



Climateworks
CENTRE

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Climateworks Centre



Forests, climate and the future:

Harnessing nature's power for net
zero and biodiversity



Acknowledgement of Country

I want to begin by acknowledging that we meet today on the unceded lands of the Ngunnawal and Ngambri people. For tens of thousands of years, First Nations communities have cared for these landscapes, managing forests, grasslands, and waterways in ways that sustain biodiversity and maintain ecological balance. Their knowledge is essential as we confront the twin challenges of climate change and biodiversity loss. As we discuss the future of forests in carbon sequestration, we recognise that Indigenous land stewardship holds key lessons for achieving a truly sustainable and nature-positive future.

Take home messages:

- + Net zero is achievable — and the land sector is essential.
- + Climate and biodiversity goals must be pursued together.
- + The good news: it's possible to achieve both — and support a growing, productive economy.
- + Strategic land use planning is the key — and the tools exist to guide it.
- + Growth in agriculture and land-based industries can go hand in hand with environmental restoration.

Who we are

Co-founded by Monash University and The Myer Foundation and working within the Monash Sustainable Development Institute.



MONASH
SUSTAINABLE
DEVELOPMENT
INSTITUTE



Influence

Since 2009 Climateworks has played an influential role in supporting critical sectors to shift to low-emissions solutions.

Scale

We began with a focus on Australia's economy - but with the Paris 2015 Climate Agreement and call to limit warming to 1.5 degrees, the need and urgency were clearly much greater.

