

General Insurance Seminar

Connecting Today
and Tomorrow

13 – 15 November 2016

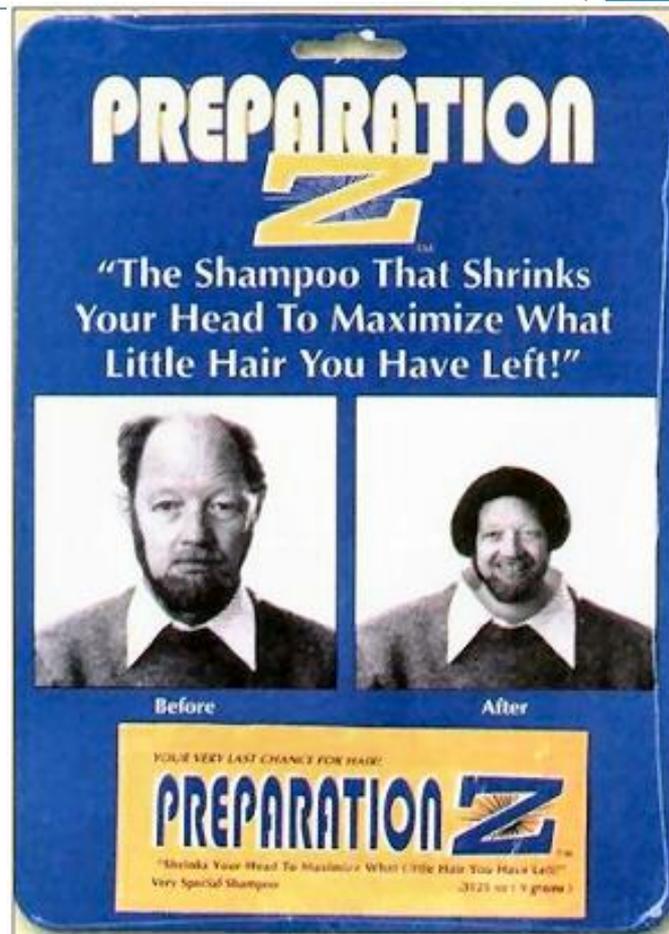
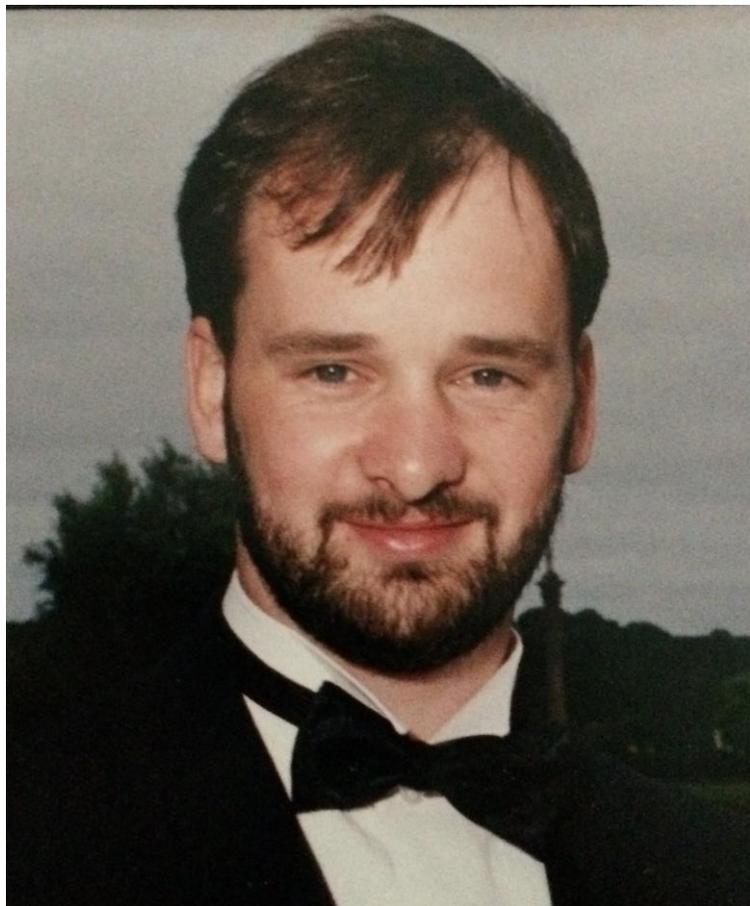
Grand Hyatt
Melbourne



