



Swiss Re



*Natural Catastrophes - Lessons for the Indian Market from 2011 Global Experience*

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*Meeting the Challenges of Change*

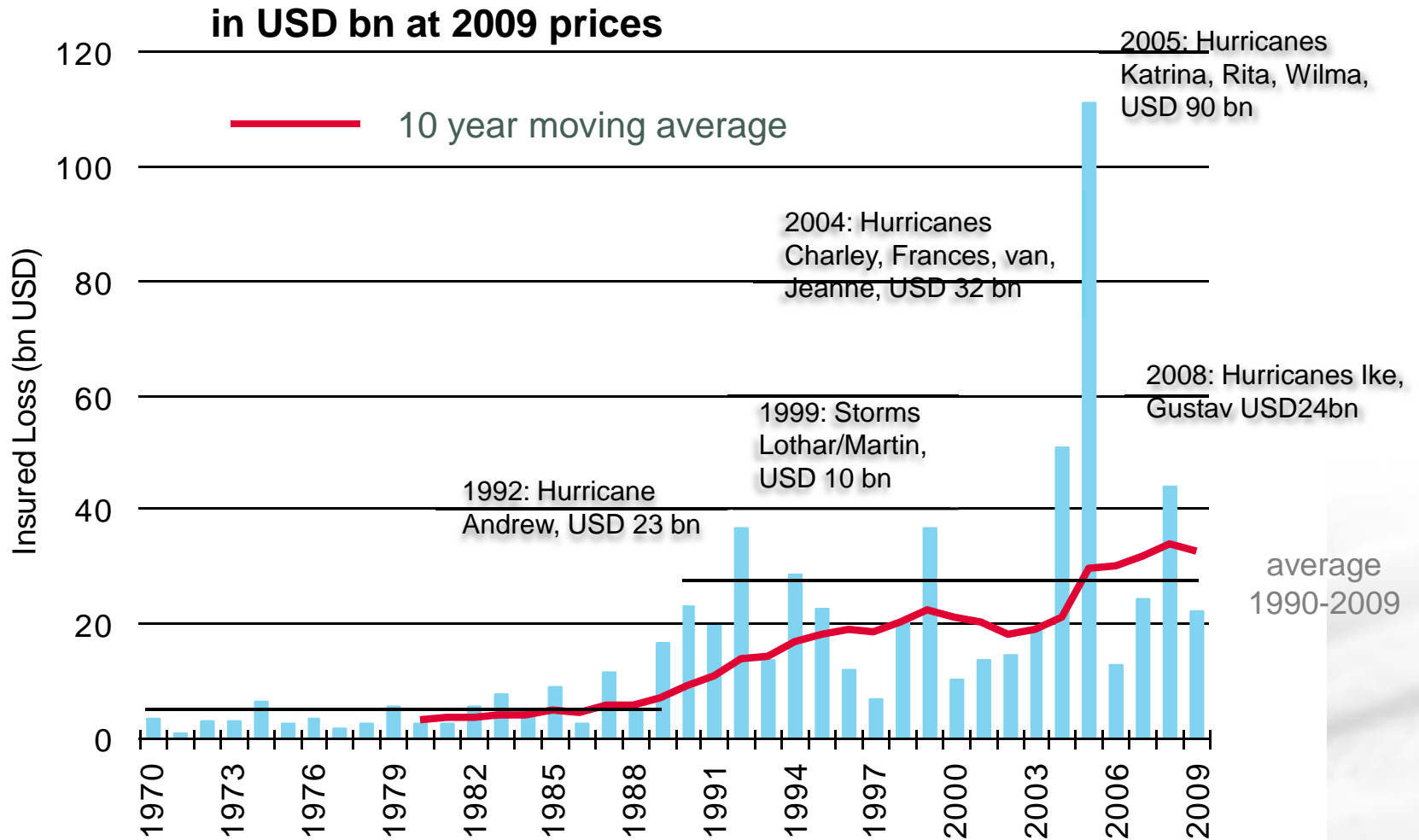
*14<sup>th</sup> Global Conference of Actuaries*

