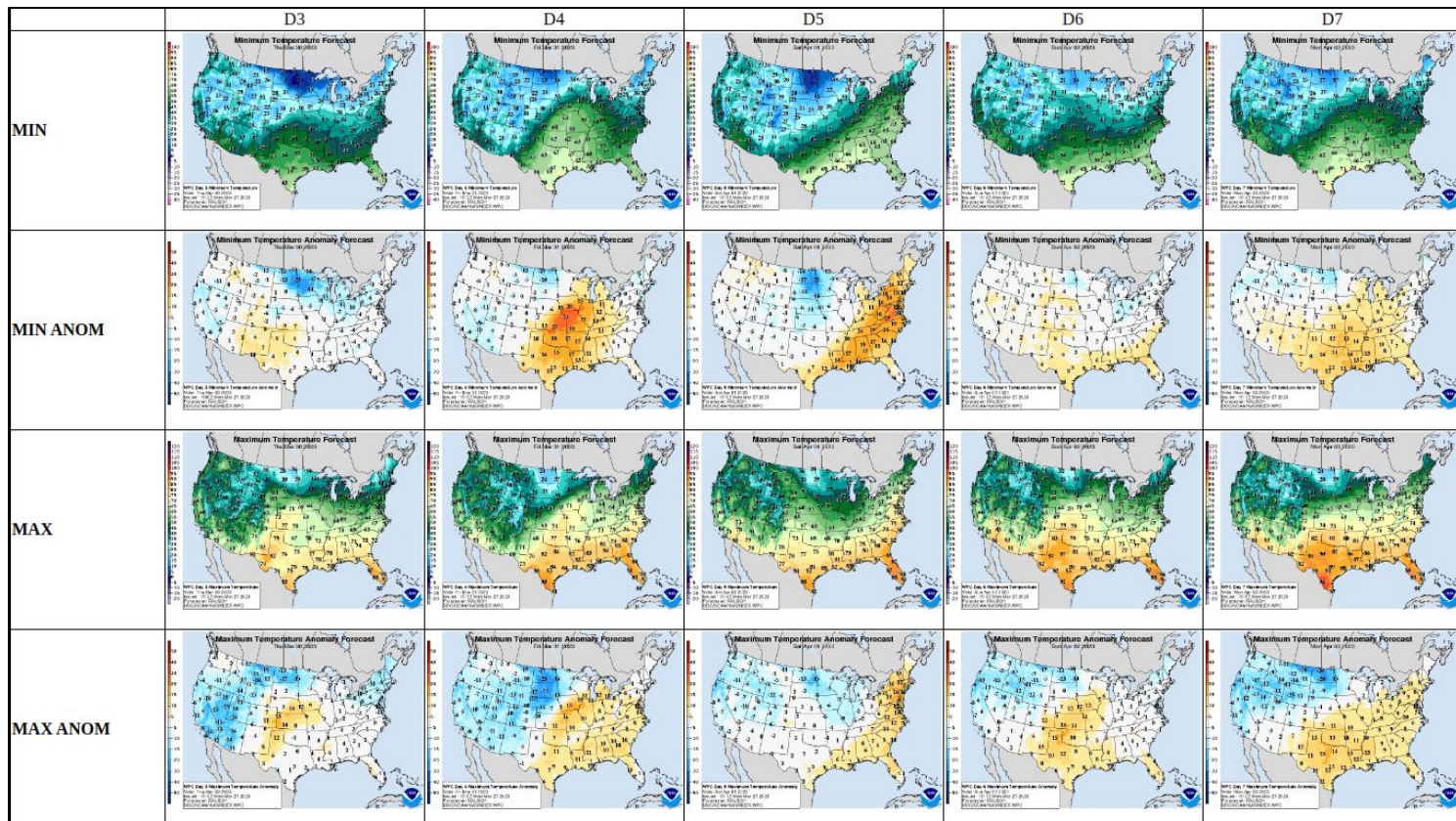
NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 19

WPC Temp Forecasts & Resources

https://www.wpc.ncep.noaa.gov/medr/medr_max.shtml

Medium Range
Temp Forecasts
(Days 3-7)




NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 20

WPC Temp Forecasts & Resources

<https://www.wpc.ncep.noaa.gov/threats/threats.php>



WEATHER PREDICTION CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NCEP: AWC · CPC · EMC · NCO · NHC · OPC · SPC · SWPC · WPC

HOME · FORECASTS & ANALYSES · ARCHIVES · VERIFICATION · INTERNATIONAL · DEVELOPMENT · ABOUT · SEARCH

HAZARD	MAR 27	MAR 28	MAR 29
EXCESSIVE RAINFALL	SLIGHT	SLIGHT	NO AREA
HEAVY SNOW (≥ 4")	HIGH	HIGH	HIGH
ICE (≥ 0.25")	NO AREA	NO AREA	NO AREA

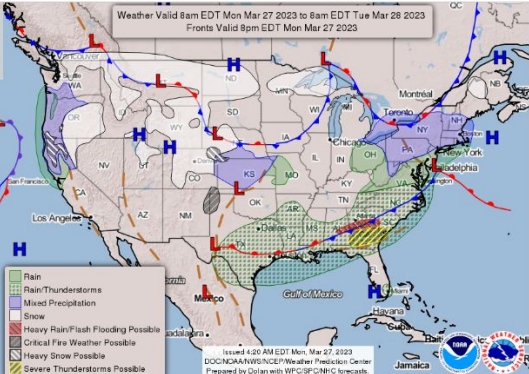
WPC'S MEDIUM RANGE HAZARDS FORECAST
WINTER STORM SEVERITY INDEX

Overview Surface Analysis Fronts QPF Excessive Rain Winter Wx Day 3-7 Forecast Tools

National Forecast Chart

Valid Mon Mar 27, 2023

Day 1 Day 2 Day 3




Options: Rain, Rain/Thunderstorms, Mixed Precipitation, Snow, Heavy Rain/Flash Flooding Possible, Critical Fire Weather Possible, Heavy Snow Possible, Severe Thunderstorms Possible

Issued 4:20 AM EDT Mon Mar 27 2023
DOC/NCA/NWS/NCEP/Weather Prediction Center
Prepared by Golan with WPC/S2P/CNHC forecasts
(Layout) Powered by EBC/USGS, MapServer by Bryan Dodge, CC BY 3.0 - MapData © OpenStreetMap

Interactive National Forecast Chart
Additional Links

WPC Top Stories:




Mesoscale Precipitation Discussion #0140 is currently in effect

Understanding WPC Excessive Rainfall Risk Categories

No Rainfall	SLIGHT	MODERATE	HEAVY
No Rainfall	Expected Rain: 0.5-1.0 inches	Expected Rain: 1.0-2.0 inches	Expected Rain: 2.0+ inches

