




7TH AUSTRALIA - NEW ZEALAND CLIMATE CHANGE & BUSINESS CONFERENCE


QUANTIFYING THE IMPACTS OF CLIMATE RELATED NATURAL DISASTERS IN AUSTRALIA & NEW ZEALAND

Martin Kreft

Munich RE 

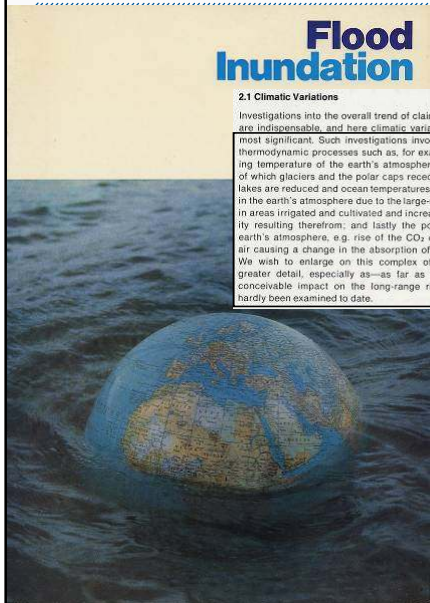
Who is Munich RE? 

- Insurer of Insurances
- Founded 1880
- The world's largest re-insurer
- Premium income ca. € 22 bn
- Leading role in insurance of natural catastrophes



Geo Risks Research of Munich Re –
Analyses of natural disasters since 1974 (staff today 30)
Core business of insurance industry is quantification of risks!

Insurance Industry, one of the First to Alert of Global Warming



Flood Inundation

2.1 Climatic Variations

Investigations into the overall trend of claims experience are indispensable, and here climatic variations become most significant. Such investigations involve a study of thermodynamic processes such as, for example, the rising temperature of the earth's atmosphere (as a result of which glaciers and the polar caps recede, surfaces of lakes are reduced and ocean temperatures rise); changes in the earth's atmosphere due to the large-scale increase in areas irrigated and cultivated and increases in humidity resulting therefrom; and lastly the pollution of the earth's atmosphere, e.g. rise of the CO₂ content of the air causing a change in the absorption of solar energy. We wish to enlarge on this complex of problems in greater detail, especially as—as far as we know—its conceivable impact on the long-range risk trend has hardly been examined to date.

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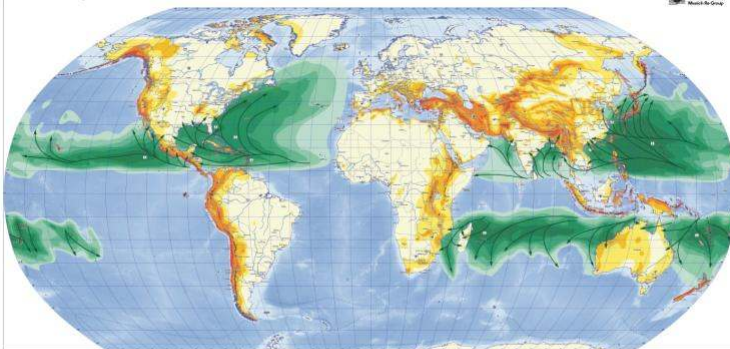
MR-Publication
Flood / Inundation (August 1973)

© January 2007, Münchener Rückversicherungs-Gesellschaft, Geo Risks Research

Globe of Natural Hazards 2009 – Products Wall map/Folding map





World Map of Natural Hazards




Natural hazards:
MR has shared its knowledge for 30 years

Globe of Natural Hazards 2009 – Products
 Globe of Natural Hazards DVD


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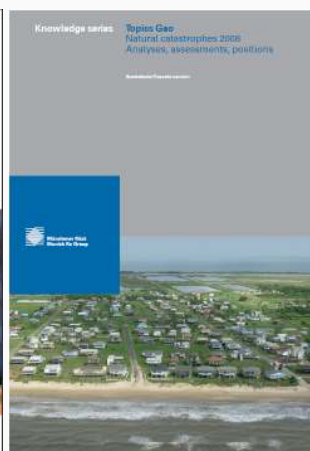
CD-ROM: 80,000 copies distributed in market – MR publication record

Topics Geo Natural catastrophes
 – Analyses, assessments, positions

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Topics Geo presents the results of our annual worldwide survey of natural catastrophes, plus practice-oriented analyses and evaluations. Topics Geo has been published for the past 15 years.

