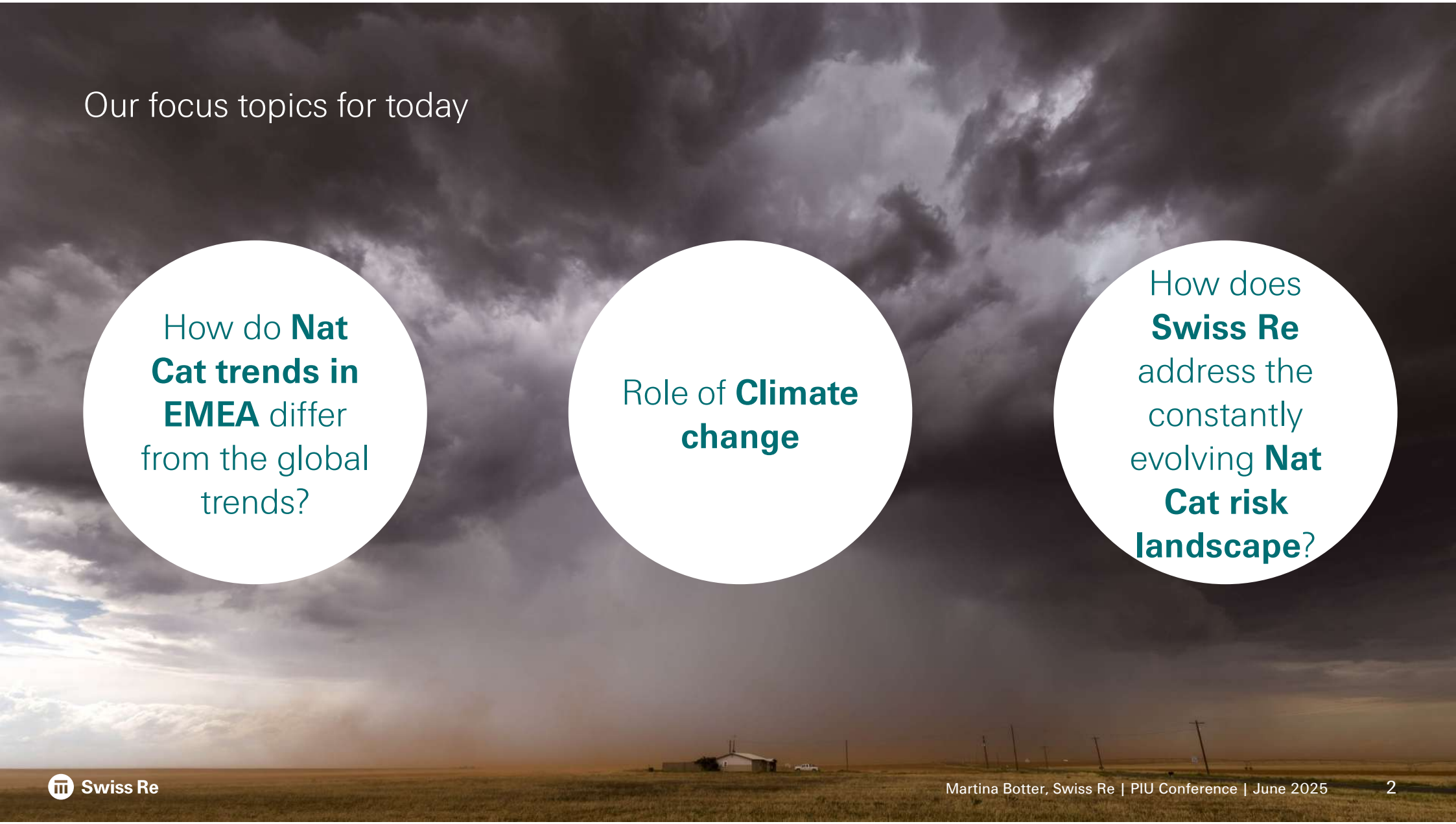
Natural Catastrophe risk on the rise: business as usual or a new normal?

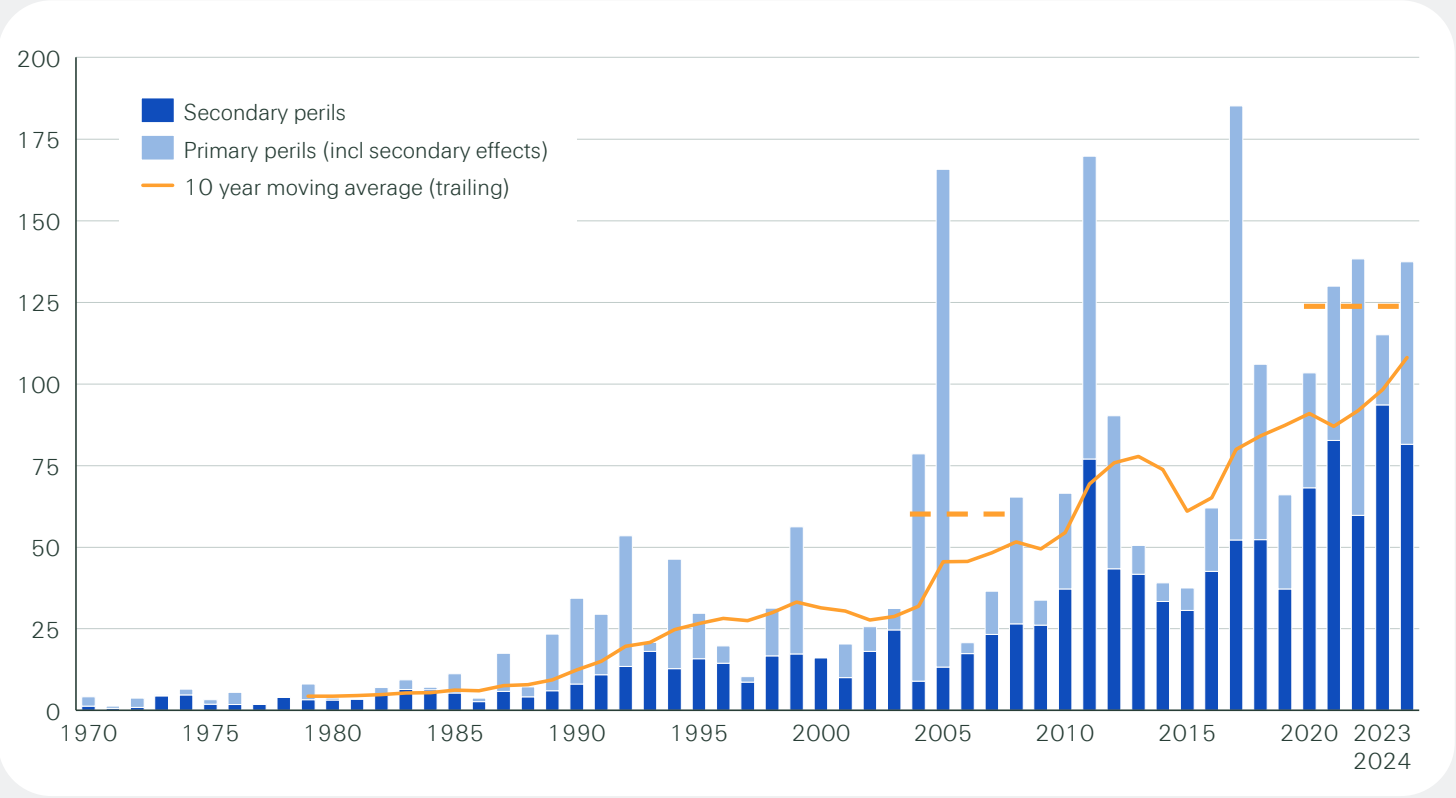
Martina Botter, Nat Cat Specialist, Swiss Re
9 June 2025

