



The Economics of Coastal Blue Carbon

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Based on work by
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The Blue Carbon Story

- Coastal ecosystems have value
 - “blue carbon”
 - ecosystem services
- Conversion due to economic pressures (aquaculture, agriculture, development,...)
- Climate Policy: New incentives to protect?
 - Payments for reducing conversion and restoration
 - Similar to forests (REDD+)
 - Could be through carbon market or intergovernmental transfers



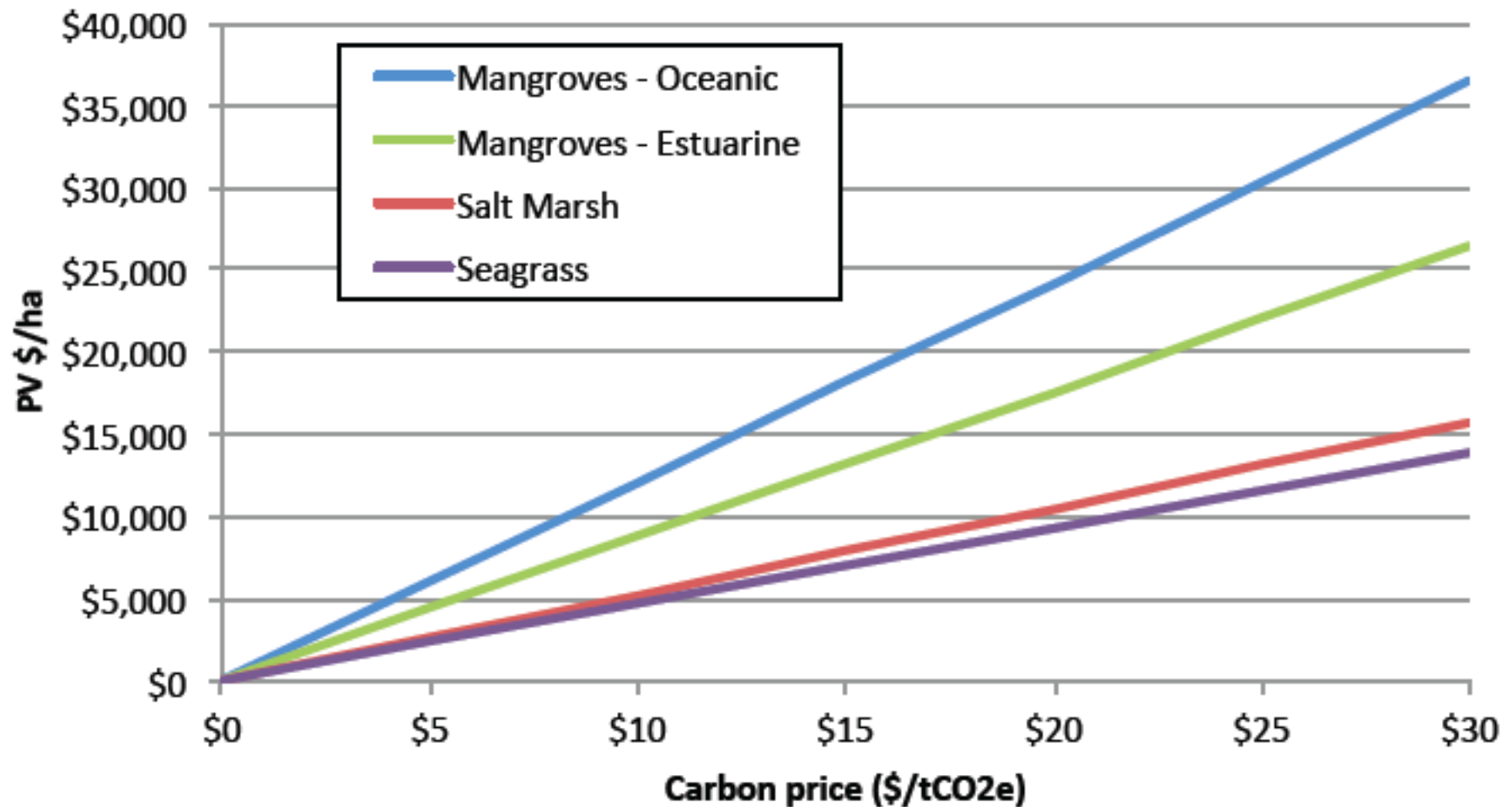
What May Be Eligible for Crediting?