NatCatSERVICE

One of the world's most comprehensive database on natural catastrophes



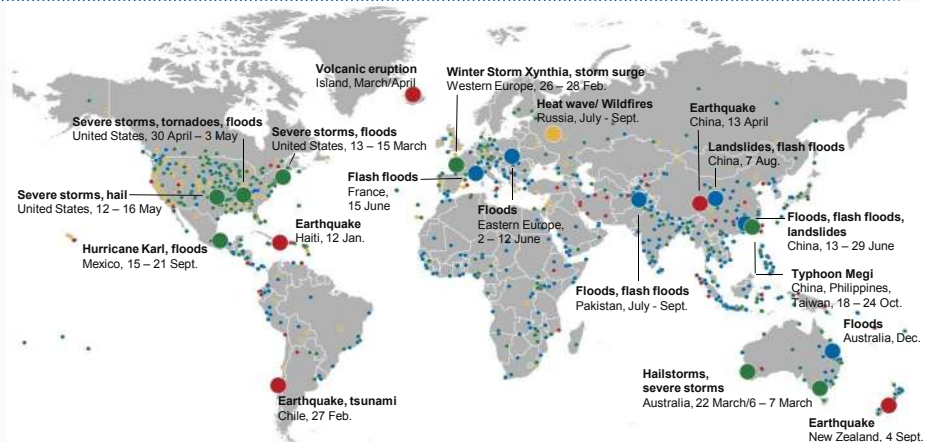
- from 1980 until today all loss events
- retrospectively, all "great" natural catastrophes since 1950
- all major events starting from 79 AD – eruption of Mt. Vesuvio (3,000 historical data sets)
- currently more than 27,000 events documented
- The Munich Re NatCatSERVICE records up to 1,000 loss events per year.