Actuaries
Institute









Natural Disasters Working Group

1 Who we are?

2 What are we doing?

3 Link to CCWG

4 Our first report





Today's presentation

- **Summary of our draft paper on natural perils**
 - Cost
 - Adaptation
 - Data
 - Funding
- **What's next in 2017**



The cost and funding of natural disasters in Australia – current position paper

Draft for discussion

Prepared by a sub-committee of the Actuaries Institute's Natural Disasters
Working Group (NDWG)

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This paper has been prepared for the Actuaries Institute 2016 General Insurance Seminar.
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Cost of natural perils (AAL, \$2016)

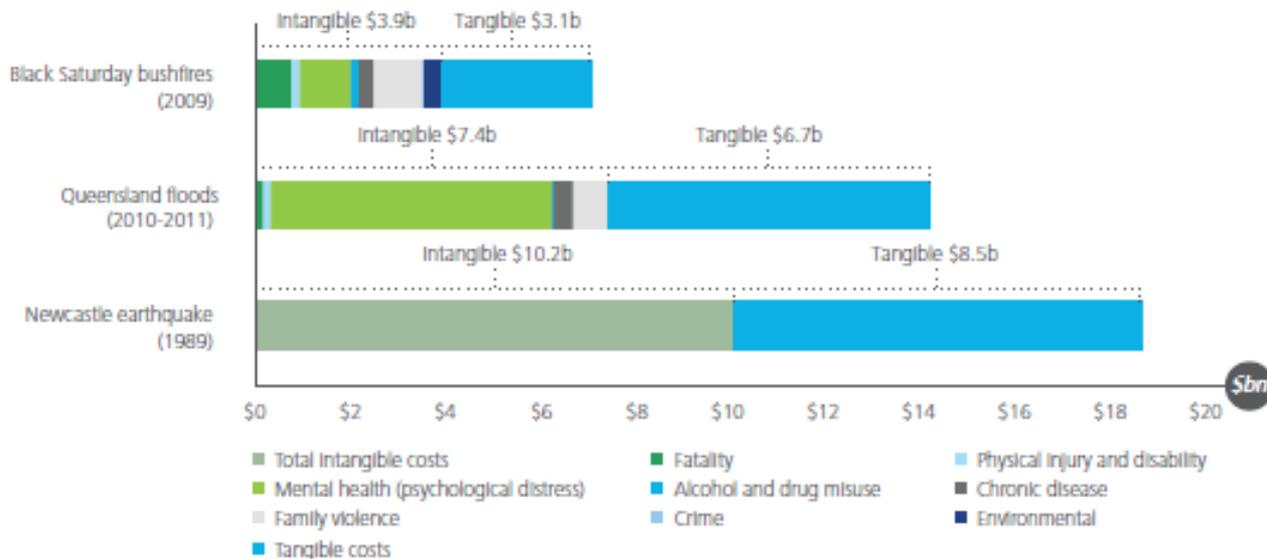
Insured tangible	\$3.7 billion
Other tangible	\$2.5 billion
Intangible	\$4.8 billion
Total	\$11 billion

Compares to often
quoted \$9.6 billion
from 2016 report by
Deloitte Access
Economics



Significant intangible costs

Chart iii: Total economic cost of Queensland floods, Black Saturday bushfires and Newcastle earthquake*



