

Mapping Ocean Wealth Valuing Australia's coastal wetlands



Blue Carbon Lab

A DEAKIN IDEA

Dr Paul Carnell



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The Nature
Conservancy
Australia




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ATLAS OF OCEAN WEALTH

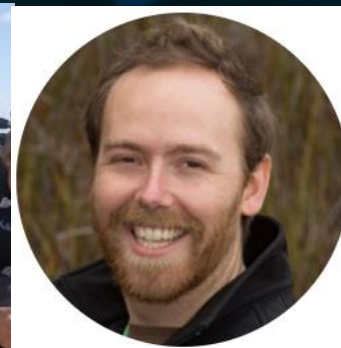
Representing the largest collection of economic, social and cultural values of coastal and marine habitats globally



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Australian Government
Australian Research Council



Environment,
Land, Water
and Planning



Department of
Primary Industries

Mangroves



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Saltmarsh



Seagrass



Fisheries



Tourism & recreation



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Coastal protection



1. Fisheries



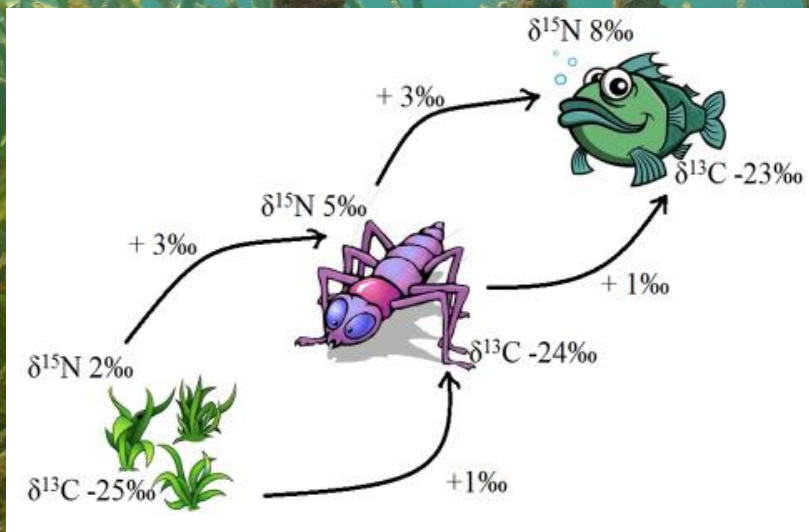
Valuing the contribution of coastal wetlands to fisheries



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- Using stable isotopes to measure dietary contribution and reliance

