Climate change and the insurance industry

Anna Gero
Climate Research Analyst,
Natural Hazards Research
Insurance Australia Group
Outline

• Who is IAG?
• Why climate change is important to insurers
• Key impacts and issues: how is the risk changing?
• Responding to climate change
Who is IAG?

• Largest general insurance group in Australia and New Zealand

• More than 10 million policies
  ➢ Motor, Buildings, Contents, Boat, CTP, Rural, Commercial, Travel, Workers Comp.

• Multiple Brands

• Insure 1 in every 3 homes, 1 in every 3 cars and 1 in every 2 farms in Australia and New Zealand
Why climate change is important to insurers
Weather and climate are core business

Australia’s most costly insured events

50% of events are hailstorms

Cyclone Larry: Event 10

All weather related except Newcastle earthquake

Insured Property Loss in July 2005

$M

0 500 1000 1500 2000 2500

'99 '90 '89 '85 '83 '03 '06 '86 '74 '74 '71 '05 '76 '67 '74 '74

Sydney Hail, Wind
Sydney Flood
Sydney Storm
Hobart Bushfire
NSW Flood
SE Australia Storm
Cyclone Madge
Cyclone Althea
Cyclone Larry
Cyclone (West) Hall
Sydney Storm
Brisbane Hail
Canberra Bushfire
Ash Wednesday
Sydney Storm
Cyclone Wanda, QLD
Cyclone Tracey
Sydney Hail
Newcastle Earthquake
Sydney Hail
NSW Hail, Wind
Sydney Hail, Storm

Weather and climate are core business

50% of events are hailstorms

Australia's most costly insured events

Cyclone Larry: Event 10

All weather related except Newcastle earthquake
# Worldwide insurance losses

## Top 10 Insured losses worldwide


<table>
<thead>
<tr>
<th>Insured Loss $b</th>
<th>Event</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0</td>
<td>Hurricane Katrina</td>
<td>'05</td>
</tr>
<tr>
<td>22.3</td>
<td>Hurricane Andrew</td>
<td>92</td>
</tr>
<tr>
<td>20.7</td>
<td>Terror attack on WTC, Pentagon</td>
<td>'01</td>
</tr>
<tr>
<td>18.5</td>
<td>Northridge earthquake</td>
<td>94</td>
</tr>
<tr>
<td>11.7</td>
<td>Hurricane Ivan</td>
<td>'04</td>
</tr>
<tr>
<td>10.0</td>
<td>Hurricane Rita</td>
<td>'05</td>
</tr>
<tr>
<td>10.0</td>
<td>Hurricane Wilma</td>
<td>'05</td>
</tr>
<tr>
<td>8.3</td>
<td>Hurricane Charley</td>
<td>'04</td>
</tr>
<tr>
<td>8.1</td>
<td>Typhoon Mireille</td>
<td>'91</td>
</tr>
<tr>
<td>6.9</td>
<td>Winter storm Daria</td>
<td>'90</td>
</tr>
</tbody>
</table>

Source: Swiss Re

- 8 out of 10 are weather related
- 5 out of 10 are from 2004 -2005
Climate change scenarios and associated costs

Many costs of climate change could be avoided by taking action today

The Stern Review released in October 2006 presents evidence that early action on climate change outweigh the costs of delayed action
Key impacts and issues: How is the risk changing?
Climate change and severe weather

- Enhanced Hydrological Cycle
- Impact on severe storms, floods and tropical cyclones
- More hot days, less cold days
- Increase in global mean temperature
Climate change and severe weather

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Change in Climate</th>
<th>Resulting change in hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclone</td>
<td>2.2°C mean temperature increase</td>
<td>Increase of 5-10% in cyclone wind speed</td>
</tr>
<tr>
<td>Bushfire</td>
<td>1°C mean summer temperature increase</td>
<td>17-28% increases in bushfires</td>
</tr>
<tr>
<td>Drought</td>
<td>1.3°C maximum temperature increase</td>
<td>25% increase in evaporation leading to increased bushfire risk</td>
</tr>
<tr>
<td>Flood</td>
<td>25% increase in 30 minute precipitation</td>
<td>1 in 100yr flood becomes 1 in 17yr flood</td>
</tr>
</tbody>
</table>

Small changes in mean climate can dramatically increase hazards

Source: Mills et al. (2001)
Climate change and severe weather:

It is not just the mega events!