Potential Credit Source	Time Period	Ecosystems
Avoided Loss of Sequestration Flux	Perpetuity*	Seagrasses Tidal Salt Marshes Mangroves
Avoided Emissions from Soil Carbon	Several Years to Decades	Seagrasses Tidal Salt Marshes Mangroves
Avoided Emissions from Biomass (REDD)	Immediate	Mangroves

* Based on input from science team that blue carbon systems continue to sequester without saturation

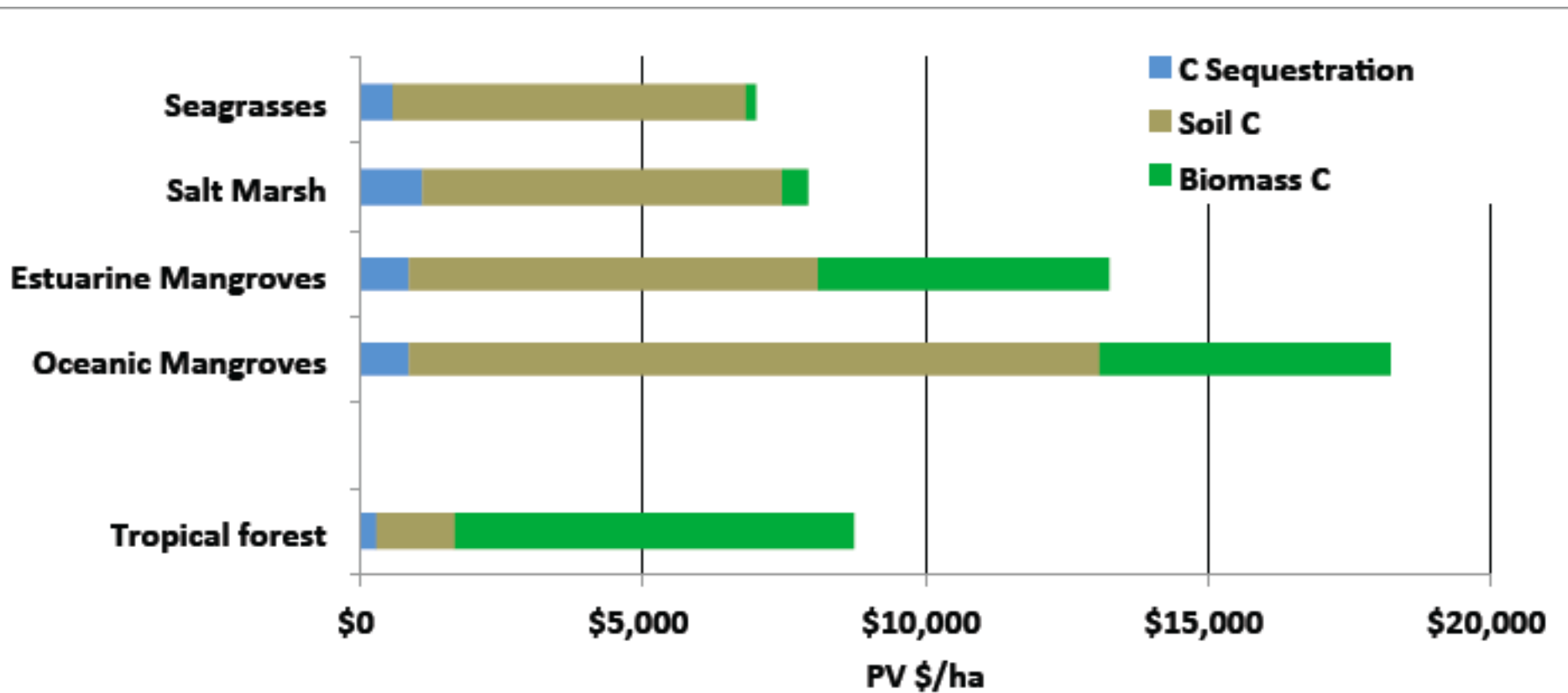


Gross Financial Returns





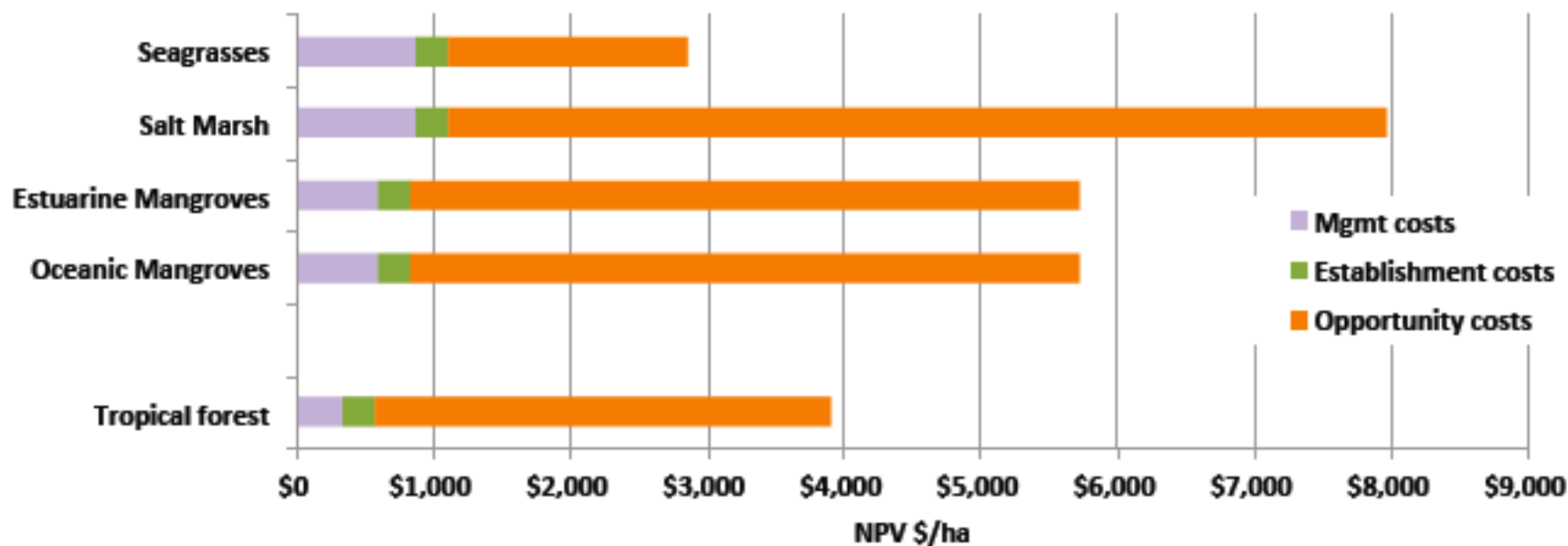
Potential Carbon-Credit Values



Source: Authors:

