



NWS Partners and Users Heat Webinar

Kimberly McMahon - NWS Public Program

Greg Carbin - NWS Weather Prediction Center (WPC)






Jon Gottschalck - NWS Climate Prediction Center (CPC)

May 13, 2024





Webinar Logistics

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- 
- 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.

Opening Remarks



Ken Graham

Director

NOAA National Weather Service



Today's Speakers



Jon Gottschalck

CPC Chief, Operational
Prediction Branch
NWS, NOAA



Greg Carbin

WPC Chief of Forecast
Operations
NWS, NOAA

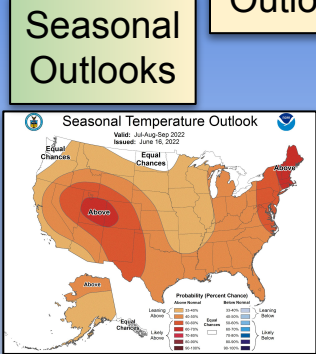


Kim McMahon

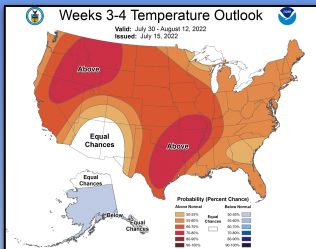
Public Weather Services
Program Manager
NWS, NOAA

National Weather Service

Impact-Based Decision Support Services and public messaging



Monthly Outlooks



Weeks 3-4 Outlooks

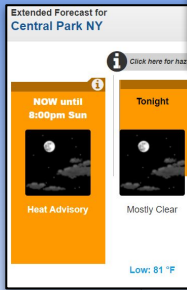
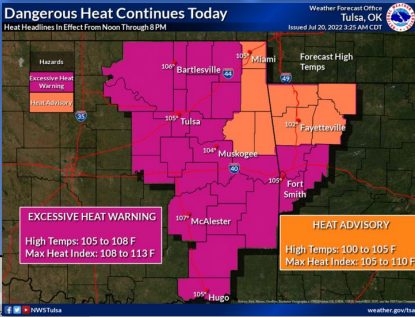
Week 2 Outlooks

Day 1-7 Forecasts

Watch, Warning, Advisory

Monitor, Update, Report

Monitor, Update, Report: Validated Observations & After Action



...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



CPC = Climate Prediction Center

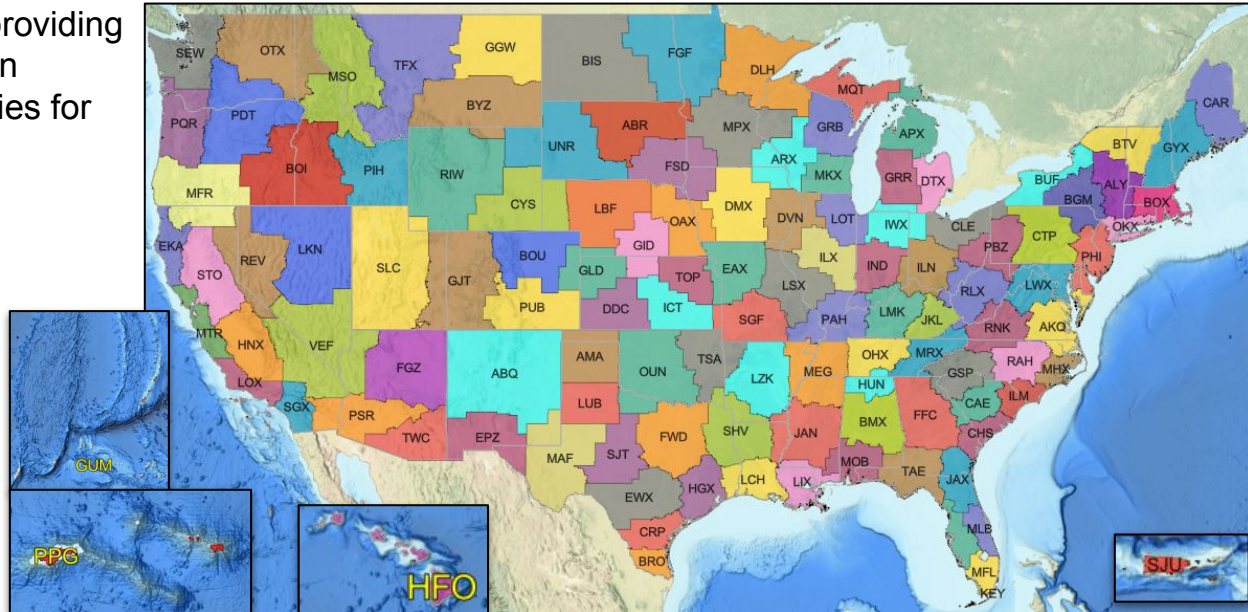
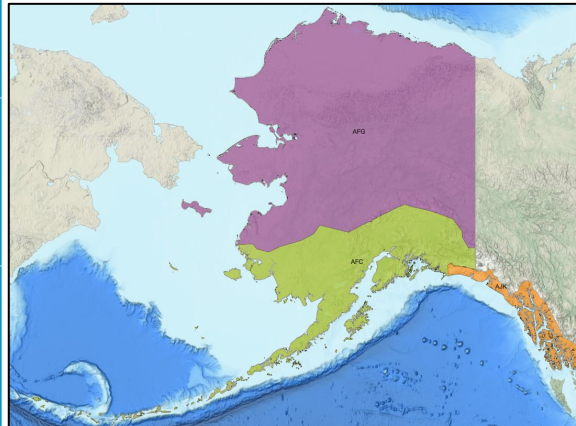
Mission: CPC delivers real-time products and information that predict and describe climate variations on timescales from weeks to years thereby promoting effective management of climate risk and a climate-resilient society.

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.

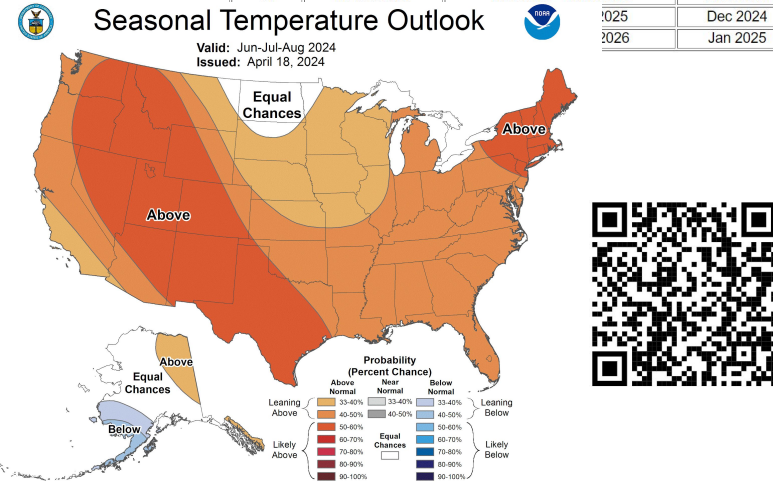
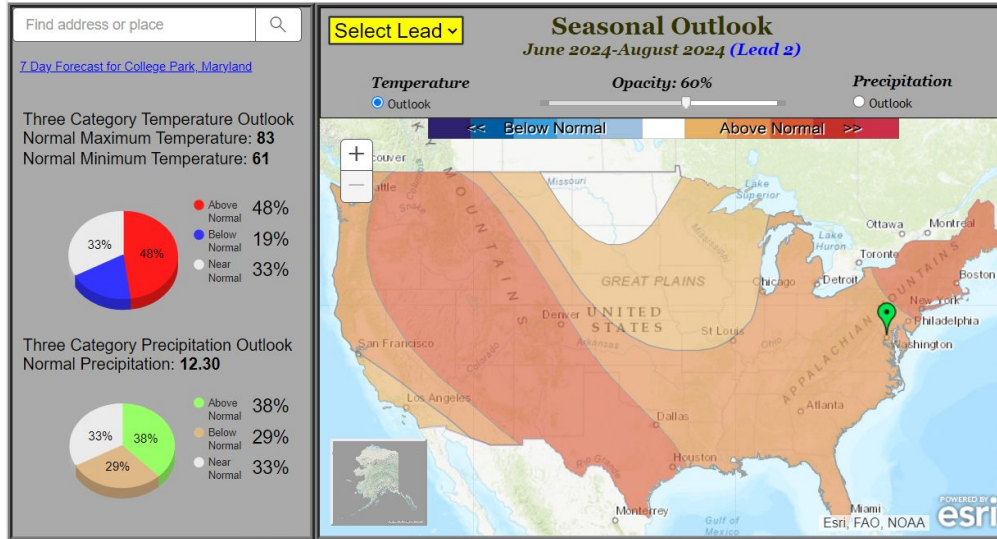


Seasonal Outlook

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: 18 APR 2024



Fcst #	Release Date	Inclusive Seasons	Fcst Month
1/2024	21 Dec 2023	JFM 2024 - JFM 2025	Jan 2024
2	18 Jan 2024	FMA 2024 - FMA 2025	Feb 2024
3	15 Feb 2024	MAM 2024 - MAM 2025	Mar 2024
4	21 Mar 2024	AMJ 2024 - AMJ 2025	Apr 2024
5	18 Apr 2024	MJJ 2024 - MJJ 2025	May 2024
6	16 May 2024	JJA 2024 - JJA 2025	Jun 2024
7	20 Jun 2024	JAS 2024 - JAS 2025	Jul 2024
8	18 Jul 2024	ASO 2024 - ASO 2025	Aug 2024
9	15 Aug 2024	SON 2024 - SON 2025	Sep 2024
10	19 Sep 2024	OND 2024 - OND 2025	Oct 2024
11	17 Oct 2024	NDJ 2024 - NDJ 2025	Nov 2024
			2025
			Dec 2024
			2026
			Jan 2025

- 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!

