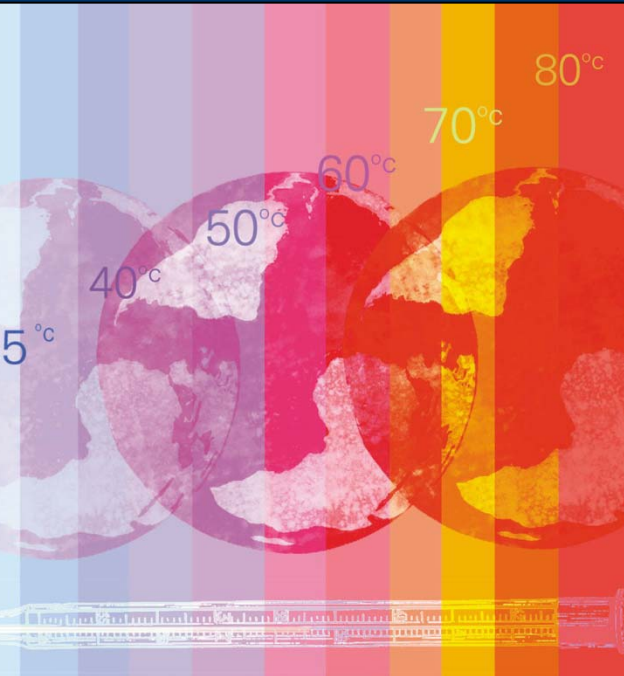


MARSH



Climate Change Adaptation: State of the Insurance Industry

Climate 2050

Gary S. Guzy

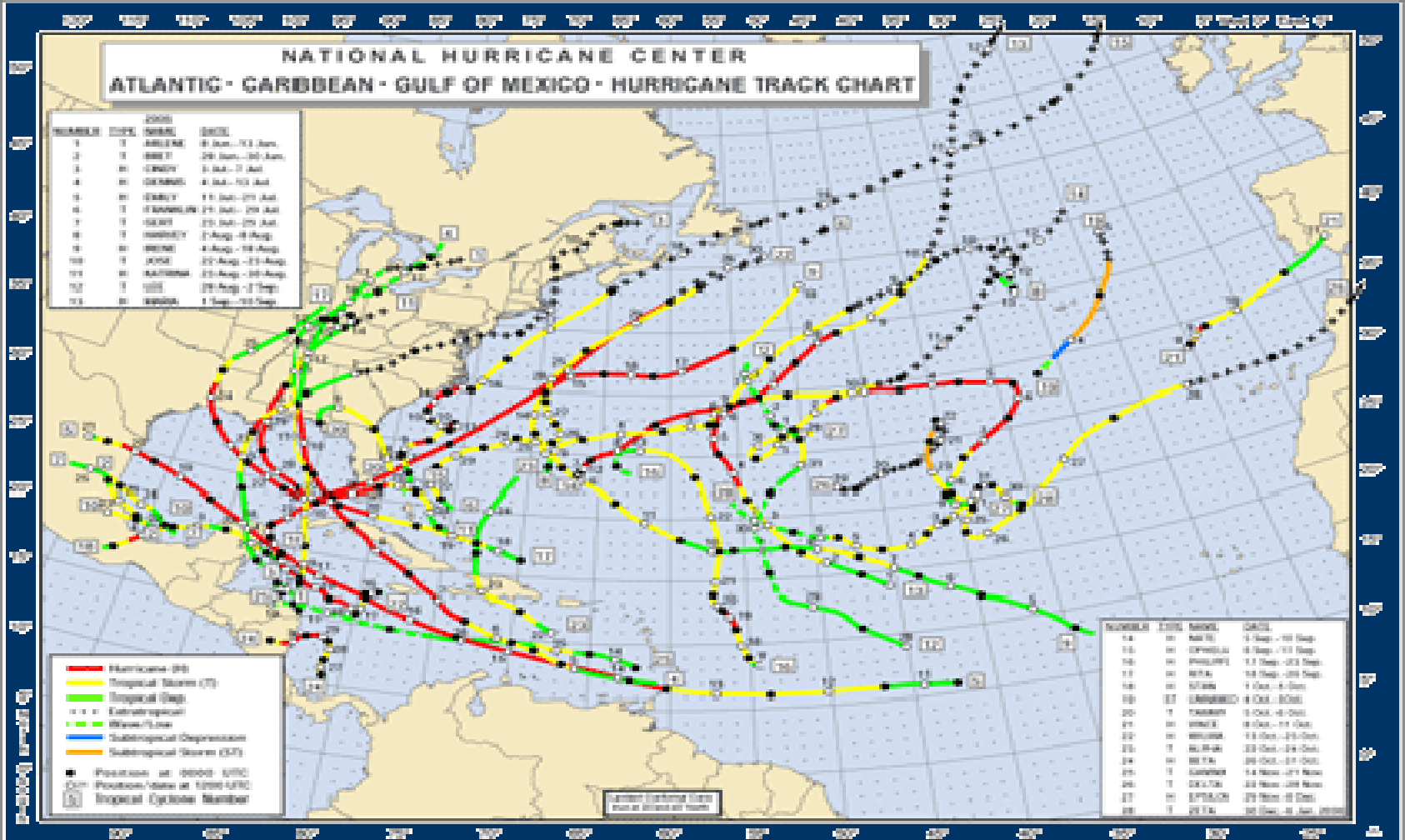
Climate Risk and Sustainability Global Practice Leader

