



Journal of Sedimentary Research

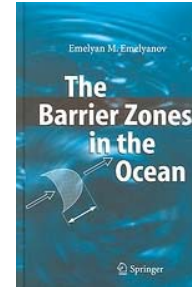
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The Barrier Zones in the Ocean, by Emelyan M. Emelyanov, 2005. Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, Germany. Hardcover, xx + 632 pages, 189 figures. Price EUR 181.85. ISBN 3-540-25391-2.



Barrier zones (transition zones, interfaces) play a key role in oceanic processes, and control the chemistry and physical parameters of the ocean. Changes in the nature of element migration, the formation of sediments with anomalous compositions, and sediment transformation are some of the processes that occur in the transition zones between different environments within the ocean. These zones received therefore particular attention, and they have been extensively discussed since the 1960s. There is no work that summarizes our knowledge on this topic, despite the large number of papers devoted to different aspects of oceanic geochemical barriers. Therefore, *The Barrier Zones in the Ocean* by Emelyanov is a very welcome book. It is a synthesis of the author's tremendous experience gained in all seas and oceans during the last 45 years. The book consists of 4 chapters and portrays various theoretical and practical aspects of the concept of barrier zones in oceans, which are interpreted as portions of the water column or sediment where the migration of elements is intensified abruptly in one or another direction, within a short space interval.

The first chapter describes general characteristics and classifies over 40 barrier zones in the ocean. The general point of the concept, that the geochemical barrier zone is a discontinuity within the continuity of medium properties, is illustrated by various examples of sediment fluxes in nature. The second chapter explores specific processes of supply, transformation, and deposition of sediment onto the seafloor with the Baltic, the Black and Mediterranean Seas, and the Atlantic Ocean as examples. This chapter discusses the fate of sedimentary matter crossing various barrier zones: river–sea, shore–sea, ice–water, ocean–atmosphere, etc. It estimates the possible geological consequences of the processes at barrier zones like the thermocline, halocline, oxygen minimum layer, CCD, euphotic layer, and upper active sediment layer. The third chapter provides an intriguing look into the role of barrier zones in the processes of present-day ore formation: placers, ferruginous oolitic ores, phosphorites, Fe-Mn nodules and crusts. The fourth chapter considers specific aspects of contamination of marine ecosystems by oil products, nutrients, heavy metals and radionuclides. It presents evidence that all these pollutants are confined to barrier zones, where they are subjected to fossilization. Thus the barrier zones create a unique self-cleaning mechanism.

In general, the book is up-to-date and clearly written. The text of each chapter is well illustrated by diagrams and graphs. The quality (photographs, figures and layout) is excellent. The price is fair.

The readership of this book consists of scientists dealing with marine geology, chemistry, ecology and geomorphology. It is particularly recommended to students taking courses in marine geology, marine chemistry, and ocean management, and also to individuals who want to proceed

with new approaches and insights. They will find in this book all information they need about oceanic barrier zones.

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