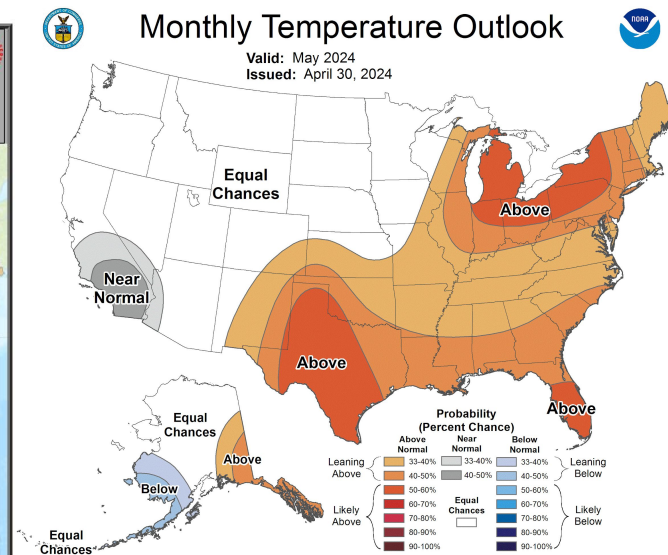
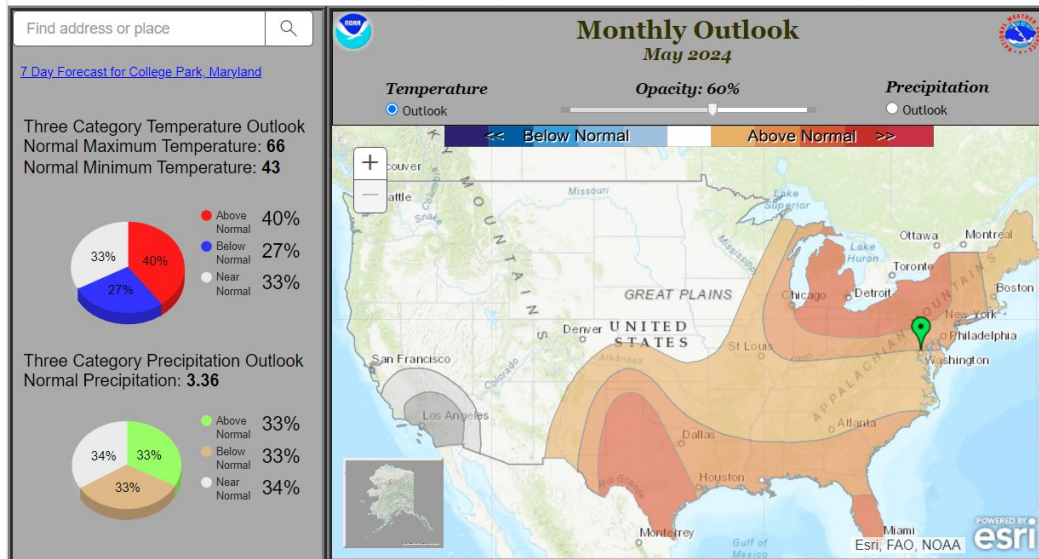
Monthly Outlook



<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: 30 APR 2024



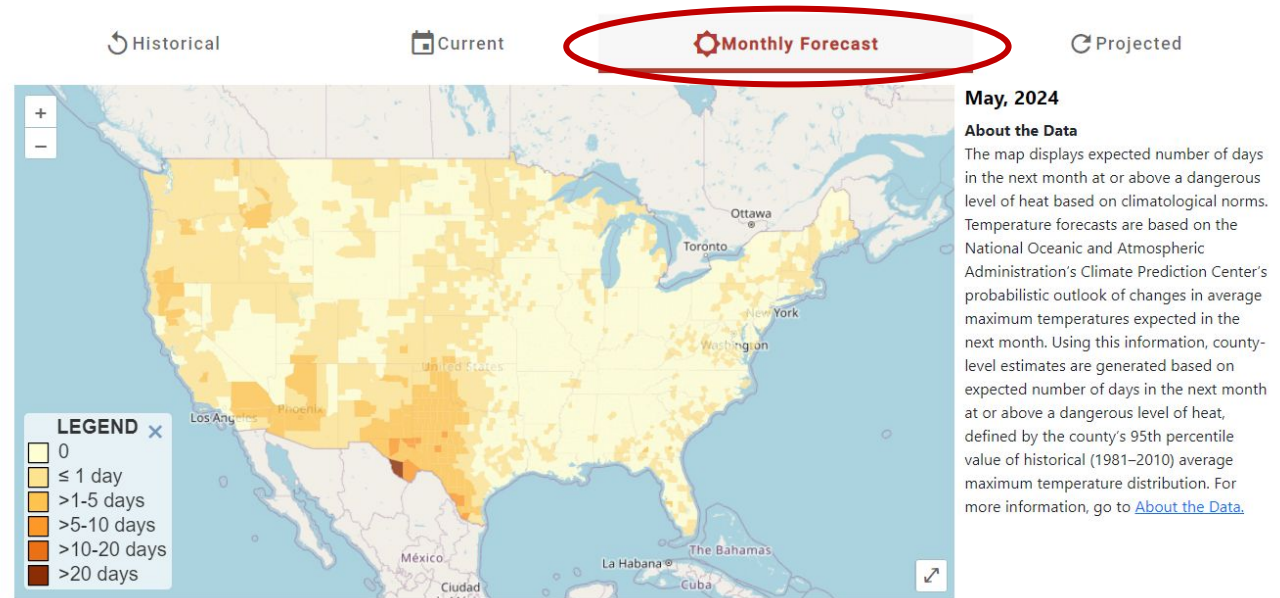
- Outlooks for next month are released **twice** a month (third Thursday and last day)
- Forecasts via interactive GIS tool (left) or static graphics (right)
- These can only **loosely** be interpreted as increased/decreased likelihood of hot days relative to normal

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



CDC Heat and Health Tracker

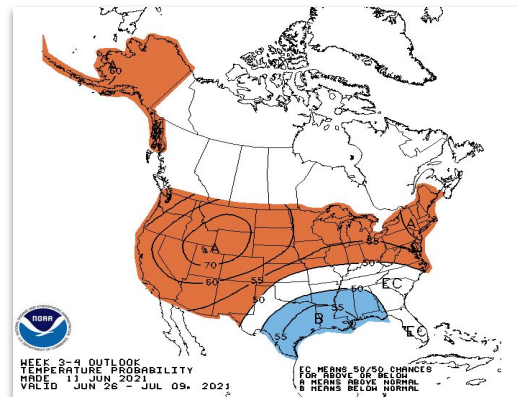
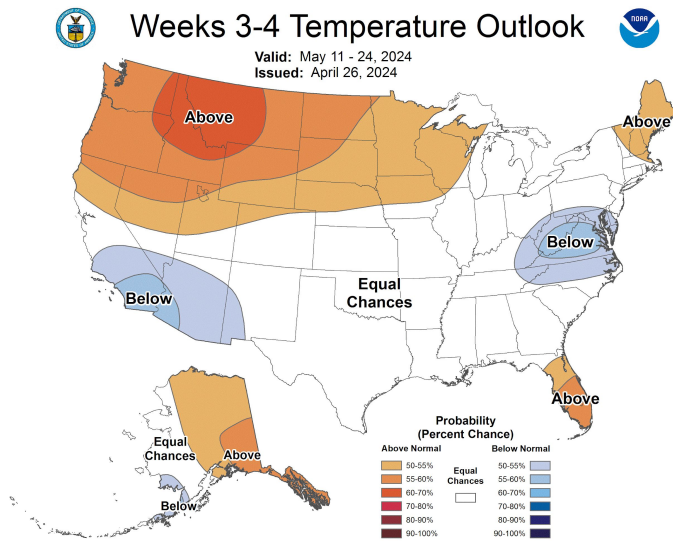
- Monthly Outlook of dangerous heat days (defined as county's 95% percentile value)
- Uses CPC Monthly Temperature Outlook
- Updates twice per month (third Thursday, and last day) with an outlook for the following month
- Available at <https://ephtracking.cdc.gov/Applications/heatTracker/>



