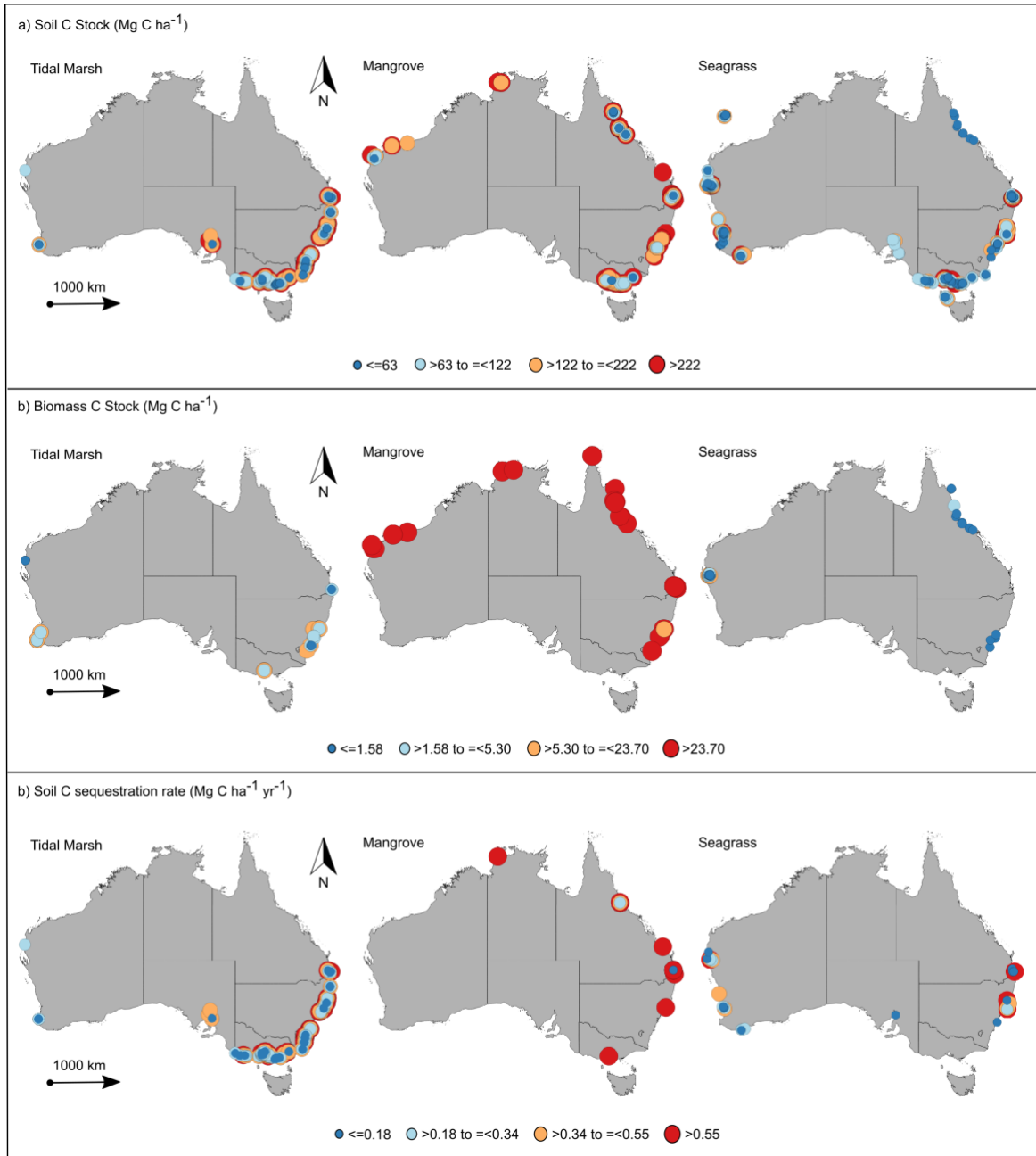


- 1 **Australian vegetated coastal ecosystems as global hotspots for climate change**
- 2 **mitigation**
- 3 Serrano et al.