Understanding WPC's Excessive Rainfall Risk Categories




Tweets from @NWSWPC

Follow

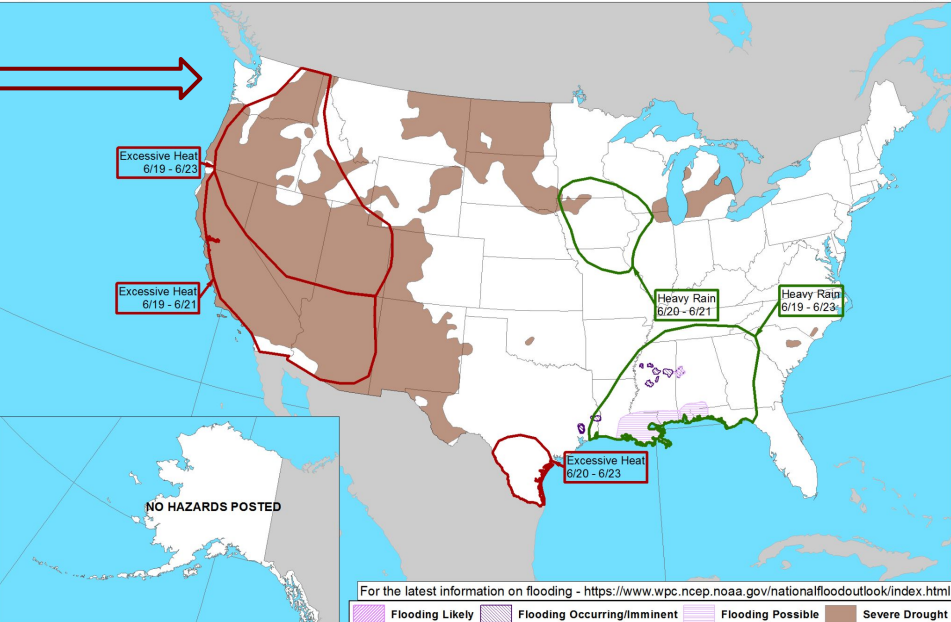
NWS Weather Prediction Center @NWSWPC · 1h
#WPC_MD 0140 affecting Southeast AL...Portions

NOAA NWS Weather Prediction Center
Follow Page 370K followers
1 hour ending 06 UTC, Mar. 26, 2023



Day 3-7 U.S. Hazards Outlook

Valid: 06/19/2021-06/23/2021



Excessive Heat 6/19 - 6/23

Excessive Heat 6/19 - 6/21

Heavy Rain 6/20 - 6/21

Heavy Rain 6/19 - 6/23

Excessive Heat 6/20 - 6/23





NO HAZARDS POSTED

For the latest information on flooding - <https://www.wpc.ncep.noaa.gov/nationalfloodoutlook/index.html>


Flooding Likely Flooding Occurring/Imminent Flooding Possible Severe Drought

Weather Prediction Center

Made: 06/16/2021 3PM EDT

Follow us:    

www.wpc.ncep.noaa.gov





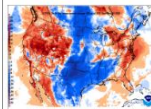
NATIONAL WEATHER SERVICE

Department of Commerce // National Oceanic and Atmospheric Administration // 21

WPC Temp Forecasts & Resources

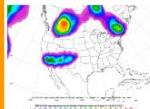
<https://www.wpc.ncep.noaa.gov/#page=tl5>

1/3/6/24-hr Changes



Change in weather parameters (temperature, dewpoint, surface pressure, etc) over the last 1/3/6/24 hours. Data is provided from the Real-Time Mesoscale Analysis (RTMA) or the Rapid Refresh (RAP).

GEFS Probabilities



Plots of GEFS probabilistic forecast of precipitation, temperature, and sea-level pressure exceeding various thresholds.

Local Storm Reports



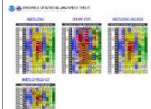
Custom plots of Local Storm Reports across the Contiguous United States. Reports include rain, snow, ice, and severe weather, as well as other significant information from storm spotters.

Experimental Extreme Precipitation Monitor



Displays the climatological significance of precipitation forecast by WPC. The climatological significance is represented by Average Recurrence Intervals (ARIs) of precipitation estimates from NOAA Atlas-14 and Atlas2.

Ensemble Situational Awareness Table



An interactive situational awareness table that displays anomalies, percentiles, and return intervals from the GEFS, NAEFS, and ECMWF Ensembles (login required to view ECMWF data).
*Please note that there is currently an issue where only users on a NOAA network can access this page. We are actively working to resolve this problem.

NDFD Forecast Temperature Records



Interactive display of where temperatures could approach or exceed records within the contiguous U.S. (based on NDFD temperature forecasts)

NWS NDFD Max/Min Temperatures and Departure from Normal



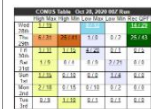
Displays Days 1-7 NDFD maximum and minimum temperatures, along with their respective departures from climatology.

Prototype Snowband Probability Forecasts



An interactive tool that depicts areas of heavy snowfall from individual members of high-resolution short range ensemble forecasts.

Weather in Context Prototype



Displays forecast information and its climatological context to quickly alert a forecaster when a record or near-record breaking event is possible. This tool is available for both CONUS and Alaska.



Early-Season Heat Wave Forecast Through Next Week

Fri, May 6, 2022
3 pm CDT

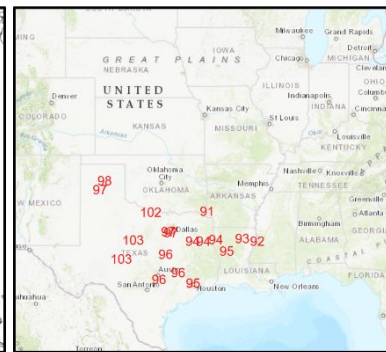
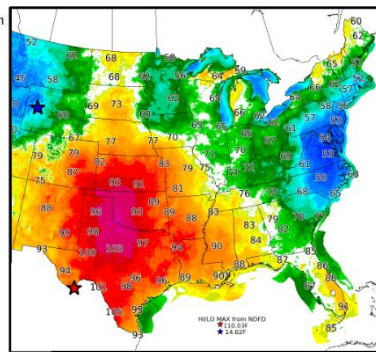
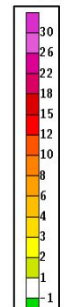
Heat Wave will expand from the Plains into the Mississippi Valley, Midwest, and Northeast.
Highs are forecast to break daily records for some locations.

