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## Addressing the Weather's Business Impact with Actuarial Expertise

by: [Society of Actuaries](#)

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With the massive destruction and loss of property caused by events such as hurricanes, earthquakes and tsunamis, weather-related claims have taken center stage and will continue to do so.

And, according to an actuarial expert, that trend means insurers must pay very close attention to improved computer modeling and the critical actuarial knowledge emerging today on extreme weather events.

“Certainly, there is a lot more attention being paid to weather-related losses now than in the past. It’s a very important topic,” said Anthony Cappelletti, FSA, FCAS

and a Staff Fellow, General Insurance, at the Society of Actuaries (SOA). “Most of all, there has been intense discussion of climate change, along with mega weather events, such as Superstorm Sandy, Katrina and the tsunamis in Indonesia and Japan.



**Anthony Cappelletti**  
**Staff Fellow, General Insurance**

“Weather-related catastrophes have been around for a long time, of course, but today there is more attention (being paid) to the topic after the recent period of increasing exposures and losses, especially in the homeowners’ insurance market,” Cappelletti added.

For example, Hurricane Katrina in the Southeast U.S. caused an estimated \$105 billion in damage along with causing approximately 1,200 deaths. Ranking second in costliest U.S. natural disasters is Superstorm Sandy, which resulted in \$65 billion in damages along the northeastern U.S. coastline.

“Accurate pricing and risk management trends related to these events is what’s important,” he said. “In my role as an actuary, accuracy is important. Actuaries must have their finger on the pulse of what’s going on in climate research and analysis to maintain the best accuracy.”

Along those lines, SOA has a new textbook, Fundamentals of General Insurance Actuarial Analysis, authored by Jacqueline Friedland, FCIA, FCAS, MAAA, that tackles today’s insurance pricing challenges as they relate to extreme weather events (from an actuarial point of view).

In addition to the actuarial input in ensuring that insurance rates and claims reserving are as accurate as possible, there are also what Cappelletti calls “market perceptions” among the companies that insure homeowners across the country.

“Equity for shareholders within these companies is important, and if shareholders perceive a company is taking on more risk, then they are going to demand better risk management and pricing data,” he said. “That’s where actuaries can make a difference.”

While the flooding and other property destruction wrought by Superstorm Sandy and massive hurricanes like Katrina grab most of the headlines, weather-related claims caused by tornados, hail, excessive rainfall, winter storms and other extreme weather events also are part of the mix. In fact, Cappelletti said, included among recent destructive weather events are the large and growing number of tornados in the Southeast and Midwest.

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Among the most effective way for insurers and risk managers to prepare for extreme weather events, and other catastrophes such as earthquakes, terrorism, wildfires and even pandemic influenza, is through predictive modeling.

“Market demand has pushed catastrophe modeling vendors to look at more types of weather events and non-weather events,” Cappelletti said. “They are keeping up with demand and expanding globally.”

Cappelletti added that there is increased demand for better catastrophe models from insurance regulators as well, as they look to ensure that insurers has an appropriate level of capital given its exposures.

“That means there is a double level of demand for these models,” Cappelletti said. Catastrophe modeling companies are keeping up with the latest research, and using experts in climate and seismology, etc., Cappelletti explained. In short, they are using the resources they can to deliver as accurate data as possible on potential losses from large weather events.

“The models are changing constantly,” he said. “What might be state-of-the-art one year will no longer be state-of-the-art a few years down the road.”

When it comes to long-term vs. short-term weather-related exposure trends, catastrophe modeling looks at events currently happening as well as those going back decades along with the latest research to ensure that their models capture both trends.

Finally, Cappelletti mentioned the increased actuarial involvement in climate analysis in the form of the Actuarial Climate Index (ACI), a new effort in the actuarial world that looks to make digestible sense out of the climate-based research happening today.

“It’s another way that actuaries have become involved in the climate analysis discussion,” he said, adding that the ACI was developed in partnership between the SOA, the Canadian Institute of Actuaries, the American Academy of Actuaries and the Casualty Actuary Society.

“These actuarial organizations have come together to fund a research project on

climate, extreme weather and the changes they can bring,” Cappelletti said, noting that the ACI will be released in early 2015. “It’s an objective measure for extreme weather and potential changes in climate. It is designed to be easy to understand, but not overly simplistic; a guide that can assist and educate the general public about climate and extreme weather risks.”

“It’s another element in looking at climate and weather-related losses and putting them in perspective,” Cappelletti said. “Today, there is so much research and data, making it difficult for the general public to understand exactly what’s being said. The ACI, which can also be used by actuaries, will serve that purpose. The SOA is thrilled to be one of the organizations involved,” he concluded. “While there is always a constant flow of climate research, this is the only research directed by a joint effort of actuarial organizations.”

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