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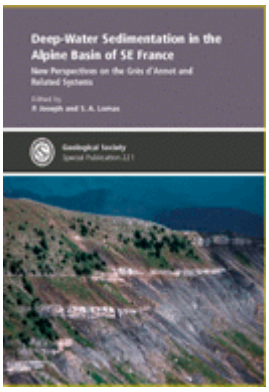
Deep-Water Sedimentation in the Alpine Basin of SE France: New perspectives on the Grès d'Annot and related systems, edited by P. Joseph & S.A. Lomas, 2004. Geological Society, London, Special Publications 221. The Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath BA1 3JN, United Kingdom; 448 pages, hardbound; price GBP 105.00. ISBN 1-86239-148-3.



The Eocene-Oligocene Grès d'Annot (Annot Sandstone) Formation of the French Alps is a confined sand-rich deep-water system controlled by synsedimentary tectonics. The seismic-scale outcrops of this region have been the source of highly influential models of turbidite system development. The transition from a deltaic domain to a deep basin is preserved and well exposed. Therefore, it is possible to study the evolution of gravity flow deposits in time and space from a proximal to a distal marine position. Overall, the strength of this volume is its broad, comprehensive and multidisciplinary science focussing on one special type of foreland basin. It demonstrates in a very clear manner how important it is to integrate as many lines of evidence and as many approaches as reasonable. Therefore, Special Publication 221 is of broad interest to both academic researchers and industrial geoscientists studying deep-water systems.

The book is subdivided into 10 sub-themes and contains 23 papers, the first of which, by editors Joseph and Lomas, provides mainly background information, outlines the main results and summarizes new perspectives. Historical reviews are given by Stanley and Bouma and Ravenne. These introductory papers highlight what is potentially new and relevant for confined deep-water systems in general, and what is excellent about Grès d'Annot-specific geology.

A first group of papers focuses on the geodynamical and structural evolution. Ford and Lickorish summarize the whole foreland basin evolution around the western Alpine Arc, whereas Apps and others present the structural setting and palaeogeographic evolution of the Grès d'Annot Basin. In this framework, Evens and others examine the relationship between the westernmost Barrême Basin and the other Grès d'Annot sub-basins.

Particularly impressive are the studies on chronostratigraphy, palaeogeography, and sequence stratigraphy that provide a basis for the depositional model. Using a novel sequence stratigraphic approach, Callec interprets the Annot Sandstone Formation as the regressive part of a second-order transgressive-regressive cycle. Based on systematic

sampling, Du Fornel and others provide a framework for detailed correlation and draw a picture of the topography of the different sub-basins, whereas Euzen and others reconstruct and simulate in three dimensions the large-scale geometry and facies distribution in two sub-basins. Guillocheau and others describe high-resolution genetic units and discuss an interesting depositional model. Broucke and others demonstrate the influence of a kilometre-scale synsedimentary flexure on the geometry of these genetic units.

A third group of papers concentrates on syndepositional tectonic activity. Lansigu and Bouroullec discuss the geometry and evolution of normal faults bounding tilted blocks. Bouroullec and others quantify the timing of fault activity and demonstrate its effect on the geometry of the depositional units. Tomasso and Sinclair examine in detail the sedimentation on such an evolving fault-block. In the Grand Coyer basin remnant, Stanbrook and Clark discuss the initiation of slumps in relation to onlap geometry.

A fourth group of papers addresses the interaction between subaqueous sedimentary density flows and basin-floor topography. McCaffrey and Kneller identify spatial non-uniformity related to changes in slope gradients, elongated scours and channels, and smaller-scale variability in sea-floor topography. Comparing tank experiments with outcrop data, Amy and others attempt to quantify the impact of a lateral basin-floor slope on the velocity field of the incoming flows and the resulting deposits. Lee and others discuss the origin of decametre-thick sandstone units that were deposited close to the base of slope. Garcia and others examine the effects of transport and depositional mechanisms on chemical variations of the density flow facies at a bed scale.

Last but not least, the magnificent large-scale onlap relationships of the Grès d'Annot outcrops are discussed in two papers. Puigdefábregas and others give a summary of the complex palaeotopography and discuss the origin of soft-sediment deformation in the slope-onlap setting. Smith and Joseph present a simple geometric model to reproduce the onlap pattern of the deep-marine sandstones on the Marnes palaeoslope. Bourgeois and others illustrate the use of 3-D full wave seismic modelling of the sedimentary architecture. And finally, Moraes and others discuss the suitability of the Annot Sandstone Formation as an outcrop analogue for Brazilian Cretaceous sandstone reservoirs.

The volume is generally well prepared and edited, and contains some excellent papers. A minor point of criticism is that the term "turbidite" is somewhat out of place in a number of phrases. Obviously, turbidity flows were not the only process transporting clastic material into the confined deepwater basin. In many cases, "density flow deposit," "depositional event" or "basin fill" (instead of "turbidite event" or "turbidite fill") would have been more appropriate. The print quality, indeed the whole appearance of the book, is excellent. The illustrations are abundant, clear and informative. Unfortunate exceptions are the low-resolution photographs in the paper of Stanbrook and Clark and some of the thoughtlessly down-scaled figures, e.g., in the paper of DuFornel and others. Apart from these shortcomings, I am pleased to give the book my full recommendation.

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