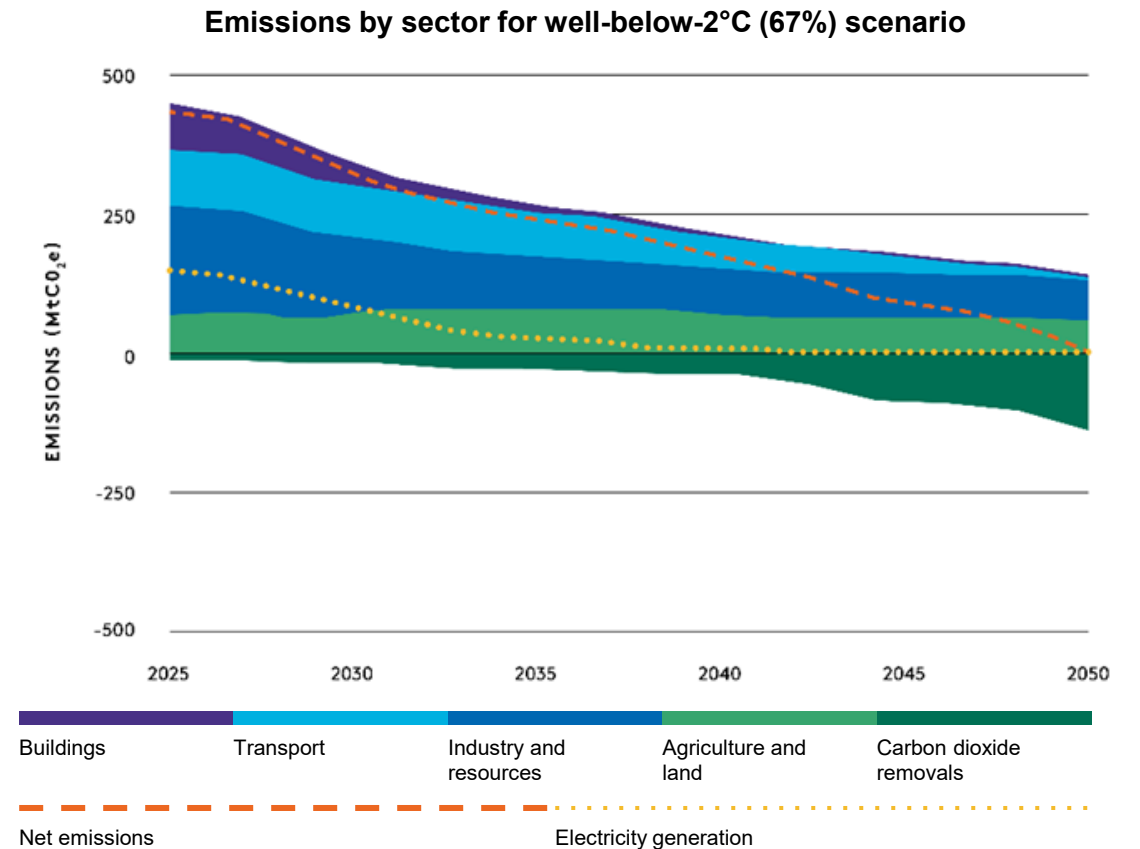
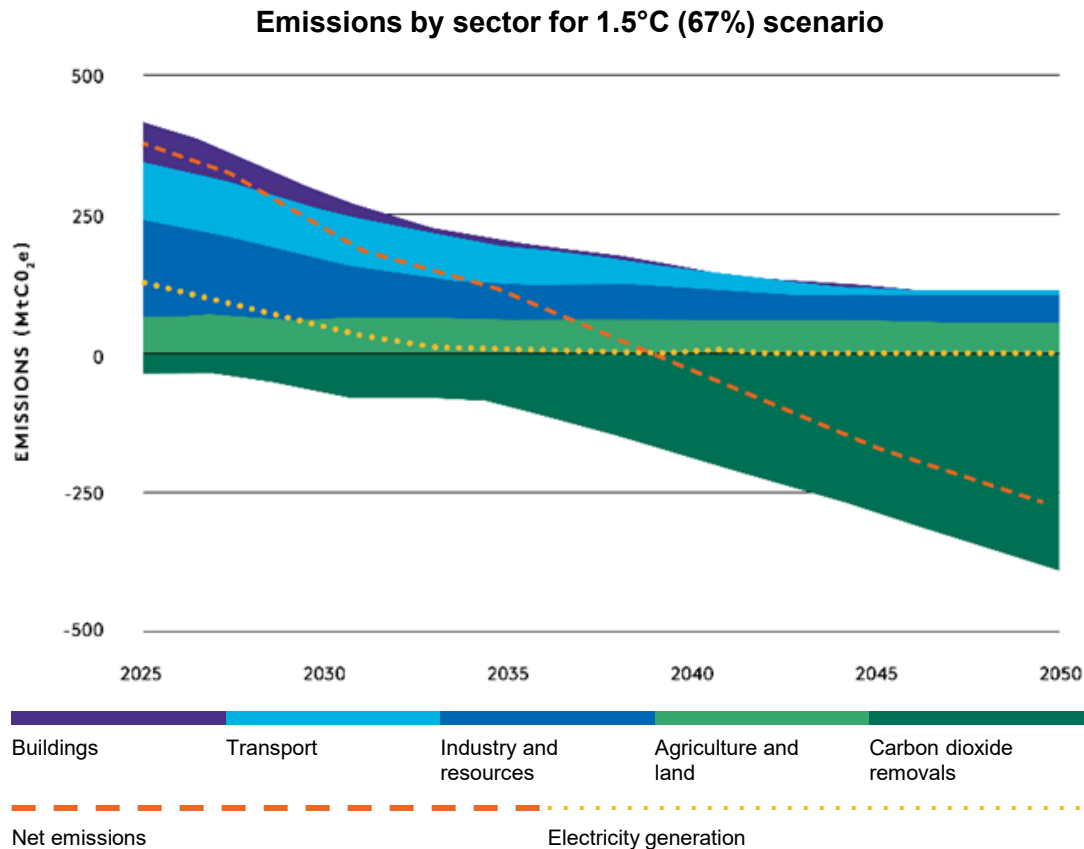
Accelerate

We bridge the gap between research and climate action, accelerating the transition to net zero emissions. We act as trusted advisors, influencing decision-makers with the power to reduce emissions at scale.

100 staff

We now operate across Australia, Southeast Asia and the Pacific, delivering a more ambitious systems wide strategy.

Cost-effective decarbonisation needs action across all sectors



Growing competition for land means optimisation matters

- + Agricultural production
- + Timber production
- + Ecosystem services
- + Carbon sequestration 'sink'
- + Biodiversity restoration
- + Renewable energy generation and transmission
- + Biofuel feedstock production



We can optimise for multiple land use goals

What is LUTO2?