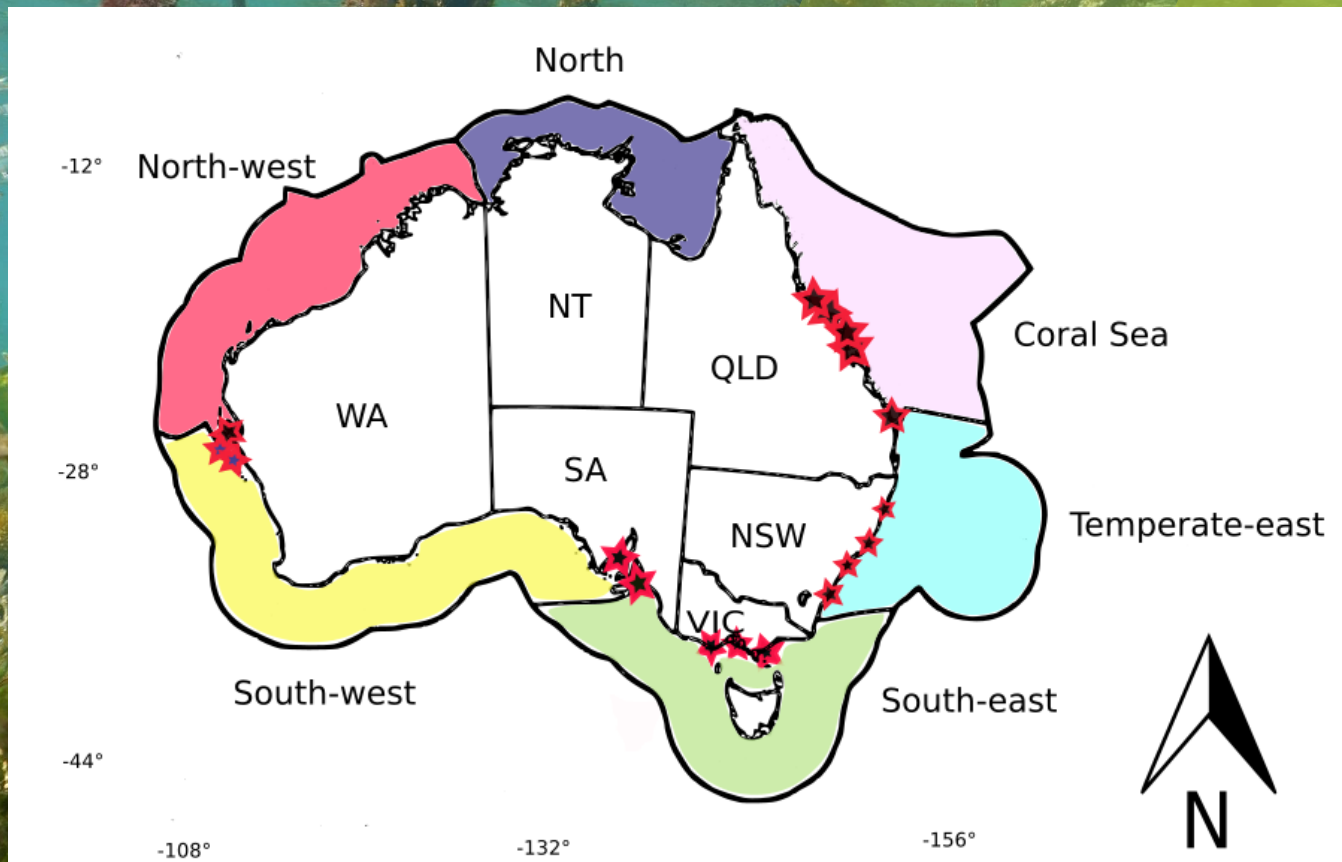


Valuing the contribution of coastal wetlands to fisheries



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Holger Janes

PhD Candidate

Australia

Flathead and whiting rely on seagrass to provide 20-30% of their diet in Port Phillip and Western Port bays



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Proportional contribution

NSW

QLD

SA

VIC

WA

9 2 13

54 30 34

15 19 15

15 19 15

11



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Species	State	Annual value attributable to ecosystems (\$ yr ⁻¹)			Total value attributable to ecosystem (\$ yr ⁻¹)
		Saltmarsh	Mangrove	Seagrass	
Eastern king prawn (<i>Melicertus plebejus</i>)	NSW	\$4.4 M	\$0.5 M	\$8.8 M	\$13.6 M
School prawn (<i>Metapenaeus macleayi</i>)		\$4.1 M	\$0.5 M	\$2.1 M	\$6.7 M
Sea mullet (<i>Mugil cephalus</i>)		\$3.9 M	\$2.1 M	-	\$6.0 M
King George whiting (<i>Sillaginodes punctatus</i>)	VIC	\$0.2 M	\$0.2 M	\$0.8 M	\$1.2 M
Black bream (<i>Acanthopagrus butcheri</i>)		-	-	\$0.5 M	\$0.5 M
Rock flathead (<i>Platycephalus laevigatus</i>)		\$0.02 M	\$0.02 M	\$0.2 M	\$0.2 M



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2. Tourism & Recreation

Recreational fishing in Port Phillip & Western Port



Dr Biao Huang
Postdoctoral Fellow



Recreational fishing catch relies on seagrass



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Recreational fishing catch relies on seagrass



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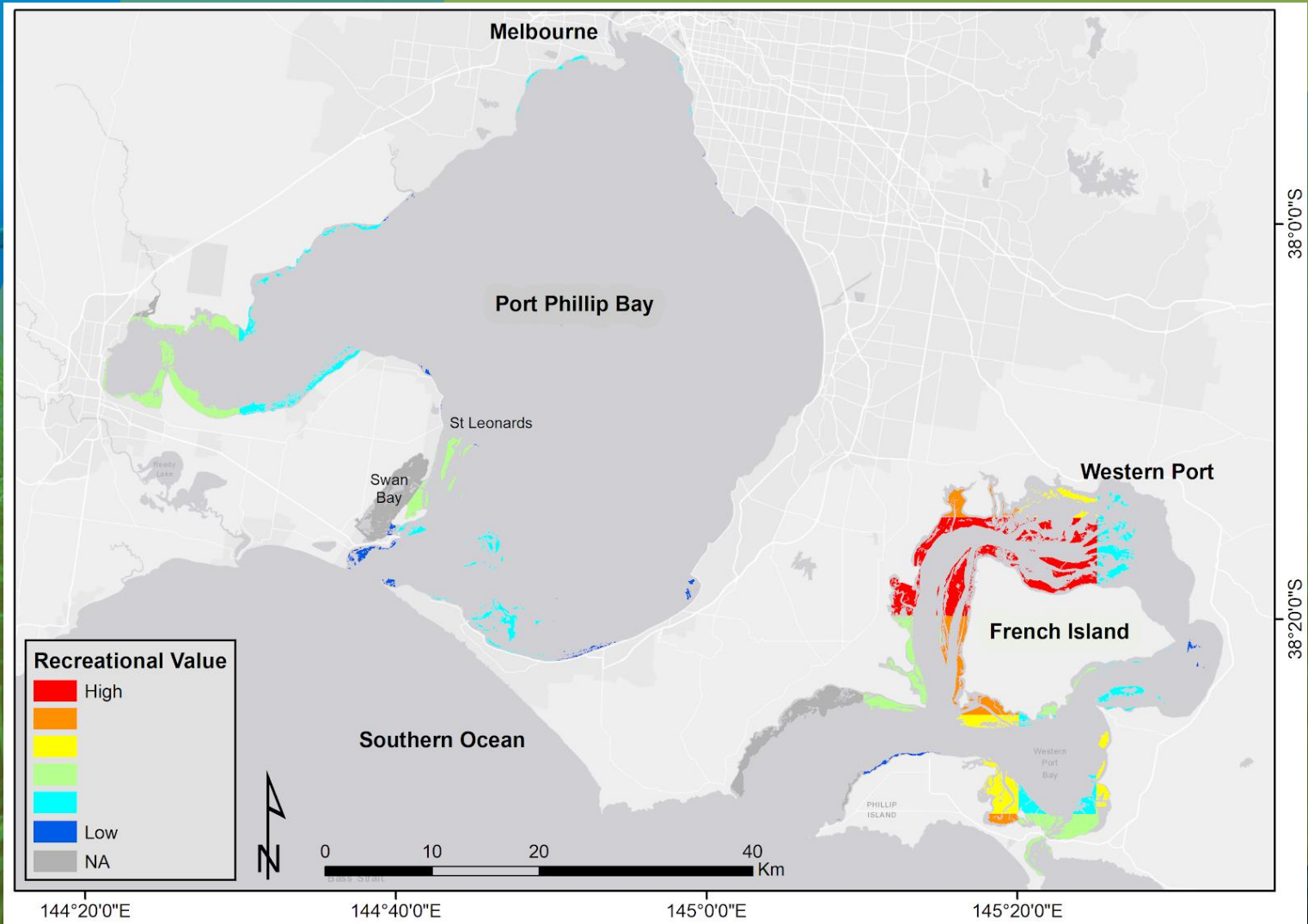
Choice modelling to value seagrass contribution to boat-based recreational fishing