26 October 2007



Marsh & McLennan Companies

What Are the Insurance Consequences of Climate Risk Today?



What are the Insurance Consequences of Climate Risk Today?

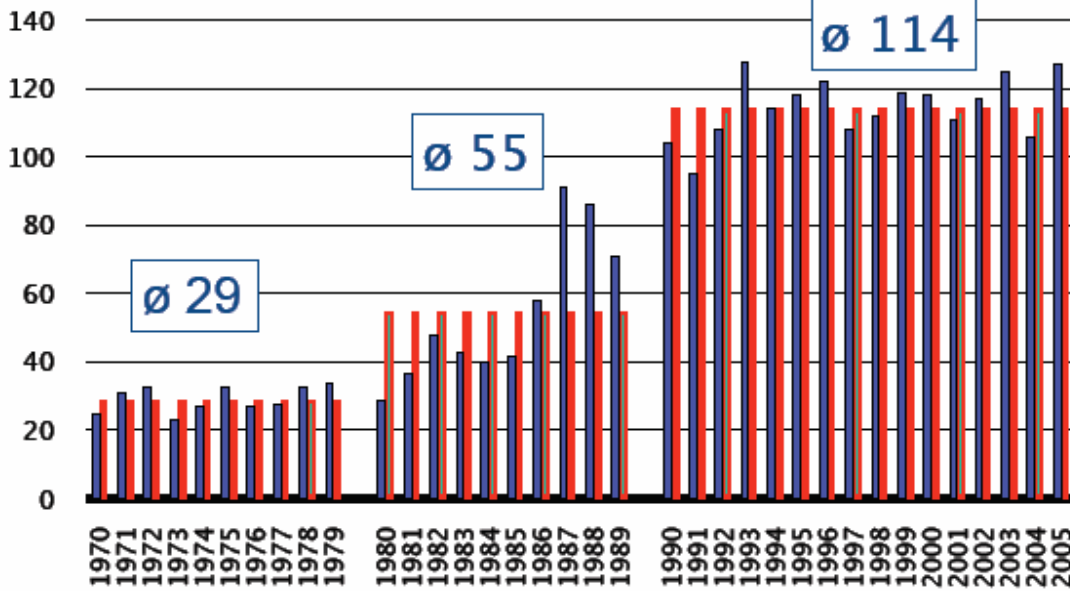


Severe weather events increased from 1970 - 2005



COMMITTED TO IMPROVING THE STATE OF THE WORLD

Weather related* nat cat events 1970 - 2005



Source: Swiss Re sigma Catastrophe database
 * Incl. floods, storms, droughts, forest fires, cold waves & frost, hail, and other

Key: Blue bars represent actual values; red bars represent decadal averages

What are the Insurance Consequences of Climate Risk Today?



Figure 2

Thames Barrier closures 1982 - 2003

Source: Environment Agency, UK

The same pattern is affecting sea level globally. Figure 2 shows a typical example, relating to the Thames Barrier, which was erected to defend London after the great flood of 1953. When it was built, it was intended to resist even a 1000-year flood, but already from experience and new projections up to the year 2100, it is clear that climate change has invalidated these calculations.

