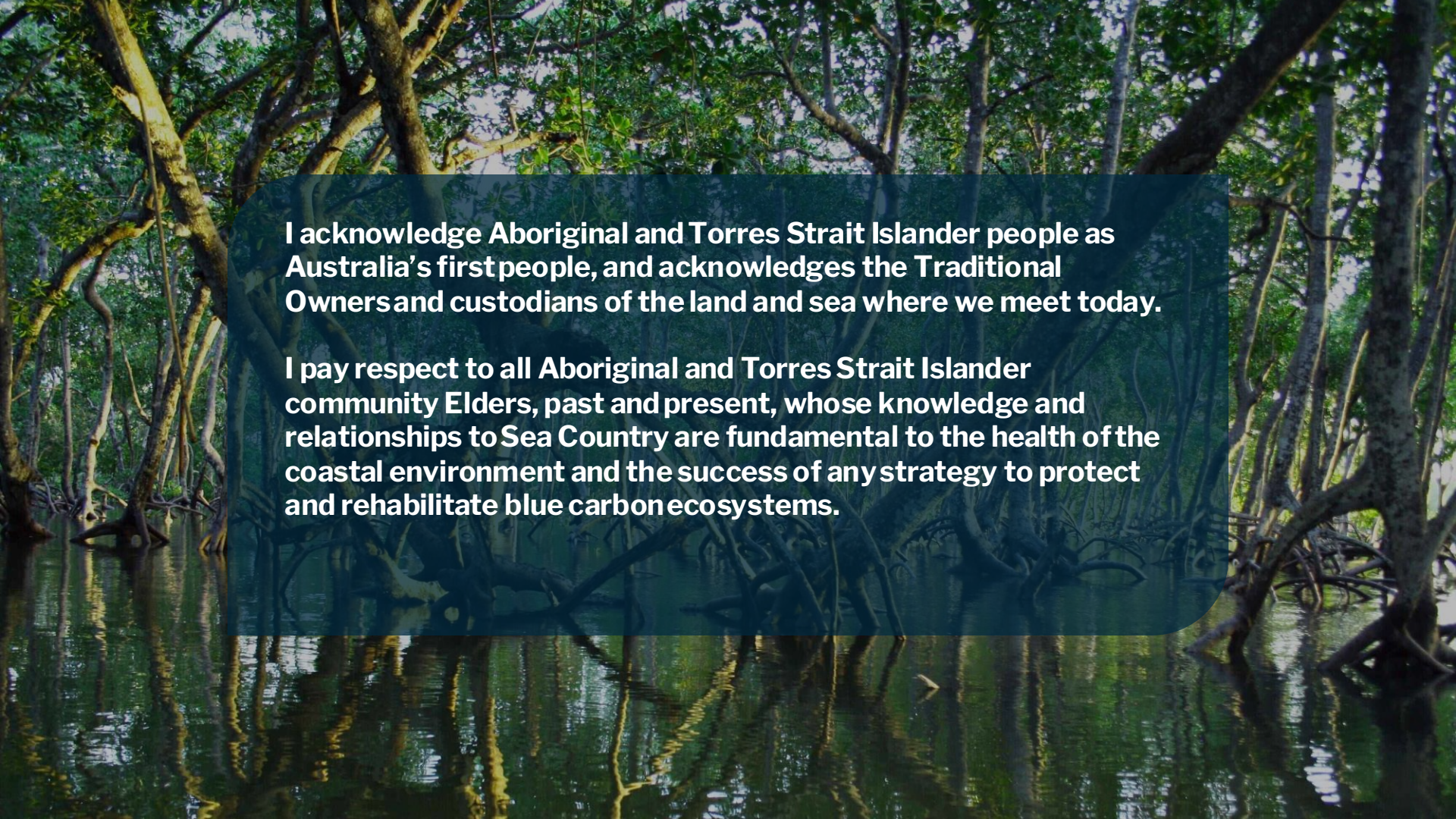


# Importance of measuring & communicating diverse benefits of blue carbon ecosystems

IPBC Annual Dialogue 2024, Cairns

Presenter: Dr Paul Carnell



