NCCARF

National
Climate Change Adaptation
Research Facility

Sarah Boulter, NCCARF, Griffith University

Its hot, the kids are striking its time to adapt!

What do we mean by adaptation?

The process of adjustment to actual or expected climate and its effects.

In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

In some natural systems, human intervention may facilitate adjustment. (IPCC)

The past 10 years…..

The “National Climate Change Adaptation Research Facility” set up in 2008 at Griffith University

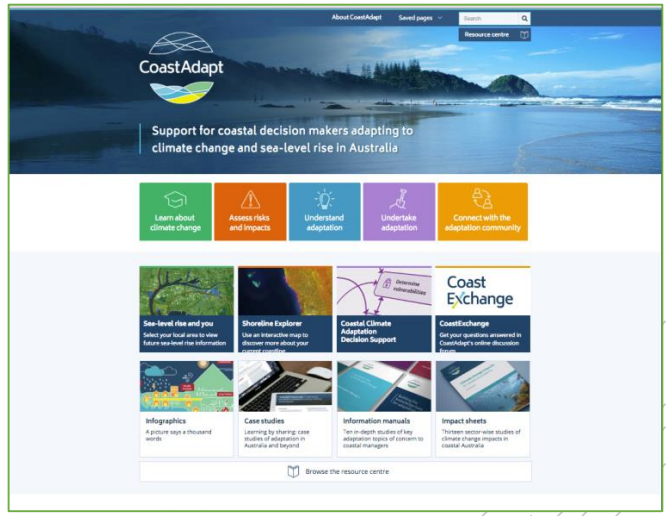
Mission: To generate and communicate the knowledge needed by decision-makers to successfully adapt Australia to climate change

5 National conferences

150 + research reports

Factsheets, technical reports, case studies

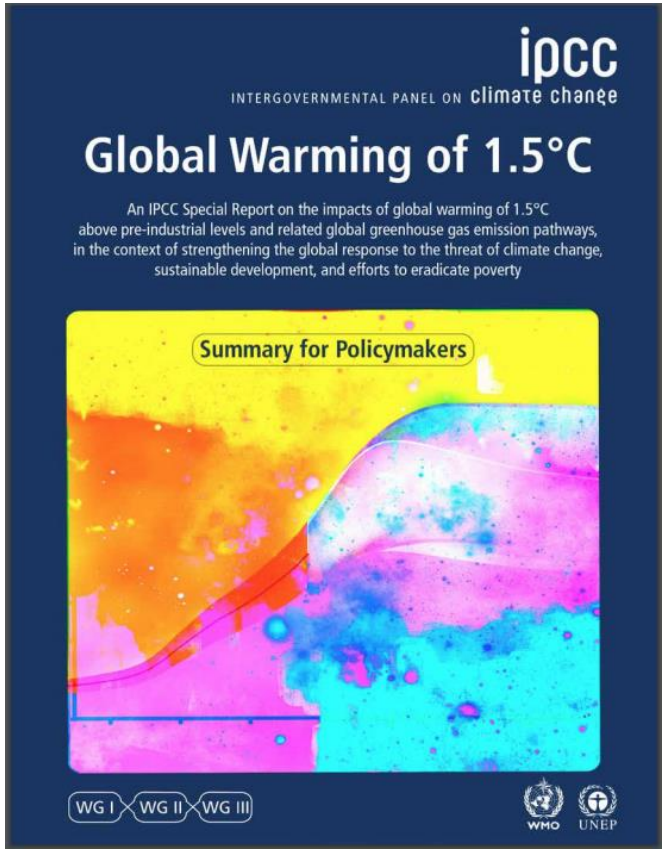
8 National networks



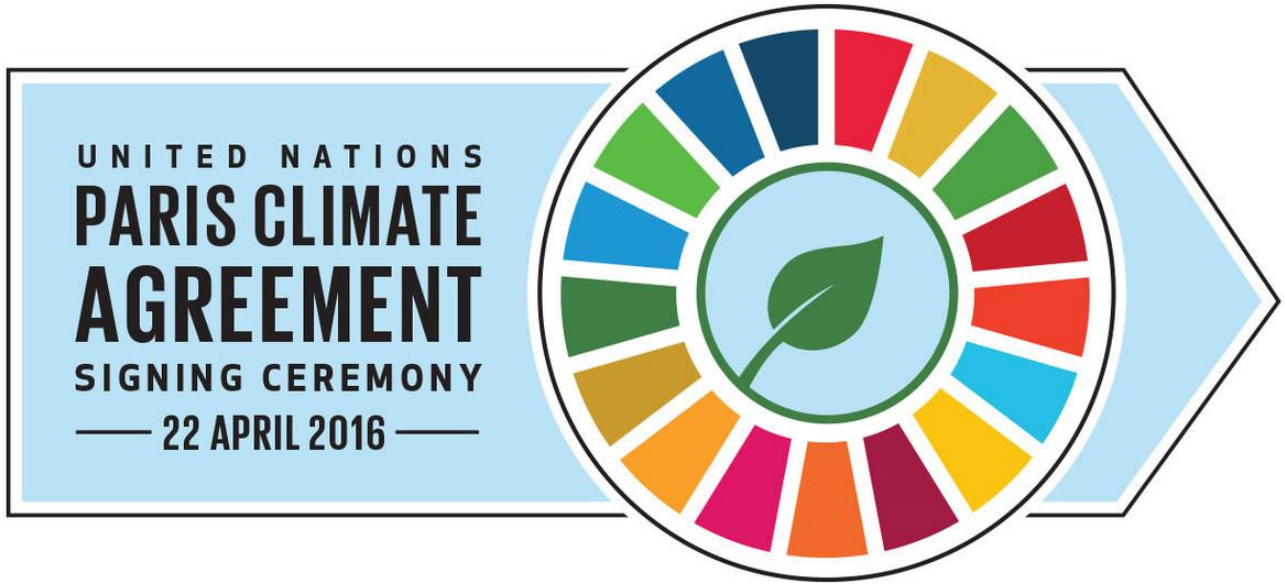
Online tool “CoastAdapt”

The past 12 months…

The release of the IPCC Special Report “Global Warming of 1.5ºC”
http://www.ipcc.ch/report/sr15/