Weeks 3-4 Outlook

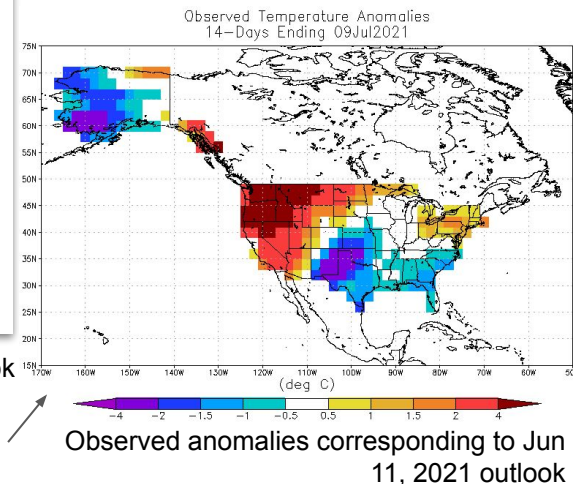


Front page: "Week 3-4 Outlooks"; <https://www.cpc.ncep.noaa.gov/products/predictions/WK34/>



Jun 11, 2021 Weeks 3-4 temperature outlook

2021 Heatwave of Pacific NW



Observed anomalies corresponding to Jun 11, 2021 outlook

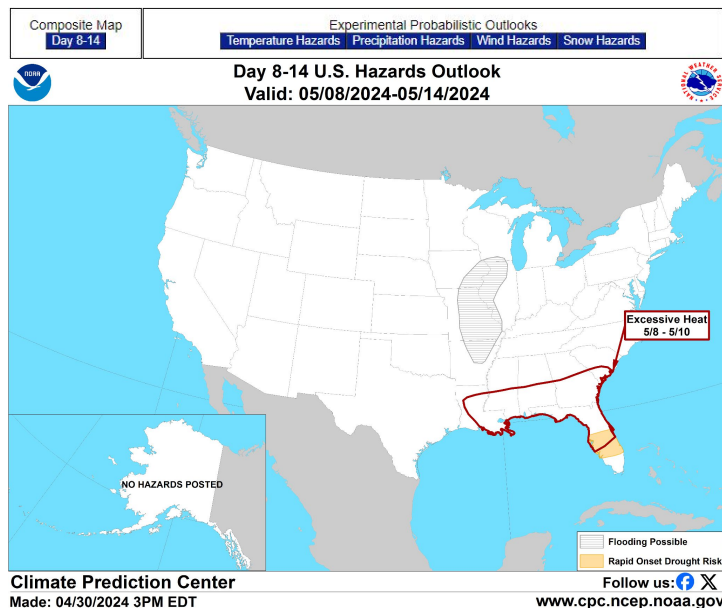
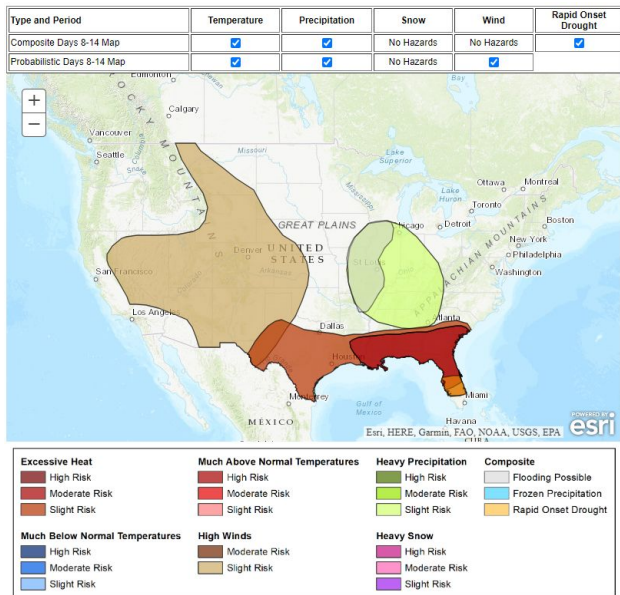
- Forecasts are issued weekly (Friday at 3PM) as static graphics
- The maps can **more confidently** be interpreted as increased/decreased likelihood of hot days relative to normal

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



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>

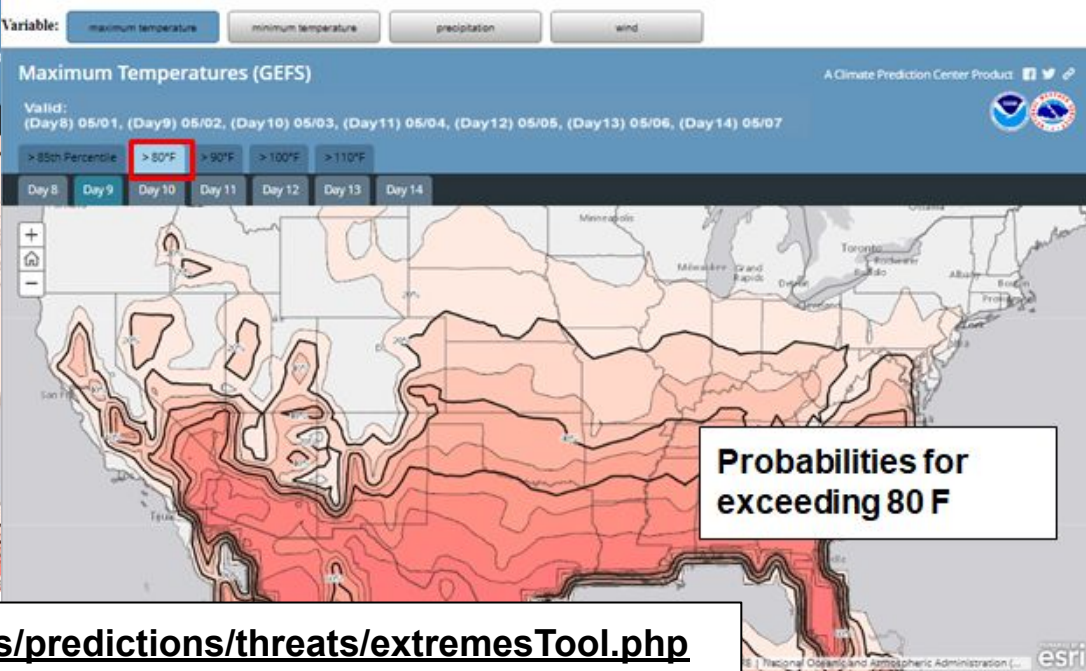
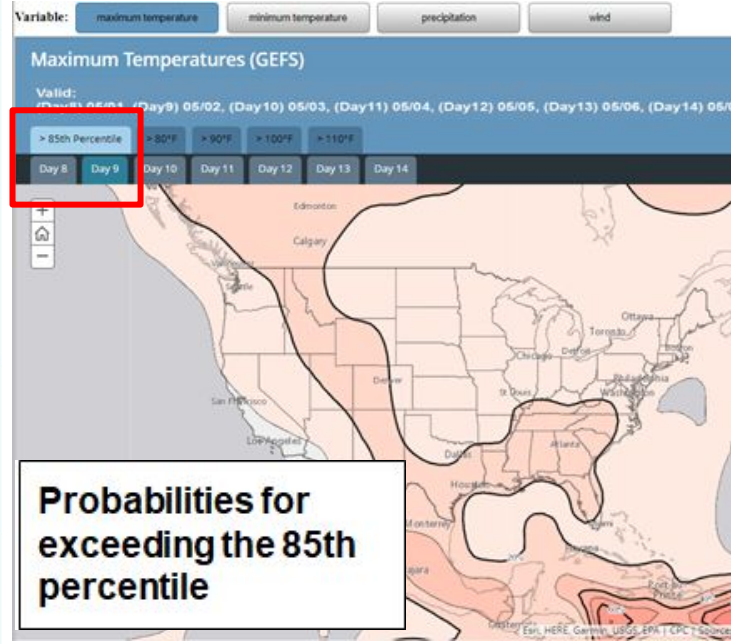


- Issued weekdays (M-F) at 3 PM in both interactive GIS interface (left) and as static graphics (middle)
- The temperature related hazards are ‘Excessive Heat’ and ‘Much Above Normal Temperatures’
- Probabilities in three levels: high, moderate, slight
- The associated forecast discussion provides additional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

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



Week-2 Probabilistic Extremes tool




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

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!

