

SIXTH ASSESSMENT REPORT

Working Group II – Impacts, Adaptation & Vulnerability

9 March 2022

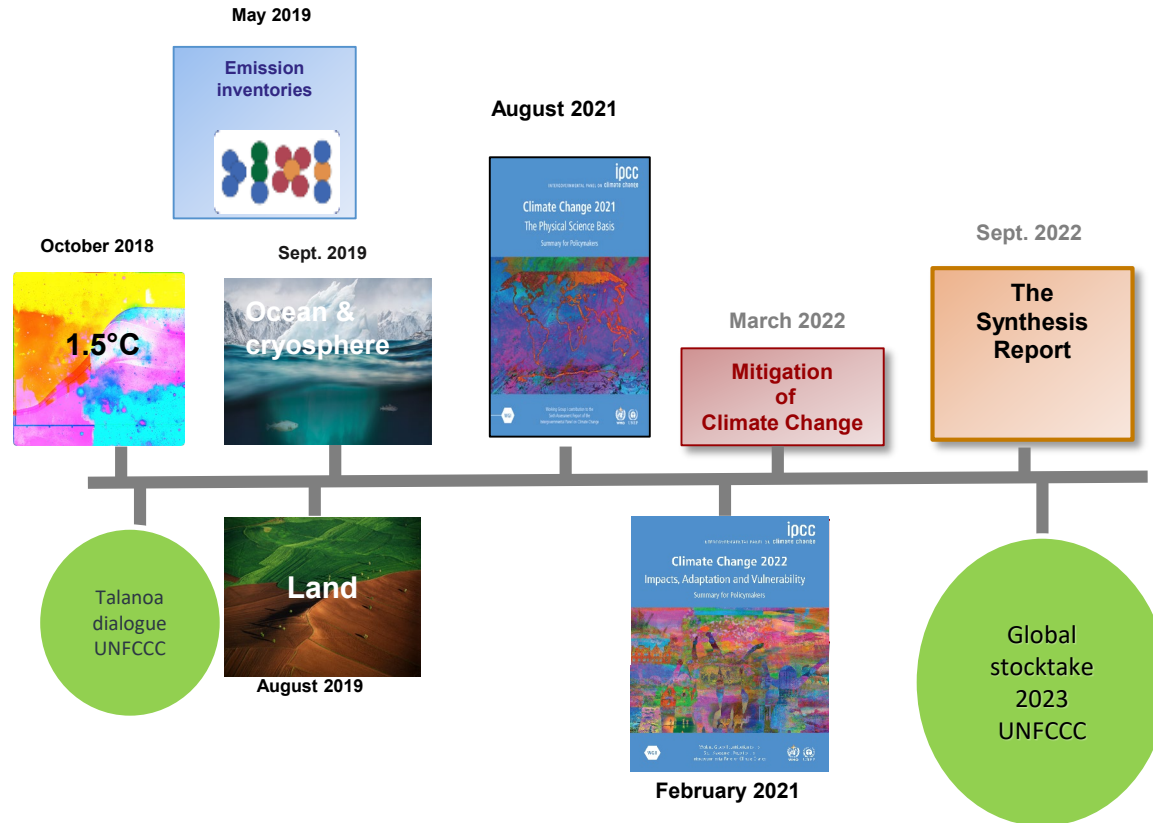
IPCC Working Group II Report ANU/UoM event

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<https://iced.s.anu.edu.au/public-policy-outreach/ipcc-pacific/factsheets>

