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Ice Lightning

By **Randolph E. Schmid**, Associated Press
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WASHINGTON (AP) ---- Poet Robert Frost once pondered whether the world would end in fire or in ice. Weather researchers say where you find ice you find fire -- at least in the form of lightning.

Whether the storm was over land, ocean or coastal areas, clouds with more ice produced more lightning, researchers studying satellite radar images report in the journal Geophysical Research Letters.

"The new thing is that when you look at different areas of the planet ... the hypothesis about the importance of ice holds up," Walter A. Petersen of the University of Alabama at Huntsville said Thursday.

The Electric Earth



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He said weather scientists have known there was a relationship between ice and lightning, but were learning new details by studying the National Aeronautics and Space Administration satellite images which can look at both the number of lightning strikes and the volume of ice in a cloud at the same time.

Crucial is what is called precipitation-sized ice, particles of a millimeter or so which sometimes can be seen falling as small hail. "Where you have more of that, you tend to have more lightning," Petersen said.

These particles crash into smaller ice particles in the swirling winds inside storm clouds, resulting in a separation of electrical charge.

The charge separated between smaller and larger particles, with the smaller carrying a positive charge to the top of the thundercloud and the larger ones with the negative charge sinking to the bottom, he explained in a telephone interview.

"You effectively make a big battery with positive and negative ends," he said, with the charge building up until it is discharged as lightning.



[The Science of Lightning](#)

The relationship between ice volume and lightning held true over such varied locations as the Himalaya Mountains, Central Africa, Madagascar, northern Australia and Florida, the researchers reported.

They found small areas of subtropical South America where lightning flash density seemed slightly less than would have been expected for the measured ice amount. Since they could find no physical reason for this the researchers said it may be a sampling error. They are doing more research on those areas.

The work was funded by the NASA's Earth Observing System and Earth Science Enterprise programs.

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