CPC Heat Key Messages

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



Key Messages for Potential Northwest U.S. Heat

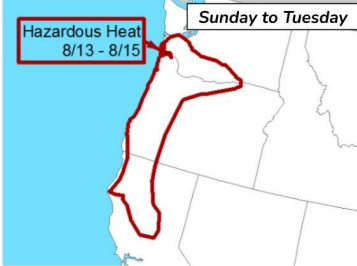
Updated Aug 8, 2023
12:00 PM PDT

Heat wave will be possible from this weekend into next week in the Pacific Northwest


- Hazardous heat will be possible in portions of the Northwest U.S. from this weekend into next week, particularly from Sunday, August 13th to Wednesday, August 16th. There is a slight risk of the heat persisting through August 18th.
- Greatest confidence exists in the interior valleys and lower elevations of southwest Washington, western Oregon, and northern California. At any given location in that region, there is generally about a 50-60 percent chance of hazardous heat, and a 30-40 percent chance of daily record highs.
- However, if the hotter forecast scenarios materialize, hazardous heat would be possible across most of the Northwest U.S.
- Now is the time to evaluate your plans and preparedness levels for a multi-day period of dangerous heat. This is particularly true for anyone without reliable access to cooled and air conditioned locations, and anyone with plans for outdoor recreation. Have a way to break your heat exposure and stay hydrated! Never leave people or pets locked in a vehicle, which can heat up to dangerous levels in minutes.

Areas with at least a 40% chance of Hazardous Levels of Heat

Sunday to Tuesday



Wednesday to Friday



Excessive Heat
High (80%)
Moderate (40%)
Slight (20%)

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

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

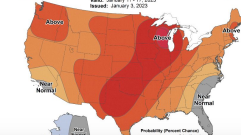
Weather Prediction Center & Climate Prediction Center

Climate News

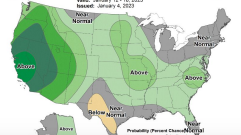
- Hazardous Winds, Snow, and Rain Forecast to Continue over the West Coast, Possibly Exacerbating Flooding Risk
- La Niña is expected to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023. In February-April 2023, there is a 71% chance of ENSO-neutral (08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

8-10 Day Outlook Temperature Precipitation	One Month Outlook Temperature Precipitation
8-14 Day Outlook Temperature Precipitation	Three Month Outlook Temperature Precipitation
Week 2-4 Outlook Temperature Exp. Precipitation	8-14 Day U.S. Hazards Outlook Probability: Temp Precip Snow Wind
U.S. Drought Information Monitor Monthly Outlook Seasonal Outlook	Global Tropics Hazards Outlook Weeks 2 and 3

8-14 Day Temperature Outlook



8-14 Day Precipitation Outlook



- 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
- Coordinate with WPC on transition from Week 2 to Week 1 and joint KMs issued

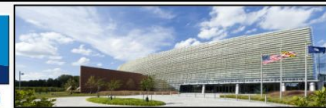


WPC Temp Forecasts & Resources



WEATHER PREDICTION CENTER

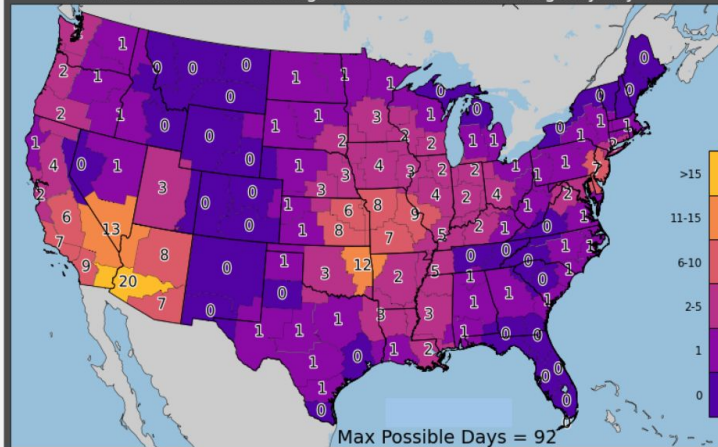
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



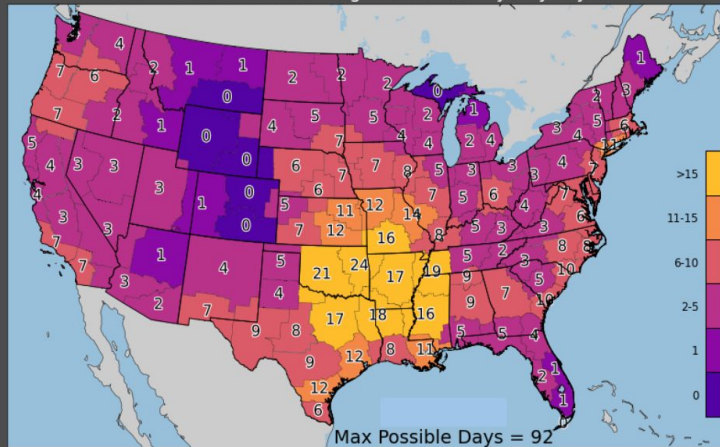
Heat is a Big Deal!

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?



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

Daily Weather Map
Day 1/2-2 1/2
Day 3-7 CONUS
Day 3-7 Hazards
Day 4-8 Alaska
Day 4-8 Atlantic
Excessive Rainfall
Flood Outlook
GIS Products
Heat Index
Mesoscale Precip Discussion
National Forecast Charts
National High & Low
PQPF
QPF
Storm Summaries
Surface Analysis
Tropical Products
Winter Weather
WPC Discussions

MAR 27	MAR 28	MAR 29
GHI	SLIGHT	NO AREA
H	HIGH	HIGH
AREA	NO AREA	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 Excessive Rainfall Risk Categories
Understanding WPC's Excessive Rainfall Risk Categories

Interactive National Forecast Chart + Additional Links

Tweets from @NWSWPC
NWS Weather Predictio... @NW... · 1h
#WPC_MD 0140 affecting Southeast AL...Portions

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

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 1/2-2 1/2 CONUS
Days 3-7 CONUS
Days 4-8 Alaska
QPF
PQPF
Excessive Rainfall
Mesoscale Precip Discussion
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Storm Summaries
Heat Index

NCEP Quarterly Newsletter

Facebook Twitter



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

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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 TUE APR 30 2024

MAXIMUM HEAT INDEX	95F THRESHOLD	100F THRESHOLD	105F THRESHOLD	110F THRESHOLD	115F THRESHOLD
FRI MAY 03	FRI MAY 03	FRI MAY 03	FRI MAY 03	FRI MAY 03	FRI MAY 03
SAT MAY 04	SAT MAY 04	SAT MAY 04	SAT MAY 04	SAT MAY 04	SAT MAY 04
SUN MAY 05	SUN MAY 05	SUN MAY 05	SUN MAY 05	SUN MAY 05	SUN MAY 05
MON MAY 06	MON MAY 06	MON MAY 06	MON MAY 06	MON MAY 06	MON MAY 06
TUE MAY 07	TUE MAY 07	TUE MAY 07	TUE MAY 07	TUE MAY 07	TUE MAY 07



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](#)

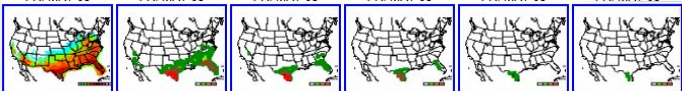
[Text of MAXIMUM Heat Index Probability Forecasts for Western US](#)

CLICK ON MAPS FOR MAXIMUM HEAT INDEX AND PROBABILITY FORECASTS

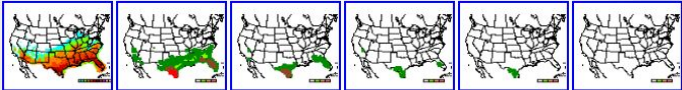
FROM TUE APR 30 2024

MAXIMUM HEAT INDEX 95F THRESHOLD 100F THRESHOLD 105F THRESHOLD 110F THRESHOLD 115F THRESHOLD

FRI MAY 03 FRI MAY 03 FRI MAY 03 FRI MAY 03 FRI MAY 03 FRI MAY 03



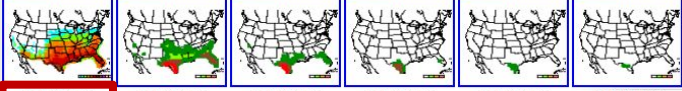
SAT MAY 04 SAT MAY 04 SAT MAY 04 SAT MAY 04 SAT MAY 04 SAT MAY 04



SUN MAY 05 SUN MAY 05 SUN MAY 05 SUN MAY 05 SUN MAY 05 SUN MAY 05



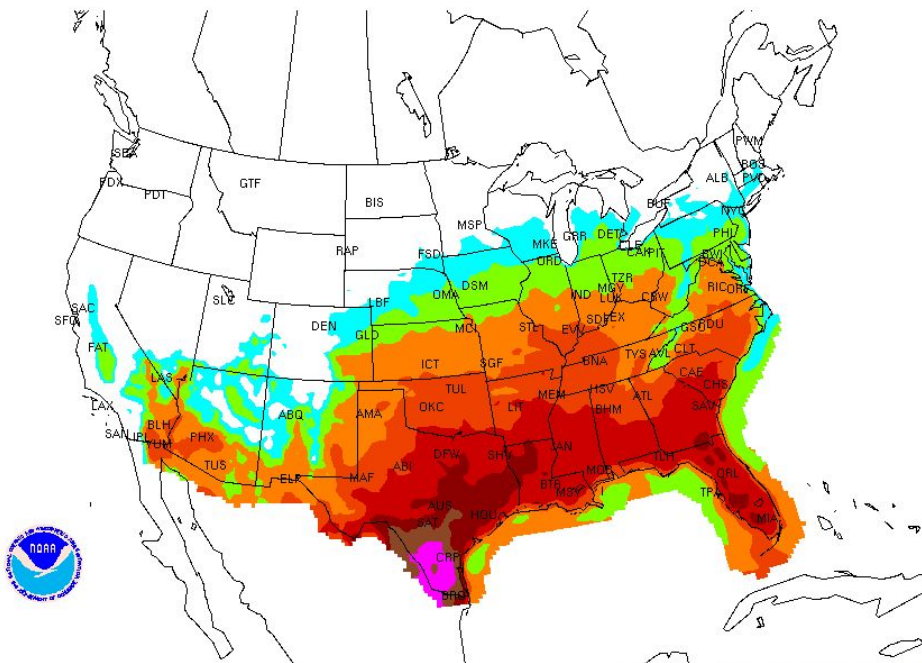
MON MAY 06 MON MAY 06 MON MAY 06 MON MAY 06 MON MAY 06 MON MAY 06