NatCatSERVICE

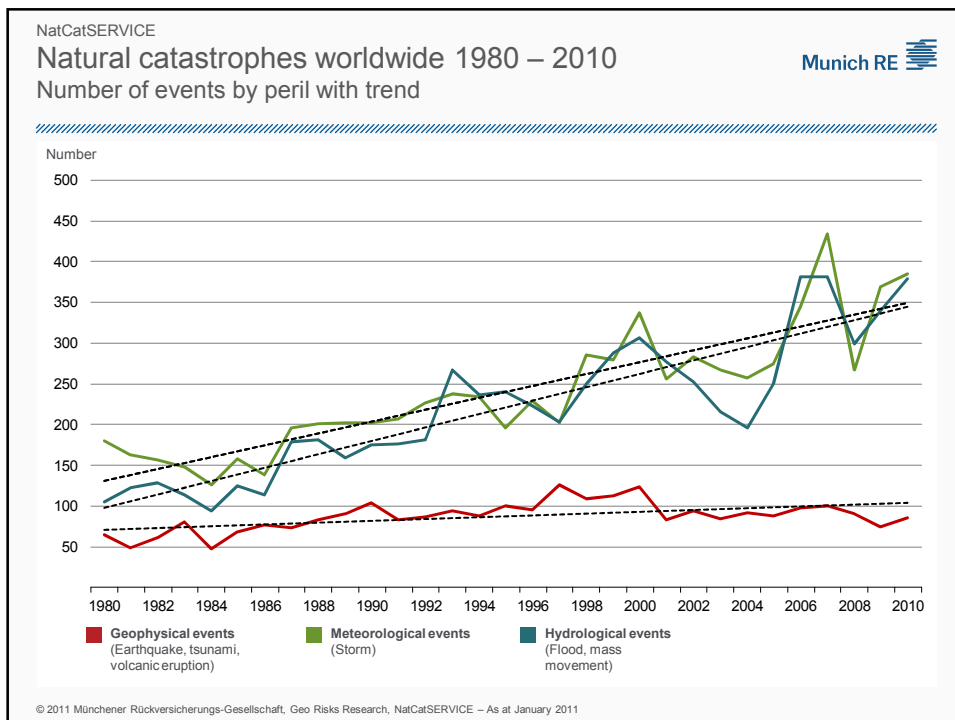
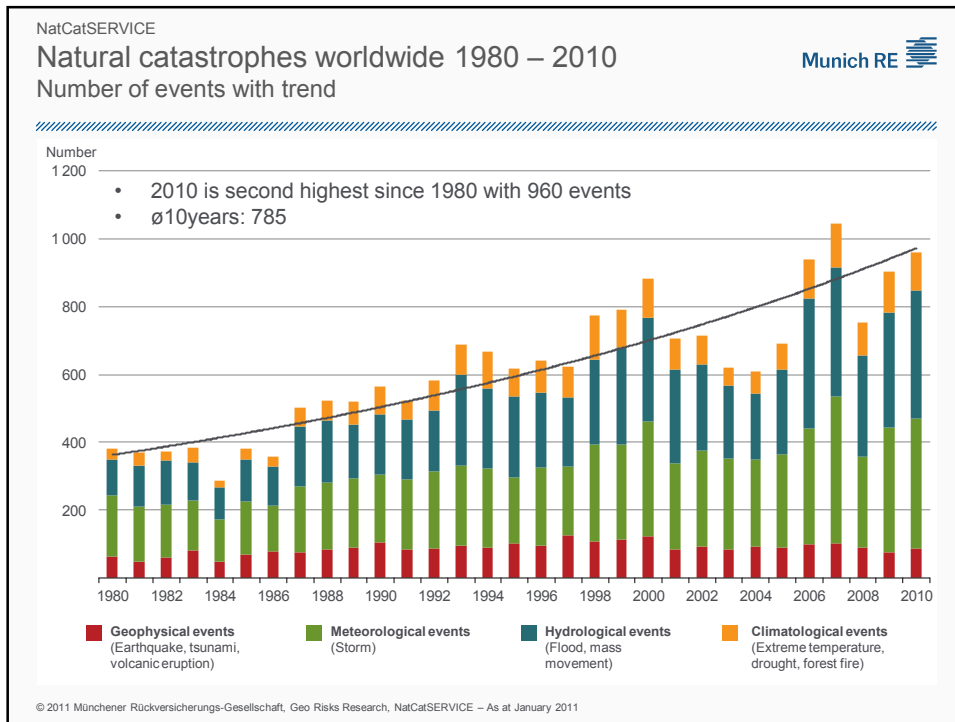
Natural Catastrophes 2010

960 loss events



- Natural catastrophes
- Selection of significant loss events (see table)
- Geophysical events (earthquake, tsunami, volcanic activity)
- Meteorological events (storm)
- Hydrological events (flood, mass movement)
- Climatological events (extreme temperature, drought, wildfire)

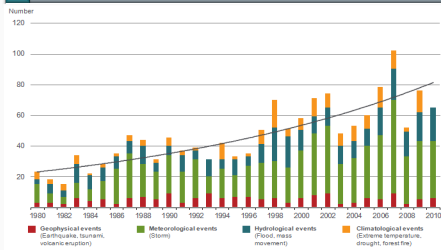
© 2011 Münchener Rückversicherungs-Gesellschaft, Geo Risks Research, NatCatSERVICE – As at January 2011



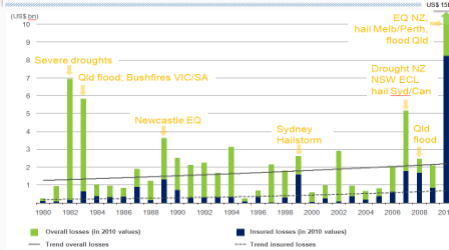
Recent major catastrophes and their effects



