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PERSPECTIVES

The Financial Toll of Unforeseen Weather Events

Our perspectives feature the viewpoints of our subject matter experts on current topics and emerging trends.

ESCALATING IMPACTS OF CATASTROPHIC WEATHER

Large insurance losses are increasingly being caused by hazardous weather events[1] such as hurricanes, floods, lightning strikes, high winds, large hail, and wildfires. Furthermore, adverse weather is not only causing loss incidents to occur, but also making the repair process of certain projects longer and more expensive by hampering supply chains and prolonging the time for repair contractors to access loss locations.

For example, in October 2023, the London Financial Times carried an article with the headline, "The insurance world is flirting with its climate doom loop." It explored the challenges for insurers continuing to write policies given the trend toward more extreme weather events associated with climate change.

However, it is our opinion that many catastrophic weather events and associated high value insurance losses *can be foreseen* when proper experts are consulted during the underwriting and risk assessment processes. This starts with Forensic Meteorology and Forensic Accounting.

In this article, we discuss how a scientific approach to analysing weather patterns can help insurers mitigate the chances of a claim arising on individual risks and minimise the costs associated with claims that have occurred.

WEATHER RISK IS FINANCIAL RISK

The role of forensic accountants specializing in quantifying interruption losses is to accurately measure the financial impact of events that have affected commercial entities. Generally, forensic accountants do not get involved in strategic decisions taken by insurers to withdraw cover from certain geographic areas and commercial risks. However, the losses that accountants do get involved in are likely to influence the strategic decision-making process of future coverage.

Forensic accounting is effective at assigning a financial value on potential exposures but is of limited use in regard to helping prevent losses. On the other hand, expert meteorologists can apply a more comprehensive risk-adjusted forecast that would provide an opportunity to minimize the chances of a loss occurring in the first place. Meteorologists are also helpful in identifying the weather facts surrounding construction delay and remediation activities.

PROBLEMS WITH HISTORICAL WEATHER DATA

Historical weather databases across the world are limited in addressing hazardous weather events that can lead to billions of dollars in insurance losses – especially in rural areas where renewable energy projects have exploded into production. Therefore, if insurance carriers rely solely on publicly available historical weather databases to assess the weather risk before issuing an insurance policy, it is possible that the weather risk is not appropriately evaluated.

The reason for this is that in rural, undeveloped areas, there are few (if any) people to report observed severe weather; furthermore, there has historically been little to no infrastructure for severe weather to damage. Therefore, once new infrastructure is placed in a rural area susceptible to severe weather, it is not the severe weather that is necessarily new, it is the infrastructure located there that is new. Therefore, the presence of new infrastructure can lead to increased loss events being identified and, hence, the misconception that severe weather events are increasing in these areas. This misconception can be overcome by obtaining and correctly analysing the appropriate meteorological data, such as identifying long-term trends in atmospheric potential for severe weather (Figure 1) instead of observed weather often biased toward highly populated urban areas.

[1] https://www.ncei.noaa.gov/access/billions/summary-stats

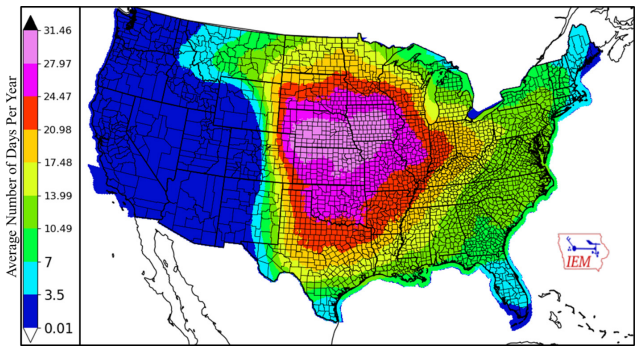

Figure 1 *- Frequency of severe hail risk (15% or higher chance of at least 1.00-inch/25 mm hail) between the years 2002-2023. (Source: NOAA; Iowa State University).*

For example, Pecos County in Texas is a large rural county and is home to many expansive solar arrays in the western part of the state. Records from the United States's National Oceanic and Atmospheric Administration (NOAA) only contain published reports of approximately one-third of the large hail events (i.e., 25 mm diameter or greater) which were likely to have occurred in Pecos County over a 16-year period spanning from 2007-2022, like the storm shown in Figure 2. More strikingly, there was no distinguishable increasing or decreasing trend in hail events across the time period studied, inferring that a proper understanding of weather risk can be a highly reliable tool for underwriting and risk management purposes, despite climate change concerns.

