

What would it cost: US derechos

Hailstorms and tornadoes are the better-known threats from the peril of severe convective storms, but last year an Iowa storm threw the spotlight on another, little-appreciated hazard from these severe weather events: the derecho.

It produced insured losses that Aon put at \$7bn, ranking it as the second most costly cat event of the year. The event caused major damage in Cedar Rapids and damaged 14 million acres of cropland in Iowa.

Technically, a derecho is defined as a straight-line wind event that tracks at least 250 miles (400 km) with gusts topping 60 mph (95km/h).

But they do not occur in isolation and an event would be accompanied by hailstorms and tornadoes, with insurance policies providing combined cover for the three sub-perils of severe convective storms (SCS).

Trading Risk asked modelling firms RMS, CoreLogic and KCC to calculate what a major derecho impacting the Midwest cities of Chicago and Des Moines would cost and to discuss the challenges of modelling for these events.

As with all modelled perils, there was a range of outcomes, but the firms all emphasised some common themes – notably, the fact that these storm losses, which are sometimes described as “secondary perils”, should be expected to produce major losses.

CoreLogic said the higher losses from last year’s storm showed “tail risk events can and do happen – even far beyond the 1-in-100-year marker, and knowing this risk and exposure is key to supporting a healthy portfolio”.

“For the north-central states affected by this event, the August 10 derecho was representative of the types of losses we should expect every few decades.”

RMS senior product manager Chris Allen agreed that the August 2020 loss reinforced that “SCS is not just an ‘attritional’ peril.”

The firm’s SCS models suggest a 1-in-50-year loss may cost \$6.6bn. The August derecho contained unusually long duration of wind gusts, which significantly raised its damage severity and provided modelling firms with new information on potential wind damage, Allen added.

KCC: regional loss viewpoint

	Five-year return period	20-year RP
DDEs – single event	\$1bn	\$7bn
All SCS events – single event	\$9bn	\$14bn
All SCS events (nationwide) – annual aggregate	\$39bn	\$53bn

“The Midwest derecho demonstrates how recent experience only contains a subset of all possibilities, and more extreme events are more likely to be missing from the observed record in the past couple of decades. Catastrophe models are designed to fill this gap in knowledge,” he continued.

KCC also highlighted that a \$7bn SCS/derecho industry loss “should not be considered an extreme loss”.

On average, two to three derecho-denominated events (DDEs) may occur in the US each year, but many are minor and do not incur significant insured losses. Every four to five years, a DDE will result in insured losses of over \$1bn, the firm projected.

KCC founder Karen Clark said assigning a severity to derechos is not as simple as for hurricanes where the category classifiers – category 3 or 5 – make it relatively obvious which events may have more destructive potential.

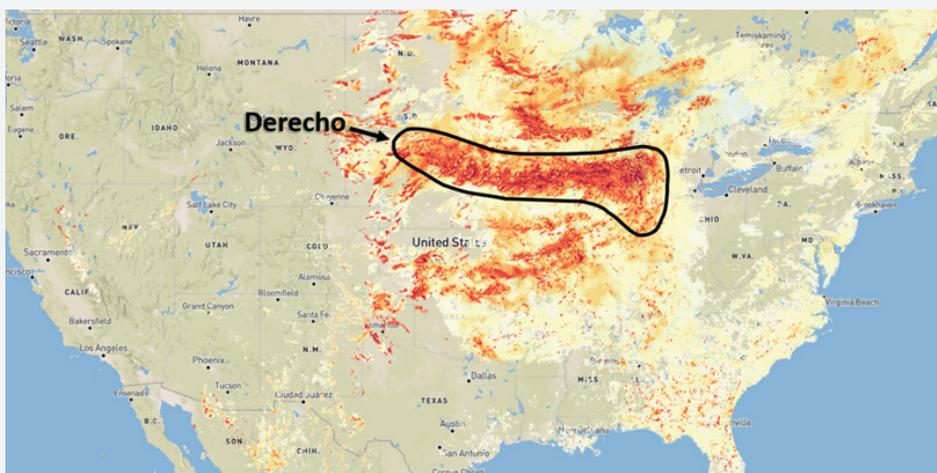
“What would make it more extreme is duration and length, but the losses would be most influenced by whether or not it impacts a metropolitan area,” she explained. Costs from the Iowa derecho were no surprise in terms of modelling for the peril – the storm was just a particularly large one.