Number of events in Oceania



Overall and insured losses in Oceania



Significant trend for weather related perils

Increasing ratio of insured / overall losses

Possible reasons for increasing insured losses

- Rise in population
- Better standard of living
- Increasing insurance density
- Settlement in extremely exposed regions
- Increased vulnerability of modern societies and technologies to natural hazards
- Climate Change

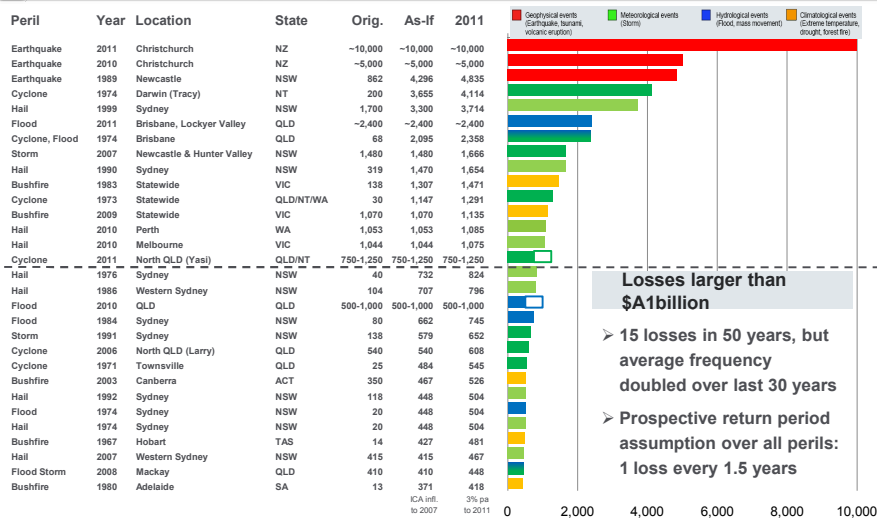
Generally no problem, as premiums should rise proportionally with the risk

A major problem, if models/premiums/risk selection are not adapted to these changes

Recent major catastrophes and their effects



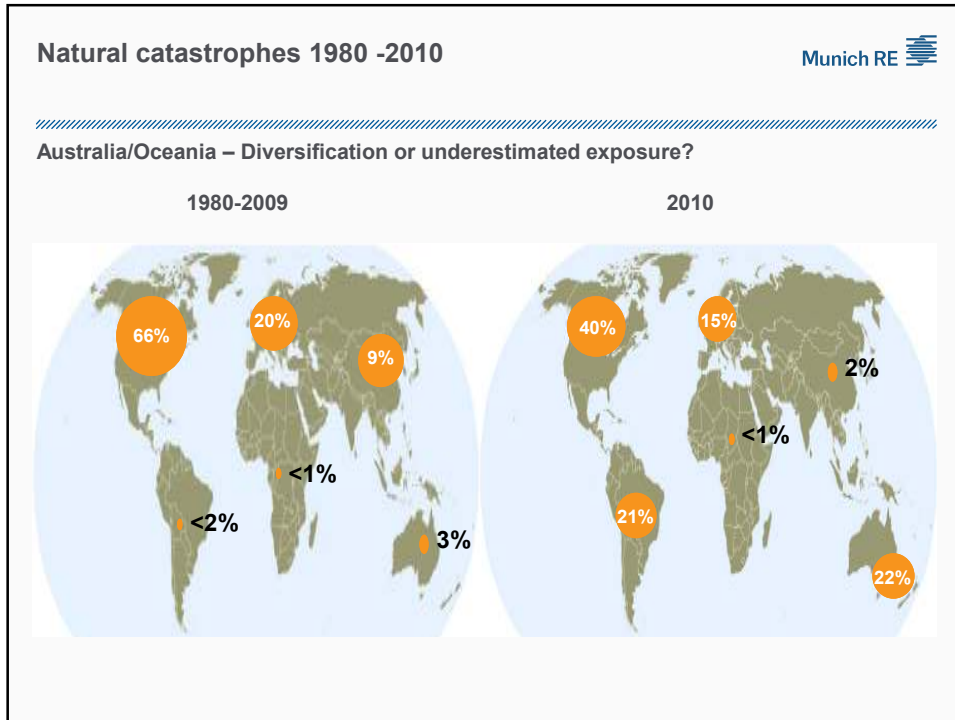
Natural Catastrophes: All losses from 1967 to 03/2011 recorded by ICA/ICNZ