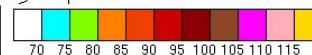
TUE MAY 07 TUE MAY 07 TUE MAY 07 TUE MAY 07 TUE MAY 07 TUE MAY 07



CLICK ON A CITY CODE FOR A TABLE OF FORECAST VALUES



DAY 7 FORECAST DAILY MAXIMUM HEAT INDEX (DEG F)
ISSUED: 0654 UTC TUE APR 30 2024
VALID: TUE MAY 07 2024
DOC/NOAA/NWS/NCEP
WEATHER PREDICTION CENTER



WPC Temp Forecasts & Resources

MAXIMUM HEAT INDEX FORECASTS

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

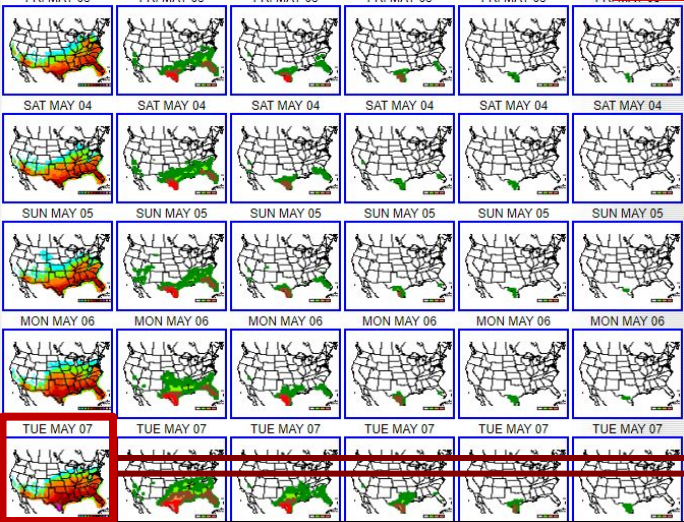
[About These Products](#)

[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 TUE APR 30 2024

MAXIMUM HEAT INDEX 95F THRESHOLD 100F THRESHOLD 105F THRESHOLD 110F THRESHOLD 115F THRESHOLD

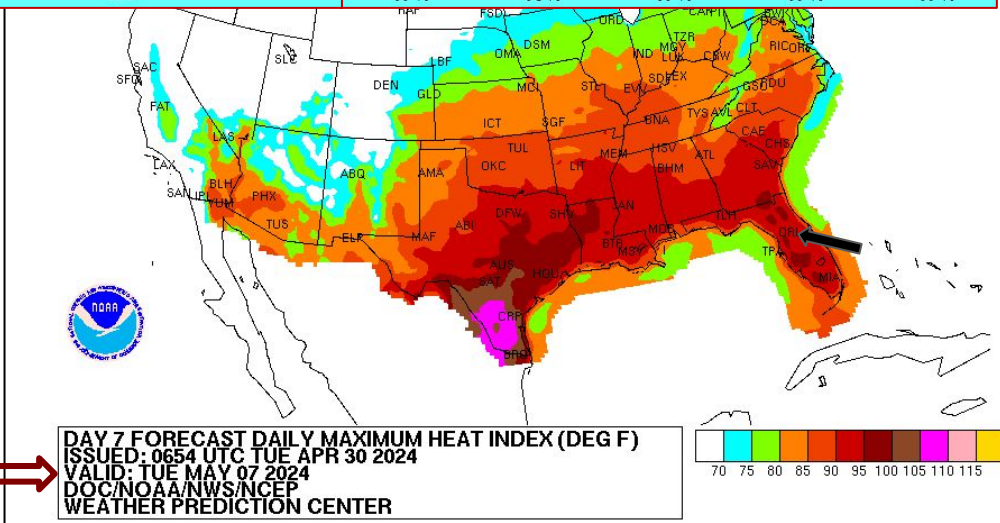


MAXIMUM HEAT INDEX
PROBABILITY OF MAXIMUM HEAT INDEX EXCEEDING:

115 F	1 %	0 %	0 %	0 %	5 %
110 F	3 %	2 %	1 %	2 %	15 %
105 F	12 %	8 %	7 %	9 %	33 %
100 F	32 %	25 %	22 %	28 %	56 %
95 F	58 %	51 %	49 %	58 %	78 %
90 F	81 %	78 %	77 %	83 %	91 %
85 F	94 %	93 %	93 %	96 %	97 %
80 F	99 %	98 %	99 %	99 %	99 %

CLICK ON A CITY CODE FOR A TABLE OF FORECAST VALUES

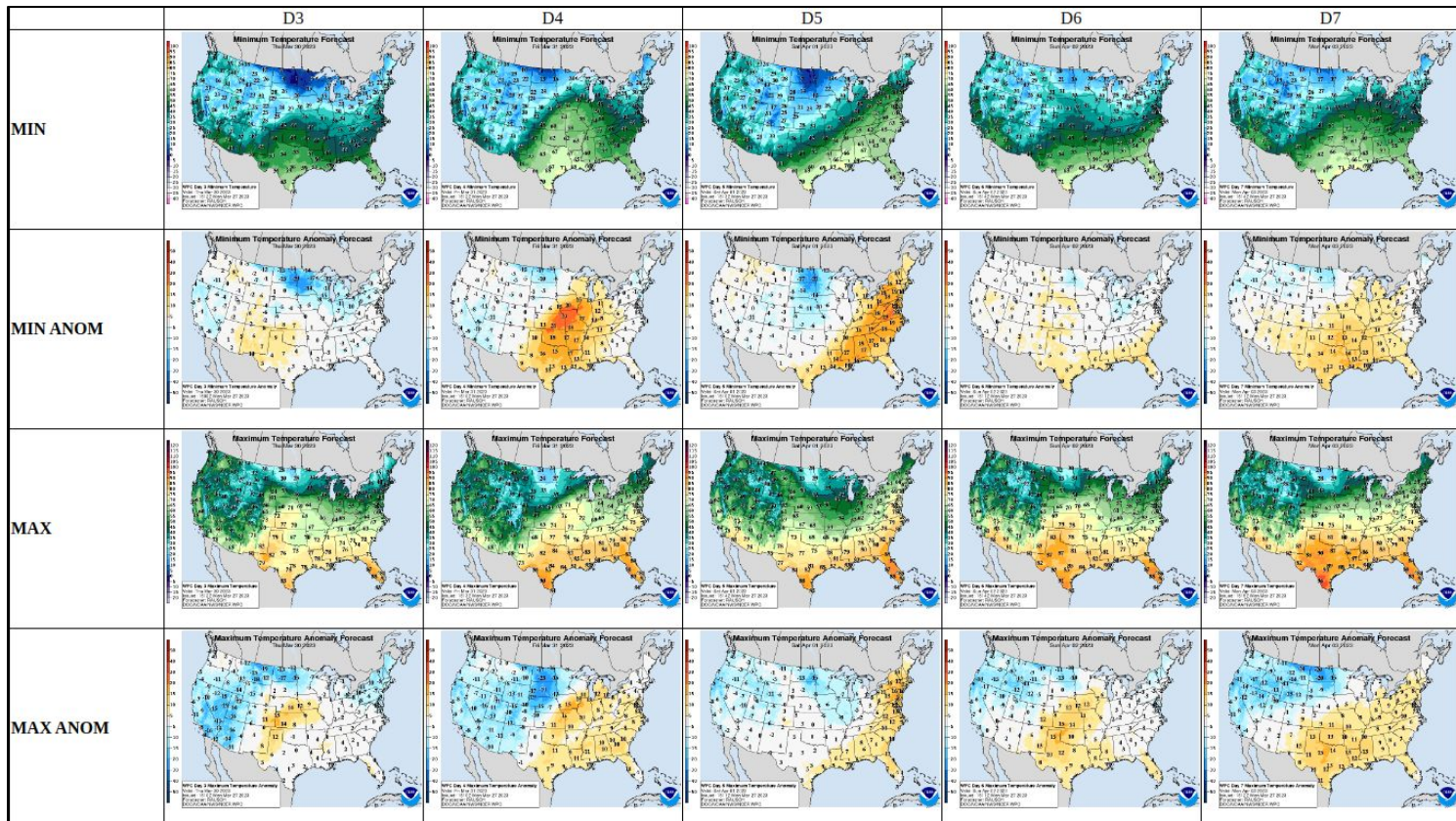
	FRI MAY 03	SAT MAY 04	SUN MAY 05	MON MAY 06	TUE MAY 07
97 F	97 F	95 F	95 F	96 F	101 F
95 F	95 F	95 F	95 F	96 F	101 F
90 F	90 F	90 F	90 F	90 F	90 F
85 F	85 F	85 F	85 F	85 F	85 F
80 F	80 F	80 F	80 F	80 F	80 F



