

## Advertisement



- News
- The Magazine
- Maps
- Science
- Education
- Games
- Events
- Blogs
- Movies
- Explorers
- Apps
- Trips

National Geographic News

# Climate Change May Spark More Lightning Strikes, Igniting Wildfires

*But the news isn't all bad—more lightning could also trim the atmosphere's methane, a potent greenhouse gas.*



A lightning strike ignites a ground fire in Elephant Butte, New Mexico.

*PHOTOGRAPH BY CARSTEN PETER, NATIONAL GEOGRAPHIC CREATIVE*

**By Jane J. Lee**

National Geographic

PUBLISHED NOVEMBER 13, 2014

**Add this to rising seas, more intense hurricanes, and more frequent thunderstorms: Climate change will also spark more lightning.**

The frequency of lightning flashes could rise by an estimated 50 percent across the continental U.S. over the next century, researchers report Thursday in the journal *Science*. That's bad news for wildfires across the country.

**Share**

Like 26  
45

Lightning triggers about half the wildfires in the continental U.S., says lead study author David Romps, an atmospheric scientist at the University of California, Berkeley. (Learn "Why Big, Intense Wildfires Are the New Normal.")

8+1 0

Email

More »

A warmer atmosphere can hold more moisture, says Romps. And moisture is one of the key ingredients for triggering a lightning strike.

Increased lightning will also affect greenhouse gases in our atmosphere, he says, though that could be both a good and a bad thing.

The bad: More lightning means more ozone, which is a potent greenhouse gas, Romps says.

But on the positive side, lightning also produces compounds called nitrogen oxides, which indirectly reduce levels of methane, another powerful greenhouse gas, says Romps. (See "New Report Offers Clearest Picture Yet of Rising Greenhouse Gas Emissions.")

### **Getting Physical**

Current predictions of lightning frequency are based on the thickness of thunderclouds because observations show that taller clouds generate more lightning, says Romps. Scientists' equations make allowances for the fact that this increase in lightning is exponential, rather than a straight one-to-one relationship.

The problem, says Romps, is that these estimates don't take into account the many physical factors that can produce lightning, such as how much moisture is in the air or the potential of a thundercloud to generate upward movement of air.

This current study incorporates those features into its predictions, says Romps.

Alexander Archibald, an atmospheric chemist at Cambridge University in the U.K., notes that Romps's new method includes a scaling feature similar to the corrections used in current methods. Overall, though, the new study's energy-based approach seems like a good contribution for predicting lightning strikes, says Archibald, who was not involved in the research.



Lightning sparked a wildfire that raged through Custer State Park in South Dakota.

*PHOTOGRAPH BY MARK THIESSEN, NATIONAL GEOGRAPHIC CREATIVE*

## **Where Sparks Fly**

Lightning forms when a spark travels from a positively or negatively charged area of a cloud to an area with the opposite charge. Vigorous updrafts—the upward movement of air—jostle particles in the cloud, which charges them, says Richard Blakeslee, a lightning researcher at NASA's Marshall Space Flight Center in Huntsville, Alabama.

Small ice particles typically take on a positive charge and tend to travel to the tops of clouds on the updrafts. Negative charges end up near the bottoms of such clouds.

So Romps and colleagues created a computer model that simulates how much

lightning is created based on precipitation (which creates the ice particles) and how much activity (like updrafts) a thunderstorm could produce.

When the researchers tested their new method against lightning flash data over the continental U.S. in 2011, they found that the simulation predicted 77 percent of the lightning flashes from that year.

The scientists are quick to caution that their results apply only to the continental U.S., based on data from the U.S. National Oceanic and Atmospheric Administration and the National Lightning Detection Network.

Romps's next step is to map the predicted increases in lightning strikes. Currently, Florida and states near the Mississippi and Ohio Rivers get the majority of lightning strikes in the U.S., he says.

Whether these places will receive even more lightning strikes in the future is anyone's guess, Romps says.

*Follow Jane J. Lee on Twitter.*

5 comments



Sign in

42 people listening



	+ Follow	Share	Post comment as...

Newest | Oldest | Top Comments



**Dash Riprock**

1 hour ago

Fact: Lightening strikes the Earth an average of 8 million times a day.....what difference is a couple more going to make? This is just another non-fact, pie in the shy, global warming story that needs to be taken with a grain of salt.....a very small grain.

Like Reply

**Lorretta Rollinson**

4 hours ago

appreciate the over use of the scientific specific words validating this piece ..