Losses larger than \$A1billion

> 15 losses in 50 years, but average frequency doubled over last 30 years

> Prospective return period assumption over all perils: 1 loss every 1.5 years



Australia 2010 Hailstorms

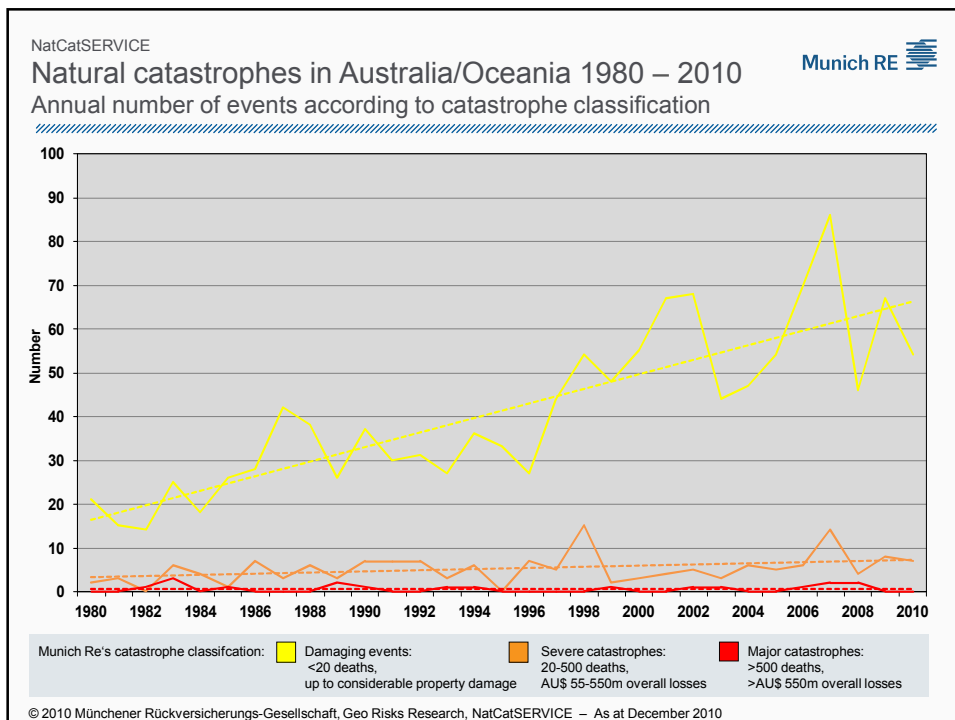
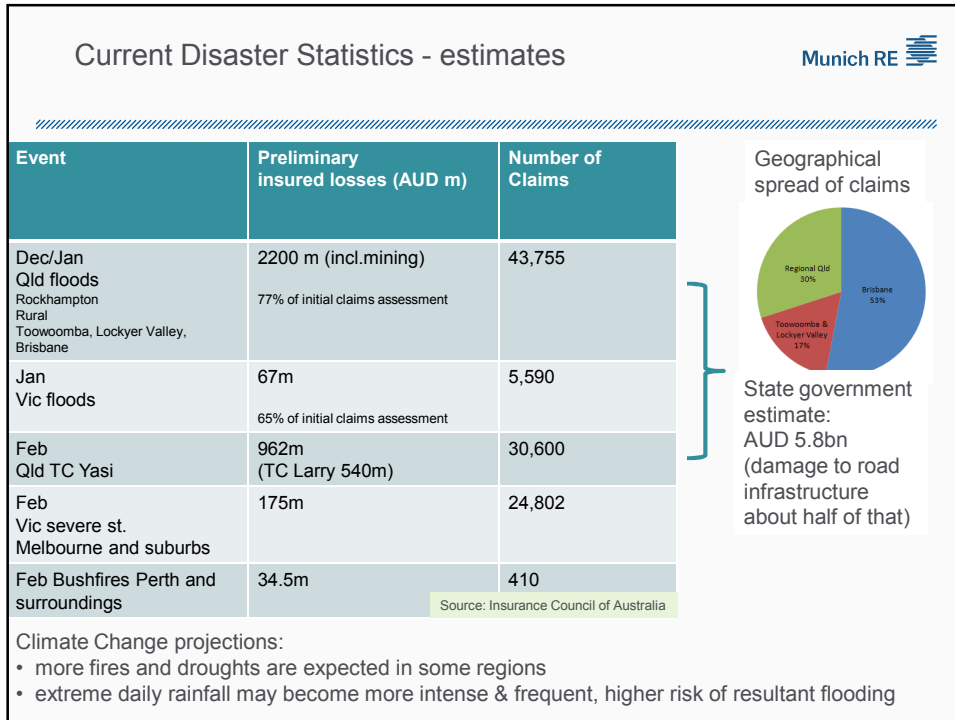
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Melbourne, 6 th March 2010	Perth, 22 nd March 2010
<ul style="list-style-type: none"> ▪ Grapefruit size hail ▪ Wind gusts of more than 100km/h ▪ 45mm of rain in 30min ▪ Over 6000 requests for assistance ▪ AUD 1,044m; 130,000 claims ▪ Com/Motor/Home 10%/45%/45% (MR estimates) 	<ul style="list-style-type: none"> ▪ Tennis ball size hail ▪ Wind gusts of more than 120km/h ▪ 63mm of rain in 2h ▪ Over 3000 requests for assistance ▪ AUD 1,053m; 150,000 claims ▪ Com/Motor/Home 5%/55%/40% (MR estimates)