19<sup>th</sup> – 21<sup>st</sup> Feb, 2012 | Mumbai, India

# Agenda

- Losses: On the rise
- Major events
  - Earthquakes
  - Floods
- Lessons learned

# Insured Nat Cat losses

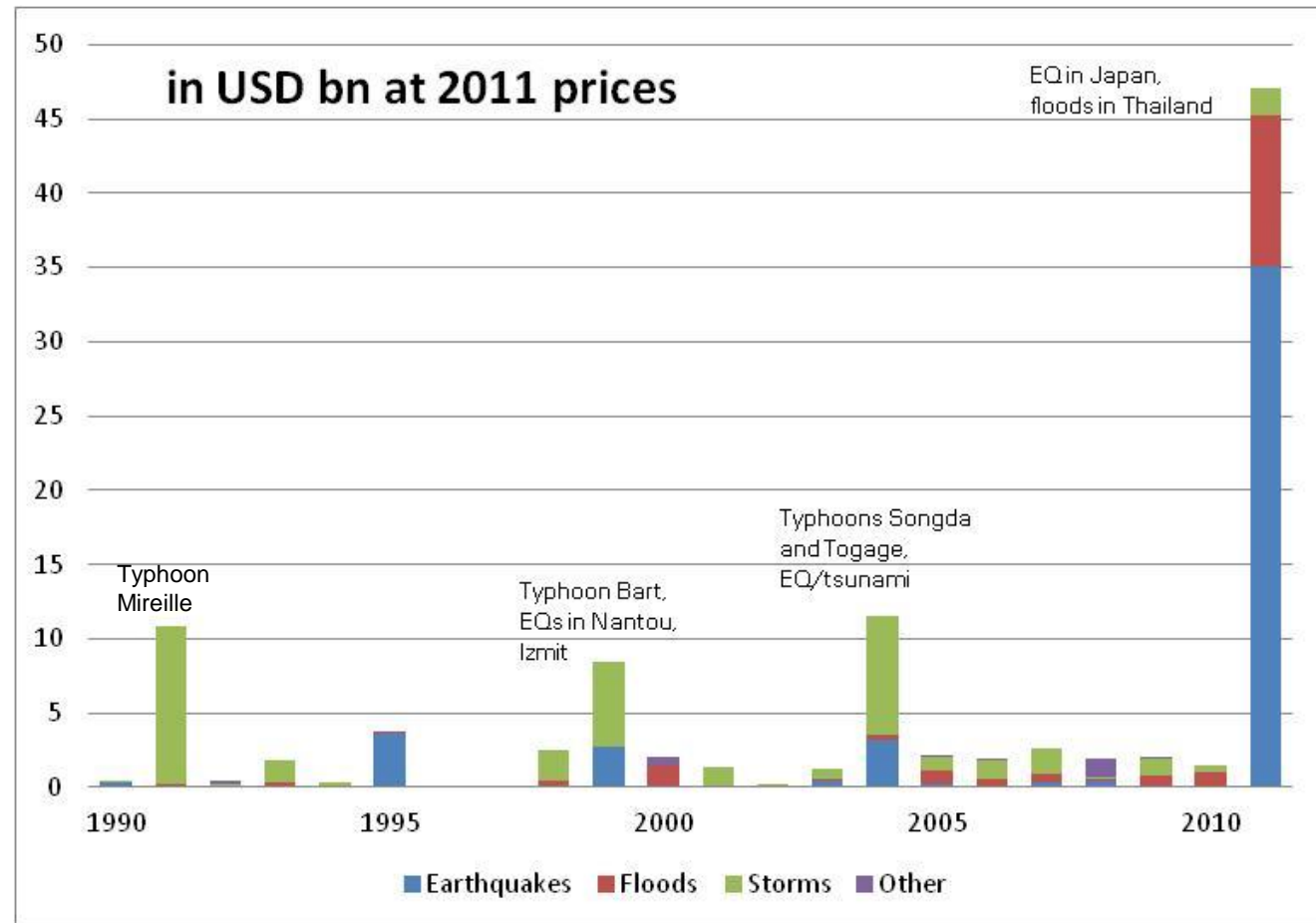


Source: Swiss Re's Sigma

# Insured losses in Asia

## Variety of factors

- Increasing values
- Concentration in exposed areas
- Insurance penetration
- Climate change
- Rise in sea level
- **Rapid development**



