

Preface

The opportunity to study palæoclimate has been an exciting, challenging and rewarding experience. As a Natural Sciences undergraduate student at the University of Cambridge, I developed a strong interest in Earth Sciences, in particular climate change, sedimentology and geomorphology. During my master's degree, I was lucky enough to take these interests further in a three-month research project. It is the results of this project which provided the impetus for writing this book.

Developing an understanding of Earth's climatic history has become all the more intriguing and necessary in order to appreciate current climate change in the context of longer timescales. Transitions from icehouse to greenhouse worlds and vice versa are the largest of the climatic switches known to occur on Earth and they are accompanied by extreme palæoenvironmental changes. This book documents one such change, the Late Carboniferous to Permian deglaciation of southern Gondwana, by drawing upon evidence from a Gondwana fragment that became the Falkland Islands (Islas Malvinas) microplate following the break-up of the supercontinent.

The sedimentology of the Hells Kitchen Member of the Port Sussex Formation in East Falkland comprises deposits that document the switch from icehouse to greenhouse conditions. These Falkland Islands strata correlate with glacial units in South Africa and South America, all of which were deposited during the widespread, Late Carboniferous to Early Permian glaciation of Gondwana. Sedimentary logging, X-ray fluorescence (XRF) scanning and reflectance scanning were carried out on solid rock cores which host these sediments. The data collected was used to support a facies evaluation and an investigation into the nature of the climate change. In addition, it presented a unique opportunity to explore the application of Milankovitch orbital cycles to sedimentary sequences at this time.

This book is published as part of the series of Springer Earth System Sciences. It serves as a case study because the Falkland Islands cores pinpoint evidence from just one locality nested within the Gondwanan supercontinent at the time of the icehouse to greenhouse transition. The research complements other accounts of Falkland Islands geology, the climate and palæotectonic reconstructions of the Gondwanan supercontinent and long-term climate change. It is hoped that it will be

a valuable resource to both scientists and students working across a range of disciplines within the Earth Sciences, but primarily its focus is geared towards those with research interests in the above areas.

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From Icehouse to Greenhouse

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