All-state losses

KCC chose to focus on shorter return periods.

The firm estimates that a \$7bn DDE, in which derecho damage is a defining feature, would be a 1-in-20-year return period event across all states.

KCC Footprint for August 8-11, 2020 SCS event with the Iowa derecho highlighted



RMS: metropolitan damages

Exposure	Sub-peril	Occurrence return period loss
DesMoines metro	Hail, tornado and straight-line wind	\$870mn
DesMoines metro	Hail, tornado and straight-line wind	\$1.91bn
Chicago metro	Hail, tornado and straight-line wind	\$3.3bn
Chicago metro	Hail, tornado and straight-line wind	\$4.87bn

In contrast, across all SCS sub-perils, the same return period could cause a \$14bn loss.

“A derecho is a specific meteorological phenomenon, and the probability of a DDE causing a \$7bn insured loss is much lower than the probability of any SCS event causing that level of loss,” the firm explained.

Metro spotlight

The 2020 derecho was particularly severe and long in duration, and its broad regional scope contributed to the scope of loss.

However, RMS noted that the return period of an event such as last summer’s derecho will be much larger in the worst-affected metros than it is at regional scale.

The damage to Cedar Rapids alone exceeded those from any other severe thunderstorm in the city over the past 30 years by a large multiple, and indicated that the return period of the event at city scale is much longer than 100 years, the firm said.

Taking a lens on the losses that would arise only in metropolitan areas from a Chicago or Des Moines event, RMS put a 100-year event in Chicago at \$3.3bn, rising to \$4.9bn for a 1-in-250-year disaster.

In the smaller city of Des Moines, the costs would be \$870mn and \$1.9bn respectively.

The firm also included all three SCS sub-perils in its estimates.

However, CoreLogic isolated the derecho wind losses only within its

estimates for Polk County, which includes Des Moines (population 500,000), and Cook County, incorporating urban Chicago (population more than 5 million).

Its analysis put the derecho losses at \$80mn-\$100mn for Des Moines, versus \$750mn-\$900mn for 1-in-50- or 1-in-100-year events.

Setting aside individual major losses, reinsurers are more concerned about aggregation of losses from convective storms, KCC explained.

The firm calculates that a 1-in-20-year annual aggregate loss for such events could reach \$53bn, which means insurers should be more concerned with the potential aggregation of SCS losses in a year versus one large event loss.

The 2011 major tornado outbreaks, which resulted in losses to the Mariah Re cat bonds, occurred alongside two major derechos.

A recurrence of that season could result in nearly \$50bn of losses, KCC projected.

CoreLogic: derecho only, metropolitan damage

Severe storm straight-line winds	\$mn, insured loss	
	1-in-50-year	1-in-100-year
Chicago, Illinois	750	900
Des Moines, Iowa	80	100

Breaking down 2020 cat losses

Total insured catastrophe losses came in above average for the past decade, according to various agency figures. But what was notable was that the year’s top losses were all relatively minor.

Munich Re, which gives the top five insured cat losses in its NatCat data, put these at \$30.1bn, while the top 10 per Aon’s statistics were \$39.3bn.

In both cases these were about \$4bn higher year on year, but well below the average across a limited four-year sample of \$50bn and \$57bn.

As a proportion of the year’s total insured losses, they are also the lowest for the past four years, at 37% for Munich’s top five of its \$82bn total and 41% for Aon’s top 10 of its \$97bn total (including public insured losses).

This leaves a huge loss tally from minor events that wouldn’t even have registered on news headlines. A similar effect is shown in Swiss Re’s data, as although the firm does not provide individual loss event figures, it said 70% of its annual disaster loss tally was derived from

so-called “secondary perils”, versus 50% in 2018 and 60% in 2018.

Munich Re calculated that the total was 26% higher than the 10-year average of \$65bn up to 2018, and Aon’s tally was 40% higher than its \$69bn average for the 21st century.

Major cat losses remain low despite above-average 2020



Source: Company reports