

Preface

Carbonate sediments deposited on shelves and ramps across the globe and in the geological record have traditionally been viewed as tropical, warm-water deposits (Bathurst 1975; Wilson 1975; Tucker and Wright 1990; James and Kendall 1992). Although it has been recognized for more than 50 years that carbonate sediments do accumulate in cool-water temperate and cold, polar environments (Chave 1952), it is only in the last several decades that these sediments have been studied seriously in the modern ocean (Nelson 1988a; James 1997; Pedley and Carannante 2006). This relative neglect is largely because they occur in environments that are difficult to document. The mid latitudes are stormy and the waters are cool but above all the shelves are mostly deep and so not amenable to research using SCUBA. The system must, as a result, be studied by remote sensing, chiefly through shipborne sampling, acoustic profiling, towed imaging and tethered water characterization. Scientific appreciation of the temperate carbonate depositional realm has thus lagged behind our understanding of the warm-water tropical environment. A direct consequence of this knowledge gap is that actualistic cool-water depositional models are not being routinely considered when interpreting the older rock record.

The Australian continent with its old, topographically subdued landscape, has a continental shelf that is almost entirely covered with carbonate sediment. The southern part of the continental shelf is the largest area of temperate, cool-water carbonate deposition in the modern world. Sediments in this vast southern region, in environments ranging from paralic to deep sea, have been examined by a variety of workers but the resultant information is scattered throughout the scientific literature (von der Borch et al. 1970; Wass et al. 1970; Belperio et al. 1988; James et al. 1992; Boreen et al. 1993; James et al. 1994; James et al. 1997; James et al. 2001; James et al. 2008), or presented as short, general summaries in special publications (James and Clarke 1997) and textbooks (Tucker and Wright 1990).

The purpose of this volume is to amalgamate and synthesize most of this information in one place, utilizing the studies of others, our own surveys, and unpublished data, to arrive at an overall synthesis of this critical region. The focus is on the continental shelf and its deposits. It is designed to serve as (1) a core of information for modern environmental studies, (2) a springboard for future marine geological research, and (3) a solid foundation upon which to build sedimentary facies and sequence stratigraphic models that are applicable to the interpretation of the older rock record.

This research has been funded by grant agencies from two countries, specifically the Natural Sciences and Engineering Research Council of Canada (NPJ), the Australian Research Council (YB), the Commonwealth Scientific and Industrial Research

Organization Division of Oceanography ship funding program, Geoscience Australia, and the University of Adelaide.

This science would not have been possible without the ceaseless efforts of officers and crews of CSIRO and Geoscience Australia vessels often under extremely difficult conditions. We are particularly grateful to Captain Neil Cheshire who skillfully guided us through many trying times and raging seas.

Our colleagues at sea and in the laboratory, Tom Boreen, Lindsay Collins, David Feary, Vic Gostin, Steve Hageman, Lisa Hobbs, Kurt Kyser, Jeff Lukasik, John Marshall, and Chris von der Borch are all silent partners in this endeavour.

The research at sea would have been impossible without the tireless efforts of Tony Belperio, Phil Bock, Kirsty Brown, Frank Brunton, Ric Daniels, Vicky Drapala, Margaret Fuller, Kieth Gaard, Paul Gammon, Karen Gowlett-Holmes, Graham Heinson, Alexandra Isern, Andrew Levings, Bobby Rice, Sam Ryan, Paul Scrutton, Rolf Schmidt, and Tony White. The exacting laboratory analyses were carefully performed by Christina Bruce, Elizabeth Campbell, Morag Coyne, Alexandra Der, Christa Kobernick, Heather Macdonald, and Rowan Martindale. Special thanks go to Isabelle Malcolm whose attention to detail, editing, analysis, and photographic skills helped greatly during the final stages of book production.

We are indebted to Peter Davies, Qianyu Li, Brian McGowran, Paul Taylor, and John Rivers for continuing discussions about our interpretations. Seafloor images from NW Tasmania were acquired with the help of Alan Williams and Bruce Barker.

The original manuscript was kindly read and criticized by Vic Gostin, Brian Jones, Andrew Levings, and John Middleton, to whom we are very grateful for their careful, insightful, and helpful suggestions.

Neritic Carbonate Sediments in a Temperate Realm
Southern Australia

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2011, XIV, 254 p., Hardcover

ISBN: 978-90-481-9288-5