

The Neuquén Basin, Argentina
A Case Study in Sequence Stratigraphy and
Basin Dynamics

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VEIGA, G. D., SPALLETTI, L. A. HOWELL, J. A. & SCHWARZ, E. (eds) 2005. *The Neuquén Basin, Argentina: A Case Study in Sequence Stratigraphy and Basin Dynamics*. Geological Society, London, Special Publications, **252**.

MCILROY, D. & FLINT, S., HOWELL, J. A. & TIMMS, N. 2005. Sedimentology of the tide-dominated Jurassic Lajas Formation, Neuquén Basin, Argentina. In: VEIGA, G. D., SPALLETTI, L. A., HOWELL, J. A. & SCHWARZ, E. (eds) 2005. *The Neuquén Basin, Argentina: A Case Study in Sequence Stratigraphy and Basin Dynamics*. Geological Society, London, Special Publications, **252**, 83–107.

GEOLOGICAL SOCIETY SPECIAL PUBLICATION NO. 252

**The Neuquén Basin, Argentina:
A Case Study in Sequence Stratigraphy and
Basin Dynamics**

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2005

Published by
The Geological Society
London

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Published by The Geological Society from:
The Geological Society Publishing House
Unit 7, Brassmill Enterprise Centre
Brassmill Lane
Bath BA1 3JN, UK

Orders: Tel. +44 (0)1225 445046
Fax +44 (0)1225 442836
Online bookshop: www.geolsoc.org.uk/bookshop

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library.

ISBN 1-86239-190-4

Typeset by Techset Composition, Salisbury, UK
Printed by MPG Books Ltd, Bodmin, UK.

Distributors

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AAPG Bookstore
PO Box 979
Tulsa
OK 74101-0979
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Orders: Tel. +1 918 584-2555
Fax +1 918 560-2652
E-mail bookstore@aapg.org

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Preface

The aims of this special publication are to present the geological history of the spectacular Neuquén Basin. It is envisaged that this book will act as both an introduction to the basin and also as a focus for recent developments in the long history of its study. Furthermore, we hope that the book goes further than just presenting the latest studies on a specific area. We have aimed to present an integrated case study in sequence stratigraphy, palaeontology and basin analysis, lessons from which have implications for systems worldwide.

The concept of this book was born in the field in Argentina. We felt that there was a need to provide high-quality case studies that integrate different aspects of basin evolution and sequence stratigraphy, and we felt the Neuquén Basin provided such a dataset. However, it was apparent that, in spite of the excellent outcrops, the fascinating geology and the number of groups working on many different aspects of the basin, it was not well known within the wider geological community.

Despite the remoteness of much of the region, many studies have been undertaken. Some of these have been driven by the prolific hydrocarbons found in the basin. Others capitalize on the basin's unique palaeontological record, while the region has also been used for detailed sequence stratigraphic and facies-based studies that utilize the excellent outcrops as analogues for subsurface reservoirs both within the basin and internationally. Structural studies on the fold and thrust belt are central to understanding the evolution of the basin and the Andean margin of Gondwana.

The structural history of the basin records the change from Late Triassic extension through Jurassic and Early Cretaceous thermal subsidence to middle Cretaceous foreland basin subsidence followed by Andean compression and uplift. Most recent stages of the evolution include the emplacement and extrusion of a variety of igneous suites.

The basin-fill succession includes deep-marine turbidite, hemi-pelagic and pelagic

systems; shallow-marine clastic and carbonate systems; evaporites; a variety of different fluvial systems; and several phases of aeolian deposition. Facies contacts such as aeolian sandstones packages within ammonite-bearing offshore shales, are testament to a dramatic relative sea-level history, much of which is linked to the tectonic evolution of the Andes. The succession also contains one of the world's most important Mesozoic fossil records. The vertebrate record includes numerous finds of marine and terrestrial reptiles, many of which are unique. Less spectacular, but of comparable importance, is the most complete southern hemisphere Mesozoic invertebrate record.

We hope that this special publication will provide an insight into this amazing area. In compiling this collection of papers we have aimed to illustrate how all aspects of the geology are interlinked and how all should be considered together. In addition, our hope is that this publication will serve both as a stepping stone to the region for further study and as a more general case study in integrating the many aspects of basin evolution. The Neuquén Basin is a unique area, with fantastic outcrops and many remaining problems to be solved. We believe that it will continue to be used as an important field laboratory and training ground for the geologists of the future.

The editors are indebted to the authors who have contributed with timely and excellent contributions. The editors also acknowledge the efforts of the various reviewers who gave their time to ensure the scientific and linguistic integrity of the final product. They are N. Bardet, J. Battacharya, R. Bersezio, R. Blakey, P. de Boer, L. Buatois, P. Cobbold, K. Curry Rogers, P. Doyle, W. Etter, J. Franzese, F. Fürsich, M. Gruszczynski, A. Guiérrez-Pleimling, A. Hartley, J. Hechem, M. Lamanna, C.O. Limarino, D. Loope, C. Morley, J. Mutterlose, E. Nichols, G. Plint, A. Ruffell, R. Scasso, T. Sempere, A. Tankard, A. Tripaldi, H. Weissert, H. Welsink, P. Wignall, B. Willis and A. Zamuner. They also thank those reviewers

who decided to remain anonymous. The impetus for this publication was born out of the long-term relationship between Universities of La Plata and Liverpool, and as such we would like to acknowledge the important role played by Professor S. Flint. Angharad Hills at the

Geological Society played an essential role with her invaluable advice.

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Luis Spalletti
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