



Natural Hazard Management and Climate Change Adaptation for Cities and Coasts in Australia

CLIMATE ADAPTATION FLAGSHIP

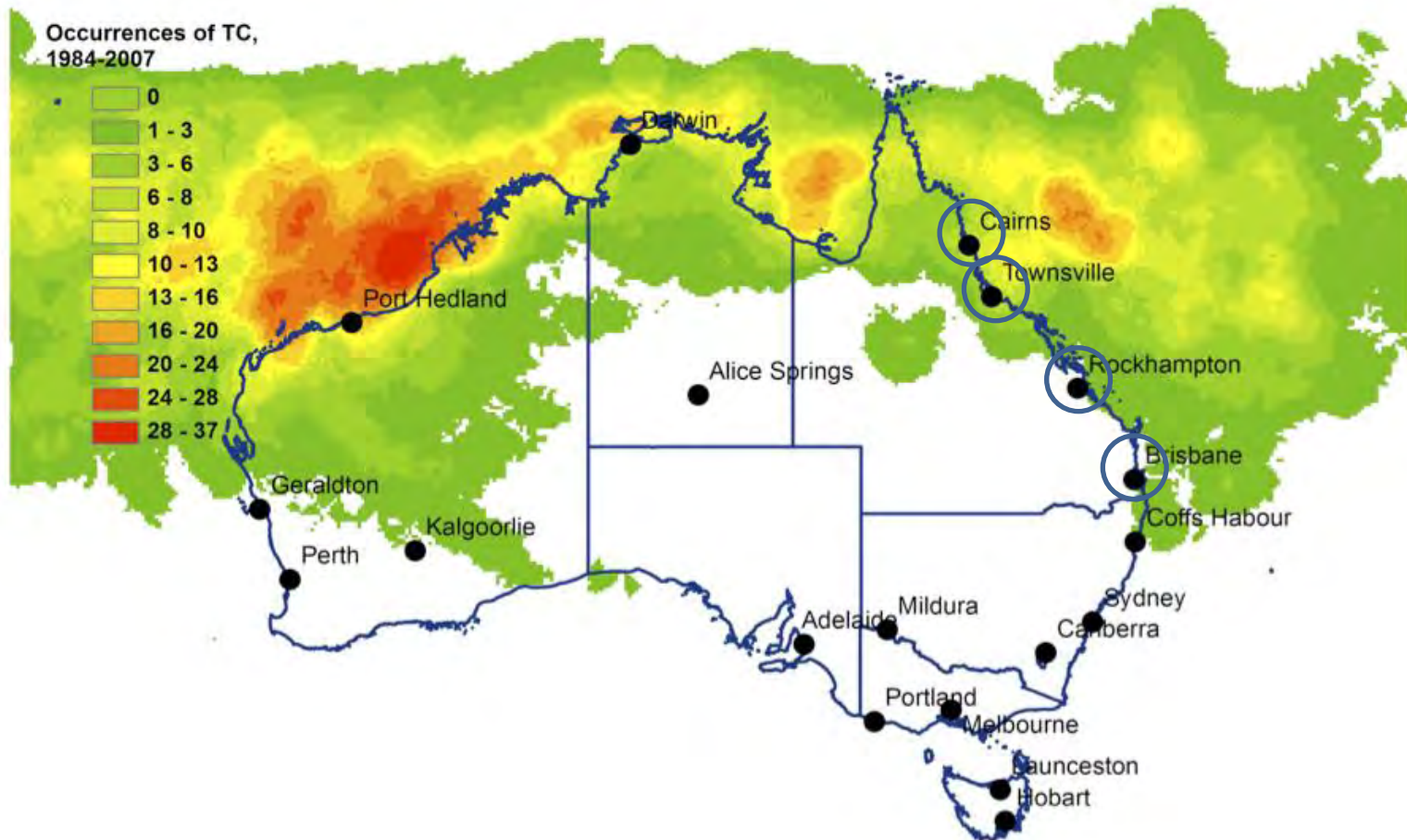
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Sustainable Cities and Coasts Theme, CSIRO Climate Adaptation Flagship
Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

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Areas Prone to Extreme Wind Events



