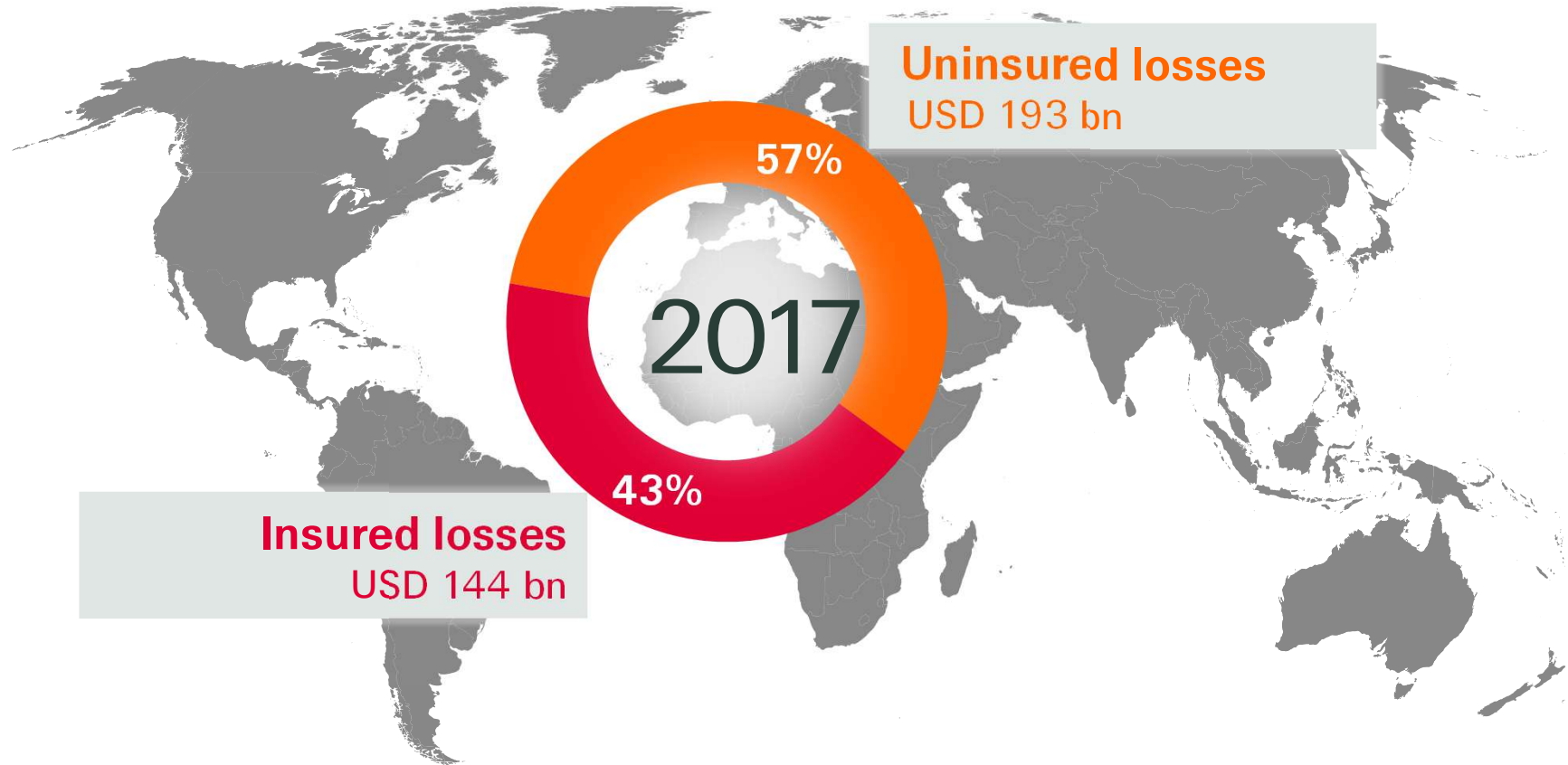
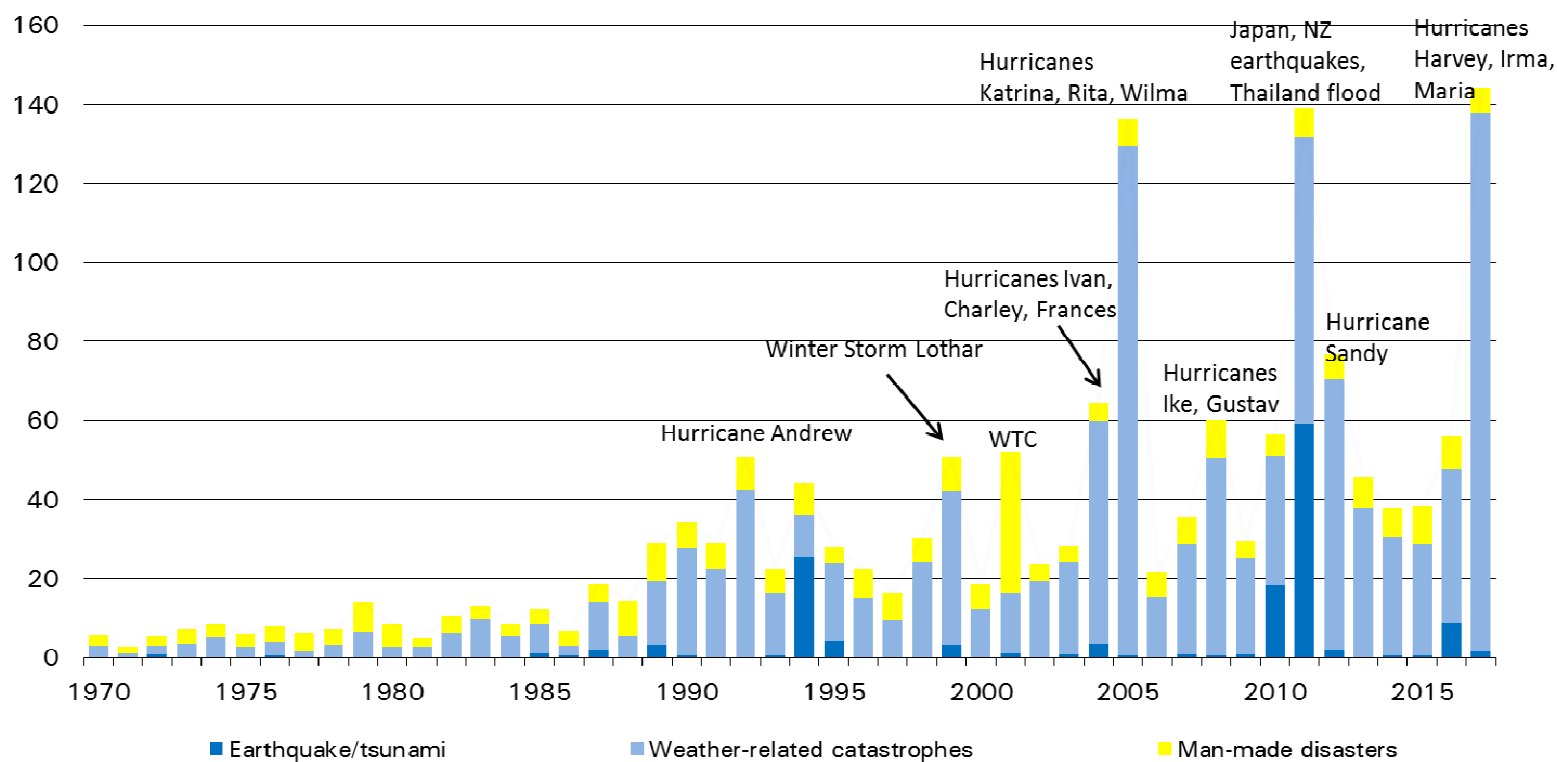