Our focus topics for today



Nat cat is a core line of business for reinsurance and its value proposition, with persistent growth of insured losses and volatility

Insured natural catastrophe losses[1] (USD bn)



5-7%
p.a. growth over last 30 years

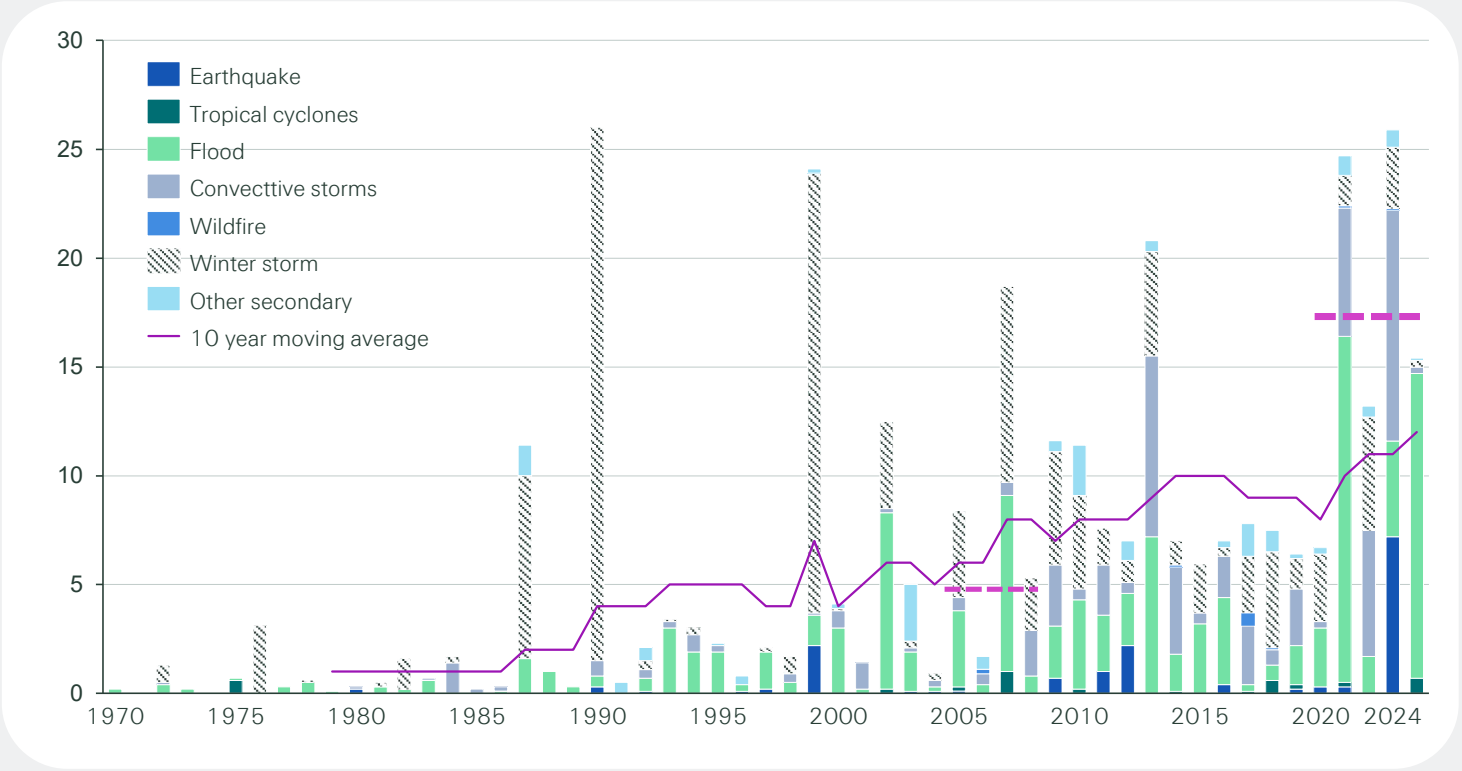
~ USD 125bn
p.a. over 2020-2024
approx. twice higher vs 20 years ago

~60%
share of secondary perils in last 5 years vs 50% over 30 years

[1] Source: Swiss Re Institute, Nat Cat sigma 2024 (preliminary)

EMEA insured Nat Cat losses 1970-2024: Flood and severe convective storms at play in recent years, region "benefitting" from low Winter storm Europe activity

Insured natural catastrophe losses[1] in US (USD bn)



6-8%
p.a. growth over last [illegible] years

~USD 17bn
p.a. over 2020-2024,
approx. 3 times higher vs 20 years ago

>70%
share of secondary perils in last 5 years vs 60% globally

[1] Source: Swiss Re Institute, Nat Cat Sigma 2024 preliminary

Slajd 4

YV0 [@Martina Botter] please double check this, based on the same calculation approach Chandan did globally
Yordanka Velichkova; 2025-05-09T09:27:06.652

MB0 0 Adjusted based on Chandan's suggestion of 6-8%
Martina Botter; 2025-05-09T09:48:22.897

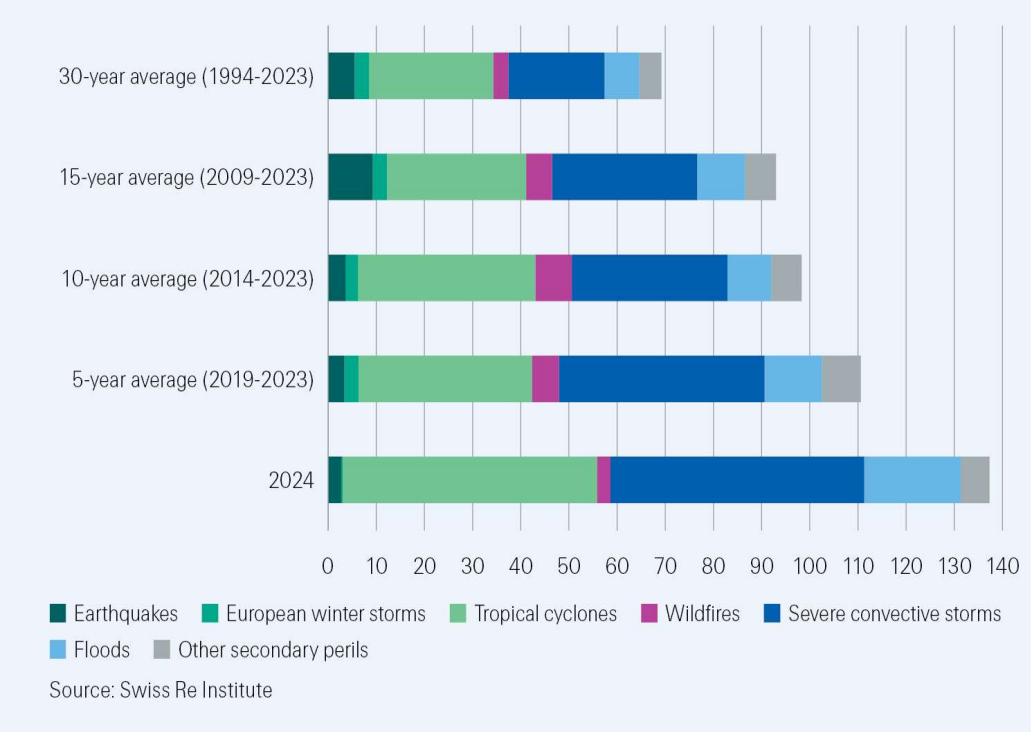
MB0 1 One more comment from Chandan: less confidence in the EMEA range compared to Global range since it is based on less events.
Martina Botter; 2025-05-12T06:58:19.184

