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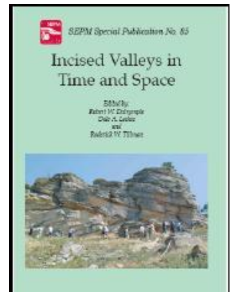
***Incised Valleys in Time and Space***, edited by Robert W. Dalrymple, Dale A. Leckie & Roderick W. Tillman, 2006. SEPM Spec. Publ. 85. Society for Sedimentary Geology (SEPM), Tulsa, Ok, USA. Hardbound, 343 pages. Price USD 120.00 (SEPM members USD 85.00; student members USD 60.00). ISBN 1-56576-122-7.




This book constitutes a second issue of SEPM Special Publication 51, "Incised-Valley Systems: Origin and sedimentary Sequences," which was first published in 1994. At that time, estuarine deposits were a new subject of interest in the study of facies and facies assemblages, and of stratigraphic units that are interpreted as incised-valley deposits.

The book is focused on the sedimentary infilling of incised valleys in different settings and consists of a collection of papers presented at two SEPM-sponsored events. The first was the SEPM conference that took place in Casper, Wyoming (2002). The second was the AAPG-SEPM annual meeting held in Salt Lake City (2003). Additional contributions have been included to enhance the scientific value of the book. Most welcome is the presence of several contributions that describe and discuss more than one example.

The book shows how extrinsic factors such as climate, tectonics, sediment supply and paleogeographic constrains control the stratigraphic infill of incised valleys. The 15 contributions that make up this volume have two main themes: (1) control on valley incision, valley location and valley shape, and (2) the influence of sedimentary supply on the sedimentary architecture of the valley infilling. The majority of the chapters concern Quaternary systems, whereas the oldest deposits studied are Jurassic-Cretaceous in age.

Eight chapters deal with incised valleys that are situated in passive continental margins; four deal with foreland basins, and the three remaining contributions concern tectonically active settings. In addition, eleven of the chapters consider areas with low to moderate accommodation space, whereas the remaining four contributions discuss areas with moderate to high accommodation space.

The fluvial sediment supply ranges widely from very low in areas with smooth topography to very high in examples related to glacial valley fills and to tectonically active areas. The case that describes low fluvial sedimentary supply associated with the introduction of sediments from the sea is of especial interest. Climate plays a major role in sediment accumulation and distribution: the contributions dealing with this aspect range from glacial, to humid-warm to semi-arid and even subtropical climates. As regards the paleogeographic settings, the examples vary from locations far inland to close to the lowstand end of the valley. Thus, the facies assemblages range from fluvial-dominated to marine-dominated.

Tandon et al. deal with the Quaternary successions from the Himalayan foreland basin. The authors show how climate, tectonics and glacioeustasy have played an important part in controlling the valley and floodplain depositional architecture in the Ganga plains.

Menier et al. study the shape and infilling of submerged parts of incised valleys displayed along the southern part of Brittany (France). The valley location and morphology were controlled by submarine topography arising from the activity of several faults. The valley fill consists of a transgressive succession.

Chaumillon & Weber reconstruct the sedimentary infilling of two modern incised-valley systems separated by a few kilometres. Their infill is very different, probably because of the variations in the type and amount of marine-derived sediments.

Payenberg et al. focus on the infilling of an incised valley by sandy shelf dunes controlled by strong tidal currents. These infilling were produced when the shelf and the valley were in submarine conditions.

Omura et al. describe and analyse an estuary—characterised by the preservation of organic matter—strongly influenced by variations in sea-level and river discharge due to climate changes.

Simms et al. deal with overfilled versus underfilled incised valleys and offer some excellent examples from the Quaternary in the Gulf of Mexico. The authors propose a classification of incised valleys based on the proportion of fluvial versus estuarine and marine fill. The overfilled and underfilled sedimentary accumulation is related to fluvial sediments.

Li et al. discuss three deltas and one estuary of varying shapes and sizes, developed under different tectonic conditions and affected by different types of tidal regime. All four sedimentary systems were formed during the last-glacial sea-level fall and filled during the following sea-level rise.

Corner proposes a transgressive/regressive cycle for a model of fjord-valley fill during two major depositional stages, deglacial (D) and postglacial (P), producing a tripartite stratigraphic succession, representing (1) deglacial transgressive, (2) deglacial highstand, and (3)postglacial forced-regressive system tracts.

Eilertsen et al. give an account of a fjord-valley-fill evolution, where the deglacial phase was characterized by a high rate of sediment supply and transgressive inundation during glacier retreat. The postglacial phase was characterized initially by a rapid base-level fall, which controlled high sedimentation rates, followed by a more gradual base-level fall with low sedimentation rates.

Rossetti discusses the role of tectonics with respect to the preservation of incised-valley estuaries in areas with low accommodation rates. The main deposition takes place during the transgressive to highstand stages of several relative variations in sea-level, resulting in compound fills with tectonic influence on valley evolution.

Plint & Wadsworth reconstruct delta-plain paleodrainage patterns reflecting small-scale fault movements. The extreme sensitivity of rivers to subtle changes in slope resulting from tectonic tilting provides the basis for the interpretation of late Cretaceous paleovalley systems in the foredeep of the western Canada foreland basin.

Garrison & Van den Bergh analyse the effect of the sedimentation rate following a relative rise in sea-level, and of the duration of a sea-level cycle on the filling of incised valleys. The authors propose a model for predicting the internal architecture and sedimentology of incised valleys resulting from various sedimentation rates and differences in relative sea-level rise during sea-level cycles of varying duration.

Plink-Björklund & Steel study several incised valleys on a coastal plain and shelf as a part of a linked shelf-slope system. This contribution focuses on the study of three incised valleys that are not V-shaped. Within the coastal-plain succession under study, these valleys have been documented by means of the regional unconformities and their correlation with probable interfluve palaeosoils and landward and oblique onlap of subhorizontal fluvial and estuarine deposits onto these regional unconformities.

Wroblewski examines the relative influences of tectonics, climate and sea-level variations on valley incision and sedimentary infill.

Finally, Pascucci et al. consider valley formation and filling in response to magmatic doming on the island of Elba (Italy) during the Miocene.

This SEPM Special Publication is, in my opinion, a comprehensive and well written book. The abundant and very good illustrations enhance the value of this volume. I strongly recommend it to all advanced students and professional geologists with a special interest in the stratigraphical and sedimentological study of incised valleys.

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