

# Converging weather patterns caused last winter's huge snows

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Unusually cold weather turned the Lincoln Memorial Reflecting Pool into an ice rink. Credit: FamousDC.com.

The memory of last winter's blizzards may be fading in this summer's searing heat, but scientists studying them have detected a perfect storm of converging weather patterns that had little relation to climate change. The extraordinarily cold, snowy weather that hit parts of the U.S. East Coast and Europe was the result of a collision of two periodic weather patterns in the Atlantic and Pacific Oceans, a new study in the journal *Geophysical Research Letters* finds.

It was the snowiest winter on record for Washington D.C., Baltimore and Philadelphia, where more than six feet of snow fell over each. After a blizzard shut down the nation's capital, skeptics of global warming used the frozen landscape to suggest that manmade climate change did not

exist, with the family of conservative senator James Inhofe posing next to an igloo labeled "Al Gore's new home."

After analyzing 60 years of snowfall measurements, a team of scientists at Columbia University's Lamont-Doherty Earth Observatory found that the anomalous winter was caused by two colliding [weather](#) events. El Niño, the cyclic warming of the tropical Pacific, brought wet weather to the southeastern U.S. at the same time that a strong negative phase in a pressure cycle called the [North Atlantic Oscillation](#) pushed frigid air from the arctic down the East Coast and across northwest Europe. End result: more snow.

Using a different dataset, climate scientists at the National Oceanic and Atmospheric Administration came to a similar conclusion in a report released in March.

"Snowy winters will happen regardless of climate change," said Richard Seager, a climate scientist at Lamont-Doherty and lead author of the study. "A negative North Atlantic Oscillation this particular winter made the air colder over the eastern U.S., causing more precipitation to fall as snow. El Niño brought even more precipitation—which also fell as snow."

In spite of last winter's snow, the decade 2000-2009 was the warmest on record, with 2009 tying a cluster of other recent years as the second warmest single year. Earth's climate has warmed 0.8°C (1.5°F) on average since modern record keeping began, and this past June was the warmest ever recorded.

While the heavy snow on the East Coast and northwest Europe dominated headlines this winter, the Great Lakes and western Canada actually saw less snow than usual—typical for an El Niño year, said Seager. Warm and dry weather in the Pacific Northwest forced the

organizers of the 2010 Winter Olympic Games in Vancouver to lug in snow by truck and helicopter to use on ski and snowboarding slopes. The arctic also saw warmer weather than usual, but fewer journalists were there to take notes.

"If Fox News had been based in Greenland they might have had a different story," said Seager.

While El Niño can now be predicted months in advance by monitoring slowly evolving conditions in the tropical Pacific Ocean, the North Atlantic Oscillation—the difference in air pressure between the Icelandic and Azores regions—is a mostly atmospheric phenomenon, very chaotic and difficult to anticipate, said Yochanan Kushnir, a climate scientist at Lamont-Doherty and co-author of the study.

The last time the North Atlantic experienced a strong negative phase, in the winter of 1995-1996, the East Coast was also hammered with above average snowfall. This winter, the North Atlantic Oscillation was even more negative--a state that happens less than 1 percent of the time, said Kushnir.

"The events of last winter remind us that the North Atlantic Oscillation, known mostly for its impact on European and Mediterranean winters, is also playing a potent role in its backyard in North America," he said.

David Robinson, a climate scientist at Rutgers University who was not involved in the research, said the study fills an important role in educating the public about the difference between freak weather events and human-induced [climate change](#).

"When the public experiences abnormal weather, they want to know what's causing it," he said. "This paper explains what happened, and why global warming was not really involved. It helps build credibility in

[climate](#) science."

**More information:** "Northern hemisphere winter snow anomalies: ENSO, NAO and the winter of 2009/10," *Geophysical Research Letters*.

Provided by Columbia University

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