Climate Change and Insurance in Australia's Coastal Zones – Drivers and Responses

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From the earliest consideration of the possibility of global climate change, the insurance industry has been an early mover – researching, writing and speaking on the subject, taking the debate to a broader business audience; and also engaging with government and the scientific community.

In a recent report entitled *From Risk to Opportunity*, Ceres, a US group representing investors, quoted the Chief Risk Officers of 19 insurers as stating:
Climate change has the potential to develop into the greatest environmental challenge of the 21st century. The recent period of intense tropical cyclone activity most likely reflects the effects of both climate variability and a superimposed global warming due to human causes.

In its submission to the Carbon Disclosure Project 3, Aetna noted:
Aetna is concerned about climate change and presently cannot envision a scenario in which a warmer and possibly more polluted planet would benefit anyone including our customers, shareholders and employees.

Community understanding

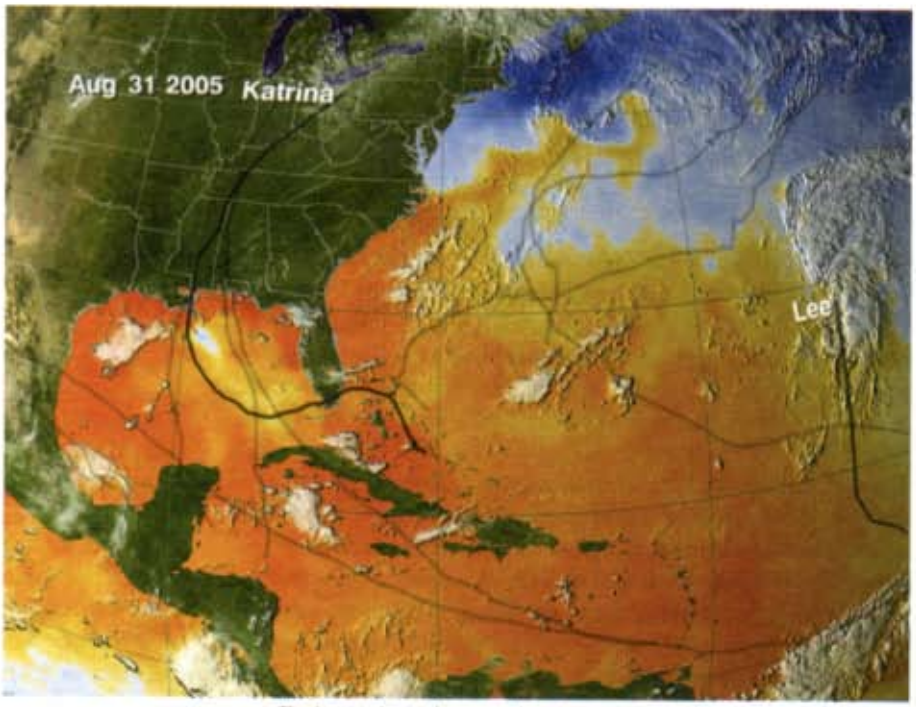
Community understanding and concern about impacts of climate change is now at a very high level. Following a Lowy Institute study in 2005 in which climate change was ranked second only to rogue states gaining a nuclear capability, a recent Newspoll survey indicated that close to 90% of respondents expressed concern at the consequences of climate change. This of course rapidly translates to political action; the views held by 90% are not to be trifled with! Thus in a very short time frame we have seen action taken by the Federal Government in relation to technology solutions, nuclear energy and establishment of a taskforce to examine how emissions trading might influence behaviour; and in parallel, state governments mandating emission reductions (South Australia 60%) and renewable energy targets. Government actions to limit development in coastal areas may not always have been precipitated by concern about the impacts of climate change, but serendipity has its place. One of the emerging issues is a genuine desire from the community for advice on what are appropriate responses.

As the principal carriers of risk of damage to property arising from natural and man-made catastrophes, insurers and reinsurers have both an appreciation of the likely consequences of a major catastrophic event and also the experience both locally and globally to support this. Consider the weight of evidence.

In Australia, 19 of the 20 largest insured losses from natural catastrophes since 1967 as recorded by the Insurance Disaster Response Organisation have been weather-related events. Globally, of the 40 largest insured losses since 1970 listed on Swiss Re's sigma database, 37 are natural catastrophes and of these 34 are weather-related events.

The cost of catastrophes has escalated rapidly in recent years and although it is not possible to definitely ascribe all of this increase to the effects of climate change, many of the events have demonstrated characteristics consistent with the predictions of the climate scientists.

In their recent shareholder letter, the Board of Munich Re noted that natural catastrophe losses in 2005 consumed 18% of reinsurance premiums compared with an average of 3% for the period 1995 to 2004, suggesting a quantum shift in the level of losses borne by the industry.



The image shows the sea surface temperature of the Caribbean Sea and the Atlantic Ocean during Hurricane Katrina. Every area in yellow, orange or red represents 28°C or above. Image courtesy of NASA.