YV0 2 Does the number of events matter, if the number of years is the same? We are looking at total insured losses in a given year.
Yordanka Velichkova; 2025-05-12T20:37:23.251

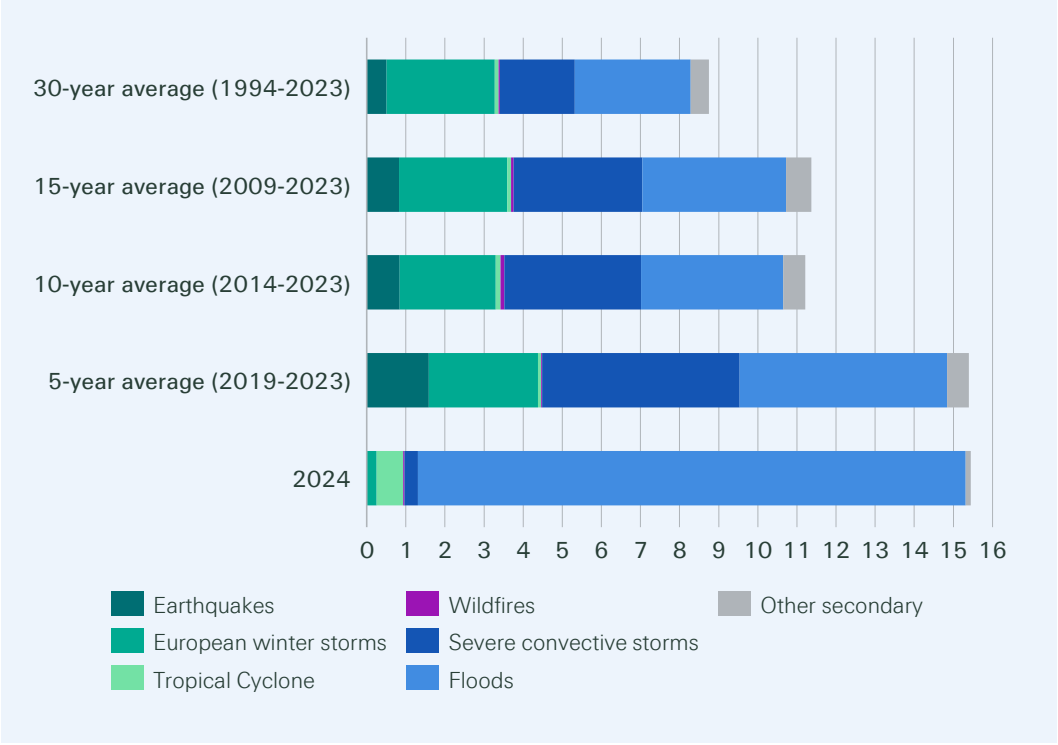
MB0 3 In principle it is correct. The way I understand this is that since every year the number of events contributing to the total loss is lower in EMEA then globally, the loss pattern is more volatile and the exponential trend curve used for estimating the p.a. growth might have a lower goodness of fit than the one on global data.
Martina Botter; 2025-05-12T20:54:34.921

2024 gives some relief post the costliest nat cat year on record in EMEA, loss potential to not be underestimated

Global insured Nat cat losses: 2024 and prior year averages



EMEA insured Nat cat losses: 2024 and prior year averages



Natural catastrophe property re/insurance impacted by various loss drivers, which are captured in Swiss Re's regularly updated models and underwriting process

	Importance of loss drivers
Economic development Growing property values, insurance penetration	+++
Concentration in exposed areas Urbanisation, population growth	+++
Changing vulnerability Sealing of surfaces, flood protection	++
Claims inflation Broader coverage, (socio)economic inflation	++
Climate change Natural variability, anthropogenic change	++

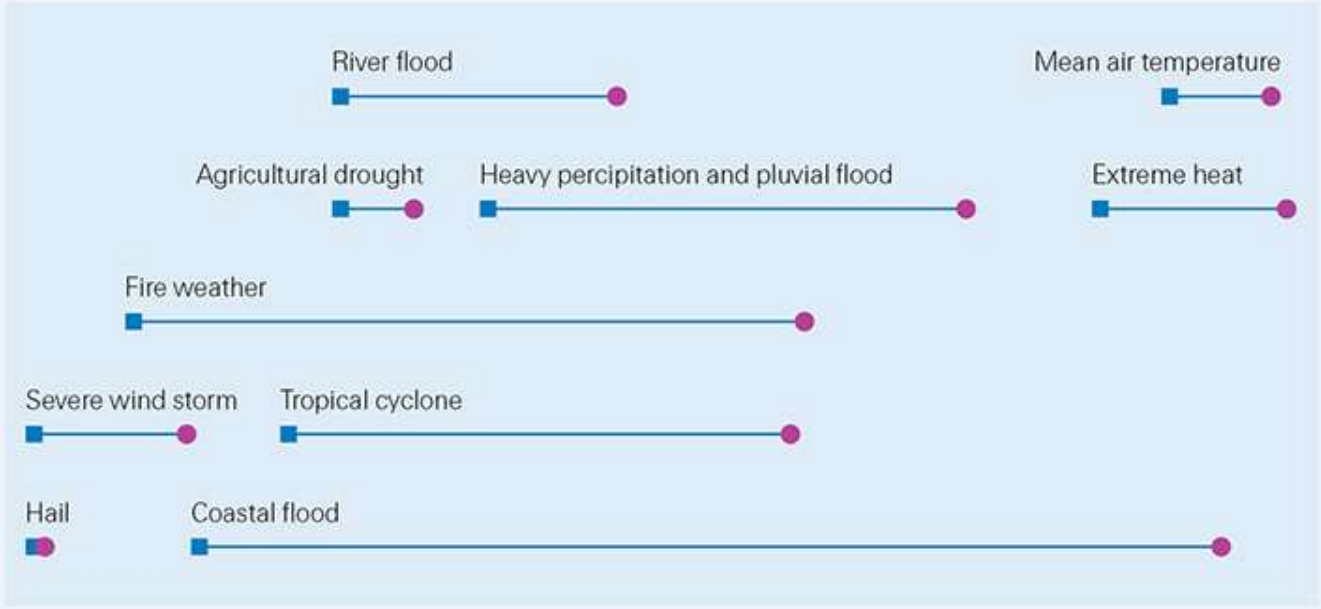
Shanghai

USD 5.8bn

Gross written natural catastrophe premiums across the Swiss Re Group in 2024 (2023: USD 5.7bn)

Source: Highlights of Swiss Re's Sustainability approach, TCFD 2024.