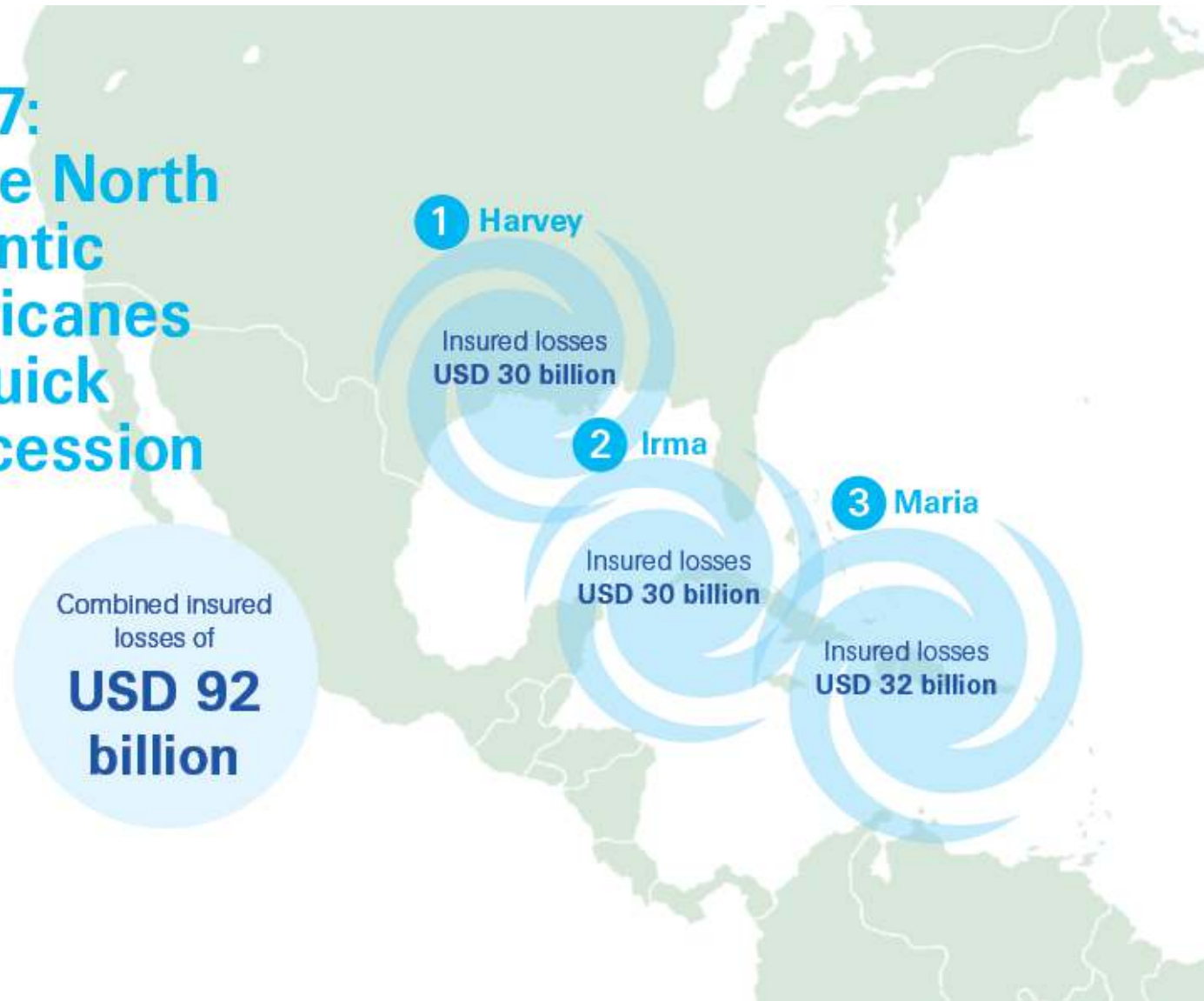
Global cat losses totalled USD 337 billion in 2017