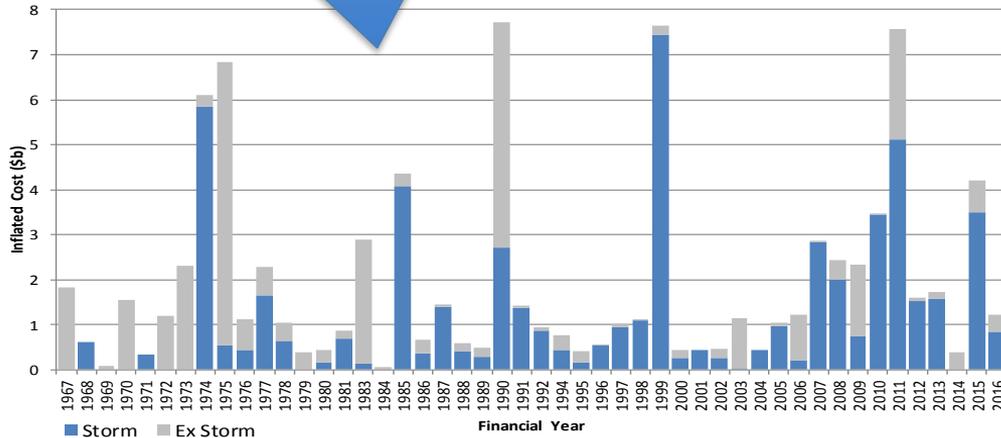
Source: Deloitte Access Economics analysis.

Note: Due to insufficient data, the total economic cost of the 1989 Newcastle earthquake was estimated using the tangible to intangible cost ratio of the 2010-11 Queensland floods and 2009 Black Saturday bushfires.



Normalised for inflation, growth, changes to building standards

Costs increasing, driven by inflation and growth in coastal exposure





State of the Climate 2016

- **Fire**

- increase in extreme fire weather and a longer fire season

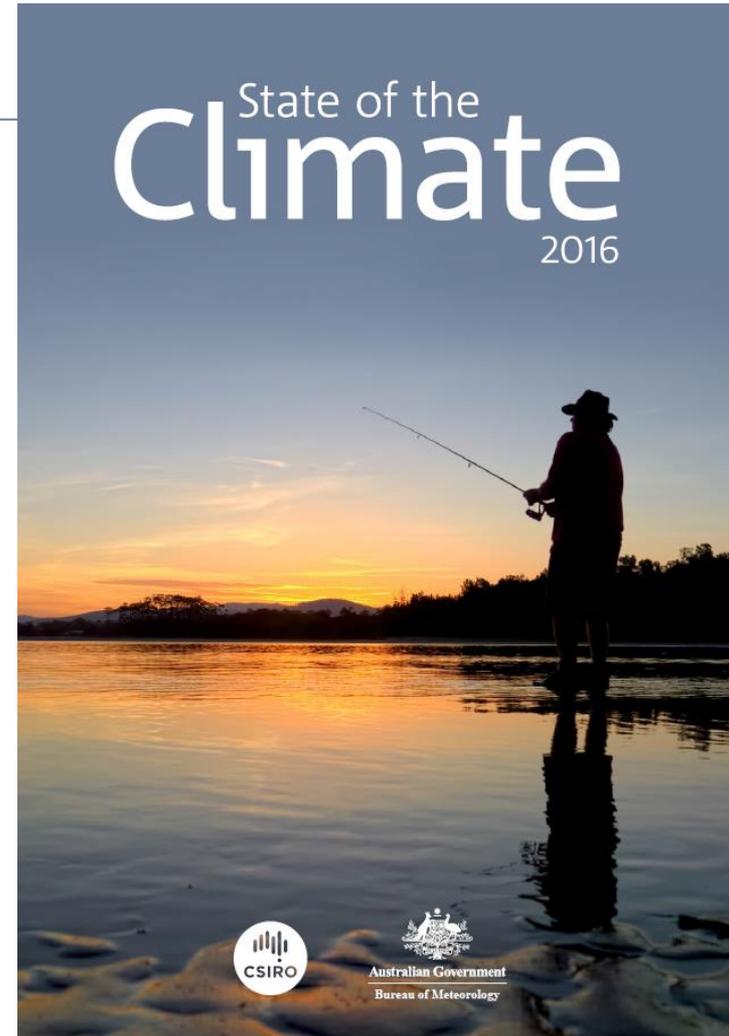
- **Cyclone**

- “there is a statistically significant downward trend in the number of tropical cyclones in the Australian region”

- **Rainfall**

- Increase in northern Australia, less elsewhere linked to fewer synoptic lows
- Mixed evidence of changes in heavy rainfall

