ICEYE

SIZING FLOOD LOSSES WITH ACCURATE OBSERVATION DATA:

THE ART OF THE POSSIBLE FOR (RE)INSURERS

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"THE ABILITY **FOR INSURERS TO IMMEDIATELY QUANTIFY HOW A CATASTROPHE EVENT IS IMPACTING THEIR PORTFOLIO** IS A GAME-CHANGER FOR AN INDUSTRY THAT HAS HISTORICALLY STRUGGLED TO ACCURATELY AND QUICKLY ESTIMATE FLOOD LOSSES."

– CHARLES BLANCHET, VP OF SOLUTIONS, ICEYE

ABOUT THIS EBOOK

The major floods of 2021 were a reminder of the growing influence of extreme weather events on society and global economies, and the ongoing challenge for the insurers in attaining accurate loss numbers immediately following a natural disaster.

Nowhere was this issue more evident than the European Floods of July 2021. These floods did not just cause major disruption to policyholders, they also resulted in serious damage to properties and tragic loss of life.

It is at times like these that communities and policyholders most need the insurance industry to fulfill its contractual obligations and deliver on its societal value. In these moments, the level of service expected by policyholders could not be greater. Rising to this client service challenge is made all the more difficult given that, in the aftermath of large events, (re) insurers are working under heightened scrutiny from capital providers, regulators and governments.

The value of fast and reliable data is therefore hard to overestimate. Whether it is knowing which clients need most urgent support, or whether it is ensuring communications with stakeholders are unequivocal, the need for comprehensive and robust information is paramount.

This eBook has three objectives. First, it attempts to unpack the challenge of sizing losses post-event. Second, it explains why traditional methods fall short. Finally, it explores how a new class of world-monitoring solutions can deliver unprecedented insights, enabling (re)insurers to base their decisions on near-time, accurate observation data that has hitherto been unavailable.

The ability to accurately size losses based on observation data presents a significant opportunity for the industry. The benefits range from more accurate reserving and smarter outwards purchasing to insight-led decisions on resource allocation and claims settlement. Indeed, if properly harnessed, these insights can ultimately improve underwriting and inform product development. As a pioneer in providing near real-time flood loss numbers, ICEYE is dedicated to working with its (re)insurance industry clients to unlock this potential.

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FLOOD: THE DRIVER OF LOSSES

The reports from major (re)insurance companies and brokers are conclusive. Last year was another major year for global natural catastrophes, and flood losses made the headlines globally. Overall, 2021 was the third costliest year on record for climate-related events, with the loss tally fuelled by extreme weather events, including severe floods.

> "**CLIMATE CHANGE IS INTENSIFYING** THE WATER CYCLE. THIS BRINGS MORE INTENSE RAINFALL AND ASSOCIATED FLOODING, AS WELL AS MORE INTENSE DROUGHT IN MANY REGIONS."
>
> - IPCC SIXTH ASSESSMENT REPORT[1]

The European floods that devastated large parts of Germany and neighboring Netherlands, Belgium and Luxembourg in July 2021 were responsible for the continent's largest-ever economic loss: $46 billion[2]. It was also Europe's most costly insurance event of the year, causing an estimated $13 billion in claims[3].

Commenting on Swiss Re Institute's preliminary sigma estimates for the year of 2021, Martin Bertogg, Head of Cat Perils at Swiss Re, noted that: "It seems to have become the norm that at least one secondary peril event such as a severe flooding, winter storm or wildfire, each year results in losses of more than $10 billion."

1 IPCC https://www.ipcc.ch/assessment-report/ar6/
2 Aon Benfield https://www.aon.com/weather-climate-catastrophe/index.aspx?utm_source=media&utm_medium=org-digital&utm_campaign=ri_esg-climate-change_all_rin_global_all&utm_content=gated-content&utm_term=press-release
3 Swiss Re sigma https://www.swissre.com/media/news-releases/nr-20211214-sigma-full-year-2021-preliminary-natcat-loss-estimates.html

"At the same time, Hurricane Ida is a stark reminder of the threat and loss potential of peak perils. Just one such event hitting densely populated areas can strongly impact the annual losses," he added.

Hurricane Ida in the US was not only the costliest insurance event of 2021, but also one of the costliest hurricane losses on record, with claims reaching $30 billion to $32 billion. The storm also had a significant flood footprint (a trend also noted with other hurricanes in the past decade, such as Hurricane Harvey in 2017 and Hurricane Sandy in 2012).

As ICEYE reported immediately after Ida hit the coast of the USA, the heavy flooding as the hurricane moved inland impacted over 22,400 miles in New Jersey, Pennsylvania and other parts of the Northeast, affecting 3,791 buildings.

Due to the increased impact of climate change, these events are expected to be more and more common across the globe in 2022 and beyond, continuing a tendency of large-scale, devastating catastrophes that hit densely populated areas.

