



# THE INSURETECH SOLUTION TO CATASTROPHIC LOSS MANAGEMENT

## Abstract

Climate change induced natural disasters have caused significant economic losses in recent years. In 2022, only about 40% of these losses were insured. The remaining 60% were either partially uninsured or fell on the insurance carriers' books. Read on to find out how a geographic information system (GIS) can address the associated challenges with catastrophic loss management by providing better insights during the underwriting process.

## The gathering storm

Climate change induced natural disasters have wreaked havoc on the catastrophe (CAT) insurance market. To give a perspective, global losses from CAT events have exceeded \$132 billion for three consecutive years, and the first quarter of 2023 has already seen \$22 billion in losses. The global economic losses from natural catastrophes (Nat CAT) totaled around \$313 billion in 2022, with Hurricane Ian being the costliest natural disaster of the year, causing roughly \$100 billion in losses<sup>1</sup>.

Only about 40% of these economic losses due to these natural disasters were insured in 2022. The remaining 60% of the losses were either partially uninsured or fell on the insurance carriers' books.

There are two main reasons for this gap. First, the cost of insurance has risen sharply since the pandemic, making it less affordable for some people and businesses. Second, the way that CAT risks are identified today is not always effective. Many smaller risks and businesses coming through the syndicates do not go through the cat modelling process. This means that these risks are not accurately assessed, and the insurance premiums may not be adequate.

It is important to model all CAT risks to analyze the total exposure and arrive at the premium adequacy. This will help to ensure that people and businesses are adequately protected in the event of a natural disaster.

Traditionally, catastrophic modeling has been a post-bind process. It is not used to evaluate incremental exposure and residual treaty capacity in real-time during the quote issuance or underwriting process. This can make it difficult for underwriters to accurately assess risk and price policies.

Another challenge that underwriters face is evaluating the concentration of risks and arriving at a probable maximum loss (PML) in real-time during the pre-bind stage for non-natural catastrophic events, such as fire or terrorism disasters. This is because there is often fewer data available for these types of events, making it difficult to accurately model their potential impact.



## A glimmer of hope

A geographic information system (GIS) can address all the challenges that the existing CAT modelling tools cannot support. During the Underwriting/pre-bind phase, a GIS offers the underwriters the following capabilities:

- Real-time visualization of risk aggregation. Underwriters can visualize the risk aggregation during the submission stage, allowing them to zoom in to their area of interest and view the risk accumulation, concentration, and probable maximum loss.
- Exposure by peril. Underwriters can view the exposure by a variety of perils, such as earthquakes, floods, wildfires, and hurricanes.

<sup>1</sup><https://www.reinsurancene.ws/swiss-re-estimates-2022-insured-cat-losses-at-132bn/>

- API connectivity with rating and pricing tools. Underwriters can connect the GIS to rating and pricing tools, allowing them to seamlessly exchange data.
- Automated cleansing and enrichment of data. Underwriters can automate the cleansing and enrichment of data, including geocoding of each risk location.

In the post-bind phase, a GIS can help underwriters with the following tasks:

- Maintaining updated accumulated risk exposure and treaty limit.

- Generating canned reports. Underwriters can generate canned reports, such as ARPC reports, or download data for further analysis.
- Hazard modeling. Underwriters can use a GIS to model hazards, such as earthquakes and floods.

During claims, a GIS can help underwriters with the following tasks:

- Predictive claim loss accumulation. Underwriters can use a GIS to predict claim loss accumulation during specific

- events, such as hurricane landfalls.
- Accurate loss calculation and analytical prediction. Underwriters can use a GIS to accurately calculate losses and make analytical predictions, even before surveys are conducted in the case of flood events.
- Identifying potential cash call events. Underwriters can use a GIS to identify potential cash call events, which can help them to quickly adjudicate losses without worrying about profit and loss.

## How does the solution work?

The solution works by first receiving the statement of values (SOV) of the account and risk data. Once the SOV is received, a basic submission clearance check is performed. If the SOV passes the clearance check, the raw SOV files are uploaded into the tool. The tool then cleans and standardizes the templates into the desirable format.