State of the Climate 2016





Existing adaptation approaches

Land planning	Low direct costs, but high opportunity cost. New developments continue in areas of high risk. Inconsistency across councils
Building standards	Effective, but costly. Focus on risk to life, not limiting property damage.
Retrofitting	Higher costs than for equivalent new property. Studies suggest favourable cost-benefit in some areas
Infrastructure to reduce impact	Can be very effective. Issues of funding and conflicting purposes (eg dams used for water supply and flood mitigation)

We use
“adaptation” to
distinguish from
“mitigation” of
greenhouse gas
emissions



Adaptation Funding

- Mostly by government currently
- Much less than post disaster funding
- Are the right incentives in place?
- Scope for more
- Studies suggest favourable cost- benefit outcomes





Evaluating adaptation cost-benefit is complex

Should we spend \$1 billion now

to save \$5 billion in tangible damage
every 100 years?

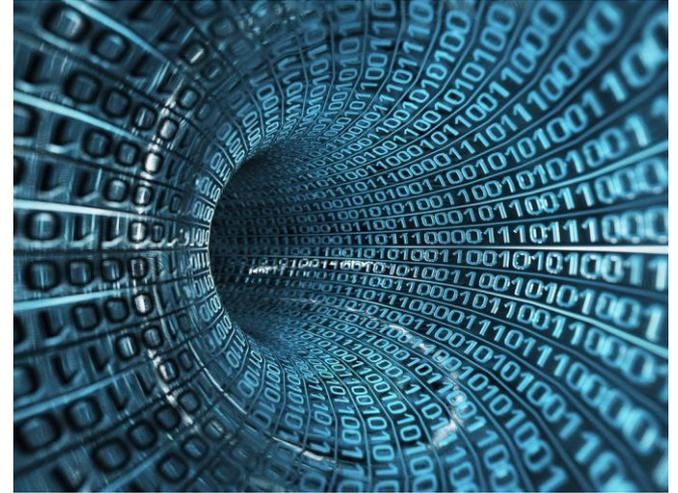
- **Assessment needs to consider:**

- It could happen next year, or in 500 years
- Intangible costs
- Future changes in population
- Future changes in risk (rising sea levels, increase in rain intensity)



What data is available

- Aggregate cost data for an event (or series of events)
- Individual loss data (typically insured losses)
- Geological, meteorological and engineering data
- Government data (including data on losses relating to public assets)





Aggregate event cost data

- Insurance Council of Australia
- Disaster funding from Treasury
- Deloitte Access Economics
- Risk Frontiers
- Australian Business Roundtable for Disaster Resilience
- Bureau of Meteorology
- Geoscience Australia
- Centre for Research on the Epidemiology of Disasters (CRED)
- Australian Emergency Management Institute (AEMI)
- Major reinsurers

The screenshot shows the Insurance Council of Australia website page titled "CATASTROPHE EVENTS AND THE COMMUNITY". It includes a navigation menu, a search bar, and a table of the 10 largest catastrophe events in Australia (2011 adjusted dollar amounts). The table columns are Rank, Event, Year, Location, State, Loss (AUD\$), and Normalised Loss* (2011) (AUD\$).

Rank	Event	Year	Location	State	Loss (AUD\$)	Normalised Loss* (2011) (AUD\$)
1	Hailstorms	1999	Sydney	NSW	1,700,000,000	4,296,000,000
2	Tropical Cyclone Tracy	1974	Darwin	NT	280,000,000	4,090,000,000
3	Earthquake	1989	Newcastle	NSW	862,000,000	3,240,000,000
4	Flood	1974	Brisbane	QLD	68,000,000	2,645,000,000
5	Flood	2010/11	Multiple	QLD	2,380,000,000	2,380,000,000
6	Hailstorm	1985	Brisbane	QLD	180,000,000	2,063,000,000
7	Ash Wednesday Business	1983	Multiple	VIC/SA	176,000,000	1,796,000,000
8	Severe Storm	2007	Multiple	NSW	1,480,000,000	1,742,000,000
9	Tropical Cyclone Midge	1973	Multiple	QLD/NT/WA	30,000,000	1,492,000,000
10	Tropical Cyclone Yasi	2011	Multiple	QLD	1,300,000,000	1,302,000,000