Hurricane Katrina's Effects Were Vast



Understanding Climate as a Fundamental Insurance Risk

- Storms, wildfires, windstorms, sea-level rise, drought
- Effect on facilities, power, transport, communications
- Health Impacts: Heat waves and new disease vectors
- Lost resources: forest resources, crop production, water supplies, biodiversity (30% species extinction at 3 deg C)
- Reputational risks; shareholder concerns; litigation possibilities
- Compliance and competitive risks

Need to Address Mitigation and Adaptation



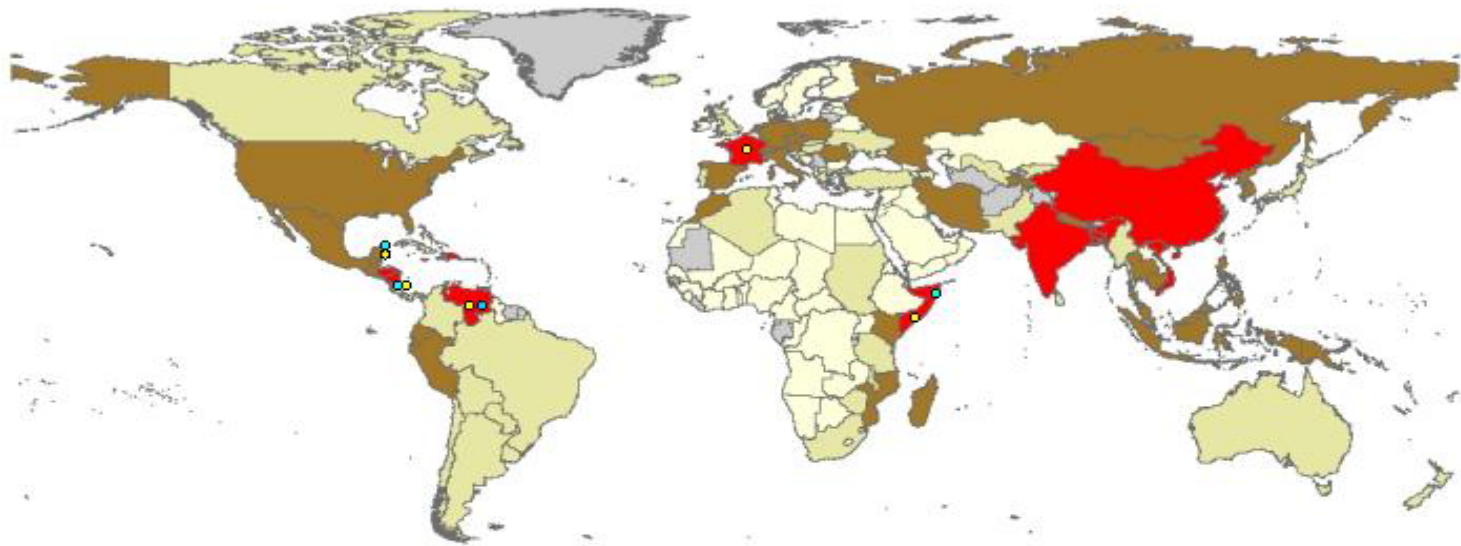
Climate Change Will Pose Severe Challenges to Developing Countries

The UN Millennium Development Goals (MDGs) and Climate Change

1. Eradicate extreme poverty and hunger	Weather fluctuations will impoverish poor farmers and reduce yields
2. Achieve universal primary education	Funding will be diverted to deal with disasters and scarcities
3. Promote gender equality and empower women	Stresses will increase as resources become scarcer
4. Reduce child mortality	Disease, water scarcity and food shortages will impede this goal
5. Improve maternal health	As with child mortality, climate change will hinder progress
6. Combat HIV/AIDS, malaria and other diseases	Water stress and warmer conditions will encourage disease
7. Ensure environmental sustainability	Climate change threatens the stability of the Earth system
8. Develop a global partnership for development	International relations will be strained by climate impacts

Disparate Distributional Impacts of Climate Change

Climate Risk Index (1995 – 2004)



Index Value 1995 – 2004 (average number of events):

Rank	Country	Index Value	Standard Deviation	Impact	Rank	Country	Index Value	Standard Deviation	Impact
1	Honduras	11.00	(2.7)	♦♦	6	Viet Nam	21.25	(9.0)	
2	Bangladesh	17.50	(12.2)		7	Dominican Republic	22.00	(14.5)	
3	Somalia	19.00	(2.2)	♦♦	8	France	24.75	(1.7)	♦
4	Venezuela	19.50	(2.3)	♦♦	9	India	26.25	(16.6)	
5	Nicaragua	21.00	(1.9)	♦♦	10	China	27.50	(25.2)	