Source: Swiss Re's Sigma (preliminary estimates)

*Losses increase as Asia develops*

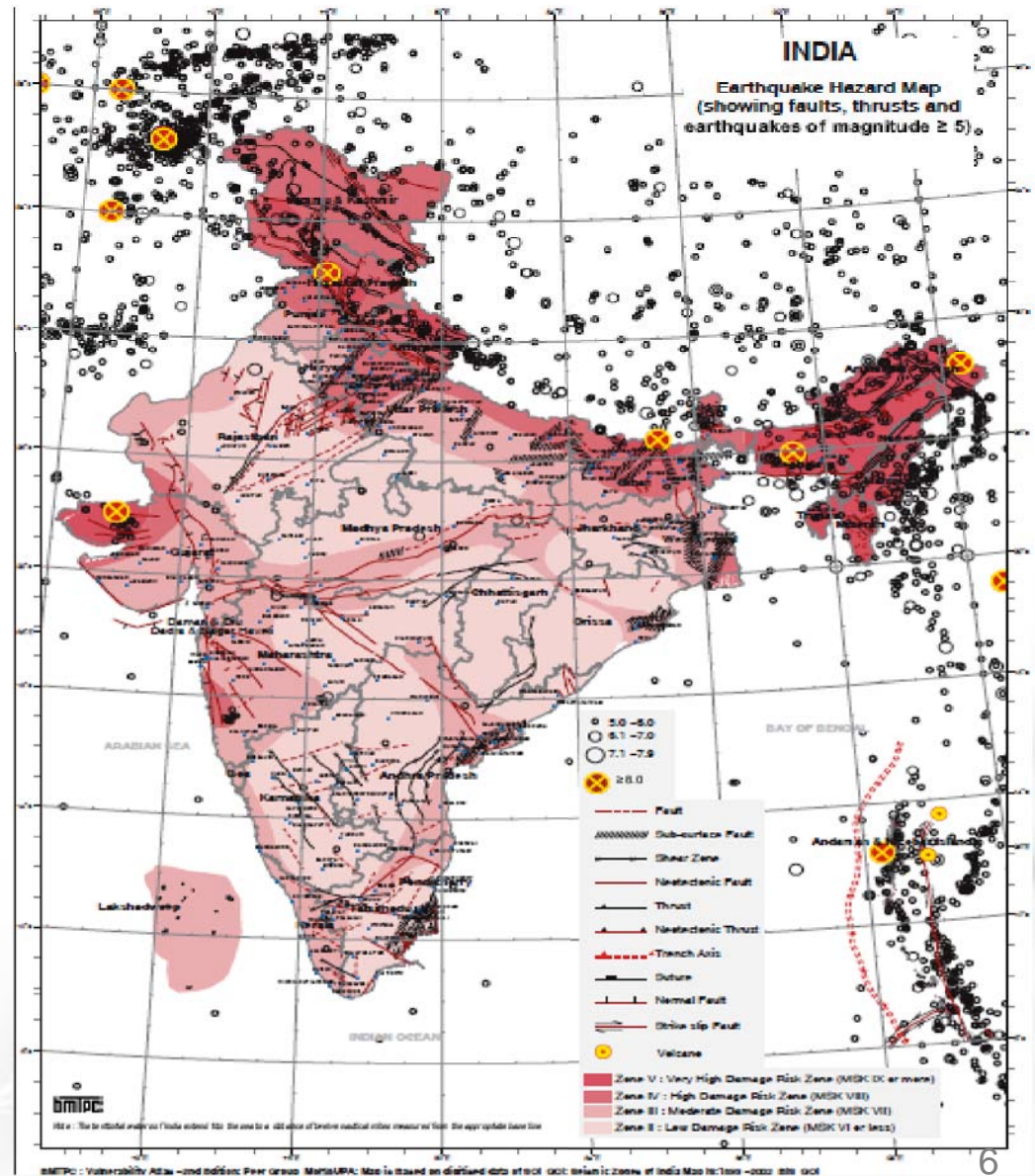
# *Earthquakes*



# India: EQ hazard map

- 59% of land vulnerable to Earthquakes
- 10.9% land is liable to severe earthquakes (intensity MSK IX or more)
- 17.3% land is liable to major earthquakes (Latur/Uttarkashi)
- 30.4% land is liable to (Jabalpur)