Individual loss data

- Typically relates to insured losses
- Spread across insurers and not shared for privacy and competition reasons
- Few insurers have sufficient data to be able to rely on own data





Geological, meteorological and engineering data

- Flood information now available to many consumers
- Australian Flood Risk Information Portal will become a useful resource
- Bushfire maps are available
- Some local governments make their data available to the public
- Expertise typically required to turn GME data into meaningful information

The screenshot shows the Australian Flood Risk Information Portal. The search results table lists 235 flood studies. The table has columns for AFSID, Name, Year, and Commissioning Organisation. The map on the right shows Queensland with numerous blue location pins indicating flood study sites.

AFSID	Name	Year	Commissioning Organisation
3443	Bogan River at Nyngan Flood Study	2014	Bogan Shire Council
3396	Amby - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3275	Bolton - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3276	Boonah - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3282	Cooyar - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3284	Dimamband - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3291	Esak - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3238	Flood Hazard Mapping - Amby	2013	Queensland Reconstruction Authority
3297	Harrisville, Munbilila and Kalbar - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3299	Imbil - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3300	Inglewood - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3302	Jondaryan - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3305	Kandanga - QRA Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3307	Kilkivan - Flood Hazard Mapping	2013	Queensland Reconstruction Authority
3308	Killamey - Flood Hazard Mapping	2013	Queensland Reconstruction Authority



Government data

- NDRRA
- Lacks consistency across governments/jurisdictions
- Not clear that sufficient data readily exists to create a holistic picture of the exposure of public assets

The screenshot shows a web browser window displaying the DisasterAssist website. The address bar shows the URL: <https://www.disasterassist.gov.au/Pages/disaster-arrangements.aspx>. The page features a navigation menu with links for Home, Find a disaster, Disaster arrangements (which is highlighted), About us, and Contact us. Below the navigation menu is a search bar with the placeholder text "Search by local government / name of disaster" and a search icon. The main content area displays the following sections:

- Disaster arrangements**
- Natural Disaster Relief and Recovery Arrangements**

Responding to a natural disaster can put significant financial pressure on a state or territory government. In recognition of this, the Australian Government provides funding under the NDRRA to help them with the relief and recovery costs.
- Disaster Recovery Payment**

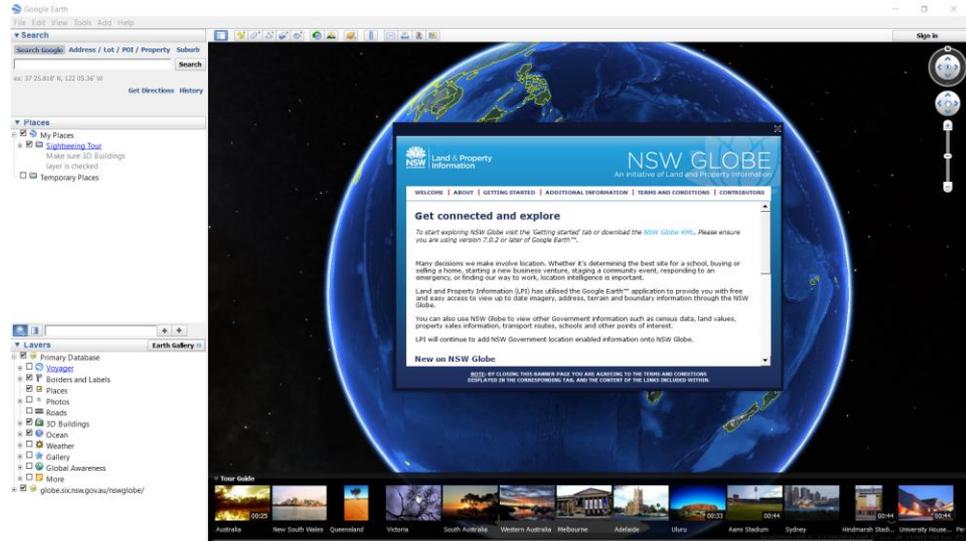
When a major disaster has had such a significant impact on individuals and families that assistance over and above the NDRRA is needed, the Australian Government may provide the Disaster Recovery Payment which is a one-off recovery payment.
- Disaster Recovery Allowance**

Major disasters can have a significant impact on people's ability to earn an income. In such situations, the Australian Government may provide the Disaster Recovery Allowance which is a short-term income support payment.