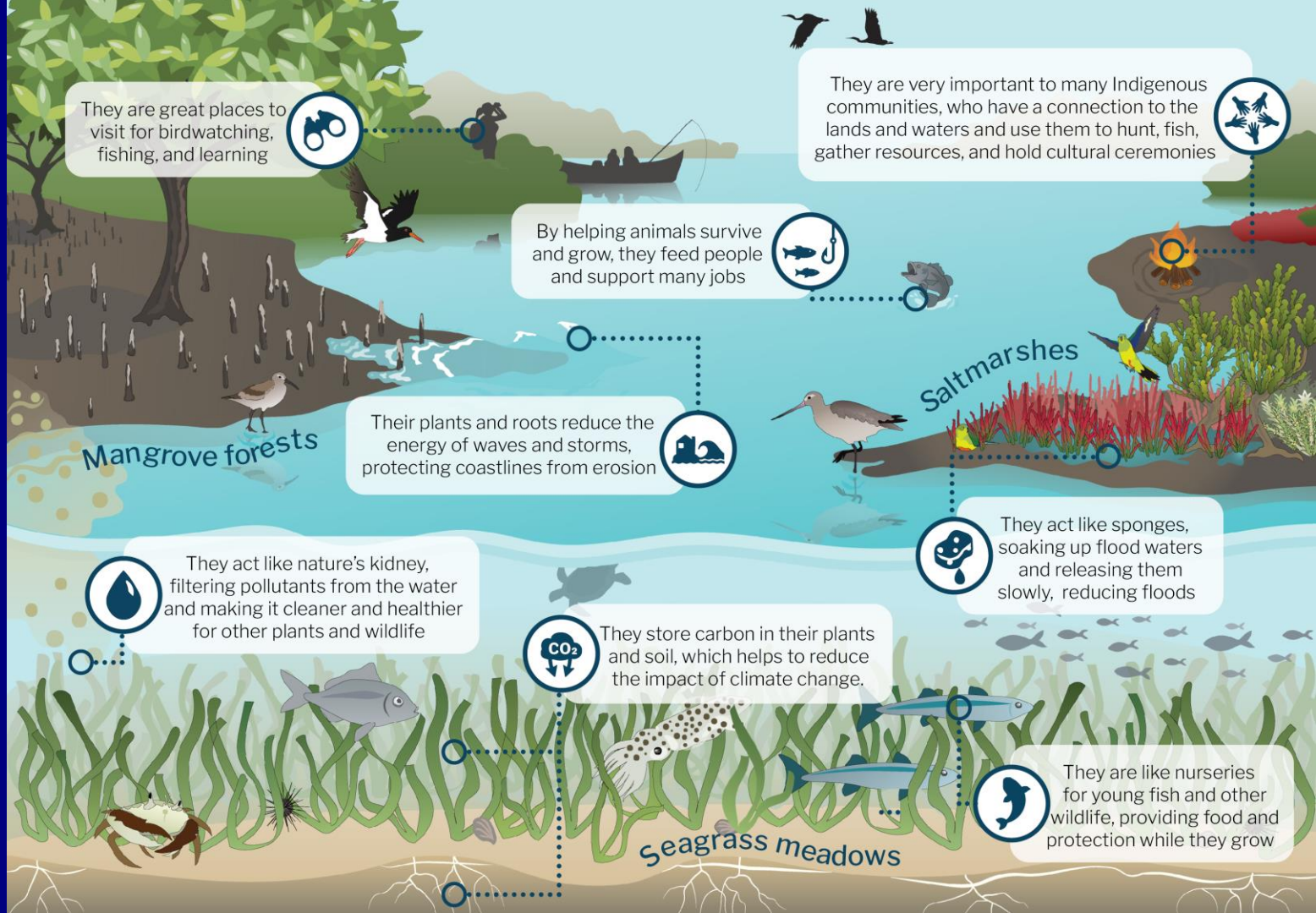
**I acknowledge Aboriginal and Torres Strait Islander people as Australia's first people, and acknowledges the Traditional Owners and custodians of the land and sea where we meet today.**

