

Special Publication 51. Incised Valley Systems Origin and Sedimentary Structures

PREFACE

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Incised valleys were not widely recognized prior to the 1980's, although there are notable exceptions. Most early workers forced the isolated, incised-valley deposits along an unconformity into a single continuous unit, ignored them by including them within larger stratigraphic units, or interpreted them as deltaic distributaries or non-incised fluvial channels. In the last decade, intense interest in the influence that changes in accommodation space have on stratigraphic organization has focused attention on incised-valley systems, because they are one of the most visible records of major decreases in accommodation. In practical terms, they are also a significant key to the identification of sequence-bounding unconformities. As a result, many successions have been re-examined, and incised-valley fills are being found in rapidly growing numbers.

This enthusiasm for incised valleys is also fuelled by the recognition that incised-valley deposits contain significant hydrocarbon reserves in basins around the world. Thus, there is a powerful economic incentive to understand how allocyclic and autocyclic factors interact to determine the nature and organization of facies within incised-valley systems. Modern, incised-valley estuarine environments are among the most heavily populated settings on the planet. Thus, an accurate and detailed understanding of their response to changing sea level is essential to predicting their response to global warming.

This volume is an outgrowth of this widespread interest in incised-valley sedimentation. Many of the papers were initially presented at the popular Special Session on the "Recognition and Facies of Incised Valley Fills" held at the AAPG-SEPM Annual Meeting (Calgary) in June, 1992. We have also solicited additional papers in order to give the broadest possible coverage of the origin and shape of incised valleys and of the facies and stratigraphic organization of valley-fill successions.

Given that incised-valley systems have not been the subject of systematic study in the past, one of our objectives in preparing this compilation was to provide an integrated examination of these systems. It is obviously impossible,

however, to produce a truly integrated presentation within the context of a volume such as this, given the lack of a pre-existing framework for comparison and the rapidly evolving nature of the field. To compensate, we have used our editorial prerogative to organize the case studies into groups with similar (paleo-) geographic settings and geologic histories, based on our perception of the fundamental organization of incised-valley systems that formed in response to changes in relative sea level. Only future research will tell to what extent we have succeeded at capturing the true "essence" of incised-valley systems in this model.

As might be expected, some form of sequence stratigraphy features prominently in most of the contributions. Due to the terminological problems which plague the field, we have asked that authors utilize widely accepted terms wherever possible, clearly indicating the source and justifying any departures from common usage. Uniformity has not been achieved, and readers must be cautious when comparing the various contributions. Hopefully this diversity of approach stimulates constructive thought rather than frustration.

In the preparation of this volume we have been assisted by many people in addition to the authors whose efforts are the basis of the volume. Therefore, we offer our sincere thanks to: our current and former employers (RWD-Queen's University; RB-University of Newcastle; BAZ-Pan-Canadian Petroleum Ltd. and Imperial Oil Resources) for the considerable logistical and financial support provided, particularly with regard to the voluminous international correspondence required (RWD specifically thanks the Ocean Sciences Institute, Department of Geology and Geophysics, University of Sydney, for their hospitality and support during the preparation of the volume, and the Advisory Research Committee, Queen's University, for a grant to help defray editorial expenses); SEPM Council for allowing this venture to proceed; Barbara Lidz, Dana Ulmer-Scholle and Peter Schelle for their editorial assistance; and the many scientists listed below for their insightful reviews of the manuscripts.

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