Insured losses in 2017: USD 144 billion

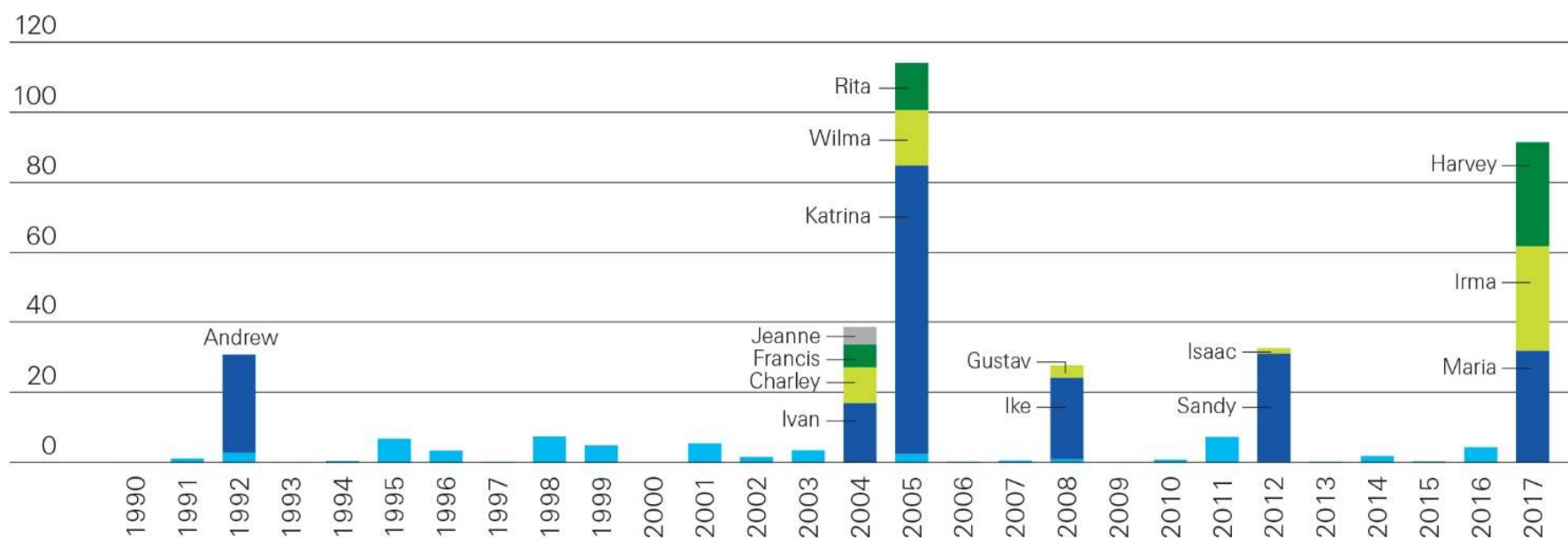


2017: three North Atlantic hurricanes in quick succession



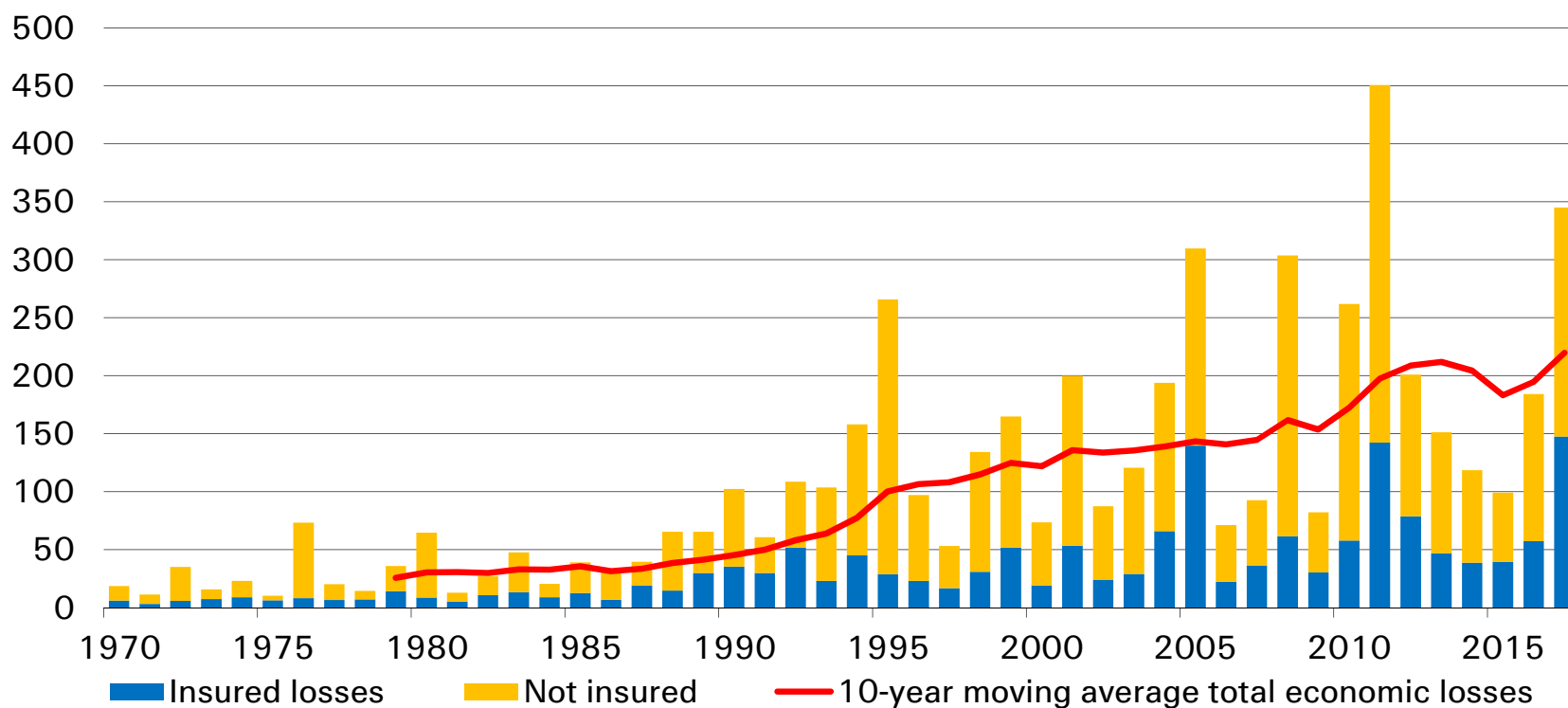
2017 hurricane season: second costliest ever

