Property Resilience and Exposure Program

Wellington October 2017

EDGE

- Context – Climate Change
- Context - Insurance
- Context - Hazards, in insurance terms
- Insurance affordability
- ICA’s Resilience Program
- The Building Resilience Rating Tool
- Property Resilience and Exposure Program (PREP)

Global Mean Temperature Deviation

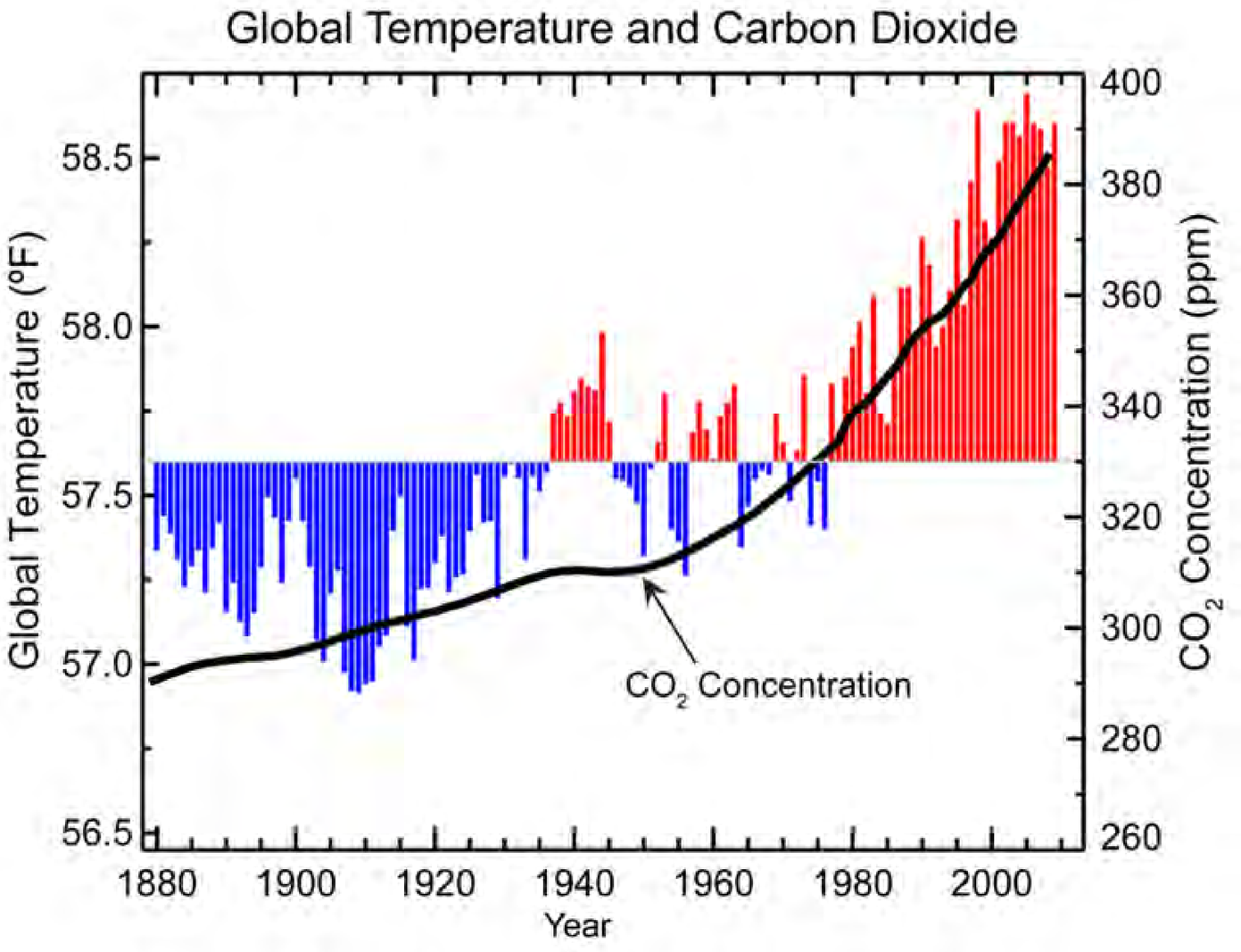
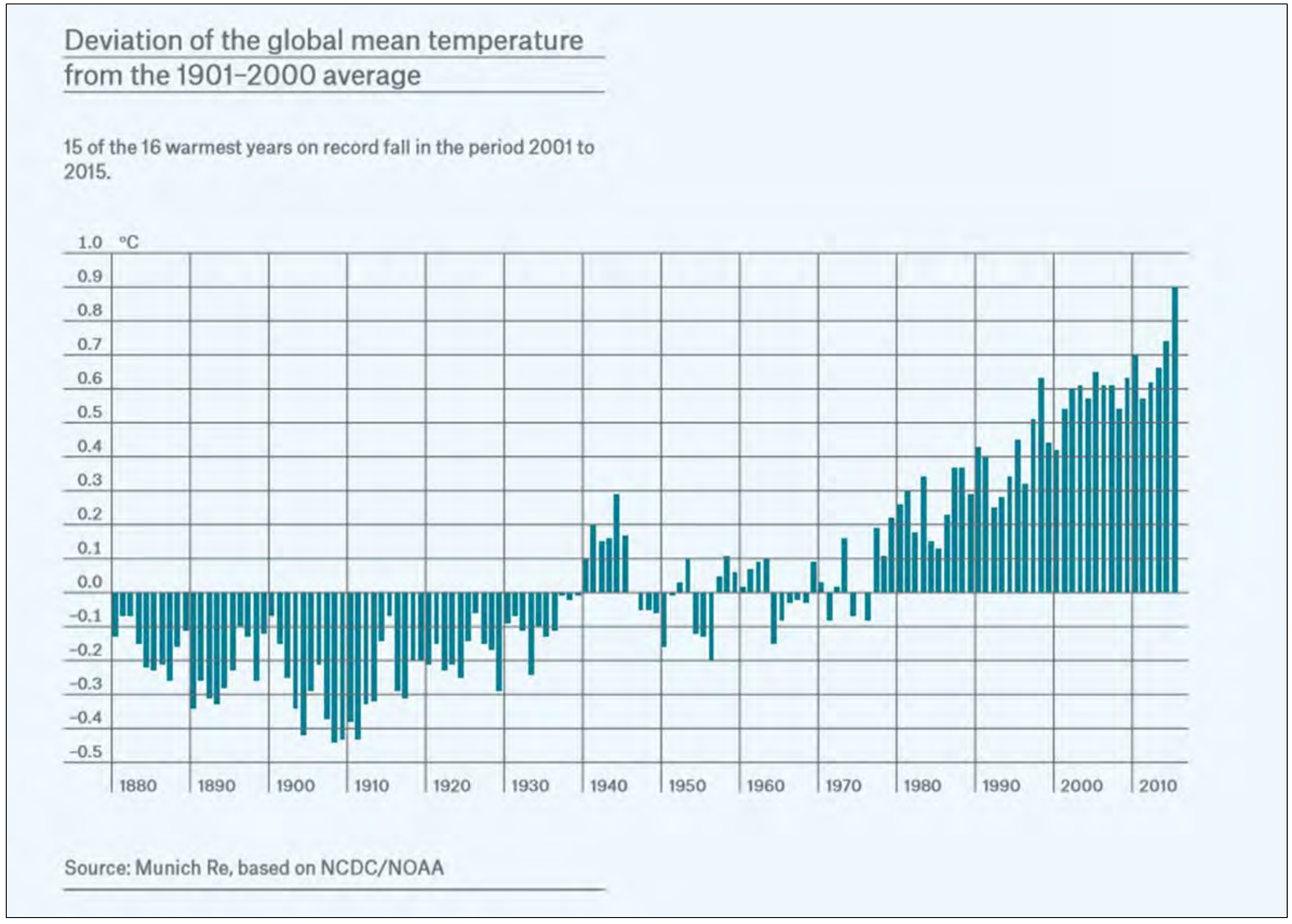
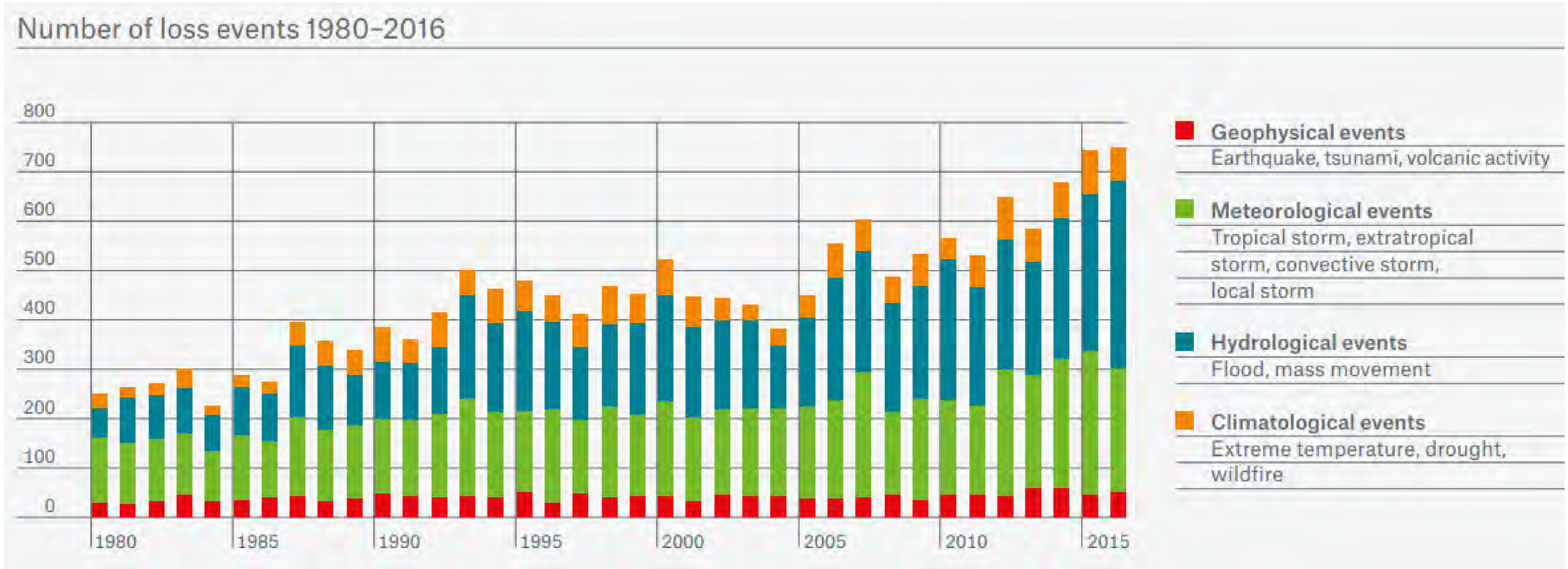