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Contribution of coastal wetlands to recreational birdwatching



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Using citizen science data and a survey of users to assess value



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The Cornell Lab of Ornithology

eBird

Submit

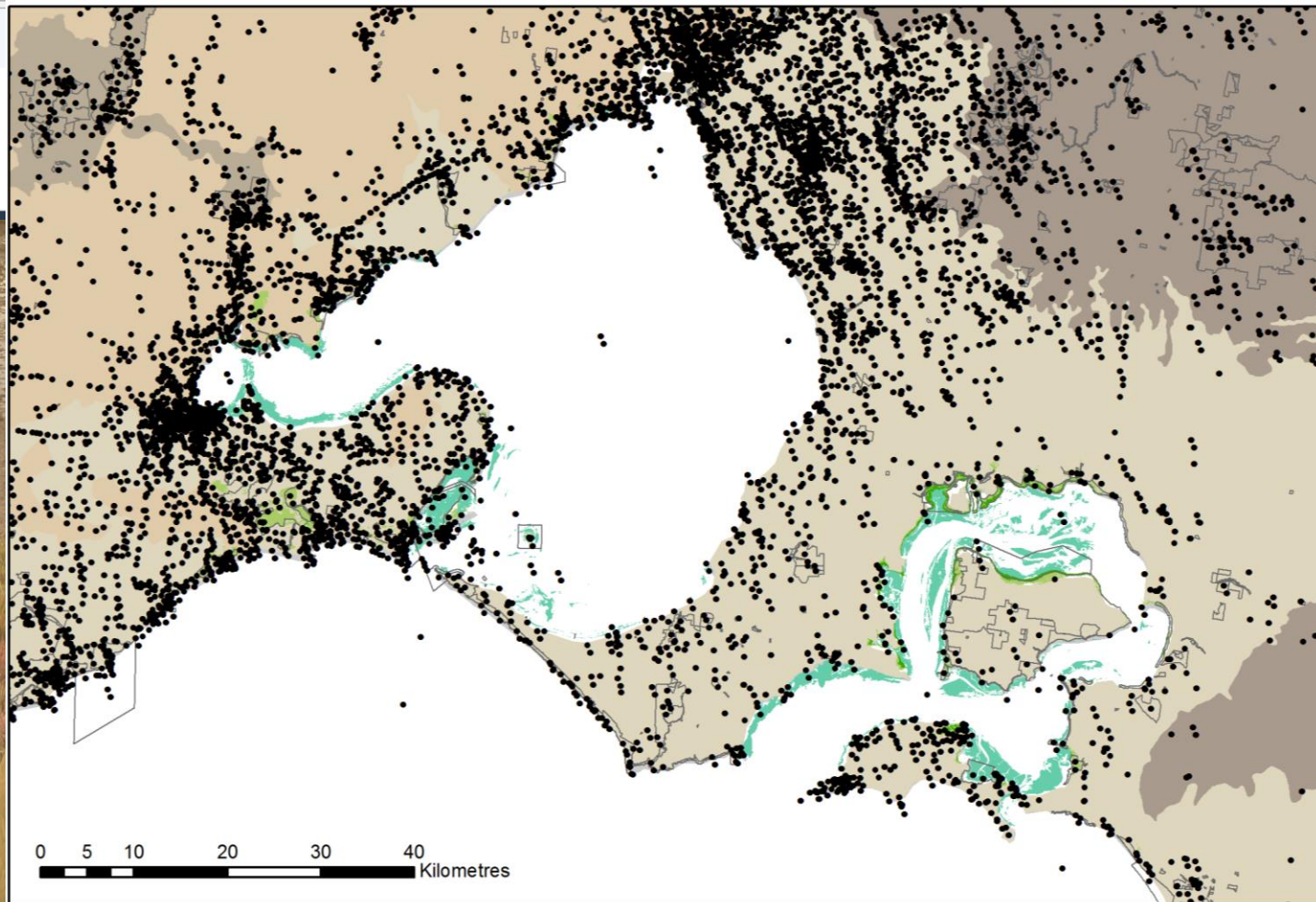
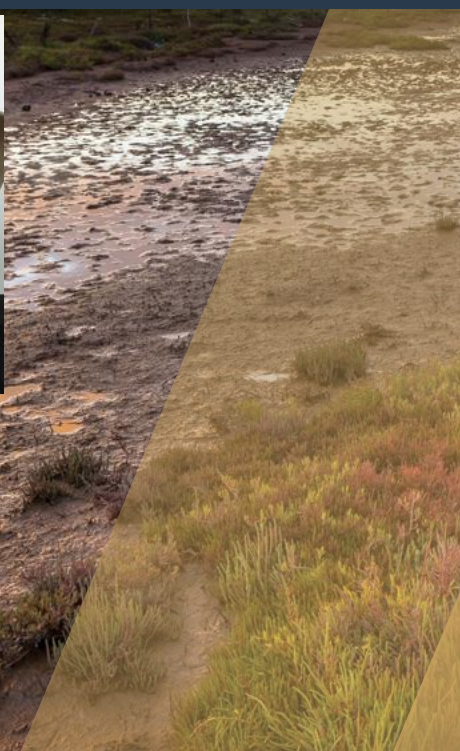
Explore



