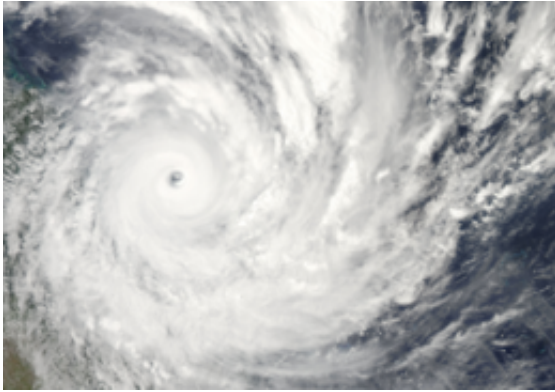


Climate phenomenon La Nina to blame for global extreme weather events

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Cyclone Yasi over Australia in February 2011. Image credit: NASA

(PhysOrg.com) -- Recent extreme weather events as far as Australia and Africa are being fueled by a climate phenomenon known as La Nina -- or "the girl" in Spanish. La Nina has also played a minor role in the recent cold weather in the Northeast U.S.

The term La Niña refers to a period of cooler-than-average sea-surface temperatures in the Equatorial Pacific Ocean that occurs as part of natural climate variability. This situation is roughly the opposite of what happens during El Niño ("the boy") events, when surface waters in this region are warmer than normal. Because the Pacific is the largest ocean on the planet, any significant changes in average conditions there can have consequences for temperature, rainfall and vegetation in distant places.

Scientists at the International Research Institute for Climate and Society (IRI), part of Columbia's Earth Institute, expect moderate-to-strong La Niña conditions to continue in the tropical Pacific, potentially causing additional shifts in rainfall patterns across many parts of the world in months to come.

These shifts, combined with socioeconomic conditions and other factors, are making some countries more vulnerable. However, La Niña and El Niño conditions actually allow for more accurate seasonal forecasts and help better predict extreme drought or rainfall in some areas. That's because they affect global atmospheric circulation patterns in known ways, and scientists can use this knowledge to help societies prepare better, issue early warnings and reduce any negative impacts associated with them.

"Based on current observations and on predictions from models, we see at least a 90 percent chance that La Niña conditions will continue through March," said IRI's chief forecaster, Tony Barnston.

Climate scientists have found La Niña's fingerprints on a number of extreme weather events such as the devastating flood that occurred in Pakistan in 2010, as well as flooding in West [Africa](#), South Africa and most recently in Queensland, [Australia](#), where an area equal to the combined size of France and Germany was underwater. La Niña is also to blame for Cyclone Yasi, one of the strongest to hit Australia, which came ashore on Feb. 2. Cyclone Yasi is the second most damaging Australian cyclone on record after Cyclone Tracy, which struck in 1974.

But La Niña isn't to blame for the recent severe weather affecting the Northeast. Winter weather for these regions is often driven not by La Niña but by large-scale weather patterns over the U.S., the northern Atlantic Ocean and the Arctic. These are often short-term, and are generally predictable only a week or so in advance. They are the culprits responsible for the dip in temperatures and spike in snow storms in the Midwest and Northeast.

In addition to extreme rainfall, La Niña can lead to drought conditions. Currently in East Africa, it has caused drier-than-usual weather, sparking food-security concerns in areas lacking irrigation,

including parts of Somalia, Kenya, Ethiopia and Tanzania. Parts of South America, Asia and the southern U.S. may also see lower rainfall for the first quarter of 2011.

Since 1950, the world has experienced six major La Niña events, wreaking havoc in countries around the world. In 2000, for example, floods associated with La Niña affected 400,000 people in southern Africa, caused at least 96 deaths and left 32,000 homeless.

La Niña conditions typically persist for 9 to 12 months, peaking sometime during the end of the year. But 2010 was a lively year for climate scientists: For the first four months of this year, El Niño conditions prevailed in the tropical Pacific, but that quickly changed, and by June, a La Niña pattern had emerged.

"Last year's transition from El Niño to La Niña was about the most sudden we've ever had," Barnston said. "When we had rapid flips like this in the past, we sometimes ended up having a two-year La Niña, such as right after the El Niño episodes of 1972 to 1973 and 1997 to 1998."

Barnston cautions that the likelihood of this happening with the current La Niña is unknown. "Even if we do have a second year of La Niña developing in northern summer 2011, we expect at least a brief return to neutral conditions from May to July of 2011."

Provided by Columbia University

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