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Nota di contenuto	The Climate Modelling Primer; Copyright; Contents; About the Companion Website; Preface; Acknowledgements; 1 Why Model Climate?; 1.1 Introduction; 1.2 What is a climate model?; 1.2.1 Climate modelling and cooking: feeding good; 1.2.2 Climate models are much more than code; 1.3 Multiple reasons for climate modelling; 1.3.1 Climate models test the robustness of prevailing theory; 1.3.2 Climate models illuminate salient features and core uncertainties; 1.3.3 Climate models reveal the apparently simple to be complex and vice versa; 1.3.4 Climate models raise new questions and suggest analogies 1.3.5 Climate models expose prevailing wisdom as compatible or incompatible with existing data and hence direct collection of new data1.3.6 Climate models explain; 1.3.7 Climate models bound (bracket) outcomes within plausible ranges; 1.3.8 Climate models train practitioners and educate the general public; 1.3.9 Climate models discipline the policy dialogue; 1.3.10 Climate models encourage sensible thinking and informed discussion; 1.4 Climat e models: sound components in careful combination; 1.4.1 Ingredients and method 1.4.2 Climate model prediction: getting the right result for the correct reason1.4.3 Climate models pushing the envelope; 1.5 Climate

modelling: about this book; 1.5.1 Climate modelling: read the label and exercise care; 1.5.2 The Climate Modelling Primer; 1.6 Summary: research and review; 2 The Evolution of Climate Models; 2.1 Introducing climate modelling; 2.1.1 The need for simplification; 2.1.2 Resolution in time and space; Types of climate models; 2.2.1 Energy balance climate models; 2.2.2 One-dimensional radiative-convective climate models
2.2.3 Dimensionally constrained climate models2.2.4 General circulation models; 2.2.5 Interactive biogeochemistry and stable isotopes; 2.3 History of climate modelling; 2.3.1 Genesis in post-World War 2 technology; 2.3.2 Evolution of climate models - not a simple timeline; 2.3.3 The evolution of predictions, projections and forecasts; 2.4 Sensitivity of climate models; 2.4.1 Definitions and terminology; 2.4.2 Equilibrium climatic states; 2.4.3 Equilibrium conditions and transitivity of climate systems; 2.4.4 Climate tipping points; 2.5 Parameterisation of climatic processes
2.5.1 Interactions in the climate system2.5.2 Justifying and evaluating parameterisation; 2.5.3 The need for observations; 2.6 Simulation of the full, interacting climate system: one goal of modelling; 2.6.1 A simple model of 'climate control'; 2.6.2 Goals of this book and the 10 reasons for climate modelling; 2.7 Summary: research and review; 3 Energy Balance Models; 3.1 Balancing the planetary radiation budget; 3.2 The structure of energy balance models; 3.2.1 Zero-dimensional energy balance models; 3.2.2 One-dimensional energy balance models 3.3 Parameterising the climate system for energy balance models

Sommario/riassunto

As a consequence of recent increased awareness of the social and political dimensions of climate, many non-specialists discover a need for information about the variety of available climate models. A Climate Modelling Primer, Fourth Edition is designed to explain the basis and mechanisms of all types of current physically-based climate models. A thoroughly revised and updated edition, this book will assist the reader in understanding the complexities and applicabilities of today's wide range of climate models. Topics covered include the latest techniques for modelling t