The Paris Agreement

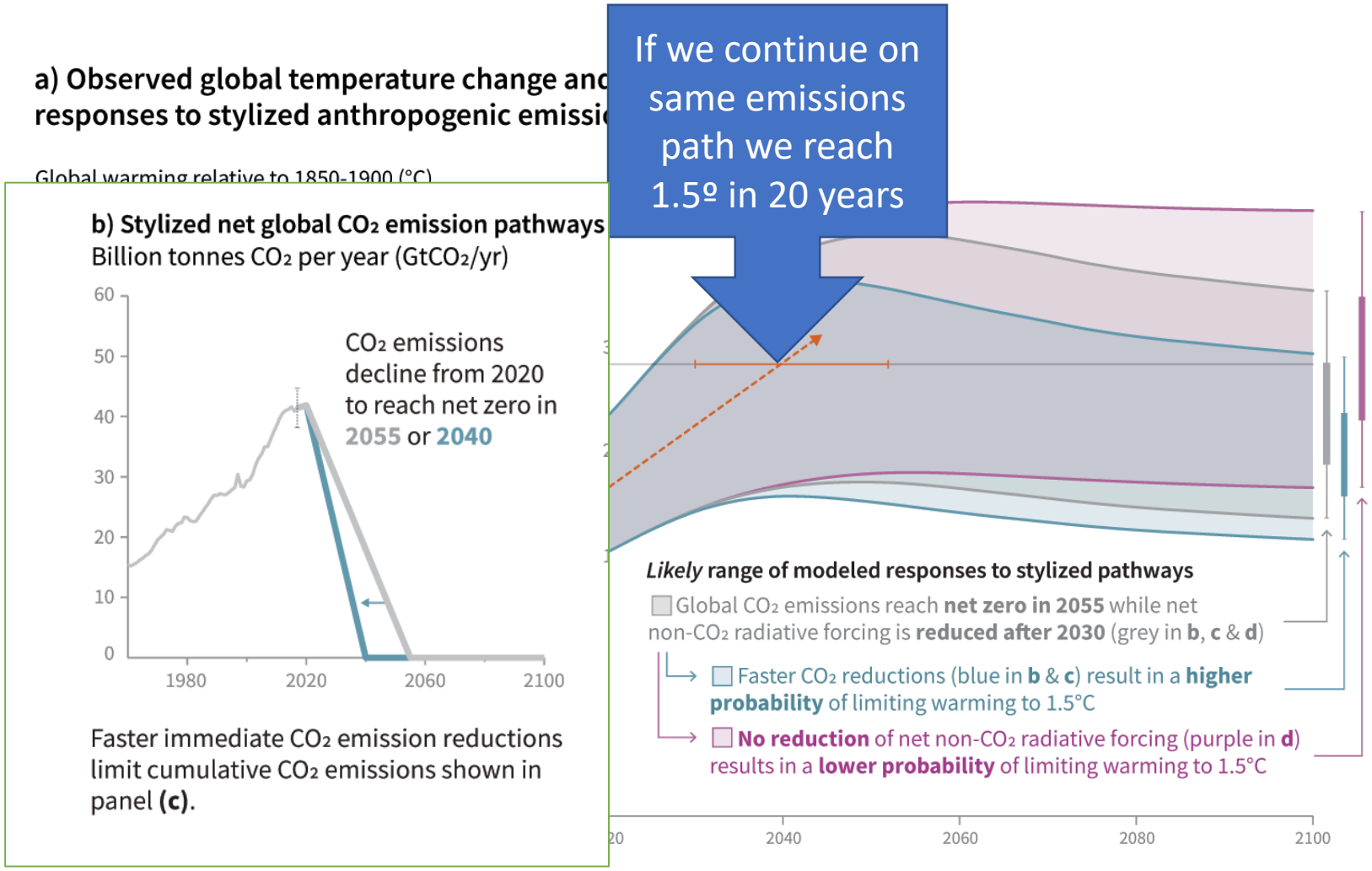


Holding the increase in the global average temperature to **well below 2°C** above pre-industrial levels and to **pursue efforts to limit the temperature increase to 1.5°C** above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change

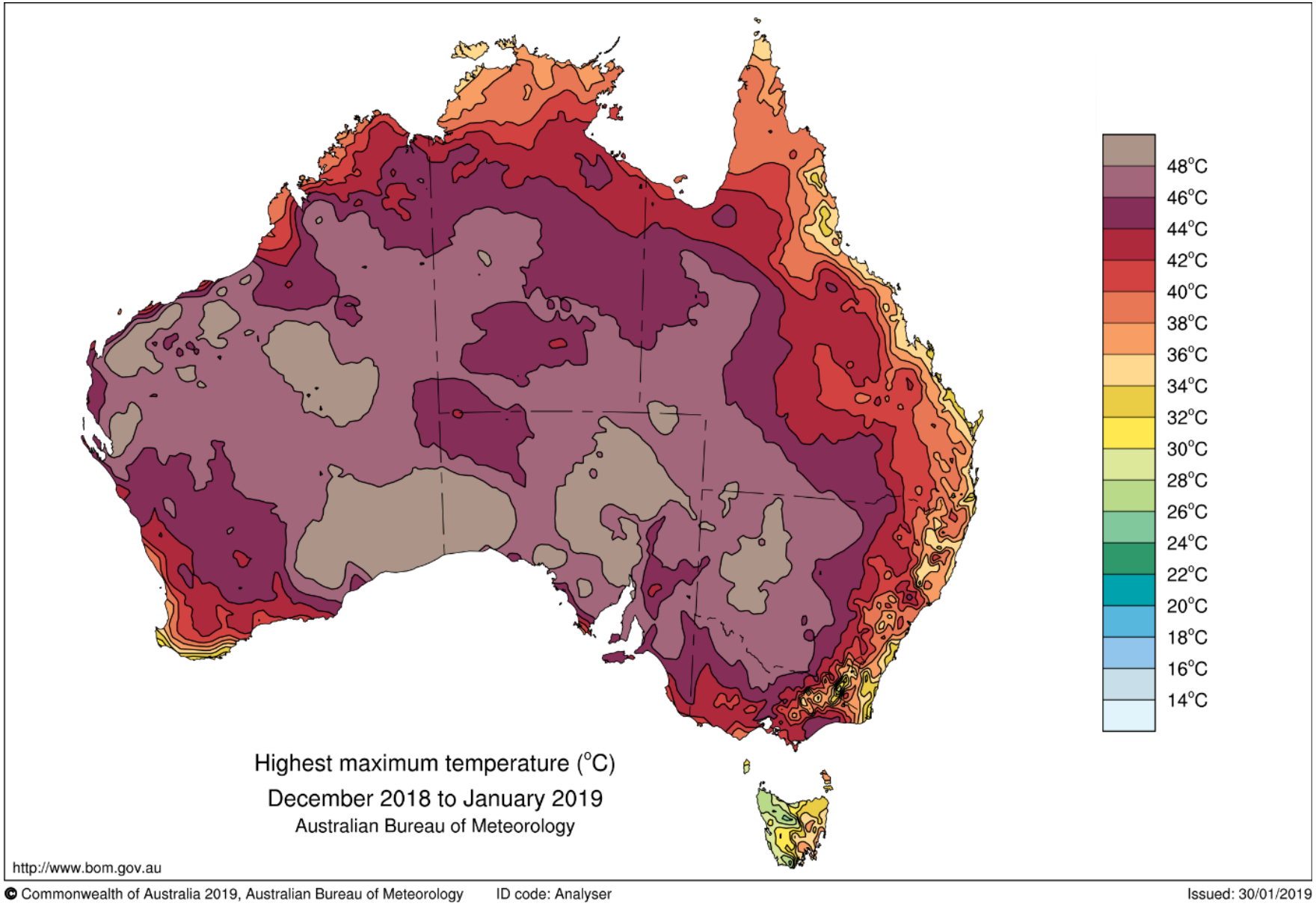
Global Warming of 1.5ºC

If we stop emitting greenhouse gases today we are unlikely to reach 1.5 degrees of warming but seas will continue to rise

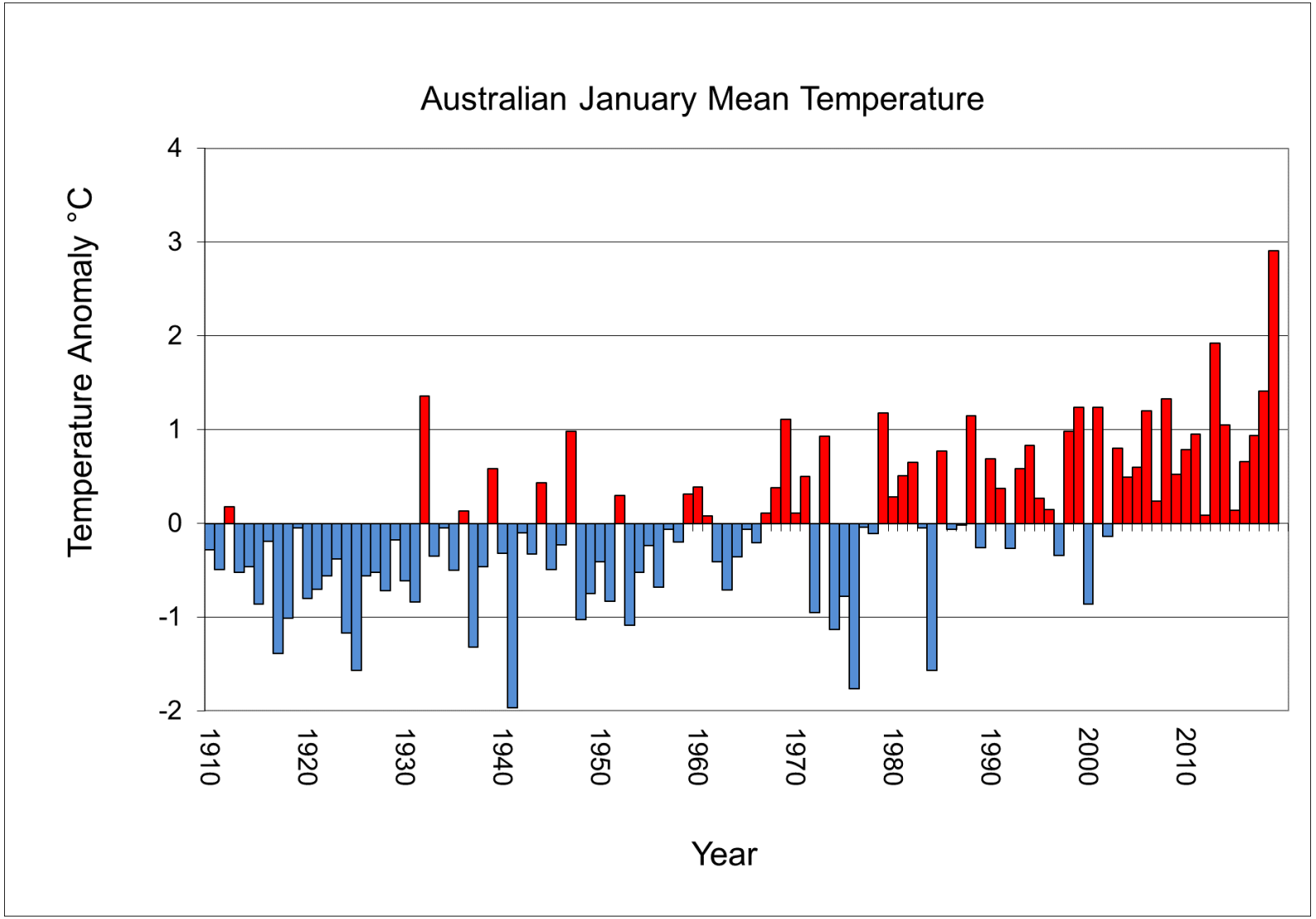
If we reach net zero emissions by 2040 we can keep warming to 1.5 degrees