Climate change: Not all perils are impacted equally



- Climate change effects likely play a role in increasing losses
- Other drivers dominate, at least for now
- Record temperatures and heat waves are in line with expectations

Figure 11
Extent of observed and projected changes due to climate change in weather related perils

Summary of climate change effects in the EMEA region over long term (2050)[1]

Wildfire

Fire weather

Projected increase especially for Western, Eastern and Central Europe (medium confidence)

New fire prone regions might emerge, like Northern, Western and Central Europe

Wildfire

Projections highly uncertain due to mixture of natural and man-made effects

Pluvial and river flood

Pluvial flood

Projected increase in pluvial flooding for Northern, Eastern, Western, and Central Europe (high confidence)

Projected increase in pluvial flooding in all of Africa expect North Africa and West Southern Africa (high confidence) and the Arabian peninsula (medium confidence)

River flooding

Projected decrease in river flooding for Northern, Eastern Europe (medium confidence) and increase for Western and Central Europe (high confidence)

Coastal flood and storms

Coastal flood

Sea level rise will occur everywhere in Europe (except in Northern Baltic Sea due to land uplift), contributing to increased coastal flooding, regardless of the level of global warming (high confidence)

Winter storm

Large natural variability; potentially regional changes in severity/frequency, but no robust statement due to high uncertainty

Severe convective storm

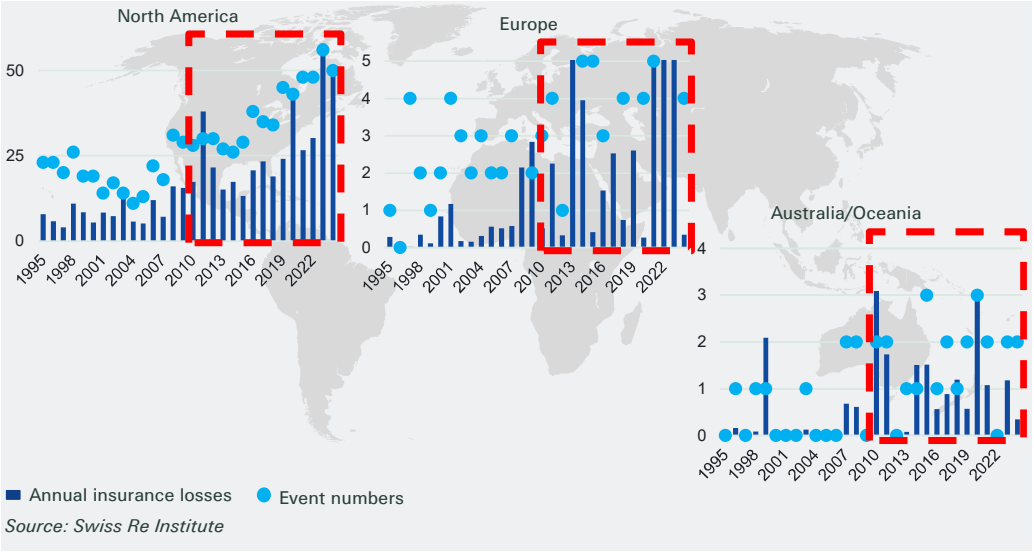
Low confidence regarding increase in frequency and severity, regionally dependent

[1]IPCC AR6 WG1

Deep Dive

Hailstorms Europe: hidden or hard to quantify risk drivers combined with rare event occurrence may lead to underestimation of loss trends over a longer-term period

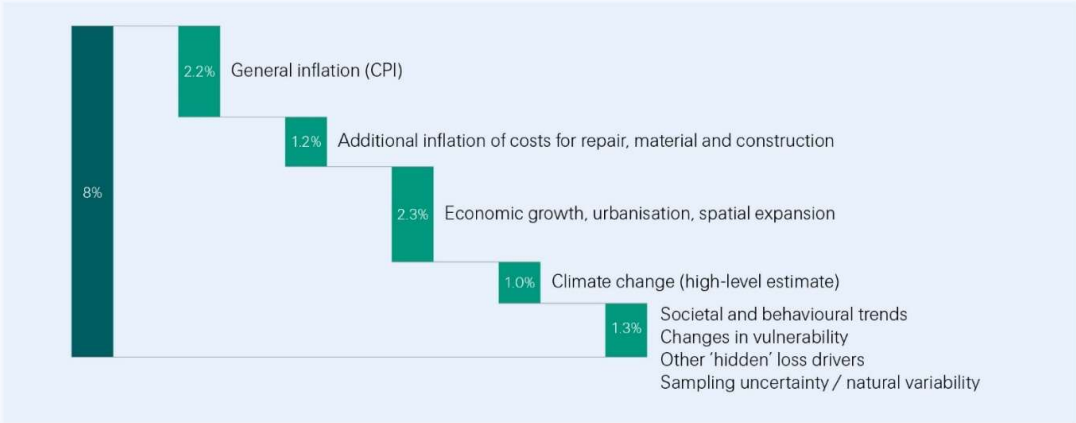
SCS losses in EMEA are growing faster than in US …



Source: Swiss Re Institute

… and there are lessons to be learned from US experience

Figure 13
Annual increase of insured losses from SCS in the US between 2008–2023, total (dark green), by driver (light green)



