

Meteorological Expert Q & A

By Dawn Corrigan

When hurricane insurance claims require mediation or [litigation](#), parties turn to meteorologists and structural engineers to perform forensic meteorology and weather reconstruction and opine on wind loads and wind damage, storm surge, and other weather conditions at the precise time and location when damage occurred.

To learn more about [weather reconstruction](#) and hurricane litigation, I spoke with expert meteorologist Dave Nolan.

Q. Before we talk about hurricane insurance litigation, tell us a little about yourself.

A. I'm an Associate Professor of Meteorology at the University of Miami. Most of my current research focuses on hurricane formation and intensification. Also on the boundary layer—the part of the hurricane that interacts with the ocean or the land—and on hurricanes and climate change. Previously I've worked on tornadoes and tropical meteorology. My Ph.D. work was on fluid dynamics.

Q. What lessons can be learned from the uptick in Atlantic hurricane and tropical storm activity during the past decade?

A. One lesson people are learning is that if hurricane seasons stay as active as they've been, every community along the gulf coast will be hit eventually. Some have already been annihilated.

We always knew there was a certain distance back from the water we had to go to build safely. Our view of what that distance is will have to change. For example, in Pensacola, 30 yards from the beach, things will still be blown away.

Q. Tell us a little about your forensic methods.

A. For cases on which I've worked as a meteorological expert on matters involving hurricane damages, where I had to report on details such as wind speed occurring at a particular moment and a particular height, I've had to do a lot of original research. On questions such as what was the peak gust, what was the sustained wind, etc., you can't just look the answers up in a table.

For such matters I have to go into the literature and figure out the answer. And my impression is that not everyone who's working on these cases is doing so. I've seen expert reports from other experts where this work hadn't been done. But I believe that was simply because they didn't have the training necessary to perform the research and arrive at more accurate results.

Q. How can this be the case?

The science isn't there. If you ask, "In the eyewall, how does wind vary with height from some altitude down to the surface?" there's no clear answer to that question yet without doing a lot of work. For the general question, "How does wind vary with height?" there are formulas, but we still have limited information on applying those formulas to hurricanes.

My point is that when you ask meteorological experts to comment on these cases, they have to do research. If they're simply plugging in numbers without that research, it's not going to work. It would be like asking a forensics lab to analyze new DNA that they'd never seen before.

Q. Are you, and other scientists like you, doing work now that will eventually produce tables that others can use to look up the answer in the future?

A. Some of my research projects are geared toward answering those questions, yes. But the results come out slowly. Take storm surge, for example. Since Katrina there's been a lot of research to try and determine why the storm surge was as large as it was. For one case I worked on I was reading about computer simulations that had only been developed a few years before.

The number of people in funding on weather-related research is tiny compared to other sciences. For a given meteorological problem you might find there are 5-10 people in the world working on it, whereas if you looked at a research issue in, say, diabetes, you'd find more than 100 labs working on it. The level of activity is higher in other fields. In one way, it's nice—when I publish, I know it's not likely someone else will beat me to my research findings. But it means new understanding is acquired slowly.

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