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Climate change could mean more lightning strikes



Bolt of lightning is seen in distance in St. Louis area on Sept. 1, 2014 / KMOV-TV

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Get ready for more lightning strikes in a warmer world.

A new study published in the journal Science predicts that **lightning strikes** will increase 50 percent across the United States during this century as a result of climate change raising temperatures. Climate scientist David Romps of the University of California, Berkeley and his colleagues examined precipitation patterns and cloud buoyancy in 11 different climate models to come up with the surprising finding.

"With warming, thunderstorms become more explosive," said Romps, an assistant professor of earth and planetary science at Lawrence Berkeley National Laboratory. "This has to do with water vapor, which is the fuel for explosive deep convection in the atmosphere. Warming causes there to be more water vapor in the atmosphere, and if you have more fuel lying around, when you get ignition, it can go big time."

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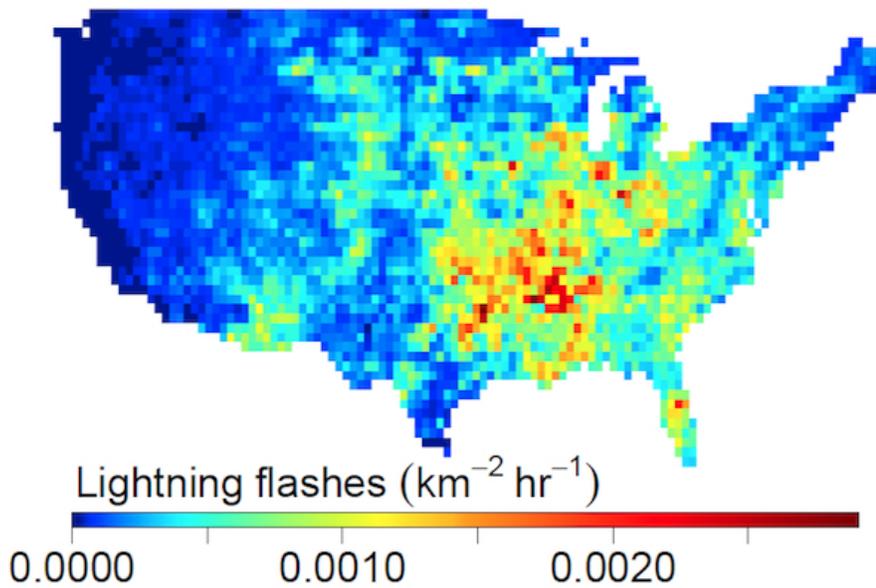


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This graphic shows the intensity of lightning flashes averaged over the year in the lower 48 states during 2011. Data from National Lightning Detection Network, State University of New York at Albany, and analyzed by David Romps, UC Berkeley.

/ NATIONAL LIGHTNING DETECTION NETWORK, STATE UNIVERSITY OF NEW YORK AT ALBANY

The [U.N. Intergovernmental Panel on Climate Change](#) says science makes clear that temperatures are rising due to increased greenhouse gas emissions. It estimates that temperatures have risen 0.85 degrees Celsius from 1880 to 2012 and are set to increase between 1.5 and 4 degrees C by the end of this century, compared to 1850.

The new findings suggest that people out for a stroll, doing yard work or golfing could face an increased **danger of getting hit by lightning**. "When you used to have two lightning strikes, now you'll have three," Romps said. "It's a substantial increase."

Currently, the National Weather Service estimates that about 33 people are killed every year by lightning and nearly 300 injured. **Men are far more likely** than women to die in lightning strikes, accounting for about 80 percent of victims. According to the Associated Press, the top states for lightning deaths in the past decade are Florida, Texas, Colorado, Georgia, North Carolina and New Jersey.

The animation below, released by the researchers, tracks a year's worth of lightning strikes across the United States.

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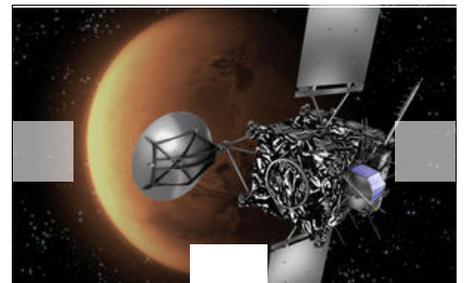
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are already ignited by lightning, Romps said. More lightning also would likely generate more nitrogen oxides in the atmosphere, which exert a strong control on atmospheric chemistry.



The findings build on early work suggesting climate change could spark more lightning. A 2012 study led by Colin Price, head of the Department of Geophysics, Atmospheric and Planetary Sciences at Tel Aviv University in Israel, found that, for every degree Celsius of long-term warming, lightning strikes increased 10 percent.

In the latest study, Romps and graduate student Jacob Seeley zeroed in on precipitation and cloud buoyancy as key factors in determining whether lightning strikes would increase.



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Nature: Lightning storm

They then looked at 11 different climate models that predict precipitation and a factor called CAPE (which stands for convective available potential energy), a measure of how explosive the atmosphere is. The data is gathered in the most recent Coupled Model Intercomparison Project (CMIP5), a resource for climate modelers.

"With CMIP5, we now have for the first time the CAPE and precipitation data to calculate these time series," Romps said.

Because the models predict little average precipitation increase nationwide over this period, the researchers determined that cloud-to-ground lightning strikes could rise 12 percent for every degree of temperature increase. That works out to a roughly 50 percent jump in lightning strikes by 2100 if Earth sees the expected 4-degree Celsius rise in temperature.

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Michael Casey covers the environment, science and technology for CBSNews.com

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