6 **Supplementary Figure 1.** Direct measurements of organic carbon (C) storage in
 7 vegetated coastal ecosystems (i.e. tidal marshes, mangroves and seagrasses) across
 8 Australia. **a)** Soil C storage (Mg C ha^{-1}) in the top meter. **b)** Living aboveground biomass
 9 C stock (Mg C ha^{-1}). **c)** Soil C sequestration rates ($\text{Mg C ha}^{-1} \text{ yr}^{-1}$). The size and colour of
 10 dots show the magnitude of C storage: C stocks in living aboveground biomass and the
 11 top meter of soil ranging from <1.58 to >222 Mg C ha^{-1} , and soil C sequestration rates
 12 ranging from <0.18 to >0.55 $\text{Mg C ha}^{-1} \text{ yr}^{-1}$. The four ranges of data (indicated by different

13 colours) are based on the lower quartile, median quartile, and upper quartile. Source data

14 are provided as a Source Data file.

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16 **Supplementary Table 1. General Linear Models.** Living aboveground biomass organic
 17 carbon (C) stock, soil C stock (in the top meter) and soil C sequestration rates in response
 18 to climate region and ecosystem type (fixed effects), and interaction between climate
 19 region and ecosystem type. Climate region: arid, semi-arid, temperate, subtropical and
 20 tropical. Ecosystem: tidal marsh, mangrove, seagrass. Significant interactions from post-
 21 hoc HSD tests are indicated with numbers in superscript ($P < 0.05$).

Variable	Factor	df	Mean Square	F	P
Aboveground biomass C stock (Mg C ha ⁻¹)	¹ Climate region	4	53,417,196	2.94	0.023
	² Ecosystem	2	1,047,413,681	57.65	<0.001
	³ Climate region * Ecosystem	3	68,069,883	3.75	0.013
Soil C stock (Mg C ha ⁻¹)	⁴ Climate region	4	40,784	3.08	0.016
	⁵ Ecosystem	2	532,031	40.17	<0.001
	⁶ Climate region * Ecosystem	7	93,491	7.06	<0.001
Soil C sequestration rates (Mg C ha ⁻¹)	⁴ Climate region	4	4,395	3.45	<0.01
	² Ecosystem	2	26,156	20.55	<0.001
	⁷ Climate region * Ecosystem	5	3,012	2.37	0.039

¹Subtropical = Tropical > Temperate = Arid

²Mangrove > Tidal marsh = Seagrass

³Tidal marsh: Temperate > Semi-arid = Subtropical

³Mangrove: Tropical > Temperate

³Seagrass: Arid > Temperate = Tropical

⁴Tropical > Arid = Semi-arid = Temperate =
Subtropical

⁵Mangrove > Tidal marsh > Seagrass

⁶Seagrass: Arid > Subtropical

⁶Mangrove: Subtropical > Temperate = Tropical = Arid = Semi-arid

⁷Mangrove: Tropical > Subtropical

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24 **Supplementary Table 2. Organic carbon (C) storage within Australian climate regions.** Estimates of area (in ha) and C stocks in living
 25 aboveground biomass and soils (in Mg C ha⁻¹), and C sequestration rates (Mg C ha⁻¹ yr⁻¹) in vegetated coastal ecosystems (i.e. tidal marshes,
 26 mangrove forests and seagrass meadows) within Australian climate regions. * Estimates based on the nearest climate region when data was not
 27 available. Mean and median ± SD.

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Region	Ecosystem	Variable	Climate region				
			Arid	Semi-arid	Temperate	Subtropical	Tropical
AUSTRALIA	Tidal marsh	Area (ha)	51,392	327,609	90,087	118,475	945,360
		Stock - Aboveground biomass (Tg C)	0.05*	0.33	0.75	0.16	1.3*
		Stock - Soil (Tg C)	11.3	44.4	15.5	18.1	145*
		Sequestration rates (Tg C yr ⁻¹)	0.03	0.10	0.04	0.04	0.33*
	Mangrove	Area (ha)	23,412	100,180	13,706	151,002	762,577
		Stock - Aboveground biomass (Tg C)	2.8	11.1*	0.97	15.3	128
		Stock - Soil (Tg C)	3.3	15.1	3.4	55.3	180
		Sequestration rates (Tg C yr ⁻¹)	0.02*	0.08*	0.02	0.13	1.2
	Seagrass	Area (ha)	2,105,141	888,069	774,155	4,866,351	4,138,299
		Stock - Aboveground biomass (Tg C)	5.4	2.3	0.21	12.4	1.9
		Stock - Soil (Tg C)	273	108*	78.2	439*	153
		Sequestration rates (Tg C yr ⁻¹)	0.80	0.10	0.33	1.3	1.1*

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32 **Supplementary Table 3. Organic carbon (C) storage per unit area within climate regions.** C stocks in living aboveground biomass and soils
33 (in Mg C ha⁻¹), and sequestration rates (Mg C ha⁻¹ yr⁻¹) in vegetated coastal ecosystems (i.e. tidal marshes, mangrove forests and seagrass
34 meadows) within Australian climate regions. Mean and median ± SD.