WPC Temp Forecasts & Resources

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

Medium Range
Temp Forecasts
(Days 3-7)



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/SF/CMC forecasts
Layout | Powered by EBC | USGS, MapInfo by Bryan Design, CC BY 1.0 - MapData © OpenStreetMap

Interactive National Forecast Chart
Additional Links

Tweets from @NWSWPC

NWS Weather Predictio... @NW... · 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

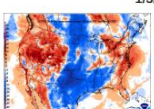
Weather Prediction Center
Made: 06/16/2021 3PM EDT

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www.wpc.ncep.noaa.gov

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



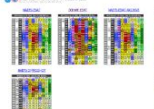
Custom plots of Local Storm Reports across the Contiguous United States. Reports include rain, snow, ice, and severe weather, as well as other significant information from storm spotters.

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)

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

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

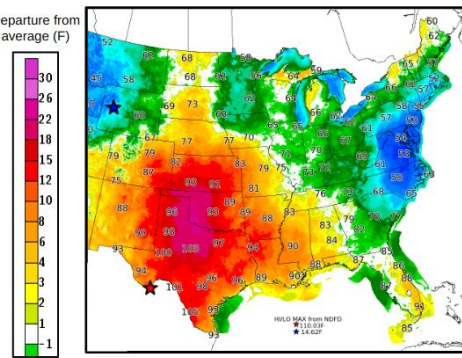
Fr. May 6, 2022
3 pm CDT

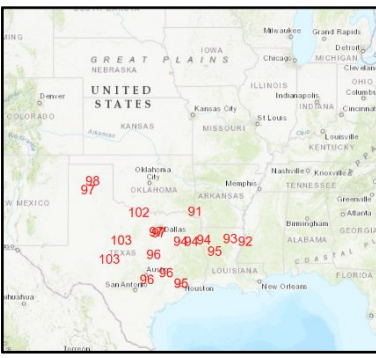
NWS NDFD MAX High Temperature (F) and Departure from Average (Fill)


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

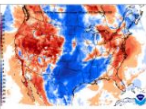
For more information go to: www.wpc.ncep.noaa.gov and www.weather.gov

Weather Prediction Center
College Park, MD



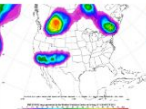
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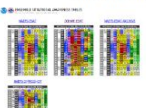
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Interactive display of where temperatures could approach or exceed records within the contiguous U.S. (based on NDFD temperature forecasts)

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

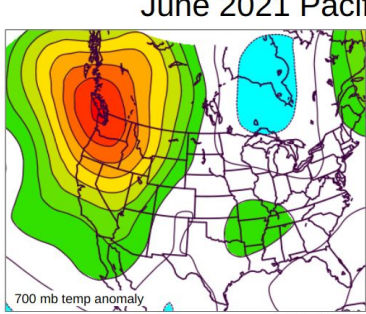


Displays forecast information and its climatological context to quickly alert a forecaster when a record or near-record breaking event is possible. This tool is available for both CONUS and Alaska.

Forecast Tools



June 2021 Pacific Northwest Heatwave

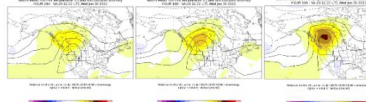


Northwestern U.S. Preliminary New All-time Maximum Temperature Records


The following locations in Washington and Oregon established new preliminary all-time maximum temperature records for any calendar day. It is quite remarkable for these temperature records to occur in June, even more remarkable some locations obliterated their previous all-time records by more than 10 degrees, and quite incredible that, in the majority of cases, the prior all-time record maximum temperature had only been set 24 hours earlier.

Washington (State all-time maximum temperature record: 118F, August 5, 1961)
 6/25/2021: 117F at Ouba breaks previous all-time maximum temperature of 114F, July 26, 1929
 6/25/2021: 115F at Vancouver breaks previous all-time maximum temperature of 110, June 27, 2021
 6/25/2021: 115F at Yacoma breaks previous all-time maximum temperature of 105, June 27, 2021
 6/25/2021: 115F at Colville breaks previous all-time maximum temperature of 105, August 6, 1981
 6/25/2021: 115F at Olympia breaks previous all-time maximum temperature of 105, June 27, 2021
 6/25/2021: 110F at Spokane breaks previous all-time maximum temperature of 105, August 4, 1961
 6/25/2021: 109F Seattle/Tacoma breaks prev. all-time maximum temperature of 104, June 27, 2021

Oregon (State all-time maximum temperature record: 119F, August 10, 1988)
 6/25/2021: 117F at Salem breaks previous prev. all-time maximum temperature of 110, June 27, 2021
 6/25/2021: 116F at Portland breaks previous prev. all-time maximum temp. of 110, June 27, 2021
 6/25/2021: 114F at Medford breaks previous prev. all-time maximum temp. of 111, June 27, 2021
 6/27/2021: 111F at Eugene breaks previous prev. all-time maximum temp. of 108, August 5, 1991



700 mb temp anomaly



SA Tables

Model Run: Station: Output: Mar 27, 2023 ... CO ... NDFD Fore ... View Table

CONUS Table - Mar 27, 2023 00Z Run									
Wind	High	High Min	Low	Low Max	Low Min	Rec	QPF		
Mon	73/17	61	21.5	0.0	0.0				
Tue	73/12	61	21.5	0.0	0.0				
Wed	67.8	60.8	22.16	0.0	0.0				
Thu	67.8	60.8	22.16	0.0	0.0				
Fri	73/12	61	21.5	0.0	0.0				
Sat	73/12	61	21.5	0.0	0.0				
Sat List	47.00	4.86	11.6	0.0	0.0				
Sun	67.11	61.15	21.54	0.0	0.0				
2nd	67.11	61.15	21.54	0.0	0.0				

Sat Apr 01 2023

STN	Max	Min	Rec	Year
50N 51 (54/2016)	1873			
AWN 61 (62/2016)	1895			
ATL 63 (65/1927)	1876			
AVL 56 (68/1927)	1876			
BHM 66 (66/2007)	1895			
BKW 53 (57/1986)	1896			
BFT 69 (71/2006)	1901			
BRN 77 (58/2016)	2000			
BRD 72 (75/2000)	1878			
BTV 71 (78/2000)	1922			
CAE 63 (67/1896)	1887			
CHA 63 (67/1927)	1897			
CHO 61 (63/1998)	1893			
CMS 65 (67/1998)	1879			
CMB 56 (54/2007)	1922			
CLT 63 (64/1998)	1876			
CMS 65 (67/1998)	1878			
CRE 62 (65/2016)	1931			
CRP 78 (74/2000)	1893			
CSE 63 (67/1929)	1891			
CUSM 65 (69/1927)	1903			
CVG 56 (58/2007)	1872			
DAN 62 (62/2016)	1916			
DAY 55 (57/2007)	1893			
DCA 48 (64/2016)	1872			
EYM 75 (78/2017)	1872			
FAY 64 (67/2016)	1918			
GLH 63 (67/2006)	1903			

Legend | East, Here, DeLorme, Mapbox, © OpenStreetMap contributors

WPC Heat Key Messages

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

Key Messages for June Southern U.S. Heat Wave Updated Jun 21, 2023 4:00 PM CDT

Dangerous heat in much of the southern U.S.; with increased concern in south and south-central Texas

- Oppressive and persistent heat will become increasingly dangerous and potentially deadly in south and south-central Texas, especially to people repeatedly exposed for long durations. Many locations in those parts of Texas have already experienced a yearly record number of hours of dangerously high heat index readings, and the heat will continue at least into next week.
- Other parts of the southern U.S. are likely to experience dangerous heat in the next week, with potential for additional record temperatures and heat index values well in excess of 100 degrees.
- There is increasing confidence that this dangerous heat wave will continue through the beginning of the July 4th holiday week, with periods of excessive heat expanding from Texas into surrounding states.
- There may be more danger than a typical heat event, due to the longevity of near-record or record high nighttime lows and elevated heat index readings. It is essential to have a way to cool down and interrupt your heat exposure.

