

Preface

The Earth's climate system includes the land surface, atmosphere, rivers and oceans and cryosphere. Many aspects of the global climate are changing as evident in the long-term observations from the top of the atmosphere to the depths of the oceans. All these observations provide the unambiguous evidence of global warming. However, the changes in climate are not expected to be uniform across the Earth. There are significant regional variations in terms of magnitude of changes in the climate system. In some cases, regional changes may not necessarily follow the global trends. Climate change impacts are already evident and are expected to become increasingly disruptive across the globe. However, the nature of the impacts and associated vulnerability varies geographically.

To make an assessment of regional climate change and the possible impacts on agriculture, water resources, health, etc., it is important to have a clear comprehensive view on the observed climate variability and change over the region. There are many research studies documenting changes in the climate system over the Indian region using different instrumental and re-analysis data sets. However, these studies used data sets of varying lengths and the results differ both quantitatively and qualitatively. There is also a strong evidence of multi-decadal variability in the climate system over the region. Therefore, it is important to make a comprehensive assessment of the changes in the regional climate system using data sets of longer period and preferably for the common period.

This book compiles articles that review observed changes in the regional climate system. Using various long-term instrumental data sets starting from 1901, the contributing authors describe the observed changes in different components of the regional climate system, atmosphere, ocean and the cryosphere. The last chapter, however, deals with the future climate change scenarios over the region derived from various coupled climate models.

It is hoped that this book will immensely contribute in better understanding of the regional climate change and its possible attribution to natural and anthropogenic activities. The book may be used as reference material for research students and policymakers.

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