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Saltmarsh and mangroves contribute to areas of higher recreational birdwatching value



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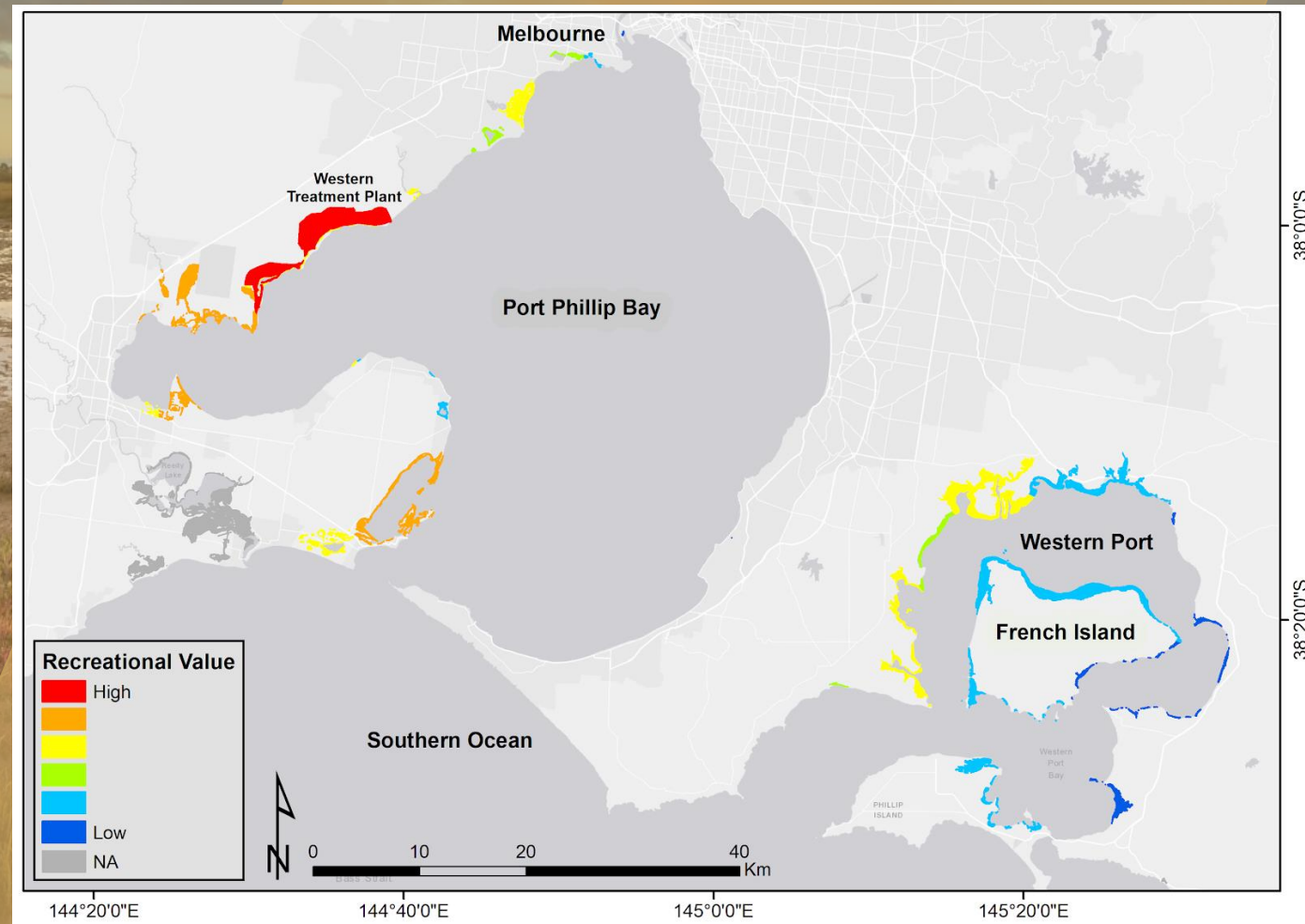
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Example: Tufted duck at the Western Treatment Plant

Resulted in a “mega-twitch” with an estimated 50 visitors in a single day



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Sean Dooley
@Twitchathon



Talking about that celebrity duck at Werribee again on [@abcmelbourne](#) in a few minutes. Photo is of the paparazzi scrum awaiting a photo opp with the 'diva' duck.

♥ 32 4:15 PM - Jan 15, 2019

3. Blue Carbon



How do we remove
already-released CO₂?