25% increase in peak gust causes 650% increase in building damages

NSW, NRMA Building Insurance only

Source: Sydney Morning Herald 25th August 2003
Climate Change: Economic Impacts

- **Agriculture** ($20 billion or 3% of GDP)
  - higher temperatures, drier conditions, less water, increased variability

- **Tourism** ($32 billion or 4.2% of GDP)
  - damage to ecosystems (Barrier reef, Kakadu, ski fields), rising sea levels, extreme weather events

- **Forestry** (1% of GDP)
  - reduced rainfall, drought, increased fire hazard, pest infestations and soil erosion

- **Fishing** ($2.5bn or 1.5% of total exports)
  - winds, changing ocean currents, rising sea temperatures may affect a number of fishing industry species

Source: Australian Government Department of Environment and Heritage

*Climate change risk and vulnerability*
## Climate change: Agricultural impacts

<table>
<thead>
<tr>
<th>Sub-sector</th>
<th>Some potential impacts from climate change</th>
</tr>
</thead>
</table>
| Grazing & livestock| • increased growth from higher CO<sub>2</sub> levels but potentially offset by reduced rainfall and higher temperatures  
• higher temperatures reducing milk yields  
• decreases in forage quality  
• increased rainfall variability reducing livestock carrying capacity  
• heat stress in Northern Australia impacting on productivity and animal welfare  
• increased risk and rates of salinisation in some areas  
• increased risk of pests, parasites and pathogens                                                                                                                                                                                                                                                                                  |
| Cropping           | • increased crop water-use efficiency due to higher carbon dioxide concentrations (CO<sub>2</sub>) → potentially reduced grain quality  
• reduced water availability due to both reduced rainfall and increased evaporation  
• reduced crop yield  
• changes to world grain trading  
• increased risk of pests, parasites and pathogens                                                                                                                                                                                                                                                                                  |

<table>
<thead>
<tr>
<th></th>
<th>2030 projected change</th>
<th>2070 Projected change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>+0.2 to +2.1 °C</td>
<td>+0.7 to +6.4 °C</td>
</tr>
<tr>
<td>Rainfall</td>
<td>-13 to +7%</td>
<td>-40 to +20%</td>
</tr>
<tr>
<td>Extreme rainfall</td>
<td>+2 to +13%</td>
<td>+4 to +40%</td>
</tr>
<tr>
<td>No. Droughts per decade</td>
<td>2 - 4</td>
<td>1 – 8</td>
</tr>
<tr>
<td>Extreme winds</td>
<td>-5 to +8%</td>
<td>-16 to +24%</td>
</tr>
<tr>
<td>Evaporation</td>
<td>+2 to +13%</td>
<td>+4 to +40%</td>
</tr>
</tbody>
</table>

Source: CSIRO: “Climate change in the Namoi Catchment”, 2006
Responding to climate change
Responding to Climate Change

1. Understand
   - Better understand the effects climate change is likely to have on insurance and the community

2. Mitigate
   - Work to reduce greenhouse gas emissions and thus the future impact of climate change, both internally and externally

3. Adapt
   - Living with some amount of climate change, no matter what other actions are taken

REDUCING RISK
**IAG’s climate change impact assessment**

**Queensland Cyclone risk**

Severe Tropical Cyclones are expected to become more intense & move further south.