The solution is designed to automate the process of cleaning and standardizing SOV

templates. This can save time and effort for underwriters, and it can also help to ensure that the templates are accurate and consistent.

If geo coding (latitude/longitude details) is not provided or the address is incomplete, the application will enrich the data with the risk location level geocoding using an external interface. Then, the application will perform a complex rule-based conversion and merging of the files into

the schema files. Once the schema files are loaded into the visualization module, the risk details will be mapped to the geospatial data available in the application.

At this stage, underwriters can see the added data in their portfolio in the visualization layer. They can perform further data analysis by drilling down into the data.

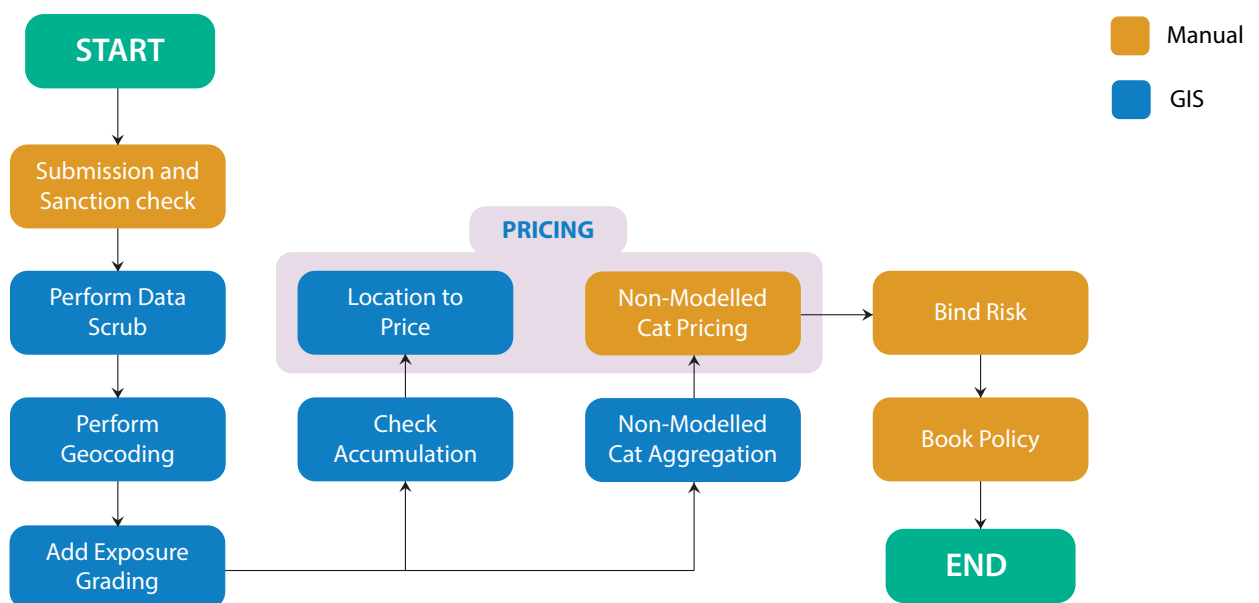


Figure 1 How the GIS solution works

For example, the red dots on the map represent risk locations. By zooming in, underwriters can see the proximity of these risk locations to major wildfires.



Figure 2 Proximity of risk locations to wildfires

They can also see the recent earthquake events that have occurred near these risk locations. In addition to this, the solution also allows underwriters to view earthquake severity zone-based mapping. This provides underwriters with a view of real-time earthquake warnings as well as earthquake severity zone-based visualization input for underwriting.