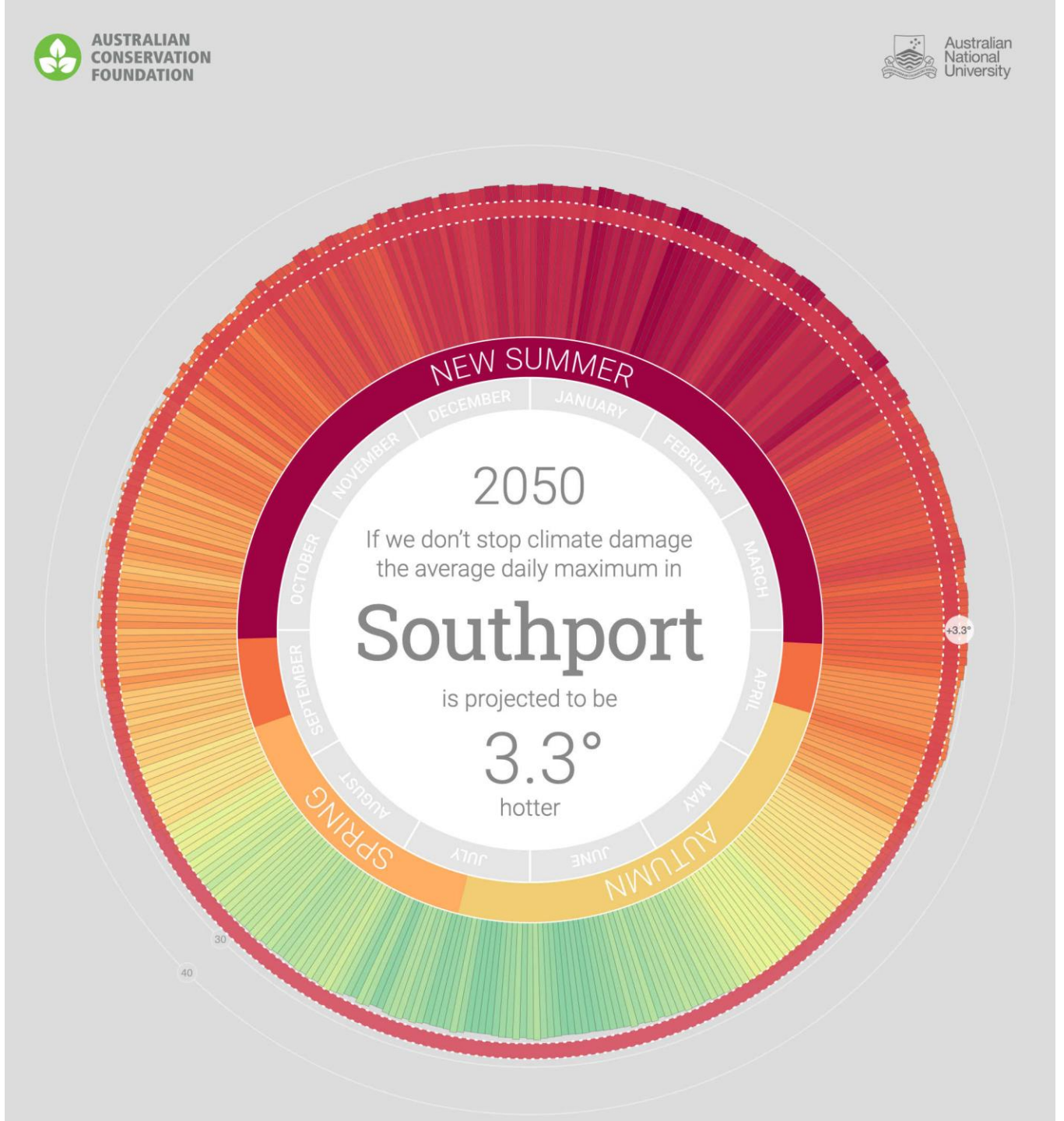
And then we had summer…



The hottest January on record… again



The “new summer”



Reason for hope…

…even government is changing

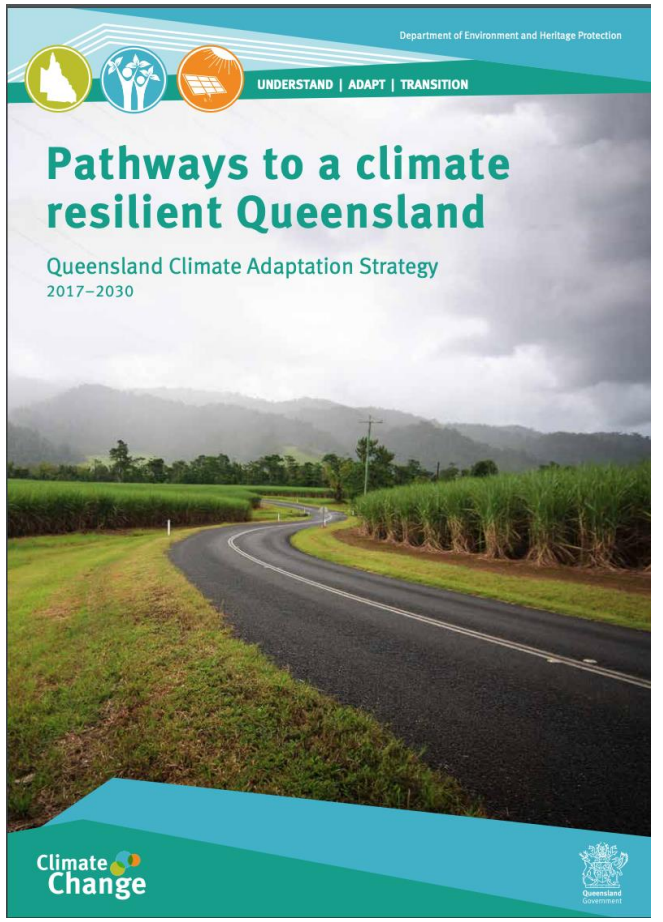
1. Powering Queensland with 50% renewable energy by 2030
2. Zero net emissions by 2050
3. Interim emissions reductions target of at least 30% below 2005 levels by 2030

People and Knowledge
Empower best-practice climate science, education and engagement to support climate risk management within Queensland's communities

State Government
Embed the consideration of climate adaptation into policies, regulations and procedures, and address risks to assets and services

Sectors and Systems
Assist sector leaders to collaborate with government agencies, local governments and other stakeholders to identify adaptation needs and to prioritise adaptation activities

Local Governments and Regions
Partner with local governments and other regional organisations to develop regional adaptation solutions, including embedding climate risk in planning and development decisions



Here in Queensland....

