

'A comprehensive introduction to weather and climate, describing phenomena from cloud scale to global scale in a very accessible way.'

Dave Gutzler, University of New Mexico, US

'This book provides an excellent overview of the climate system from the global to the local scale. It is excellently written at a level that provides detail, whilst being accessible at the introductory level. It is my first choice for the core text for my intermediate level undergraduate climatology course.'

Julie Jones, Sheffield University, UK

This book presents a comprehensive introduction to weather processes and climatic conditions around the world, their observed variability and changes, and projected future trends. Extensively revised and updated, this ninth edition retains its tried and tested structure while incorporating recent advances in the field. From clear explanations of the basic physical and chemical principles of the atmosphere, to descriptions of regional climates and their changes, the book presents a comprehensive coverage of global meteorology and climatology. In this new edition the latest scientific ideas are again expressed in a clear, non-mathematical matter.

New features include:

- Extended and updated treatment of atmospheric models
- Final chapter on climate variability and change has been completely rewritten to take account of the IPCC 2007 scientific assessment
- New full colour text design featuring over 30 colour plates
- Over 360 diagrams have been redrawn in full colour to improve clarity and aid understanding

Atmosphere, Weather and Climate continues to be an indispensable source for all those studying the earth's atmosphere and world climate, whether from environmental and earth sciences, geography, ecology, agriculture, hydrology, or related disciplinary perspectives. Its pedagogic value is enhanced by several features: learning points at the opening of each chapter and discussion topics at their ending, boxes on topical subjects and on twentieth century advances in the field.

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The late **Richard J. Chorley** was Professor of Geography at the University of Cambridge.

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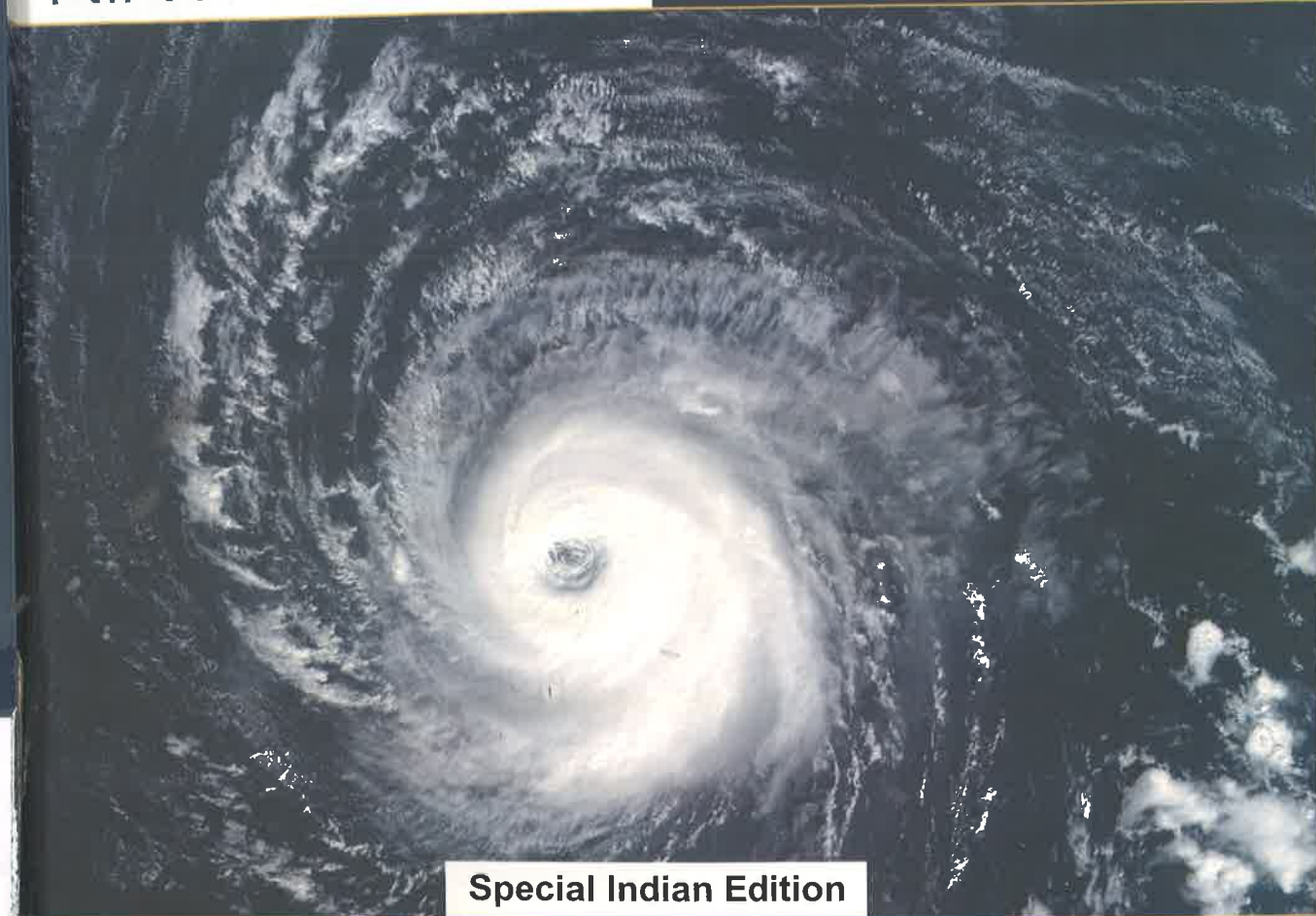
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NINTH EDITION

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Roger G. Barry and
Richard J. Chorley



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Preface to the ninth edition

This revised ninth edition of *Atmosphere, Weather and Climate* will prove invaluable to all those studying the earth's atmosphere and world climate, whether from environmental, atmospheric and earth sciences, geography, ecology, agriculture, hydrology or related disciplinary perspectives.

Atmosphere, Weather and Climate provides a comprehensive introduction to weather processes and climatic conditions. Since the last edition, we have added an introductory overview of the historical development of the field and its major components. Following this there is an extended treatment of atmospheric composition and energy, stressing the heat budget of the earth and the causes of the greenhouse effect. We then turn to the manifestations and circulation of atmospheric moisture, including atmospheric stability and precipitation patterns in space and time. A consideration of atmospheric and oceanic motion on small to large scales leads on to a chapter on modelling of the atmospheric circulation and climate that also presents weather forecasting on different time scales. This was revised by my colleague Dr Tom Chase of CIRES and Geography at the University of Colorado, Boulder. This is followed by a discussion of the structure of air

masses, the development of frontal and non-frontal cyclones and of mesoscale convective systems in mid-latitudes. The treatment of weather and climate in temperate latitudes begins with studies of Europe and America, extending to the conditions of their subtropical and high-latitude margins and includes the Mediterranean, Australasia, North Africa, the southern westerlies, and the subarctic and polar regions. Tropical weather and climate are also described through an analysis of the climatic mechanisms of monsoon Asia, Africa, Australia and Amazonia, together with the tropical margins of Africa and Australia and the effects of ocean movement and the El Niño–Southern Oscillation and teleconnections. Small-scale climates – including urban climates – are considered from the perspective of energy budgets. The final chapter revised by Dr Mark Serreze of CIRES stresses the structure and operation of the atmosphere–earth–ocean system and the causes of its climate changes. Since the previous edition appeared in 2003, the pace of research on the climate system and attention to global climate change has accelerated. A discussion of the various modeling strategies adopted for the prediction of climate change is undertaken, in