

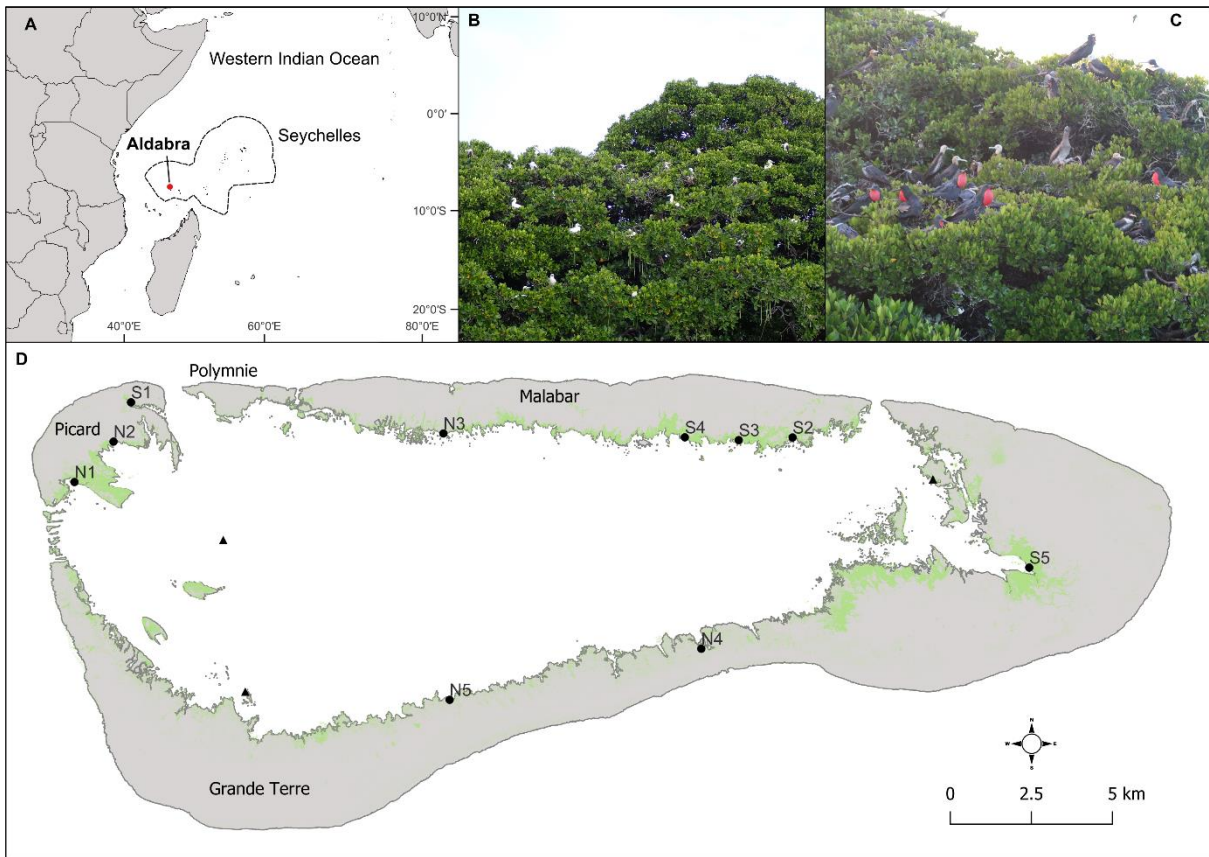
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## **Supplemental information**

**Seabird nutrient subsidies enrich mangrove  
ecosystems and are exported  
to nearby coastal habitats**

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## SUPPLEMENTAL INFORMATION



**Figure S1. Study site and sampling locations, Related to STAR Methods.**

(A) Location of Aldabra Atoll (Seychelles) in the Western Indian Ocean.

(B) Red-footed boobies nesting in mangroves at Aldabra.

(C) Frigatebird breeding colony in mangroves at Aldabra.

(D) Sampling locations (circles) on Aldabra at sites with seabirds (S1–S5) and sites with no/few seabirds (N1–N5), with mangrove distribution shown in green. Triangles show locations of additional seawater sampling sites in the lagoon.

**Table S1. Mangrove forest structure at each site on Aldabra Atoll, Related to STAR Methods.**

Sites with nesting seabirds (S1–S5) and no nesting seabirds (N1–N5). Community composition of main mangrove species shown; Rm: *Rhizophora mucronata*, Bg: *Brugueira gymnorrhiza*, Ct: *Ceriops tagal*. DBH: diameter at breast height.