The case for emission reduction is compelling…. what about adaptation?

Five Reasons For Concern (RFCs) illustrate the impacts and risks of different levels of global warming for people, economies and ecosystems across sectors and regions.

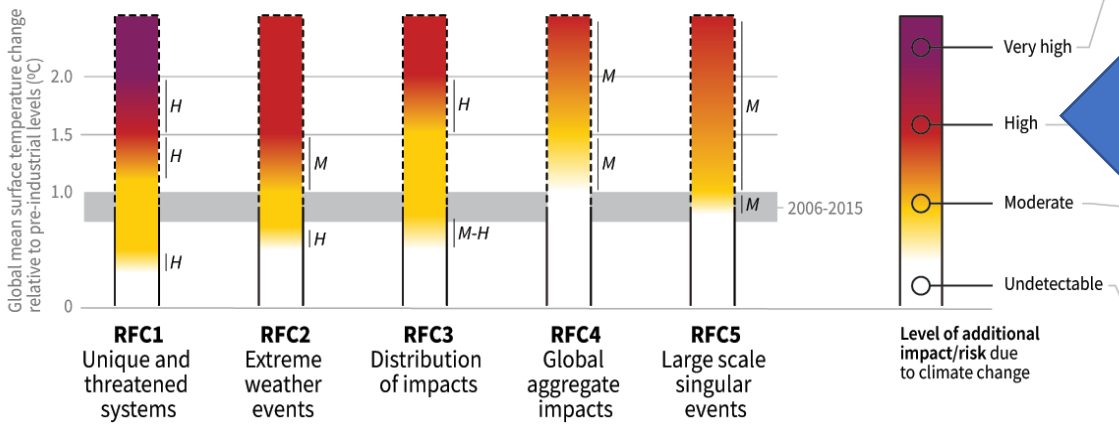
Purple indicates very high risks of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards,

There are limits to adaptation

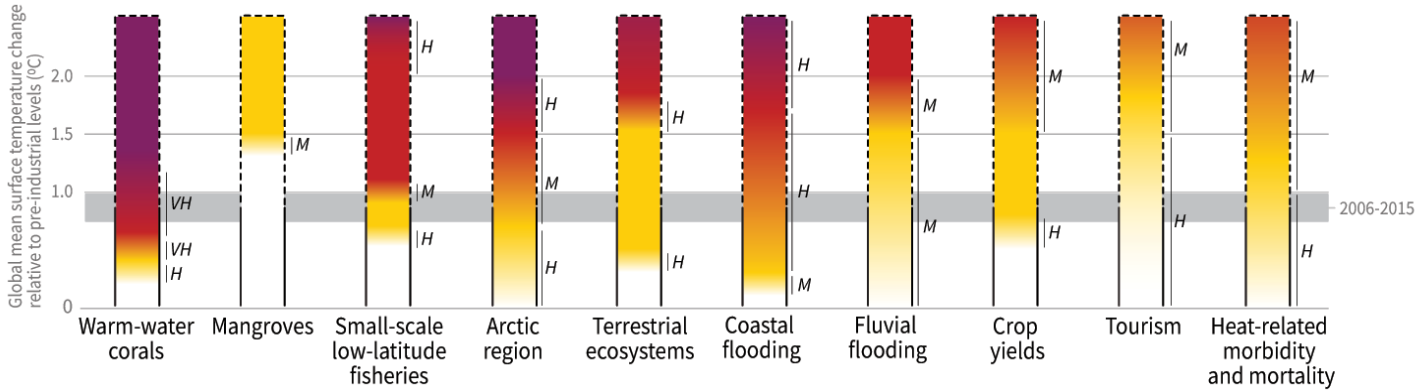
impacts/risks are detectable and attributable to climate change with at least medium confidence.

White indicates that no impacts are detectable and attributable to climate change.

Impacts and risks associated with the Reasons for Concern (RFCs)