Source: Vulnerability Atlas of India (BMTPC)



# India: EQ events

Event	Economic Loss (in million USD)	Insured Loss (in million USD)	Magnitude	Intensity
Bhuj, 2001	5,693	126.5	7.6	IX
Uttarkashi, 1991	99	0.11	6.1	VIII
Latur, 1993	434	0.35	6.4	VIII
Jabalpur, 1997	52	0.72	6.0	VII

Source: Swiss Re's Sigma

# Major earthquake events

		Economic losses	Economic losses as % of GDP	Insured losses	Insurance industry contribution <sup>2</sup>	
→	11.03.2011	Japan	up to 300	up to 5.4%	35	up to 17%
	27.02.2010	Chile	30	18.6%	8	27%
→	22.02.2011	NZ	15	10%	12	80%
	12.01.2010	Haiti	8	121%	0.1	1%
	04.09.2010	NZ	6	5.3%	5	81%
	06.04.2009	Italy	4	0.2%	0.5	14%
	23.10.2011	Turkey	0.75	0.10%	0.03	4%
	04.04.2010	Mexico	0.95	0.09%	0.2	21%

Source: Swiss Re's Sigma

USD billion (at 2011 prices)



# Closer look

Christchurch, NZ  
February 22, 2011

Tohoku, JP  
March 11, 2011

Magnitude

6.3

9.0

Shaking Duration

a few seconds

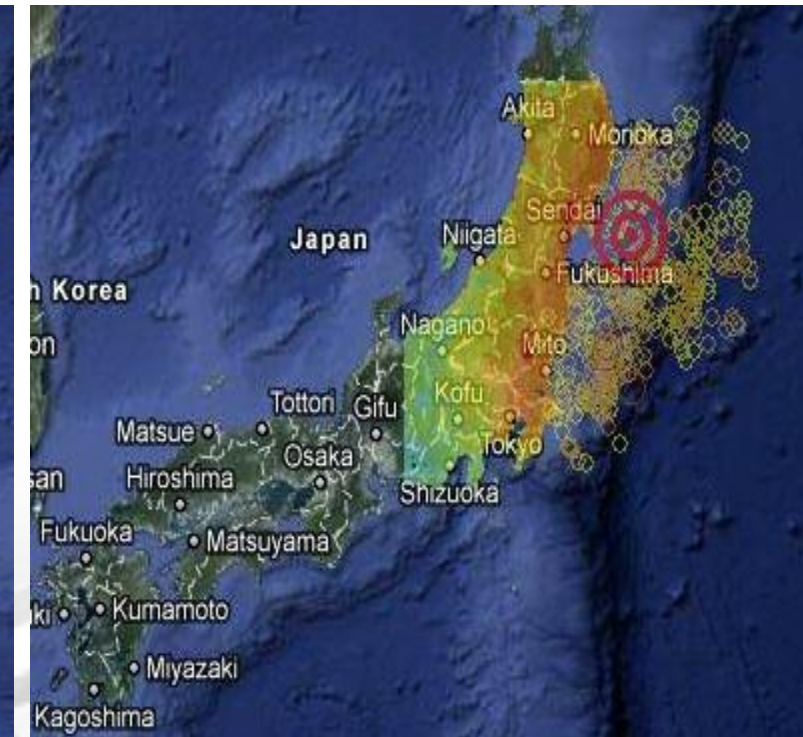
~ 180 seconds

Secondary loss agents

Liquefaction

Tsunami

- Seismicity (well) understood
- Developed Markets
- Catastrophe models exist



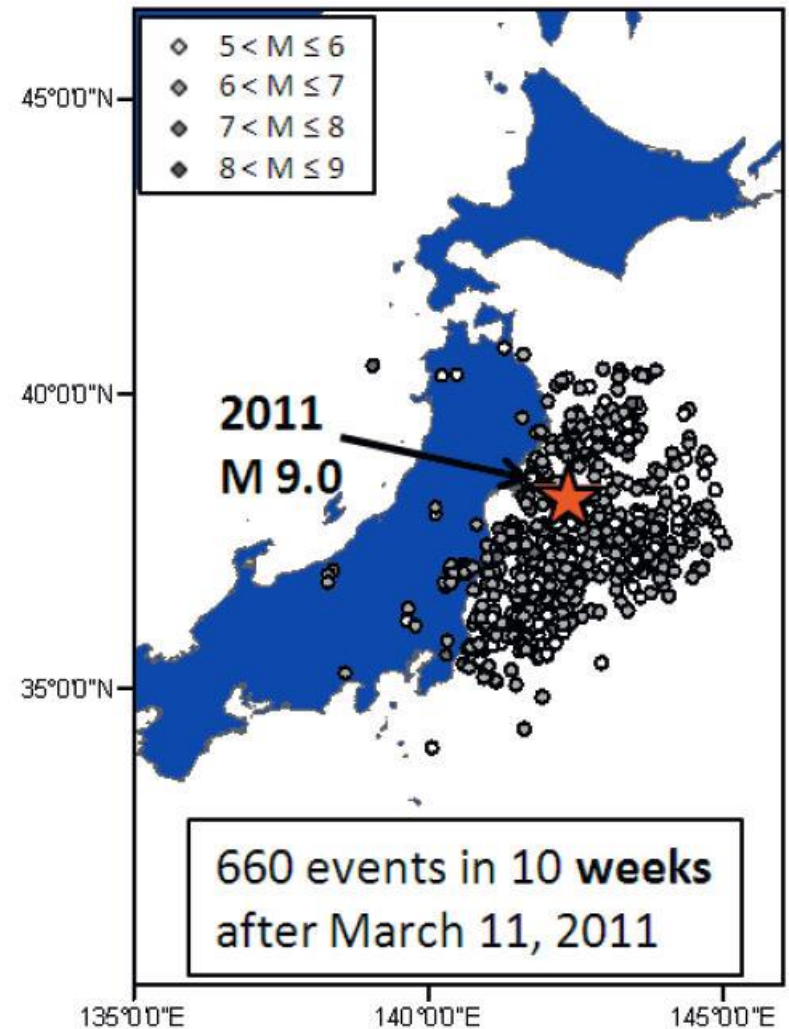
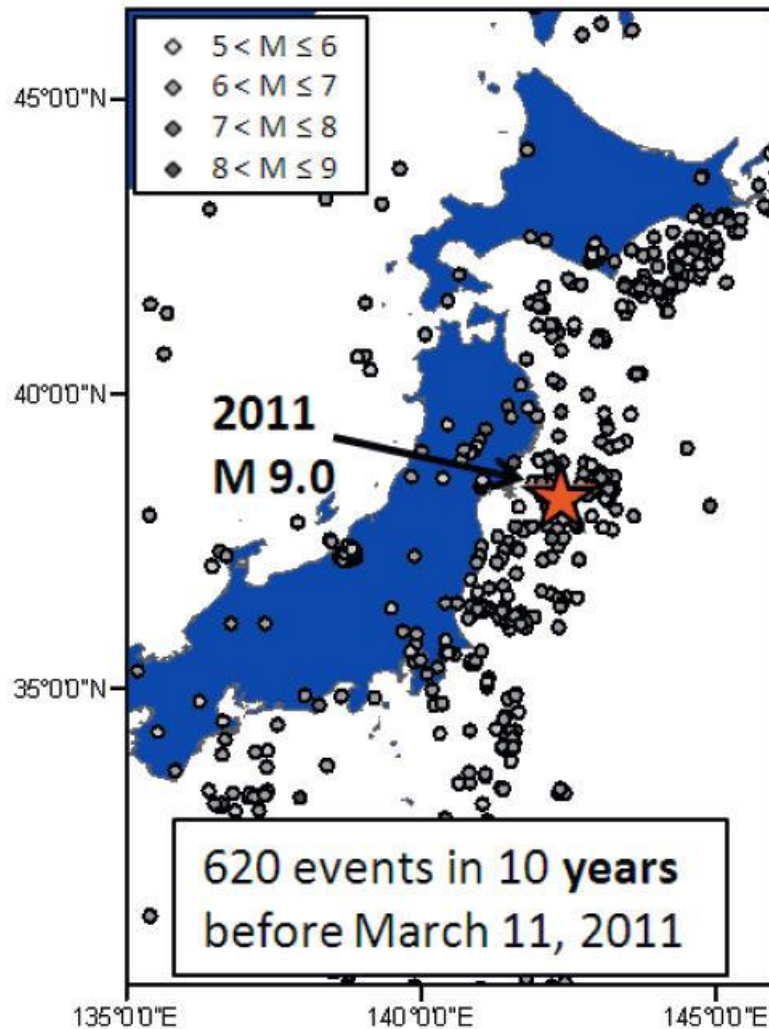
Source: Swiss Re's GeoPortal / CatNet for Clients  
[http://www.swissre.com/clients/client\\_tools/about\\_catnet.html](http://www.swissre.com/clients/client_tools/about_catnet.html)