NWS NDFD MAX High Temperature (F)
and Departure from Average (Fill)

Forecast Record or Near-Record MAX
High Temperatures (F)

Sunday May 8th

Departure from
average (F)



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

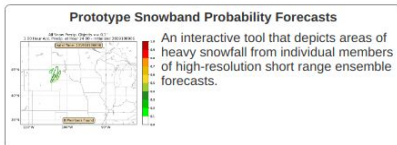
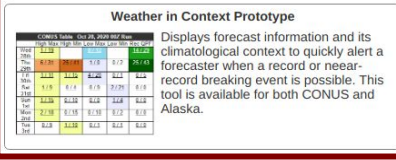
For more information go to:
www.wpc.ncep.noaa.gov and www.weather.gov

Weather Prediction Center
College Park, MD



NATIONAL WEATHER SERVICE

可也

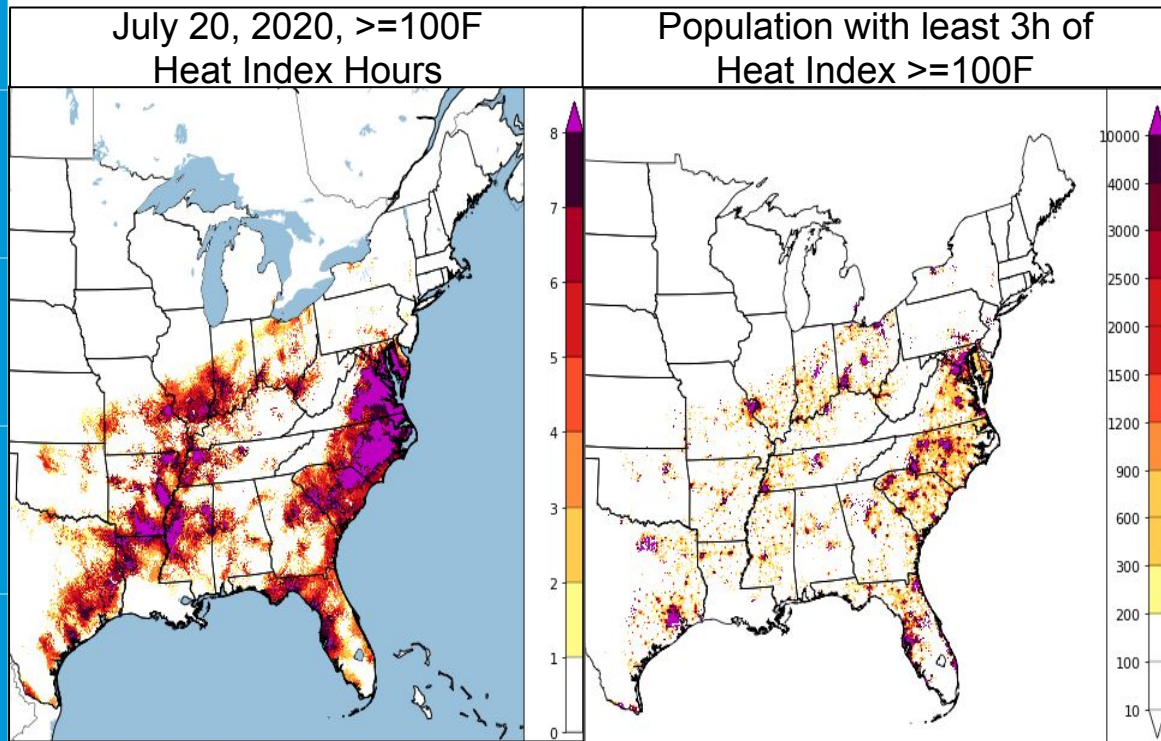




WPC Temp Forecasts & Resources



Future Heat Wave Visualization, Messaging, & Talking Points



WPC developed **talking points** and social media **key messages** during some of the more significant heat outbreaks of 2021.

Information included:

- **Pop. Statistics in WWA**
- **Temp Records and Context**
- **Heat and its Impacts FAQ**
- **NWS Safety Messaging**

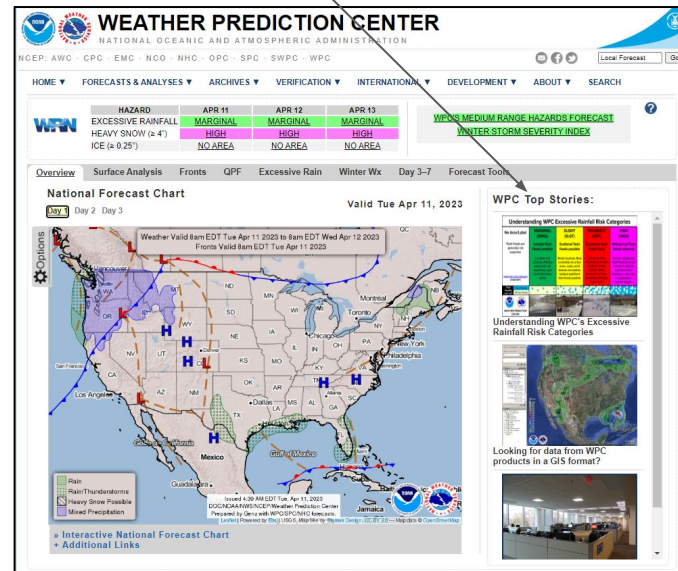
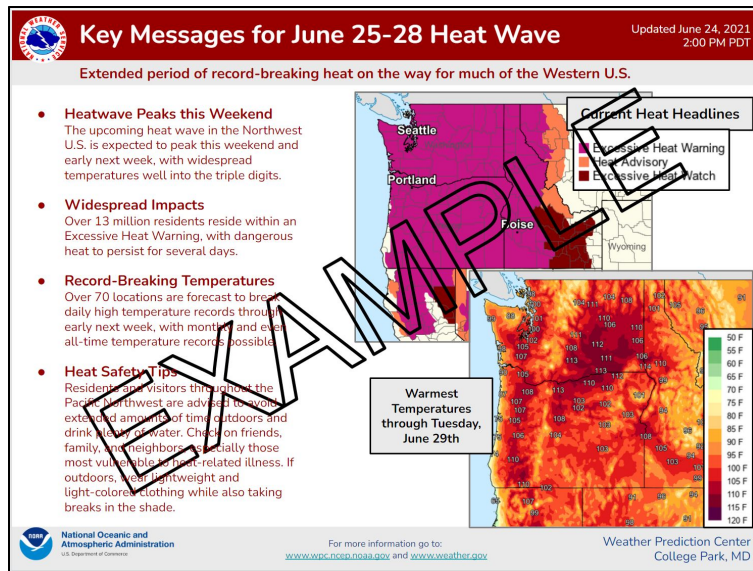
WPC resources for the field (Forecast Tools Page):

- **Situational Awareness Tables**
- **NDFD Max/Min Records Page**
- **Weather in Context Viewer**



WPC Temperature Key Messages

Key Messages are provided on the WPC Home Page under “Top Stories” (when active)



- New product for **high confidence and high impact events (roll over from CPC Key Messages for Heat)**
- Provides shareable graphics, talking points and concise details surrounding event
- Similar to Key Messages NHC and WPC issue for tropical storms and winter storms, respectively