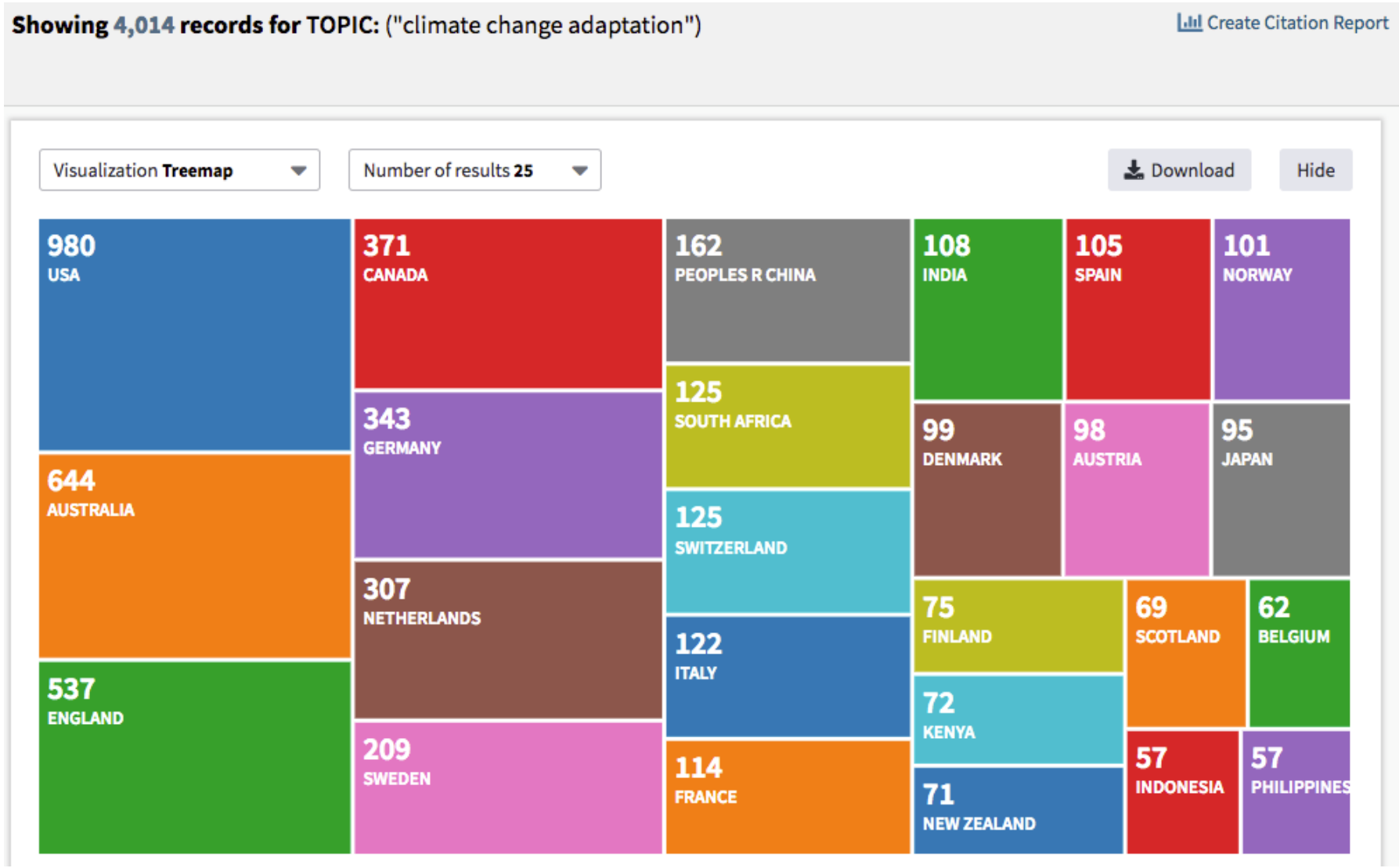


Impacts and risks for selected natural, managed and human systems



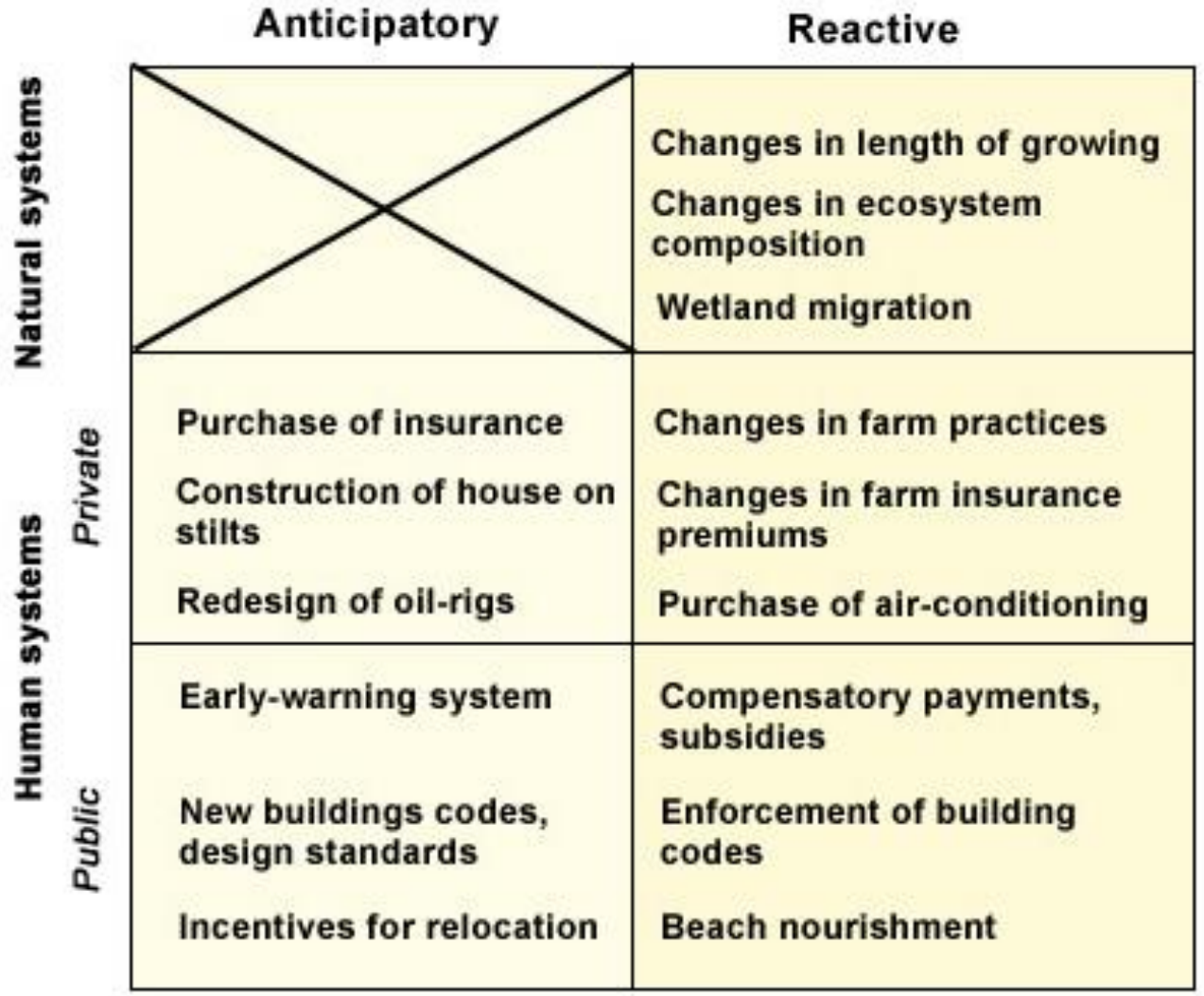
Confidence level for transition: *L*=Low, *M*=Medium, *H*=High and *VH*=Very high

Australia is a world leader in adaptation research



Types of adaptation

- Autonomous vs planned (intent)
- Public vs private
- Reactive vs anticipatory (timing)
- Bottom up vs top down
- Sectoral, cross-sectoral or multi-sectoral



An example: Spaulding Rehabilitation Hospital

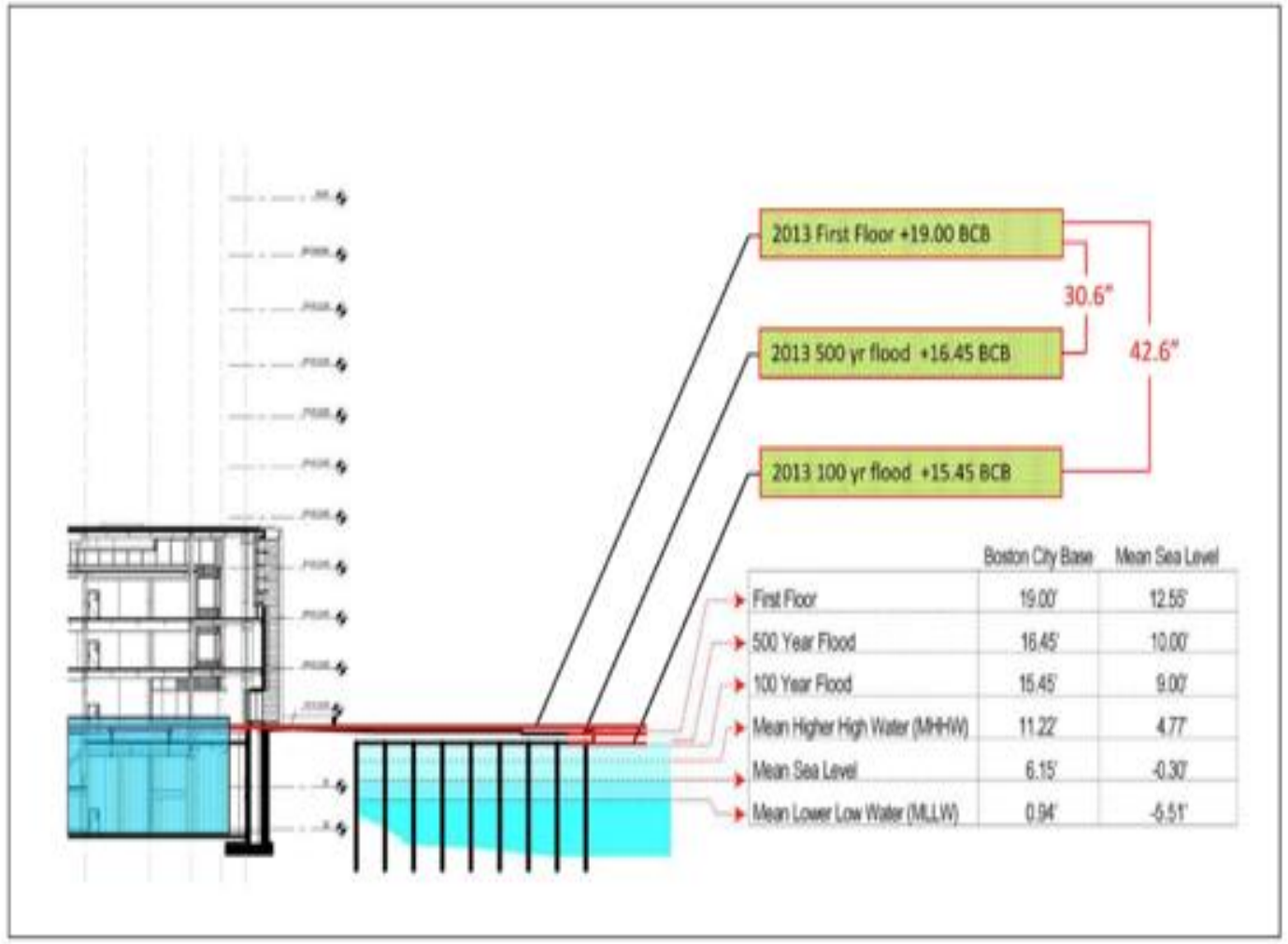
Hazards

- Built on contaminated land in Charlestown ex-Naval Yard at current sea level
- Sea level rise, Hurricanes, Extreme heat

https://toolkit.climate.gov/case-studies/investment-infrastructure-sea-level-hospital-will-pay-reducing-risk