Rank



Not specified

- ♦ Down 10 countries where more than 50% of deaths were caused by one individual event
- ♦ Down 10 countries where more than 50% of losses were caused by one individual event

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Insurance Industry Response and Risks

- Seen as “canary in the coal mine”?
- Focus due to size of industry
- Focus due to core competency in risk evaluation, monetization
- Post-Katrina legacy of withdrawals, rates, deductibles, coverage disputes, litigation
- Reaction of increased regulatory oversight

Key Strategy 1: Developing an Enhanced Understanding and Appropriate Pricing of Climate Risks



CATASTROPHE MODELING FORUM

A Project of
The Center for Health and the Global Environment
Harvard Medical School

and

Insurance Information Institute

Supported by

American International Group, Inc.

and

Lloyd's

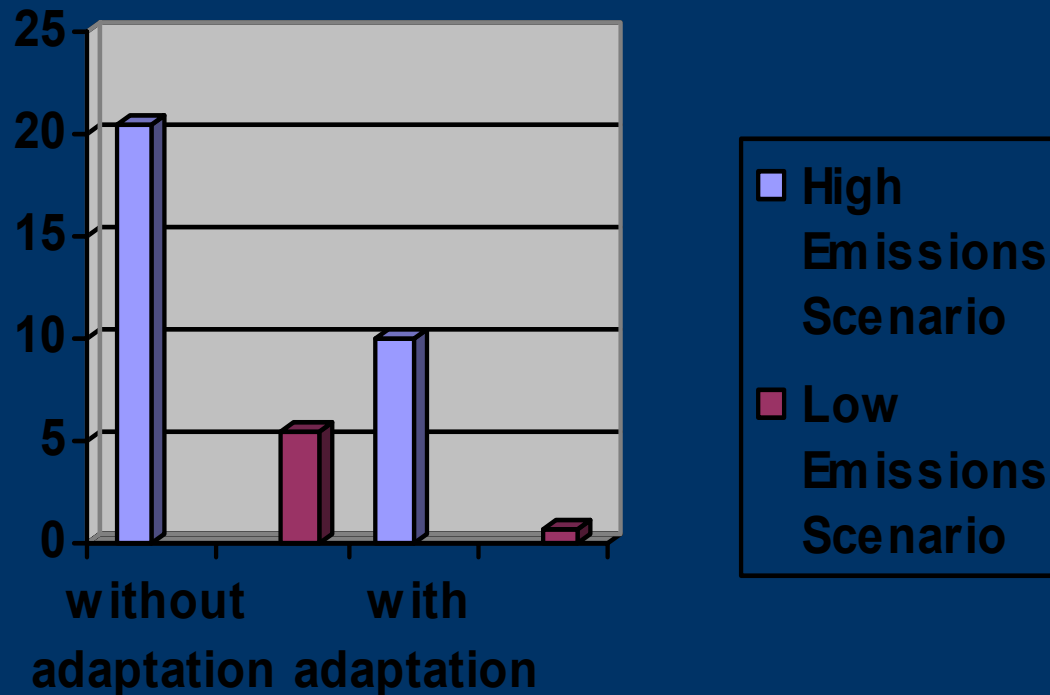


LLOYD'S



Key Strategy 2: Limit the Risk Through Loss Control and Preparedness

Example: Projected Flood Damage Costs Affected by Mitigation and Adaptation (ABI)



Key Strategy 3: Limit the Risk By Limiting Emissions, Enhancing Regulatory Certainty, and Avoiding Future Climates

Example: MMC Climate Risk Industry Leadership



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MMC Activities to Elevate Dialogue on Climate Change Risk Management

- World Economic Forum Global Risk Network Report
- Climate Risk Alert
- Affiliation with Pew Center on Global Climate Change's Business Environmental Leadership Council
- Clinton Global Initiative commitment with Yale University and Ceres on training independent corporate directors
- Membership in the U.S. Climate Action Partnership
- Dialogue with World Resources Institute on Carbon Capture & Storage Liability and Insurability Issues
- Carbon Disclosure Project recognition as Best in Class Climate Leadership Index

Key Strategy 4: Limit and Spread the Risk by Enhancing Creative Tools for Resilience

Munich Climate Insurance Initiative

Mission statement



 MCII

Key Strategy 5: Develop Products around New Opportunities and Solutions

Risk Consulting Practice

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Carbon Emissions Credit Delivery Guarantees Reducing Risks From GHG Emissions Reduction Credits

Marsh, the world's leading risk and insurance services firm, has been working with a number of insurers and reinsurers to develop and perfect a credit delivery guarantee for greenhouse gas (GHG) emissions reduction credits. Several insurers have recently announced that they are providing new coverage in this area.