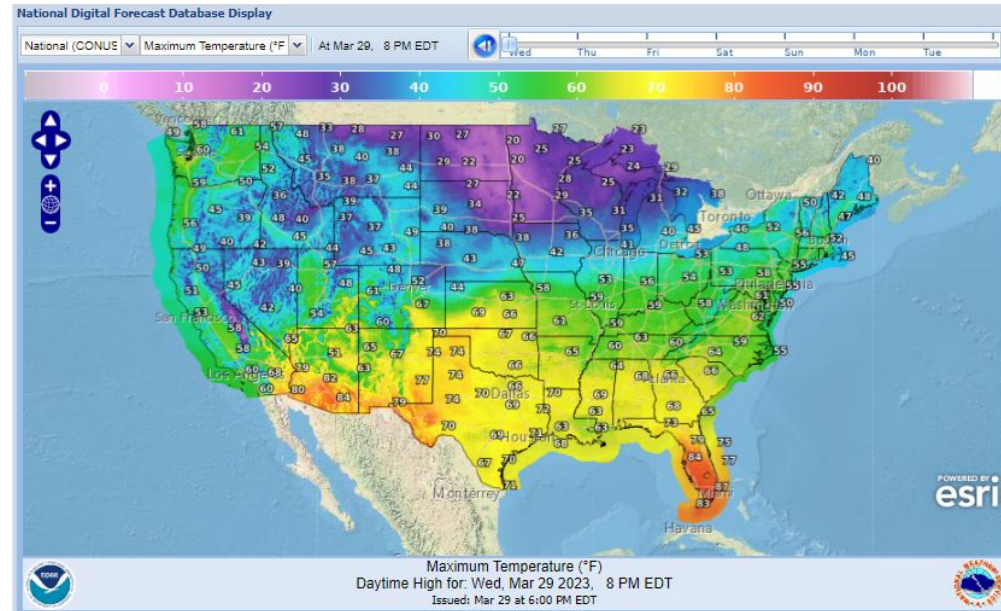
WFO Routine Forecast Products



- 122 local Weather Forecast Offices (WFO)
- Graphical forecasts of 2.5km x 2.5km resolution
- Forecast out to 7 days:
 - Max and Min Temperatures
 - Hourly Temperatures, Dewpoints, and Relative Humidity
 - Sustained Wind Speed/Direction, and Gusts
 - Sky Cover (clouds)
 - Probability of Precipitation (%)
 - Amount of Precipitation (QPF)
 - Apparent Temperature (Heat Index or Wind Chill)
 - Wet Bulb Globe Temperature (WBGT)
 - Other elements as appropriate e.g. Snowfall Amount, Wave Height, etc.



<https://digital.mdl.nws.noaa.gov/>



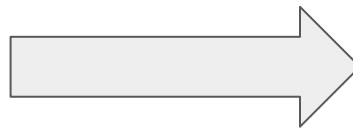
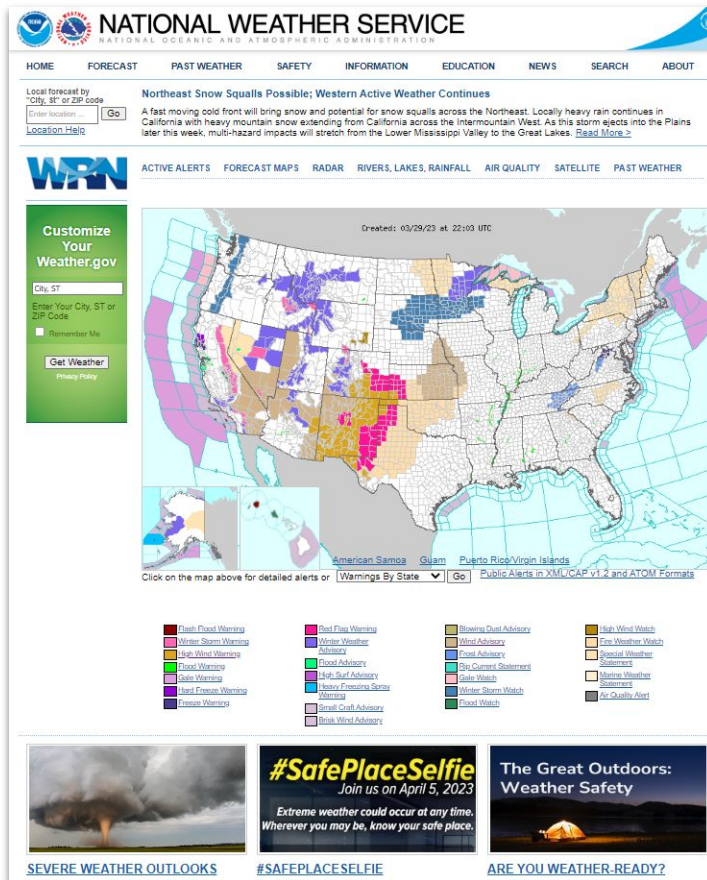
NATIONAL WEATHER SERVICE