The 6th IPCC Assessment Cycle



Report by numbers



270 Authors



67 Countries



43 % Developing countries
57 % Developed countries



41 % Women / 59 % Men



675 Contributing authors



More than
34,000 scientific papers



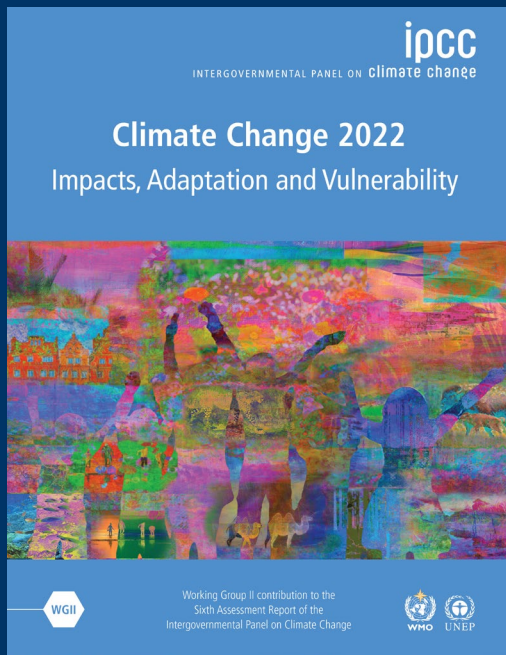
62,418
Review comments

- The best understanding to date
- Increased data etc since AR5
- Increased experience: of the 8 years since AR5 – at least 7 were the hottest on record

The human mind is not equipped to deal with climate change...

‘If you were to design a problem that the mind is not equipped to deal with, you know, climate change would fit the bill. It's distant. It's abstract. It's contested.’

Dan Kahneman in *Hidden Brain*, 2018



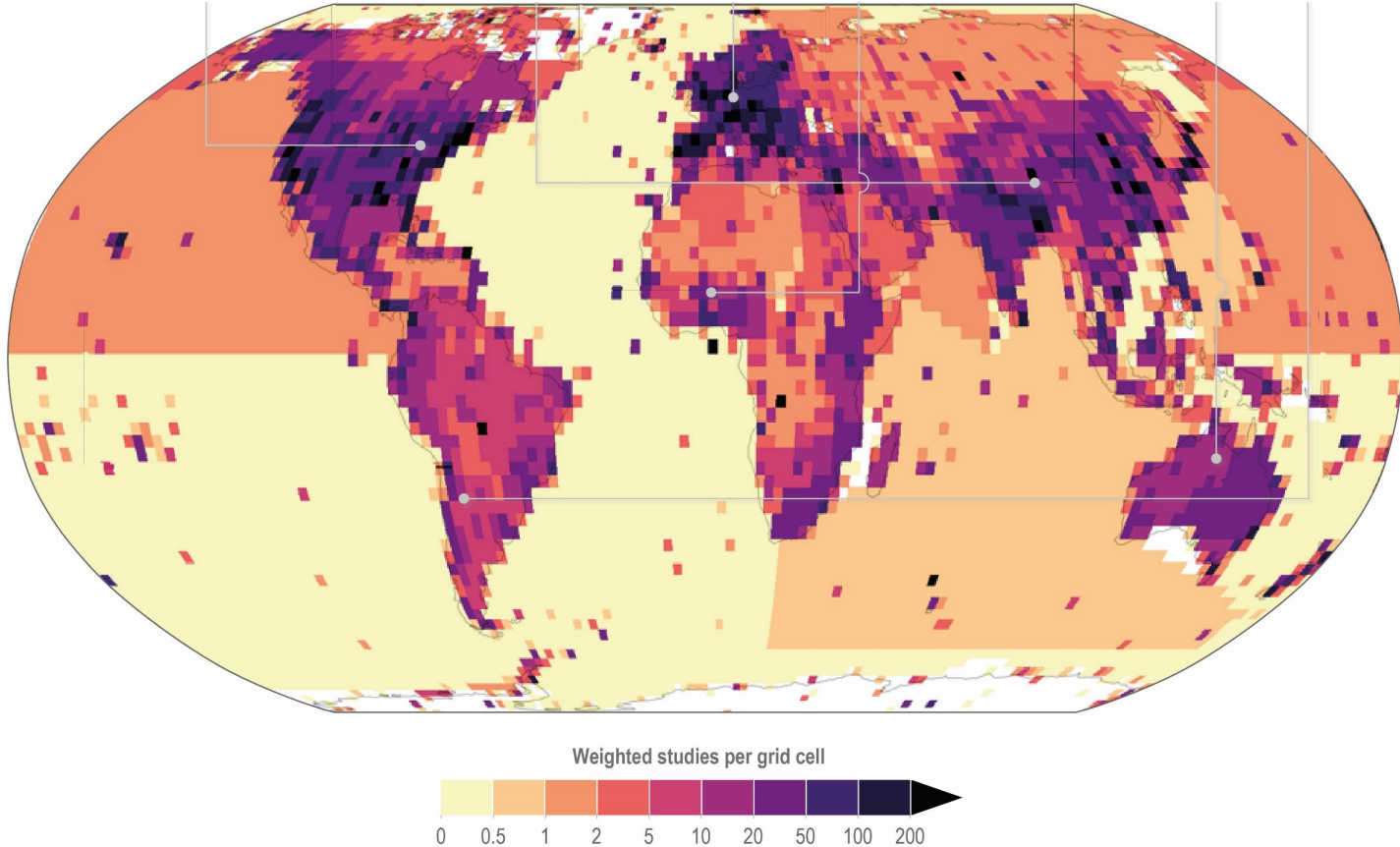
“ The scientific evidence is unequivocal: climate change is a threat to human well-being and the health of the planet.

Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future.

This report offers solutions to the world.



Climate change: evidence of impacts



Future global climate risks



Heat stress

Exposure to heat waves will continue to increase with additional warming.



Water scarcity

At 2°C, regions relying on snowmelt could experience 20% decline in water availability for agriculture after 2050.



Food security

Climate change will increasingly undermine food security.

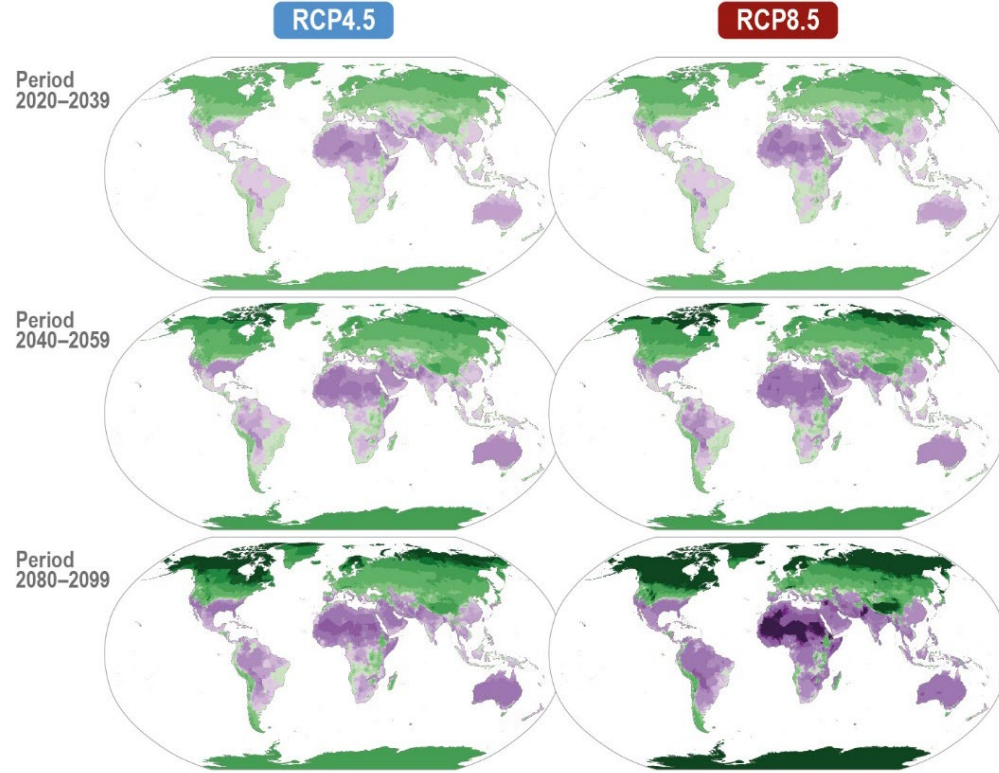


Flood risk

About a billion people in low-lying cities by the sea and on Small Islands at risk from sea level rise by mid-century.



