

An Unexpected Side Effect Of Climate Change: More Lightning

For every two strikes in the year 2000, there will be three in 2100.

It was only two months ago that California governor Jerry Brown declared his state in crisis. Wildfires, accelerated by the long, parched drought, were burning up homes, cars, and even a sawmill in the north. Today, a new study predicts what many threatened by these kinds of fires have feared most: Climate change will increase lightning strikes by as much as 50% by 2100. For areas threatened by wildfires, that's bad news.

For every single-degree increase in temperature (in Celsius) over the next 100 years, the frequency of lightning strikes will grow by 12%, a paper from researchers at the University of California Berkeley and the State University of New York Albany, published in *Science*, concludes.



Berkeley researcher and lead author David Romps used three sets of data to show how warming and lightning strikes were linked. By looking at precipitation levels across the lower 48 states, measuring the intensity of storms, and analyzing radio signals that track strikes through the National Lightning Detection Network, he found strong ties between temperature and conditions ripe for lightning. The way Romps explains it, lightning needs all three states of water—liquid, gas, and ice—moving quickly in the atmosphere to create an electric field. When liquid water and ice swap electrons, they create a charge that translates into the snap of light we call lightning.

The warmer the air (thanks, greenhouse gases), the more water vapor the atmosphere holds, Romps says. And water vapor is “fuel for thunderstorms.”

But it was only when Romps and his colleagues looked over a decade’s worth of data, up until 2005, that they were able to nail down the link between climate models and increased lightning strikes.

“This is where our jaws kind of hit the floor because they line up incredibly well. It’s really a remarkable match,” Romps says. “For every two strikes you have in the year 2000, you’ll have three in 2100.”



In 2013, lightning caused at least 22,600 fires, resulting in \$451 million worth of damage to homes. The federal fire budget is already far overtaxed—since 2002, the U.S. government has broken its coffers trying to put wildfires out every year. And wildfires started by lightning are particularly difficult to stop, because they spark in remote areas and go unmonitored until the flames are too big to douse.

Romps' next task at hand will be to determine which areas are most at risk of wildfires started by lightning strikes. But what about reversing the course we're on? If we decrease emissions, might we be able to keep lightning strikes under control?

That remains to be seen. "If we're going peel off from this business-as-usual trajectory, it will require concerted effort from China, India, the United States, the world," Romps says.

[Photos: Flickr user James Loesch]



SYDNEY BROWNSTONE

Sydney Brownstone is a New York-based staff writer at Co.Exist. She's written for the Village Voice, Mother Jones, Brooklyn Magazine, The L Magazine, and has contributed to NPR. Continued

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