



world ocean review 
Living with the oceans. 2014

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Marine Resources – Opportunities and Risks

Published by
maribus in cooperation with



future ocean
KIEL MARINE SCIENCES



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Preface

Following on from *World Ocean Review 2*, which explored the future of fish and fisheries, I am delighted to present the third volume in the series. In this *World Ocean Review* (WOR 3), we focus on marine resources and the opportunities and risks associated with their potential exploitation.

Two salient facts merit particular attention. Firstly, very little is known at present about the resources found in the world's oceans, and their exploration and especially their production pose immense technical challenges. And secondly, there is insufficient public awareness and debate about these resources and their utilization. Oil, gas, minerals and methane hydrates lie in the lightless depths of the oceans, and their extraction is hidden from sight. Even the products manufactured from them are not always obvious or tangible in our daily lives. This contrasts sharply with the large body of information available about the world's fish stocks and the fishing industry, and the public's justified interest in this topic. Obtaining food from the sea is fundamental to our lives and has formed part of our consciousness for thousands of years. In that sense, raising people's awareness of the problems associated with fishing is a relatively simple task. Indeed, politicians are now responding to growing public pressure – partly created by publications such as WOR 2 – and are turning their attention to more sustainable fishing in the hope that the extinction of numerous species of fish can still be averted.

But there is still a long way to go before we achieve a similar level of knowledge and public awareness of marine resources. In my view, it is crucial to launch a debate about the use of these non-living marine resources – for without our natural collective interest in these diverse problems, we cannot exert the pressure that is needed to ensure that marine resources are extracted and utilized in a sustainable manner.

In this volume, you will find information about the formation, exploration and production of marine resources: not only oil and gas but also ores, in the form of manganese nodules, cobalt crusts and massive sulphides. A separate chapter is devoted to methane hydrates. The extraction of all these resources poses major technical challenges and is a highly contentious issue due to the environmental risks involved. It could also become the basis for a powerful economic sector with the prospect of extremely high returns and significant political ramifications.

Yet if such large-scale business is hidden from view, this not only poses a threat to the environment: it also jeopardizes fundamental human rights and social justice. The multinationals in particular, such as Shell, ExxonMobil and Total, which have been producing oil in West Africa for years, saw no need to protect the natural environment or to ensure equitable sharing of benefits from oil revenue in the past.

There are very significant opportunities but also risks for the future in and on the seabed. I hope that WOR 3 will give you all the facts you need.



Nikolaus Gelpke

maribus gGmbH Managing Director, mareverlag publisher and IOI President

Humankind has lived with the sea and utilized its services since time immemorial. We are drawn to the sea, for the coasts offer many benefits to local communities. But with the world's population rapidly increasing, many of us are starting to worry about the future of the oceans and the coasts. How can a balance be achieved between conservation and use? Is development towards sustainable use of marine resources possible?

These questions are particularly relevant in the case of mineral and energy resources from the sea. Resources that regenerate quickly, such as fish, shellfish and algae, can in principle be exploited sustainably, provided that their habitats are secure and harvesting is regulated so that enough of the resource remains in the sea to allow reproduction. The challenges relating to fishing, for example, were discussed in *World Ocean Review 2*. Mineral and energy resources, however, form over many millions of years, and there is only a finite amount of these resources available for future generations. What's more, they often lie hundreds of metres under the seabed and can only be extracted with complex technology. How can these resources be exploited equitably and, as far as possible, sustainably? And can the environmental pollution associated with their extraction be minimized?

World Ocean Review 3 is dedicated to these marine resources. It focuses on their utilization as sources of energy and metals, and gives the facts about the known oil and gas deposits beneath the seabed and the fixed gas hydrate deposits on the continental shelves. It informs readers about the potential afforded by the three main types of mineral deposit: manganese nodules, cobalt crusts and massive sulphides.

Methane hydrates are the subject of much discussion at present. Very extensive deposits of what is effectively natural gas trapped in ice are believed to exist – perhaps larger than all the world's known oil and gas reserves combined. There are initial plans to extract gas hydrates on the continental shelves. This will create risks, but also opportunities. Methane hydrates are a cleaner fuel than coal. Could methane hydrate extraction be a bridging technology in the transition to a sustainable energy supply for our societies?

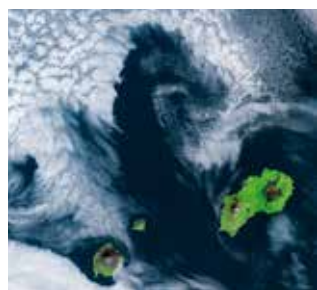
Marine resources have great potential, and it may be possible to start exploiting them profitably very soon. However, their extraction is fraught with risks and could potentially cause severe degradation of the marine environment. Is that what we want? If not, what mitigation options exist? What kind of framework must be negotiated at the national and global political level?

The future of the oceans is intimately linked with the future of marine and coastal resource extraction and therefore with most people's, if not everyone's, future. In that sense, I wish you an interesting and informative read.



Prof. Dr. Martin Visbeck

Spokesperson of the Cluster of Excellence "The Future Ocean"



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1 Oil and gas from the sea



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