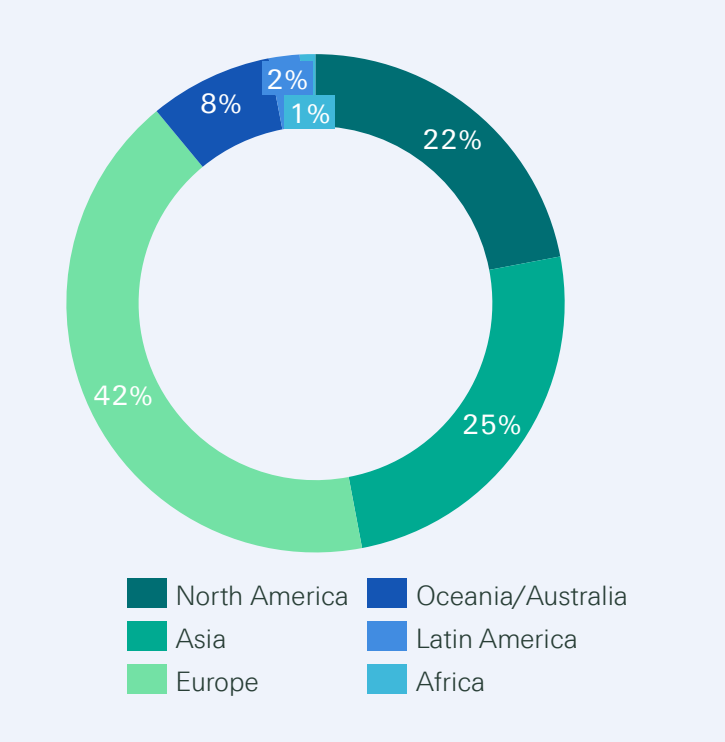
Source: Swiss Re Institute

2024 biggest flood loss events

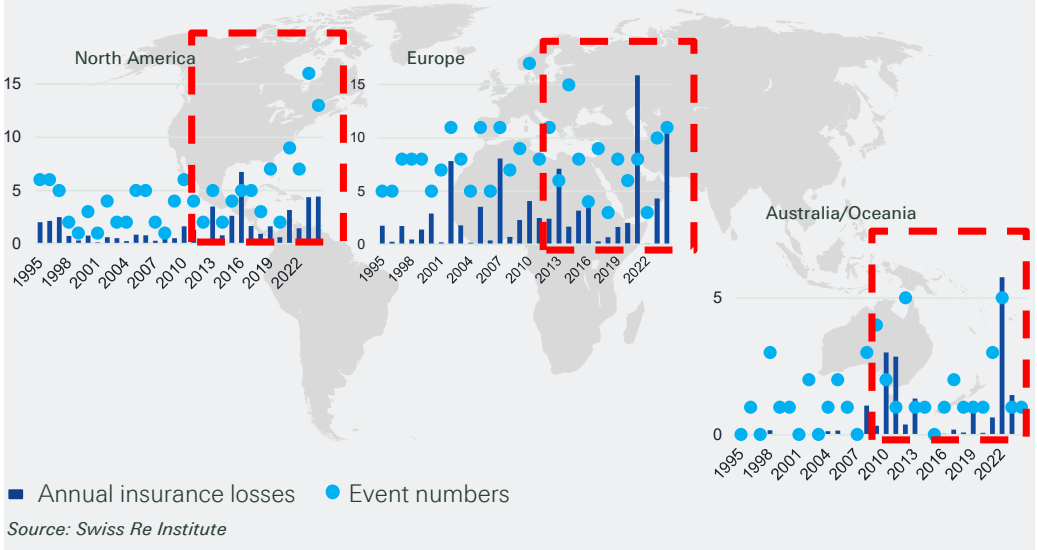
Deep Dive

Flood: a most relevant peril in EMEA

EMEA has the highest share of Flood[1] insured losses globally over the last 30 years …



… driven by a complex interplay of loss drivers



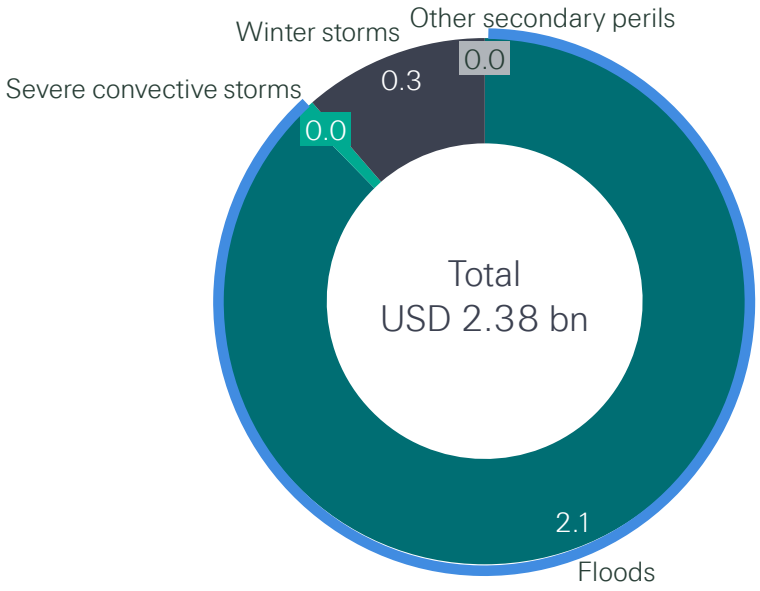
Source: Swiss Re Institute

[1] Riverine and pluvial, does not include tropical cyclones induced flooding

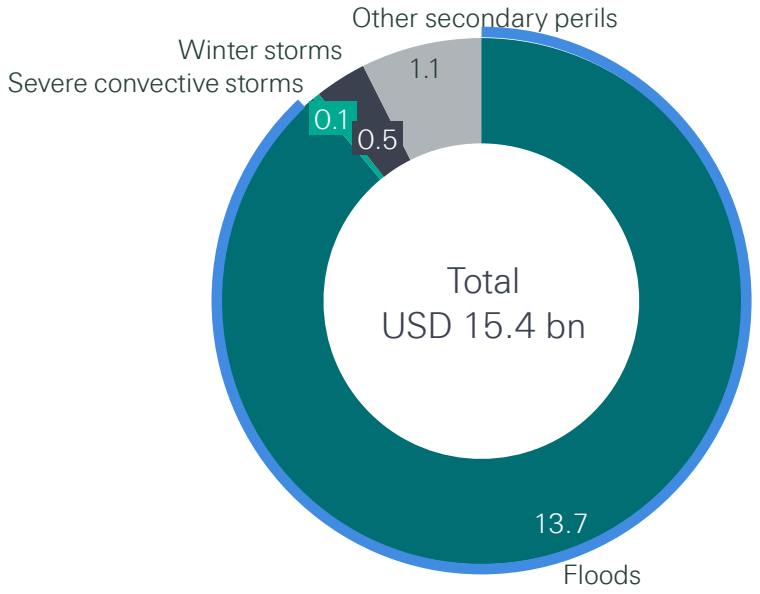
YV0 Deep Dive

Flood has been overwhelmingly the largest uninsured loss driver in Poland over the last three decades

Poland insured losses, 1995-2024
(in USD billion, 2024 prices)



Poland uninsured losses, 1995-2024
(in USD billion, 2024 prices)



Source: Swiss Re Institute

Slajd 12

YV0 [@Martina Botter] : what does vector mean? Delete or rephrase?
Yordanka Velichkova; 2024-06-24T20:24:07.835

Nat cat represents the core of our P&C reinsurance business, we continuously invest to drive confident Nat Cat underwriting decisions

Proprietary Nat Cat risk view

A key driver of Swiss Re's competitive advantage: deeper Nat Cat insights; flexible risk view updates; broader peril coverage

Nat Cat portfolio monitoring

Insights drive portfolio and go-to-market strategies (risk appetite), as well as our nat cat agenda (model development, UW practices, etc)

Nat Cat UW processes

Cat modelling fully integrated in all UW workflows; consistent risk view across Swiss Re Group

Comprehensive risk knowledge and modelling tools are provided by a large Nat Cat expert team to Swiss Re and its clients

Consistent hazard maps

Proprietary hazard maps for fluvial, pluvial and coastal flooding, down to **10 meters resolution**.
A major input for single risk costing.

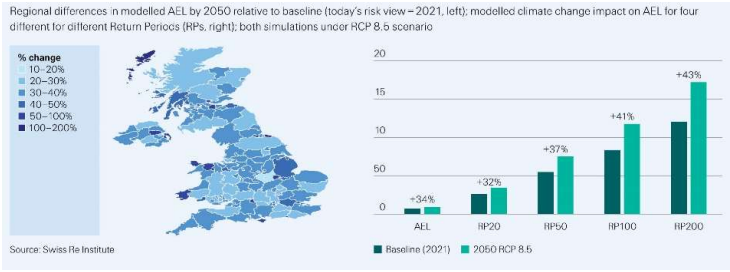
Fully probabilistic model

Inland flood fully-probabilistic model, based on **EU-wide event set** from hydrological modelling and **hazard maps**.

Market and claim knowledge serving e.g. disaggregation assumptions and vulnerability functions.

Climate change scenarios

Part of our macro-trends analysis, de-biasing past data and making our models adequate for today risk landscape.