Biosequestration





Blue carbon soil sampling



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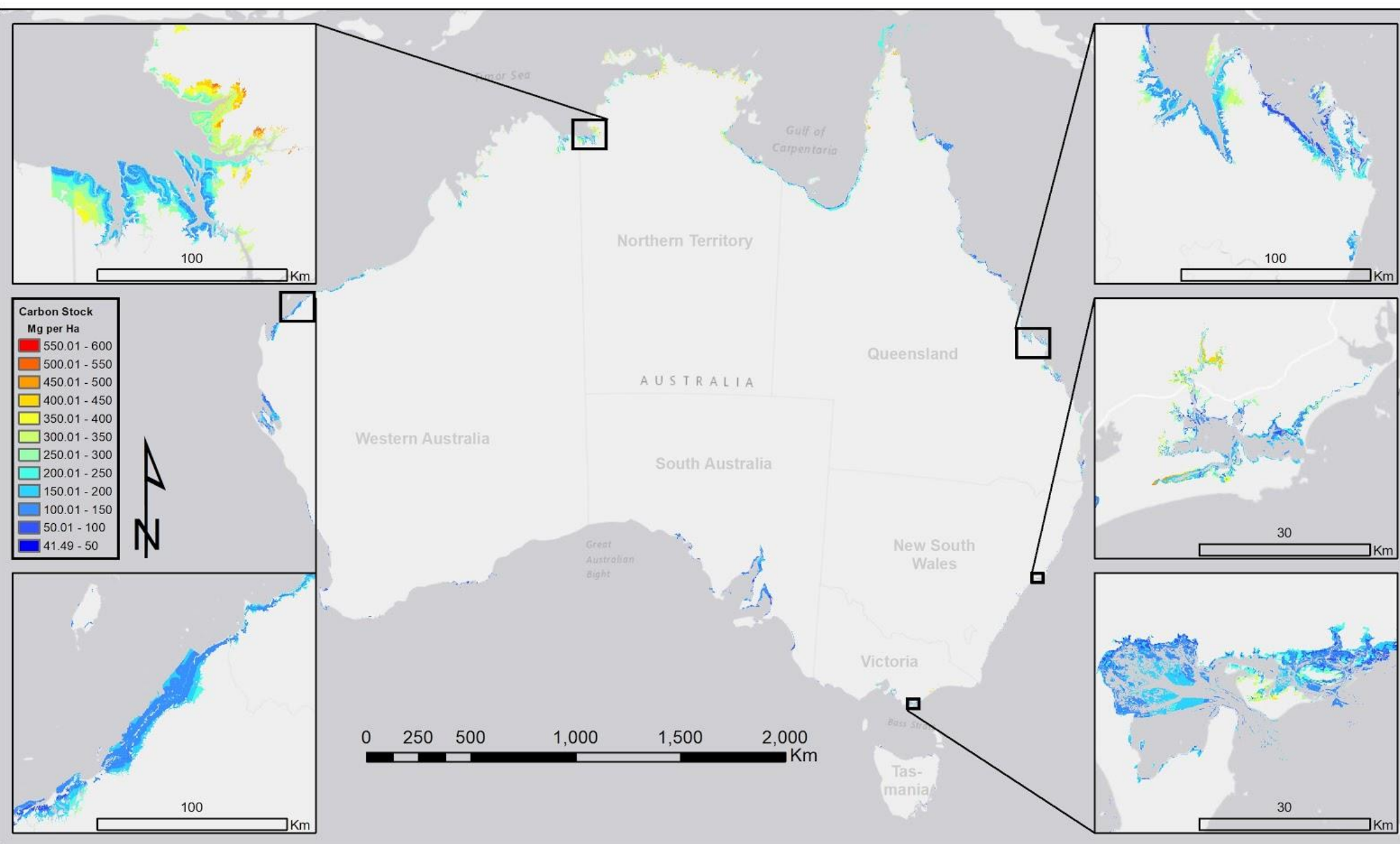