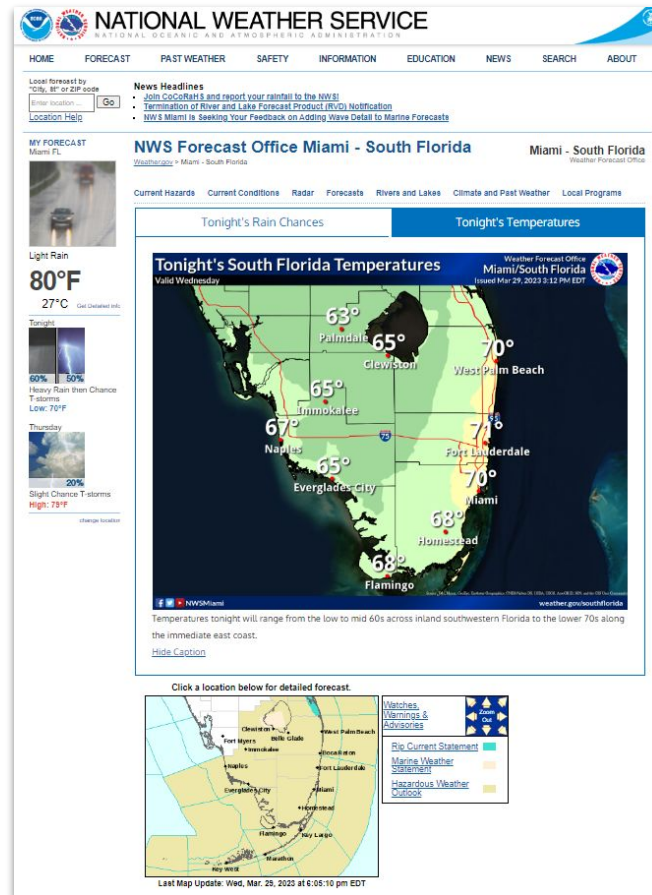
Weather.gov

&

WFO pages

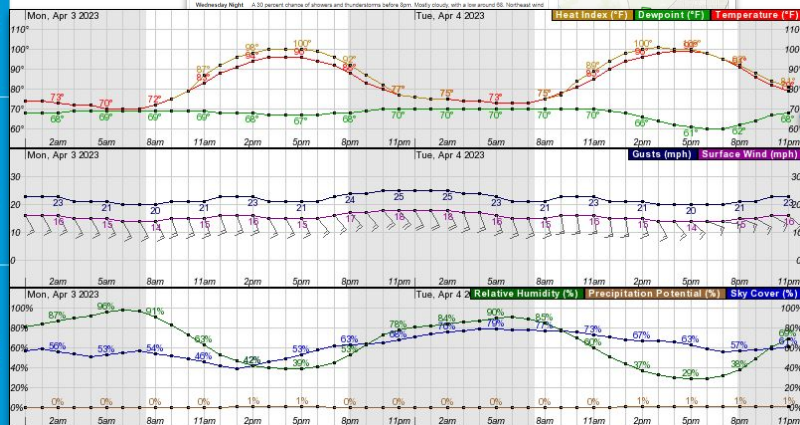
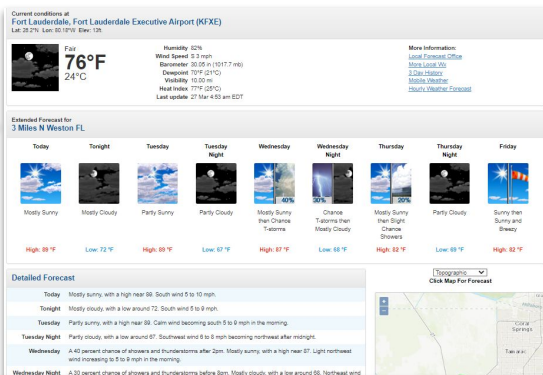


[Weather.gov](https://www.weather.gov)



WFO Routine Forecast Products

Point N' Click



Hourly Weather Graph

Zone Forecast Product for Southern New England
 National Weather Service Boston/Norton MA
 700 AM EDT Mon Jul 18 2022

Zone Forecast Product

MAZ015-182000-
 Suffolk MA-
 Including the city of Boston
 700 AM EDT Mon Jul 18 2022

.TODAY...Cloudy with a chance of showers with a slight chance of thunderstorms. Highs in the lower 80s. South winds 10 to 15 mph. Chance of rain 40 percent.

.TONIGHT...Cloudy. A chance of showers with a slight chance of thunderstorms in the evening, then a chance of showers with isolated thunderstorms after midnight. Some thunderstorms may produce gusty winds and heavy rainfall in the evening. Humid with lows in the lower 70s. South winds around 15 mph with gusts up to 30 mph. Chance of rain 40 percent.

.TUESDAY...Partly sunny in the morning, then clearing. Warmer with highs in the lower 90s. West winds 10 to 15 mph with gusts up to 25 mph.

.TUESDAY NIGHT...Mostly clear. Humid with lows in the lower 70s. West winds 5 to 10 mph. Gusts up to 20 mph in the evening.

.WEDNESDAY...Sunny, hot with highs in the mid 90s. West winds 5 to 10 mph.

.WEDNESDAY NIGHT...Mostly clear. Lows in the mid 70s.

.THURSDAY...Partly sunny with a chance of showers. Hot with highs in the lower 90s. Chance of rain 40 percent. Heat index values up to 100.

.THURSDAY NIGHT...Mostly clear. Lows in the lower 70s.

.FRIDAY AND FRIDAY NIGHT...Clear, hot. Highs around 90. Lows in the lower 70s.

.SATURDAY...Sunny, hot with highs in the lower 90s.

.SATURDAY NIGHT...Partly cloudy. Lows around 70.

.SUNDAY...Partly sunny with a 30 percent chance of showers. Hot with highs around 90.



Outlooks: Days 1-7



Text based HWO

Hazardous Weather Outlook
National Weather Service Wilmington NC
1009 PM EDT Wed Jul 27 2022

NCZ110-290215-
Coastal Brunswick-
1009 PM EDT Wed Jul 27 2022

...MODERATE RISK OF RIP CURRENTS IN EFFECT FROM 6 AM EDT THURSDAY THROUGH THURSDAY EVENING...
...HEAT ADVISORY IN EFFECT FROM NOON TO 7 PM EDT THURSDAY...

This Hazardous Weather Outlook is for southeast North Carolina.

.DAY ONE...Tonight.

No hazardous weather is expected at this time.

.DAYS TWO THROUGH SEVEN...Thursday through Tuesday.

Please listen to NOAA Weather Radio or go to weather.gov on the Internet for more information about the following hazards.

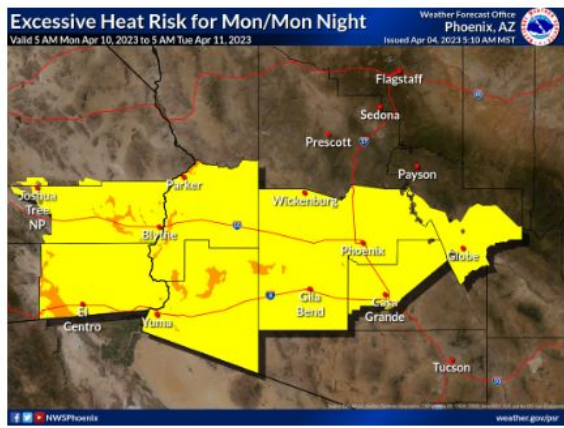
Moderate Risk of Rip Currents.
Heat Advisory.

Heat indices of 105F to 109F are likely Thursday through Saturday.



Experimental Graphical Hazardous Weather Outlook (gHWO)

Example: <https://www.weather.gov/erh/ghwo?wfo=psr>



Risk Level	Category	Definition
Green	None	No Excessive Heat Risk.
Yellow	Limited	Heat exhaustion possible with prolonged exposure.
Orange	Elevated	Heat exhaustion likely with prolonged exposure. Heat stroke possible.
Red	Significant	Heat exhaustion or heat stroke likely with prolonged exposure.
Purple	Extreme	Dangerously hot conditions could quickly result in heat exhaustion or heat stroke.

24 Hr Hazard Risks	Today	Wed	Thu	Fri	Sat	Sun	Mon
Severe Thunderstorm	Green	Green	Green	Green	Green	Green	Green
Tornado	Green	Green	Green	Green	Green	Green	Green
Thunderstorm Wind	Green	Green	Green	Green	Green	Green	Green
Hail	Green	Green	Green	Green	Green	Green	Green
Lightning	Green	Green	Green	Green	Green	Green	Green
Excessive Rainfall	Green	Green	Green	Green	Green	Green	Green
Excessive Heat	Green	Green	Yellow	Yellow	Yellow	Yellow	Orange
Wind	Yellow	Green	Green	Green	Green	Green	Green
Frost/Freeze	Orange	Green	Green	Green	Green	Green	Green
Fog	Green	Green	Green	Green	Green	Green	Green
Fire Weather (Hot/Dry/Windy)	Green	Green	Green	Green	Green	Green	Green
Snow/Sleet	Green	Green	Green	Green	Green	Green	Green
Blowing Dust	Yellow	Green	Green	Green	Green	Green	Green





WFO Watch, Warning, Advisory

<https://www.weather.gov/safety/heat-ww>



Excessive Heat Watch

Conditions favorable for an excessive heat event to meet/exceed local heat warning criteria in the next 24 to 72 hrs



Heat Advisory

Heat Index values forecast to meet/exceed local heat advisory criteria for 1 to 2 days.