Adaptations to reduce risk

- Floor level 30 inches above 500 yr flood level
- Avoid flooding from sea level rise for design life
- Mechanical and electrical infrastructure on roof
- Off-grid power generation
- Triple glazed windows that can be opened
- Granite and landscape berms absorb & deflect waves



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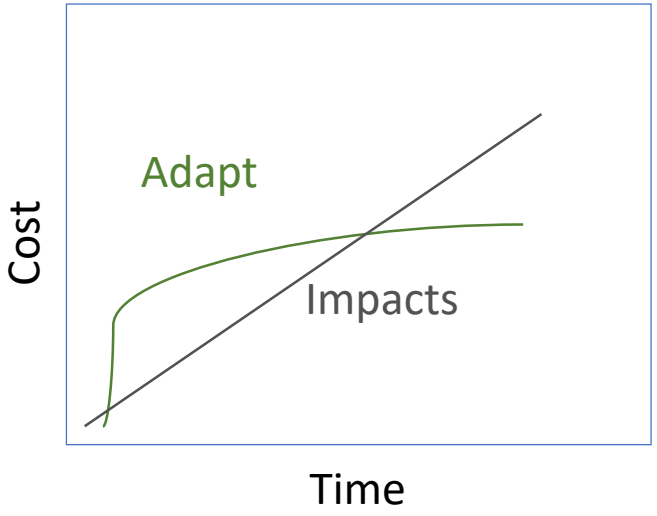
Adaptations that make good business sense

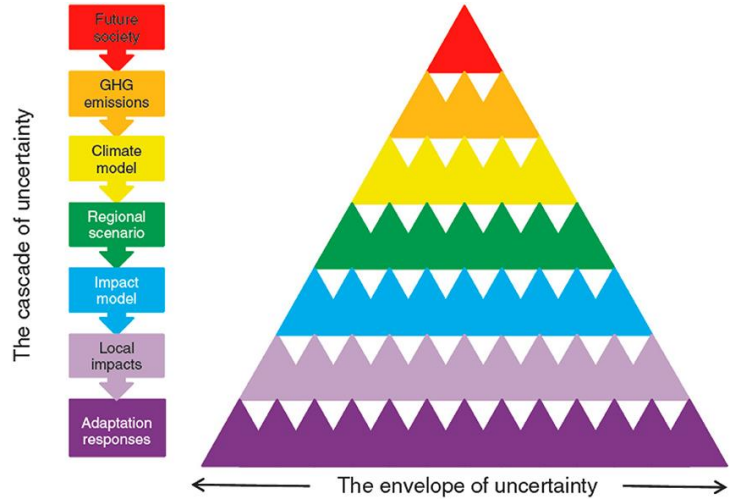
- Additional build cost 0.2-0.5% on measures not required by code
- BUT ongoing operational savings more than offset initial investment

https://practicegreenhealth.org/sites/default/files/upload-files/case_studies/spauldingrehabilitation.case_.study_.pdf

Barriers to adaptation

- Finance
- Legal risk
- Who's responsible/leadership
- Uncertainty
- Information
- Maladaptation





Legal risk – when the ‘big end’ of town talks…

Due diligence (Australia Prudential Regulation Authority: foreseeable risks can expose Boards and companies to legal risk)

ABC NEWS LOCATION: Sydney, NSW Change

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Climate change could threaten entire financial system, APRA warns

By Stephen Long

Updated 17 Feb 2017, 7:12pm

Climate change could threaten the stability of the entire financial system, the prudential regulator has warned, as it prepares to apply climate change "stress tests" to the nation's financial institutions.

In its first major speech on climate change, the Australian Prudential Regulation Authority chastised companies for a lack of action on the risks it poses.

"While climate risks have been broadly recognised, they have often been seen as a future problem or

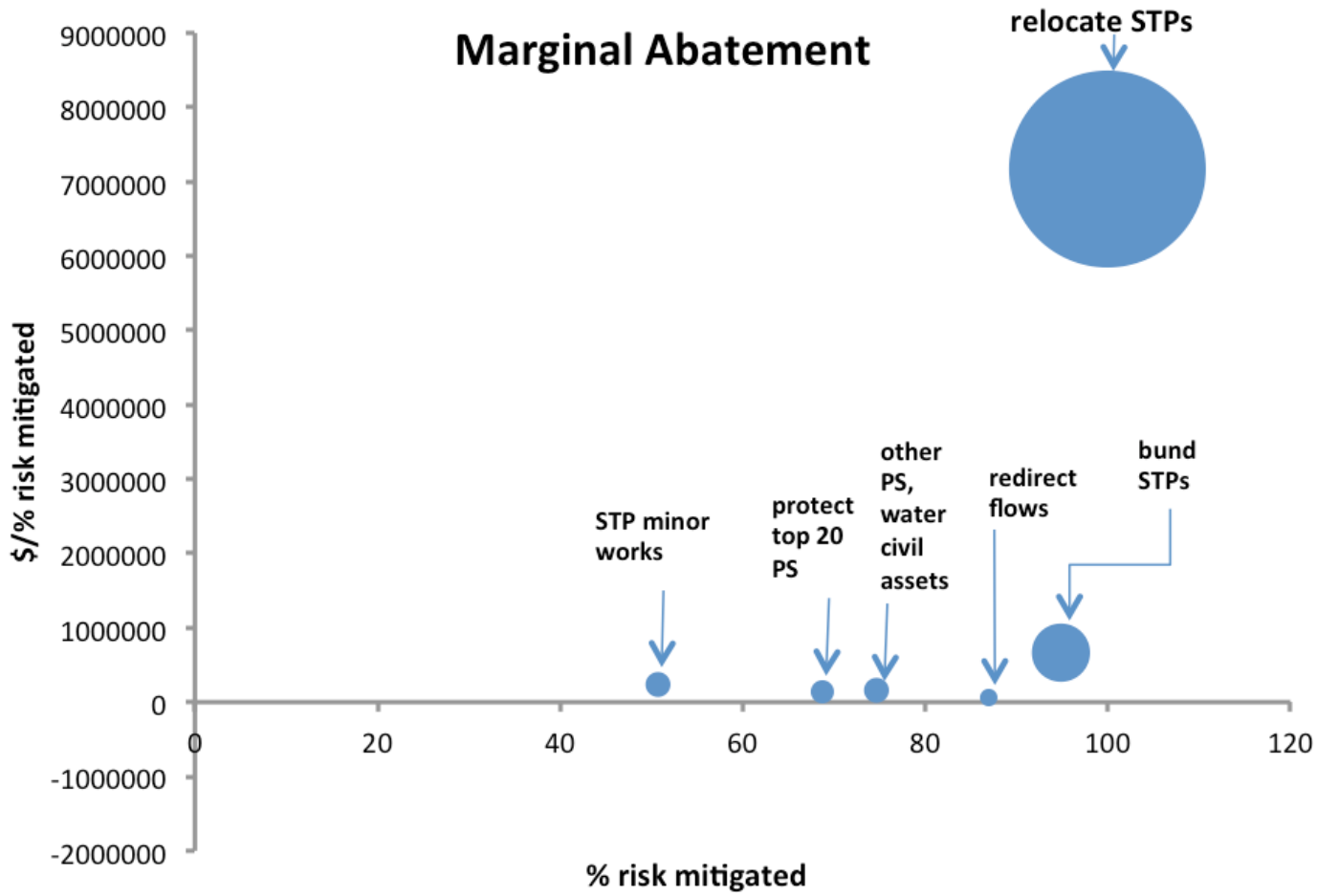
Finance:
Brisbane Water

- Brisbane's water supply and waste water treatment authority (Queensland Urban Utilities)
- 2011 floods impact (loss of power, inundation, damage)