Carbon emissions reduction credits typically would arise in Clean Development Mechanism (CDM) or Joint Implementation (JI) projects whereby entities enter into a forward-based contract that provides the promise of the future delivery of GHG emissions reductions. The allocation of non-delivery risks between buyers and sellers of carbon credits is a key commercial issue and one that affects the price of certified emissions reduction (CER) projects. Pricing categories for emissions reductions have emerged based on the risk distribution between buyers and sellers, with forward-based contracts for perceived high risk, non-guaranteed emissions reductions facing significant price discounts.

By employing an insurance-based credit delivery guarantee, a company has the ability to mitigate the risks surrounding future credits generated and to which it has committed. This allows those credits to more closely approximate an outright carbon emissions allowance; future credits can thus also be differentiated from non-guaranteed credits.

CDM and JI Project Challenges

CDM and JI projects present a wide range of risks. These include:

- design and operational risks, such as whether a new technology will be delivered in time and on budget, and whether it will work;
- financial and credit risks, such as whether a project manager or technology provider will remain financially able to perform and operate the project over its projected life;
- performance risks, such as natural disasters that could inhibit the completion and operation of the project;
- political risks, stemming from the host country, including political instability, ownership interests in the project and the carbon credits generated, currency convertibility, etc; as well as
- Kyoto Protocol specific risks, such as whether a CDM project will receive approval from the CDM executive board so that emissions reductions can be properly certified.



Climate Wise: Principles for the Insurance Industry

1 Lead in risk analysis

- Support and undertake research on climate change to inform our business strategies and help to protect our customers' and other stakeholders' interests.
- Support more accurate national and regional forecasting of future weather and catastrophe patterns affected by changes in the earth's climate.
- Use research and improve data quality to inform levels of pricing, capital and reserves to match changing risks.
- Evaluate the risks associated with new technologies for tackling climate change so that new insurance products can be considered in parallel with technological developments.
- Share our research with scientists, society, business, governments and NGOs through an appropriate forum.

3 Support climate awareness amongst our customers

- Inform our customers of climate risk and provide support and tools so that they can assess their own levels of risk.
- Encourage our customers to adapt to climate change and reduce their greenhouse gas emissions through insurance products and services.
- Increase the proportion of repairs that are carried out in a sustainable way through dialogue with suppliers and developers and manage waste material appropriately.
- Consider how we can use our expertise to assist the developing world to understand and respond to climate change.

5 Reduce the environmental impact of our business

- Encourage our suppliers to improve the sustainability of their products and services.
- Measure and seek to reduce the environmental impact of the internal operations and physical assets under our control.
- Disclose our direct emissions of greenhouse gases using a globally recognised standard.
- Engage our employees on our commitment to address climate change, helping them to play their role in meeting this commitment in the workplace and encouraging them to make climate-informed choices outside work.

2 Inform public policy making

- Work with policy makers nationally and internationally to help them develop and maintain an economy that is resilient to climate risk.
- Promote and actively engage in public debate on climate change and the need for action.
- Support work to set and achieve national and global emissions reduction targets.
- Support Government action, including regulation, that will enhance the resilience and reduce the environmental impact of infrastructure and communities.
- Work effectively with emergency services and others in the event of a major climate-related disaster.

4 Incorporate climate change into our investment strategies

- Consider the implications of climate change for company performance and shareholder value, and incorporate this information into our investment decision-making process.
- Encourage appropriate disclosure on climate change from the companies in which we invest.
- Encourage improvements in the energy-efficiency and climate resilience of our investment property portfolio.
- Communicate our investment beliefs and strategy on climate change to our customers and shareholders.
- Share our assessment of the impacts of climate change with our pension fund trustees.

6 Report and be accountable

- Recognise at Company Board level that climate risk has significant social and economic impacts and incorporate it into our business strategy and planning.
- Publish a statement as part of our annual reporting detailing the actions that have been taken on these principles.

www.climatewise.org.uk

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