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Book review

Biogeochemical Dynamics at Major River-Coastal Interfaces, T.S. Bianchi, M.A. Allison, W.-J. Cai. Cambridge University Press, New York (2014). 658 pp.

During the last couple of decades, our knowledge of the biogeochemical processes in the delta systems of the world's largest rivers has improved considerably, although it still lags behind our knowledge of smaller rivers, mainly since these rivers are often in remote areas and/or are logistically challenging to study. The main objective of the book *Biogeochemical Dynamics at Major River-Coastal Interfaces* by Bianchi, Allison and Cai is to provide the reader with a comprehensive overview of what is known about the biogeochemical processes in the world's major large delta-front estuaries, including the natural and anthropogenic factors that control and regulate them.

The book is generally well organised with an introductory section and a separate section about water dynamics from source to sink, after which the river systems of the eastern and western hemispheres are discussed in more detail in separate sections. Most chapters are written by internationally recognised experts in their fields and, although using the aid of specialists in writing a book is not without its pitfalls, the approach has resulted in a book with an up-to-date overview of the entire field. However, some of the chapters could have been better related to each other and, in my opinion, the book would have benefitted from a slightly more integrated approach. For instance, it contains four chapters about the Mississippi River system, where one chapter or two combined chapters would have been better.

There are other river systems that could have been discussed in greater detail; for example, the Yukon system is discussed in a separate chapter, while much larger, and arguably more important, river systems in the Arctic region, including the Mackenzie River, the second largest river system in North America after the Mississippi River system, and the Yenisey River system, the

Siberian Arctic River system with the highest annual discharge of all Arctic rivers, are discussed only in general terms in a combined chapter. This is in contrast to the very thorough discussion of other major river systems including the Mississippi River and all the major rivers that drain the Himalayas.

Bianchi et al. have provided a comprehensive overview of what is known about the biogeochemistry of river-coastal systems, with an extensive overview of both bulk and molecular based approaches for a wide range of river systems. Personally, I would have liked to have seen a slightly greater emphasis on the application of biomarkers and biomarker-based proxies, such as the glycerol dialkyl glycerol tetraether lipids based the BIT index, as well as recent advances in molecularly based analytical techniques such as compound specific isotope/radiocarbon analyses, widely used to understand the fate of fluvially transported organic carbon. Where these techniques are discussed, for instance in the section dealing with the evolution of carbon signatures carried by the Ganges–Brahmaputra river system, it clearly underlines the usefulness of such molecular approaches.

In summary, *Biogeochemical Dynamics at Major River-Coastal Interfaces*, will be an essential book for the library and specialist bookshelf/eReader and will serve as an authoritative reference point for years to come, particularly considering that predicted changes in the global climate and increase in the human population are likely to have a dramatic impact on sediment and carbon delivery of all large rivers worldwide.

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