Generally **North**: HI>100 **South**: HI >105, and Min nighttime lows ≥ 75

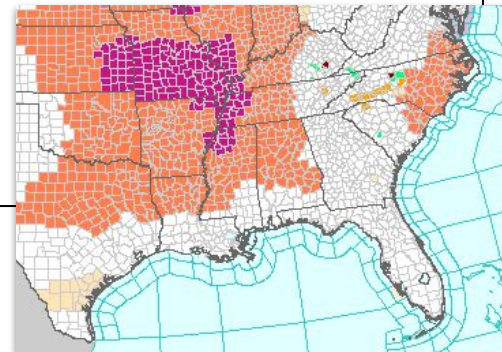


Excessive Heat Warning

Heat Index values forecast to meet or exceed locally defined warning criteria for at least 2 days.

Generally **North**: HI>105 **South**: HI >110

Min nighttime lows ≥ 75



IMPORTANT NOTE:

Strongly encourage local forecast offices to work with local partners, especially public health partners, to adjust criteria to reflect local impacts



NATIONAL WEATHER SERVICE

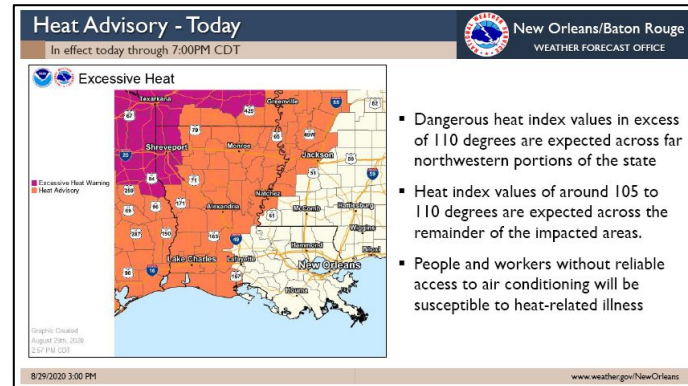
Department of Commerce // National Oceanic and Atmospheric Administration // 30



Successful Collaboration Adjusting Criteria

Post Hurricane Laura 2020

- With nearly 100% of customers without power NWS offices reached out to the Louisiana Governor's Office of Homeland Security and Emergency Preparedness to validate the need for lowered criteria



New England / Northeast 2016-2017

- Multi-year effort to set Heat Advisory criteria that better reflect health impacts

2016

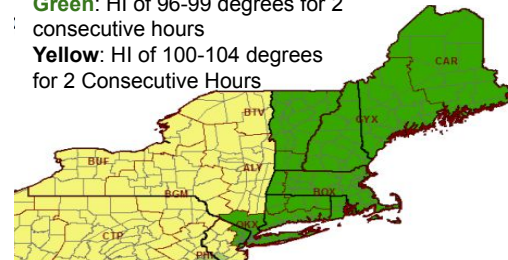
Green: Heat Index of 100-104 degrees for 2 Consecutive Hours



NWS Offices serving New England worked with Northeast Health Departments and NE Heat Consortium 2016-2017

2017

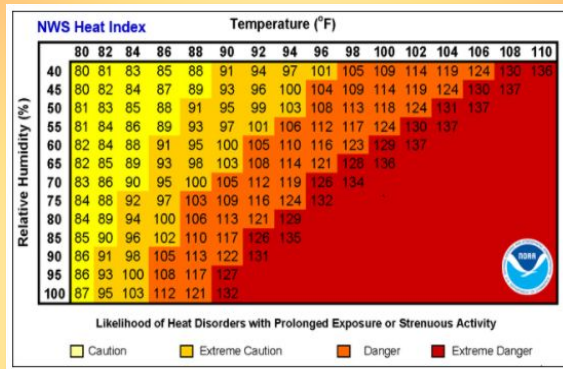
Green: HI of 96-99 degrees for 2 consecutive hours
Yellow: HI of 100-104 degrees for 2 Consecutive Hours



NATIONAL WEATHER SERVICE

NWS Forecast Tools used to assess Heat

Heat Index



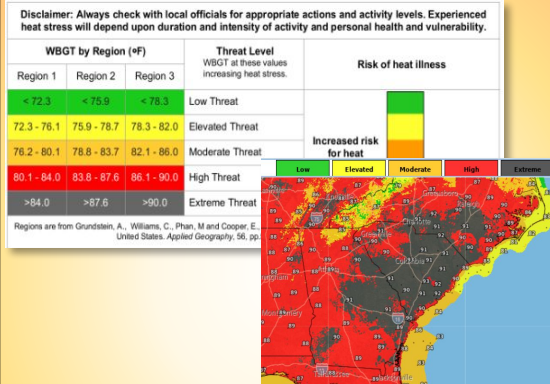
Heat stress in context for **general public.**

- Relatively simple: T + RH
- Light physical activity in shade



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

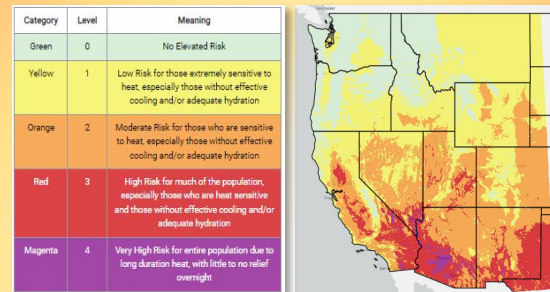
Wet Bulb Globe Temperature



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

- More Complex: T + RH + wind + solar radiation
- High levels of physical activity

Western Region HeatRisk Prototype



Heat forecasts in **climatological context** with CDC-based health impact messaging.

