Preface

Antarctic Climate Evolution is the first book dedicated to understanding the history of the world's largest ice sheet and, in particular, how it responded to and influenced climate change during the Cenozoic. To explain the story of Antarctic ice and climate history, information on terrestrial and marine geology, sedimentology, glacier geophysics, ship-borne geophysics, and numerical ice sheet and climate modelling is presented within thirteen chapters.

The book's content largely mirrors the structure of the Antarctic Climate Evolution (ACE) program (www.ace.scar.org), an international initiative of the Scientific Committee on Antarctic Research (SCAR), affiliated with the International Polar Year 2007–2009, to investigate past changes in Antarctica by linking climate and ice sheet modelling studies with terrestrial and marine geological and geophysical evidence of past changes. The programme is designed to determine climate conditions and change in both the recent past (i.e. during the last glacial maximum, when temperatures were cooler than at present) and the more distant past (i.e. in the pre-Quaternary, when global temperature was several degrees higher than it is today). This new cross-disciplinary approach has led to a substantial improvement in the knowledge base on past Antarctic climate and to our understanding of the factors that have guided its evolution. This in turn has allowed us to build hypotheses, examinable through numerical modelling, for how the Antarctic climate is likely to respond to present and future global changes.

Most of the subcommittees in ACE have been responsible for individual chapters, and in this way we have been able to cover the complete history of the Antarctic Ice Sheet and its climate evolution. The book will be of interest to research scientists from a wide range of disciplines including glaciology, palaeoclimatology, sedimentology, climate change, environmental science, oceanography and palaeoentology. It will also be valuable as a supplementary text for undergraduate courses.

We are grateful to our many friends and colleagues for advice and encouragement through the gestation of the book over the last 3 years. We also acknowledge input to the ACE initiative by a number of scientists (many of them contributed to this book), including P. Barrett, A.K. Cooper, J. Francis, R. Gersonde, M.J. Hambrey, D.H. Harwood, A. Moldonado, D. Pollard,

D. Sugden, G. Villa, P.-N. Webb and G.S. Wilson. We are sure that the chapter authors will join us in thanking the reviewers for their comprehensive and valuable comments and suggestions. We acknowledge their very special contributions to this book by naming them here: J. Evans, J. Francis, W. Howard, L. Krissek, A. Mackintosh, C. O'Cofaigh, G. Orombelli, A.H. Orsi, D. Pollard, C.A. Ricci, I.C. Rutt, E. Stump, C. Summerhayes and G.S. Wilson. Finally we thank Linda Versteeg-buschman, Femke Wallien and Suja Narayana of Elsevier Science for their support in the production of this book.

Fabio Florindo
Martin Siegert
Rome and Edinburgh,
July 2008