Oxley Creek Wastewater treatment plant

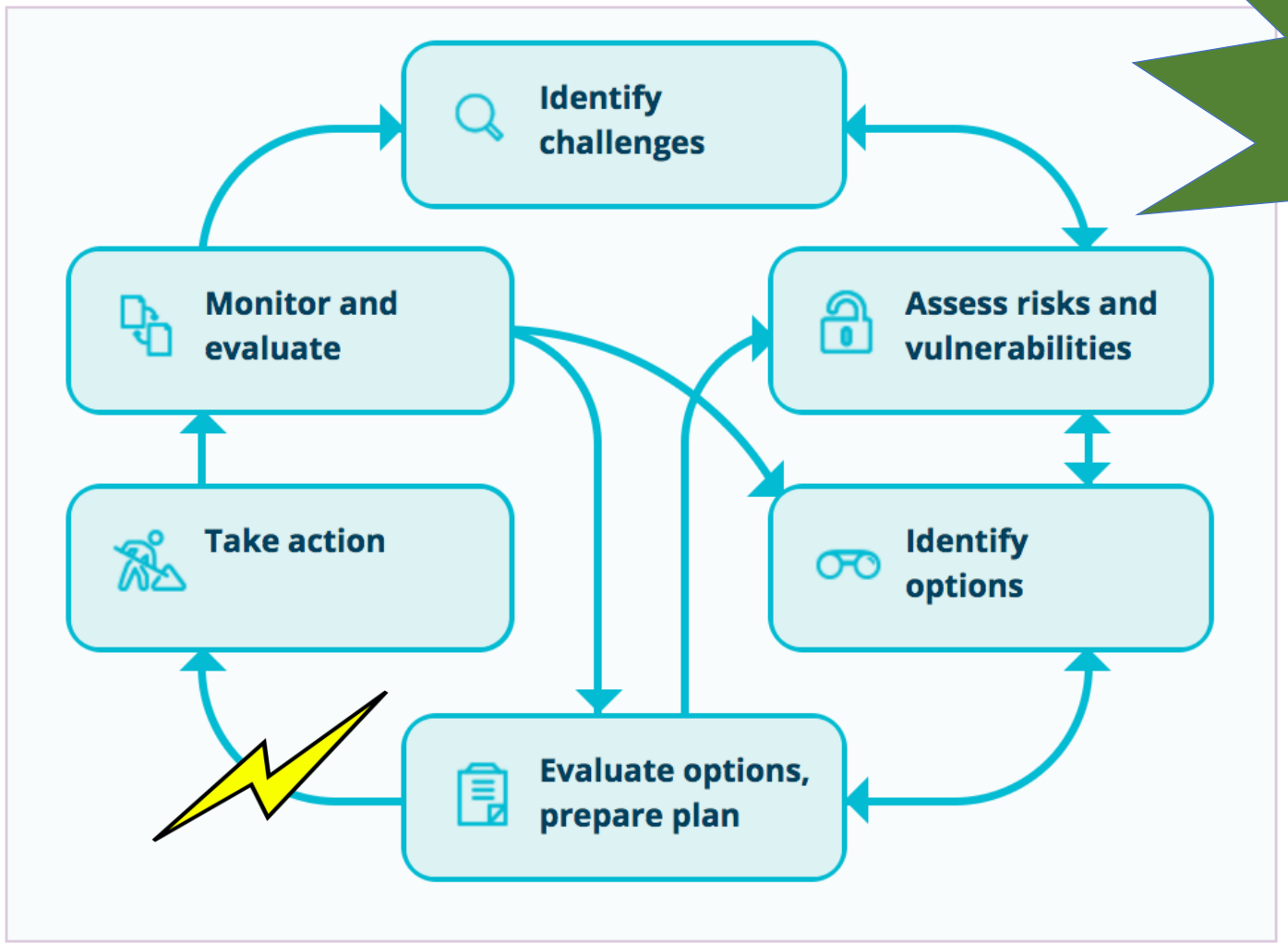
Financial analysis

- Developed a flood adaptation and resilience plan
- Considered capital cost versus risk reduced
- Initial investment in redesign and raising electrical and critical infrastructure



Size of circle represents cost of option
STP = sewerage treatment plant
PS = pumping stations

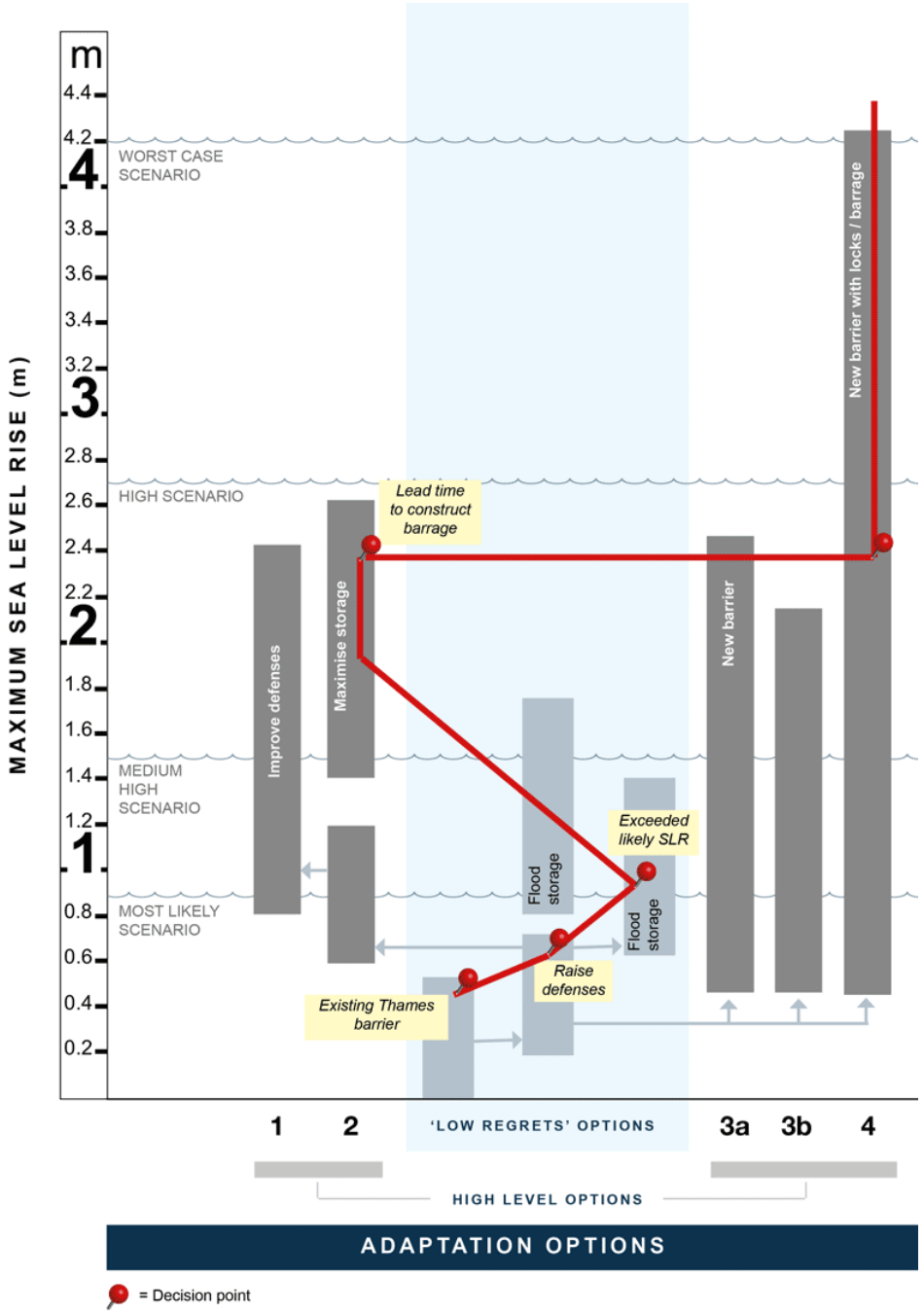
Uncertainty produces a disconnect between planning and action