What do we know about Hail?

- Very few studies globally as to how hail risk will change
- Sydney study: increase in frequency & intensity of hailstorms
- Australian wide study: similar increase in hail frequency along the eastern seaboard
- Little work has been done to quantify the relation of hailstorms and ENSO
- Comprehensive and detailed analysis of past and future hailstorms is crucial in order to improve risk management strategies

With 9 out of the largest 24 losses in Australia, Hail presents the most underestimated peril!



Reasons for globally increasing losses caused by natural disasters



- Rise in population
- Better standard of living
- Increasing insurance density
- Settlement in extremely exposed regions
- Increased vulnerability of modern societies and technologies to natural hazards
- **Change in environmental conditions - Climate Change**

In general no problem for insurance as premiums should rise proportionally with risk!

Problem for insurance, if risk models are not adapted to the changes!



Example of population change & settlement in extremely exposed regions: South East Queensland (SEQ)



- SEQ: Brisbane, Gold and Sunshine Coast
- > 2.7m residents, 66% of states population
- Strongest population growth in Qld (71% within the last 5 years!)
- Australia's highest exposed values concerning TC's, highest loss potential.

Sunshine Coast



Subject: Point Cartwright, 1965
Source: © Sunshine Coast Regional Council / Bill O'Keamey



Subject: Point Cartwright, 2007
Source: © Above Photography

1961 population 33,500

2006 > 295,000

Gold Coast – Surfers Paradise



Subject: Surfers Paradise, 1959
Source: © Newsprint / Norm Lye



Subject: Surfers Paradise, circa 1990s
Source: © Graham Weeks

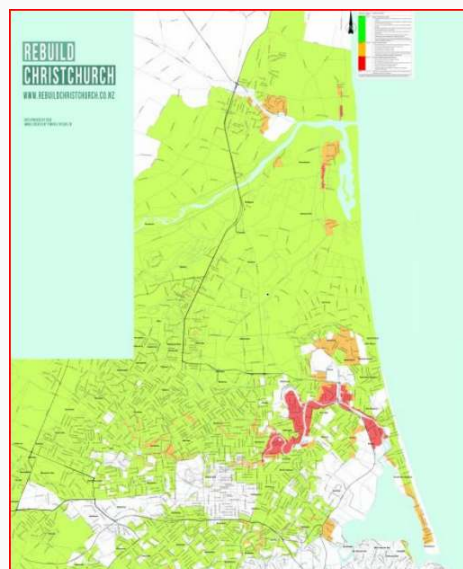
1961 population 33,700

2006 > 507,500

Should this worry us?