Insured losses from North Atlantic hurricanes 1990 – 2017 (USD billion) at 2017 prices



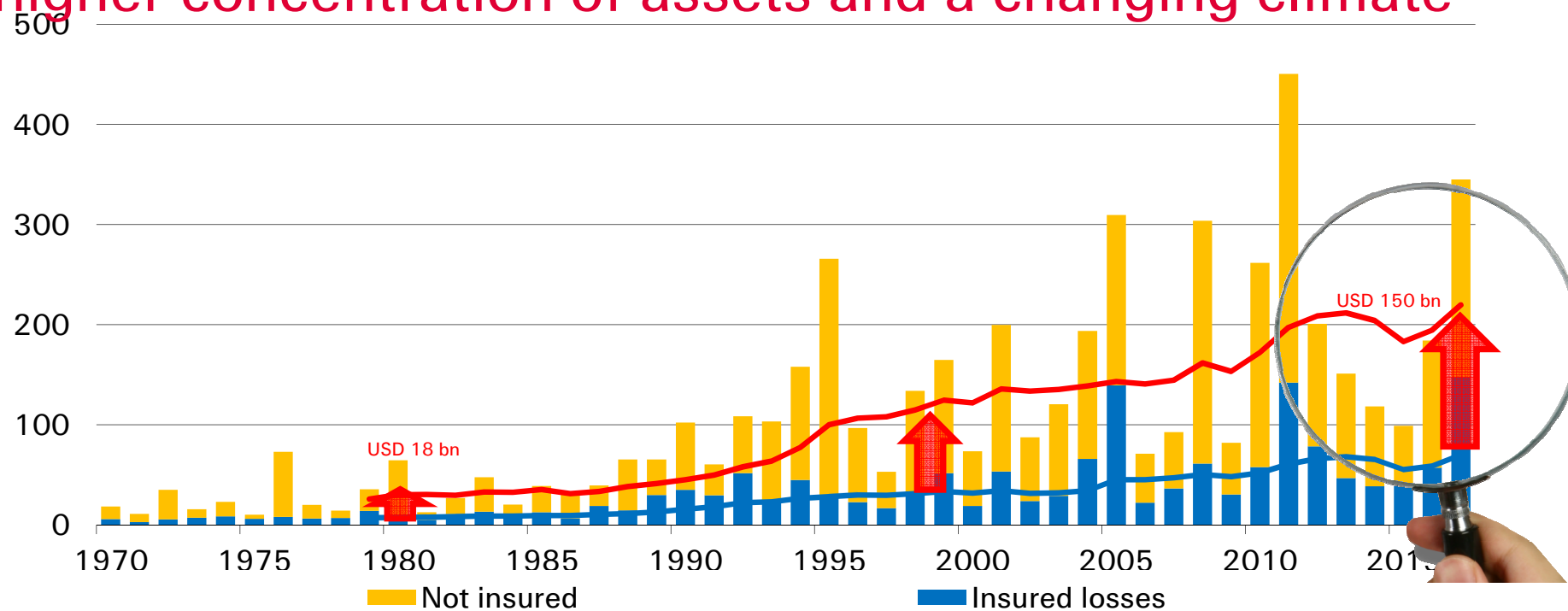
Source: Swiss Re Institute

Total losses increased more than 8 times between 1970 and 2017 (10-years moving average) :Already inflation adjusted basis.