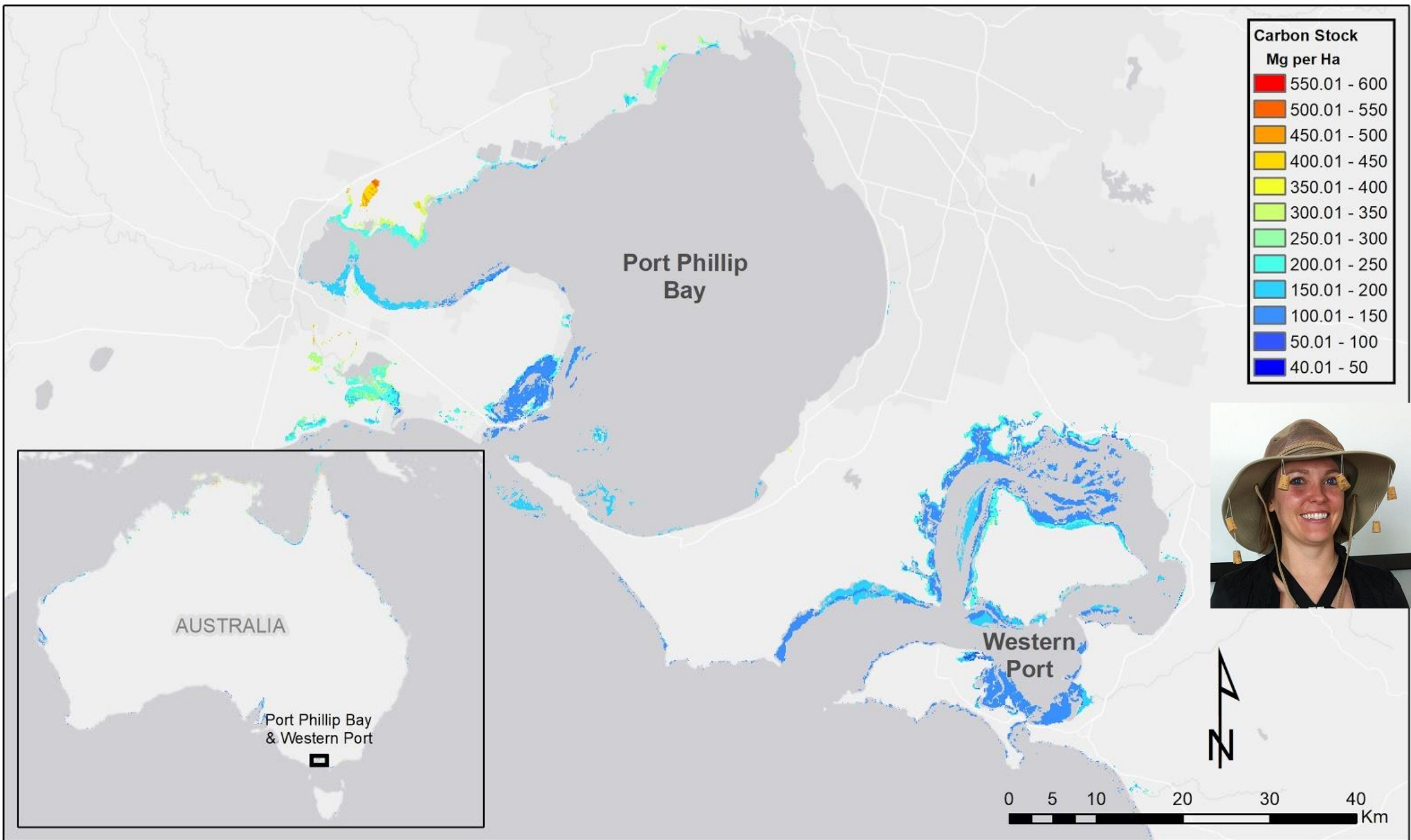
Developing national blue carbon inventory and maps



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How does mangrove rehabilitation influence plant biomass & soil carbon?

A case study from the Richmond River, NSW



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Soil carbon accumulated since rehabilitation in 1990



