Marine Extremes: Ocean Safety, Marine Health, and The Blue Economy
Erika J Techera & Gundula Winter (eds); New York: Routledge, 2019; 231 pages

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The ocean and seas of the world have fascinated humans for aeons. They have been well-documented in the logbooks and journals of mariners and explorers of yore, as well as in the writings of well-known contemporary writers, thinkers, and scholars. Given their remote and seemingly inhospitable nature, global oceans are appreciated for their natural beauty, vast biodiversity, medium of transportation and communication, and rich source of natural resources (e.g., oil, gas, minerals, fish, nutraceuticals, etc.)

In recent years, the global ocean has been seriously affected by extreme anthropogenic behaviours (e.g., the dumping and discharging of waste, illegal fishing, and piracy) and extreme weather events (e.g., storms, *tsunamis*, marine heatwaves). Safe and healthy oceans are essential for human actions and ecosystem services.

There is a broad consensus on the global environmental crisis in the maritime domain. Yet, diverging opinions persist on the scale of the change required to tackle the issue at hand. While some suggest minor changes to the current order, others strive for radical changes to make the world walk the path of sustainability. *Marine Extremes: Ocean Safety, Marine Health, and The Blue Economy* by Erika J Techera and Gundula Winter (eds) aim to highlight the more notable impacts that marine extremes have on global oceans and seas, the coastlines of littoral and island States, and the people dependent upon them. These impacts will continue to intensify under current climate change and growth projections.

Coming from a range of disciplinary backgrounds, the contributors to the book offer their analyses of the impact of marine extremes on communities, infrastructure, and marine ecosystems, as also the emerging opportunities presented by marine extremes. The edited volume is divided into five parts (Part I: Introduction, Part II: Safe Oceans, Part III: Healthy Oceans, Part IV: Wealth from the Oceans, and Part V: Synthesis).

The book begins by explaining the concept of marine extremes. The opening chapters (Chapter 1, *Introduction to Marine Extremes*, and Chapter 2, *The Science, Social Science, and Governance of Marine Extremes*) present the idea from various points of view. Techera and Winter offer an admirably comprehensive definition. Explaining "marine extremes" in the context of growing concern over over-fishing, marine debris, and climate change, as well as the growing interest in wealth generation from the oceans and the concept of the blue economy, the editors encompass the environment, activities, events, and impacts occurring in or relevant to the oceans. The devasting consequences of marine extremes led to them developing a research theme entitled "Oceans and the Blue Economy" within the Matariki Network of Universities (https://matarikinetwork.org). The

main objective of their research has been to determine innovative solutions that would promote cooperation in terms of sustainable exploitation of ocean resources and collaboration on marine challenges. The edited volume is a product of a workshop held in 2017 and is the first in a long list of oncoming publications under the overarching theme.

Part II of the book is committed to the need for 'safe' oceans. Chapter 3, *Coastal Process, Extreme Events, and Forecasting*, delves into the impact of extreme weather events on the coastal zone, ranging from flooding to disrupting economic activities of coastal communities and their way of life. The authors highlight that multidisciplinary collaboration is needed to mitigate the impact of extreme weather events in coastal zones. Chapter 4, *Community Values and Preferences for Coastal Hazard Interventions*, emphasises the importance of community values in optimising the management of coastal hazards. It is their view that without implementing community-based values, policies will be subjective and suboptimal by nature. The authors have included a pilot study (*Quantifying Community Values for Coastal Hazard Management in Western Australia*) within the chapter in order to emphasise the importance of community values as an important and effective part of the formulation and implementation of policy. Chapter 5, *Nature-based Solutions to Mitigate Extreme Coastal Impacts*, prioritises the ability of natural systems to protect coastal areas and reduce the effects of coastal flooding and erosion. Given their ability to withstand extreme weather events, nature-based solutions provide a sturdy foundation for the ecosystem services dependent upon them. The authors stress that multidisciplinary research is needed to flesh out areas wherein restoration efforts can be carried out to reduce the impact of hazards and benefit the populace. The chapter highlights the need to create a public perception of nature-based solutions, their ecosystem services, their benefits, and even their shortcomings.