# Liquefaction



*Picture by Risk Frontiers*

# After shocks



# Lessons learned

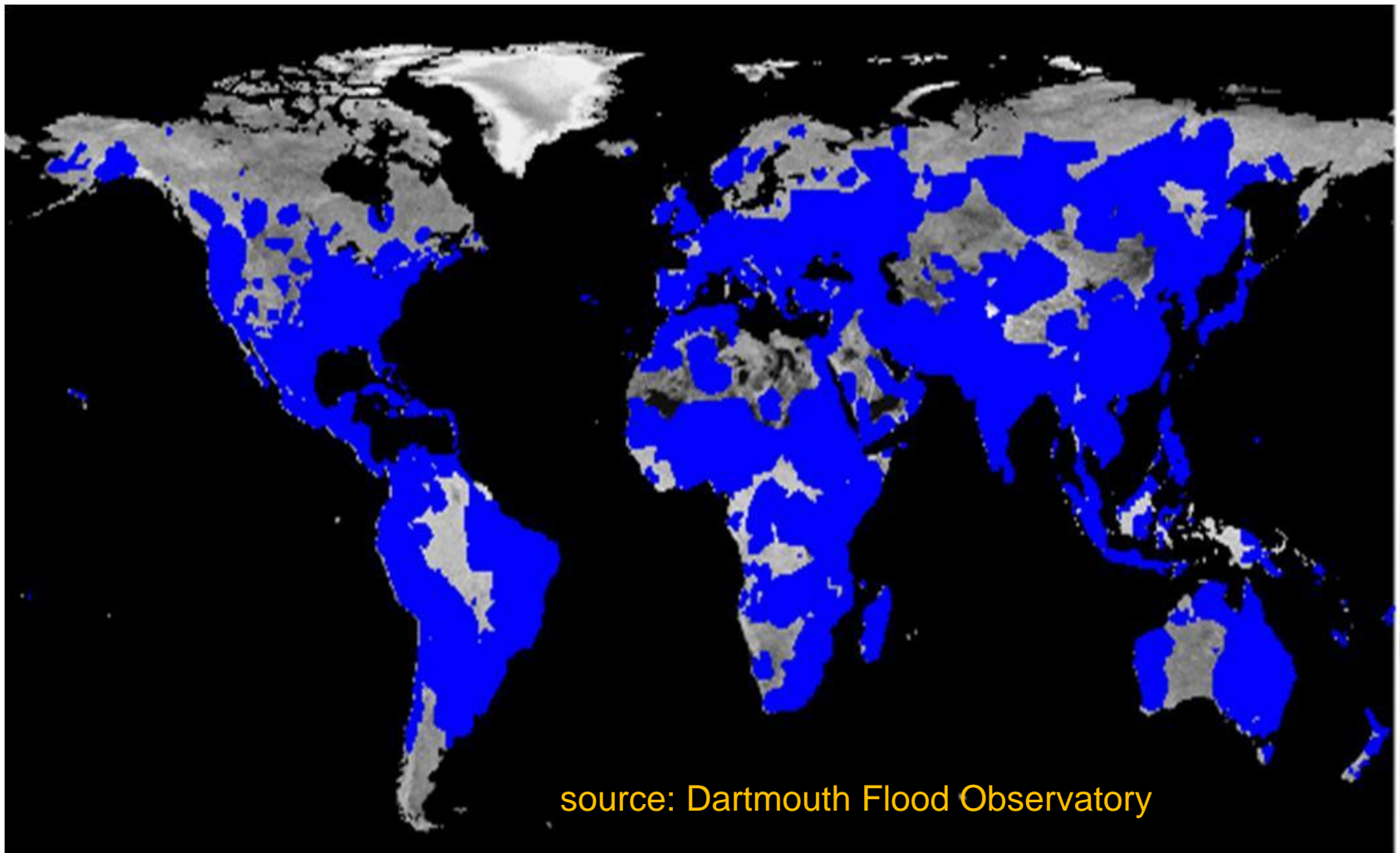
- Earthquake models help underwriters assess EQ risk
- Existing models are good in estimating damage from **ground shaking**
- However, secondary loss agents also matter
  - Tsunami
  - Aftershocks
  - Liquefaction
  - Business Interruption (BI)
  - Contingent BI (CBI)