SIZING FLOOD LOSSES THE TRADITIONAL WAY

Historically, there has been no reliable, fast and accurate truth data for water extent and depth in the immediate aftermath of flood events. (Re) insurers - as well as brokers - have therefore relied on inconsistent, qualitative and labor-intensive field reporting, or slow and fallible models. Neither of these methods has the right combination of speed, comprehensiveness, and accuracy to determine which customers were truly impacted by a flood, and how badly.

LOSS MODELS VS. COMPREHENSIVE OBSERVATION DATA

When a major catastrophe event occurs, such as a large hurricane, the (re) insurance industry typically uses outputs from vended catastrophe models to estimate the size of the likely impact on their portfolio.

However, these estimates, which are widely relied upon by the industry and its regulators, are in no way based on an observation of what actually happened during the event in question. Instead, the 'cat models' convert a hypothetical hazard value (e.g. water depth or ground motion) and an assumed vulnerability of the properties likely to be in harm's way into a probable dollar loss.

Of course, some models are better than others - and, with the computational power that is now available, the models have become more complex over the last decade. However, this complexity has also increased model uncertainty - and with it the scope for misunderstandings. Indeed, paraphrasing the statistician George Box, while some models are useful, all models are wrong; they are necessarily only an approximation of reality, not a reflection of reality itself. Worse still, these models are extremely sensitive to their inputs, the quality of which can vary considerably. Furthermore, the assumptions underpinning the models are rarely transparent to those who consume the output.

All of this means that the (re)insurance industry uses cat models with great care. Yet, over the years, the use of cat models has proliferated from their original purpose. They were designed to be used probabilistically - i.e. to simulate losses to a portfolio using hundreds of thousands of synthetic events. By contrast, they were never intended to be used deterministically - i.e. to provide an accurate estimate of the loss from a given, single event. When used probabilistically across portfolios, these models benefit from the law of large numbers. When used on single events, their frailties are more exposed.

It is generally accepted that, of all the perils, flood is the most challenging to model. By its nature, flood is a very dynamic hazard with inundations influenced by multiple factors on the ground, playing out in real-time. The hazard gradient (i.e. how depth varies between locations) is very steep. In other words, one side of the street can be under water while the other is dry. This means that, relative to other perils, flood models are both expensive and inaccurate. It also means that they are available for a small number of countries globally - which itself is a problem given that anywhere it can rain it can flood.

Overall, this implies that capturing flood extent and inundation data accurately can only be achieved through observation data from a range of independent, reliable and consistent sources.

THE COST OF WAITING FOR ACCURATE LOSS ADJUSTMENTS

Of course, (re)insurers do not rely on models alone when it comes to sizing the expected losses and recoveries from an event. The gross, top-down estimates coming from the cat models are compared to the actual claims coming in from the field.

However, while these bottom-up data points are more accurate than the modelled estimates, they can literally take years to fully roll in. When sending loss adjusters to the field, these professionals cannot be deployed until it is safe to do so - once floodwaters have receded -, and these resources are sometimes already tied up in assessing prior catastrophes that have occurred in the same region. This can be an issue, for instance, during the

"IT'S A BIG DEAL TO KNOW IF 10,000 HOUSEHOLDS WERE IMPACTED BY A FLOOD. **IT'S ANOTHER THING TO KNOW WHICH 1000 OF THEM WERE IMPACTED BY THREE METERS** OR MORE OF WATER, BECAUSE THEY NEED IMMEDIATE ASSISTANCE. THE FLOOD EXTENT IS BASICALLY THE OUTLINE OF THE FLOOD, WHILE OUR FLOOD DEPTH RASTER ALLOWS YOU TO ZOOM IN ON ANY HOUSE, CLICK ON IT AND SEE WHAT WAS THE DEPTH."

– NATE UHLENBROCK, GLOBAL HEAD OF SOLUTIONS PRODUCTS

North Atlantic Hurricane Season where it is not uncommon to have two, three or even four landfalling hurricanes in succession.

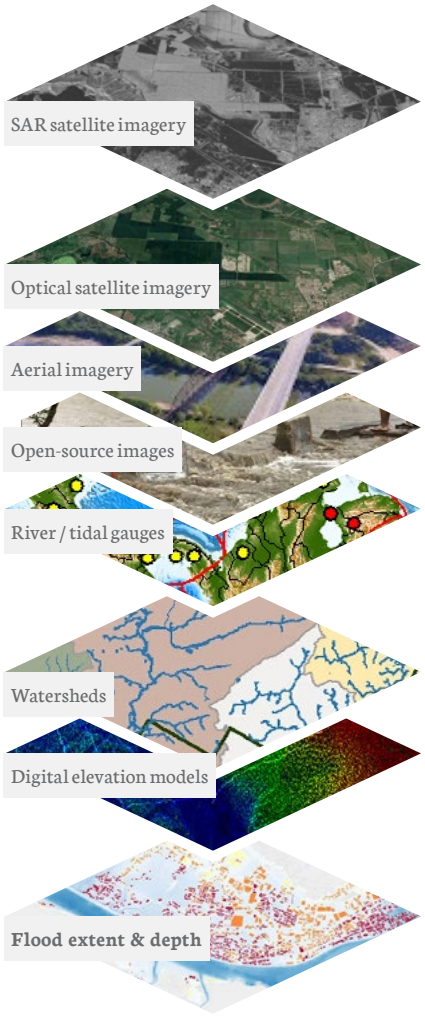
In such situations - where resources are constrained and yet the stakes are high - (re)insurers need to carefully manage and dynamically prioritise their adjusters. This is, however, particularly challenging in the absence of accurate insight into the interplay between where the hazard is most damaging and where their book is most exposed. The lack of efficiency in determining when, where and how to best deploy field resources further compounds the time element in sizing losses the traditional way.