NZ's Climate change example??
Not rising sea level – falling land level.

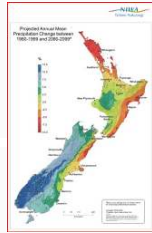


The impact of changing hazards on risk modelling

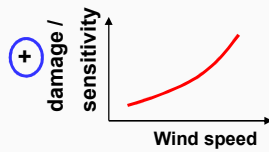


From hazard to risk: Principle of NatCat modelling, Tropical Cyclones

Hazard: historical events, probabilistic event set



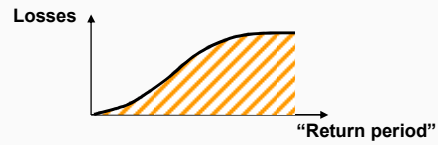
Vulnerability function



Individual portfolio/liability data



Risk curve



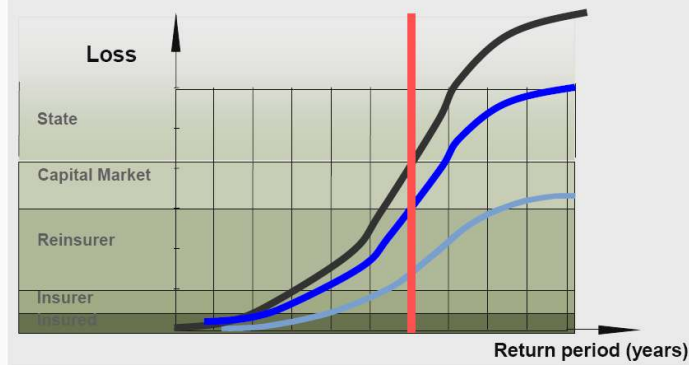
How does it all fit together?



How much risk do you **want to assume**?

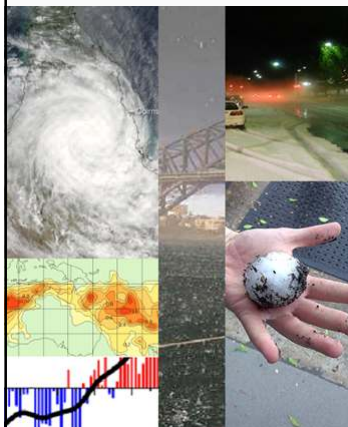
Do you **know how much** you assume?

Do you **control** the risk you (want to) take?



Where to from here ... the insurance sector's role in partnership with society

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- Provision of data on weather-related losses to science, political decision makers and the public
- Transparency of risks via risk measurement & risk adequate premiums
 - sound actions, prevention, reduced loss loads for society
- Products promoting society's emissions reduction goals (mitigation)
- Products enhancing society's hazard-adaptive capability (adaptation)

Conclusions

Natural catastrophes and insured losses rising – but definitely an insurable risk!

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- Natural catastrophes, especially weather related events, are increasing dramatically in number and magnitude, both globally and in Australasia.
- There is more and more scientific evidence for causal links between global warming and increasing frequencies and intensities of natural catastrophes.
- For Australia/Oceania the Southern Oscillation Index shows a correlation with loss frequency and severity.
- We have to mitigate global warming and adapt to the changing risks in respect to the regionally specific risk patterns.
- Mitigation and adaptation measures open up great economic chances for companies and countries being on the forefront in these processes.
- Natural catastrophes are still insurable. However we have to adapt our risk assessment, our modeling, our rates, our risk selection and accumulation control continuously.



Thank you for your attention