# Floods



# Floods

River Flood affected regions (1986-2006)



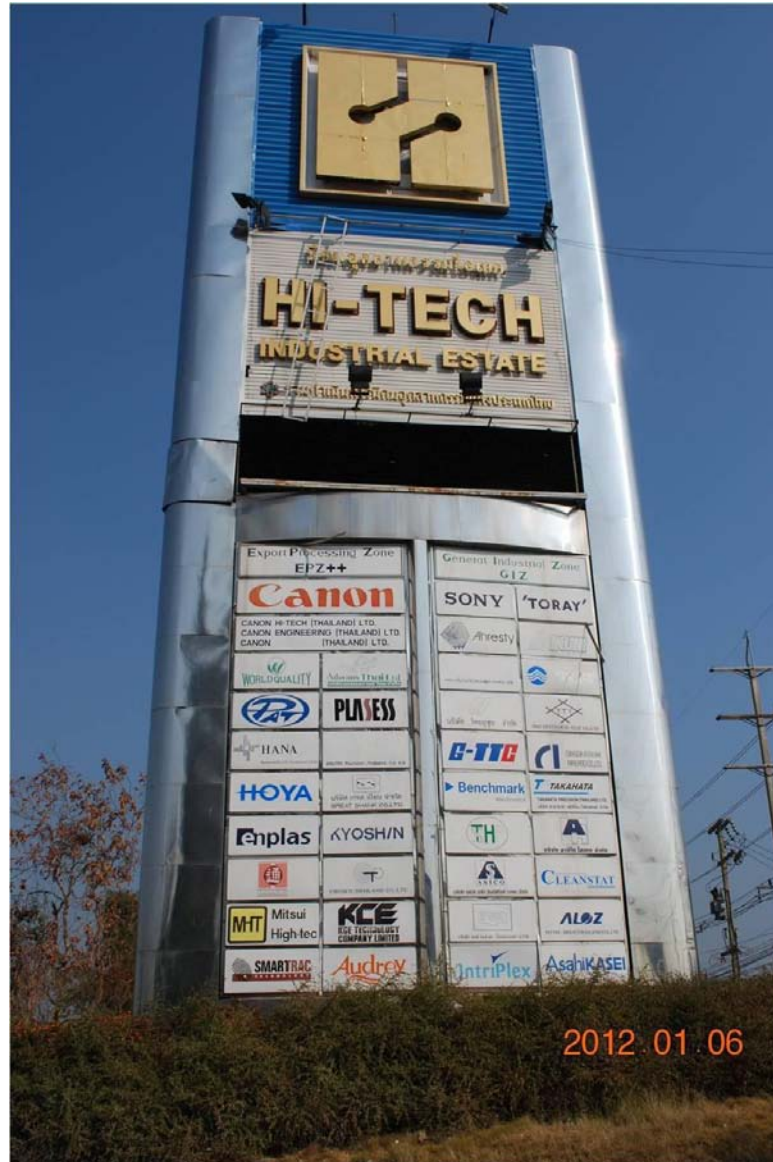
source: Dartmouth Flood Observatory

# Recent flood events

Event	Economic Loss (in billion USD)	Insured Loss (in billion USD)	Reinsured
Queensland, Dec-Feb	5.3	2.1	65%
Brisbane, Feb	6.4	2.3	75%
→ Thailand, Jul-Nov	20+	8 to 11	NA