Lloyd's of London *360 Risk Report* recently noted:
We don't know exactly what impact climate change will have. But we do know that it presents society and the economy with an increasing level of uncertainty as it seeks to manage its risk.

Noting that responding to climate change 'must become business as usual for insurers', the report concludes:
Failure to take climate change into account will put companies at risk from future legal actions from their own shareholders, their investors and clients.

This conclusion clearly puts at the forefront of the insurers' objectives the obligation to engage with the wider community to ensure that the global experience is shared and that underwriting decisions align with the community desire to avoid the worst consequences of global climate change.

Coastal implications

Bringing this global perspective to a local level, what are the implications for coastal zones, their residents and the companies insuring property and other activities in these areas?

Some of the likely early impacts of climate change include an increase in sea temperature, rising sea levels and increased storm activity. The Great Barrier Reef is both a huge tourist attraction to Queensland and a strong physical barrier protecting the coast

from damage by storm activity. Thus the Reef is vital to the economy of Queensland as both a generator of tourism revenue and as a protector of the Queensland coast and its infrastructure.

However, a relatively small increase in sea temperatures will result in the loss of large amounts of the reef to bleaching (97% loss with 2–3°C of warming) which will weaken the fabric of the reef. The combination of the increase in sea surface temperature and the accompanying sea-level rise is likely to lead to increased storm activity, and with a denuded reef providing less protection, storm losses in affected coastal areas are likely to rise dramatically.

If the bleaching and weakening of the Reef begins to occur, given the greatly increased transparency in insurance pricing, residents and property owners in these coastal areas are likely to see significant increases in insurance premiums to reflect the increased loss potential.

Insurance implications will not be confined to property owners. One of the likely consequences of increased losses will be a search by property owners to find someone to accept responsibility for their losses. As action of the sea is not covered by most property policies issued in Australia, it is likely that actions may be taken against planners and other authorities that allowed development to take place as well as engineers, architects and builders.

As examples of potential exposure, consider the rapid increase in residential development along Australia's coastline. From central Queensland to Adelaide development is almost continuous with much of this in potentially problematic areas. Canal developments with buildings only a metre or two above high-tide levels, apartments, houses and infrastructure so close to the high-water mark 'that it cannot be built out' highlight the potential for litigation against planning and approval authorities.

Should insurers deliver a message to these sectors by declining cover for coastal developments that are at risk from likely sea-level rises in the next 50–75 years?

Well established criteria of insurability include randomness of occurrence and fortuity of loss, i.e. the loss is independent of the will of the insured. With well documented predictions of significant (i.e. more than 1-2 metres) of sea-level rise predicted within this century, a coastal development that does not factor in these risk issues is probably not insurable.

Climate change has long been acknowledged as a critical issue by the insurance industry, both from the loss potential aspect and as a critical risk management issue for clients. It is likely that in the near term we will see action taken by insurers in areas of pricing, coverage and risk management advice. Property owners and professionals operating in coastal zones would be well advised to consider the implications of likely consequences of climate change.

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Carbon Dioxide Capture and Storage

Abridged by Prue Barnard, National Assistant, MCCN*

Carbon dioxide (CO_2) capture and storage (CCS) is being considered as a potential mitigation device for climate change to help prevent CO_2 from being distributed into the atmosphere. CCS separates CO_2 from industrial and energy-related sources, and then stores this in long-term isolation from the atmosphere – potentially helping to stabilise atmospheric greenhouse gas concentrations.

Capture and storage

CO_2 can be compressed and stored/used in:

1 geological formations
2 oceans
3 mineral carbonates
4 industrial processes.

1 Geological formations

Storage options include:

- combined with enhanced oil recovery
- storage in gas or oil fields
- storage in saline formations
- enhanced coal bed methane recovery.

(See following article by John Bradshaw.)

2 Oceans

There are two ways in which CO_2 could be stored in the ocean:

- by injecting and dissolving CO_2 into the water column (typically below 1,000 metres);
- by depositing it onto the seafloor at a depth below 3,000 m, where CO_2 is denser than water and is expected to form a lake that would delay dissolution of CO_2 into the surrounding environment.

Ocean storage and its ecological impacts are still in the research phase. Dissolved and dispersed CO_2 would become part of the global carbon cycle and eventually equilibrate with the CO_2 in the atmosphere. In laboratory experiments, small-scale ocean experiments and model simulations, the technologies and associated physical and chemical phenomena include an increase in acidity (lower pH). Ocean storage data and model calculations indicate that 65-100% will be retained after 100 years and 30-85% after 500 years.

3 Mineral carbonation

This technology is currently in the research phase.

4 Industrial uses of captured CO_2

The potential for industrial uses of CO_2 is small and is not expected to contribute to significant reduction of CO_2 emissions. Processes using captured CO_2 instead of fossil hydrocarbons do not always achieve net lifecycle emission reductions.

Environmental risks and costs

1 Geological storage

There are two types of leakage scenarios – abrupt and gradual. Both leakage scenarios may potentially result in lethal or other effects on flora and fauna, and the contamination of groundwater. Furthermore, pressure build-up caused by CO_2 injection could trigger seismic events.