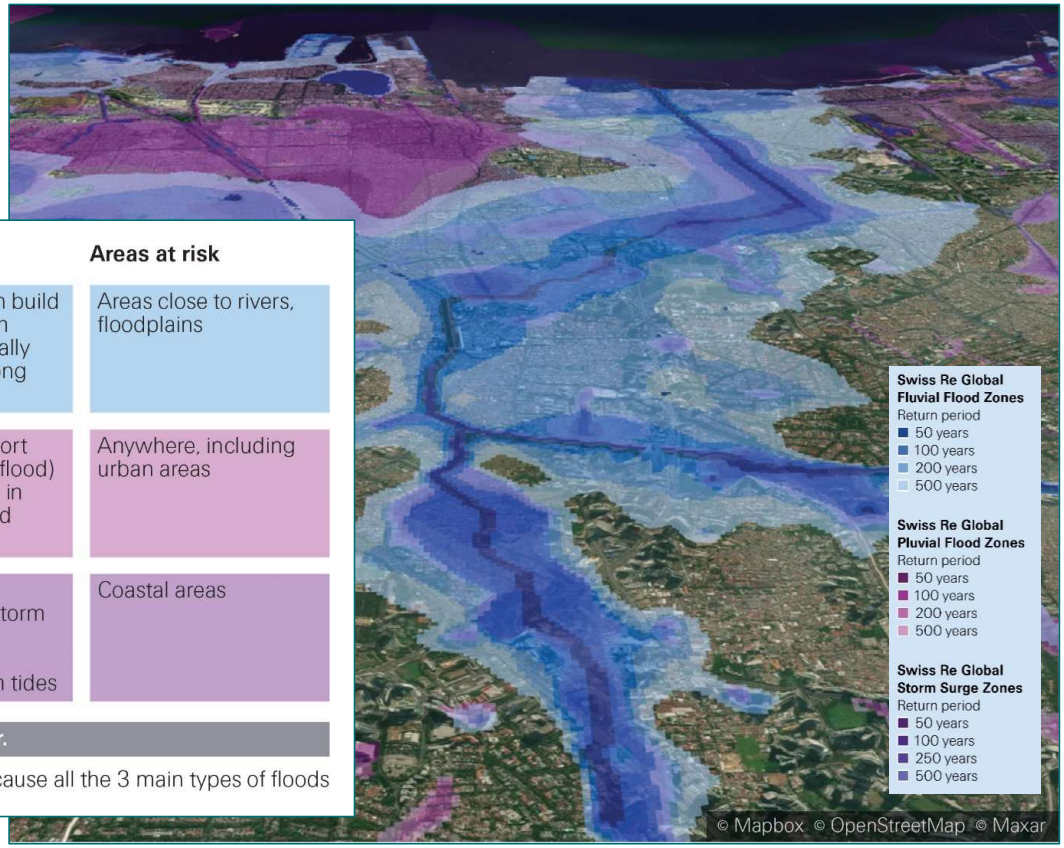


Understanding the drivers of flood risk: fluvial flood, pluvial flood and storm surge have different causes and loss factors

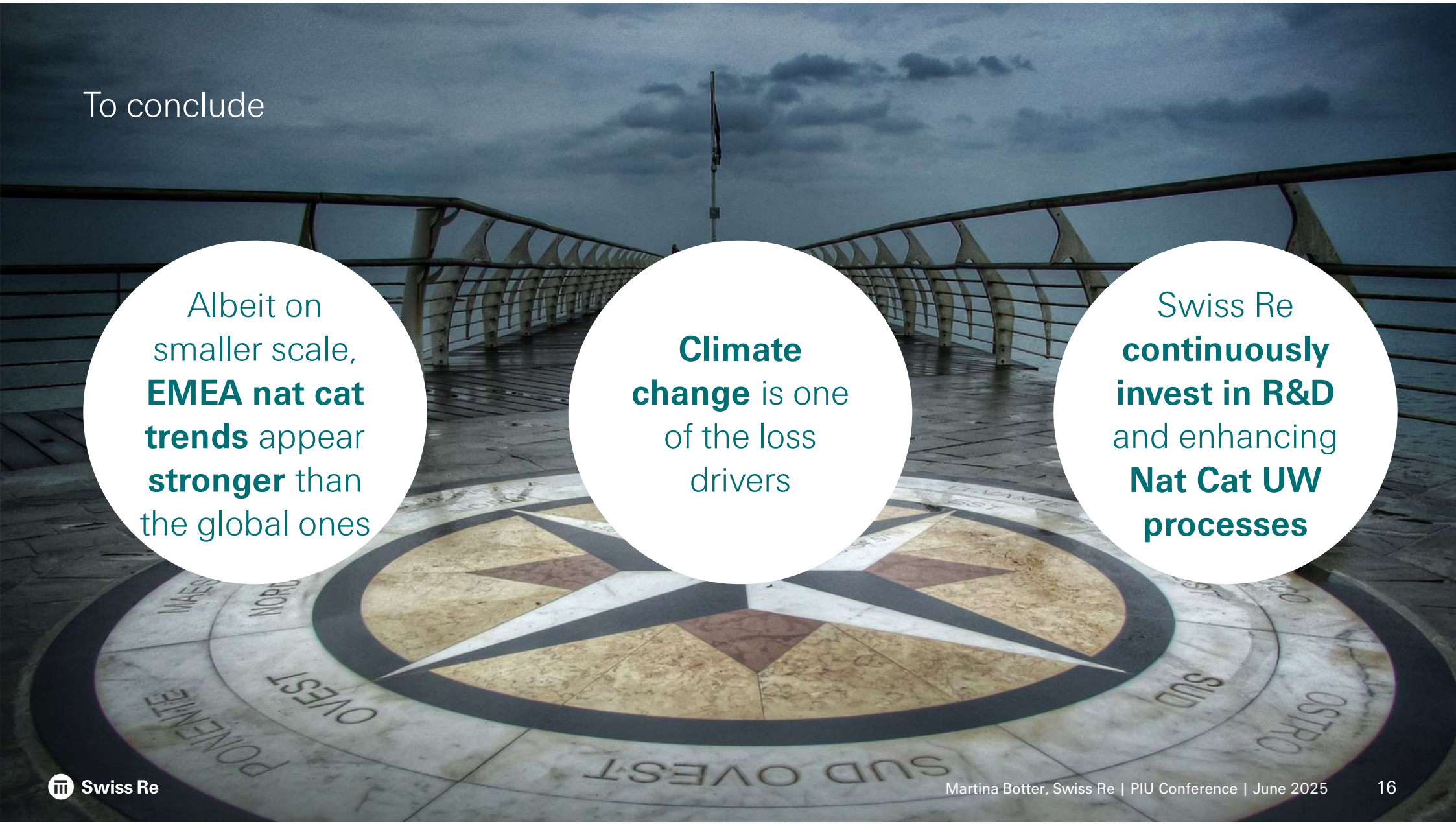
		Sources	Typical causes*	Characteristics	Areas at risk
Inland	Fluvial flood	Major and moderate-sized rivers, lakes	Heavy rainfall over days or weeks, but also snow melt, ice jams	▪ Flood wave can build up rapidly (flash flood) or gradually ▪ Often last for long periods	Areas close to rivers, floodplains
Inland	Pluvial flood	Surfaces not able to drain and minor rivers	Extreme rainfall in short time. Soil infiltration excess and overwhelmed drainage systems	▪ Sudden and short duration (flash flood) ▪ High flow rates in steepterrain and debris	Anywhere, including urban areas
Coastal	Storm surge	Seawater	Storm-force onshore winds pushing water against a coast over hours.	▪ Surge height influenced by storm and coast characteristics ▪ Interaction with tides	Coastal areas

+ Tsunami, reservoir or dam failure, ground-water flooding. sewer flooding, mudflow, lahar.