Figure 1 US National Oceanographic and Atmospheric Administration

Global Mean Temperature Deviation



Loss Events, Correlated with Temperature Deviations



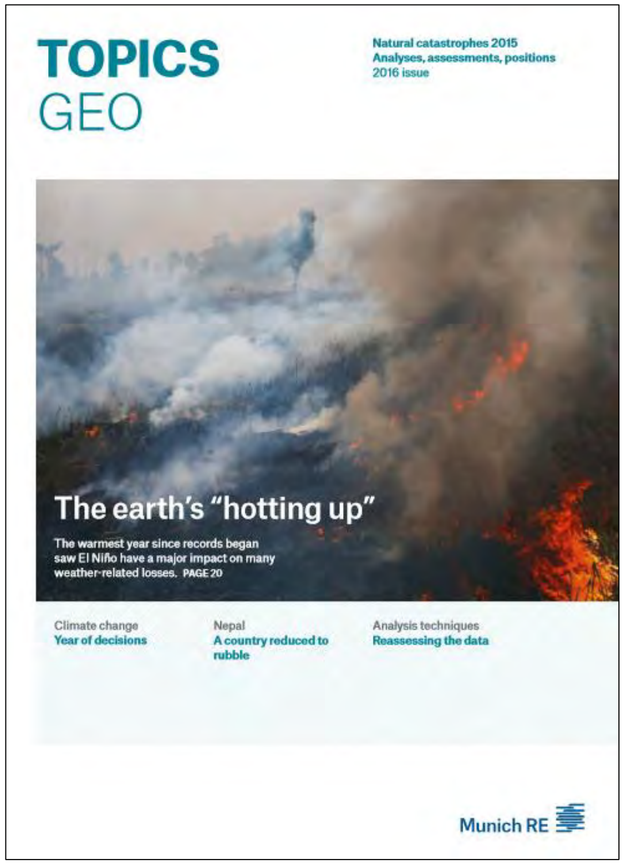
Source: Munich RE

Changing risk profile – Increase in loss events

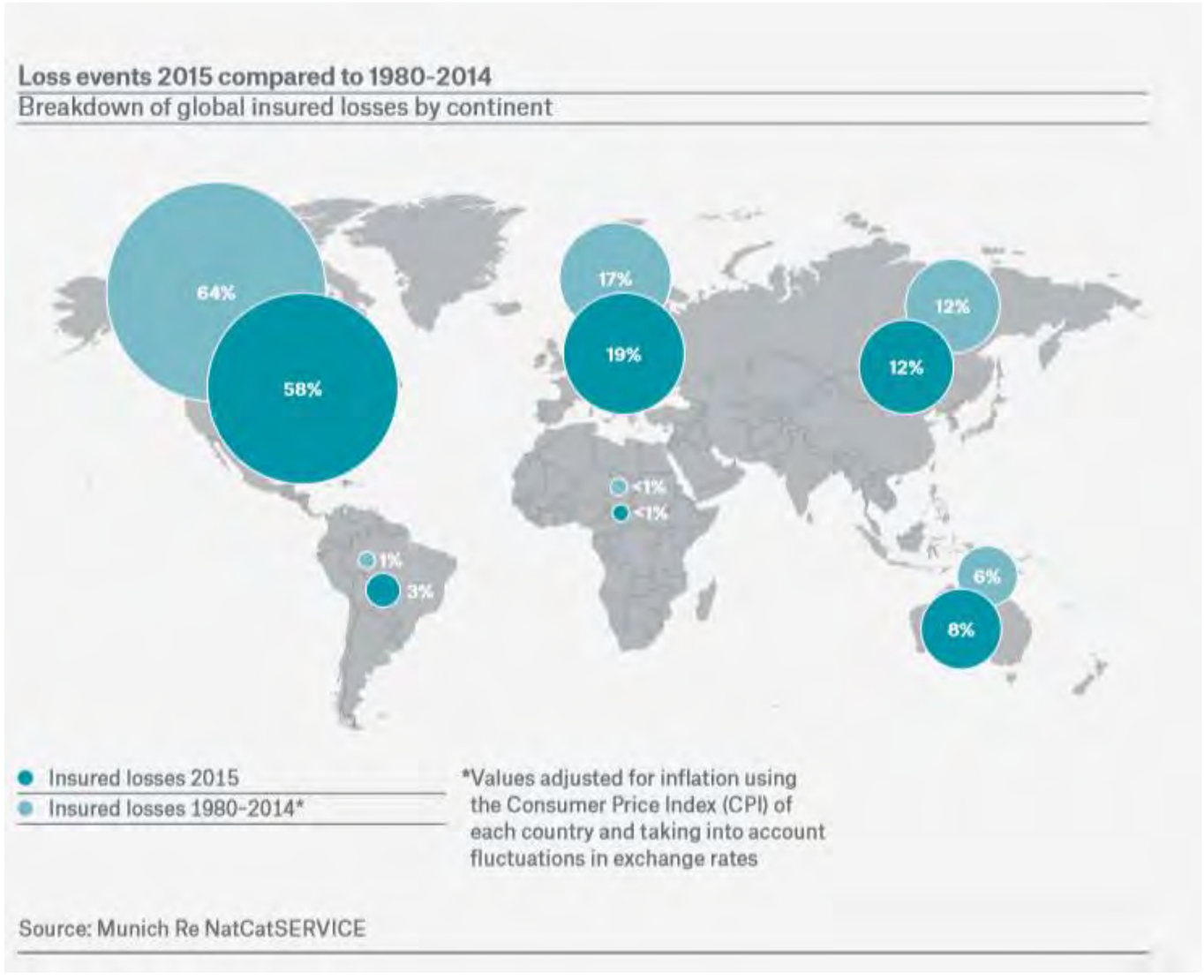
Government and insurers need to work together

Costs of natural disasters on the economy will skyrocket in the next few years

New approaches to mitigation and pre-disaster investment urgently needed



In Global Re-Insurance Terms – Australia accounts for 2% of the market, but 8% of the losses:



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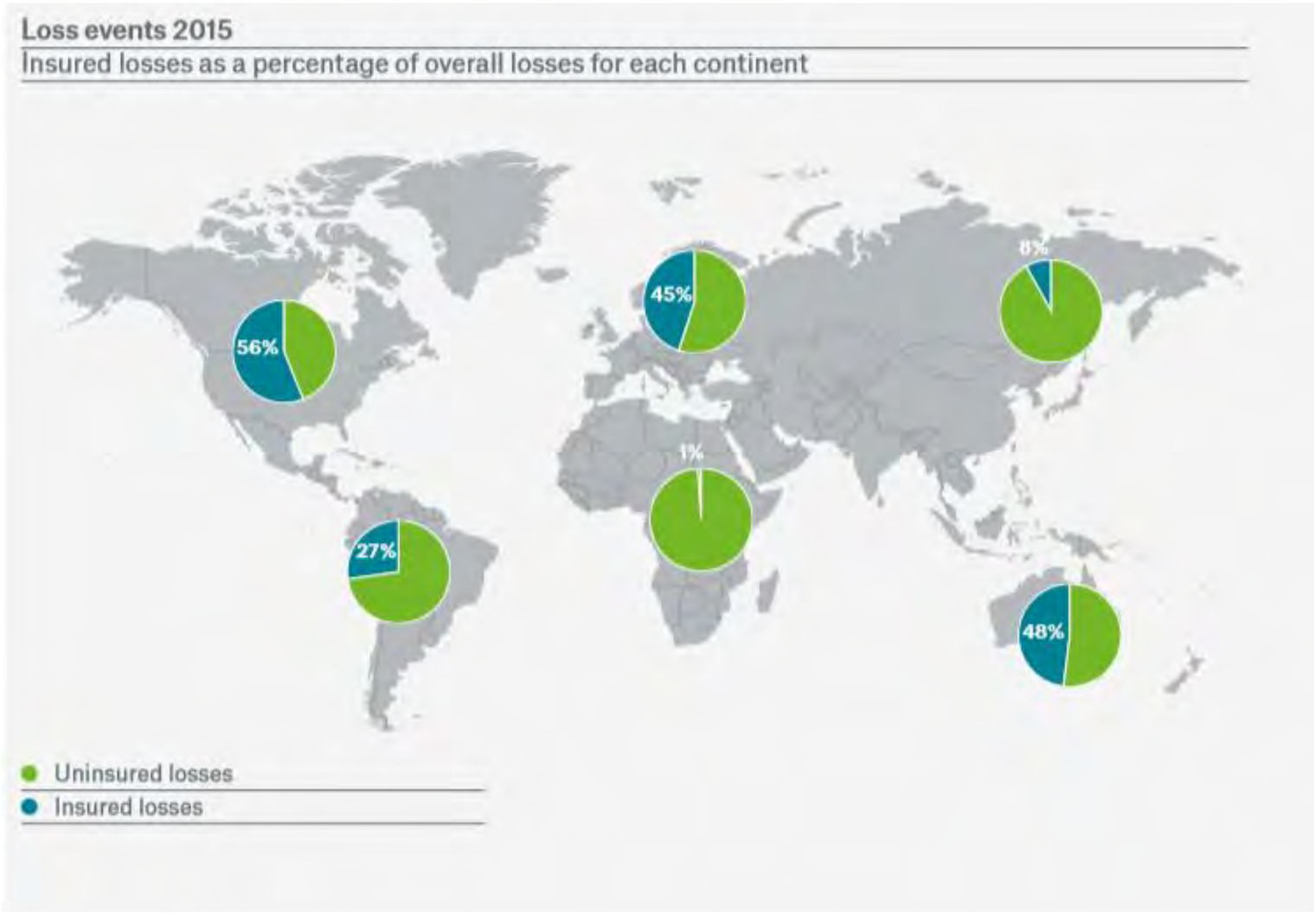
Our insured assets are a relatively high proportion of the total value of assets:



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ICA Catastrophe Database

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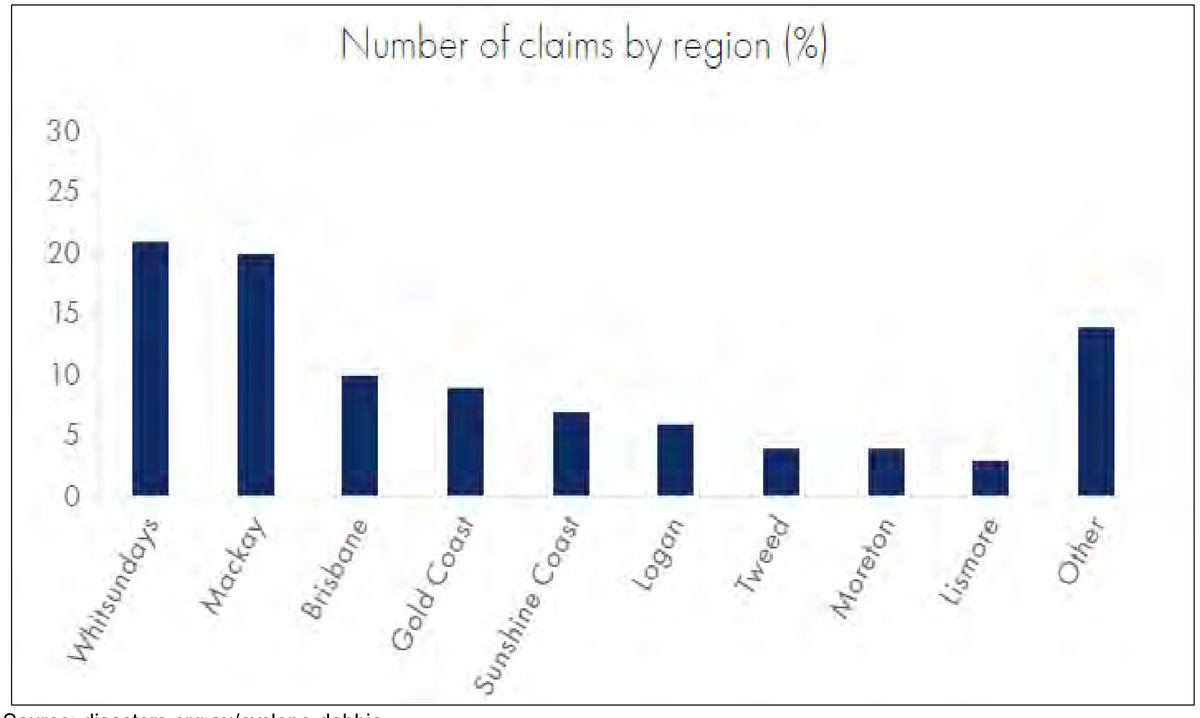
Historical Catastrophe Database 1967 - Present Day Welcome to the revised Historical Catastrophe Database, recording data from the ICA on disaster events that have occured over the last 50 years in the Australian market. This database has recently undergone a significant review and upgrade, in order to fill in gaps in knowledge and to ensure that the most accurate information can be presented. The review included accessing ICA's archives to collect historical information previosuly only available in hard copy, in staff diaries, reports, member infromation submitted to ICA and collected media articles. Events that were not declared a Catastrophe have been included where records of the event have been found in ICA archived documents.

CURRENT STATUS: Updated 28 July 2017
Issues / Questions / Input to Provide: Email admin@icadataglobe.com

ICA REF Number	ICA CAT Number	ICA / Cresta Zone(s) 1-49	State	Event Type	Event Name	Event Description	Esstimated Loss Value (Original)	Event Start Date	Event End Date	Estimated Loss Value (2015)	ICA Comments
2017			✓	*REVIEWED 28/7/2017*							
201703	CAT173		QLD, NSW	**Cyclone, storm, storm surge, flooding**	**Cyclone Debbie**	Cyclone Debbie struck the QLD coast in the vicinty of Airlie Beach, Queensland, on Tuesday 28th march 2017, at midday as a Category 4 Severe Tropical Cyclone. Over the next 7 days storm and flood damage from the cyclone Debbie system continued along the eastern seaboard with storm and flood related damage occuring as far south as the NSW/VIC border. There are an estimated 65,879 odged claims as at 6th July 2017 which inlcude: - 33,366 Residential Building Claims, (61% closed) - 20,083 Contents Claims, (59% closed) - 4,449 Domestic Motor Claims, (76% closed) - 518 Domestic Other (Majority caravan) - 5,566 Commercial Property Claims - 703 Commercial Motor Claims - 1,081 Business Interruption Claims - 112 Commercial Other see www.disasters.org.au for regional breakdowns (to be updated on 18 July 2017).	$1,403,000,000	27/03/2017	10/4/2 017		OPEN Claims Footprint http://icadata.link/CAT173 (DataGlobe Users Only)
201702	CAT172		NSW (Sydney, Illawarra)	**Hail**	**Sydney Storm**	On Saturday, 18 February, a large storm impacted Sydney and parts of the Illawarra region. Significant number of claims for hail damage to vehicles and roofs, including incidental claims for contents damage. Lodged claims include: - 15,201 Residential Building Claims, - 5,466 Contents Claims, - 28,311 Domestic Motor Claims, - 1,108 Domestic Other - 799 Commercial Property Claims - 2,666 Commercial Motor Claims - 48 Business Interruption Claims - 121 Commercial Other	$512,000,000	18/02/2017	18/02/2017		CLOSED
201701	CAT171		NSW	**Bushfire**	**NSW Bushfires**	Over the period 12 Feburary to 18 February up to 100 bushfires occured throughout NSW. The most devestatiing bushfire occured to the East of Dunedoo, destroying an estimated 26 homes and causing significant equipment, fencing and livestock losses to rural properties. A further 11 homes were destroyed and 12 damaged in a fast moving fire near Carwoola on 17 February. Approximately 7 other homes were destroyed in other bushfires across NSW during the period.	$33,500,000	12/02/2017	18/02/2017		CLOSED
2016	↴		✓	*REVIEWED 21/7/2017*							
201623	CAT 165		Eastern SA, VIC, Western NSW	**Hail Storm**	**November Hailstorm**	On 11 November 2016, a severe storm/hailstorm struck Victoria's far North West, as well as parts of Eastern South Australia and Western New South Wales. The storm which brought hail the size of golf balls, strong winds with gusts of almost 100km/hour, and heavy rain (with Mildura receiving 29mm of rain in 15min) was likened to a mini tornado. Typical hail and storm damage has been reported to residential and commercial buildings, as well as a significant number of vehicles. Estimated Value $467 million (71% Domestic, 29% Commercial). Lodged Claims 49,456 (88% Domestic, 12% Commercial).	$467,000,000	11/11/2016	11/11/16		CLOSED
201622	Undeclared		NSW	**Bushfire**	**NSW Bushfires**	On 6,7,8 November upto 21 bushfires were active along the NSW coast. Very limited property damage was reported. The event was not declared a catastrophe for insurance purposes. The insured loss estimate is based upon market reporting from approximatley 50% of insurers within the footprint, modelled to estimate the industry loss estimate.	$1,000,000	06/11/2016	08/11/16		