Damage by 1974 Tracy Cyclones in Darwin, Australia



Damage by 2011 Yasi Cyclone in Queensland, Australia

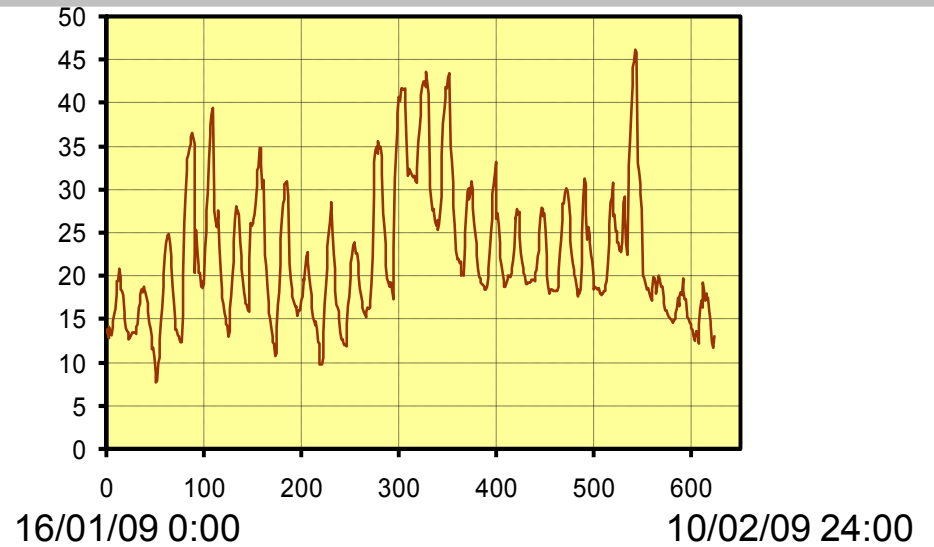


Damage by 209 Bushfire in Victoria, Australia

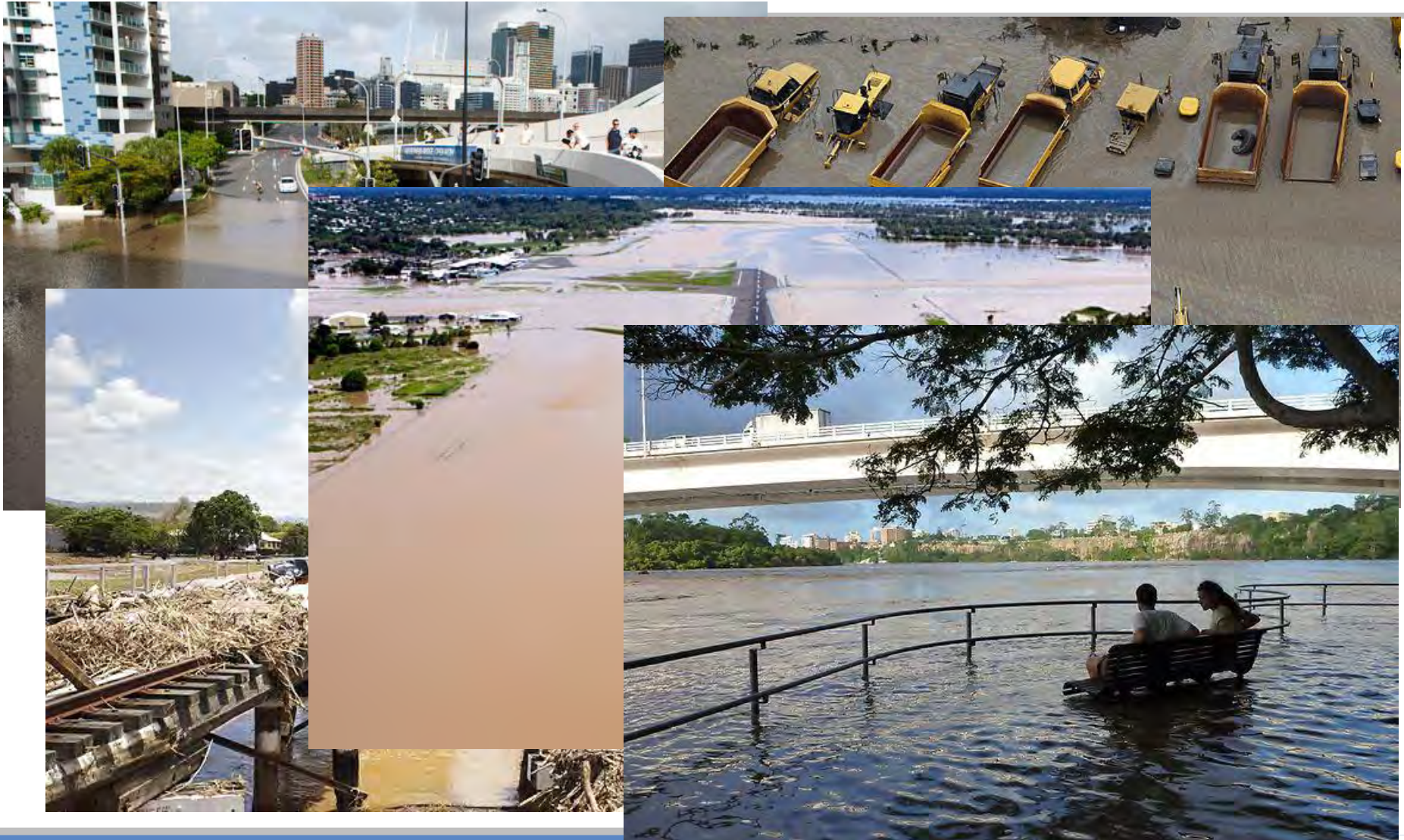


The Age

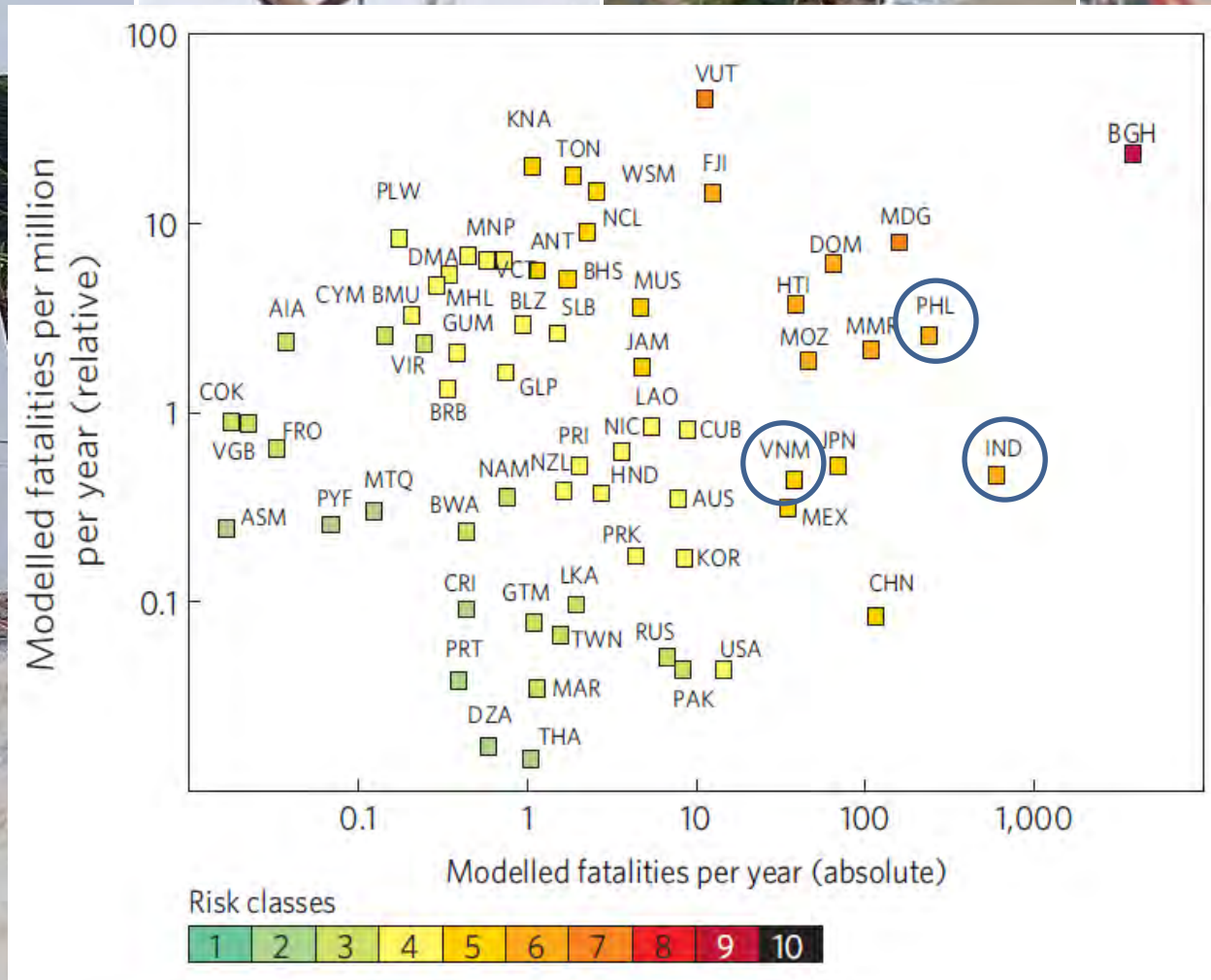
2009 Heatwave in Victoria, Australia



Damage by 2010-11 Flooding in Queensland, Australia



Risk to Disasters – A Overview cross Nations



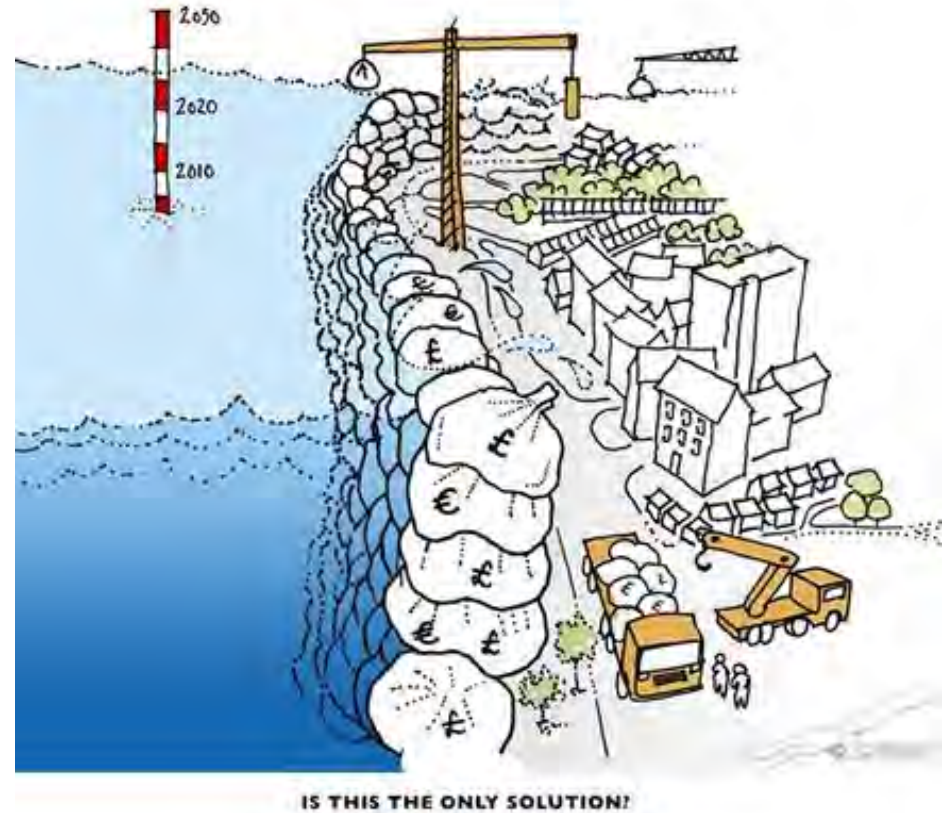
Coastal Living in Australia



Questions for Our Cities

How would climate change profoundly affect on our human settlement and cities?

How would our cities respond to the change by coping, transition and transformation?



Climate Adaptation

- Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.
- Adjusting natural and human systems to diminish system *vulnerability* to *uncertain* climate change in terms of increasing adaptive capacity and decreasing climate variability sensitivity.

Climate Adaptation for Urban and Coastal Settlement



Coastal Management Policy In Australia

(direction and guidance)

- Protects, conserves and enhances coastal resources
- Maintains natural physical coastal processes
- Ensures infrastructure and services facilitate having no adverse impacts on ecological values or physical coastal processes
- Ensures management actions on State or local government coastal land consistent
- Encourages public participation in the management of public coastal land
 - collaborative actions,
 - knowledge sharing,
 - community awareness and
 - monitoring, review and reporting of the effectiveness of management.



Coastal Planning in Australia

Coastal Area: Height of 10 metres
Australian Height Datum (AHD)

Objective:

- Set criteria for coastal activities, for land-use planning, coastal activities and development assessment ,
- Avoid the social, financial and environmental costs arising from the impacts of coastal hazards,
- Take into account the projected effects of climate change