Mangrove tree biomass carbon accumulated since rehabilitation in 1990



4. Coastal protection



Developing our own model from the following open-source models

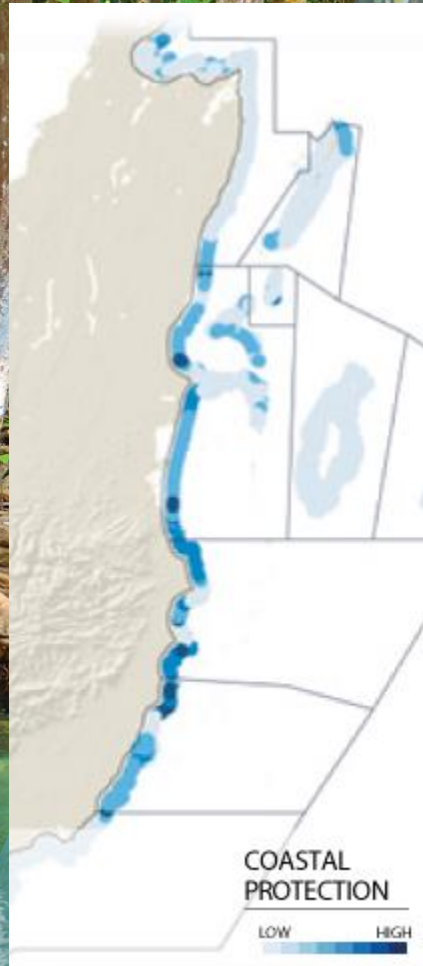


Jaya Kelvin
PhD Candidate

InVEST Toolbox

InVEST

integrated valuation of
ecosystem services
and tradeoffs



Wave attenuation and reduced erosion tools



- XBeach
- Delft3D

<https://oss.deltares.nl/>

SWAN

Simulating WAVes Nearshore

<http://swanmodel.sourceforge.net/>

<https://naturalcapitalproject.stanford.edu/invest/>

Coastal Wetland role in coastal protection

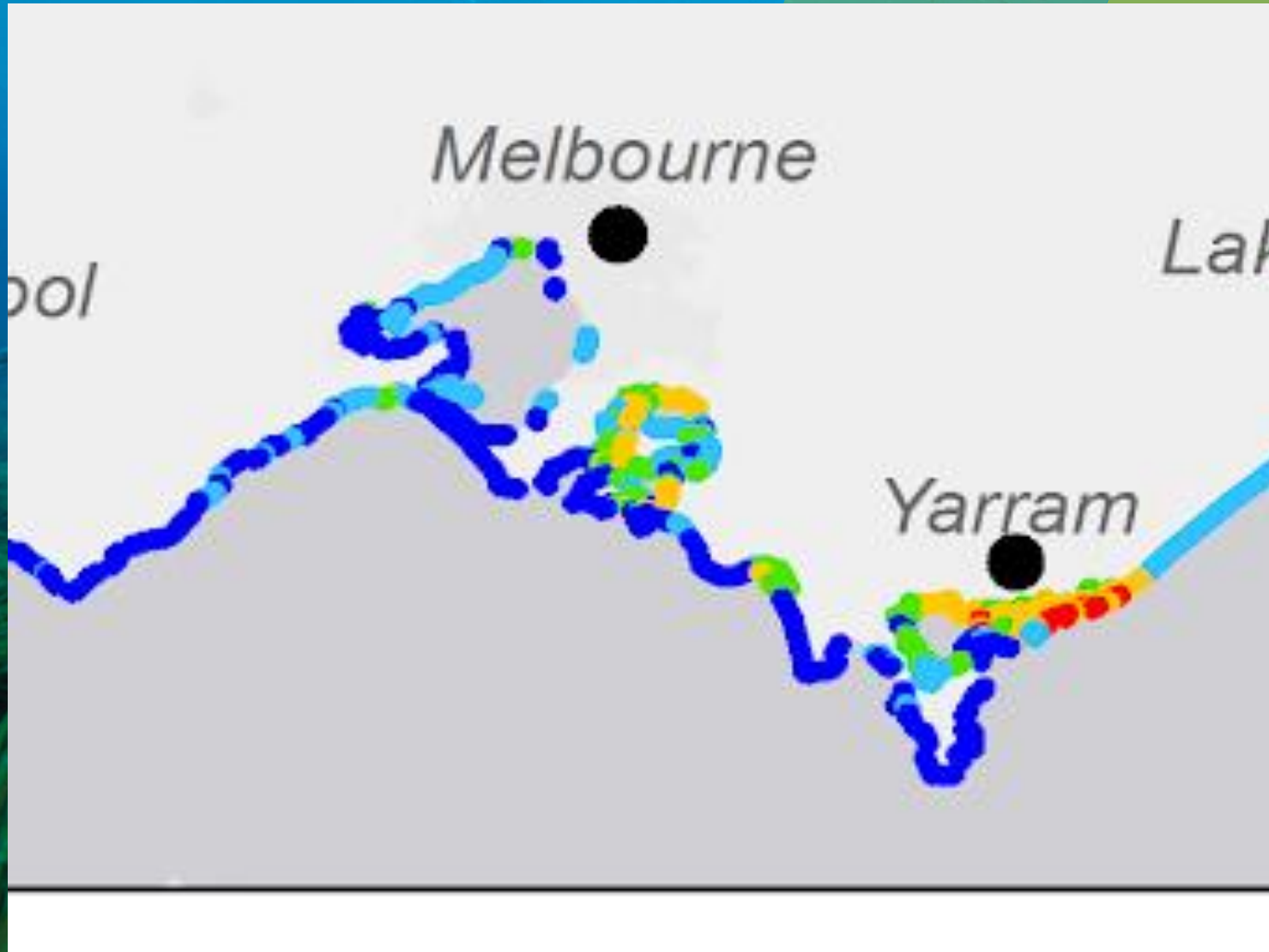


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Total protected values (property) from coastal wetlands

