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Daniel M. Alongi

**Blue Carbon**  
Coastal  
Sequestration for  
Climate Change  
Mitigation



Springer

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# Blue Carbon

Coastal Sequestration for Climate Change  
Mitigation

 Springer

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# Preface

The issue of blue carbon as a mitigation strategy for climate change impacts on global greenhouse gas emissions has been in place only for the past few years. Since 2009, there has been an explosion of scientific papers reporting on carbon stocks in a variety of estuarine and marine wetland habitats, especially tidal salt marshes, mangrove forests and seagrass meadows. Not surprisingly, there has been an explosion of websites, strategic ideas and pilot projects involving either restoration or replanting (or both) of these valuable coastal habitats. And while there have been a number of papers totalling up the amounts of carbon sequestered in soil and biomass in tidal wetlands, there is no complete overview of the entire issue or a critical look as to whether or not **REDD+** projects are truly worthwhile and certainly whether or not the money being put into such projects is money well spent.

The purpose of this book is to make a critical appraisal of this exploding ecological and climate change issue, a sort of ‘stop and smell the roses’ type of analysis and reflection on where the entire issue is headed. Indeed, the time is ripe for such a critical review as projects are being planned or run without a good understanding of the complexities of the issue of climate change adaptation and mitigation; there is a sense of rushing to judgement without a good sense of the intricacies and practicalities running such a project entails. As the reader will see, much has been learned by trial and error as the practical knowledge base expands and as naivety dissipates after the hard lessons have been learned.

Perhaps given the alluring nature of blue carbon as a panacea for climate change mitigation, it was inevitable that mistakes would be made in the early ‘band wagon’ days. But mistakes are still being made and some projects still lack good project planning and evaluation, and a good grounding in hard scientific reality. Not all lost habitat can be restored and some alternative sites have not been selected using the best or the most stringent set of scientific criteria.

Blue carbon is not a simple, linear course correction for losses or for partial destruction of habitat, as we all have much more to learn about how best to minimise

mistakes and poor decisions, and how to maximise lessons learned the hard way and to best utilise the rapidly expanding state of knowledge. I hope that this slim volume will help in facilitating restoration and rehabilitation of these precious marine and coastal resources which continue to disappear at an alarming rate.

# Acknowledgements

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# Glossary

ACR	American Climate Registry
Anaerobic Soil	Soil which contains no free oxygen (aerobic soil)
Blue Carbon	Term coined to refer to the acquisition and storage of carbon in aquatic ecosystems especially in coastal habitats such as salt marshes, seagrass beds and mangrove forests
CAR	Carbon sequestration rate
CBD	Convention on Biological Diversity
CCB	The Climate, Community and Biodiversity Standard
CDM	Clean Development Mechanism
C <sub>org</sub>	Organic carbon
FAO	Food and Agriculture Organisation of the UN
G	Gram
Gg	Gigagram = 10 <sup>9</sup> grams
GCF	Green Climate Fund
GEF	Global Environment Fund
GHG	Greenhouse gases (carbon dioxide, methane, nitrous oxide)
GPA-Marine	Global Program of Action for the protection of the marine environment from land-based activities
IOC	International Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature and Natural Resources
LDCF	Least Developed Countries Fund
LULUCF	Land-Use, Land-Use Change and Forestry
MACs	Marginal abatement costs
MAR	Mass sediment accumulation rate
MEAs	Multilateral Environmental Agreement
Mg	Megagram = 10 <sup>6</sup> g or tonne
NAMAs	National Appropriate Mitigation Actions
NPV	Net present value