Headline: Sick of hearing about record heat? Scientists say those numbers paint the story of a warming world

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A man pours cold water onto his head to cool off on a sweltering hot day in the Mediterranean Sea in Beirut, Lebanon, Sunday, July 16, 2023. AP FILE PHOTO

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The summer of 2023 is behaving like a broken record about broken records.

Nearly every major climate-tracking organization proclaimed June the hottest June ever. Then July 4 became the globe's hottest day, albeit unofficially, according to the University of Maine's Climate Reanalyzer. It was quickly overtaken by July 5 and July 6. Next came the hottest week, a tad more official, stamped into the books by the World Meteorological Organization and the Japanese Meteorological Agency.

With a summer of extreme weather records dominating the news, meteorologists and scientists say records like these give a glimpse of the big picture: a warming planet caused by climate change. It's a picture that comes in the vibrant reds and purples representing heat on daily weather maps online, in newspapers and on television.

Beyond the maps and the numbers are real harms that kill. More than 100 people have died in heat waves in the United States and India so far this summer.

Records are crucial for people designing infrastructure and working in agriculture because they need to plan for the worst scenarios, said Russell Vose, climate analysis group director for the National Oceanic and Atmospheric Administration. He also chairs a committee on national records.

In the past 30 days, nearly 5,000 heat and rainfall records have been broken or tied in the U.S. and more than 10,000 records set globally, according to NOAA. Texas cities and towns alone have set 369 daily high temperature records since June 1.

Since 2000, the U.S. has set about twice as many records for heat as those for cold.

"Records go back to the late 19th century and we can see that there has been a decade-on-decade increase in temperatures," said Gavin Schmidt, director of NASA's Goddard Institute for Space Studies, keeper of the agency's climate records. "What's happening now is certainly increasing the chances that 2023 will be the warmest year on record. My calculations suggest that there's, right now, a 50-50 chance."

The larger the geographic area and the longer stretch of time during which records are set, the more likely the conditions represent climate change rather than daily weather. So the hottest global June is "extremely unlikely" to happen without climate change, as opposed to one city's daily record, Texas state climatologist John Nielsen-Gammon said.

Still, some local specifics are striking: Death Valley has flirted this summer with the hottest temperature in modern history, though that 134 degree Fahrenheit (56.7 Celsius) record is in dispute.

Phoenix grabbed headlines among major U.S. cities on Tuesday when it marked a 19th consecutive day of unrelenting mega heat: 110 degrees Fahrenheit (43.3 Celsius) or more. It kept going, reaching a 22nd straight day on Friday. The daytime heat was accompanied by a record stretch of nights that never fell below 90 Fahrenheit (32.2 Celsius).

“Everybody’s drawn to extremes,” Vose said. “It’s like the Guinness Book of World Records. Human nature is just drawn to the extreme things out of curiosity.”

But the numbers can be flawed in what they portray.

The scientific community “doesn’t really have the vocabulary to communicate what it feels like,” said Stanford University climate scientist Chris Field, who co-chaired a groundbreaking United Nations report in 2012 warning of the dangers of extreme weather from climate change.

“I don’t think it captures the human sense, but it really does underscore that we live in a different world,” Field said of the records.

Think of the individual statistics as brush strokes in a painting of the world’s climate, Cornell University climate scientist Natalie Mahowald said. Don’t fixate on any specific number.

“The details of course matter, but the thing that really matters, especially for the impressionist painting, is when you step back and take a look at everything that’s happening,” Mahowald said.

She and other climate scientists say long-term warming from burning coal, oil and natural gas is the chief cause of rising temperatures, along with occasional boosts from natural El Nino warmings across parts of the Pacific, like the planet is experiencing this year.

El Nino is a natural temporary warming of parts of the Pacific that changes weather patterns worldwide and adds an extra warm boost. An El Nino formed in June and scientists say this one looks strong. For the previous three years El Nino’s cool flip side, La Nina, dampened a bit of the heat humans are causing.

A super El Nino spiked global temperatures in 1998, then was followed by less warming and even some flat temperatures for a few years until the next big El Nino, Mahowald said.

Weather won’t worsen each year and that should not become a common expectation, but it will intensify over the long run, she said.

The University of Michigan’s Richard Rood used to blog about climate records for Weather Underground, but in 2014 he got sick of continuously new extremes and stopped.

“I think we need to get away from that sort of record-setting sensationalism at some level and really be getting down to the hard work,” he said, addressing the need for people to adapt to a warmer world and get serious about slashing emissions causing hotter, more extreme weather.

NOAA tracks weather observations from tens of thousands of stations throughout the U.S. and its global calculations incorporate data from more than 100,000 stations, Vose said.

When those records come in, the agency checks their quality and calculates where the numbers fit historically. NOAA’s National Center for Environmental Information in North Carolina is the arbiter of

national records, while the local National Weather Service offices handle those for individual cities, Vose said.

A special international committee deals with world records and, at times, scientists disagree on the reliability of 100-year-old data. Those disagreements come into play over questions such as determining the hottest temperature recorded on Earth.

Validating records takes time. Because of a backlog of extreme weather events to analyze, officials haven't finished approving 130 degree Fahrenheit records from 2020 and 2021 at Death Valley, Vose said.

"Our primary job is keeping score, meaning what happened? How unusual was it?" he asked. "It's not like we take great joy in saying it was the warmest year on record. Again."

It's the bigger picture that matters, Northern Illinois University climate scientist Victor Gensini said.

"Look at them all together in the aggregate sense of the atmospheric orchestra," Gensini said. "There are so many clear signs that we are just not living in the same type of climate that we were."

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