**I pay respect to all Aboriginal and Torres Strait Islander community Elders, past and present, whose knowledge and relationships to Sea Country are fundamental to the health of the coastal environment and the success of any strategy to protect and rehabilitate blue carbon ecosystems.**



# Blue carbon ecosystems

# Diverse benefits



# Mapping Ocean Wealth Australia



## COASTAL WETLAND

Saltmarsh

Mangroves

Seagrass

## MEASURABLE BENEFITS

FISHERIES



TOURISM &  
RECREATION



BLUE  
CARBON



COA STAL  
PROTECTION



The Nature Conservancy 



HSBC 



Department of  
Environment, Land,  
Water & Planning 



Australian Government

Australian Research Council



Primary  
Industries

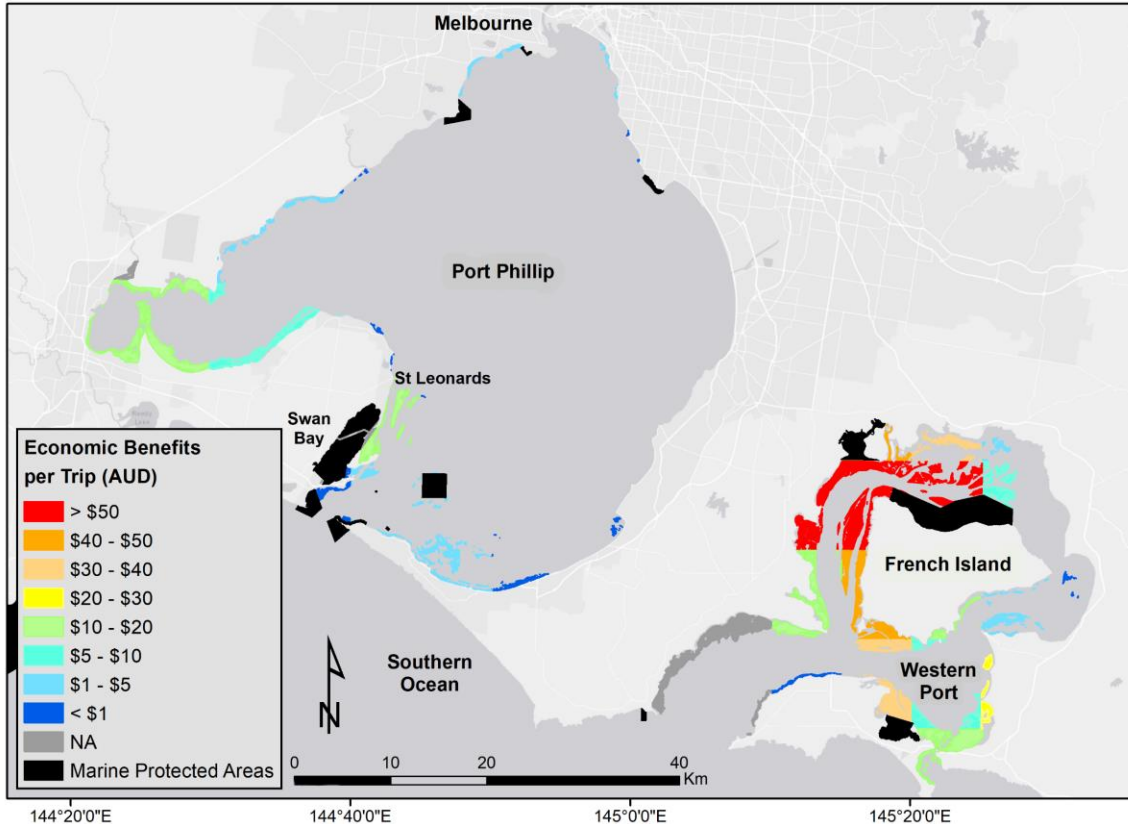
# Coastal wetlands **power** Australia's **Inshore fisheries**



