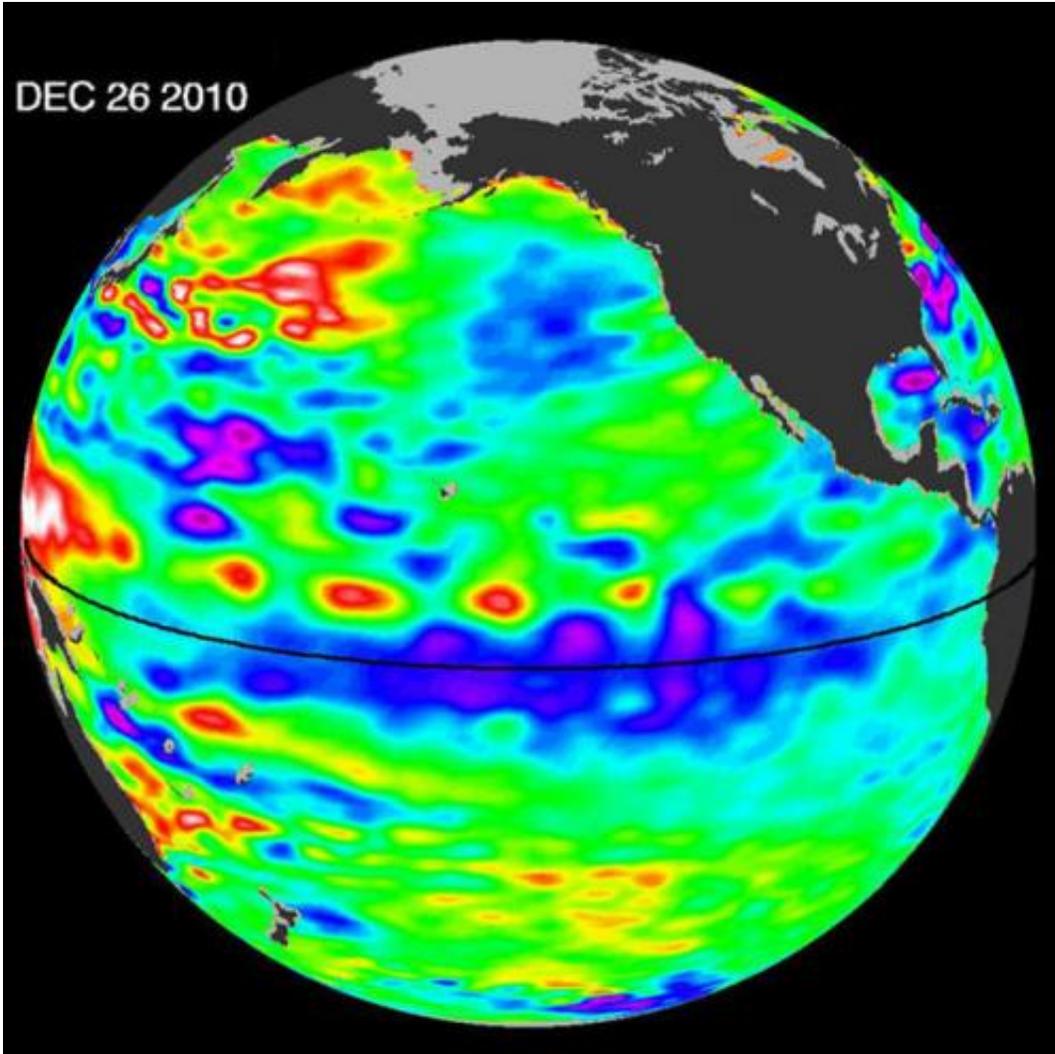


# What's to blame for wild weather? 'La Nada'

June 28 2011, By Dauna Coulter

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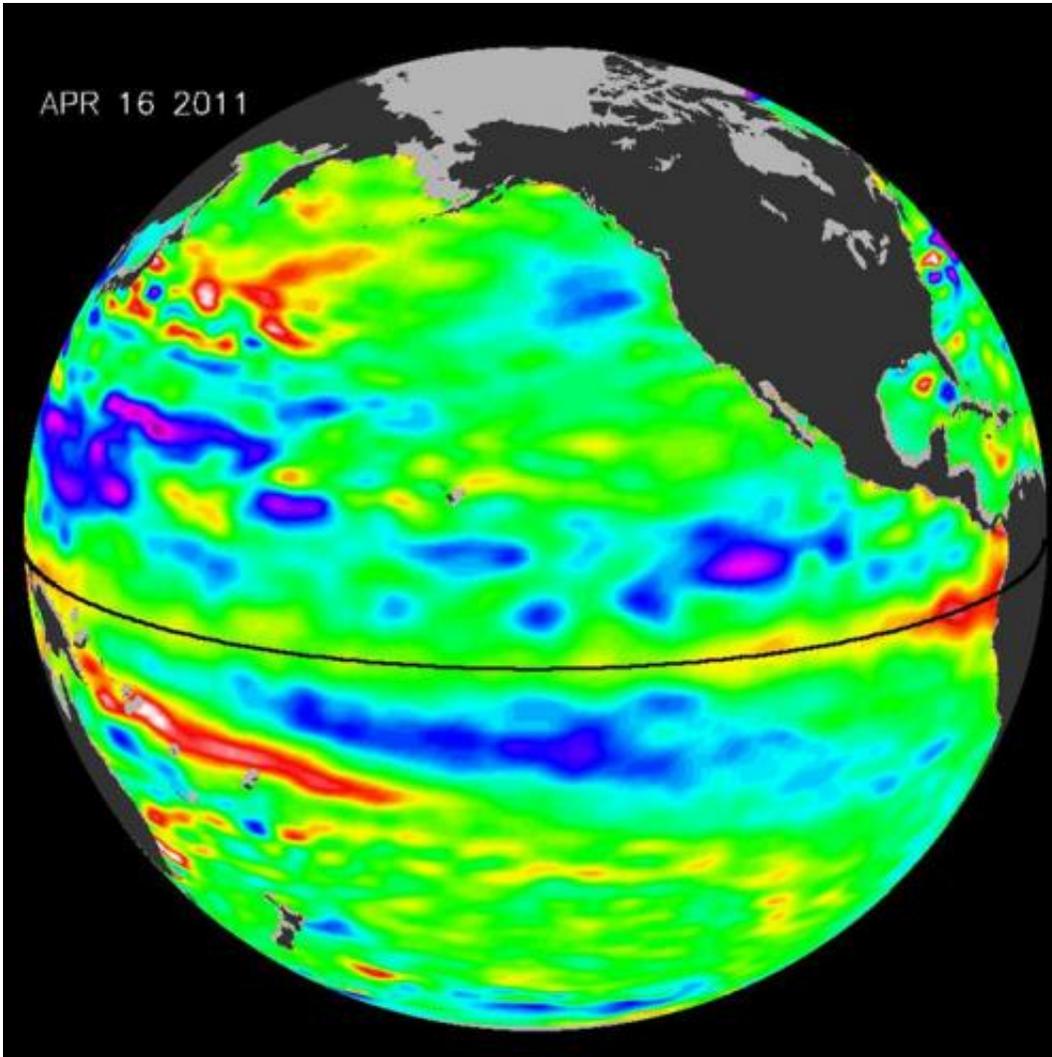
The blue and purple band in this satellite image of the Pacific Ocean traces the cool waters of the La Niña phenomenon in December 2010. Credit: Ocean Surface Topography Mission (OSTM)/Jason-2 satellite, NASA JPL

(PhysOrg.com) -- Record snowfall, killer tornadoes, devastating floods: There's no doubt about it. Since Dec. 2010, the weather in the USA has been positively wild. But why?

Some recent news reports have attributed the phenomenon to an extreme "La Niña," a band of cold water stretching across the Pacific Ocean with global repercussions for climate and weather. But NASA climatologist Bill Patzert names a different suspect: "La Nada."

"La Niña was strong in December," he says. "But back in January it pulled a disappearing act and left us with nothing – La Nada – to constrain the jet stream. Like an unruly teenager, the jet stream took advantage of the newfound freedom--and the results were disastrous."

La Niña and El Niño are opposite extremes of a great Pacific oscillation. Every 2 to 7 years, surface waters across the equatorial Pacific warm up (El Niño) and then they cool down again (La Niña). Each condition has its own distinct effects on weather.



This satellite image, taken in April 2011, reveals La Niña's rapid exit from the equator near the US coast. The cool (false-color blue) water was gone by early spring. Credit: Ocean Surface Topography Mission (OSTM)/Jason-2 satellite, NASA JPL

The winter of 2010 began with La Niña conditions taking hold. A "normal" La Niña would have pushed the jet stream northward, pushing cold arctic air (one of the ingredients of severe weather) away from the lower US. But this La Niña petered out quickly, and no El Niño rose up to replace it. The jet stream was free to misbehave.

