Financial Risks of Climate Change

Dr Sebastian Catovsky
Policy Adviser, Natural Perils

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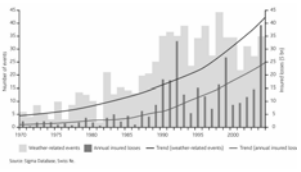
Role of Insurance in Weather Protection

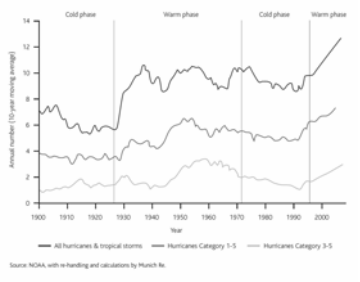
- Spreading risk
- Protection for occasional, unexpected weather
- Risk needs to be managed
- Costs borne by society
  - Insured
  - Tax-payer
  - Individual

Changing costs of extreme weather

- Costs doubling each decade
- Since 1990, $16 bn each year on average
- 2004 was costliest year on record: $40 bn
- UK Floods: Boscastle, Carlisle, North Yorkshire
- 2005 Scandinavia Storm

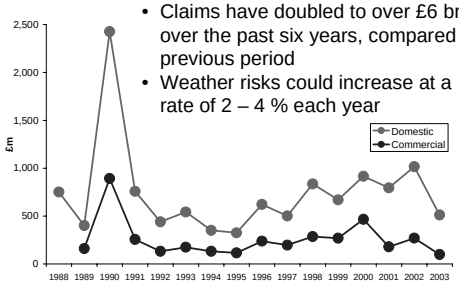


Changing patterns of hurricanes

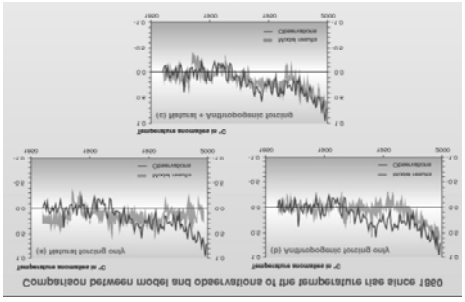


UK Weather Damage Claims

- Claims have doubled to over £6 bn over the past six years, compared to previous period
- Weather risks could increase at a rate of 2 – 4 % each year

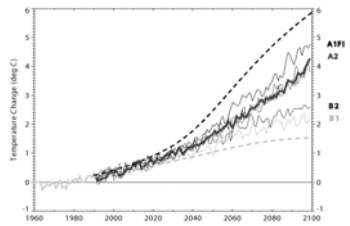


What is driving these changes?

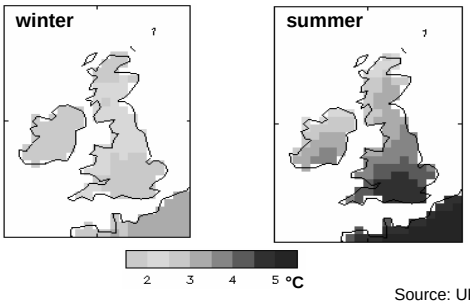


Source: IPCC

IPCC Global Temperature Scenarios



TEMPERATURE RISE by 2080s

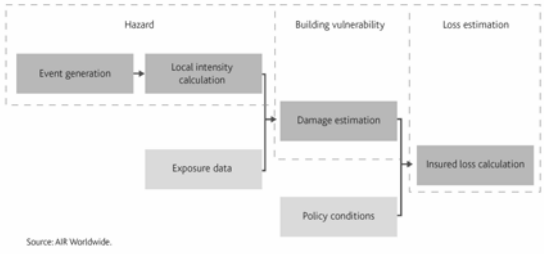


Source: UKCIP

Climate change and extreme storms

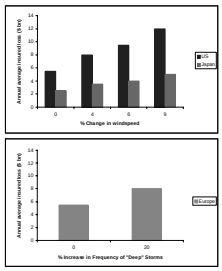
Weather Feature	Region	Stress-test*	Key References
Hurricane	US	Increased average wind-speed by 6%, with sensitivity tests for +4 to +9%	Third Assessment Report, Intergovernmental Panel on Climate Change, 2001, http://www.ipcc.ch Knutson and Tuleya (2004) Journal of Climate, 17(18): 3477–3495.
Typhoon	Japan	Increased average wind-speed by 6%, with sensitivity tests for +4 to +9%	
Windstorm	Europe	Increased frequency of storms that occur once every 20 years (or less) by 20%	Leckebusch and Ulbrich (2004) submitted to Global and Planetary Change. Kuzmina and others (2005) submitted to Geophysical Research Letters.

AIR Catastrophe Model



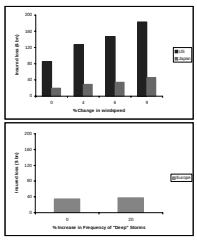
Changes in annual storm losses

- Doubling CO_2 could lead to increase in losses by two-thirds
- Insured: $16 bn each year on average
- Total: $27 bn each year on average



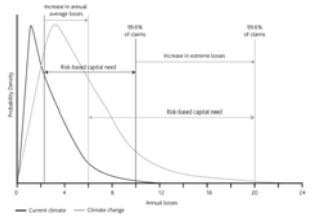
Changes in extreme storm losses (1-in-250 yr)

- Hurricanes could rise by three-quarters to $100 – 150 bn
- Typhoons could rise by two-thirds to $25 – 34 bn

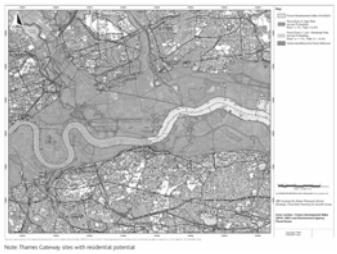


Implications for global capital markets

Capital required could rise by two-thirds to $200 bn, increasing costs of capital

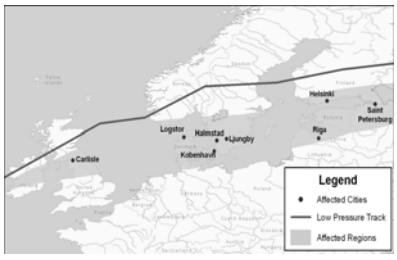


Limitations of simulations: 1. Socio-economic factors



Source: ABI Report "Making Communities Sustainable"

Limitations of simulations: 2. Storm characteristics



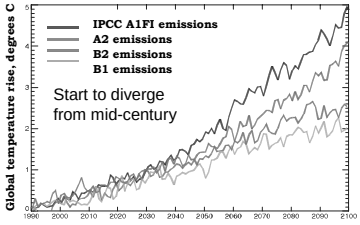
Source: Länsförsäkringar

European Flood Risk

Annual costs could rise to €100 – 120 bn

Tackling Climate Change

Mitigation – avoiding worst impacts
Adaptation – some climate change inevitable



Managing climate risks: 1. Emissions

(b) Japanese typhoon

Emission Scenario	Annual average insured loss	Annual average total loss	Insured loss with chance of occurring once every 100 years	Insured loss with chance of occurring once every 250 years
High	$3.0 bn	$1.5 bn	$11 bn	$16 bn
	Loss reduction relative to high emissions			
Medium-High	20%	20%	20%	20%
Medium-Low	70%	70%	70%	70%
Low	85%	85%	80%	85%

Managing climate risks: 2. Vulnerability

Insurance as a messenger of change

Source: Munich Re