Cyclone Debbie

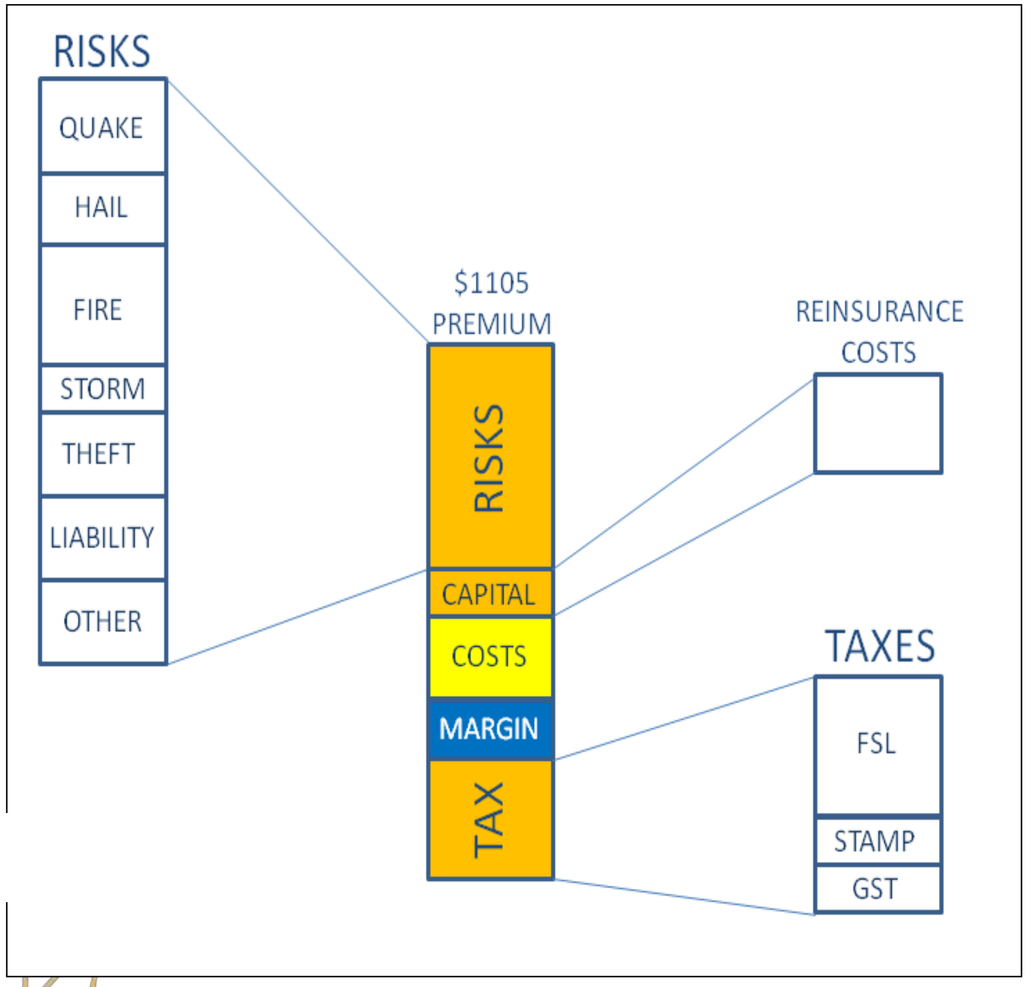
- Category 4 Tropical Cyclone
- February / March 2017
- $1.4 Billion – Still open
- 57% domestic claims, 43% commercial claims
- 33,366 Residential building claims

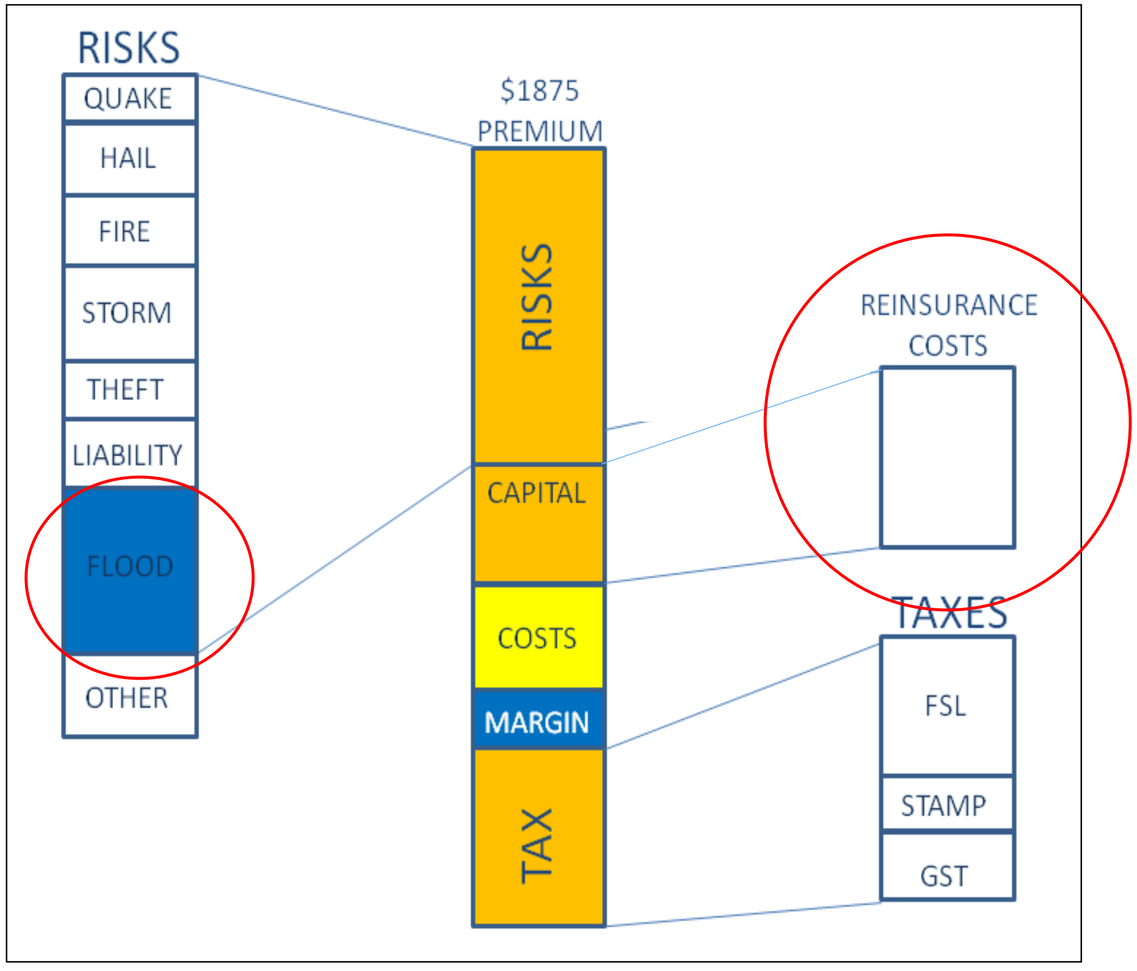


Source: disasters.org.au/cyclone-debbie

Changing risk profile – more money at risk per square km

Premiums: Increasing over time due to increase in risk





Australian averages (per week):

- $223 - current housing costs.
- $193 - transport costs.
- $161 - recreation costs.
- $59 - household furnishing & equipment.
- $44 - clothing & footware.

Australian spending habits | ASIC's MoneySmart
https://www.moneysmart.gov.au/.../budgeting/spending/australian-spending...

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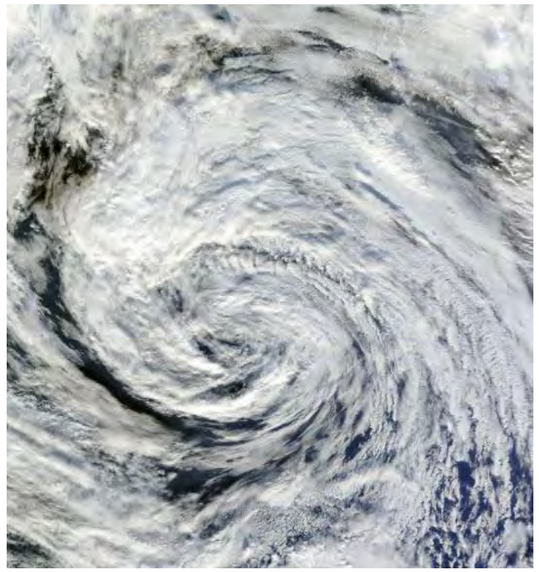

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Typically, if a house ignites in a bushfire it results in total loss:

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Storms; Cyclones are retaining their strength for longer once they hit shore:

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For every metre of water ingress into a home it costs approx. $100,000 in damage reparations:

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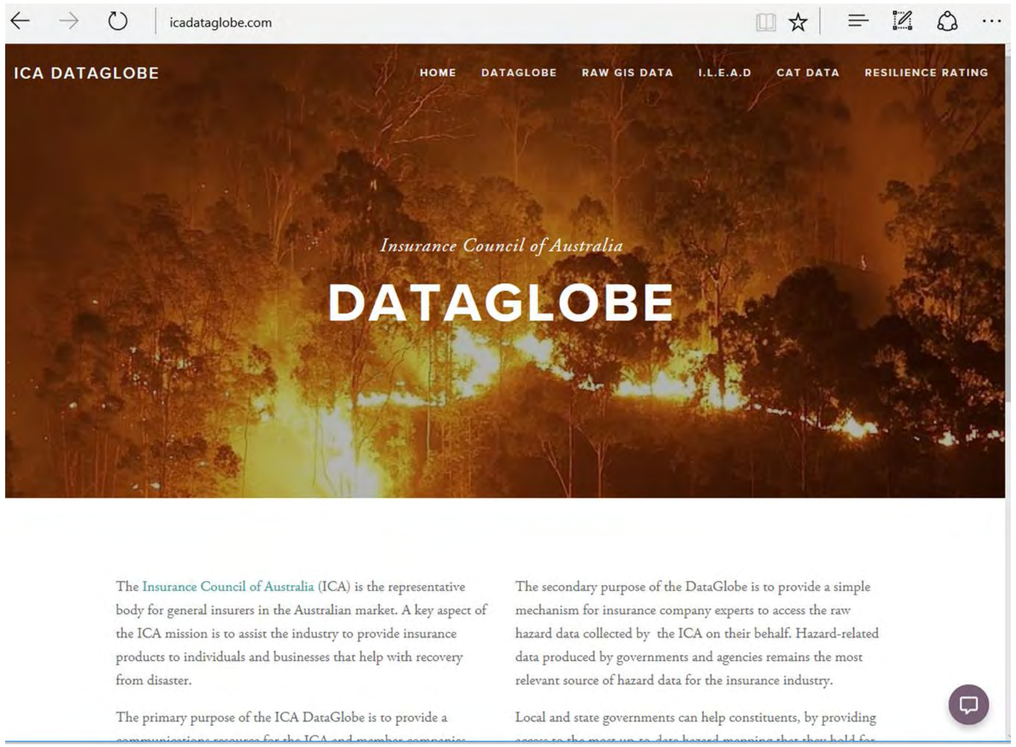
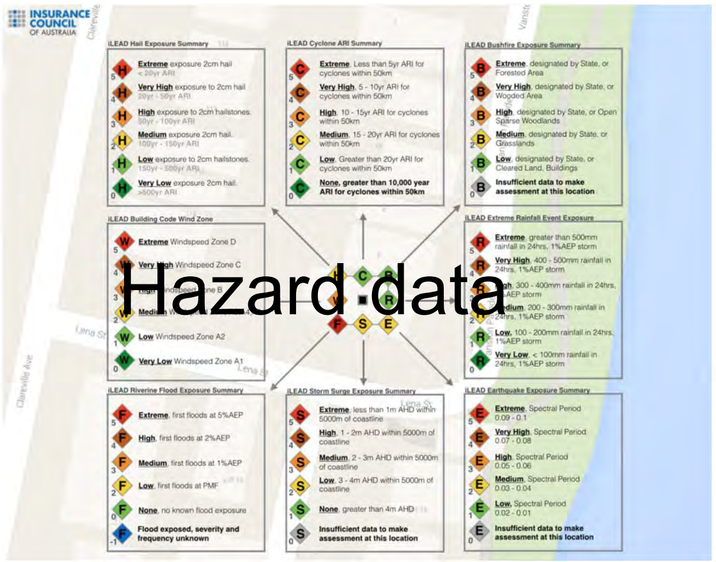
The Resilience Program

- To produce a verified and robust methodology for collating current and future knowledge on resilience and durability of Australian residential properties;
- To present resilience information and guidance in a format that is easy for users to access, use and understand;
- To drive the resilience agenda with the aim of creating a more resilient built environment for Australian communities.



The Building Resilience Rating Tool: Resilience based decision making



Resilience Score

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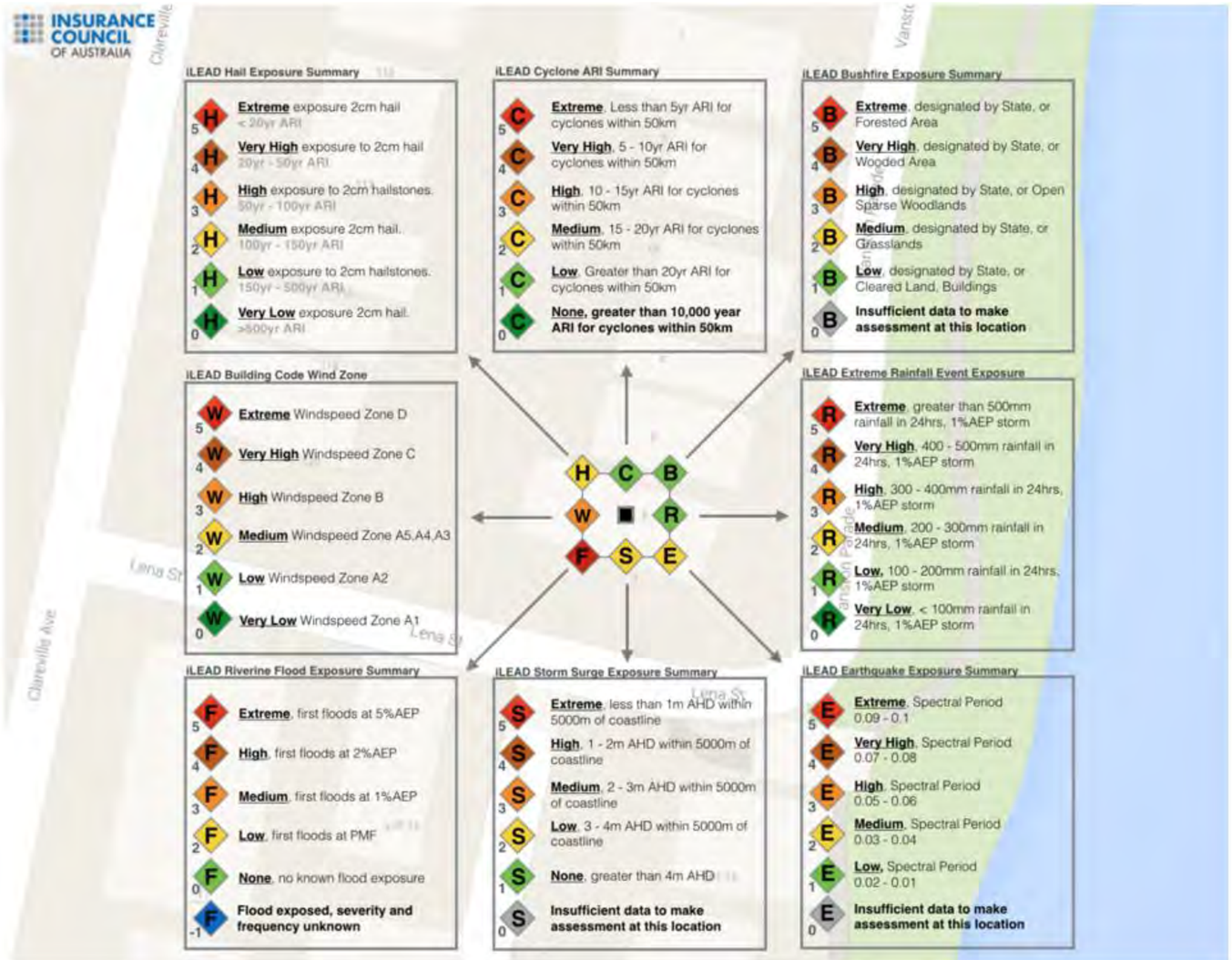
Dataglobe includes hazard mapping for flood, bushfire, storm, storm tide and cyclone



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Insulation Internal Wall

The following products are related to Insulation Internal Wall. Below each as a list of hazards that this product has been tested against. Click on the hazard for more information about how this product relates to this hazard.

Rockwool

Inundation

Inundation - Freshwater — PRODUCT RESILIENCE RATING 3

Storm

Expanded Polystyrene

Inundation

Inundation - Freshwater — PRODUCT RESILIENCE RATING 4

Storm

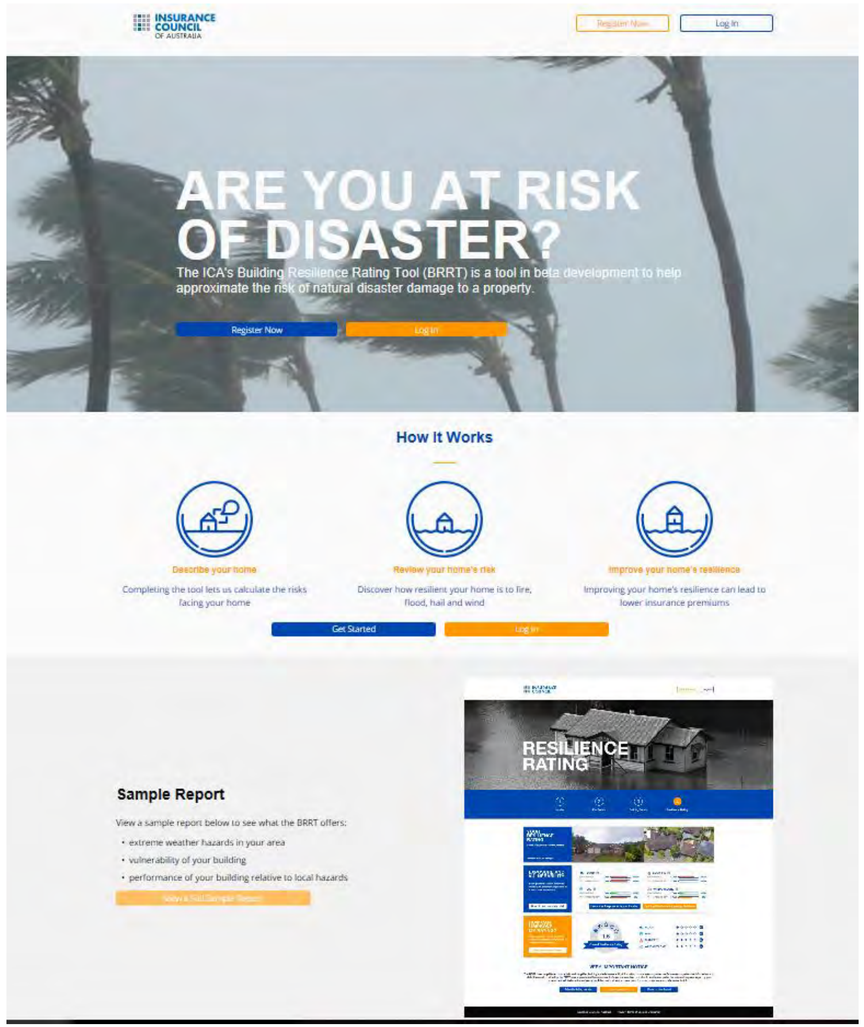
Glasswool

Inundation

Inundation - Freshwater — PRODUCT RESILIENCE RATING 2

www.resilient.property

The Building Resilience Rating Tool – BRRT – is at the centre of the resilience program to drive behavioural change. Connecting the measured resilience of homes to insurance premiums.