Source: *sigma* 2/2017

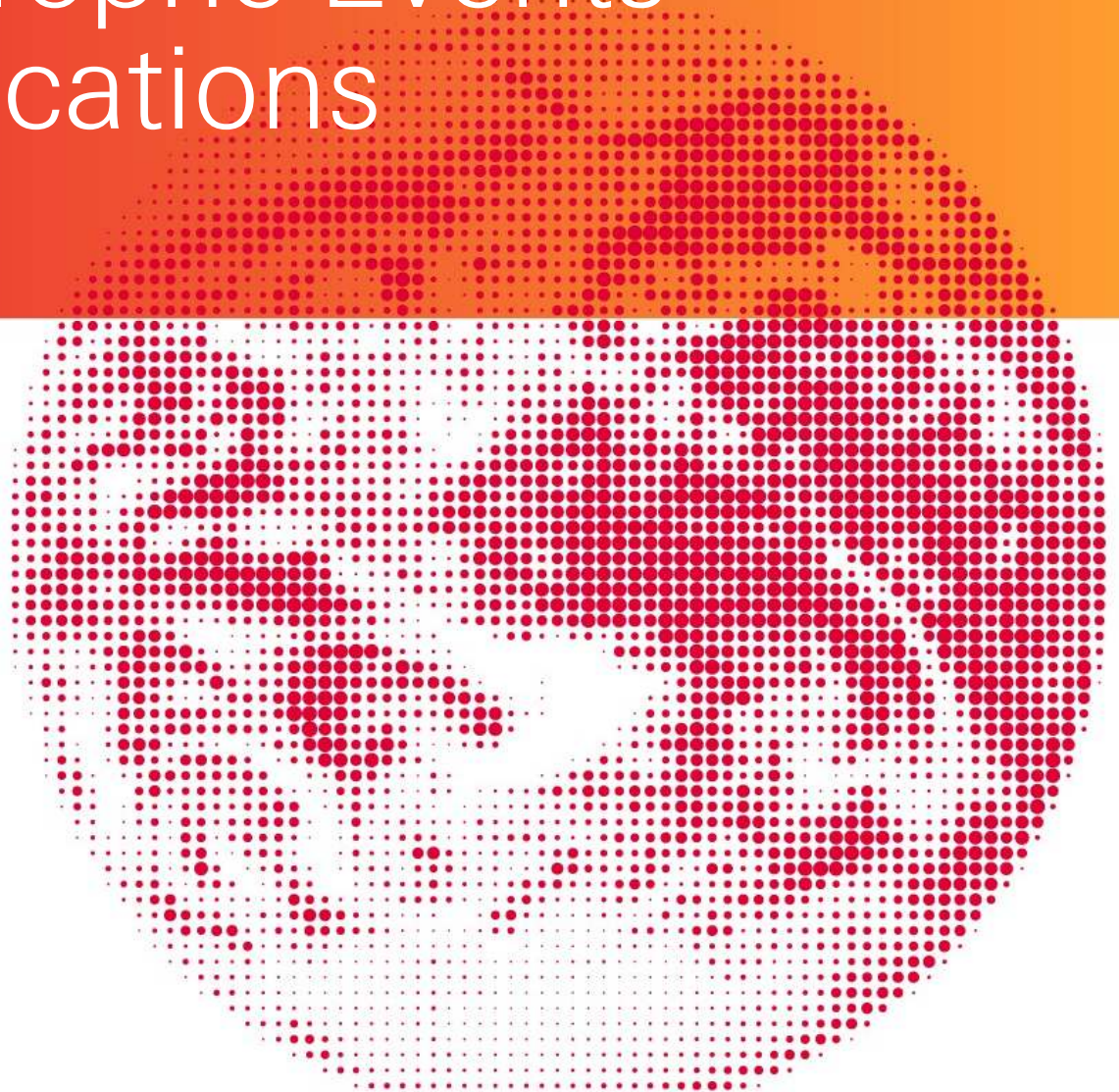
Protection gap continued to widen...
 mainly driven by economic development, population growth,
 higher concentration of assets and a changing climate



Source: *sigma* 2/2017

Recent Catastrophe Events and their implications

Amitabha Ray



On a lighter note Some things about Natcat & the topic today

- **Recent** in the NatCat context means the past decade and a half .
- We usually talk of return **periods** of 100yrs /200yrs /500 yrs in our area for large losses.
- Therefore in the very long run either we are all dead or would have survived only with Nat cat insurance (or reinsurance) !!!
- Property is a **short tail** business .But you need to incorporate long term peril pricing into this mix else : one day you will be out of pocket or unable to afford reinsurance !
- Its called **NatCat** but increasingly there is a **man made** component to it
- No NatCat model has been perfect but an inaccurate model is better than no model at all. Models help **us see** blind spots (as you will see later)

