

A September Heat Dome Pushes Records Across the South

NASA says a high-pressure weather pattern trapped hot air over several states near the end of summer.



An empty schoolyard appears very hot under a hazy sun, with shimmering pavement and wilted grass.

Much of the south-central United States baked under a heat dome in mid-September, just as summer was nearing its official end. According to NASA's Earth Observatory, more than 41 million people, about 12 percent of the U.S. population, were under a National **Weather Service** extreme heat **advisory**, watch, or warning on September 15. The National Weather Service is the federal agency that issues weather alerts, and these alerts mean dangerous heat is possible or already happening.

The hottest area stretched across large parts of Texas, Oklahoma, Arkansas, Missouri, and Tennessee. NASA's map showed air temperatures at 4 p.m. Central Time on September 15 across the contiguous United States, meaning the connected 48 states, not Alaska or Hawaii. The darkest red areas were near or above 104°F. NASA made the map by combining satellite observations with a computer model, which is a set of math equations used to estimate how the **atmosphere** is behaving.

Several cities set new daily high temperature records that day. Dallas reached 101°F. Mem-

phis reached 99°F. Nashville reached 100°F, breaking a daily record that had stood since 1927. All three cities were at least 12°F warmer than normal for that date. The day before, Nashville also set a record-high minimum temperature of 75°F. A minimum temperature is the lowest temperature during a day, usually reached overnight, and a high nighttime low can make it harder for buildings and bodies to cool down.

The cause was a heat dome. A heat dome forms when high **pressure** high in the atmosphere pushes hot air downward and traps it near the ground. High pressure is an area where air is pressing down more strongly than in nearby places. That sinking air can block **convection**, the rising movement of warm air that helps form clouds and storms. With fewer clouds and less rain, more **sunlight** reaches the ground, and temperatures climb even higher.

Humidity made the situation worse in some places. Humidity is water vapor in the air. When the air is humid, sweat does not **evaporate** as easily, so the body has a harder time cooling it-

self. NASA said meteorologists warned that high humidity, limited cloud cover, and light winds could make the air feel hotter than the thermometer reading. That can raise the risk of heat-related illness, such as heat **exhaustion**, when the body overheats.

This event matters because weather is not only something on an app. It changes choices people make about outdoor sports, recess, bus stops, construction work, and electricity use. It also shows how science classes connect to daily life. A heat dome is about air pressure, sunlight, wa-

ter vapor, and energy moving through Earth's system.

The event also fits into a larger pattern reported by NOAA, the National Oceanic and Atmospheric Administration, a U.S. science agency that tracks weather and **climate**. NASA said June through August 2026 was the warmest such three-month period in the contiguous United States in a 132-year record. It was 0.4°F warmer than the previous records, set in 1936 and 2021. One hot week does not explain climate by itself, but records over many years help scientists see how unusual an event is.

Written from reporting by NASA.

THINK IT THROUGH

1. When a heat alert affects a large region, how should communities balance keeping normal routines with protecting people from danger?

2. NASA used satellites and a computer model to show the heat. What are the strengths and limits of using models to make decisions about weather?

3. What information would you want beyond temperature records to judge how serious this heat dome was for people living in the affected states?

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A I S O T N T B S F U H S I T C E U
N A U O C A T E U Y R E F T P A V O
I R N H O N A A P U A E O P M L H D
E P L D N A I A I P G Y E S A U D R
T T I V V U T C U I N T E T U R A C
A D G Z E E N S E S R R Y S S D H E
A A H H C X V A A D E U T V H L O A
M A T U T L H E G D U E O H L M R Y
A R J M I R I A V M V P N C S R H P
T D S I O C E M U E A I I H A A S R
N U I D N S I S A S O R S I C Y U E
E A R I O E P N W T T R R O R S A S
R N P T D I W H A E E I S O R I V S
P N A Y T V N E E N A E O L S Y L U
M E P V E V A P O R A T E N V H S R
I H P H Y O N S E O E P H Y L R X E
T E S A T V P R H R E L F E L H E A
W C H W B O R T M I A E T R R E E T

ADVISORY

ATMOSPHERE

CLIMATE

CONVECTION

EVAPORATE

EXHAUSTION

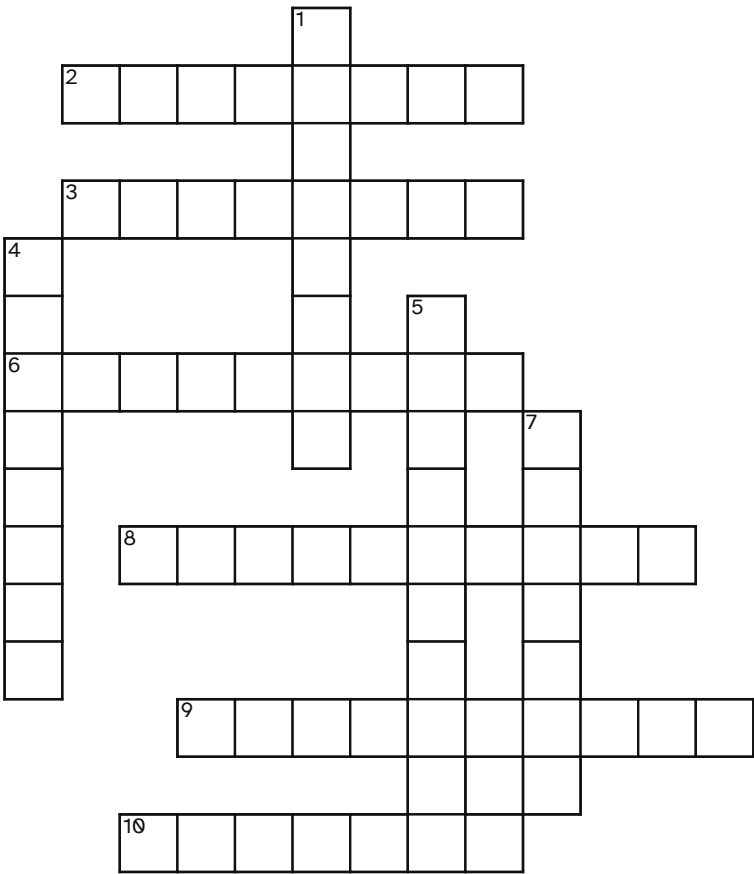
HUMIDITY

PRESSURE

SUNLIGHT

WEATHER

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ACROSS

- 2 Amount of water vapor in the air
- 3 Light and energy arriving from our star
- 6 Change from liquid water into an unseen gas
- 8 Heat-related illness caused by an overheated body
- 9 Warm air rising and helping form clouds and storms
- 10 Daily outdoor conditions, such as wind, rain, and temperature

DOWN

- 1 Official notice that dangerous conditions may occur
- 4 Downward push of air on a surface
- 5 Layer of gases surrounding Earth
- 7 Long-term pattern of conditions in a place

Where this came from

This article was written for 3andB from the reporting below. It is not a reprint — the wording is ours and the facts are theirs.

NASA

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<https://science.nasa.gov/earth/earth-observatory/summer-goes-out-with-a-heat-dome/>

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The article and its discussion questions, a word search, and a crossword.

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