Coastal Planning In Australia

Land-use planning

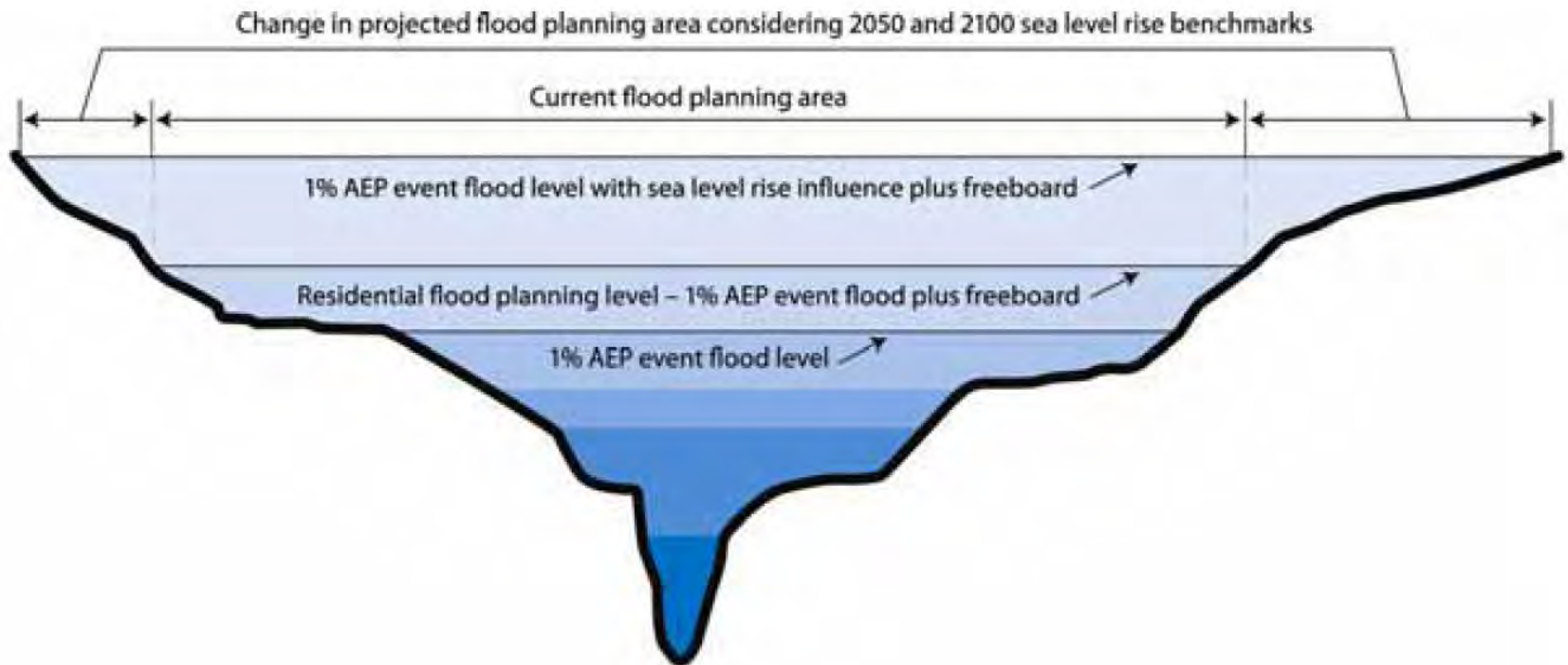
- Avoid or minimise the exposure of communities to the risk of adverse coastal hazard impacts, maximise the conservation of coastal resources
- Incorporate a coastal hazard adaptation strategy for urban localities within a high *coastal hazard area* by 2100
 - e.g. Hospital - 0.2% AEP
 - Power station – 0.2% AEP
 - water treatment plant – 0.5%AEP



Consideration of Climate Change

Climate Change

- Sea-level rise factor of 0.8 metres
- Increase in the maximum cyclone intensity by 10 per cent