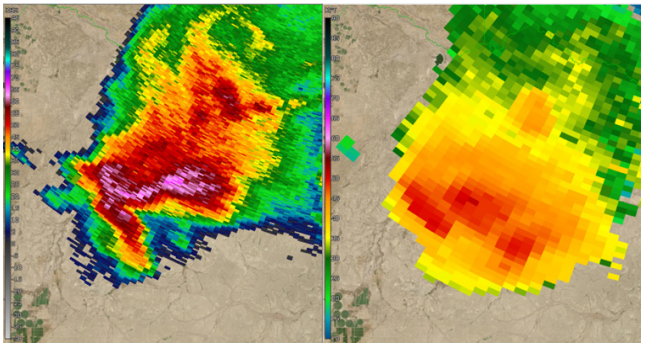

Figure 2 *- Base Reflectivity (left) and Echo (storm) Tops (right) of a hail-producing supercell thunderstorm in Pecos County, Texas in 2022 (Source: NOAA; Gibson Ridge Radar Software).*

GLOBAL WEATHER THREATS

Weather is notoriously difficult to predict. However, long-term historical trends indicate that certain geographies have always been – and will likely always be – prone to certain catastrophic events:

- Tropical cyclones, as they always have, will continue to result in catastrophic losses across the warm, tropical ocean basins and unleash unrelenting winds, storm surge, and flooding across the southern and eastern U.S., Mexican and Canadian coastlines, the Caribbean, and Central America. Typhoons will continue across portions of the western Pacific into east Asia (Figure 3), as cyclones will continue to thrash in the warm climates of southwest Asia in India and the Persian Gulf nations, and into east Africa.

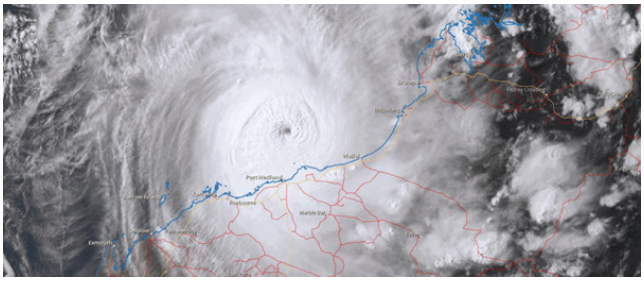

Figure 3 *- Cyclone Ilsa making landfall alongshore Western Australia on April 13, 2023 (Source: Australian Bureau of Meteorology).*

- Winter weather events, such as Storm Ciarán (Figure 4) in 2023, will continue to occur across higher latitudes and mountainous areas on both sides of the equator, unleashing high winds, storm surges and large waves in coastal areas, numbing cold, and heavy snowfall and ice accumulation.

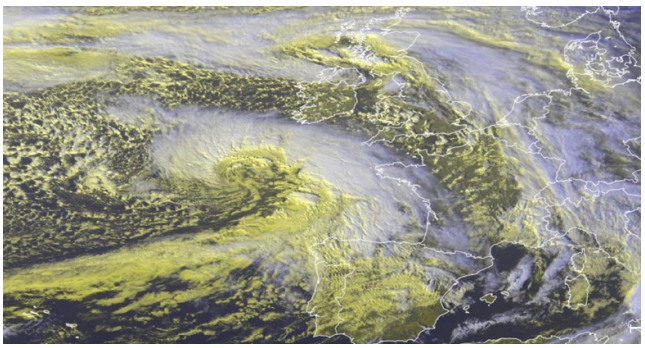

Figure 4 *- Satellite imagery of Storm Ciarán on November 3, 2023 (Source: EUMETSAT).*

- Severe thunderstorms[2] including hail, thunderstorm downburst winds, derechos[3], and tornadoes will continue across midlatitude regions globally – not just in North America, but across southern Europe and the Mediterranean into north and central Africa, southwest and southern Asia, much of the Australian continent, and the Patagonia region of South America.

- In addition to severe convective storms and hurricanes, low-and-mid-latitude regions across the world will continue to experience flooding concerns due to tropical cyclones or localized severe weather events (Figure 5). Many times, this risk is underestimated as extensive flooding can occur in otherwise dry climates, sometimes with little or brief rainfall.

