

# The heat is on; NOAA, NASA say 2014 warmest year on record

January 16 2015, by Seth Borenstein

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In this July 1, 2014 file photo, Amanda Ouellet wipes her face with a cold wet towel to cool off while working outside holding an advertising sign in Las Vegas. Federal science officials announced Friday that for the third time in a decade, the globe sizzled to the hottest year on record. Both the National Oceanic and Atmospheric Administration and NASA calculated that in 2014 the world had its hottest year in 135 years of record-keeping. Earlier, the Japanese weather agency and an independent group out of University of California Berkeley also measured 2014 as the hottest on record. (AP Photo/John Locher, File)

For the third time in a decade, the globe sizzled to the hottest year on record, federal scientists announced Friday.

Both the National Oceanic and Atmospheric Administration and NASA calculated that in 2014 the world had its hottest year in 135 years of record-keeping. Earlier, the Japanese weather agency and an independent group out of University of California Berkeley also measured 2014 as the hottest on record.

NOAA said 2014 averaged 58.24 degrees Fahrenheit (14.58 degrees Celsius), 1.24 degrees (0.69 degrees Celsius) above the 20th-century average.

But NASA, which calculates temperatures slightly differently, put 2014's average temperature at 58.42 degrees Fahrenheit (14.68 degrees Celsius) which is 1.22 degrees (0.68 degrees Celsius) above the average of the years 1951-1980.

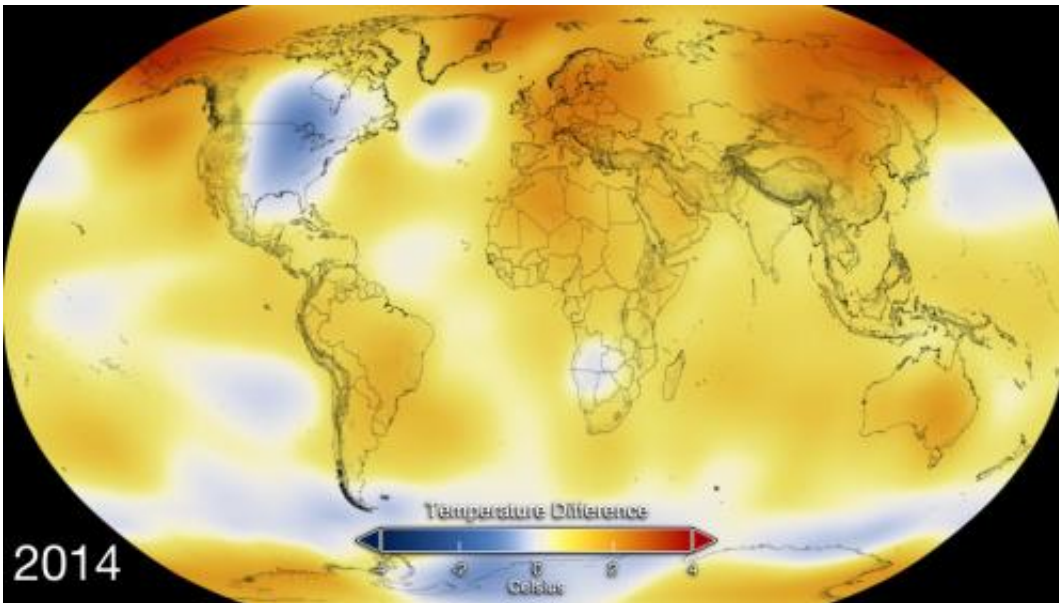
Earth broke NOAA records set in 2010 and 2005. The last time the Earth set an annual NOAA record for cold was in 1911.

NOAA also said last month was the hottest December on record. Six months in 2014 set marks for heat. The last time Earth set a monthly cold record was in December 1916.

"The globe is warmer now than it has been in the last 100 years and more likely in at least 5,000 years," said climate scientist Jennifer Francis of Rutgers University, who wasn't part of either research team. "Any wisps of doubt that human activities are at fault are now gone with the wind."

Texas A&M University climate scientist Andrew Dessler and other experts said the latest statistics should end claims by non-scientists that warming has stopped. It didn't, as climate denial sites still touted claims

that the world has not warmed in 18 years.



This color-coded map displays global temperature anomaly data from 2014.  
Credit: NASA's Goddard Space Flight Center

2014's heat was driven by record warmth in the world's oceans that didn't just break old marks: It shattered them. Record warmth spread across far eastern Russia, the western part of the United States, interior South America, much of Europe, northern Africa and parts of Australia. One of the few cooler spots was in the central and eastern United States.

"Every continent had some aspect of record high temperatures" in 2014, said Tom Karl, director of NOAA's National Climatic Data Center.

Nine of the 10 hottest years in NOAA global records have occurred since 2000. The odds of this happening at random are about 650 million to 1, according to University of South Carolina statistician John Grego. Two other statisticians confirmed his calculations.

Climate scientists say one of the most significant parts of 2014's record is that it happened during a year where there was no El Nino weather oscillation. During an El Nino, when a specific area of the central Pacific warms unusually and influences weather worldwide, global temperatures tend to spike. Previous records, especially in 1998, happened during El Nino years.

Every year in the 21st century has been in the top 20 warmest years on record, according to NOAA.

Temperatures have risen by about 1.6 degrees Fahrenheit (0.9 degrees Celsius) since the mid-19th century and pre-industrial times, said Gavin Schmidt, director of NASA's Goddard Institute for Space Studies, where the space agency tracks warming temperatures.

"We are witnessing, before our eyes, the effect of human-caused climate change," said Pennsylvania State University professor Michael Mann.

Some non-scientists who deny man-made global warming have pointed to satellite temperature records—which only go back to 1979—which show a warming world, but no record this year and less of a recent increase than the longer-term ground thermometers. But Mann, Dessler, Francis and others say there have been quality and trustworthy issues with some satellite measurements and they only show what's happening far above the ground. They said ground measurements are also more important because it is where we live.

University of Alabama Huntsville scientist John Curry, who measures temperature via satellite, puts 2014 in a cluster of warm years behind 2010 and 1998. He said he is "puzzled that this difference between surface and deep atmosphere continues to occur as it has now for 36 years. Our theories can't explain it. I don't know what is going on."

Georgia Tech professor Judith Curry, who is not in the mainstream of climate scientists, wrote that talk about the record implies that temperatures will get warmer, something she says won't happen for at least another decade. But she added in a blog post in response to the NOAA announcement: "I'm not willing to place much \$\$ on that bet, since I suspect Mother Nature will manage to surprise us."

NASA's Schmidt says temperatures will continue to rise with year-to-year variations and he wouldn't be surprised if 2015 breaks 2014's record: "The increase in greenhouse gases is unrelenting and that in the end is going to dominate most things going on."

This was the 38th year in a row that the world was warmer than the 20th century average, according to NOAA data. Most people in the world and the United States were born after 1976 and have never lived in a cooler than normal year.

"You want to understand what that (cooler) world is like and you wonder are you ever to going to experience that," said Victor Gensini, a 28-year-old meteorology professor at the College of DuPage in Illinois.

**More information:** NASA: [data.giss.nasa.gov/gistemp/](http://data.giss.nasa.gov/gistemp/)

NOAA: [www.ncdc.noaa.gov/sotc/global/2014/13](http://www.ncdc.noaa.gov/sotc/global/2014/13)

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