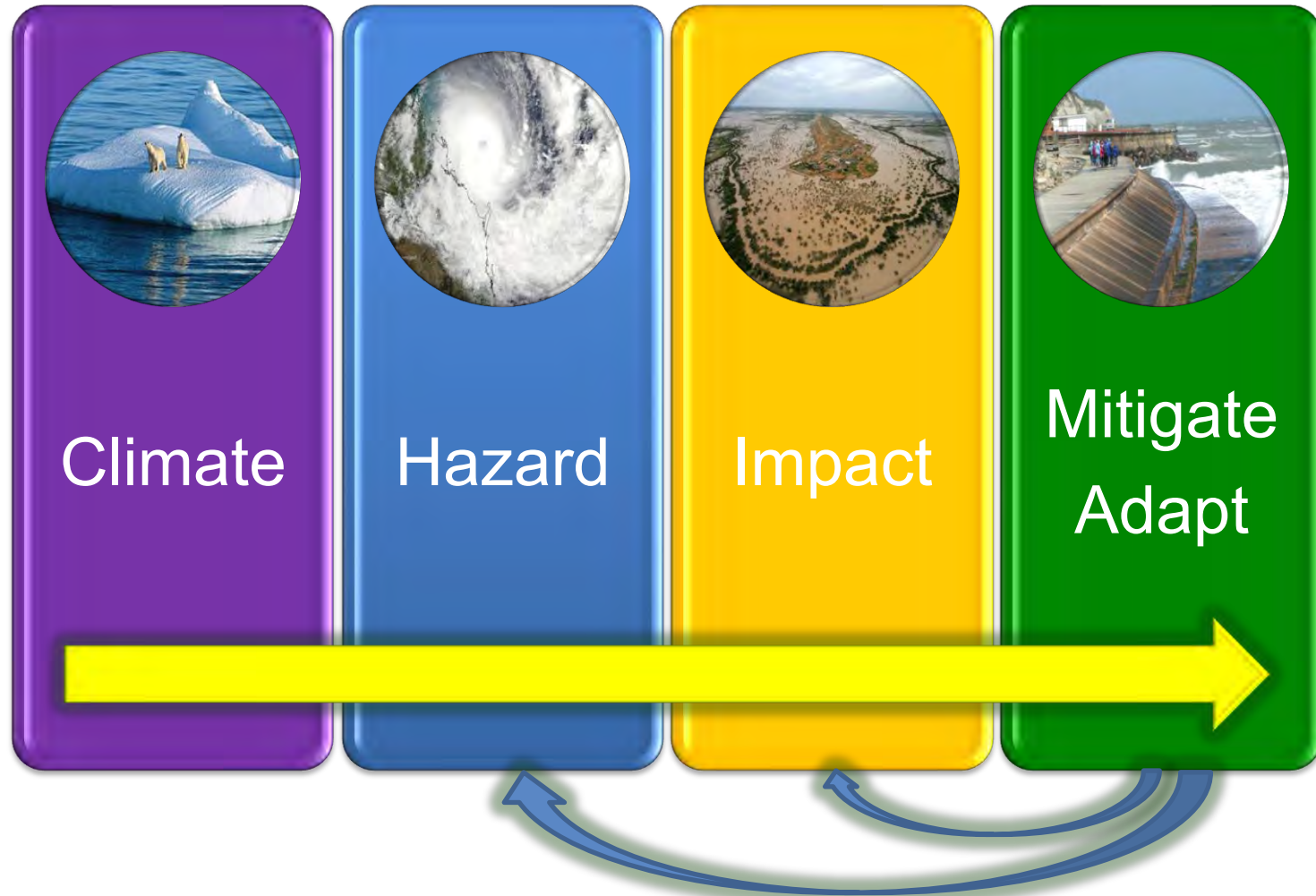
Adaptation by Proper Planning

Development in Coastal Hazard Areas

- Coastal-dependent development
- Temporary, readily relocatable, or able to be abandoned
- Essential community service infrastructure that cannot feasibly be located elsewhere
- Redevelopment that does not increase the risk to people and property.



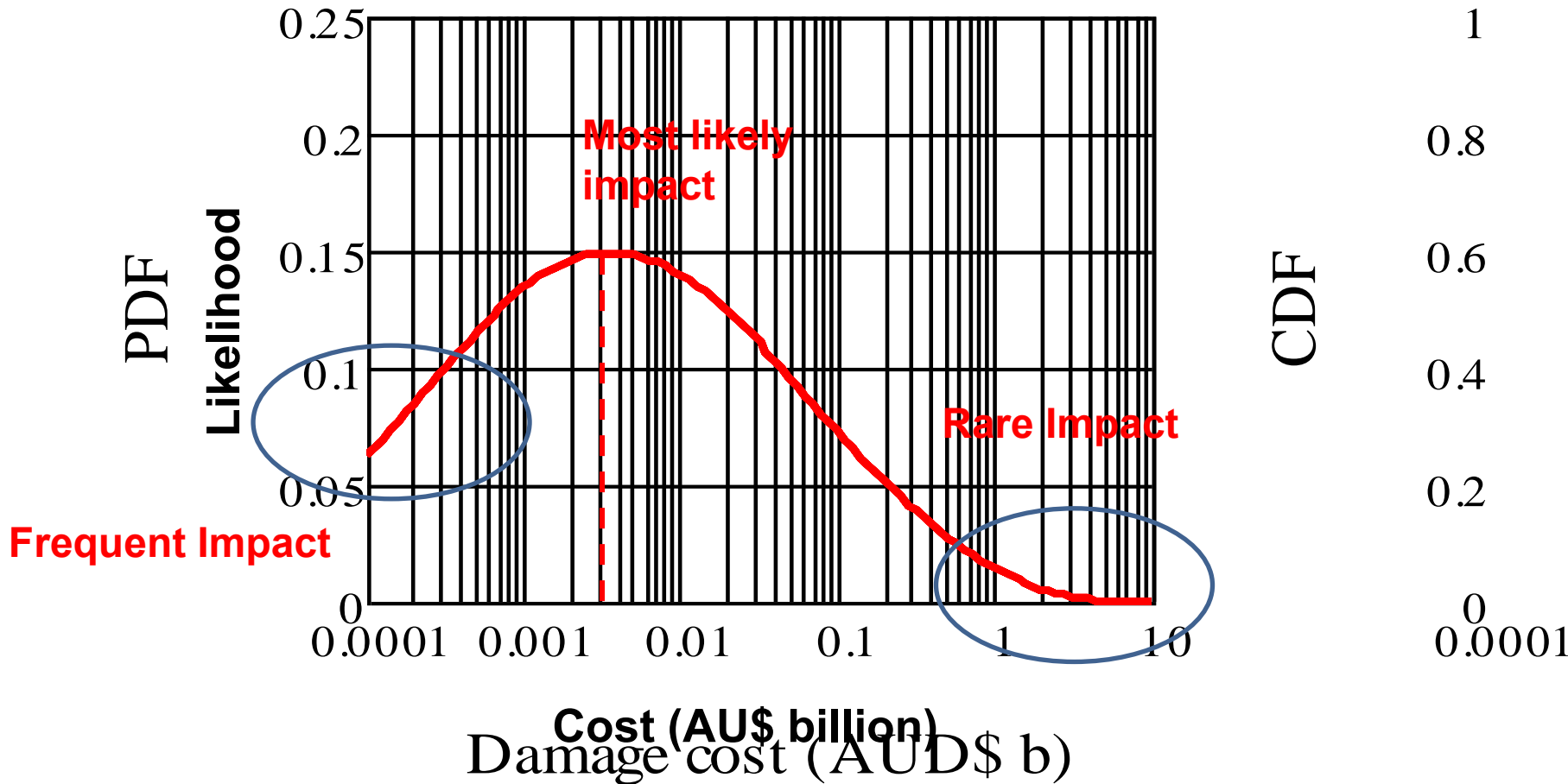
Knowledge to Implement Climate Adaptation for Cities