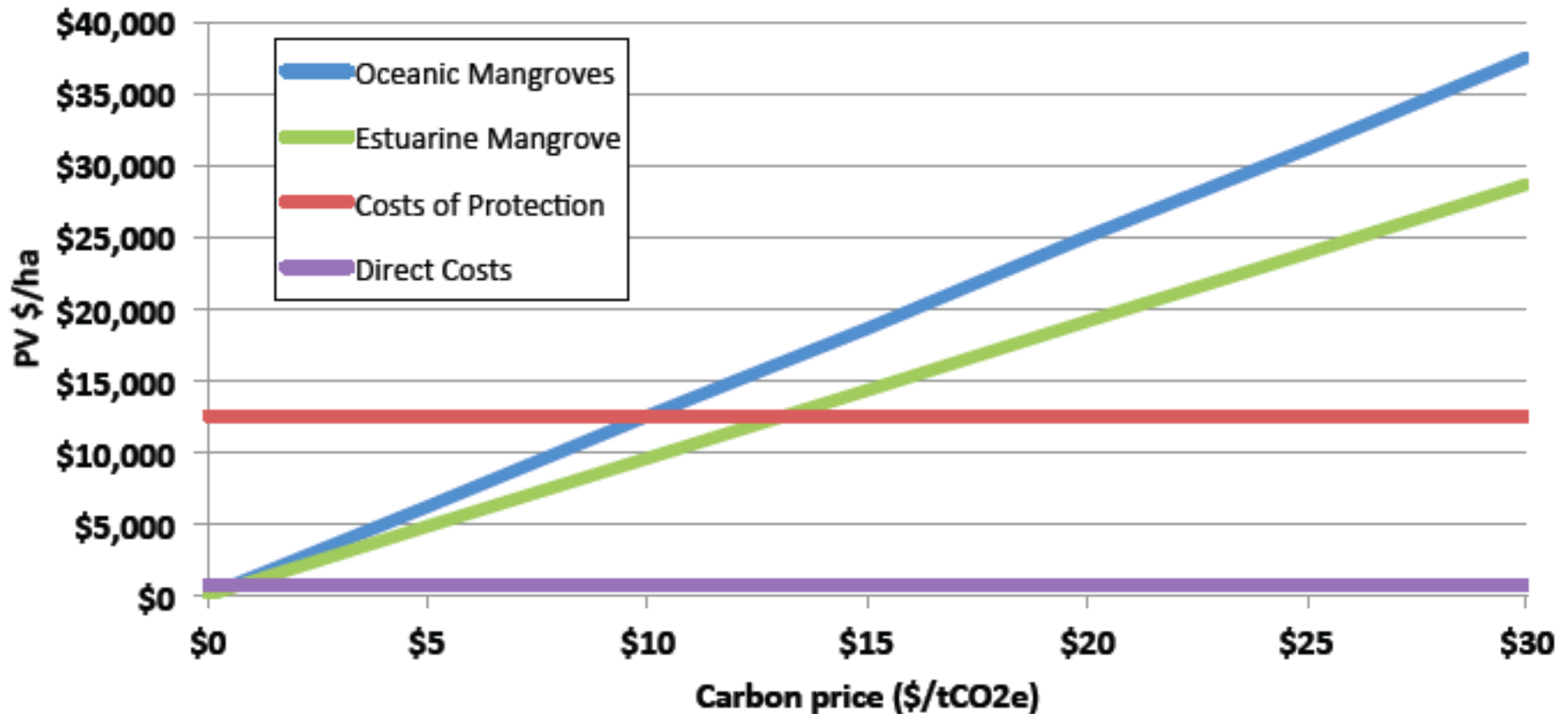


Cost of Protection





Net Benefits of Blue Carbon: mangroves





Opportunity Cost

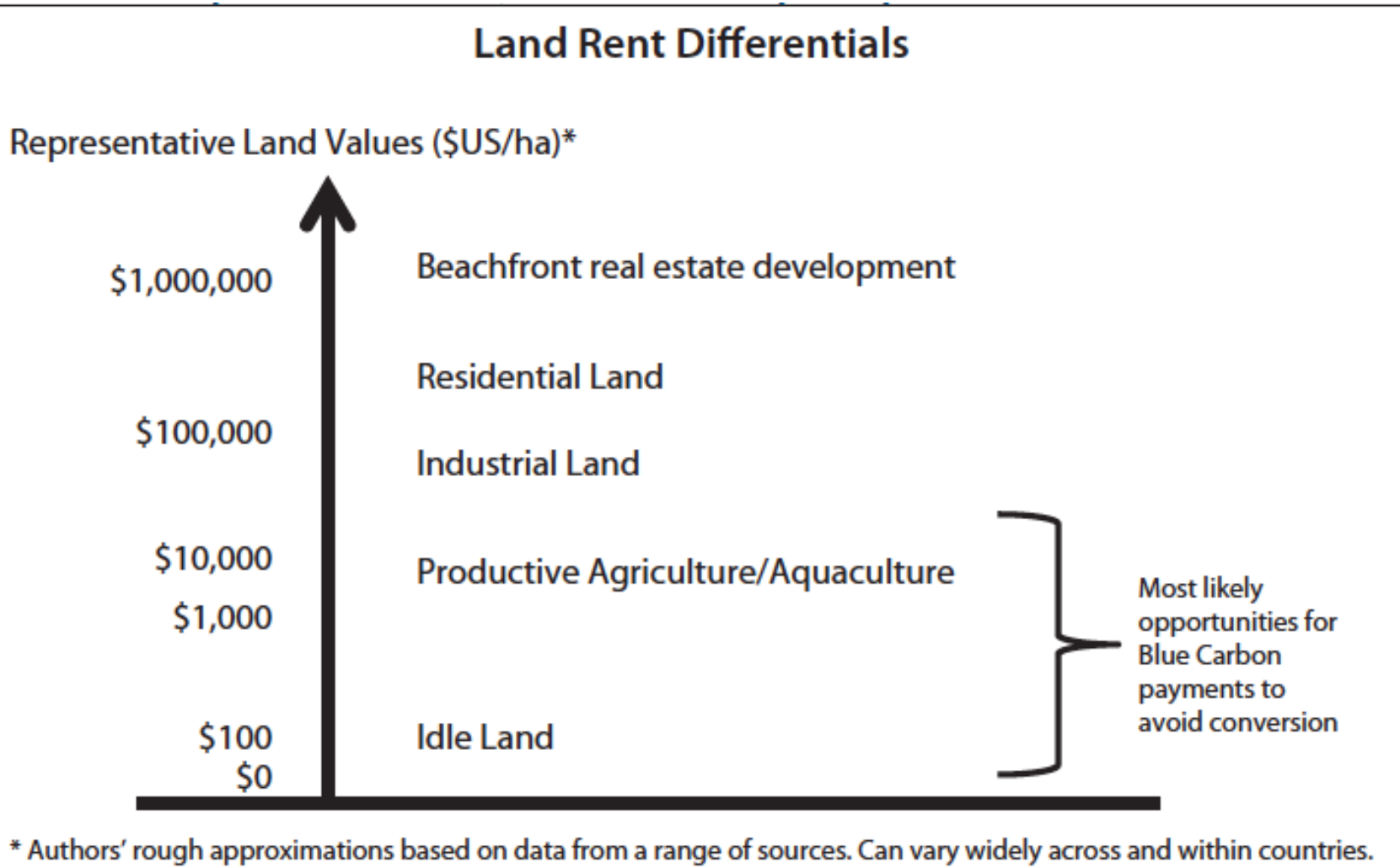


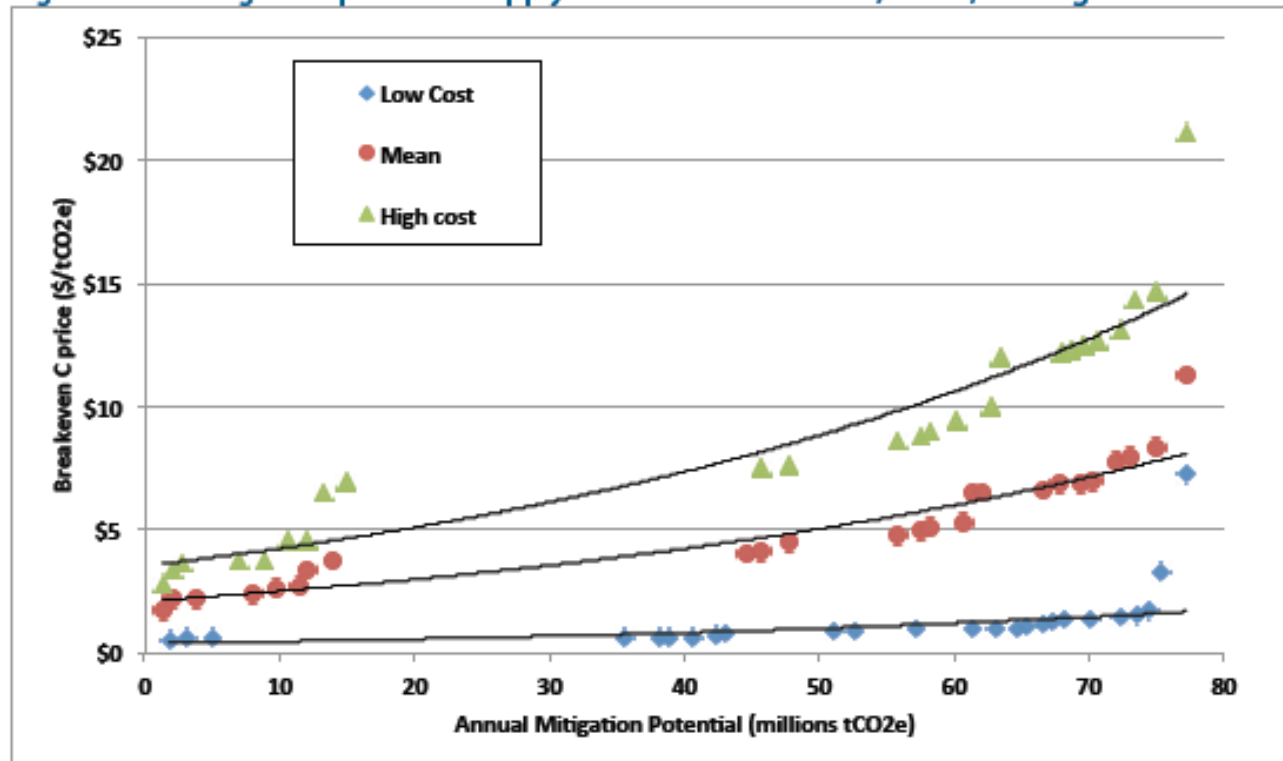
Table 6. Top 25 mangrove countries by break-even carbon price (\$/t CO₂e). Mitigation potential (t CO₂e/yr) is discounted to the present with a 10% rate as well as scaled down to represent only lands at risk from conversion to agriculture, aquaculture, or wood harvests.

