



METADATA

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Abstract

In this book, the structure, composition and dynamics of the atmosphere, as well as the climate system, are studied. The effect of solar radiation on Earth's surface and on the atmosphere is also presented, while the dynamics of temperature, humidity and pressure are examined. The Earth's energy balance is, then, analyzed using simple models. Basic principles of thermodynamics are introduced for the study of atmospheric balance and the change of temperature and pressure with height, as well as the equations of motion for the transport of gaseous masses in the atmosphere. Ocean circulation and the factors that affect it are also studied. Greenhouse gas emissions from man-made sources as well as natural ones, are calculated.

Gaseous pollutants and suspended particles, mathematical models for the dispersion of pollutants in the atmosphere and climate models are also studied. Furthermore, the interaction of the oceans with carbon dioxide in the atmosphere is examined. The interaction of solar radiation with atmospheric pollutants and clouds is one of the most important components in understanding climate. Therefore, the laws of radiation and the interaction of gaseous and particulate pollutants with solar radiation are examined. Finally, the textbook analyzes the criteria for the implementation of restrictive measures for greenhouse gas emissions in the atmosphere and it examines scenarios of changes in greenhouse gas emissions in the climate.

