

# Study blames global warming for 75 percent of very hot days

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In this Jan. 29, 2015 file photo, children play under the water that they manage to spill over from a water tank, to cool off from the summer heat, at the Alemão Complex slum in Rio de Janeiro, Brazil. The next day it's unusually beastly hot, scientists say you can blame three-quarters of it on humans. As climate change gets worse around mid-century, that percentage of extremely hot days being caused by man-made greenhouse gases will push past 95 percent, according to a new study published Monday in the journal *Nature Climate Change*. (AP Photo/Leo Correa, File)

If you find yourself sweating out a day that is monstrously hot, chances are you can blame humanity. A new report links three out of four such days to man's effects on climate.

And as [climate change](#) worsens around mid-century, that percentage of extremely [hot days](#) being caused by man-made greenhouse gases will push past 95 percent, according to the new study published Monday in the journal *Nature Climate Change*.

Humans have not had as great an effect on heavy downpours, though. The Swiss scientists who did the study calculated that 18 percent of extreme rain events are caused by global warming. But if the world warms another two degrees Fahrenheit (1.1 degrees Celsius)—expected to happen around mid-century—about 39 percent of the downpours would be attributed to humanity's influence, according to the study. That influence comes from greenhouse gases, mostly carbon dioxide from the burning of coal, oil and gas.

"This new study helps get the actual probability or odds of human influence," said University of Arizona [climate](#) scientist Jonathan Overpeck, who wasn't part of the research. "This is key: If you don't like hot temperature extremes that we're getting, you now know how you can reduce the odds of such events by reducing [greenhouse gas emissions](#)."

Lead author Erich Fischer, a climate scientist at ETH Zurich, a Swiss university, and colleague Reto Knutti examined just the hottest of hot days, the hottest one-tenth of one percent. Using 25 different computer models. Fischer and Knutti simulated a world without human-caused greenhouse gas emissions and found those hot days happened once every three years.

Then they calculated how many times they happen with the current level of heat-trapping gases and the number increases to four days. So three of

the four are human caused, the team said.

And when the scientists dialed up the [greenhouse gases](#)—using current pollution trends—to simulate a world about mid-century, they got 26 of those super-hot days, "almost a whole month," Fischer said.

The figures that Fischer and Knutti calculated are global estimates. The margins of error, plus or minus about 13 percent with current hot days, grow larger when smaller regions are considered. However, they found Africa and South America now have the highest percentages of unusual hot days that could be blamed on human influence, 89 percent and 88 percent respectively. Europe, at 63 percent, and North America, with 67 percent, come in at the lowest. By mid-century, if emissions continue at current pace, all continents will be able blame at least 93 percent of super hot days on humans.

Half a dozen outside scientists praised the study as valid, elegant and important.

When people ask if a single weird weather event is due to human activity or just natural variation, that's the wrong question because both factors are always involved, said Princeton University climate scientist Michael Oppenheimer, who wasn't part of the study but praised it heavily. This study, he said, asks the right question: "How much of the change is due to human activity and how much is natural variation?"

And once that percentage of damages, costs and deaths can be attributed to [human influence](#), it's easier for governments to put a price on carbon dioxide emissions in an effort to control global warming, said Duke University [climate scientist](#) Drew Shindell.

**More information:** *Nature Climate Change*, [DOI: 10.1038/nclimate2617](#)

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