A world-leading integrated land systems geospatial model that identifies how best to simultaneously meet:

- + domestic and international agricultural demand
- + climate targets
- + biodiversity targets
- + while staying within water use limits

LUTO2

L A N D
U S E
T R A D E
O F F S

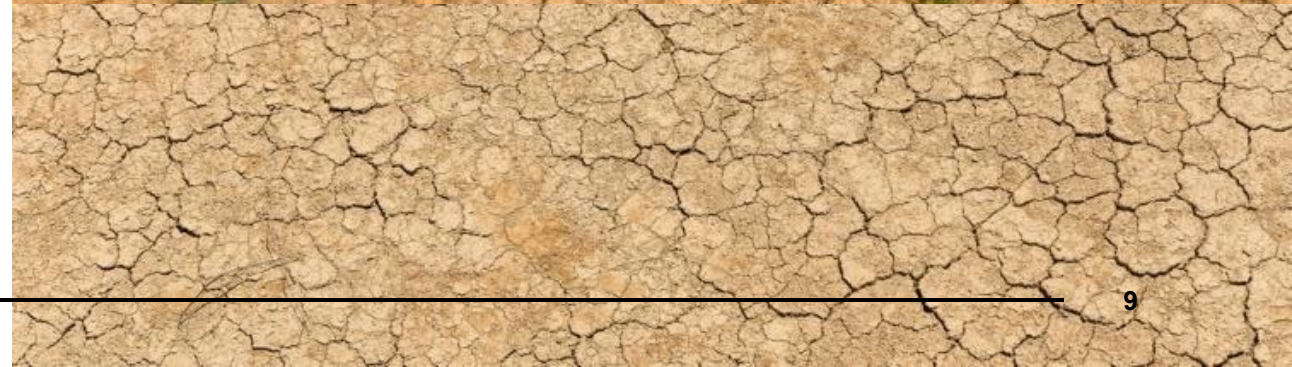


LUTO2 shows the optimal distribution
of agricultural production

and non-agricultural
land use

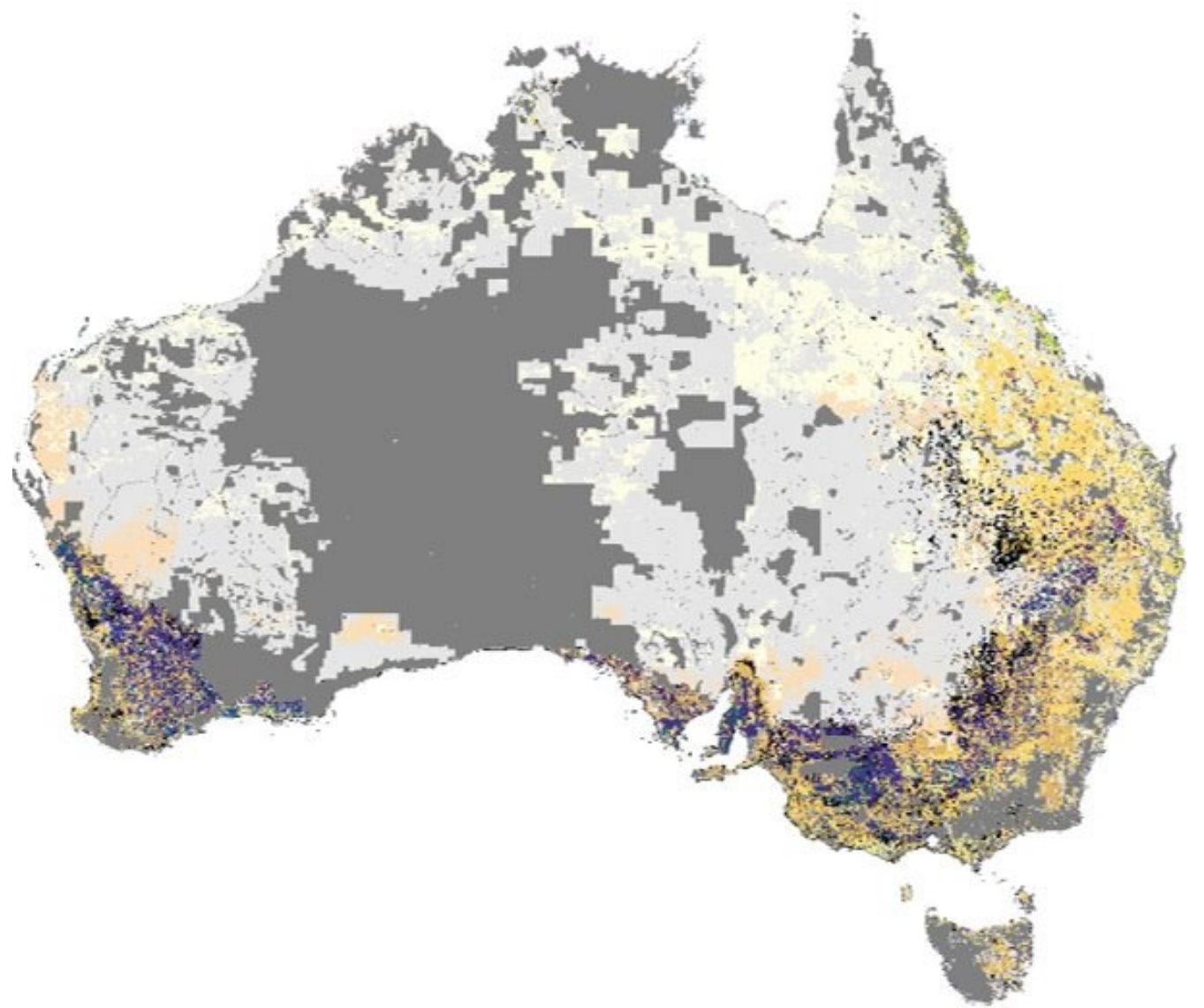
combined with agricultural
and land management practices