Map valid through Tuesday, June 27
Forecast Highest Heat Index

Map valid from June 29 to July 5
Risk of Excessive Heat

National Oceanic and Atmospheric Administration
Weather Prediction Center & Climate Prediction Center

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

WEATHER PREDICTION CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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

HAZARD	APR 11	APR 12	APR 13
EXCESSIVE RAINFALL	MARGINAL	MARGINAL	MARGINAL
HEAVY SNOW (≥ 4")	NO AREA	NO AREA	NO AREA
ICE (≥ 0.25")	NO AREA	NO AREA	NO AREA

WPC Top Stories:

- Understanding WPC Excessive Rainfall Risk Categories
- Understanding WPC's Excessive Rainfall Risk Categories

Looking for data from WPC products in a GIS format?

Interactive National Forecast Chart
Additional Links

- 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

WPC Heat Key Messages

Comparing Key Message days with heat-related Emergency Department visits in FEMA Region 6, Jun-Sep 2023

Heat-Related Emergency Department Visit Rates (per 100,000) in 2023 in HHS Region 6

HHS Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, Texas

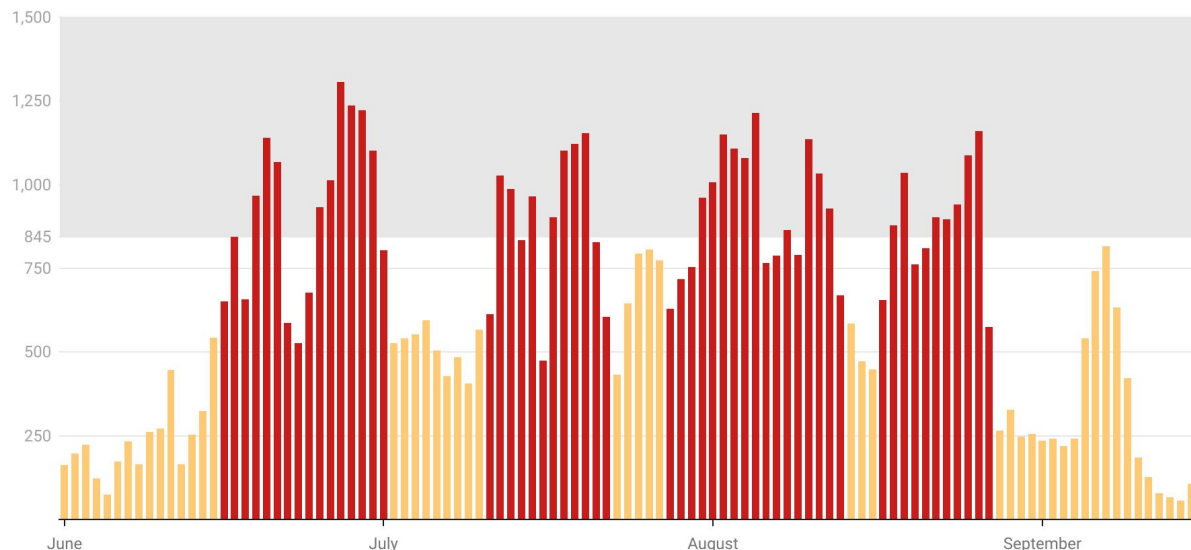


Chart: Alex Lamers • Source: HHS/CDC • Created with Datawrapper



Red days: Key Message graphic in effect for HHS Region 6

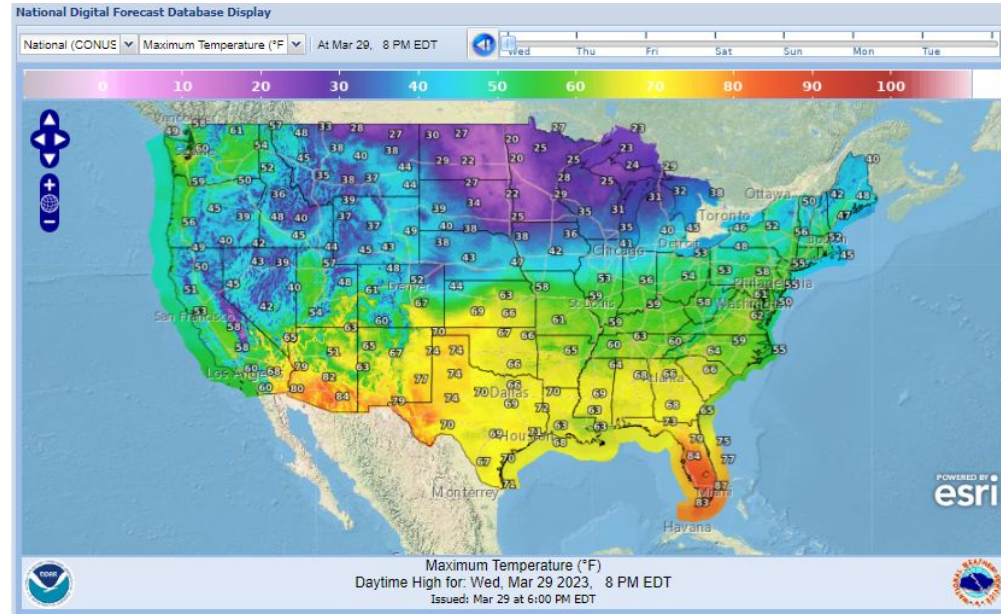
Other days: No Key Message graphic

WFO Routine Forecast Products



122 local Weather Forecast Offices (WFO)

- Graphical forecasts of 2.5km x 2.5km resolution
- weather.gov
- digital.weather.gov
- graphical.weather.gov
- weather.gov/forecastpoints



<https://digital.weather.gov/>



Outlooks: Days 1-7

Text based HWO

Experimental Graphical Hazardous Weather Outlook (gHWO)

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

Hazardous Weather Outlook
 National Weather Service Des Moines IA
 303 AM CDT Mon Aug 21 2023

IAZ004>007-015>017-023>028-033>039-044>050-057>062-070>075-081>086-092>097-221100-

Emmet-Kossuth-Winnebago-Worth-Palo Alto-Hancock-Cerro Gordo-Pocahontas-Humboldt-Wright-Franklin-Butler-Bremer-Sac-Calhoun-Webster-Hamilton-Hardin-Grundy-Black Hawk-Crawford-Carroll-Greene-Boone-Story-Marshall-Tama-Audubon-Guthrie-Dallas-Polk-Jasper-Poweshiek-Cass-Adair-Madison-Warren-Marion-Mahaska-Adams-Union-Clarke-Lucas-Monroe-Wapello-Taylor-Ringgold-Decatur-Wayne-Appanoose-Davis-

303 AM CDT Mon Aug 21 2023

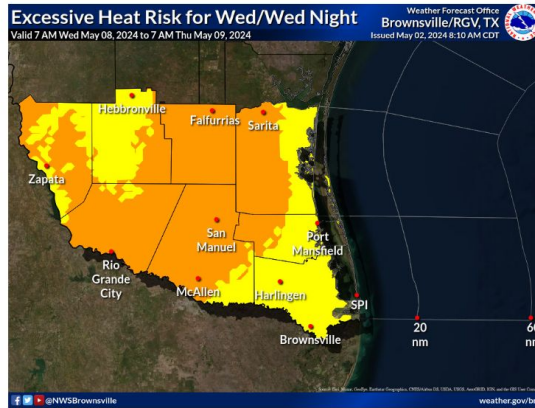
This Hazardous Weather Outlook is for portions of central Iowa.

.DAY ONE...Today and tonight

Hot and humid conditions continue today with dangerous heat index values. A Excessive Heat Warning is in effect for the area. Please refer to the National Weather Service website at weather.gov/desmoines for further details.

.DAYS TWO THROUGH SEVEN...Tuesday through Sunday

The long duration heat event continues through at least Wednesday with dangerous heat index values. An Excessive Heat Warning is in effect for the area through Wednesday evening. Please refer to the National Weather Service website at weather.gov/desmoines for further details.



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

24 Hr Hazard Risks

Filter Elements ▾

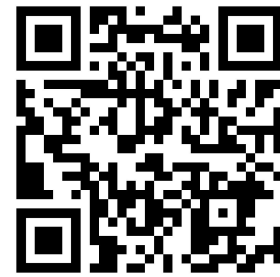
	Today	Fri	Sat	Sun	Mon	Tue	Wed
Severe Thunderstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tornado	<input type="checkbox"/>	<input type="checkbox"/>					
Thunderstorm Wind	<input type="checkbox"/>	<input type="checkbox"/>					
Hail	<input type="checkbox"/>	<input type="checkbox"/>					
Lightning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excessive Rainfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excessive Heat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wind	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Fire Weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rip Current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Marine Hazard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>





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.