**Sydney Hail risk**

In a future climate, Sydney April ’99 hailstorm (hail size 9cm+) that cost $1.7bn could become twice as frequent.
Risk Mitigation: Building Codes for Residential Housing

- Introduced around 1980 to keep occupants safe
- Codes are not specifically designed to reduce damages
- Building code regions reflect relative risk from tropical cyclone winds
Risk Mitigation: Cyclone Larry and building codes

- Category 4 at landfall Innisfail, Qld.
- Estimated cost $350m across insurance industry
- Most damage from severe winds and wind-driven rain
- Newer houses sustained little damage: potential evidence that building codes are effective
## Hail Gun: Roof material breaking point

<table>
<thead>
<tr>
<th>Roof material</th>
<th>What size hailstone caused roof to crack?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrugated steel sheets</td>
<td>Not penetrated</td>
</tr>
<tr>
<td>Concrete tiles (new)</td>
<td>7cm (diameter)</td>
</tr>
<tr>
<td>Terracotta tiles (new)</td>
<td>7cm</td>
</tr>
<tr>
<td>Old slate (100 yrs old)</td>
<td>5cm</td>
</tr>
<tr>
<td>Old terracotta (50 yrs old)</td>
<td>5cm</td>
</tr>
</tbody>
</table>
How will hail storms change with further warming?

Decadal hail distributions of 4cm diameter or greater for the Sydney Basin modelling domain for the future climate numerical model IPCC IS92a scenario.

Source: IAG sponsored research
Working with Customers and Community: Flood Solutions – New Zealand

• IAG-Sponsored Climate Modelling
  ➢ Improved assessment of **current and future** flood risk

• Working with local authorities to advise on flood solutions:
  ➢ Planning / building controls
  ➢ River and catchment management
  ➢ Engineering works
  ➢ Relocation / resumption of high risk homes
The Australian Business Roundtable on Climate Change

An unusual alliance of 6 major companies and an NGO:

- BP Australia
- Insurance Australia Group
- Origin Energy
- Swiss Re
- Visy Industries
- Westpac
- Australian Conservation Foundation (ACF)

Represents a range of views but all seeking to:

- reduce business risk
- embrace opportunities associated with climate change
The Australian Business Roundtable on Climate Change

Key Findings

• Economic impacts significant & widespread
• Acting early reduces damage and buys time
• Deep cuts in emissions can be made without significant impact on economic growth

Key Recommendations

• Broad Framework & Carbon Price Signal
• Innovation and investment
• National resilience
IAG and climate change: Customers

Climate Help

Don’t underestimate the effects of climate change.

With recent events like Hurricane Katrina, persistent droughts, and worsening bushfire seasons, there are now more signs than ever that our climate is changing.

Because cars are a significant cause of climate change, NRMA Insurance has created a new environmental program called Climate Help. It shows you how to offset your car’s emissions, and how to help combat climate change with a unique method called carbon credits.

Forests reduce the CO₂ we produce.
IAG and climate change: Customers

Home Help
IAG and climate change: Customers

GreenSafe Car Profiler

We're here to help you choose a cleaner, safer car

Buying a car is a big personal decision but many people don't know that it also has a big social and environmental impact.

That's why we built the GreenSafe Car Profiler. It helps you to compare a range of cars on their environmental impact, safety features and running costs. That means you can make a more informed choice about which car to buy.
Climate Change: IAG to be Carbon Neutral

- This means all the CO₂ IAG operations produces will be offset by:
  - purchasing greenpower
  - reducing the amount of CO₂ produced
  - continuing support of hybrid vehicles
  - expansion of climate friendly products
IAG’s journey so far

- Climate modelling
- Plan to be carbon neutral in 5 years
  - Hybrid car fleet
  - Purchase of Green power electricity
  - 5 star Green building in Adelaide
  - Monitor & reduce energy consumption
- Understanding building vulnerability - Hail Gun
- Climate Help product to offset car emissions
- Sharing knowledge with customers
  - GreenSafe car profiler, Home Help websites
  - Smash repair industry – Bumper bars
Conclusions

1. Climate change is real and early action is needed

2. IAG is keen to ensure insurance remains affordable and available

3. Action required on many fronts
   • Understand, Mitigate and Adapt
   • Working together, action on all fronts

4. Insurance industry is a key player in an effective economic & societal response