Data amalgamations

- ICA Dataglobe
 - Hazard mapping of flood, earthquake, bushfire, storm surge, cyclone
- NSW Globe
- Queensland Globe
- WA has an open data policy





Key gaps in/issues with the data available

- Productivity Commission
 - Inadequacies and inconsistencies in state data
 - Public assets not well assessed
 - Indirect costs can be substantial
- What are current building standards?
- Inconsistency between maps
- Measurements not necessarily most relevant for specific use
- Access to the detailed data
- Changes to the built environment





Funding of natural disasters

- Pre-funding via insurance/reinsurance
- Government assets largely post-funded
- Non-insured tangible assets may not be funded ... left to the individual
- Intangible assets (if funded) post-funded via welfare spending





Funding of non-insured costs

- Physical assets tend to follow a user-pays philosophy
- Intangible assets tend to follow a community rating philosophy
- Better measurement/recognition of intangible costs could drive more progressive mitigation policies
- Pre-funding of non-insured costs could lead to increased spending on mitigation strategies





Pooling and alternative risk transfer

- Pools can be a good **temporary** solution
- Incentives to reduce risks are required
- Alternative capital
 - Catastrophe bonds
 - Industry loss warranties
 - Collateralised reinsurance
 - Sidecars



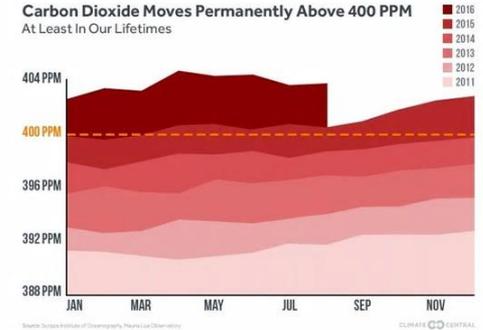


NEXT STEP FOR NDWG IN 2017 – FUTURE POSITION PAPER



Drivers of future risks

- **Economic growth**
- **Climate change**
- **Demographic changes**
 - Population growth
 - Population aging
 - Population location shifts

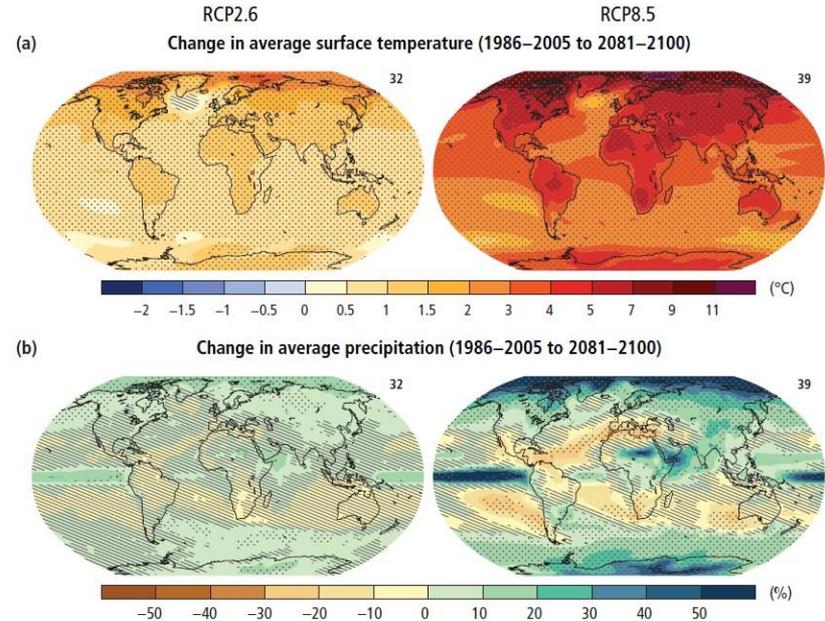




Climate changes

IPCC's projection (AR5)