Knowledge of Hazard and Exposure

Knowledge of Impacts

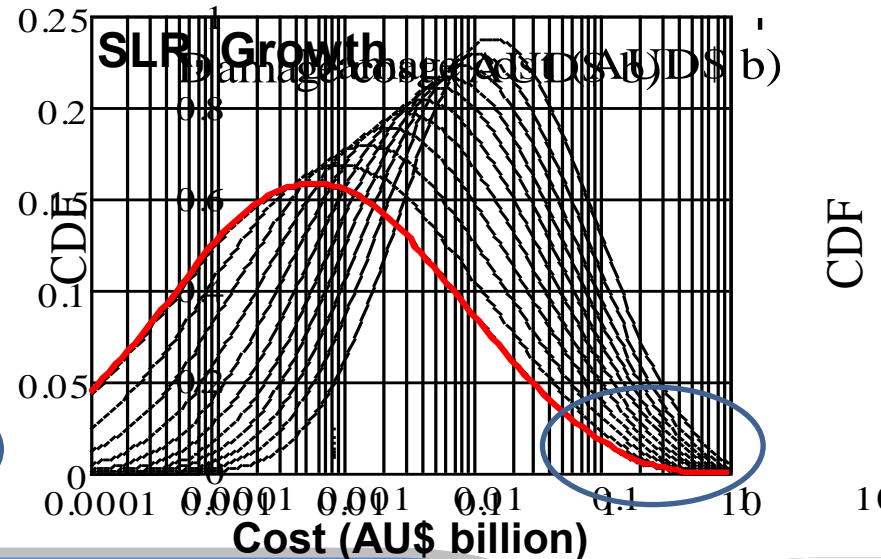
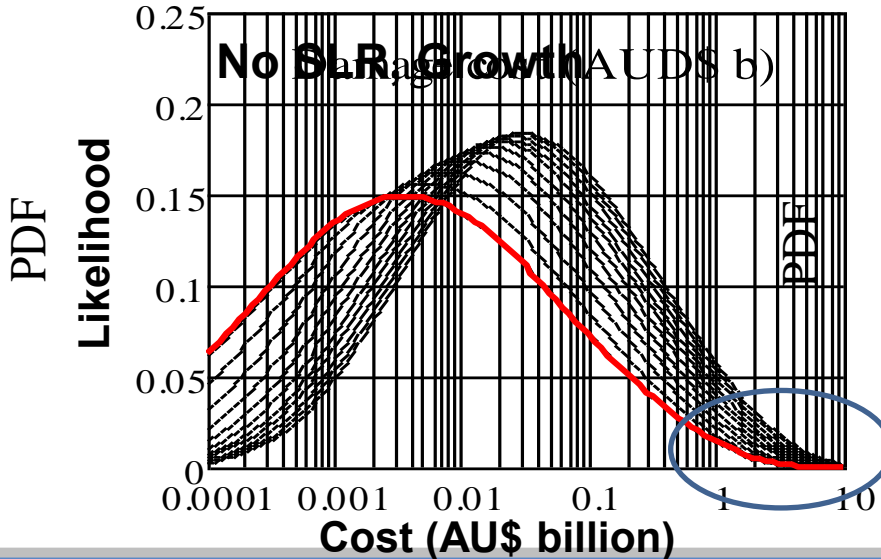
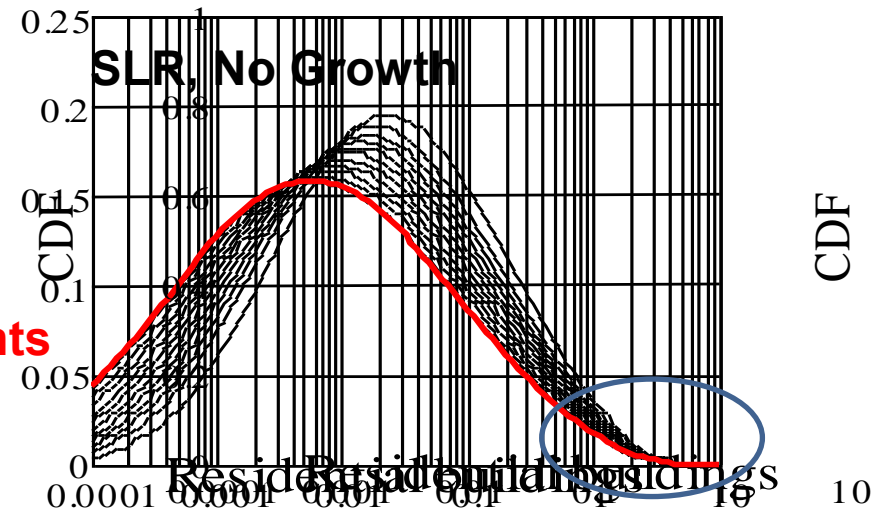
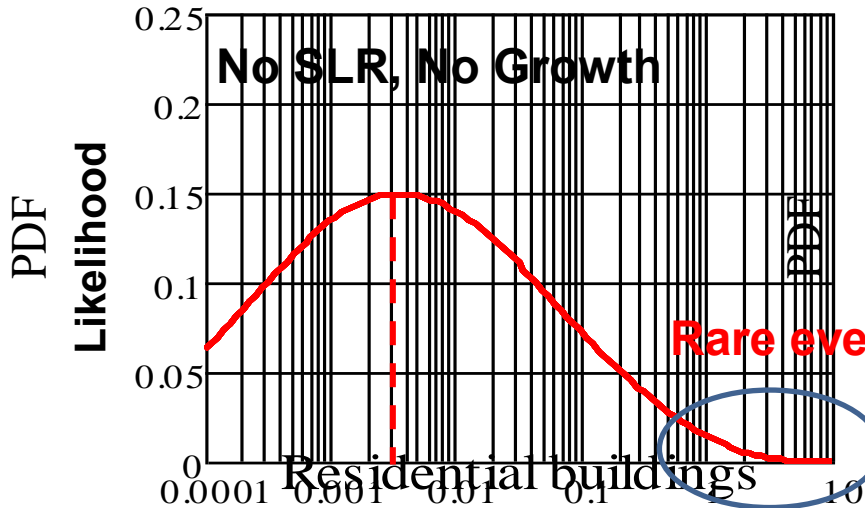
Residential buildings