- In Australia, combined they provide on average **61%** of diet for commercial fisheries species
- This contribution equates to **1000's of tons** of fish biomass per year = at least **\$35.6 million** in Aus.
- 1 hectare of seagrass = **207 kg more fish** per year compared to seafloor without seagrass

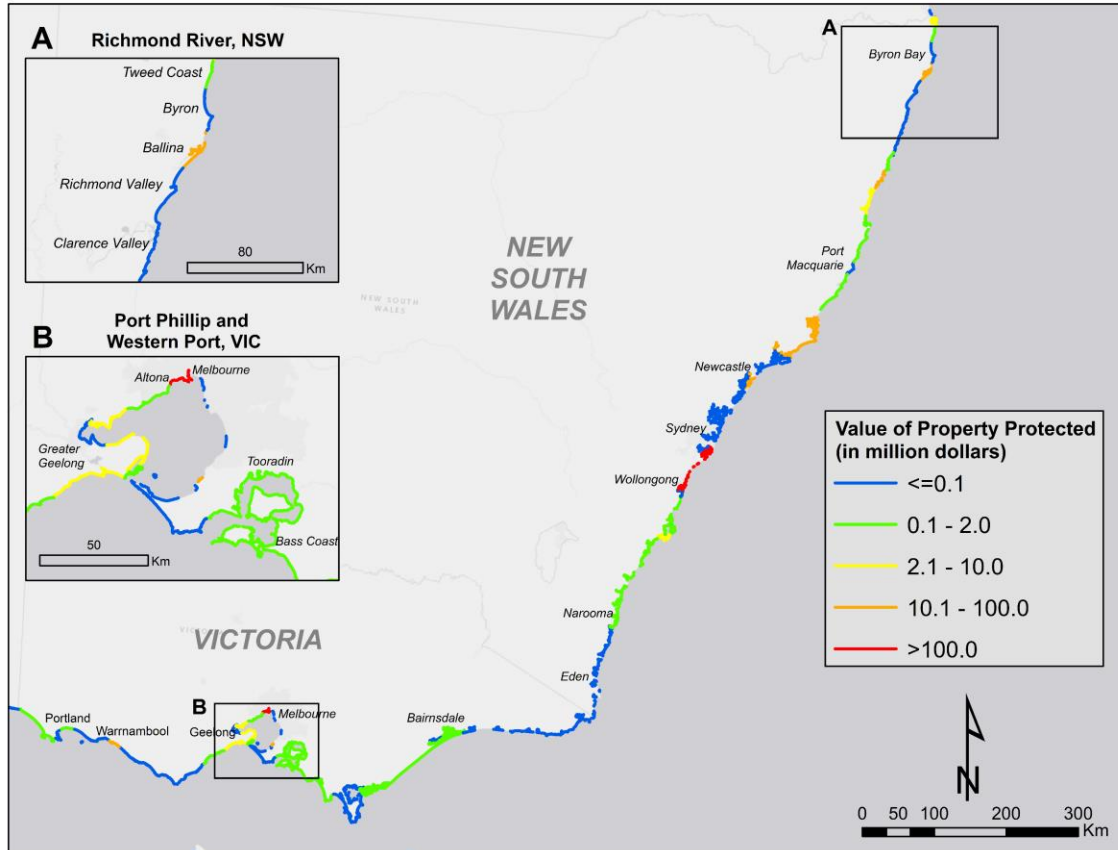
# Seagrass meadows support recreational fishing

With an estimated 3 million recreational fishing trips, this adds up to over **\$33.1 million per annum**



# Coastal Hazard Risk Reduction:

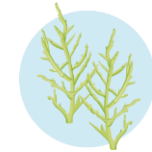
## Mapping the Role of Wetlands in **protecting shorelines**



- Coastal wetlands protect **\$2.7 billion** valued property across south-eastern Australia



\$1.86 billion



\$702 million



\$82.7 million



# A guide to measuring and accounting for the benefits of restoring blue carbon ecosystems



Australian Government

Department of Climate Change, Energy,  
the Environment and Water



# A guide to measuring and accounting for the benefits of restoring blue carbon ecosystems

**Purpose:** to demonstrate the benefits of restoring coastal blue carbon ecosystems, for climate (coastal protection, flood risk reduction, climate change mitigation), biodiversity, and people (First Nations peoples, fisheries, pollution, recreation).