Source: Swiss Re's Sigma and AON

# Concentration of exposure

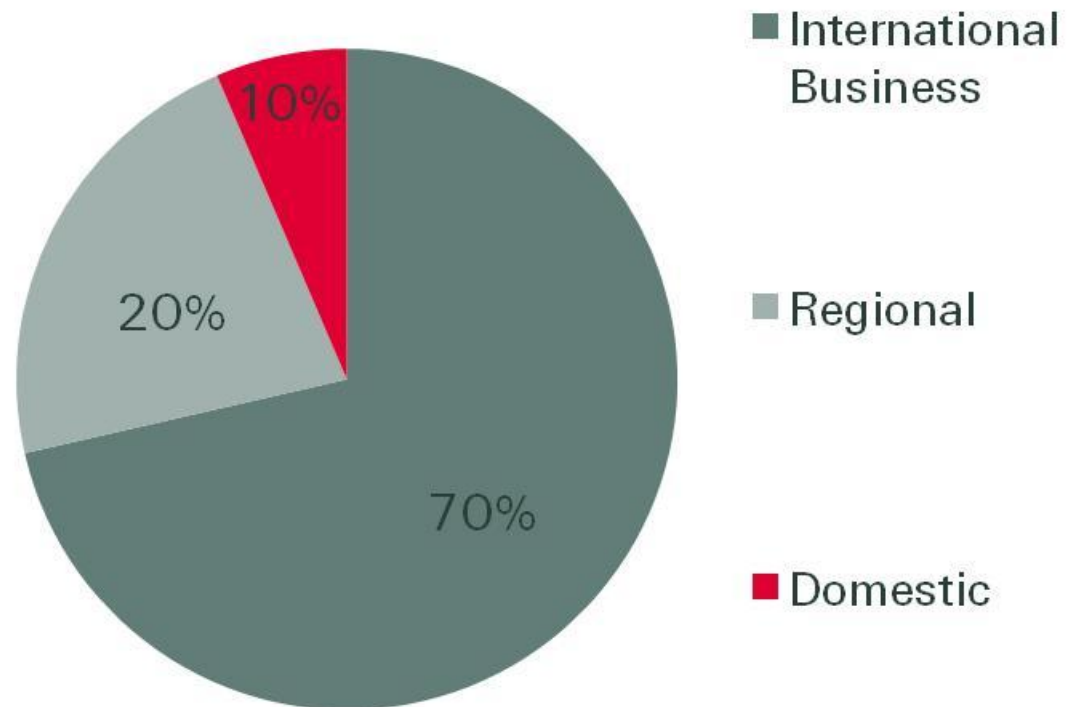




# BI and CBI



# *Underwritten, where?*



Source: Swiss Re internal estimates

# Lessons learned

- Estimated loss vs. Premium
  - Economic loss: 20+ Bn.
  - Industry loss: 8 -11 Bn.
  - **Property premium (2010): 630 Mn.**
- (Current) conditions doesn't adequately cover for flood risk.
  - Flood premium needs to be risk adequate.
  - Need to reduce the exposure via sub-limits per location and meaningful deductibles.

# Lessons learned

- Large Nat Cat risks (including flood)
  - Should be ceded into **Cat XL** treaty rather than into proportional ones
- Cat XL
  - Covered according to event definition clause
- Data quality
  - Exposure reporting needs to be granular

## *Take away...*

Insurance plays a key role in post-disaster recovery financing.

Good catastrophe models are essential part of Nat Cat property underwriting.

Need to be mindful of secondary loss agents  
**Liquefaction, BI, CBI, Tsunami, Aftershocks**

A competitive and affordable insurance market can lower economic vulnerability to natural catastrophes

Swiss Re



Thank you for your kind  
attention and happy to take  
questions

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