Today's Outline

- Nat Cat surprises observed in recent events
- Learning from Christchurch Earthquake
- Nat Cat blind spots in urban centres and high growth markets
- Influence of cognitive biases and market perceptions on Nat Cat modelling

Recent key earthquake events (2010-2014)

- 2010 Chile Earthquake, Mw 8.8
 - Significant losses from industrial facilities, mainly due to **business interruption**
- 2011 Christchurch Earthquake, Mw 6.3
 - Back to back, relatively **small events** on a relatively low hazard zone, generating significant insurance losses, mainly due to **liquefaction**-related damage
- 2013 Tohoku Earthquake, Mw 9.0
 - Major damage and losses from tsunami; complications due to failure of nuclear power plants; **Extreme earthquake** magnitude for the region

Each of the earthquakes surprised us with larger than anticipated losses .

INDIA : Northern Himalayan Range

Recent key weather events (2010-2014)

- 2011 Thailand Flood
 - Significant losses to the concentration of risks in industrial parks, mainly due to business interruption
- 2011 Flood in Australia + Cyclone Yasi
 - Several flood events in the state of Queensland were followed by Cyclone Yasi creating increased demand surge
- 2012 Hurricane Sandy
 - Major property damage and business disruption to an urban centre. Massive wind footprint, storm surge, flooding, blackouts, fire. Unanticipated track and size due to interaction with other weather system
- 2013 Typhoon Haiyan
 - Major damage and losses from wind and storm surge; Highest recorded wind speed ever. Extreme wind and storm surge

Most of these events surprised us with larger than anticipated losses

Where are the surprises coming from?

• Extreme events

- EQ magnitude 9 in the Sendai region
- Unexpected interactions between physical phenomena
- ...

• Exposure data

- Underinsurance/missing data
- Business interruption
- Insurance conditions
-

• Secondary perils

- Liquefaction/Tsunami/Landslide
- Storm surge/Rainfall/Hail/Flash floods/Mudslides/Bush fire
- Nat Cat interactions with engineering risks, and ...

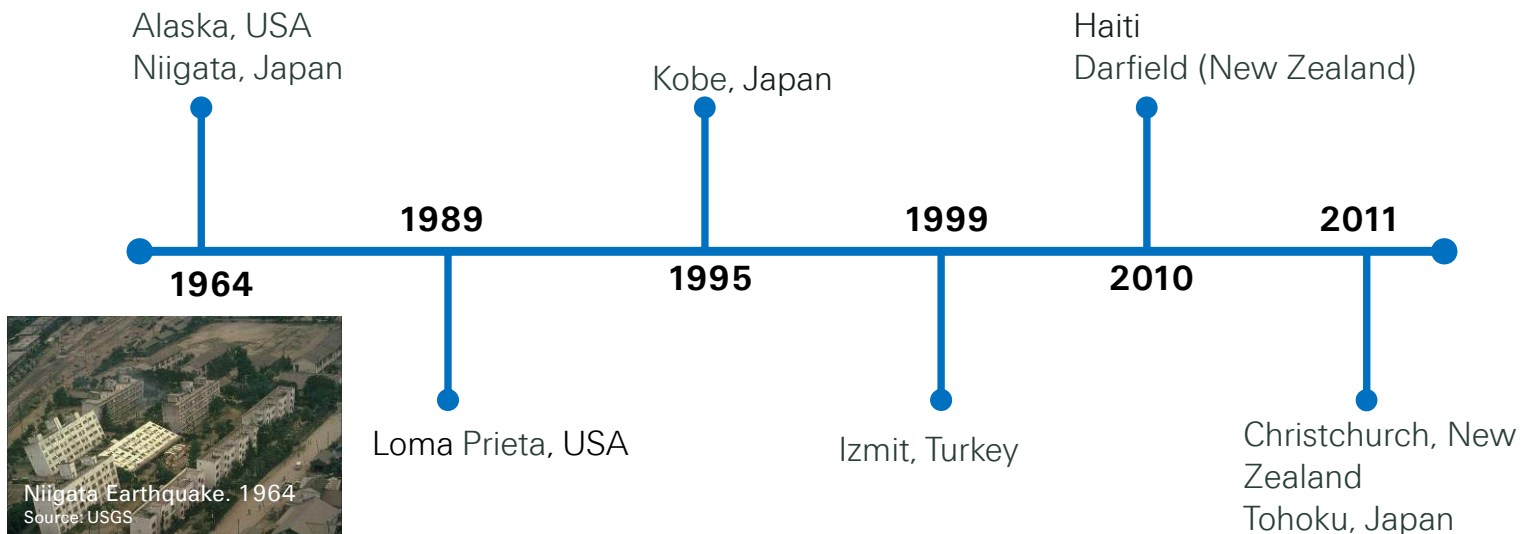
• Insurance/political/social environment

- Claims settlement practices
- Role of government's decisions on losses during/after a Nat Cat event
- ...

Most of the surprises are avoidable ?