## **Objectives:**

Provide a *process* to implement Ecosystem Accounting for restoration projects in coastal blue carbon environments

Info. on how to populate accounts, data needs, methods to use, outputs produced

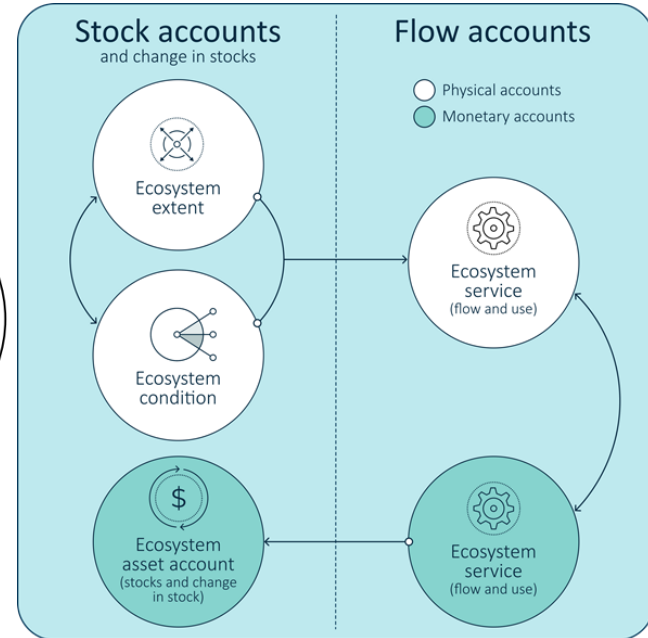
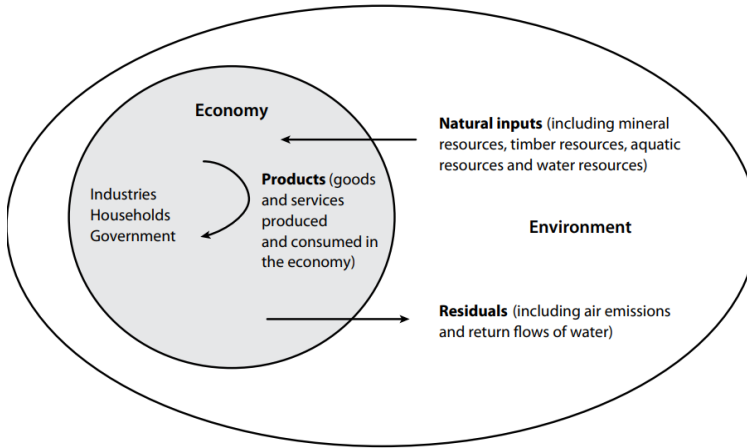
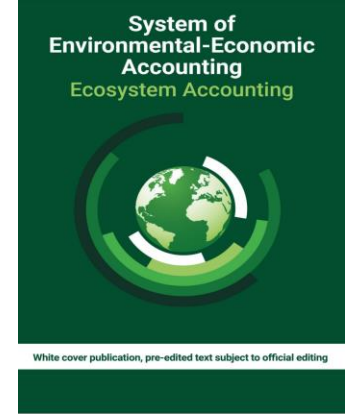
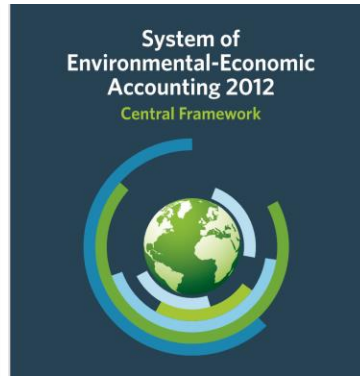
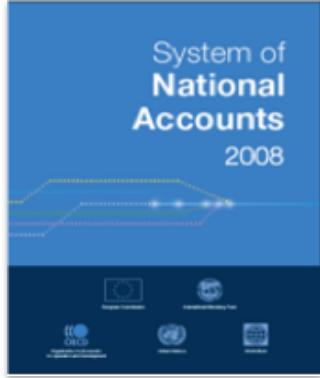
Provide standardized approach to valuing the ecosystem services