Human mortality risk increases

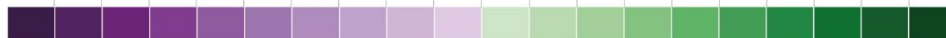


Changes in temperature-related mortality rates per 100,000

Additional deaths per 100,000

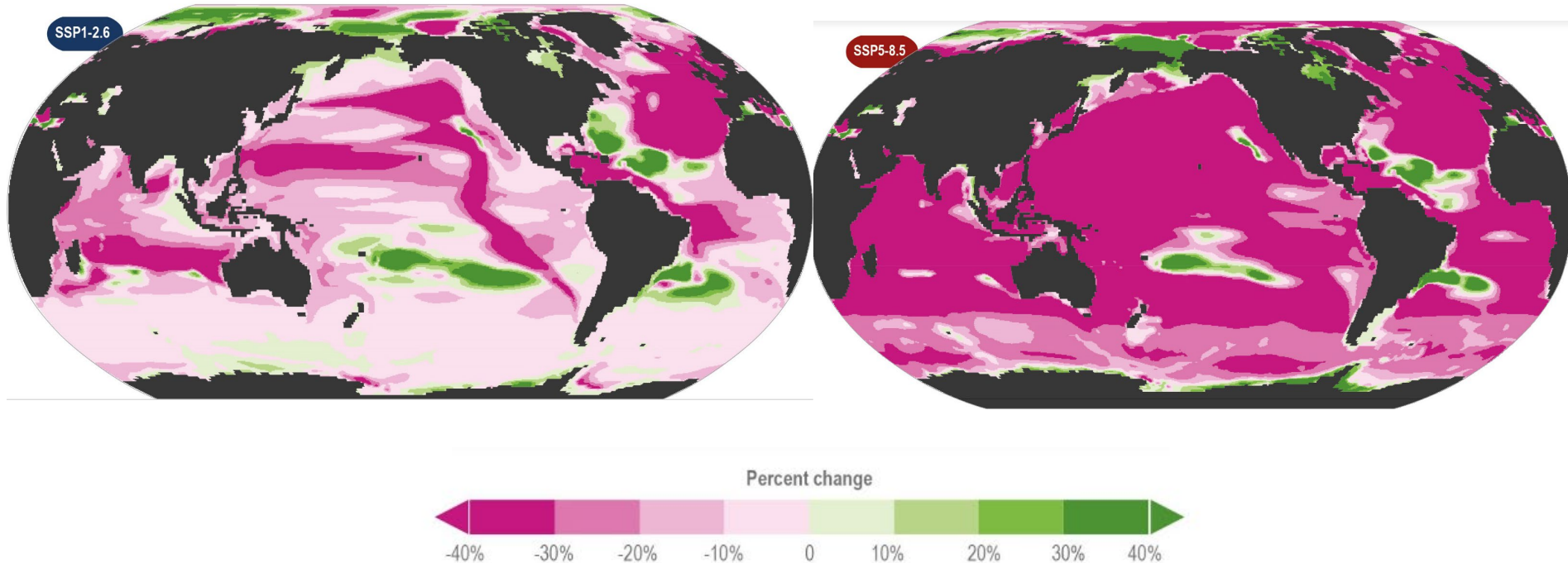
Avoided deaths per 100,000

>330 300 285 255 135 45 15 10 5 0 5 10 15 45 135 255 285 300 >330















Impacts on marine animal biomass

Simulated change by 2090-2099, relative to 1990 - 1999



Impacts on human systems

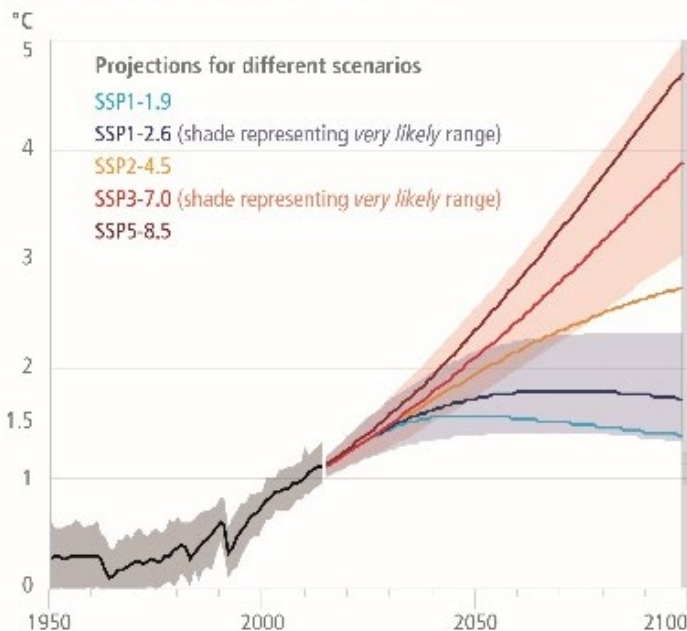
(b) Observed impacts of climate change on human systems