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BUILDING RESILIENCE

Assess local hazards and how your building may perform when they occur

Register Now | Log In

How It Works

Describe your home

Completing the tool lets us calculate the risks facing your home

Review your home's risk

Discover how resilient your home is to fire, flood, hail and wind

Improve your home's resilience

Improving your home's resilience can lead to lower insurance premiums

Get Started | Log In

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Register Now | Log In

SIGN UP

Email address

Password (8 characters minimum)

Password confirmation

I have read and accept the Disclaimer, Privacy Policy and Terms of Use

Sign up

Already have an account?
Log in

Didn't receive confirmation instructions?

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Register Now | Log In

LOG IN

joel@edgeenvironment.com.au

.....

Remember me

I have read and accept the Disclaimer, Privacy Policy and Terms of Use

Log in

Don't have an account?
Sign up

Forgot your password?

Didn't receive confirmation instructions?

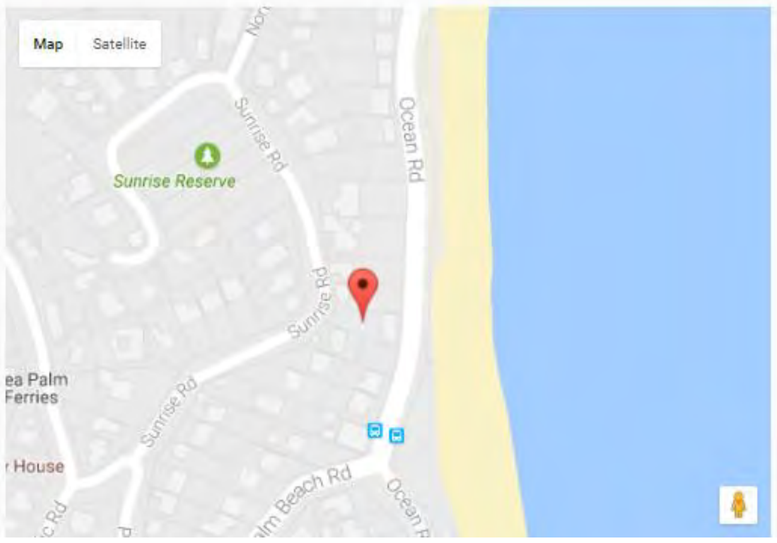
LOCATION

Please enter your property address

1 Plot Location — 2 Plot Details — 3 Building Details — 4 Results

13A Ocean Road, Palm Beach, New South Wales, Australia

SUBMIT



PLOT DETAILS

Where do I find this information?

1 Plot Location — 2 Plot Details — 3 Building Details — 4 Results

1 Plot Details

URBAN DENSITY

Urban density considers how shielded or exposed your property is to strong winds/cyclones.

Suburban

Rural sheltered

Rural exposed

City

SITE SLOPE

Slope (or gradient) is the measure of how steep the plot on which the house sits is. The plot slope can magnify the wind risk. The most important detail is the average gradient from bottom to top

② Additional Structures +

EXTERNAL GAS BOTTLE

Combustible structures close to your property can significantly increase risk to your house if they ignite during a bushfire. This primarily concerns rural properties

None

External gas bottles

DETACHED STRUCTURES

Combustible structures close to your property can significantly increase risk to your house if they ignite during a bushfire. This primarily concerns rural properties.

No additional structures

Detached garage, shed or greenhouse within 6m of house

FIREWOOD

Firewood near the house can significantly increase the risk during a bushfire

None

Firewood storage within 20m of house

FENCES, SCREENS, TRELLIS

BUILDING DETAILS

Where do I find this information?

1 Plot Location — 2 Plot Details — 3 Building Details — 4 Results

1 General Building Details

STOREY

How many storeys does your building have? Houses higher than a single storey are more expensive to repair. If your house has more than three storeys, select "3 or greater"; the result will still be accurate.

1 | 2 | 3 or greater

BUILDING CONDITION

Building condition is a guage of how well a

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

② Roof Details +

ROOF SHAPE

The shape and complexity of your roof can have a strong influence on its response to extreme weather. Identify the closest match to the majority of your roof.


Hip


Gable


Flat


Other

ROOF PITCH

How steep is your roof? Roof pitch is the average angle of the slope of your roof against horizontal. Roof pitch can affect how well your roof performs during storms with intense rainfall and wind.

0 to 10

11 to 20

21 to 45

> 46

ROOF COVERING

Perhaps the most important element of your building. The roof protects the rest of the building and all of its contents. The be considered a resilient roof, the material used must be appropriate for the hazards expected in your location. A sound choice of roof material will have a large impact on your ability to withstand storms, hail and bushfires.

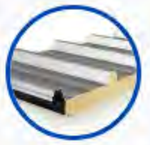

Zinc aluminium coated corrugated steel


Colour coated corrugated steel roofing


Slate


Concrete tile


Terracotta tile


Insulated Sandwich Panel with Coated Steel


Composite and Rubber Shingle Roofing


Steel Tiles


Other

③ Walls

EXTERNAL WALL CLADDING

The qualities of the materials used for the skin of you house are fundamental to how well it will perform during flood, bushfire and cyclones. Choose the material listed here that makes up the majority of your exposed external walls.


Brick cladding


Stone cladding


PVC cladding


Aluminium cladding


Galvanised steel cladding


Hardwood weatherboard


Softwood weatherboard


Fibre cement weatherboard


Concrete in situ


Zinc


Copper


Rendered


Insulated Sandwich Panel with Coated Steel


Cross laminated timber

INTERNAL LININGS

Internal linings are the materials we select to finish our walls. A common internal lining in a modern house is plasterboard. In double brick houses it is common that plaster is applied directly to the walls to give them a smooth finish. Internal linings are selected for their aesthetic and acoustic qualities. Internal linings are a factor in the calculation of your house's Resilience to Flood and Wind/Cyclone.


Plasterboard


Brick


Plaster


Fibre cement sheet


Block


Stone

④ Ground Floor +

FLOOR FINISHES

Floor finishes are building elements that takes part in the calculation of your house Resilience to Flood, and Wind/Cyclone.

Polished concrete

Ceramic tiles

Timber feature flooring

Interlocking panel flooring

Broadloom carpet

Carpet tiles

Hardwearing floor covering

GROUND FLOOR STRUCTURE

Ground floor structure is the what sits between the floor you can stand on and the ground under the house.

Concrete slab on ground

Suspended timber structure

Suspended steel structure

Suspended concrete

GROUND FLOOR ENCLOSURE

None

Timber

Steel

Masonry

Fibre cement sheet

RESILIENCE RATING

1 Plot Location — 2 Plot Details — 3 Building Details — 4 Results

YOUR RESILIENCE RATING

13A Ocean Road, Palm Beach, New South Wales, Australia

Generated 16/5/2017, 4.16pm

EXPOSURE AND VULNERABILITY

FLOOD

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

HAIL

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

BUSHFIRE

WIND/CYCLONE

YOUR RESILIENCE RATING

13A Ocean Road, Palm Beach, New South Wales, Australia

Generated 16/5/2017, 4.16pm

EXPOSURE AND VULNERABILITY

FLOOD

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

HAIL

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

BUSHFIRE

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

WIND/CYCLONE

EXPOSURE LOW HIGH

VULNERABILITY LOW HIGH

How did we calculate this?

Learn about exposures in your location

Learn more about the resilience of building materials

MY RESILIENCE RATING

3.4

Overall Resilience Rating

View My Recommendations

FLOOD	★★★★★	5.0
HAIL	★★☆☆☆	2.1
BUSHFIRE	★★½☆☆	2.3
WIND/CYCLONE	★★★★☆	4.1

RECOMMENDATIONS

1 Plot Location — 2 Plot Details — 3 Building Details — 4 Results

13A Ocean Road, Palm Beach, New South Wales, Australia

Generated 16/5/2017, 4.16pm

The following table of recommendations details the best material for each building element for each hazard, however the recommendations may not necessarily be practical for your building.