Place importance on accurate, appropriate data

Implement guide at 2 case study sites: Hunter River, NSW & Trinity Inlet, QLD

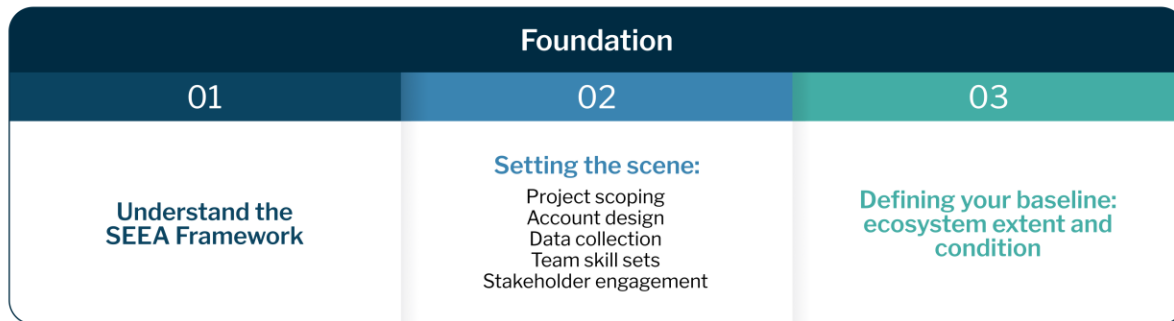
**Target audience:** groups implementing coastal restoration projects

# The System of Environmental Economic Accounting (SEEA)



# How to use the guide

## How to use this guide



Choose your ecosystem services of interest:



Carbon sequestration



Carbon emission reduction



Water purification



Coastal protection



Fish production



Cultural Services:  
Traditional Owner values



Cultural Services:  
Recreation and existence values

Outputs: Measure change over time using EEA tables



# Trinity Inlet case study



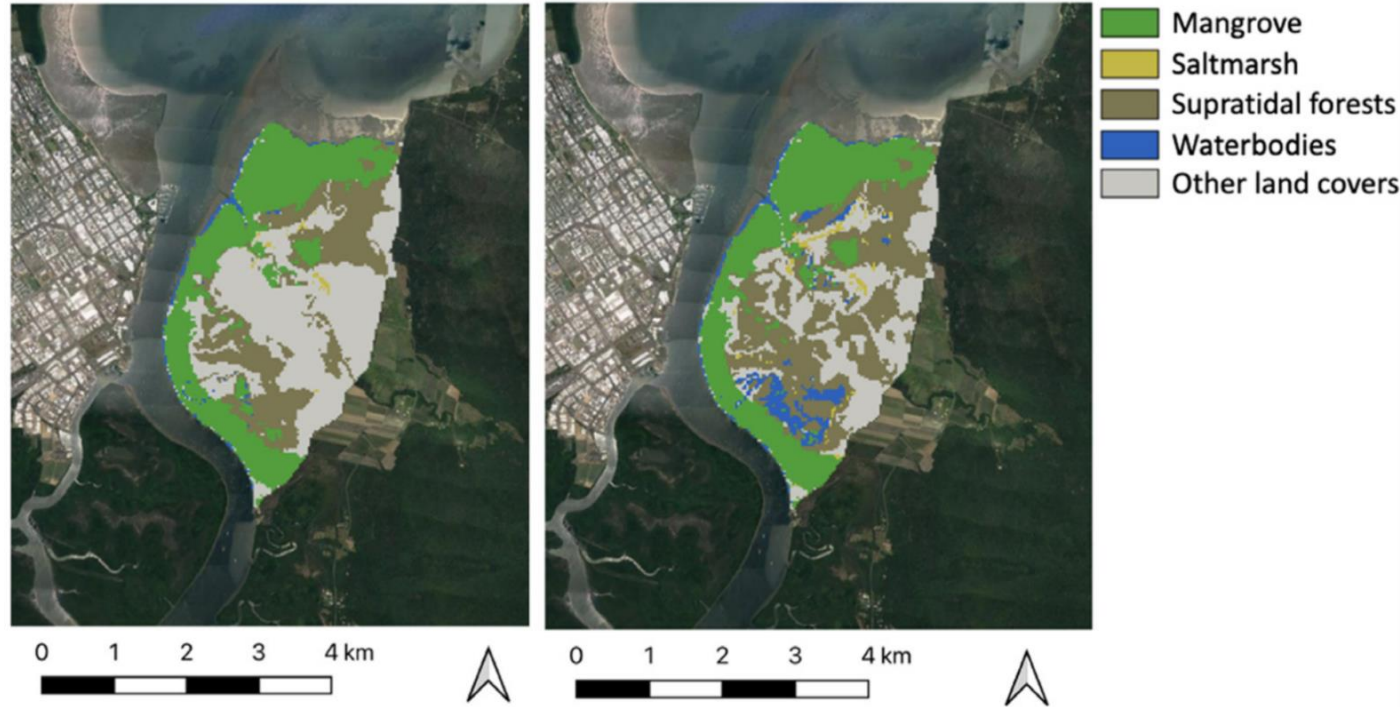
# Trinity Inlet case study



# Trinity Inlet case study



# Trinity Inlet case study



**An increase of over 100 ha of blue  
carbon ecosystems, mostly supratidal  
forests**





# Trinity Inlet case study

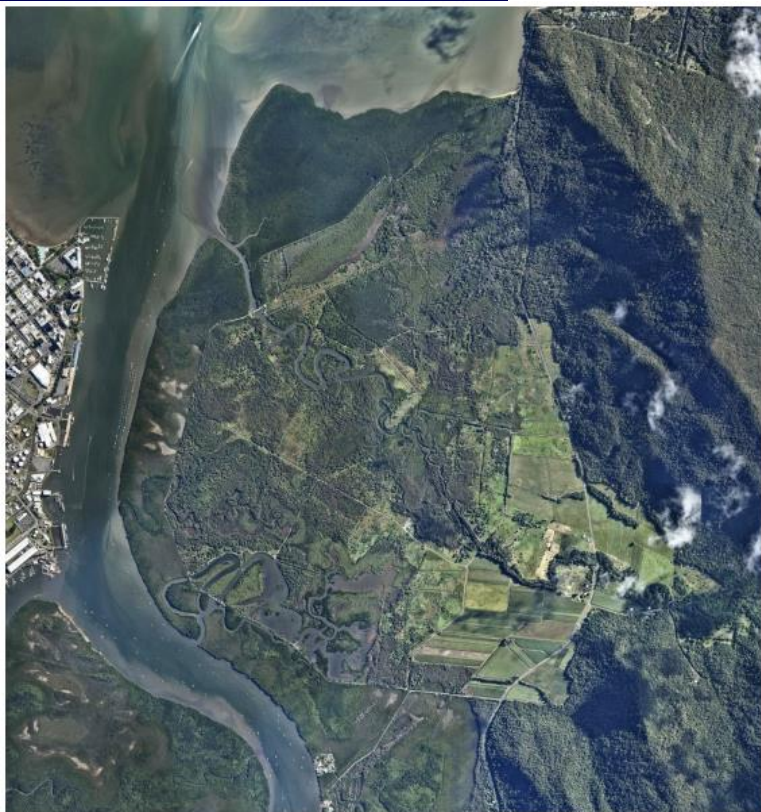


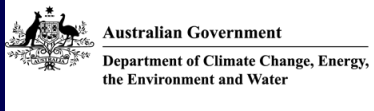
Figure 11: Aerial imagery of the East Trinity Inlet restoration project, with downtown Cairns to the West. Image from Nearmap.