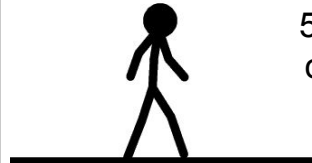
- How significantly above normal the temperatures are
- Messaging can target more sensitive/vulnerable groups



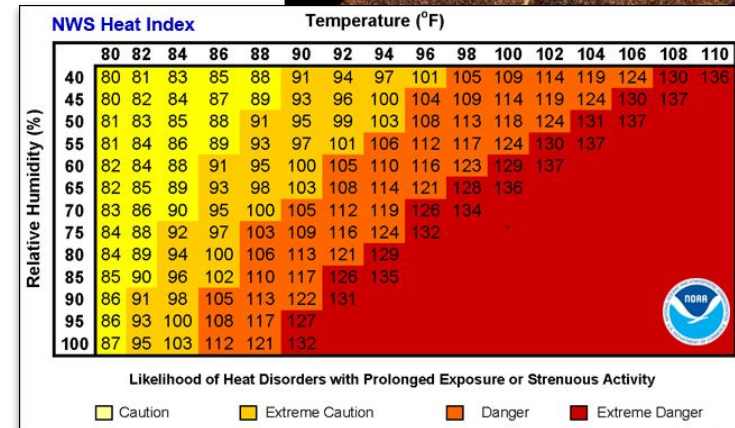
Heat Index

- Derived from Steadman's work and simplified by Lans Rothfus
- Traditional measurement of Heat stress due to high temperatures and high humidity. Includes several (21) parameters and assumptions such as:

- body mass & height
- clothing
- physical activity
- heat tolerance
- sunlight and UV exposure
- wind speed



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





Wet Bulb Globe Temperature (WBGT)

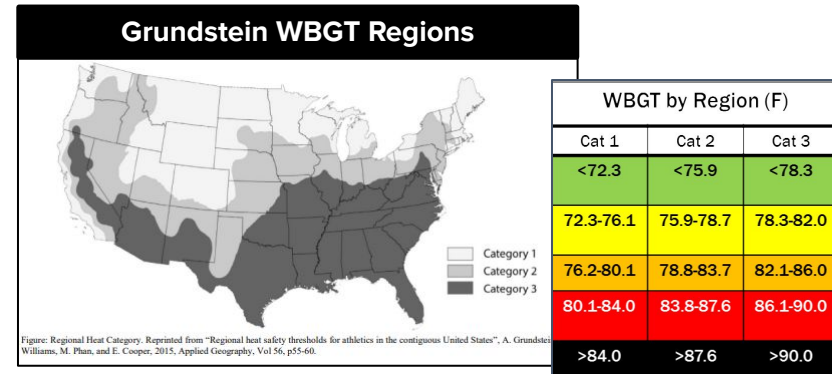
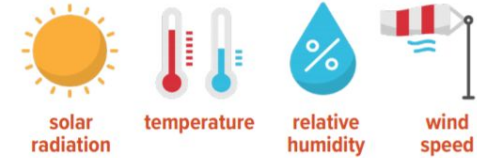
What is it?

- Estimates the effect of temperature, humidity, wind, and solar radiation on the human body
- Effective indicator of heat stress for active populations

	WBGT	HEAT INDEX
Measured in the sun	●	●
Measured in the shade	●	●
Uses temperature	●	●
Uses relative humidity	●	●
Uses wind	●	●
Uses cloud cover	●	●
Uses sun angle	●	●

What are the benefits?

- Particularly useful for outdoor workers, athletes, people exercising or active outdoors, etc.
- Can help establish guidelines for activity modifications during exercise or outdoor work

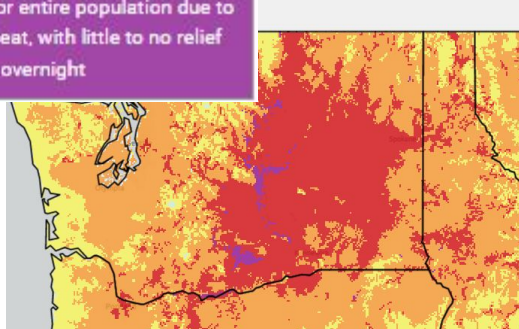




Experimental Heat Tools



Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight



NWS Western Region HeatRisk Prototype

What does it take into account?

- How above normal temps are for a location
- Time of the year
- Duration of unusual heat
- Overnight temps
- Difference between lows and highs

What are the benefits?

- Helps people understand what forecasted heat means to them
- Provides heat risk guidance for decision makers and heat sensitive populations who may need to take action below NWS heat product levels



Event Messaging

S
o
c
i
a
l

M
e
d
i
a

EXTREME & DANGEROUS HEAT

Through Friday. High Fire Danger.

Extreme Heat Wave
Length of 10 days
Relief still many days away

POWER OUTAGES
POSSIBLE

USE CAUTION
WITH FIRE SOURCES

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

Details:
Valleys & Mountains: Highs 100-110, Lows 70-80.
Coasts: High 85-95, Lows 65-75

NATIONAL WEATHER SERVICE
Los Angeles / Oxnard Weather

Deadly Heat Wave

Through This Weekend

What To Do

- Avoid strenuous activity; cancel outdoor activities
- Seek air-conditioned buildings or operate air-conditioning, despite financial costs
- Check-in on family/friends
- Prepare for hot overnight temperatures
- Drink before you're thirsty
- In an emergency, call 911

HeatRisk

NONE LOW MODERATE HIGH VERY HIGH

Interact With Us [f](#) NWSPPhoenix [Weather.Gov/PSR](#) [@NWSPPhoenix](#) [YouTube](#) NWSPPhoenix

Weather Stories

NWS Forecast Office Las Vegas, NV
[Weather.gov](#) > Las Vegas, NV

Las Vegas, NV
Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Hot Rec Fcst Partial Co. Alerts!

Weekend Recreation Forecast

Very Hot Temperatures

LIMIT TIME OUTSIDE
KEEP HYDRATED
WEAR LIGHT CLOTHING

	Fri	Sat	Sun
Red Rock Canyon	92°	97°	100°
Mt. Charleston	75°	80°	82°
Valley of Fire	100°	106°	110°
Lake Mead	95°	101°	104°
Death Valley	106°	113°	115°
Mojave National Preserve	93°	98°	100°

NATIONAL WEATHER SERVICE Las Vegas
9:00 AM - Friday, June 11, 2021

[Show Caption](#)

Click a location below for detailed forecast.

Watches Warnings & Advisories

Excessive Heat Warning

Wind Advisory

Frost Advisory

Excessive Heat Watch

Fire Weather Watch

Air Quality Alert

Hazardous Weather Outlook

Last Map Update: Fri, Jun. 11, 2021 at 6:55:34 am PDT



NATIONAL WEATHER SERVICE

Outreach & Engagement Materials



Seasonal Safety Campaigns

<https://www.weather.gov/safetycampaign>



Agency collaborations: OSHA messaging in NWS heat products

Take extra precautions if you work or spend time outside. When possible reschedule strenuous activities to early morning or evening. Know the signs and symptoms of heat exhaustion and heat stroke. Wear lightweight and loose fitting clothing when possible. To reduce risk during outdoor work, the Occupational Safety and Health Administration recommends scheduling frequent rest breaks in shaded or air conditioned environments. Anyone overcome by heat should be moved to a cool and shaded location. Heat stroke is an emergency! Call 9 1 1.