*Tropical cyclones can cause all the 3 main types of floods



To conclude



Albeit on smaller scale, **EMEA nat cat trends** appear **stronger** than the global ones

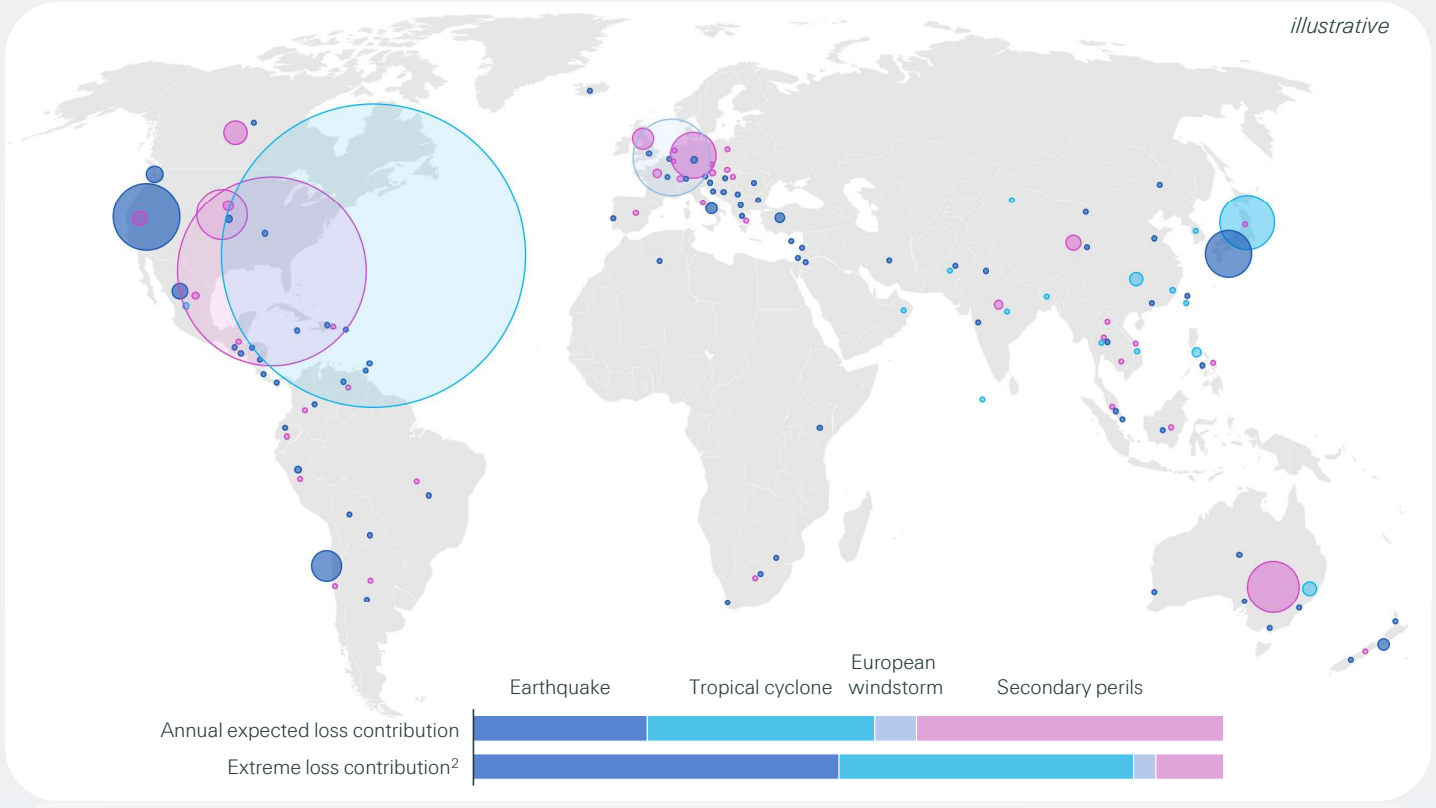
Climate change is one of the loss drivers

Swiss Re **continuously invest in R&D** and enhancing **Nat Cat UW processes**

Appendix

Global scale, diversification and sophisticated proprietary nat cat modelling capabilities are key drivers of Swiss Re's profitability

Swiss Re's global nat cat book[1]



Powerful resources

~200
models, covering >90% of global insured exposures

~30
secondary perils' risk views added or enhanced since 2019

50+
full-time scientists

[1] Based on portfolio as of 1 January 2023, net of retrocession. Size of bubble proportional to annual expected loss
[2] Extreme loss contribution refers to 99% tail VaR

Source: Investor Day 2023

Risk assessment and Nat Cat underwriting in a rapidly changing environment

01 Loss severity is driven by many compounding effects, not just climate change

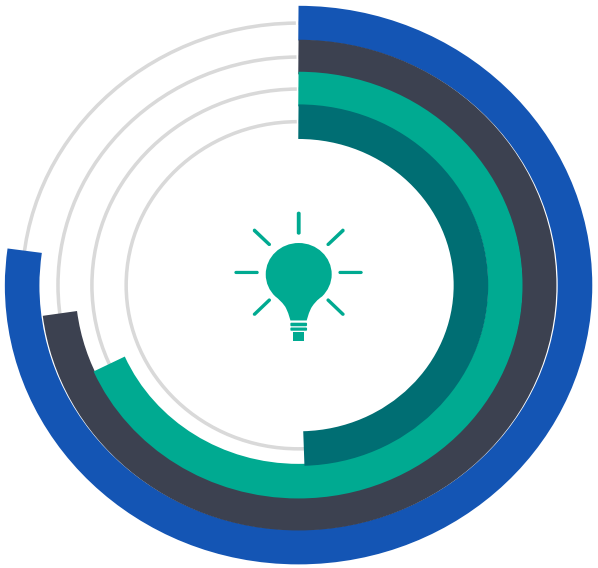
02 Up-to-date exposure data matters, especially in times of high inflation

03 Sharing of peril specific, granular exposure data is key

04 Sometimes bold changes in our risk view are required

05 Selection of appropriate observation windows and debiasing of historical data is key

Our climate change related research: To ensure sustainability, the (re)insurance industry needs to incorporate *all* risk trends in a forward-looking way



Best Practice for Nat Cat Model Development

The **systematic review, quantification and incorporation** of climate change and **all relevant risk trends** is an official component of Best Practice for Nat Cat Model Development and one of the **most scrutinised** items during model sign off.

Primary perils

Primary perils (TC, WS) are **dominated by natural variability**.
We invest in better understanding natural variability, while monitoring climate science and implementing any climate change signals in our risk views.

Secondary perils

Secondary perils **bear the most immediate climate change signal** (*not applicable for SCS*).
Intensified focus and review of current costing approaches, enhanced tracking and aggregation on a Group level.