	Your house description	Best element to resist flood	Best element to resist hail	Best element to resist wind and cyclone	Best element to resist bushfire
Building condition	7				
Ceiling lining	Plasterboard	Concrete in situ	Concrete in situ	Concrete in situ	
Decks, patios and verandahs	Stone				Concrete
Door bushfire shutters	None				Bushfire shutter BALFZ
Door cyclone shutters	None			C4 Cyclone rated	
External door	Timber door			PVC framed glass door	Aluminium framed glass door
External rafters and beams or soffits openings	No			You have the best material/option	You have the best material/option
External stairs	Stone				Concrete
External wall cladding	Stone cladding	Brick cladding		Brick cladding	Concrete in situ
Floor finishes	Timber feature flooring	Hardwearing floor covering		Hardwearing floor covering	
Floor height	0.5	Higher than the Probable Maximum Flood			
Garage door	None			You have the best material/option	
Ground floor enclosure	Masonry				Steel
Ground floor structure	Concrete slab on ground				You have the best material/option
Guttering	Painted steel		No gutters		Aluminium
Internal linings	Plasterboard	Block		Block	
Internal wall coverings	Paint	None		None	
Position on slope	Bottom third			You have the best material/option	
Proximity to vegetation	Within 15m				No vegetation
Roof covering	Other		Composite and Rubber Shingle Roofing	Composite and Rubber Shingle Roofing	Zinc aluminium coated corrugated steel
Roof fastening	None		Cyclone 2	Cyclone 2	
Roof insulation	glasswool		None	None	
Roof pitch	0 to 10		21 to 45, > 46	21 to 45	21 to 45
Roof shape	Flat				
Roof structure	In situ concrete			Trussed roof framing timber	
Site slope	Flat			You have the best material/option	
Storey	2	1	1	1	1
Urban density	Suburban			City	

BUILDING RESILIENCE

Assess local hazards and how your building may perform when they occur

Register Now | Log In

How It Works

Describe your home

Completing the tool lets us calculate the risks facing your home

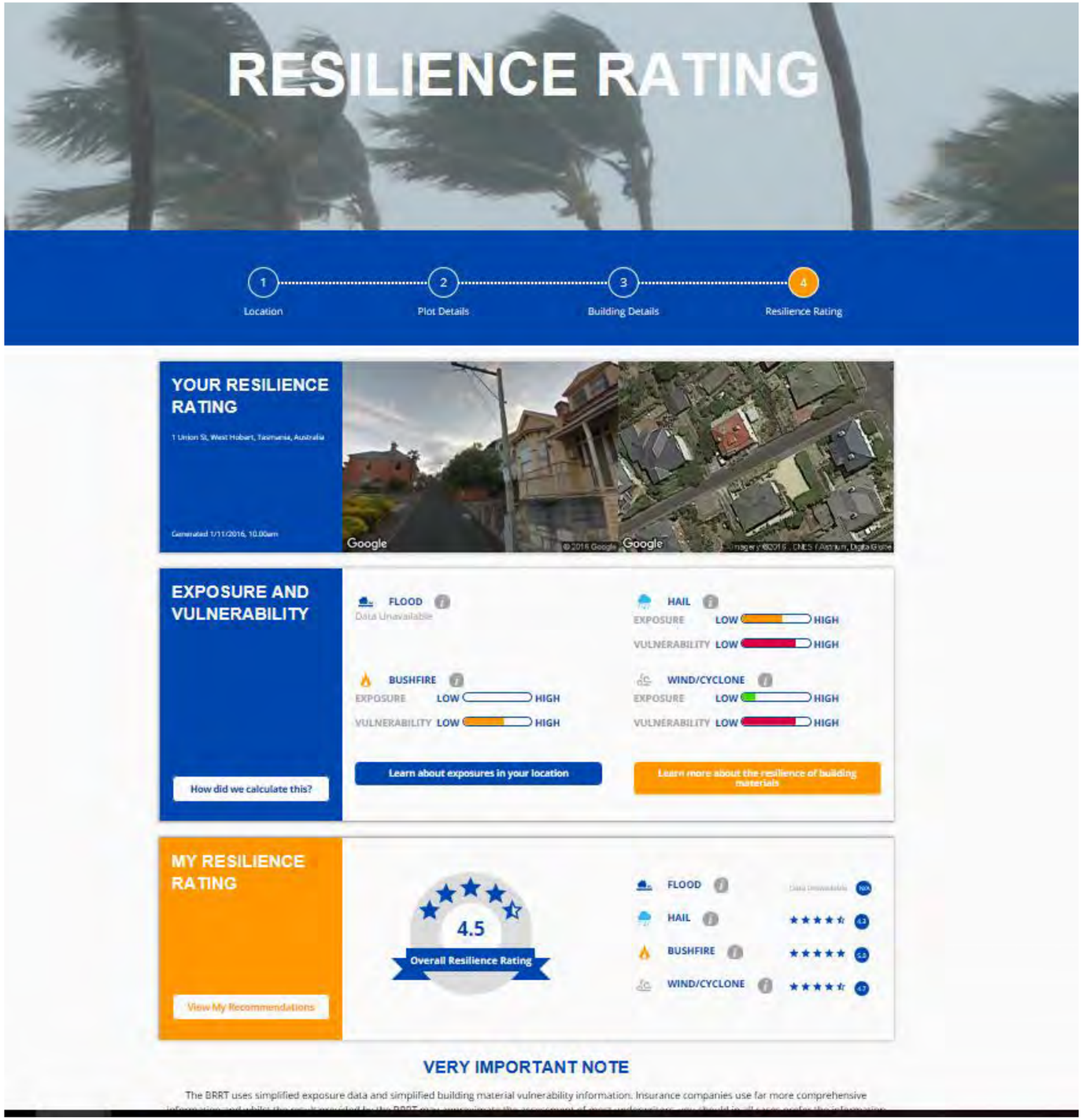
Review your home's risk

Discover how resilient your home is to fire, flood, hail and wind

Improve your home's resilience

Improving your home's resilience can lead to lower insurance premiums

Get Started | Log In



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Property Resilience & Exposure Program

Local Government and the insurance industry collaborating to build resilience and address insurance affordability

The Property Resilience and Exposure Program (PREP) is designed to collate data sources and develop an understanding of built environment resilience. Using the Building Resilience Rating Tool, this approach can start addressing insurance affordability and provide a helicopter view of how development controls may be impacting risk and resilience.

PREP provides a mechanism for local governments to:

- Engage with the insurance industry on insurance affordability
- Identify local issues that may be driving increases in insurance premiums.
- Consider the costs and benefits of specific mitigation options that might lead to constituents being able to access reduced insurance premiums following implementation.

PREP provides a mechanism for insurers to:

- Acknowledge the existing mitigation and adaptation that a local government has undertaken to modify and reduce the impacts of local hazards.
- Ensure that they are able to continue to provide cover in locations where hazards are perceived to exist.

To engage in PREP the first step is providing existing detailed hazard mapping to provide a more accurate representation of the risk in the LGA.

Building information on properties including building materials and plot information is then collated and collected by the local government. Both sets of data are processed by the Building Resilience Rating Tool and Resilience Maps are produced to show hot spots of vulnerability.

Detailed flood mapping

Building data

Resilience map

Join PREP and build resilience of your LGA
info@buildingresilience.org

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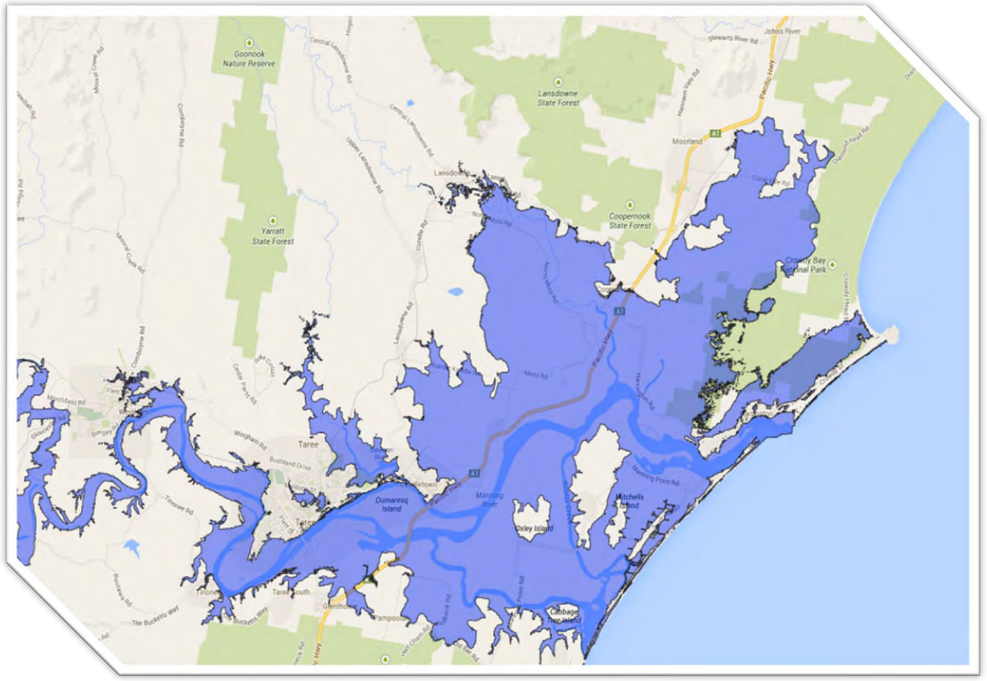
Property
Resilience &
Exposure
Program

Resilience context

Increasing losses and community awareness due to increasing intensity and frequency of extreme weather events

Development on more marginal areas such as flood plains and bush urban interfaces

More valuable assets, in higher density



Increasing risk for insurers, resulting in higher premiums for the community and increased risk for local governments who have a duty of care and possible legacy liability

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Property Resilience & Exposure Program