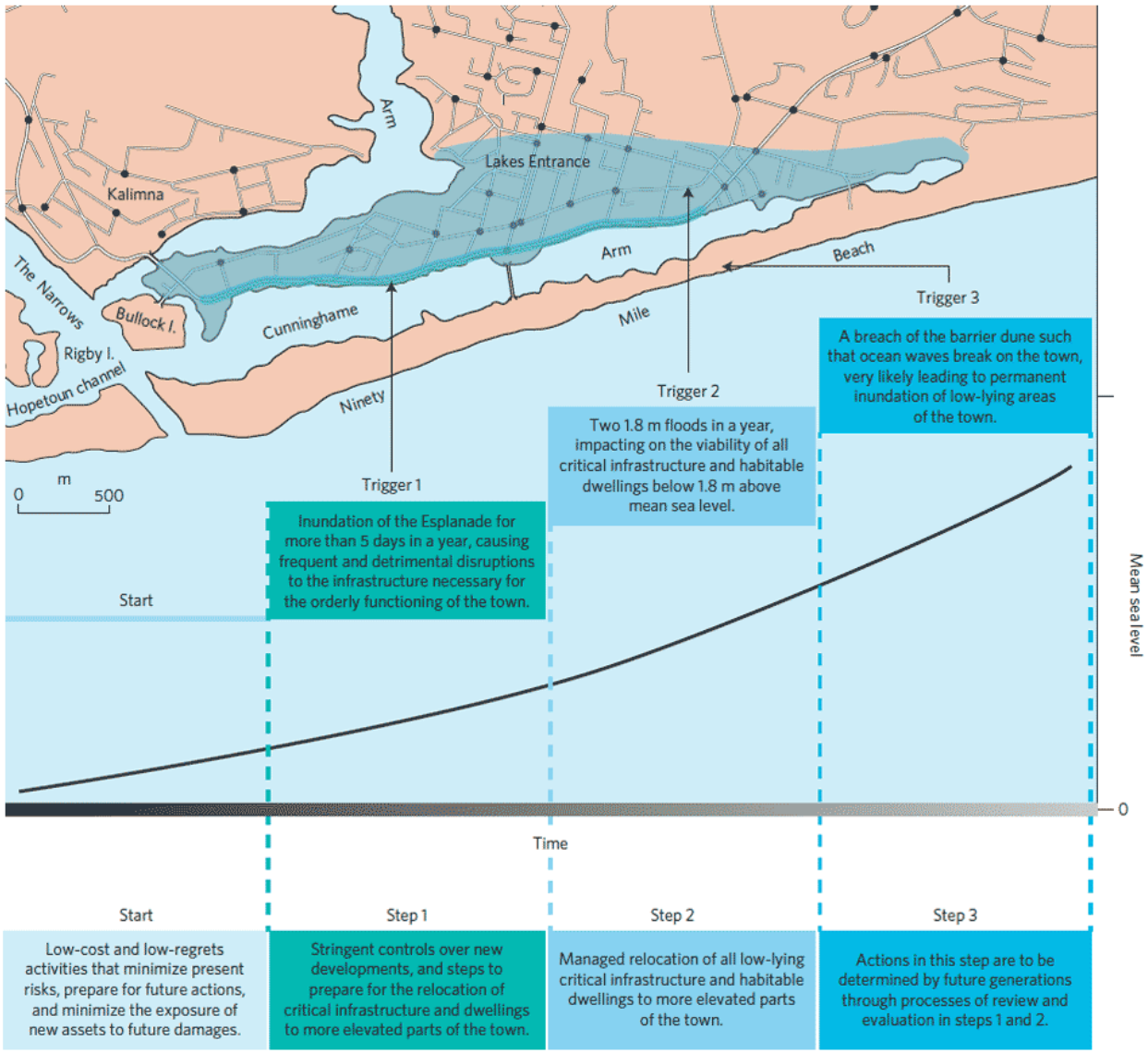
Stakeholder engagement

https://coastadapt.com.au/

Thames River Barrier – dealing with uncertainty



East Gippsland Council



Knowledge-related barriers to adaptation

1. Inaction due to uncertainty about location, timing and severity of CC and SLR
2. Lack of detailed geomorphological and coastal process information
3. Risk poorly identified and assessed
4. Lack of proper quantitative cost estimates of risks, impacts and solutions
5. Pricing environmental assets
6. Inaction due to uncertainty about what to do
7. Lack of understanding of impacts of interventions on coastal sediment movement and ecosystem function
8. Difficulty in accessing information

Failure to win hearts and minds

- Scepticism and non-acceptance by vested interests
- Failure to recognise the importance of the issue
- Lack of leadership and of consistent messaging
- Lack of acceptance by community, senior management, elected officers

What about the environment…

- In reality…. biodiversity and ecosystems will adapt to climate change autonomously (i.e. independently of human intervention and management).
- **Adaptation is undertaken by people and determined by their values**

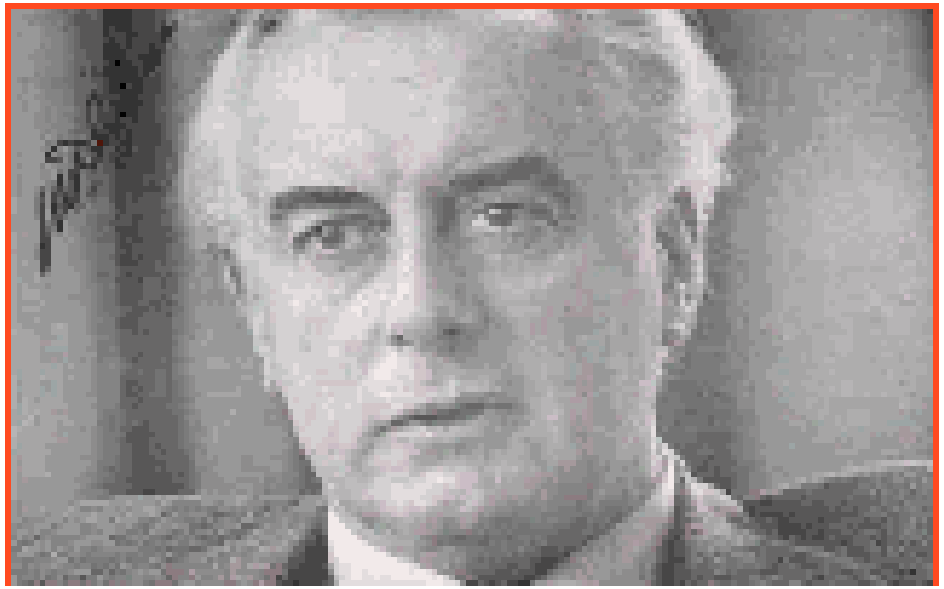
The challenges for managing biodiversity

- **There is unavoidable uncertainty**
  - What will global policy (and therefore emissions) look like?
  - How will biodiversity respond?
- **There are (ecological) limits to the potential for adaptation**
  - Some species are already at their limit
- **Natural systems are dynamic and complex**

QLD NEWS

White lemuroid ringtail possum is Australia's first native mammal victim of climate change, say scientists

Peter Michael, North Queensland Correspondent, The Courier-Mail
July 22, 2014 10:00pm



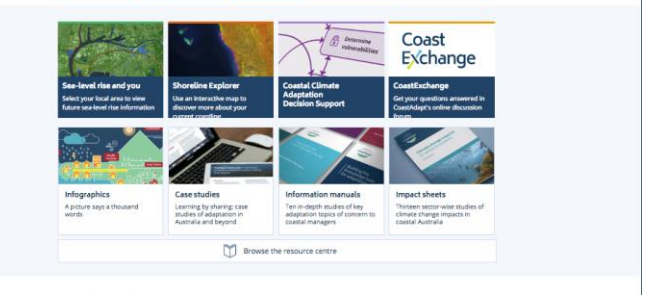
It’s time.

Enablers/catalysts for adaptation (action)

Knowledge is power, for all adaptors from households through to national governments

Knowing:

- What the risks are
- What the options are
- What the costs and benefits are of these options
- When to act



More information…

- www.nccarf.edu.au
- www.coastadapt.com.au
- www.climatechangeinaustralia.gov.au/
- www.qld.gov.au/environment/climate/climate-change/adapting