Ultimately, this has serious material consequences for insurance companies. It makes it difficult to accurately reserve for anticipated losses to their portfolio, causes delays in feeding back information to shareholders and other stakeholders (and elevating the risk that numbers may have to be corrected at a later date), putting carriers on the back foot before they have even begun the claims settlement process.

Ultimately, the traditional approach to sizing losses hamstrings the industry in performing its primary function when disaster strikes. (Re)insurers are left triangulating between crude modelled loss estimates and slow, incomplete claims, when they should be responding proactively to clients in their hour of need. Customer satisfaction erodes, and - as losses escalate - so do expense and loss ratios.

CLOSING THE DATA GAP: FLOOD OBSERVATION INSIGHTS

There is no doubt that the ability to size losses, both at an industry and portfolio level, using immediate, empirical data is a superior approach. The ability to observe the extent of a flood and its depth at each location - anywhere in the world - is an entirely new capability. Marrying this with information on the properties impacted empowers (re)insurers with accurate loss numbers in near real-time.



The simple reason why the industry remains so reliant on the traditional, less accurate approach to sizing losses is that until recently, observation data was not readily available or affordable. While some pioneering indemnity and parametric products have been structured around data from flood sensors and river gauges, this requires a significant upfront investment and is far from universally available.

The ICEYE approach to sizing flood losses is therefore a game-changer in providing truth data to the (re) insurance industry. By combining SAR imagery with multiple auxiliary information sources, ICEYE produces flood depth and flood extent analysis, with the first outputs being delivered in 24 hours.

PUTTING INSIGHTS TO GOOD USE

MORE EFFICIENT RESOURCE ALLOCATION

Determining how, when and where to deploy loss adjusters and other claims professionals presents a significant challenge in the aftermath of a natural catastrophe. Using the traditional method of sizing losses, carriers and third-party administrators are largely reactive, responding as claims are notified. As an event surges, they are left to manage the reality and cost of resources becoming stretched.

With accurate data in near real-time, carriers are able to determine the areas where the greatest property damage has occurred and where complex claims are most likely to arise. This insight enables them to take an altogether more proactive response, resulting in a safer and more efficient deployment of personnel on the ground.

PARAMETRIC SOLUTIONS

Devising parametric solutions for flood risk has traditionally proved a challenge as there has been a lack of consistent, accurate, global flood data. Some products have sought to use precipitation measured by rainfall gauges (data used successfully within some micro-insurance schemes to cover drought, for instance). More sophisticated parametric approaches have made use of flood sensors and flood depth monitors to use actual flood depth as a policy trigger. But they may still leave 'blind spots' - areas between sensors and gauges where the data is less granular, and these solutions can of course only be implemented in places where there are ground sensors.

ICEYE's flood monitoring capabilities include the full suite of data sources, enabling (re)insurance companies to devise parametric solutions for a wide range of scenarios. Through its work with first movers, including Swiss Re Corporate Solutions, AXA Climate and Descartes, ICEYE is developing parameters and triggers for multiple different use cases and end clients, including government agencies, emergency management organizations and Tier-1 insurers.

FASTER CLAIMS PAYMENTS

The ability to size losses from major flood events using near real-time observational data from trusted and verifiable sources has obvious applications for claims management. Insurance carriers can use ICEYE's flood insights to quickly understand which properties within their portfolios have been affected, size the extent of the losses and expedite the claims settlement process. Depending on the nature of loss, there is the potential to pay claims based on observable data only, without the need for loss adjusters.

For P&C insurance companies, there is a clear competitive advantage in their ability to settle claims quickly post-event. Typically, the faster a claim can be processed and settled, the lower the cost.

A seamless claims experience inevitably increases customer trust and retention and boosts stakeholder perception of a carrier's brand and reputation in the market.

WHY ICEYE?

For sizing flood losses, ICEYE's primary differentiation is its globally consistent, accurate flood observation data in near real-time that includes both extent and depth, as no other source can provide this data on the market today. When combined with property and exposure data in loss models, ICEYE's data is the fastest and most accurate way for (re)insurers to size losses from a flood.

Interested in learning more? If you are keen to enable your organization with actionable natural catastrophe insights, you can read more about ICEYE's Flood Insights, or get access to our latest Flood Briefings here.

WANT TO KNOW MORE?

Out clients have access to near real-time hazard and damage data to accurately and quickly respond to natural disasters, improve their decision-making, and ultimately transofmr their customer experience.

CONTACT US
WWW.ICEYE.COM/FLOOD