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**Sinopsis**

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Within the realm of the newly evolving discipline of environmental sciences, the stable-isotope methodology is being used to an ever-increasing extent, especially in the study of the water cycle and of paleo-climatology. This book introduces the rules of the game, by reviewing the natural variability of stable isotopes in the hydrosphere, describing the physico-chemical basis of isotope fractionation, and applying this knowledge to natural waters as they move through the hydrologic cycle from the ocean to the atmosphere, the biosphere and the lithosphere. There is a special focus on the processes at the surface-atmosphere and land-biosphere-atmosphere interfaces, since these are the sites of major changes in isotope composition. In response to the increasing awareness of our changing climate, a discussion on the global view of the changing water cycle, in the past and future, winds up the presentation.

**Contents:**

The Hydrosphere \_ An Overview

The Isotopes of Hydrogen and Oxygen

Isotope Fractionation

Models of Isotopic Change in the Water Cycle

The Ocean System and the Marine Atmosphere

Clouds and Precipitation

Snow and Snowmelt Processes

The Land-Biosphere-Atmosphere Interface

Surface Waters

Water in Soils and Plants

Saline Waters

Sub-Surface Waters

The Continental Scale Water Balance and Its Isotopic Signature

Isotopes and Climate Change