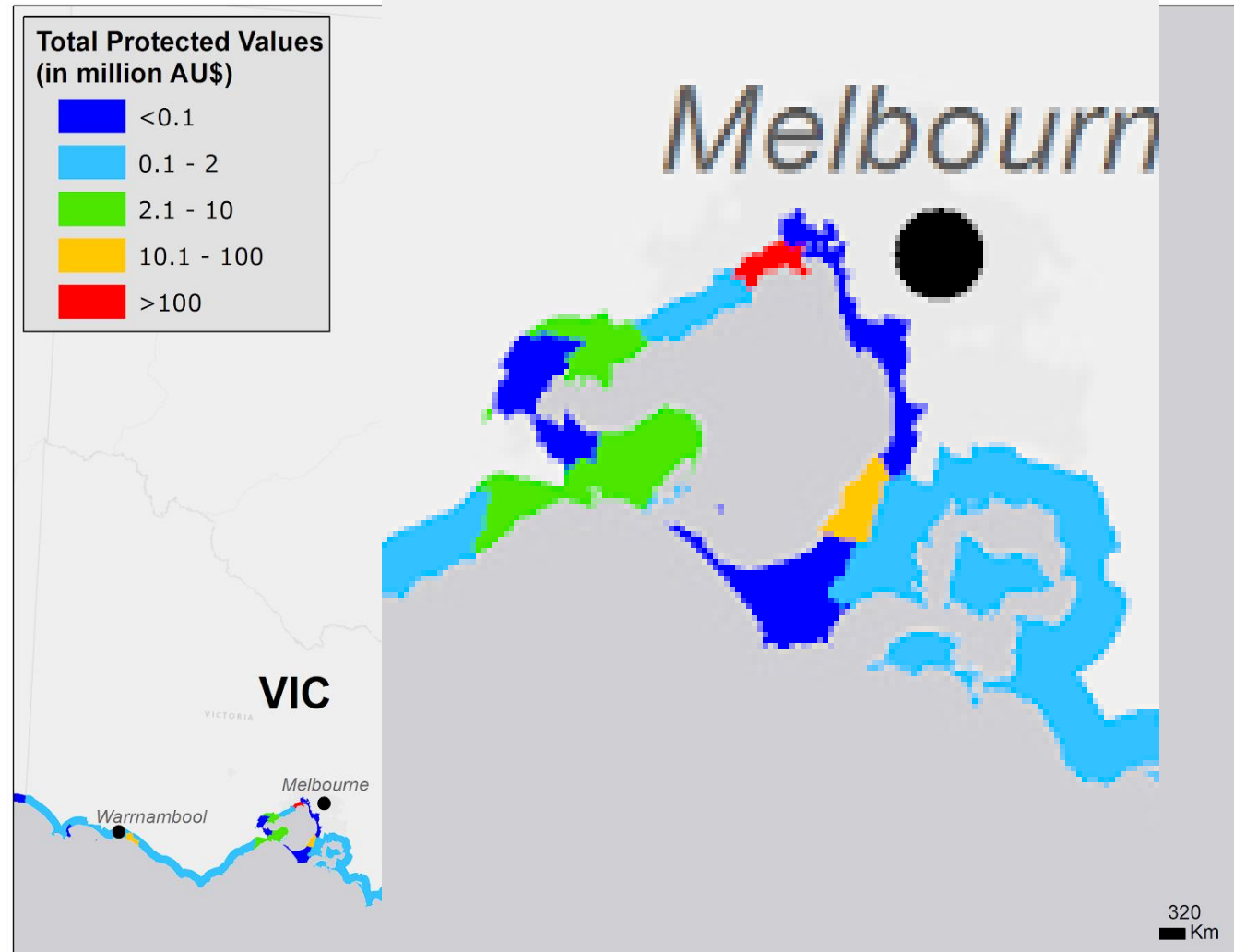


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Making the case for conservation of coastal wetlands



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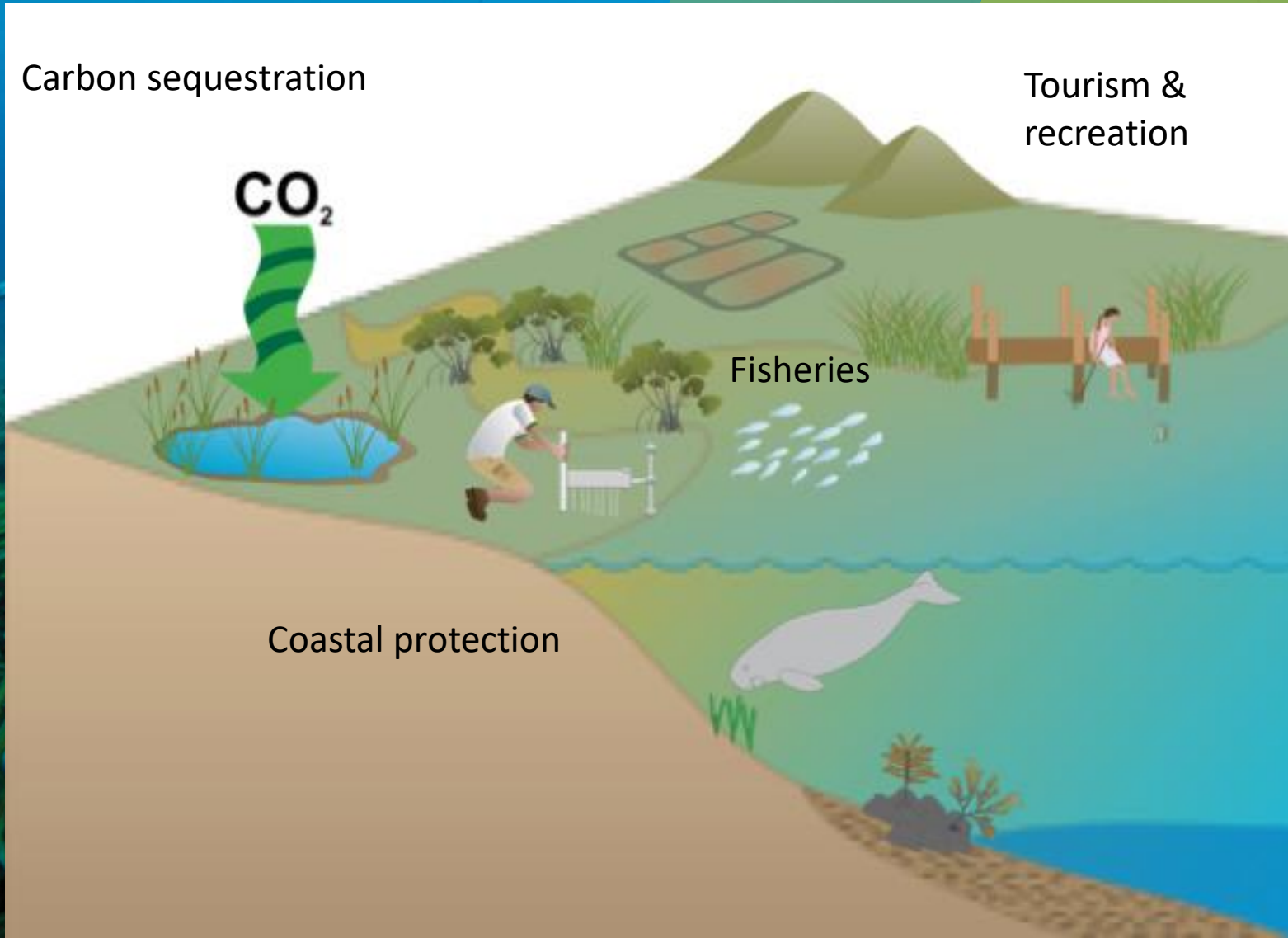
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Carbon sequestration

Tourism & recreation

Fisheries

Coastal protection





ATLAS OF OCEAN WEALTH

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VIEW THE ATLAS



Deakin team



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