while accounting for climate change
impacts



LUTO2's coverage

- + All privately owned (non-urban) and crown lease land in Australia. This is more than 60% of Australia's landmass.
- + Integrates data on biodiversity, carbon sequestration, water use, agricultural productivity, and food systems—including trade, food loss and waste, and dietary trends.
- + Spatial resolution of 1.1km²
- + Over 4 million grid cells
- + Includes water availability and use – so not pushing any catchment into water stress



Solutions in LUTO2

Agricultural management practices:

- + Agricultural technology (fertiliser)
- + Agricultural technology (energy intensity)
- + Methane reduction (livestock)
- + Ecological grazing
- + Early dry-season savanna burning
- + Biochar (cropping soil amendment)

Non-agricultural or mixed land-uses:

- + Environmental plantings (mixed species)
- + Riparian buffer plantings (mixed species)
- + Carbon plantings (hardwood)
- + Human induced regeneration
- + Agroforestry (mixed species belt plantings + sheep or beef)
- + Farm forestry (hardwood belt plantings + sheep or beef)
- + Bioenergy with carbon capture and storage (BECCS)



Biodiversity data now included

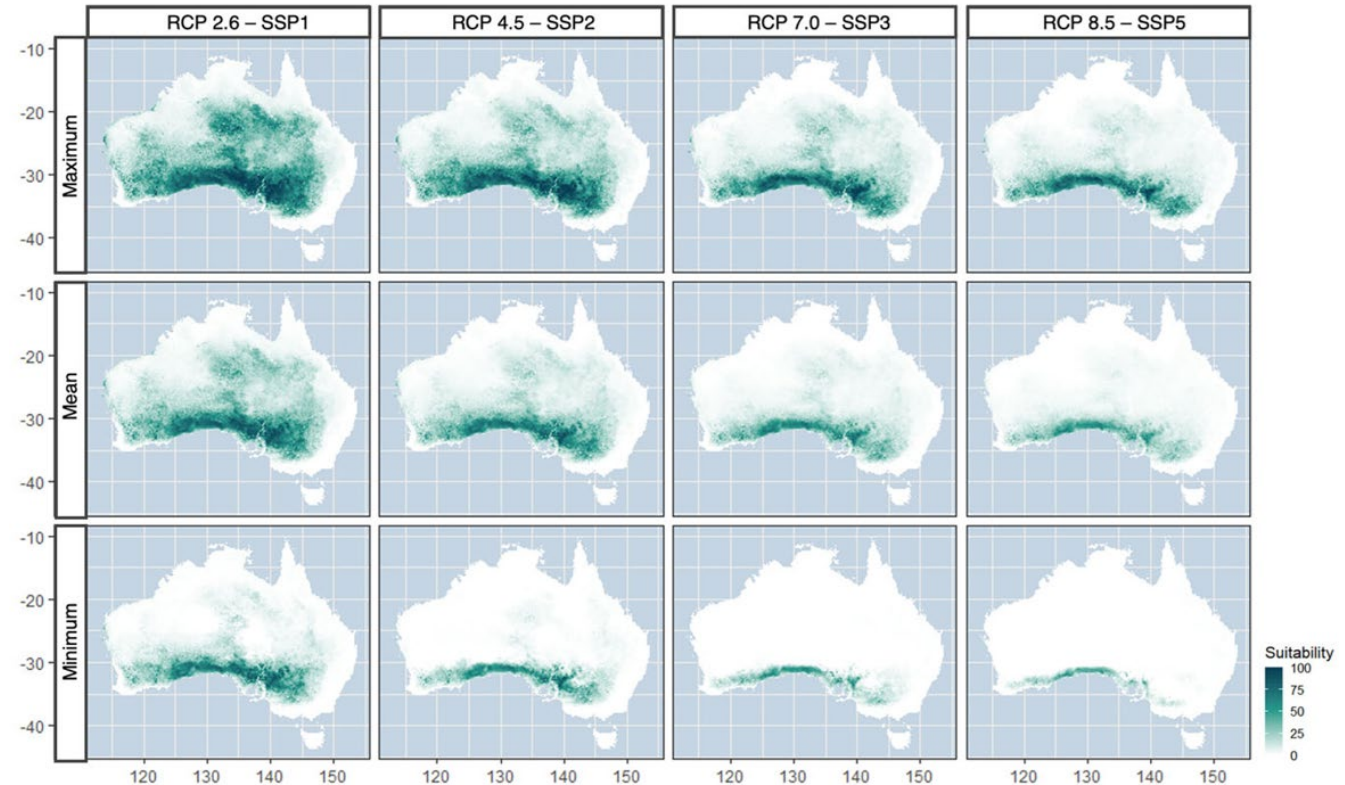
Modelling of over 10,000 species to predict habitat suitability under climate change. Plus:

- + Habitat Condition Assessment System
- + National Connectivity Index
- + Major Vegetation Groups
- + Threatened and Migratory Species
- + Threatened Ecological Communities

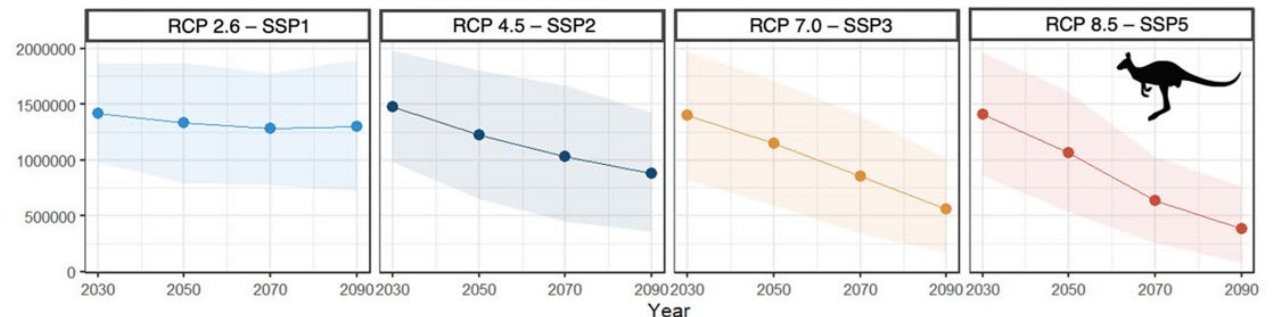
Enables modelling of Global Biodiversity Framework targets

Common Wallaroo (*Macropus robustus*)

Variation (minimum, average & maximum) in habitat suitability predictions in 2090 under different climate scenarios



Average and range of total quality-weighted area of habitat suitability over time (km²) under different scenarios



What does LUTO2 tells us about Australia's land use future?

- + An ambitious climate goal for the land and agriculture sector can be met while meeting Global Biodiversity Framework targets and projected agricultural demand.
- + Meeting this goal requires significant changes to both land management practices and land uses.
- + There are opportunities to synergise climate and biodiversity objectives - but the choice of strategies matter.