Human systems	Impacts on water scarcity and food production				Impacts on health and wellbeing				Impacts on cities, settlements and infrastructure			
	Water scarcity	Agriculture/crop production	Animal and livestock health and productivity	Fisheries yields and aquaculture production	Infectious diseases	Heat, malnutrition and other	Mental health	Displacement	Inland flooding and associated damages	Flood/storm induced damages in coastal areas	Damages to infrastructure	Damages to key economic sectors
												
Global	±	-	○	-	-	-	-	-	-	-	-	-
Africa	-	-	-	-	-	-	-	-	-	-	-	-
Asia	±	±	-	-	-	-	-	-	-	-	-	-
Australasia	±	-	±	-	-	-	-	not assessed	-	-	-	-
Central and South America	±	-	±	-	-	-	not assessed	-	-	-	-	-
Europe	±	±	-	±	-	-	-	-	-	-	-	-
North America	±	±	-	±	-	-	-	-	-	-	-	-
Small Islands	-	-	-	-	-	-	-	-	-	-	-	-
Arctic	±	±	-	-	-	-	-	-	-	-	-	±
Cities by the sea	○	○	○	-	○	-	not assessed	-	○	-	-	-
Mediterranean region	-	-	-	-	-	-	not assessed	-	±	-	○	-
Mountain regions	±	±	-	○	-	-	-	-	-	na	-	-