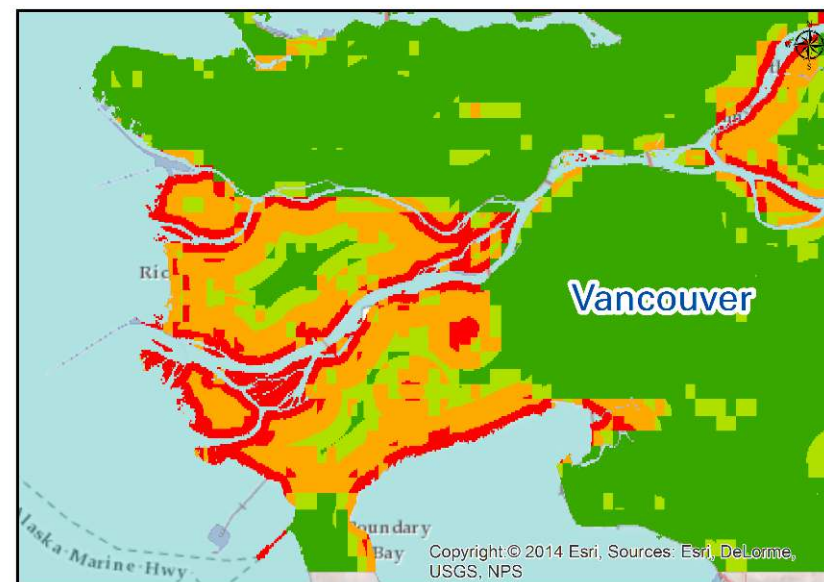
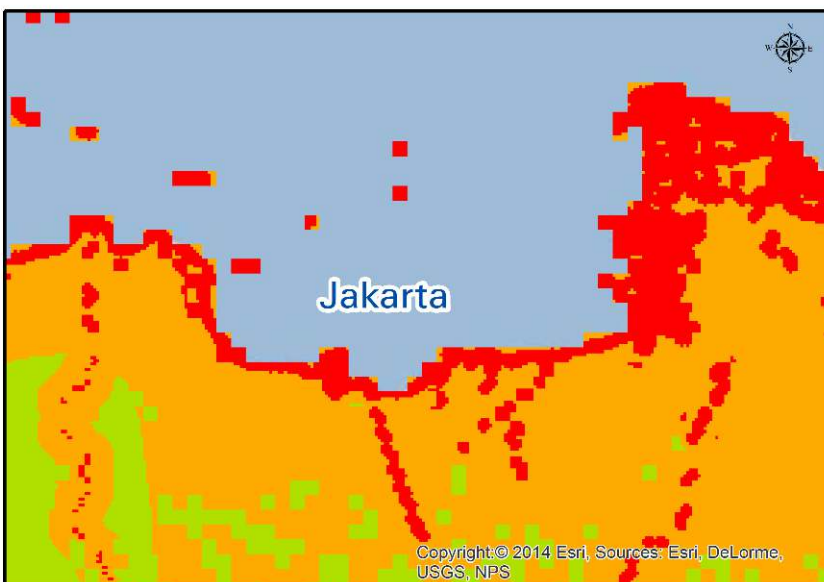
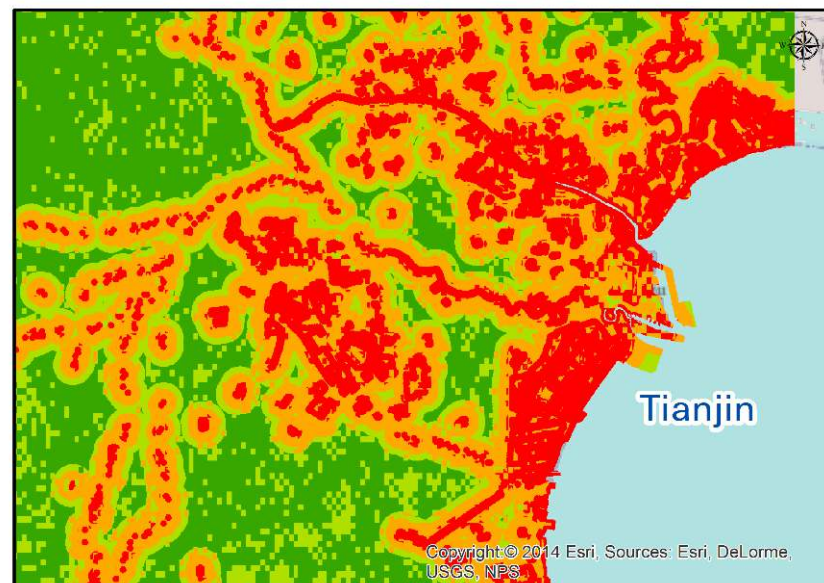
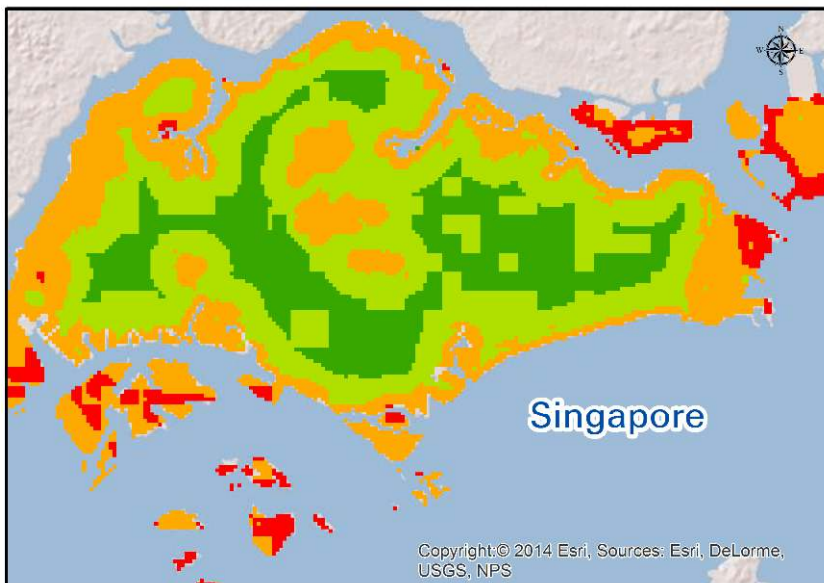
Lesson 1: Maximise learning from the past events