Table ES.2: Key estimated ecosystem service impacts (and selected other impacts) of the East Trinity Restoration Project.

Component	Aspect measured	Change attributable to the project (2022 data unless otherwise stated)	\$AUD (\$2022 unless otherwise stated)
Cultural services – First Nations	The aim of this project was to identify First Nations values and cultural services	East Trinity provides a range of cultural services to the traditional owners. These include services from harvesting, ceremony, knowledge generation, transmission and governance. Emphasis is on the importance of the site for identity, recreation, wellbeing, family and community. Account also demonstrates the circular nature of ecosystem provision, as it includes both services derived from the ecosystem, but also other services, such as caring for Country, which offer benefit to the ecosystem. Economic values were not estimated for First Nations values.	
Cultural services – recreation	Recreational fishing	9,125 fishing trips per year	\$187,063 per year (\$474,500 welfare value)
	Recreational bird watching	180 birdwatching trips per year	\$17,712 per year (\$31,446 welfare value)
Water quality	Removal from water of Nitrogen, Total Suspended Solids, Total Phosphorus	7 tons of N, 1,220 tons of TSS, and 1.1 ton of TP per year	\$119,646 per year
Carbon abatement	Emissions avoided	2,307 t CO <sub>2</sub> e – 37,419 t CO <sub>2</sub> e over analysis period*	\$62,645 – \$5,612,921 over analysis period
	Carbon sequestered in vegetation and soil	79,578 t CO <sub>2</sub> e – 104,268 t CO <sub>2</sub> e over analysis period*	\$2,447,023 – \$15,640,268 over analysis period
	Net abatement amount [avoided emissions + carbon sequestration]	81,615 t CO <sub>2</sub> e – 141,688 t CO <sub>2</sub> e over analysis period*	\$2,509,667 – \$21,253,189 over analysis period
Existence value	Community existence value for restoration	Value of community preferences for wetland restoration	\$22,932 per year (welfare value)
Restoration costs	Total cost of restoration over project period	Tidal gate modification and removal, 1.2 km of additional levee, maintenance and monitoring, pest management	\$9,822,961 in combined expenditure since 2001



# A guide to measuring and accounting for the benefits of restoring blue carbon ecosystems



The Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW) commissioned a team led by Deskin to develop a guide. The Guide outlines the process for measuring and accounting for the benefits of restoring blue carbon ecosystems (e.g. saltmarsh, seagrass).

The Guide introduces a process for reporting on the ecosystem services provided by coastal blue carbon ecosystems. These include: carbon storage, biodiversity, water purification, coastal protection, fish production, Traditional Owner cultural values, recreation and community values.

The Guide uses the [United Nations System of Environmental Economic Accounting Framework \(UN SEEA\)](#).

Download the Guide



This Guide is a 'working version', which will be tested and refined by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). This includes further exploring the use of UN SEEA at a project-level. This work will help to understand and quantify the economic, environmental, and social changes from restoring blue carbon ecosystems. Methods on data collection and account design to report on the ecosystem services resulting from restoration may be refined in future versions.





# Coastal wetland ecosystems

# Importance of measuring & communicating diverse benefits of blue carbon ecosystems

IPBC Annual Dialogue 2024, Cairns

Presenter: Dr Paul Carnell

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@PaulECarnell



## Acknowledgement of Country

RMIT University acknowledges the people of the Woi wurrung and Boon wurrung language groups of the eastern Kulin Nation on whose unceded lands we conduct the business of the University.

RMIT University respectfully acknowledges their Ancestors and Elders, past and present.

RMIT also acknowledges the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.