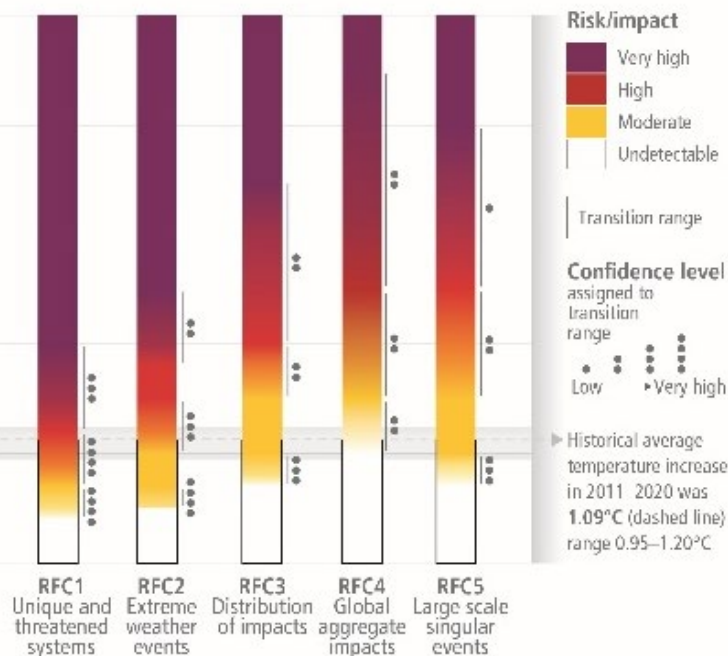
Global risks: burning ember diagrams

Global and regional risks for increasing levels of global warming

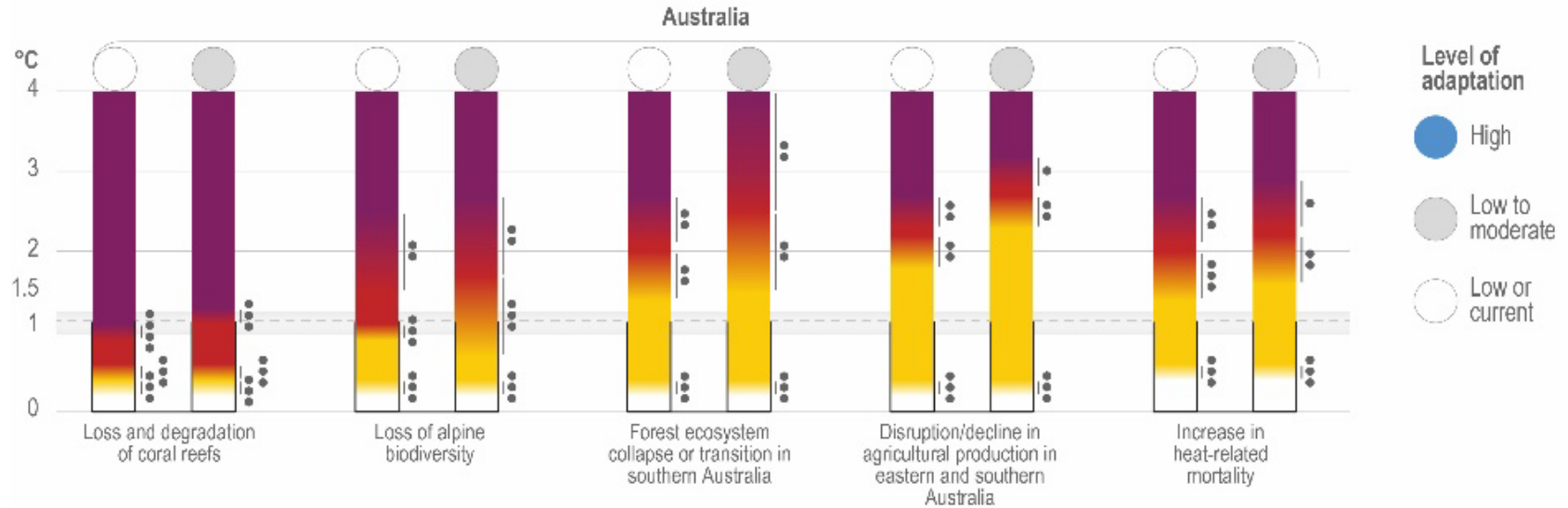
(a) Global surface temperature change
Increase relative to the period 1850–1900



(b) Reasons for Concern (RFC)
Impact and risk assessments assuming low to no adaptation



Australia: risks

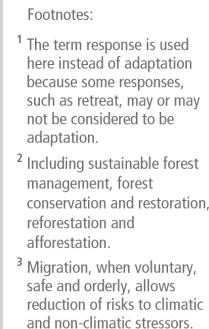


- Also addressed complex and cascading risks









To avoid mounting losses, urgent action is required to adapt to climate change.

At the same time, it is essential to make rapid, deep cuts in greenhouse gas emissions to keep the maximum number of adaptation options open.



Feasibility assessment of adaptations

System transitions	Representative key risks	Climate responses ¹ and adaptation options	✓ Potential feasibility	Synergies with mitigation	Dimensions of potential feasibility					
					 Economic	 Techno-logical	 Insti-tutional	 Social	 Environ-mental	 Geo-physical
Land and ocean ecosystems	Terrestrial and ocean ecosystem services	Forest-based adaptation ²	●	●	●	●	●	●	●	●
		Sustainable aquaculture and fisheries	●	●	●	●	●	●	●	●
		Agroforestry	●	●	●	●	●	●	●	●
		Biodiversity management and ecosystem connectivity	●	●	●	●	●	●	●	●
	Water security	Water use efficiency and water resource management	●	●	●	●	●	●	●	●
	Food security	Improved cropland management	●	●	●	●	●	●	●	●
		Efficient livestock systems	●	●	●	●	●	●	●	●

Adaptation limits and maladaptation

- A narrowing window for action: above 1.5°C some adaptation solutions may no longer work or work as effectively
- Limits: above 1.5°C, people living on small islands and those dependent on glaciers/snowmelt may no longer be able to adapt
 - by 2°C farming challenged in many current growing areas
- Even effective adaptation cannot prevent all losses and damages
- Current global financial flows are insufficient
- Most finance targets emissions reductions rather than adaptation
- Alert to possible maladaptive responses including through additional GHG emissions

“ There are increasing gaps
between adaptation action taken
and what’s needed.
These gaps are largest among
lower income populations.
They are expected to grow.

Accelerating climate adaptation



- Political commitment and follow-through across all levels of government
- Institutional framework: clear goals, priorities that define responsibilities
- Enhanced knowledge of risks & adaptation improves responses
- Monitoring and evaluation of adaptation measures are essential to track progress
- Inclusive governance that prioritises equity, justice and inclusion





Climate resilient development is already challenging at current global warming levels.

The prospects will become further limited if warming exceeds 1.5°C and may not be possible if warming exceeds 2°C.



Australian
National
University

Thankyou

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Every half a degree matters
Every year matters
Every choice matters

Howden and Colvin 2018