Region	Ecosystem	Variable	Climate region																			
			Arid				Semi-arid				Temperate				Subtropical				Tropical			
			N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
AUSTRALIA	Tidal marsh	Stock - Aboveground biomass (Mg C ha ⁻¹)	n/a	n/a	n/a	n/a	3	1.0	1.0	0.09	46	8.3	7.2	6.0	3	1.4	1.5	0.4	n/a	n/a	n/a	n/a
		Stock - Soil (Mg C ha ⁻¹ in 1 m-thick)	2	221	221	25	4	136	137	89	220	173	141	121	66	153	135	147	n/a	n/a	n/a	n/a
		Sequestration rates (Mg C ha ⁻¹ yr ⁻¹)	2	0.51	0.51	0.06	4	0.31	0.31	0.20	220	0.40	0.32	0.28	66	0.35	0.31	0.34	n/a	n/a	n/a	n/a
	Mangrove	Stock - Aboveground biomass (Mg C ha ⁻¹)	8	121	75	95	n/a	n/a	n/a	n/a	9	70	86	41	5	101	78	64	15	167	159	101
		Stock - Soil (Mg C ha ⁻¹ in 1 m-thick)	7	141	124	64	10	151	125	95	106	247	234	116	34	366	311	250	105	236	250	141
		Sequestration rates (Mg C ha ⁻¹ yr ⁻¹)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	1.31	1.31	0.13	9	0.85	0.84	0.41	13	1.5	1.00	1.09
	Seagrass	Stock - Aboveground biomass (Mg C ha ⁻¹)	36	2.5	2.1	2.1	n/a	n/a	n/a	n/a	4	0.27	0.23	0.21	n/a	n/a	n/a	n/a	12	0.46	0.21	0.57

Stock - Soil (Mg C ha ⁻¹ in 1 m-thick)	164	130	125	75	15	121	98	109	241	113	83	95	120	90	65	83	9	37	48	22
Sequestration rates. (Mg C ha ⁻¹ yr ⁻¹)	8	0.38	0.27	0.31	1	0.11	n/a	n/a	12	0.50	0.30	0.44	15	0.26	0.20	0.19	n/a	n/a	n/a	n/a

36 **Supplementary Table 4. Organic carbon (C) storage within Australian administrative jurisdictions.** Estimates of area (in ha) and C stocks
 37 in living aboveground biomass and soils (in Mg C ha⁻¹), and C sequestration rates (Mg C ha⁻¹ yr⁻¹) in vegetated coastal ecosystems (i.e. tidal
 38 marshes, mangrove forests and seagrass meadows) within Australian jurisdictions. Mean and median ± SD.

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Region	Ecosystem	Variable	State						
			NT	QLD	NSW	VIC	TAS	SA	WA
AUSTRALIA	Tidal marsh	Area (ha)	428,038	601,808	15,399	49,655	12,719	48,096	377,210
		Stock - Aboveground biomass (Tg C)	0.57	0.78	0.09	0.41	0.11	0.16	0.45
		Stock - Soil (Tg C)	65.0	90.2	2.6	8.6	2.2	7.8	57.6
		Sequestration rates (Tg C yr ⁻¹)	0.15	0.21	0.0003	0.02	0.01	0.02	0.13
	Mangrove	Area (ha)	384,679	406,097	12,726	5,746	0	29,297	212,333
		Stock - Aboveground biomass (Tg C)	63.5	57.6	1.0	0.40	n/a	3.3	32.0
		Stock - Soil (Tg C)	89.4	114	3.7	1.4	n/a	4.4	44.3
		Sequestration rates (Tg C yr ⁻¹)	0.58	0.51	0.01	0.01	n/a	0.02	0.28
	Seagrass	Area (ha)	666,629	8,275,771	20,881	262,234	84,500	962,000	2,500,000
		Stock - Aboveground biomass (Tg C)	0.34	13.8	0.02	0.07	0.02	2.4	5.5
		Stock - Soil (Tg C)	26.3	562	2.2	29.7	9.6	119	311
		Sequestration rates (Tg C yr ⁻¹)	0.17	2.1	0.01	0.13	0.04	0.19	0.94

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