Liquefaction is not a new concept by any means



Key liquefaction events over the last decades

Can other urban centres experience events similar to Christchurch?



Liquefaction potential ■ High ■ Medium ■ Low ■ Nil

Source: Swiss Re CatNet®

Lesson 2: Make secondary loss agents as primary part of modelling

Non-modelled perils account for **30%** of claims

eg : Floods following Wind

Fire Following EQ

Severe Convective storms/Hailstorms

Lesson 3: Non-scientific aspects are as important as scientific elements

Understand regional insurance/claims settlement practices and political environment

Government intervention had far-reaching consequences for insurers

Source: Swiss Re expertise publication, Small quakes, big impact: lessons learned from Christchurch

Lesson 4: Understand your exposure

Underwriters, claims personnel, cat analysts, experts and clients must engage in discussions to better understand exposure data and insurance conditions

Potential blind spots in exposure data

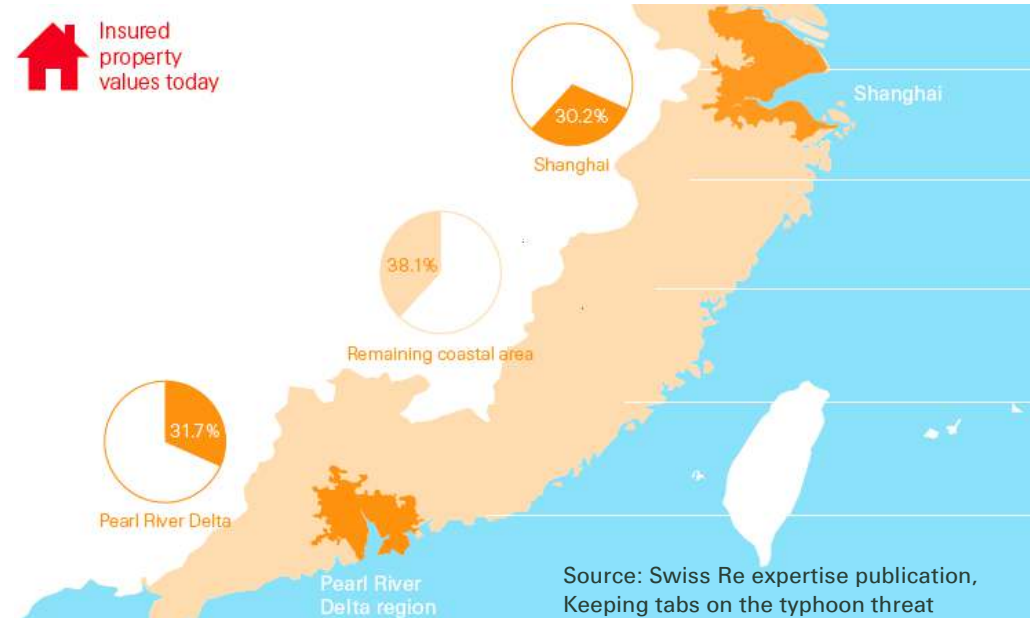
- Foreign exposure data (termed as incidental exposure)
 - Review exposure in industrial clusters and high hazard zones
- Non-property exposure data
 - Reflect auto physical damage, marine (boats), engineering risks adequately in costing
- Potential missing or unreported data
 - Lead to significant underestimation in potential losses and inadequate Nat Cat insurance cover
- Underinsurance of property and business interruption
 - Models work on full replacement values not on insured limits
- Policy conditions and wording (e.g., event definition)
 - Capture “what is covered and not covered in policies” in the exposure data

Challenges in anticipating losses for high growth regions

Example: Typhoon risk in China

- Concentrated exposure combined with natural variability make losses a matter of hit and miss
- Past experience may not be relevant for rapidly changing regions
- Urban complexity can lead to secondary disasters
- Insured exposure not well understood

What if a cyclone hit today?



Exposure clusters in coastal China

Costing based on past experience only will significantly underestimate extreme losses

Key messages

- Maximize learning from the **past experience**
- Make **secondary loss agents** as primary part of modelling
- **Collaborate** across business functions to understand your exposure
- Past experience is essential but **not sufficient** for Nat Cat costing in high growth markets
- **Critically analyse** to see beyond standard model outcomes

What will be the next surprise?





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