Country	Break-even C price, avg cost	Discounted mangrove mitigation potential	Cumulative mangrove mitigation potential	Annual mitigation revenue potential, \$/yr @\$15/t CO ₂	Total mangrove area, 2005 (ha)	Annual Revenue potential (\$/ha)
Senegal	\$1.70	1,342,843	1,342,843	\$22,380,714	115,000	\$194.61
Cambodia	\$2.14	692,276	2,035,119	\$11,537,939	69,200	\$166.73
Guinea-Bissau	\$2.16	1,832,201	3,867,320	\$30,536,677	210,000	\$145.41
Malaysia	\$2.34	4,181,896	8,049,216	\$69,698,271	565,000	\$123.36
Sierra Leone	\$2.60	1,716,291	9,765,507	\$28,604,843	100,000	\$286.05
Madagascar	\$2.73	1,539,227	11,304,734	\$25,653,783	300,000	\$85.51
Tanzania	\$3.35	755,870	12,060,604	\$12,597,840	125,000	\$100.78
Myanmar	\$3.78	1,790,324	13,850,928	\$29,838,734	507,000	\$58.85
Indonesia	\$4.04	30,679,644	44,530,572	\$511,327,397	2,900,000	\$176.32
India	\$4.10	1,133,760	45,664,332	\$18,896,005	448,000	\$42.18
Pakistan	\$4.46	2,026,638	47,690,970	\$33,777,304	157,000	\$215.14
Mexico	\$4.74	8,137,233	55,828,204	\$135,620,556	820,000	\$165.39
Gabon	\$4.90	1,698,338	57,526,542	\$28,305,641	150,000	\$188.70
Nicaragua	\$5.13	681,651	58,208,193	\$11,360,853	65,000	\$174.78
Vietnam	\$5.32	2,564,008	60,772,201	\$42,733,462	157,000	\$272.19
Ecuador	\$6.53	684,104	61,456,305	\$11,401,728	150,500	\$75.76
Thailand	\$6.53	603,800	62,060,105	\$10,063,336	240,000	\$41.93
Papua New Guinea	\$6.58	4,570,866	66,630,971	\$76,181,108	380,000	\$200.48
Venezuela	\$6.83	1,124,822	67,755,793	\$18,747,035	223,500	\$83.88
Philippines	\$6.90	1,762,242	69,518,035	\$29,370,699	240,000	\$122.38
Brazil	\$6.98	872,828	70,390,863	\$14,547,128	1,000,000	\$14.55
Honduras	\$7.83	1,631,183	72,022,046	\$27,186,382	67,200	\$404.56
Panama	\$7.95	1,056,887	73,078,933	\$17,614,785	170,000	\$103.62
United States	\$8.34	1,953,947	75,032,880	\$32,565,786	195,000	\$167.00
Colombia	\$11.31	2,261,764	77,294,644	\$37,696,062	350,000	\$107.70



Global supply potential at different prices

Figure ES-1. Mitigation-potential supply functions for low-cost, mean, and high-cost scenarios.





Conclusions

- 1) Economic value of blue carbon > financial value
- 2) Payments of blue carbon → conservation
 - in some cases, but not all
 - shrimp farms – YES
 - mega hotels – probably not
- 3) Polluters pay for habitat protection and restoration
- 4) Value of protection >> Value of restoration
- 4) Much heterogeneity within countries (case in point – Indonesia)
- 5) Policy challenges remain
 - protocols (how much, additionality, stacking)
 - tenure



NICHOLAS INSTITUTE REPORT

State of the Science on Coastal Blue Carbon A Summary for Policy Makers

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<http://nicholasinstitute.duke.edu/oceans/bluecarbon>