Resilience context

Increasing losses and community awareness due to increasing intensity and frequency of extreme weather events

Development on more marginal areas such as flood plains and bush urban interfaces

More valuable assets, in higher density

Increasing risk for insurers, resulting in higher premiums for the community and increased risk for local governments who have a duty of care and possible legacy liability

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Property Resilience & Exposure Program

How PREP works

Detailed Hazard Mapping

- Existing data as displayed in ICA Data Globe is illustrated to show local governments representative data used by the insurance industry to price risk
- Existing hazard data from local government (such as flood study mapping) provided to ICA to allow insurers to use best available hazard data for decision making

Building information (metadata)

- Local government collates existing data available on buildings to form database
- Local government collects additional data to develop better picture of resilience based on floor heights, construction materials and locations

Resilience Mapping

- Using hazard data and building information data, resilience maps are produced to show property resilience on a suburb scale
- Local governments and insurance industry engage on property resilience, best available data, and how insurance affordability can be addressed

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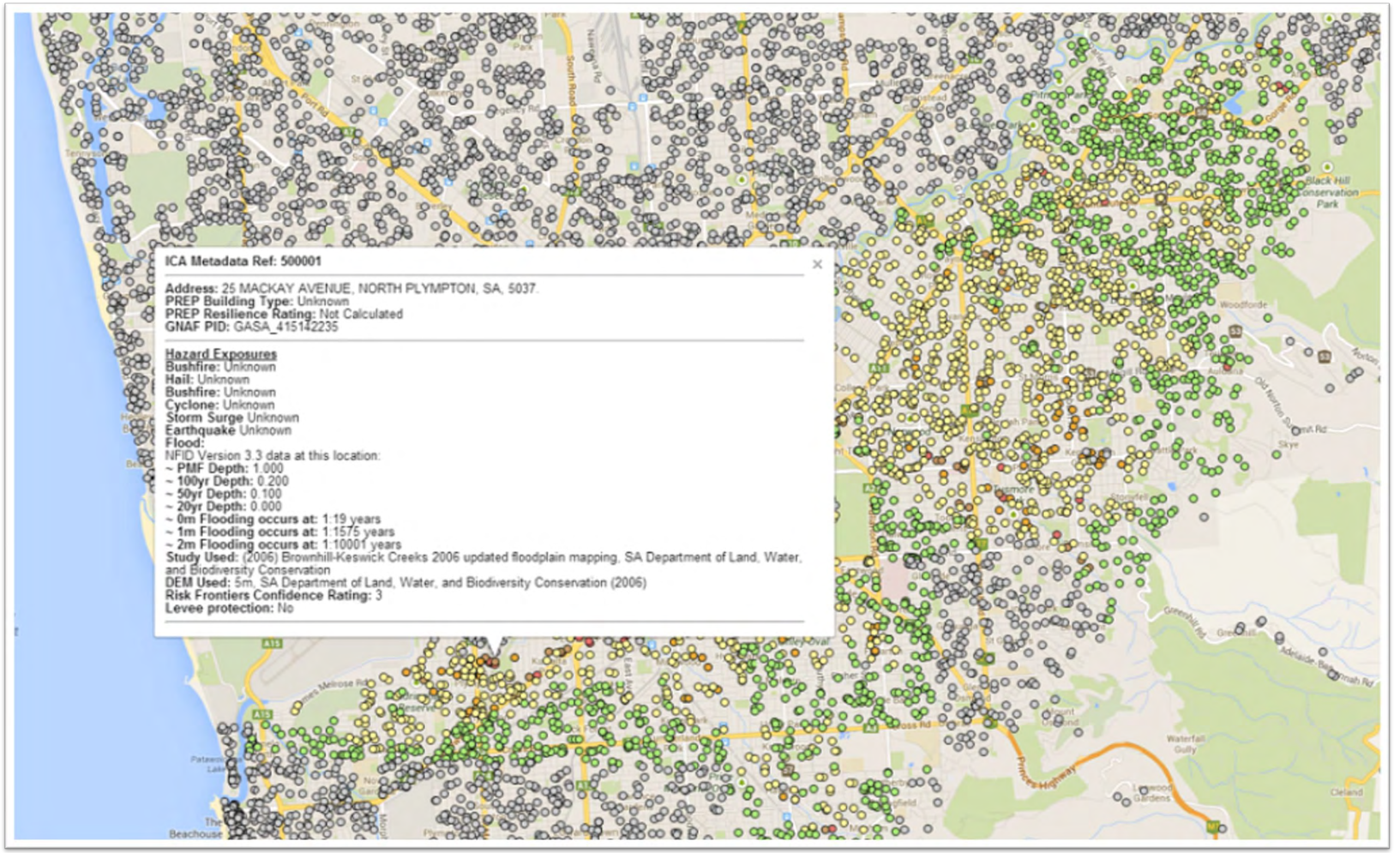
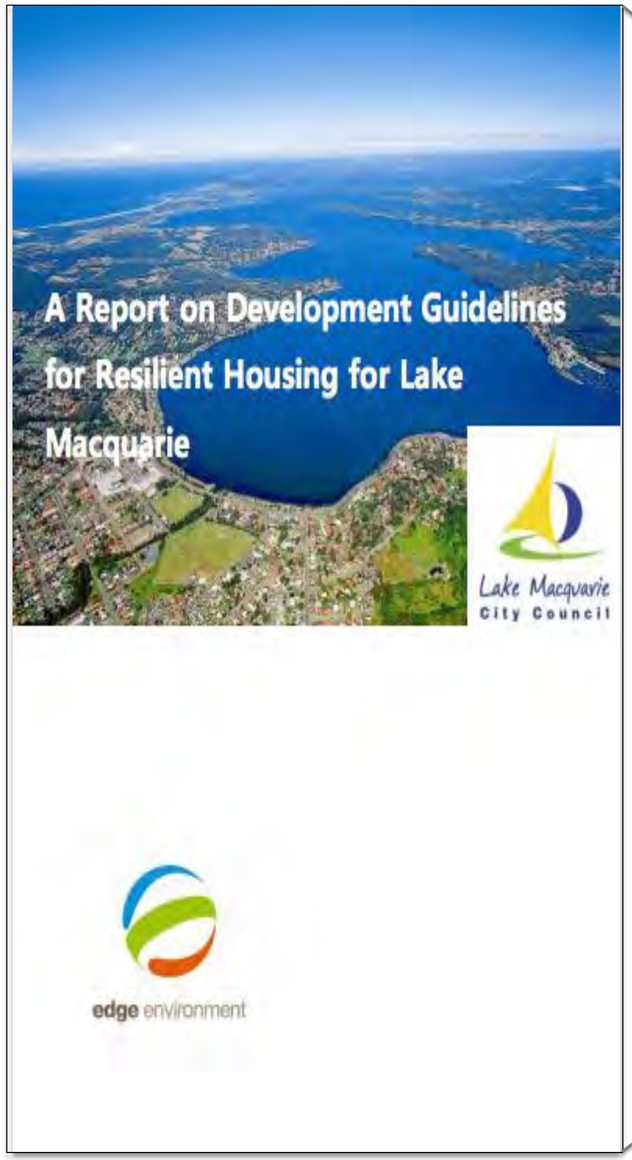
Property Resilience & Exposure Program

ICA Data Globe



Since 2012…Flood Resilient Guidelines incorporated into Development Control Plan



Principle 3. Raising of floor height: The principle of raising of floor height is based on the premise that the building floor level can be raised above the predicted flood and sea level risk point as they increase.		
Performance Criteria The principle may be achieved where:	**Suggested Acceptable Solutions**	**Considerations and Case Study**
P3.1 The building design facilitates raising of the floor level above the specified AHD.	**A3.1 The building is designed on bearer and joists on piers** The development is constructed using a bearer and joist construction on piers and the structure can be raised using jacks or a crane so that the pier and floor height can be increased. • A plan detailing how the building will be raised in future must be submitted with DA. **A3.1.1 The building is designed to allow for additional floor height by adding to existing floor with new material** In buildings where there is a concrete slab ground floor, and where it is anticipated that it may be possible to achieve a floor height above the risk level by increasing the floor height with an additional layer of concrete, ceiling, door and window heights must allow for additional height of floor. • DA submissions must be marked with allowance for additional floor height, and all future window and door heights must comply with DCP. **A3.1.2 Development independent of any external structure** • To achieve the principle of raising, the building must be structurally independent of any external structures such as garages, sheds, workshops. **A3.1.3 The building is designed with a floatable foundation that will allow the structure to become buoyant as flood waters rise** • The building is designed with a foundation that allows the house structure to lift from the foundation and become buoyant as flood waters rise while being guided on guide posts. There are currently two models for designing in this way. Appendix E provides further guidance.	• Lake Macquarie Yacht club case study (see section 5.1.4). • Where adaptation includes fill, wall cavity should include drainage. • Extra thickness of slab can mean greater bearing pressures on the foundation beneath. Floatable foundations have a specific set of considerations need to be factored into building and site design. See Appendix E for further guidance.
Performance Criteria	**Suggested Acceptable Solutions**	**Considerations and Case Study**
P3.2 Structural integrity: the	**A3.2 The building has specific jacking points/connections that are clearly**	• AS/NZS 1170.0 (Structural design

Conclusion

- A changing Climate is the new norm
- Cost of damage increasing
- Insurance Premiums going up
- Collaboration required with Local Government to drive resilient communities
- PREP is a mechanism to drive that change

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