Part III is devoted to 'healthy' oceans. Chapter 6, *Monitoring Ocean and Estuary Health* aims to understand the health of global estuaries, coastal seas, and oceans and how they change. Over the past 25 years, the need to monitor the physical, geochemical, and biological facets of ocean health. To highlight the need for and importance of monitoring the health of the ocean, monitoring efforts carried out by Australia and New Zealand have come in for special laudatory mention. Chapter 7, *Pollution from Land-based Sources*, uses case studies to highlight how extreme industrial and agricultural activities, coupled with increasing urbanisation, impact the oceans around us. The case studies indicate that unless mitigation efforts are vigorously implemented, anthropogenic activities will continue to impact the coastal environmental health and, ultimately, the health of the overall society. The authors point out that temperature plays a pivotal role in the overall functioning of many species; a slight temperature fluctuation can result in irreversible changes. Chapter 8, *Impact of Marine Heatwaves*, uses the 2011 marine heatwave in Western Australia as a case study to highlight the generic impact of marine heatwaves on the marine ecosystems. In Chapter 9, *Local, Community-led Interventions to Address Global-scale Problems and Environmental Extremes in Coastal Ecosystems*, the authors investigate how people-centric management models are sufficiently responsive and flexible to deal with future changes brought about by marine extremes.

Part IV is dedicated to generating wealth from the oceans. The authors of Chapter 10, *Aquaculture*, point out that aquaculture is being seen as one of the viable ways of addressing food security challenges. The chapter provides useful insights into aquaculture production and the science underpinning it. The authors state that for aquaculture to be sustainable, it is essential to identify new sites and species, and emphasise that new methods need to be developed to address the impact of aquaculture. New techniques such as polyculture and offshore aquaculture have accordingly been highlighted. Chapter 11, *Extreme Human Behaviours Affecting Marine Resources and Industries*, brings out the linkages between the fishing industry, illegal fishing, human

trafficking, and maritime piracy. While each is damaging in its own right, the combined effect is devastating in respect of aspirations and endeavours related to the blue economy. Chapter 12, *Impact of (Extreme) Depth on Life in the Deep-sea*, focuses upon the importance of the deep sea in the functioning and buffering of global systems. Monitoring the health of the ocean, they aver, is essential and given the inaccessible nature of the deep sea, monitoring the health of this part of the enormous ocean becomes much more critical. Given the existing superficiality in terms of knowledge of marine resources (e.g., oil, gas, minerals, flora, and fauna), the deep sea demands far more significant research mobilisation.

The book's final section, Part V, synthesises the information presented in Parts II, III and IV, thereby identifying future directions that need to be taken. Chapter 13, *Addressing the Challenges and Harnessing the Benefits of Marine Extremes*, illuminates the fact that merging knowledge and information across disciplines related to the variety of challenges posed by maritime extremes is a necessary first step, even though it is unlikely, in and of itself, to be a sufficient one. To promote interdisciplinary research, the editors propose a research agenda based on the information contained in the book. The editors' effort is to enable stakeholders to use the information and, thus, guide existing ocean governance, anthropogenic activities, and response to marine extremes.

The book delves into the nuances of how marine extremes affect communities, infrastructure, and marine ecosystems, by using information and knowledge generated by the physical and social sciences. Attention is drawn to the opportunities and hazards posed by marine extremes, as derived through multiple techniques and strategies, thereby lessening the adverse impact of future marine extremes. The authors offer several related perspectives that cover the many facets of the issue and, importantly, attempt to provide feasible and economically viable solutions. The principal aim of the volume is to enhance the current marine scientific knowledge and embed this knowledge across the ocean governance policies of State as well as benevolent non-State actors, as the global future is dependent upon the world ocean and the services provided by it. Given the multitude of perspectives and disciplines presented, the edited volume is of significant value to several scholars. It will help people reap the benefits of the oceans sustainably.

Although the book does present several perspectives, it needs to do more in order to adequately justify its title. In other words, while the title incorporates "The Blue Economy", the chapters themselves address the subject in a disappointingly perfunctory manner. Part IV of the book, entitled *"Wealth from the Oceans"*, does touch on the "Blue Economy" while discussing the pros and cons of aquaculture, the impact of anthropogenic behaviours on marine resources and dependent industries, and lastly, the effect of extreme depth on life in the deep sea. Still, the treatment lacks adequate depth and centrality. It might have made for better reading had Techera and Winter guided their authors to delve into the blue economy with more evident and rigorous scholarship. That said, the book commendably focuses on the oceans from a climate change perspective, which is very much the need of the hour. And yet, precisely because of this obsessive attention to climate change, the ever-growing and evolving field of the blue economy appears to get sidelined.

In conclusion, while the book has undeniable value, One cannot escape the sneaky feeling that it would have been far more beneficial for the editors — and the Matariki Network of Universities — to have dwelt upon nuanced aspects of the blue economy in greater depth and to have generated, in the process, much-awaited literature that would not only benefit academia but also guide policymakers in the governments of the world.

About the Reviewer:

Dr Shushant Parashar is an Associate Fellow at the National Maritime Foundation (NMF). His current research is focused upon the various facets of India's endeavours to transition from a "brown" model of economic development to a "Blue" one, and in so doing, to lead a regional transition to a sustainable Blue Economy. He may be contacted at mgssa2.nmf@gmail.com