Heat Safety Website

<https://www.weather.gov/heat>



Heat Safety Tips and Resources

www.weather.gov > [Safety](#) > Heat Safety Tips and Resources

Heat Safety | **Heat Watch vs. Warning** | **Heat Forecast Tools** | **During a Heat Wave** | **Heat Related Illnesses**

Heat Impacts: Vulnerable Populations

- PREGNANT**: Extreme heat events have been associated with adverse birth outcomes such as low birth weight, preterm birth, infant mortality, and congenital malformations.
- NEWBORNS**: Newborns are extra sensitive to heat because their ability to regulate body temperature is limited.
- CHILDREN**: Young children and infants are particularly vulnerable to heat, as their bodies are less able to adjust to heat than adults. Those under four are especially vulnerable.
- ELDERLY**: Older adults, especially those who have preexisting diseases, take certain medications, live alone or have limited mobility are at higher risk for heat illness.
- CHRONIC ILLNESS**: People with chronic medical conditions are more likely to have a serious health problem during a heat wave.

Source: The Impacts of Climate Change on Human Health in the United States, A Scientific Assessment (U.S. Global Change Research Program)

weather.gov

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

Graphics



NATIONAL WEATHER SERVICE



Federal Interagency Heat Health Efforts



GRAPHICS

Heat Exhaustion

ACT FAST

- Move to a cooler area
- Loosen clothing
- Sip cool water
- Seek medical help if symptoms don't improve

Symptoms: Dizziness, Thirst, Heavy Sweating, Nausea, Weakness

Heat Stroke

ACT FAST

CALL 911

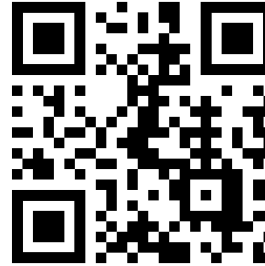
- Move person to a cooler area
- Loosen clothing and remove extra layers
- Cool with water or ice

Symptoms: Confusion, Dizziness, Becomes Unconscious

Heat exhaustion can lead to heat stroke. *Heat stroke can cause death or permanent disability if emergency treatment is not given.*

Stay Cool, Stay Hydrated, Stay Informed!

heat.gov



Federal Heat Health Information Hub

HEAT.gov
National Integrated Heat Health Information System

Home News & Events Learn Urban Heat Islands Tools & Information At Risk Groups Planning & Preparing About

Welcome to HEAT.gov

Heat related illnesses and death are largely preventable with proper planning, education, and action. Heat.gov serves as the premier source of heat and health information for the nation to reduce the health, economic, and infrastructural impacts of extreme heat.

Heat.gov is the web portal for the National Integrated Heat Health Information System (NIHHIS)

News

- White House Announces Actions on Extreme Heat
- New Heat Health Webinar Series: Overlooked and Overlooked
- NOAA & HHS Collaborate on New Climate and Health Outlook

Tools & Information

Who is at Risk to Extreme Heat

Climate and Health Outlook

Joint Social Media Campaigns May 15-19, 2023 #NIHHIS #HeatSafety

National Weather Service @NWS · May 17

Everyone is at risk from the dangers of extreme heat, but these groups are more vulnerable than most. Ensure that your loved ones and neighbors are safe from the heat and remain Weather-Ready. [#NIHHIS](https://weather.gov/safety/during#NIHHIS) [#NationalHeatSafetyWeek](https://weather.gov/safety/during#NationalHeatSafetyWeek)

Effects: Vulnerable Populations

NEWBORNS Infants are extra vulnerable to heat because their ability to regulate body temperature is limited.

CHILDREN Young children and infants are particularly vulnerable to heat because their bodies are less able to dissipate heat than adults. Those under four are especially vulnerable.

ELDERLY Older adults, especially those with pre-existing conditions, take certain medications, live alone or have limited mobility are at high risk for heat stress.

Effects: Vulnerable Populations

NEWBORNS Infants are extra vulnerable to heat because their ability to regulate body temperature is limited.

CHILDREN Young children and infants are particularly vulnerable to heat because their bodies are less able to dissipate heat than adults. Those under four are especially vulnerable.

ELDERLY Older adults, especially those with pre-existing conditions, take certain medications, live alone or have limited mobility are at high risk for heat stress.

NEVER leave anyone alone in a closed car. Use air conditioners and stay in the shade.

CDC @CDCgov · May 16

Getting too hot can make you sick when your body can't properly cool itself off. Beat the heat this summer by remembering to:

- Stay cool
- Stay hydrated
- Stay informed

More tips on how to prevent heat-related illnesses during [#NationalHeatSafetyWeek](https://www.cdc.gov/diseases/nationalheat): bit.ly/2S8Brng

BEAT THE Heat

Stay Cool. Stay Hydrated. Stay Informed.

FEMA @fema · May 15

Remember to stay cool and hydrated during the next few days to avoid exhaustion and heat stroke.

We recommend you avoid high-energy activities during the midday heat such as sports, hiking, and moving the lawn.

More: [#NationalHeatSafetyWeek](https://ready.gov/heatduring)

STAY HYDRATED.

During extreme heat, drink plenty of water even if you don't feel thirsty.

READY.GOV/HEAT

Current Conditions and Future Outlooks

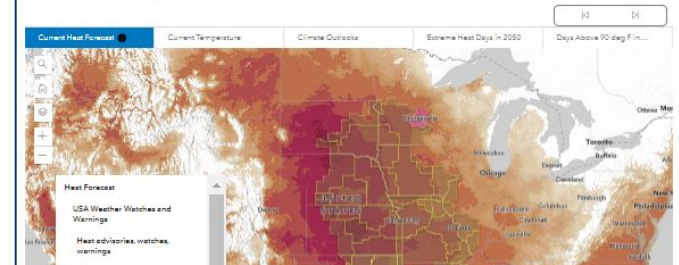
Extreme Heat

31,317,858 people in warning area



At left, see the current number of people in the U.S. that are currently under active National Weather Service extreme heat advisories, watches, and warnings.

Below, interact with current and future heat tools to understand where dangerous heat conditions may exist in the future.



NATIONAL WEATHER SERVICE

Questions?

Contributors:

Kim McMahon
Greg Carbin
Alex Lamers
Evan Oswald
Steve Baxter
Jessica Lee
Rachel Gross
Sarah Rogowski
Andrea Bair

Presentation PDF and Recording will be
available after processing at
<https://www.weather.gov/wrn/calendar>

Links:

Climate Prediction Center Homepage
<https://www.cpc.ncep.noaa.gov/>

Weather Prediction Center Homepage
<https://www.wpc.ncep.noaa.gov/>

National Weather Service
<https://www.weather.gov/>

NWS Heat Safety
<https://www.weather.gov/heat>

Federal Heat Health Information Hub
<https://www.heat.gov/>

CDC Heat & Health Tracker
<https://ephtracking.cdc.gov/Applications/heatTracker/>