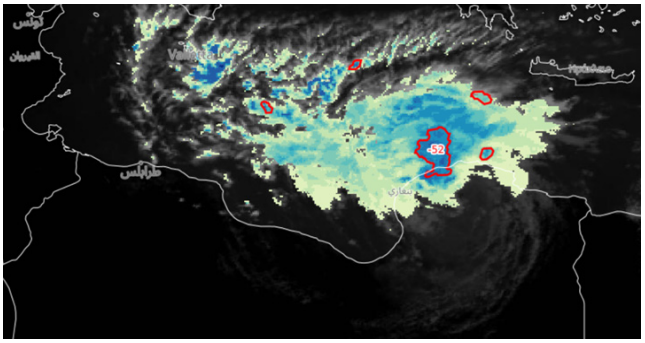

Figure 5 *- Infrared satellite imagery – rapidly developing thunderstorm enhancement during Storm Daniel on September 10, 2023, over the Libyan coastline (Source: EUMETSAT).*

UNDERSTANDING THE WEATHER EVENT: POST LOSS

While mitigating weather-related losses is an important first step, damaging weather can still occur. Understanding weather events which result in reported losses is of utmost importance. For example, if heavy rain and flooding resulted in a loss at a renewable energy complex (Figure 6), it is important to understand if the rainfall amount was typical and common or truly a statistically significant event on-site. Furthermore, the number of rain events, and the duration between events, are often needed as they can result in multiple deductibles under policy language and impact the time frame in which additional damage could be mitigated.

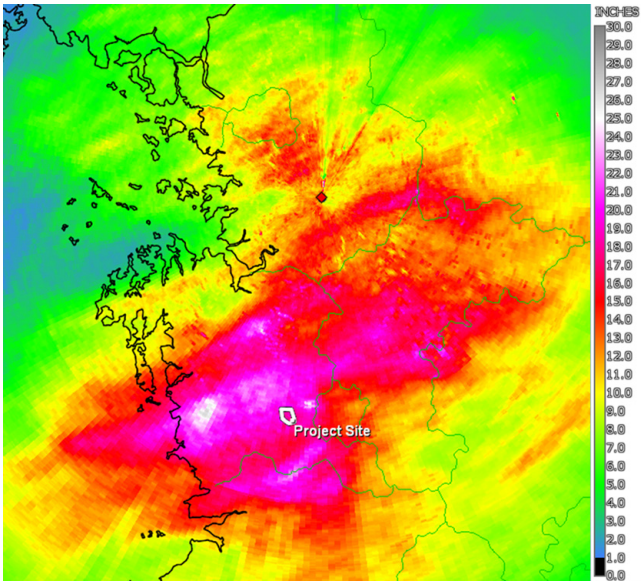

Figure 6 *- Radar-derived storm total precipitation (in inches) during the July 2023 historic floods in the Republic of Korea (Source: NOAA; Gibson Ridge Radar Software).*

Furthermore, if a solar array or wind turbine is lost due to a wind event, was that event considered a severe convective storm? Was there a tornado involved? What was the wind speed and direction? Many of these questions are

[2] Also commonly known as *Severe Convective Storms*
[3] A derecho is a widespread, long-lived, straight-line windstorm associated with a fast-moving group of severe thunderstorms known as mesoscale convective systems.

important not only for determining policy coverage, but also for identifying subrogation potential due to manufacturing defects, installation errors, or other issues that may have arisen, perhaps in the process of protective stowing. These types of forensic weather investigations can be conducted even in very rural areas with limited data (Figure 7).

Ultimately, understanding the weather conditions resulting in a loss also helps insurers update and reassess their risk by continuing to insure a particular site.

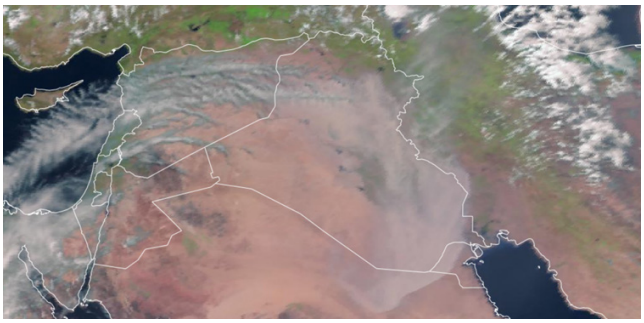

***Figure 7** - Visible satellite imagery of a dust storm moving toward the Persian Gulf from Iraq, Kuwait, and the Kingdom of Saudi Arabia on May 16, 2022 (Source: EUMETSAT).*

CONCLUSION: HOW METEOROLOGY CONSULTANTS CAN HELP

The above issues are relevant to all corners of the world. Globally, despite extensive human effort, severe weather events remain untamed and unharnessed. However, by obtaining the appropriate weather data and analysing it in a comprehensive manner, forecasting the occurrence of catastrophic weather events becomes more accurate. This type of analysis can benefit insurers by making it easier to correctly evaluate the risk of a weather event occurring, and expert meteorologists working closely with forensic accountants can help ensure that only those losses flowing from an insured event are included in the claim(s).

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J.S. Held also has a highly skilled specialized group experienced specifically in damage evaluation and quantum calculations for insurance claims and dispute resolution in the Renewable Energy sector.