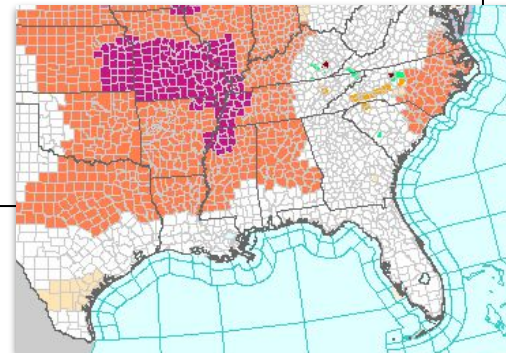
Generally **North:** HI>100 **South:** HI >105, and Min nighttime lows >/=75



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:

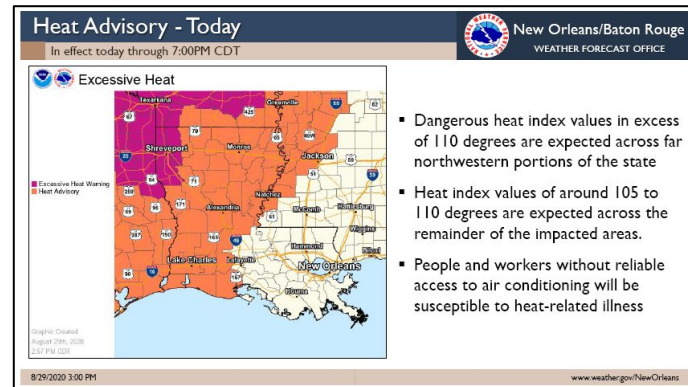
Strongly encourage local forecast offices to work with local partners, especially public health partners, to adjust criteria to reflect local impacts



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

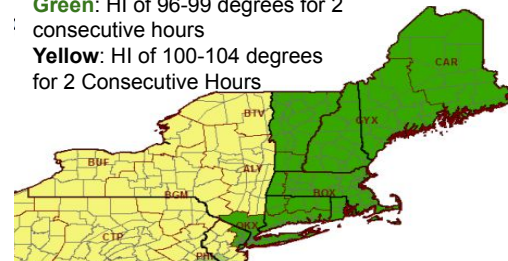
Green: Heat Index of 100-104 degrees for 2 Consecutive Hours



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

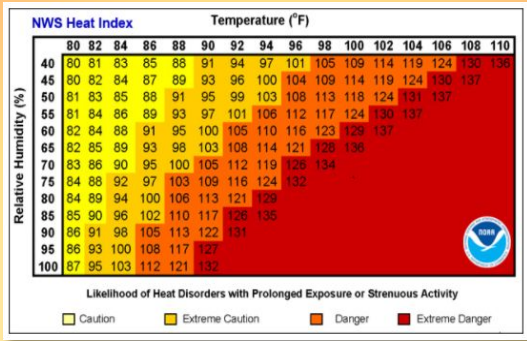
2017

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



NWS Forecast Tools to Assess Heat

Heat Index



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

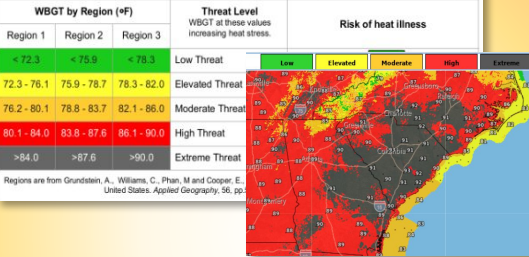
- Relatively simple: T + RH
- Light physical activity in shade



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

Wet Bulb Globe Temperature

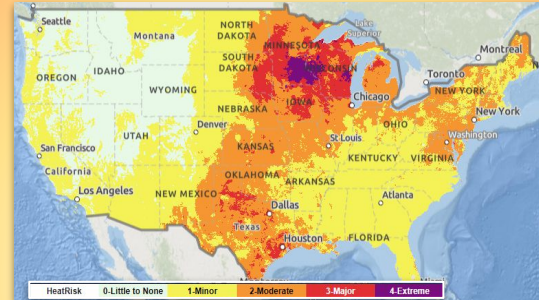
Disclaimer: Always check with local officials for appropriate actions and activity levels. Experienced heat stress will depend upon duration and intensity of activity and personal health and vulnerability.



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

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

HeatRisk (experimental)



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

- Impacts-based: MaxT + MinT + CDC heat-health data
- Spectrum of heat-health impacts for *all* populations






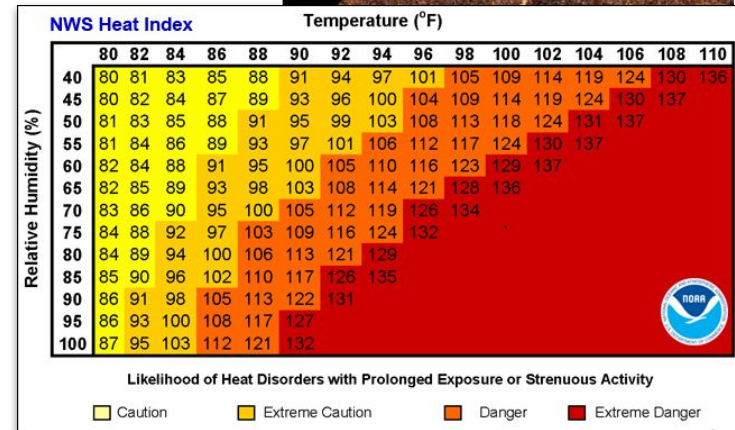
Heat Index



- 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

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



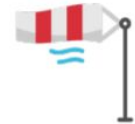
solar radiation



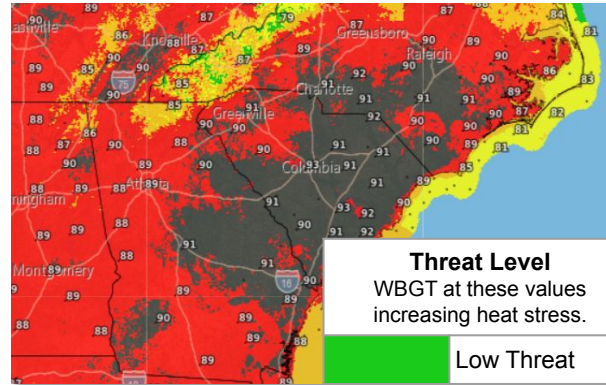
temperature



relative humidity



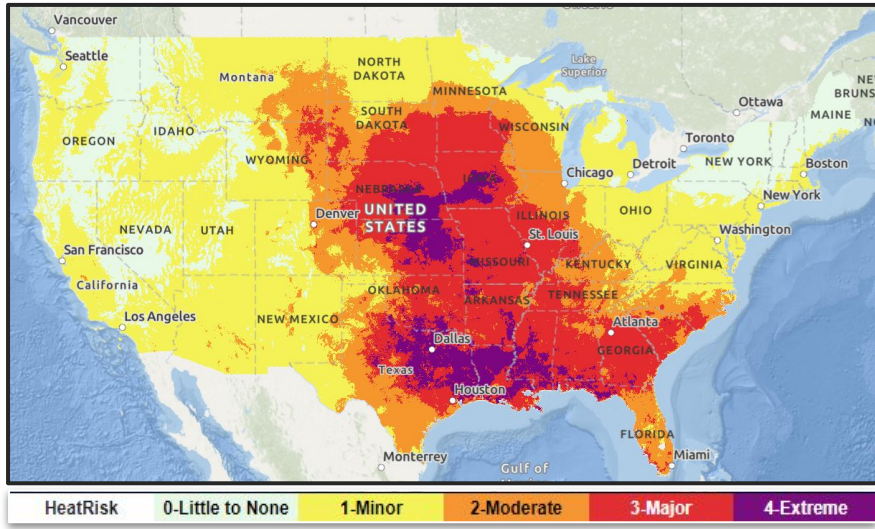
wind speed



Threat Level WBGT at these values increasing heat stress.	Risk of heat illness
Low Threat	Increased risk for heat illness
Elevated Threat	
Moderate Threat	
High Threat	
Extreme Threat	

HeatRisk (experimental)

Expanded Coast to Coast in April 2024



If you missed our April 22 webinar,
you can find the recording at
[weather.gov/wrn/calendar](https://www.weather.gov/wrn/calendar)

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

Messaging Resources

Federal Heat Health Information Hub

heat.gov

Seasonal Safety Campaigns

weather.gov/safetycampaign

Heat Exhaustion	Heat Stroke
<p>ACT FAST</p> <ul style="list-style-type: none"> Move to a cooler area Loosen clothing Sip cool water Seek medical help if symptoms don't improve 	<p>ACT FAST</p> <p>CALL 911</p> <ul style="list-style-type: none"> Move person to a cooler area Loosen clothing and remove extra layers Cool with water or ice
<p>Dizziness</p> <p>Thirst</p> <p>Heavy Sweating</p> <p>Nausea</p> <p>Weakness</p>	<p>Confusion</p> <p>Dizziness</p> <p>Becomes Unconscious</p>
<p><i>Heat exhaustion can lead to heat stroke.</i></p> <p><i>Heat stroke can cause death or permanent disability if emergency treatment is not given.</i></p>	
<p>Stay Cool, Stay Hydrated, Stay Informed!</p>	

Heat Safety Website: weather.gov/heat



NATIONAL WEATHER SERVICE

Questions?

Contributors:

Kim McMahon
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Steve Baxter
Jessica Lee
Gail Hartfield
Phil Grigsby

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>

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

Federal Heat Health Information Hub
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