Knowledge of Multiple Drivers to Impacts

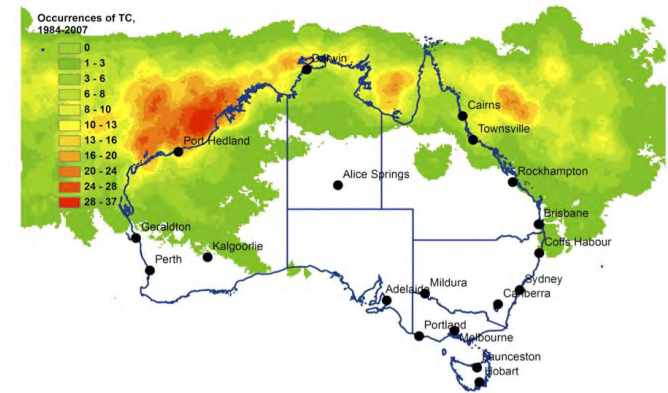
Residential buildings

Residential buildings



Knowledge of Vulnerability

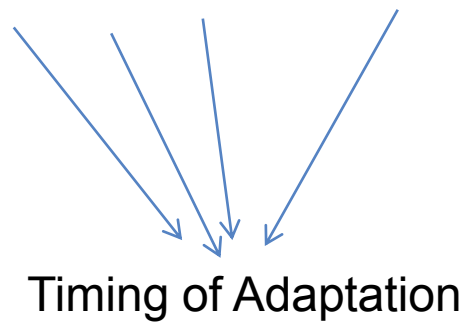
Wind Hazard in 500 Years Average
Recurrence Interval for residential buildings



Vulnerable to
extreme wind
hazard

Knowledge of Uncertainties in Impacts

Knowledge of Timing and Its Implications



- To maintain long-term view in policy-making and planning
- Late action in adaptation may reduce the benefit significantly

Avoid This !!



Climate Adaptation Flagship

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Leading Research in Climate Adaptation for Cities and Coasts