Site	Species composition			Tree density (trees. ha <sup>-1</sup> )	Tree DBH (cm)	Tree height (m)	Above-ground biomass (Mg. ha <sup>-1</sup> )
	% Rm	% Bg	% Ct				
<b>Seabird</b>							
S1	100	0	0	2700 ± 1885	12.6 ± 6.6	7.4 ± 2.5	219.5 ± 246.6
S2	88	9	3	4650 ± 1788	13.3 ± 5.5	7.2 ± 2.1	335.8 ± 114.7
S3	84	10	6	4100 ± 1957	10.1 ± 5.1	6.9 ± 2.4	195.4 ± 84.6
S4	65	26	9	4600 ± 1750	10.9 ± 5.8	7.5 ± 2.9	254.4 ± 126.2
S5	98	0	0	4350 ± 4957	8.1 ± 5.8	6.9 ± 3.2	178.1 ± 105.6
<b>No seabird</b>							
N1	78	13	9	9450 ± 4017	6.3 ± 4.2	4.4 ± 2.1	160.3 ± 90.2
N2	99	0	1	5150 ± 2708	9.3 ± 4.4	6.5 ± 2.3	194.8 ± 83.8
N3	52	8	40	9350 ± 6552	8.3 ± 5.3	4.8 ± 2.3	252.5 ± 134.5
N4	96	0	4	1350 ± 1299	5.6 ± 2.9	2.2 ± 0.2	7.1 ± 6.48
N5	78	22	0	450 ± 334	5.7 ± 4.6	2.3 ± 0.2	3.1 ± 3.3

**Table S2. Results of linear mixed models to test differences of nutrient parameters between seabird and non-seabird sites, Related to Figure 1, 2 and 3.**

Significant differences ( $P \leq 0.05$ ) are marked in bold. RE-N: nitrogen resorption efficiency, RE-P: phosphorus resorption efficiency.

Nutrient parameter	F-value	<i>P</i> -value	Conditional R2	Marginal R2
Mangrove leaves <i>Rhizophora mucronata</i> (N <sub>obs</sub> = 80, N <sub>site</sub> = 10)				
% N	50.7	<b>&lt; 0.0001</b>	0.75	0.71
% P	10.2	<b>0.013</b>	0.61	0.38
C:N	44.1	<b>&lt; 0.0001</b>	0.51	0.47
C:P	6.86	<b>0.031</b>	0.40	0.19
RE-N %	2.61	0.15	0.40	0.11
RE-P %	1.59	0.24	0.53	0.09
δ <sup>15</sup> N ‰	5.09	<b>0.05</b>	0.66	0.24
Sediment (N <sub>obs</sub> = 240, N <sub>site</sub> = 10)				
δ <sup>15</sup> N ‰	21.4	<b>0.0017</b>	0.95	0.65
Gastropod (N <sub>obs</sub> = 240, N <sub>site</sub> = 10)				
<i>Littoraria</i> spp. δ <sup>15</sup> N ‰	113.8	<b>&lt; 0.0001</b>	0.68	0.64
Sesarmid crab (N <sub>obs</sub> = 150, N <sub>site</sub> = 10)				
<i>Sesarma leptosoma</i> δ <sup>15</sup> N ‰	35.2	<b>&lt; 0.001</b>	0.93	0.73
Portunid crab (N <sub>obs</sub> = 86, N <sub>site</sub> = 9)				
<i>Thalamita crenata</i> δ <sup>15</sup> N ‰	16.8	<b>0.005</b>	0.83	0.55
Macroalgae (N <sub>obs</sub> = 70, N <sub>site</sub> = 7)				
<i>Halimeda</i> spp. δ <sup>15</sup> N ‰	11.0	<b>0.021</b>	0.94	0.58

**Table S3. Results of linear mixed models to test differences in surface seawater nutrients, Related to Figure 3.**

Significant differences ( $P \leq 0.05$ ) are marked in bold.

	Fixed effects	F-value	P-value	Conditional R2	Marginal R2
Lagoon surface seawater nutrients					
<b>NOx</b> (N <sub>obs</sub> = 54, N <sub>site</sub> = 14)	Seabird	2.80	0.12	0.85	0.23
	Tide	0.22	0.64		
	Seabird: Tide	5.76	<b>0.021</b>		
<b>Phosphate</b> (N <sub>obs</sub> = 54, N <sub>site</sub> = 14)	Seabird	34.1	<b>0.0001</b>	0.97	0.78
	Tide	4.02	<b>0.052</b>		
	Seabird: Tide	17.8	<b>0.0001</b>		