Spatial Patterns in Catchment Hydrology

Observations and Modelling

For many years now, modelling tools have been available to simulate spatially distributed hydrological processes. These tools have been used for testing hypotheses about the behaviour of natural systems, for practical applications such as erosion and transport modelling, and for simulation of the effect of land use and climate change. However, so far the quality of the simulations and spatial process representations has been difficult to assess because of a lack of appropriate field data.

Spatial Patterns in Catchment Hydrology: Observations and Modelling brings together a number of recent field exercises in research catchments, that illustrate how the understanding and modelling capability of spatial processes can be improved by the use of observed patterns of hydrological response. In addition the introductory chapters review the nature of the hydrological variability, and introduce basic concepts related to measuring and modelling spatial hydrologic processes. This introductory material provides the conceptual and theoretical background needed to move into this exciting area of research for a general earth sciences/water engineering audience. The book demonstrates that there is rich information in patterns that provide much more stringent tests of the models and much greater insight into hydrological behaviour than traditional methods.

Written in an intuitive and coherent manner, the book is ideal for researchers, graduate students and advanced undergraduates in hydrology, and a range of water related disciplines such as physical geography, earth sciences, and environmental and civil engineering as related to water resources and hydrology.

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