- Rising surface temperature
- More frequent and longer heat waves
- Rising global mean sea level
- More frequent and intense precipitation events





Demographic changes

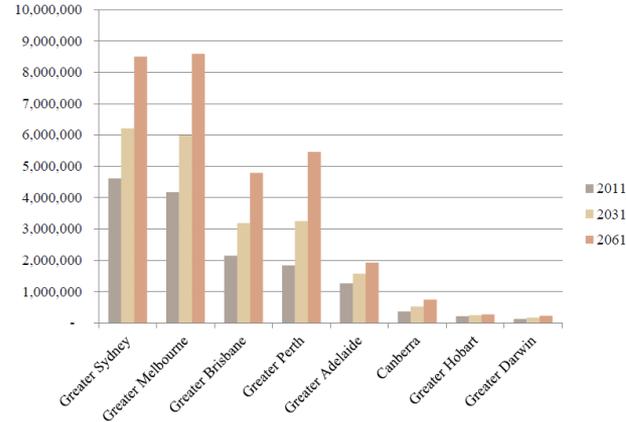
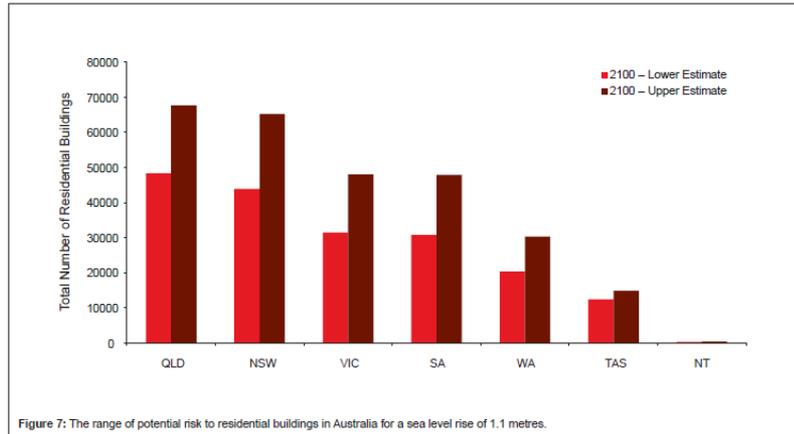
Driver	Changes	Impact
Population growth	38m by 2050	Increase exposure
	More than 50% of growth from overseas migration	Increase vulnerability
Population aging	>20% aged 65+	Increase vulnerability

*source: Australian Bureau of Statistics 2013 projections



Demographic changes

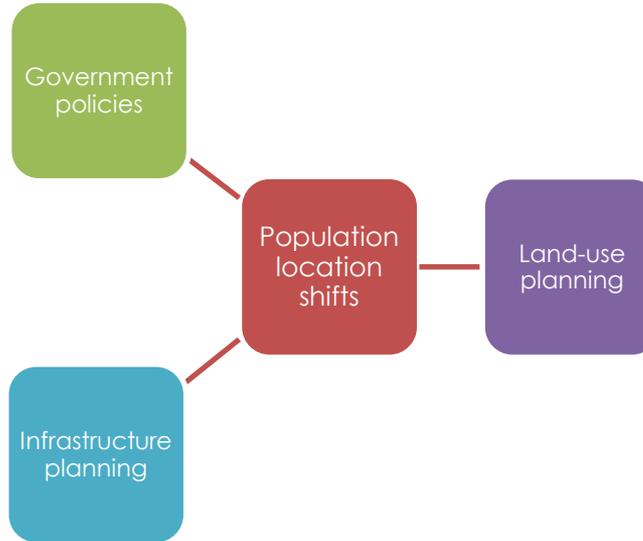
- **Population location shifts**
 - Interstate migration
 - Urbanisation
 - Coastal living



Source: Infrastructure Australia analysis of Australia Bureau of Statistics (2013b) – Series B data.



Challenges in projecting population location shifts





Next Steps for 2017