



Atlas of sedimentary structures in estuarine and tidally-influenced river deposits of the Rhine-Meuse-Scheldt system - their application to the interpretation of analogous outcrop and subsurface depositional systems.

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A reliable interpretation of the depositional environment of an ancient rock unit would hardly be possible if no knowledge exists of the present-day

depositional environments, the processes that play a role in them, and the traces that are left by these processes, for instance in the form of sedimentary structures. The uniformitarianism *ad agum* "The present is the key to the past" expresses this well. It would, consequently, be ideal if every sedimentologist would have the opportunity to walk around in each possible environment (my teacher stated correctly that you have to 'undergo' an environment if you want to understand it). This ideal will, unfortunately, remain an ideal: the education of geologists may include excursions to, and fieldwork in, a wide variety of environments, but certainly not in all. Many earth scientists have never visited a glaciated area, hardly anybody in the world has visited the deep-sea floor, and even marginal-marine environments are for many geologists that are educated (or working) in the middle of a continent out of direct reach.

This lack of personal experience is compensated, at least partly, by the sedimentological literature.

Numerous descriptions of modern environments provide, at least in principle, the information that sedimentologists need for the interpretation of the depositional environment of ancient rocks. The problem is, however, that space in books and journals is limited, and that the number of illustrations is, as a rule, too low to give a truly detailed picture of the modern environment that is described. With the atlas under review here, this problem has been solved, at least for estuarine and tidally-influenced river deposits. The authors worked for decades in deposits formed in these environments, in a recent setting (in the SW part of The Netherlands), in outcropping ancient rocks (Tremp-Graus Basin, Spain) and in core. This extensive experience has led to a deep insight into the sedimentology of these environments, resulting in the development of diagnostic parameters for recognizing them, also in ancient rocks. It should be mentioned in this context, however, that diagnostic parameters do, obviously, not exist of specific features: rather do the lateral changes (facies shifts) and the vertical development (sequences), in combination with specific structures, provide the diagnostic data.

Researchers with an extensive knowledge tend, if they want to share their knowledge with colleagues, to write a book. But, as mentioned above, in most cases the space in books is insufficient to show all the relevant aspects in detail. Yet, a field-based figure is commonly much more informative than a description. It is therefore fortunate that the authors have chosen to compile an atlas. And it has become an impressive work, indeed! The Atlas, in contrast to most books, in landscape format, and at a much larger size (48 x 32 cm), offers ample opportunity to show photos that reveal even tiny details. These photos, like the artwork commonly in full colour, are highly informative and all of excellent quality. And they show details that are rarely shown in text books. A good example is the photo (of some 80 cm wide on pages 40 and 41, which shows a 'composite' lacquer peel that is more than 10 m wide!

The structure of the Atlas is simple: it is subdivided into six chapters, followed by 2 appendices, a reference list and an index. The structure is not only simple but also logical: an introductory chapter (1) is followed by a chapter (2) about processes and facies of estuaries and associated fluvial channels. Chapter 3 then comes with what is, in my opinion, the key part of the Atlas: a detailed account of the characteristic sedimentary structures and assemblages of the Pliocene and younger (till the present-day) estuarine and fluvial deposits of the Rhine-Meuse-Scheldt river systems. The next chapter (4) shows how the data from the (sub-recent) sediments dealt with in Chapter 3 can be used for the interpretation of hard-rock equivalents, and Chapter 5 goes even an important step farther, indicating how the data from Chapter 3 can be applied to core analysis. The final chapter (6) provides a synthesis where all the earlier presented material is summarized, including a discussion of diagnostic parameters.

Appendix 1 gives an overview of the hard-rock outcrop localities mentioned in the Atlas (particularly in Chapter 4), with their stratigraphy and paleogeographical setting, and Appendix 2 does so for the subsurface formations from which cores were analysed in Chapter 5. Particularly the interpretations of the paleogeographical settings are, in my opinion, highly interesting, as they show clearly what is the general 'framework' of estuaries, and how – sometimes significant – differences between the individual estuarine areas exist.

However interesting the text may be - and it is certainly most useful - the strength of this work is (as should be with an atlas) in the figures. Particularly the photos of lacquer peels give details that are often difficult to

distinguish in the field. The field photographs are, however, also very instructive, just like the many schemes, block diagrams, etc.

The Atlas in its entity it is a magnificent work. Unavoidably, there are some minor shortcomings (e.g. in stratigraphic terminology), and the printing of captions in italics makes reading unnecessarily tiring. Moreover, the large size of the Atlas and the thick paper (which makes the Atlas heavy) make it unpractical to take the Atlas into the field. On the other hand, the size-related large photos and the thick paper make it a work that will survive frequent usage (and I'm sure that it will be consulted frequently, indeed). Further, the printing is of excellent quality, and on excellent paper. This all makes the Atlas a valuable work that will certainly contribute not only to a better understanding of estuarine deposits, but that will also be helpful in recognising such deposits in ancient rocks. For such a service, the price is certainly not too high. The sedimentological community could only wish that more depositional environments would be treated in a similar way.

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