"By mid-January 2011, La Niña weakened rapidly and by mid-February it was 'adios La Niña,' allowing the jet stream to meander wildly around the US. Consequently the weather pattern became dominated by strong outbreaks of frigid polar air, producing blizzards across the West, Upper Midwest, and northeast US."

The situation lingered into spring -- and things got ugly. Russell Schneider, Director of the NOAA-NWS Storm Prediction Center, explains: "First, very strong winds out of the south carrying warm, moist air from the Gulf of Mexico met cold jet stream winds racing in from the west. Stacking these two air masses on top of each other created the degree of instability that fuels intense thunderstorms."

Extreme contrasts in wind speeds and directions of the upper and lower atmosphere transformed ordinary thunderstorms into long-lived rotating supercells capable of producing violent tornadoes.

In Patzert's words, "The jet stream -- on steroids -- acted as an atmospheric mix master, causing tornadoes to explode across Dixie and Tornado Alleys, and even into Massachusetts."

All this because of a flaky La Niña?

"La Niña and El Niño affect the atmosphere's energy balance because they determine the location of warm water in the Pacific, and that in turn determines where huge clusters of tropical thunderstorms form," explains Schneider. "These storms are the main energy source from the tropics influencing the large scale pattern of the jet stream that flows through the US."

In agreement with Patzert, he notes that the very strong and active jet stream across the lower US in April "may have been related to the weakening La Niña conditions observed over the tropical Pacific."

And of course there's this million dollar question: "Does any research point to climate change as a cause of this wild [weather](#)?"

"Global warming is certainly happening," asserts Patzert, "but we can't discount global warming or blame it for the 2011 tornado season. We just don't know ... Yet."

What will happen next? And please don't say, "La Nada."

Provided by Science@NASA

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