Convective Storms: State of the Risk

Severe convective storms are among the most common, most damaging natural catastrophes in the United States. The result of warm, moist air rising from the earth, they manifest in various ways, depending on atmospheric conditions – from drenching thunderstorms with lightning, to tornadoes, hail, or destructive straight-line winds.

Population growth and economic development have contributed to increasing losses from such storms. At the same time, research suggests their geography, frequency, and intensity also may be changing. In 2021, severe convective storms resulted in the third-costliest year on record for the U.S. insurance industry, according to Aon.

Such perils have driven a greater share of insured losses in recent years. Catastrophe modeling firm RMS says the average annual insured U.S. loss from convective storms nearly equals that from hurricanes, at around $17 billion.

Secondary Perils – What's in a Name?

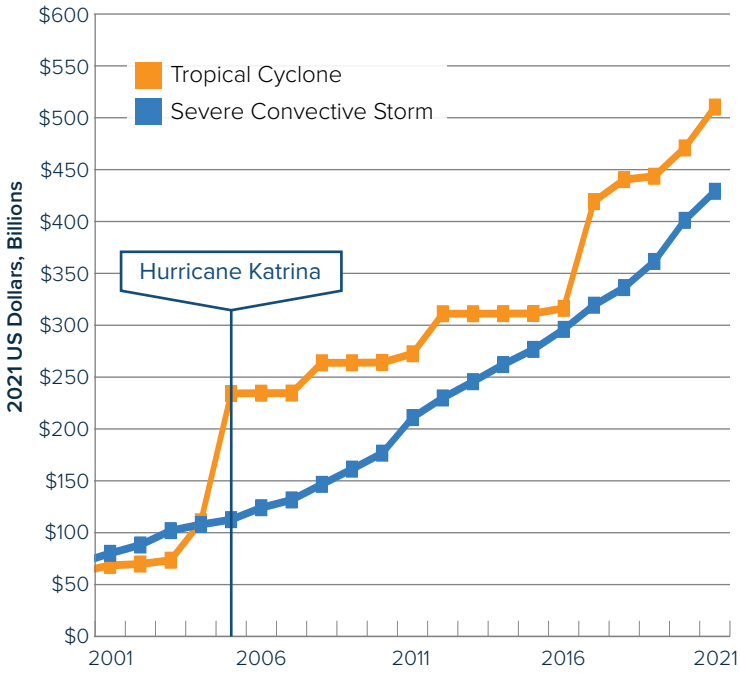
Severe convective storms often are categorized as secondary perils, which Swiss Re describes as "natural catastrophes that typically generate losses of low to medium magnitude but can happen relatively frequently."

Losses from both primary and secondary perils have been rising since 1970 – which shouldn't be surprising, given that both often occur in tandem and are affected by the same loss-driving trends, including population growth, rising property values in exposed regions, and effects of climate change. For this reason, some have suggested abandoning the distinction entirely.

In 2020, for example, there was no single major primary-peril loss-making event, according to Swiss Re. "Rather, it was a year of many small to mid-size events, including severe convective storms."

Convective Storm, Hurricane Losses Rise in Parallel

Cumulative Insured Losses, 2001-2021 YTD



Source: Aon (Catastrophe Insight)

Tornadoes

It's tempting to link extreme events like December 2021's destructive "quad-state tornado" to climate change, but Dr. Phil Klotzbach – a researcher in the Department of Atmospheric Science at Colorado State University and Triple-I non-resident scholar – says, "Not so fast!"

"The relationship between tornadoes and climate change is messy, especially given the relatively short reliable record we have," Klotzbach says. Doppler radar and other technologies have increased observations, he explains. If tornadoes aren't reported, they don't officially exist – so, improved tracking can "reveal" non-existent "trends".

A NOAA report says that in the 1970s there were about 150 days per year with at least one confirmed tornado in the United States. That has fallen to between 90 and 100 days in recent years, but the number of days with 30 or more tornadoes "has increased by a factor of five, from one day every other year to 2.5 days annually."

Regardless of frequency trends or causality, Klotzbach says damage from tornadoes is likely to keep increasing because of population shifts leading to greater development in tornado-prone areas.

Hail

Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere, where they freeze into ice. Property damage from hail can be devastating.

Steve Bowen, a meteorologist at Aon and director of the broker's Impact Forecasting unit, has said hail can contribute 50 to 80 percent of severe convective storm insured losses in any given year. Bowen says that over the past decade hail damage to vehicles, buildings, and crops has averaged $8 billion to $14 billion annually.

Hail is hard to insure because the damage it inflicts is often hidden, and many property owners don't file claims until months or years after the storm. Its frequency and severity vary over time, making it extremely difficult to predict future loss, and its geographic reach may be changing.

Roofs are the part of buildings most vulnerable to hail – and that damage can progress to wall system damage, particularly if not discovered quickly. Damage severity — and, consequently, replacement or repair cost — varies by the roof materials and composition.

Damage to cars also is a large component of hail costs. AutoTrends Magazine found the average cost of hail damage for a personal automobile is about $2,500. If policyholders have optional comprehensive coverage that protects them from natural disasters, including hail, their insurers will likely cover the damage.

But suppose a policyholder is a car dealer or has a business that involves a fleet of vehicles. If the dealer is located in "Hail Alley" – a vaguely defined area that touches Texas, Oklahoma, Colorado, Kansas, Nebraska, and Wyoming and, like Tornado Alley, may be on the move – coverage is going to be costly.

Mitigation and resilience: What to do?

The National Institute of Building Sciences found that every $1 spent on hazard mitigation can save the nation up to $13 in future disaster costs.

How can individuals, communities, and businesses get ahead of risks that seem so capricious and whose costs can vary so wildly? How are risk managers and insurers integrating convective storm resilience into their strategies and operations?

Secure the property, build in resilience. When managing risks related to wind, water, and fire, it's important to make sure property and buildings are well constructed and maintained and that any objects that might become projectiles in high wind are secured – especially in areas where tornadoes or destructive straight-line winds tend to arise suddenly. Likewise, in hail-prone areas it is important to put vehicles and equipment that could be damaged under cover.

Identify damage quickly. Because wind and hail can expose structures to further damage due to water seepage or animal intrusion, it's important to detect damage from these events as early as possible. Historically, it has been difficult, time-consuming and dangerous for insurance adjusters to get up onto every insured building in an area affected by convective storms in order to look for damage. Advances in aerial imagery are helping to address this deficit. Whether using drones, manned aircraft or satellite technology, it is getting easier, safer, and less expensive to assess rooftop damage due to convective storms.

Evolving insurance approaches. As a result of significant storm-related losses in recent years, some insurers are obligating policyholders to take on increased risk-sharing of storm losses through deductibles. For each loss paid by the insurer, the policyholder contributes dollars through the application of a deductible.

Another emerging approach is parametric insurance. Parametric policies cover risks without the complications of sending adjusters to assess damage post-catastrophe. Speed of payment and reduced policy administration costs may ease the burden on both insurers and policyholders. A parametric policy pays a fixed amount if an event that meets agreed-upon criteria (a certain wind speed, for example) triggers the policy, regardless of whether the policyholder's property is damaged.