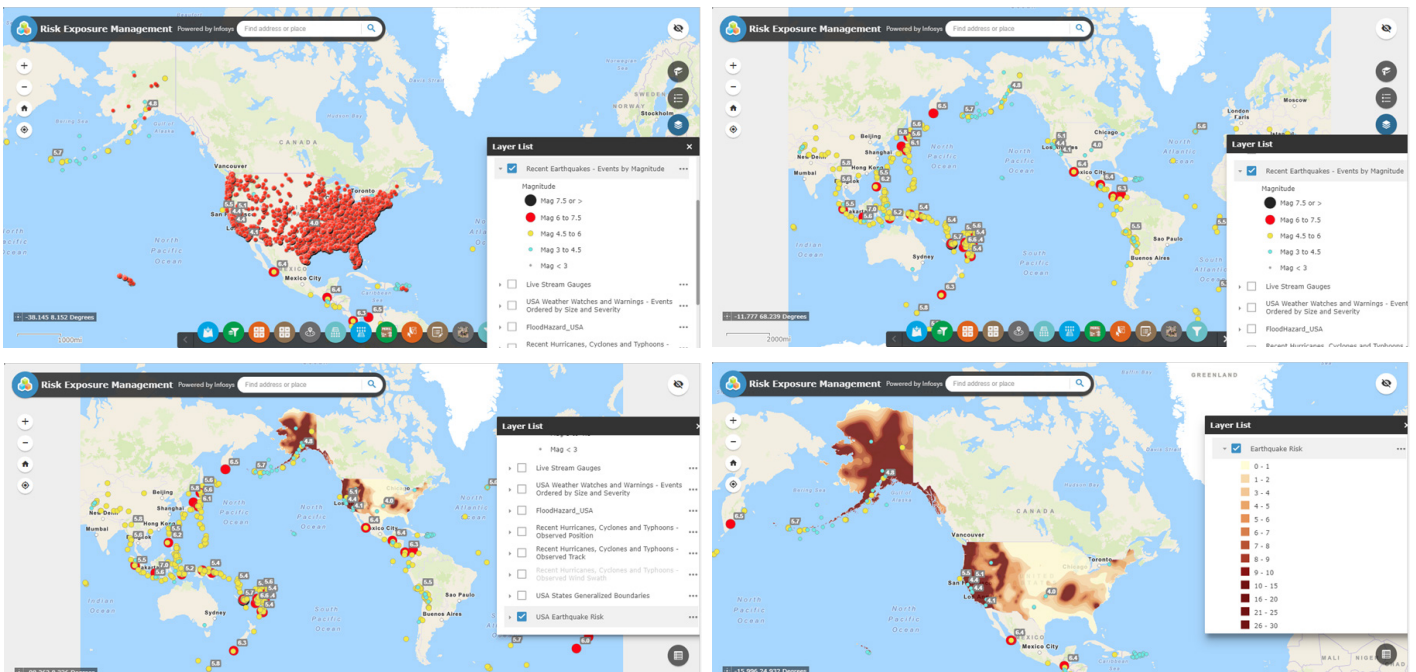


Figure 3 Earthquake severity zone mapping



The solution allows underwriters to see the risk aggregation by perils. This means that they can see the total number of risk locations that are exposed to a particular peril, such as windstorm or flood.

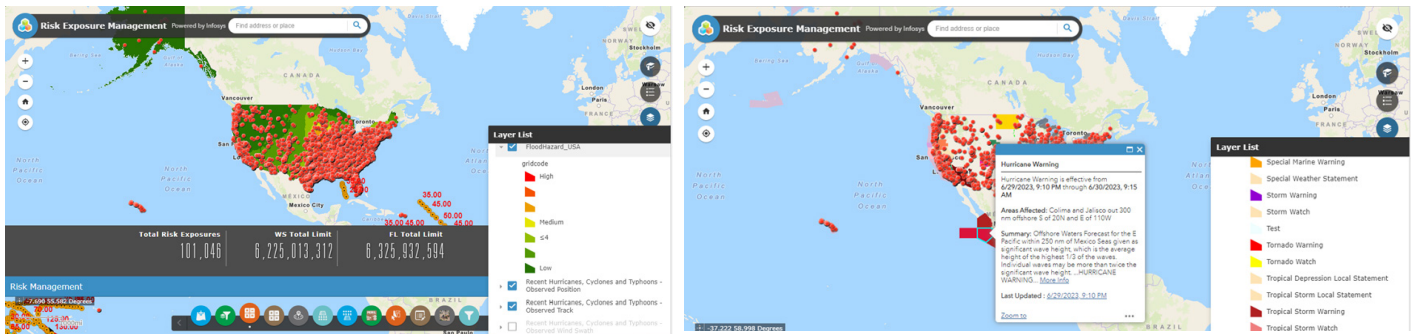


Figure 4 Risk aggregation by perils

The solution also provides live cyclonic and hurricane paths with real-time wind speed and predictive landfall visualization. This information can be overlaid with the insured risk locations to help underwriters estimate the probable maximum loss (PML) immediately. If the PML is too high, underwriters may need to trigger a cash call.

