

New NASA study links current extreme summer events to climate change

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In this Sept. 30, 2011 file photo, Sailboats and a floating dock lie on the dry, cracked dirt in a harbor at Lake Hefner in Oklahoma City as drought continues to be a problem across the state. The relentless, weather-gone-crazy type of heat that has blistered the United States and other parts of the world in recent years is so rare and off-the-charts that it can't be anything but man-made global warming, a new statistical analysis from a top government scientist says. (AP Photo/Sue Ogrocki, File)

The relentless, weather-gone-crazy type of heat that has blistered the United States and other parts of the world in recent years is so rare that it can't be anything but man-made global warming, says a new statistical analysis from a top government scientist.

The research by a man often called the "godfather of global warming" says that the likelihood of such temperatures occurring from the 1950s through the 1980s was rarer than 1 in 300. Now, the odds are closer to 1

in 10, according to the study by NASA scientist James Hansen. He says that statistically what's happening is not random or normal, but pure and simple climate change.

"This is not some scientific theory. We are now experiencing scientific fact," Hansen told The Associated Press in an interview.

Hansen is a scientist at NASA's Goddard Institute for Space Studies in New York and a professor at Columbia University. But he is also a strident activist who has called for government action to curb greenhouse gases for years. While his study was published online Saturday in the *Proceedings of the National Academy of Science*, it is unlikely to sway opinion among the remaining climate change skeptics.

However, several climate scientists praised the new work.

In a blunt departure from most climate research, Hansen's study — based on statistics, not the more typical climate modeling — blames these three heat waves purely on global warming:

—Last year's devastating Texas-Oklahoma drought.

—The 2010 heat waves in Russia and the Middle East, which led to thousands of deaths.

—The 2003 European heat wave blamed for tens of thousands of deaths, especially among the elderly in France.

The analysis was written before the current drought and record-breaking temperatures that have seared much of the United States this year. But Hansen believes this too is another prime example of global warming at its worst.



In this Aug. 19, 2003 file photo, the Ibardin lake, which provides drinking water to the southern French cities of Hendaye, Biriatu and Urrugne, is almost dry due to the recent heat wave, near the French-Spanish border. The relentless, weather-gone-crazy type of heat that has blistered the United States and other parts of the world in recent years is so rare and off-the-charts that it can't be anything but man-made global warming, a new statistical analysis from a top government scientist says. (AP Photo/Bob Edme, File)

The new research makes the case for the severity of global warming in a different way than most scientific studies and uses simple math instead of relying on complex climate models or an understanding of atmospheric physics. It also doesn't bother with the usual caveats about individual weather events having numerous causes.

The increase in the chance of extreme heat, drought and heavy downpours in certain regions is so huge that scientists should stop hemming and hawing, Hansen said. "This is happening often enough, over a big enough area that people can see it happening," he said.

Scientists have generally responded that it's impossible to say whether single events are caused by global warming, because of the influence of natural weather variability.

However, that position has been shifting in recent months, as other studies too have concluded climate change is happening right before our eyes.



In this Thursday, Aug. 2 2012 photo, Dr. James E. Hansen head of the NASA Goddard Institute for Space Studies gestures during an interview with the Associated Press at his office in New York. (AP Photo/Mary Altaffer)

Hansen hopes his new study will shift people's thinking about climate change and goad governments into action. He wrote an op-ed piece that appeared online Friday in the Washington Post.

"There is still time to act and avoid a worsening climate, but we are wasting precious time," he wrote.

The science in Hansen's study is excellent "and reframes the question," said Andrew Weaver, a climate scientist at the University of Victoria in British Columbia who was a member of the Nobel Prize-winning

international panel of climate scientists that issued a series of reports on global warming.

"Rather than say, 'Is this because of climate change?' That's the wrong question. What you can say is, 'How likely is this to have occurred with the absence of global warming?' It's so extraordinarily unlikely that it has to be due to global warming," Weaver said.

For years scientists have run complex computer models using combinations of various factors to see how likely a weather event would happen without global warming and with it. About 25 different aspects of climate change have been formally attributed to man-made greenhouse gases in dozens of formal studies. But these are generally broad and non-specific, such as more heat waves in some regions and heavy rainfall in others.

Another upcoming study by Kevin Trenberth, climate analysis chief at the National Center for Atmospheric Research, links the 2010 Russian heat wave to global warming by looking at the underlying weather that caused the heat wave. He called Hansen's paper an important one that helps communicate the problem.



In this Thursday, Aug. 2 2012 photo, Dr. James E. Hansen head of the NASA Goddard Institute for Space Studies gestures during an interview with the

Associated Press at his office in New York. (AP Photo/Mary Altaffer)

But there is bound to be continued disagreement. Previous studies had been unable to link the two, and one by the National Oceanic and Atmospheric Administration concluded that the Russian drought, which also led to devastating wildfires, was not related to global warming.

White House science adviser John Holdren praised the paper's findings in a statement. But he also said it is true that scientists can't blame single events on global warming: "This work, which finds that extremely hot summers are over 10 times more common than they used to be, reinforces many other lines of evidence showing that climate change is occurring and that it is harmful."

Skeptical scientist John Christy of the University of Alabama at Huntsville said Hansen shouldn't have compared recent years to the 1950s-1980s time period because he said that was a quiet time for extremes.

But Derek Arndt, director of climate monitoring for the federal government's National Climatic Data Center, said that range is a fair one and often used because it is the "golden era" for good statistics.

Granger Morgan, head of engineering and public policy at Carnegie Mellon University, called Hansen's study "an important next step in what I expect will be a growing set of statistically-based arguments."

In a landmark 1988 study, Hansen predicted that if greenhouse gas emissions continue, which they have, Washington, D.C., would have about nine days each year of 95 degrees or warmer in the decade of the 2010s. So far this year, with about four more weeks of summer, the city

has had 23 days with 95 degrees or hotter temperatures.

Hansen says now he underestimated how bad things would get.

And while he hopes this will spur action including a tax on the burning of fossil fuels, which emit carbon dioxide, a key greenhouse gas, others doubt it.

Science policy expert Roger Pielke Jr. of the University of Colorado said Hansen clearly doesn't understand social science, thinking a study like his could spur action. Just because something ought to happen, doesn't mean it will, he said.

In an email, he wrote: "Hansen is pursuing a deeply flawed model of policy change, one that will prove ineffectual and with its most lasting consequence a further politicization of climate science (if that is possible!)."

More information: "Perception of climate change," by James Hansen, Makiko Sato, and Reto Ruedy, *PNAS*, 2012.

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