Natural Capital Measurement will become a new normal — gathering metrics beyond carbon sequestration

- + There has been lack of consensus on common metrics to measure genuine outcomes in halting and reversing nature loss.
- + Scientifically credible, practical, and standardized metrics are needed to bring measurability to the term 'Nature Positive'.
- + The Natural Capital Measurement Catalogue promotes consistency in natural capital measurement by providing an open-source classification system for natural capital metrics and their associated measurement methods and public data sources.

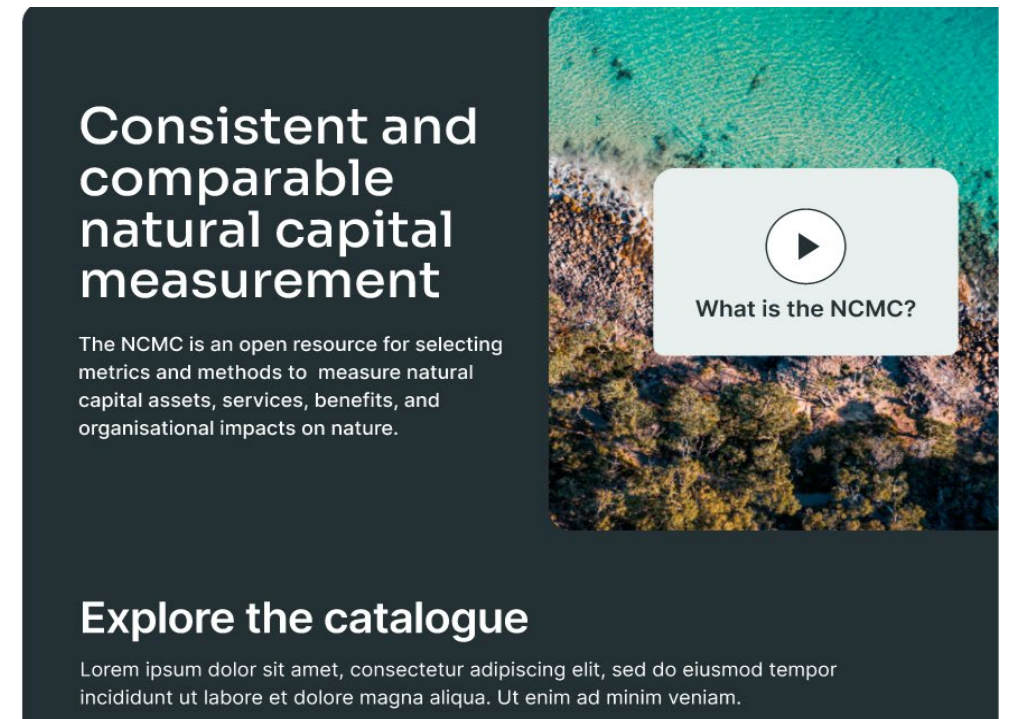
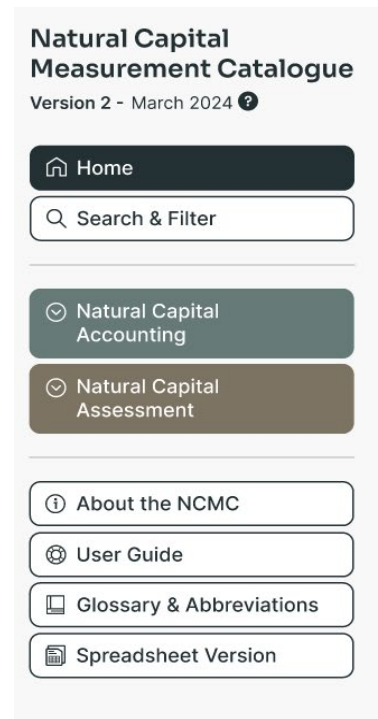
New national resource:

Natural Capital Measurement Catalogue

- + Open source compilation of publicly available metrics / methods / data sources
- + Consistent with local and international frameworks
- + Purpose-driven selection of metrics/methods by user
- + Not prescriptive or exhaustive
- + Doesn't collect data
- + Evolving web resource available at:

<https://naturalcapitalmeasurement.org>

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Social licence in land use planning

- + Open and ongoing conversation is needed to ensure that land use transitions are fair and equitable.
- + Cultivate markets and develop incentives that support sustainable land management.
- + Strengthen social licence through transparency in environmental performance.



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Thank you.

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Climateworks Centre operates as an
independent not-for-profit within
Monash University.