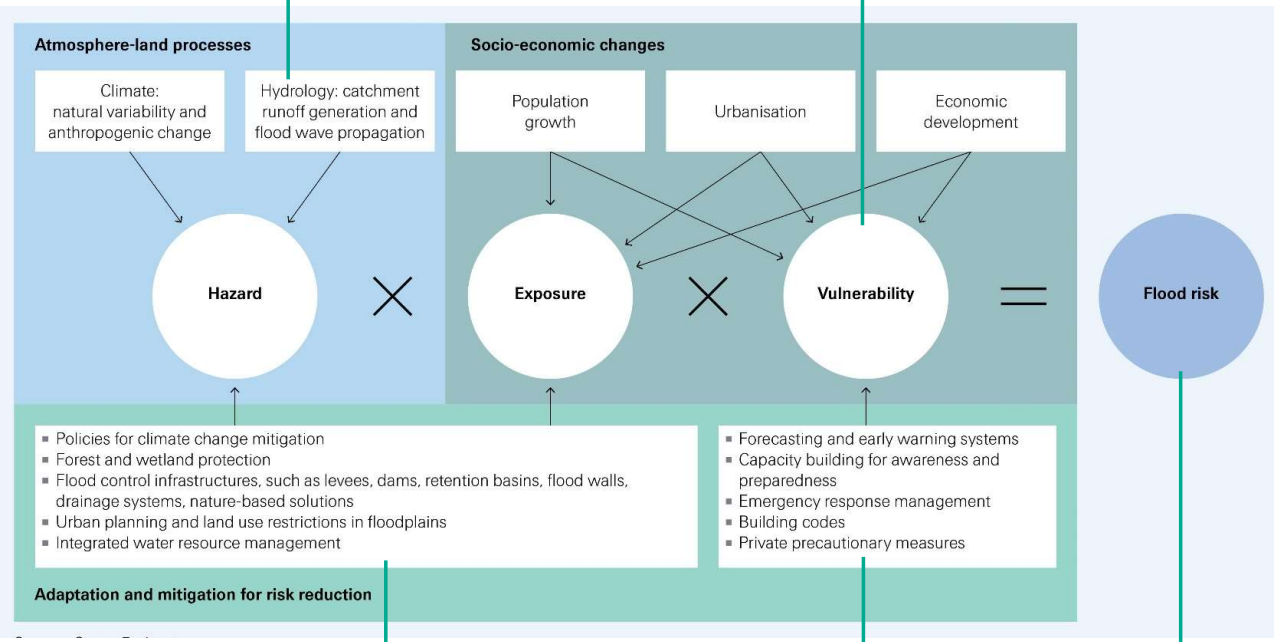
Beyond climate change

Build on a **forward-looking risk view** to guide Nat Cat underwriting decisions. Economic growth and urbanisation are today the main drivers behind rising losses from weather events.

Flood risk is determined by a combination of climate and land processes, and influenced by socio-economic factors

How is land topography and drainage capacity?

E.g., electrical equipment in basements?



Any flood defence in place?

Any emergency response?

Insurance for protection against residual flood risk?

A complex interplay of many factors resulted in record losses from “Bernd”

- **Extreme precipitation** over days. **Climate change** likely one driver for the increase of these events
- **Severe convective storms** with heavy rain a month earlier had left the **soils close to saturation**
- The topography with **steep river valleys** exacerbated the **flash intensity** of the event
- **Soil erosion and debris flow** due to the heavy flows and fewer trees after 2018 drought
- In some areas, the rapid onset of flooding undermined **alert and emergency systems**
- **Supply chain disruptions**, inflation, increased material costs and labour shortages

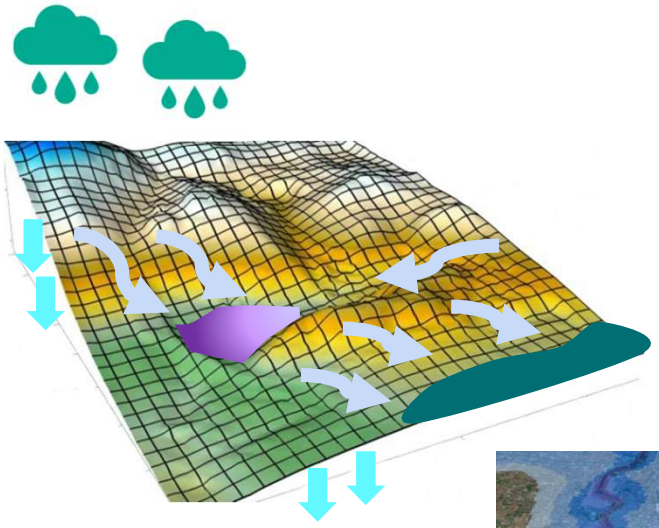
Challenges of flood risk modelling

Complex modelling chain > from weather input to flood water depth

Multiple inland flood sources > fluvial and pluvial

Localized peril > high-resolution > computationally demanding

Forward-looking > macrotrends (climate change, urbanization, flood protections)



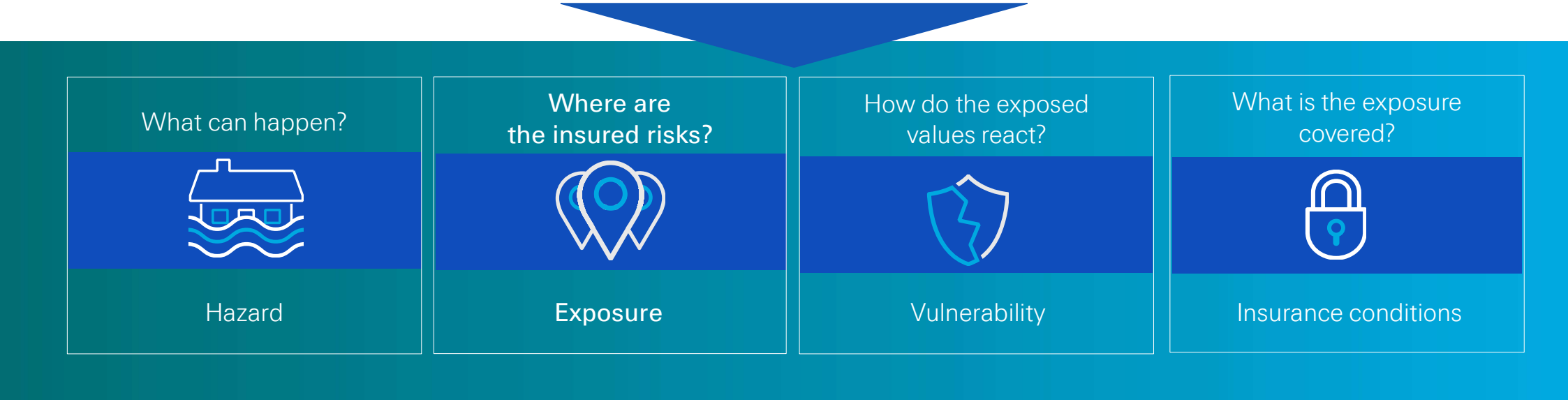
Event-based and exposure-based natural catastrophe modelling: Four-Box Principle

Event-based modelling

The goal of the cat model is to produce a so-called 'event loss set' (ELS), i.e. loss numbers for a predefined set of simulated events.

Exposure-based modelling

The input for the model is a description of the exposure (of a reinsurance contract), which is usually a 'client portfolio'



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