

New study validates hurricane prediction

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Hurricanes in some areas, including the North Atlantic, are likely to become more intense as a result of global warming even though the number of such storms worldwide may decline, according to a new study by MIT researchers.

Kerry Emanuel, the lead author of the new study, wrote a paper in 2005 reporting an apparent link between a warming climate and an increase in hurricane intensity. That paper attracted worldwide attention because it was published in *Nature* just three weeks before Hurricane Katrina slammed into New Orleans.

Emanuel, a professor of atmospheric science in MIT's Department of Earth, Atmospheric and Planetary Sciences, says the new research provides an independent validation of the earlier results, using a completely different approach. The paper was co-authored by postdoctoral fellow Ragoth Sundararajan and graduate student John Williams and appeared last week in the *Bulletin of the American Meteorological Society*.

While the earlier study was based entirely on historical records of past hurricanes, showing nearly a doubling in the intensity of Atlantic storms over the last 30 years, the new work is purely theoretical. It made use of a new technique to add finer-scale detail to computer simulations called Global Circulation Models, which are the basis for most projections of future climate change.

“It strongly confirms, independently, the results in the *Nature* paper,”

Emanuel said. “This is a completely independent analysis and comes up with very consistent results.”

Worldwide, both methods show an increase in the intensity and duration of tropical cyclones, the generic name for what are known as hurricanes in the North Atlantic. But the new work shows no clear change in the overall numbers of such storms when run on future climates predicted using global climate models.

However, Emanuel says, the new work also raises some questions that remain to be understood. When projected into the future, the model shows a continuing increase in power, “but a lot less than the factor of two that we've already seen” he says. “So we have a paradox that remains to be explained.”

There are several possibilities, Emanuel says. “The last 25 years' increase may have little to do with global warming, or the models may have missed something about how nature responds to the increase in carbon dioxide.”

Another possibility is that the recent hurricane increase is related to the fast pace of increase in temperature. The computer models in this study, he explains, show what happens after the atmosphere has stabilized at new, much higher CO₂ concentrations. “That's very different from the process now, when it's rapidly changing,” he says.

In the many different computer runs with different models and different conditions, “the fact is, the results are all over the place,” Emanuel says. But that doesn't mean that one can't learn from them. And there is one conclusion that's clearly not consistent with these results, he said: “The idea that there is no connection between hurricanes and global warming, that's not supported,” he says.

Source: MIT

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