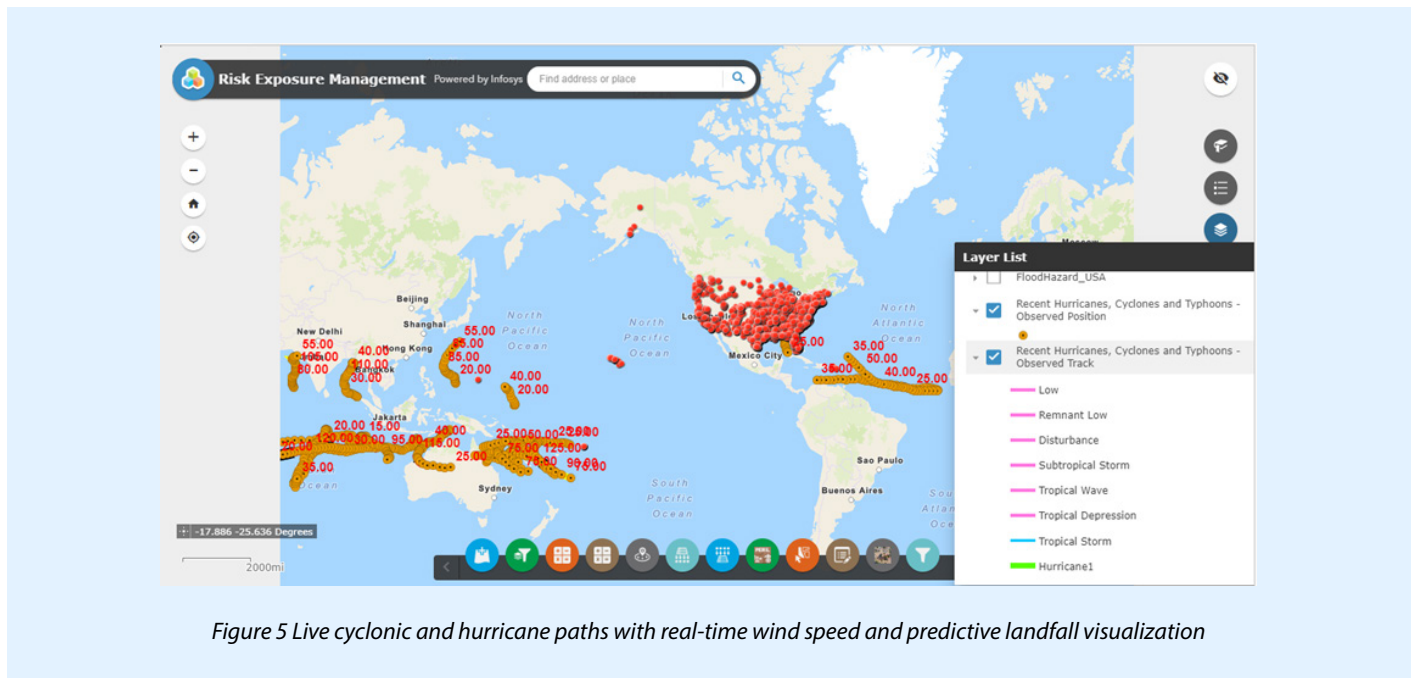


Figure 5 Live cyclonic and hurricane paths with real-time wind speed and predictive landfall visualization

The solution has the potential to revolutionize the way large risks are insured against catastrophic perils. By providing better pre-bind risk management, insurance carriers can secure additional facultative cover when needed. This will help them to manage their books better with enhanced capacity and thus

help to reduce the near 60% coverage gap that exists today. As the frequency and severity of catastrophic events continue to increase, the need for innovative solutions to loss management is more important than ever. Insurtech offers a promising innovative approach to this challenge, and it is an

industry to watch in the years to come.

References:

- [Natural catastrophes and inflation in 2022: a perfect storm - Swiss Re sigma | Swiss Re](#)

## Authors



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