ESTIMATING THE IMPACTS OF NATURAL HAZARDS ON PROPERTY AND BUILDING LOSSES

bushfire&natural HAZARDS CRC

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THE PROJECT AIMS TO MEASURE AND UNDERSTAND THE IMPACTS OF NATURAL HAZARDS IN TERMS OF THE TOLL ON HUMAN LIFE AND INJURIES, AND BUILDING LOSSES AND DAMAGE, IN ORDER TO PROVIDE AN EVIDENCE BASE FOR EMERGENCY MANAGEMENT POLICY AND PRACTISE.

BUILDING DAMAGE AND LOSSES FROM NATURAL DISASTERS

▶ Insured losses caused by natural disaster events have increased rapidly in recent years. Figure 1 shows data from the Insurance Council of Australia's Historical Disaster Statistics list.
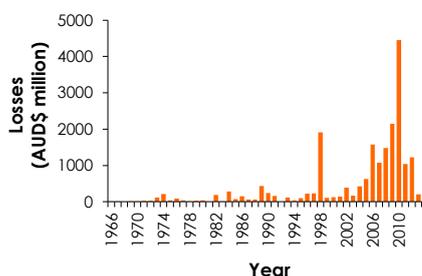
Figure 1: *Australian weather-related natural disaster losses, 1966-2013*

▶ The data in Figure 1 exhibits a statistically significant increasing trend over time (p<0.0001).

▶ Over the same period there have been societal changes – e.g. significant increases in population and wealth.

▶ *Normalisation* refers to the process of adjusting historical losses for known societal changes (e.g. numbers of homes, the value of these homes, and improvements in building codes and construction).

▶ Normalised losses effectively estimate the losses as if *past events* were to impact *present-day society* (i.e. an 'apples-versus-apples' comparison of event losses over time).

▶ After normalisation the loss data shows a different picture (Figure 2), with **no** statistically significant trend (p>0.5).

▶ This result implies that no signal has yet been detected to indicate that losses from causes other than population and wealth growth are increasing.
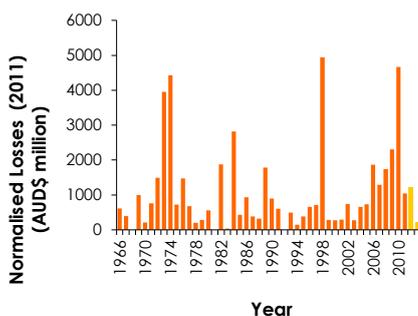
Figure 2: *Australian normalised weather-related natural disaster losses, 1966-2013*

MAJOR AUSTRALIAN DISASTER LOSSES

▶ Normalisation allows a comparison of the most damaging natural hazard events , even if they occurred many years apart (Table 1).

Event	Ranking	Year	Normalised cost
Sydney Hailstorm	1	1999	4.3 Billion AU$
Tropical Cyclone Tracy	2	1974	4.1 Billion AU$
Newcastle Earthquake	3	1989	3.2 Billion AU$
QLD Floods	5	2011	2.5 Billion AU$
Ash Wednesday Bushfires	7	1983	1.8 Billion AU$

Table 1: *The largest Australian natural disasters ,1925-2013 (in terms of normalised losses)*

▶ No single peril dominates - damaging hailstorms, tropical cyclones, floods, earthquakes and bushfires all feature in the top 7 events.

FATALITIES

▶ Similarly, the number of human fatalities per year should be adjusted to take into account population growth.

▶ After normalising for population growth, human fatalities from natural hazards show a statistically significant *decreasing* trend (p<0.001)(Figure 3).
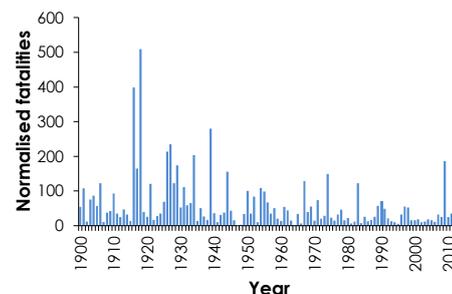
Figure 3: *Fatalities from natural hazards, normalised by population, 1900-2012 (Source: PerilAUS database, Risk Frontiers)*

FUTURE WORK

Future work will focus on two areas:

• Collecting data from coronial records and conducting analyses about the circumstances of natural hazard deaths for flood, cyclone, bushfire, severe storm, heatwave and earthquake.

• Updating and improving existing data sets of building losses, and conducting temporal and spatial analyses for each hazard, thus providing a natural priority ranking of hazard risks.

COMMENTS FROM THE END USERS

A quantitative evidence base allowing analysis of how disaster resilience strategies (such as land use planning) influence risk is a critical outcome for disaster managers. Evidence based legislation, policy and organisational process are essential to minimise the future increase of disaster risk. *(Simon Opper, NSW SES)*

REFERENCES

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