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Titolo	Runoff prediction in ungauged basins : synthesis across processes, places and scales / / edited by Gunter Bloschl, Technische Universitat Wien, Austria, Murugesu Sivapalan, University of Illinois, Urbana-Champaign, Thorsten Wagener, University of Bristol, Alberto Viglione, Technische Universitat Wien, Austria, Hubert Savenije, Technische Universiteit Delft, the Netherlands [[electronic resource]]
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Nota di contenuto	Contents; Contributors; Foreword; Prediction in ungauged basins: context, challenges, opportunities; Preface; Abstract; 1 Introduction; 1.1 Why we need runoff predictions; 1.2 Runoff predictions in ungauged basins are difficult; 1.3 Fragmentation in hydrology; 1.4 The Prediction in Ungauged Basins initiative: a response to the challenge of fragmentation; 1.5 What this book aims to achieve: synthesis across processes, places and scales; 1.5.1 Synthesis across processes; 1.5.2

Synthesis across places; 1.5.3 Synthesis across scales; 1.6 How to read the book and what to get out of it
2 A synthesis framework for runoff prediction in ungauged basins2.1 Catchments are complex systems; 2.1.1 Co-evolution of catchment characteristics; 2.1.2 Signatures: a manifestation of co-evolution; 2.2 Comparative hydrology and the Darwinian approach; 2.2.1 Generalisation through comparative hydrology; 2.2.2 Hydrological similarity; Climate similarity; Catchment similarity; Runoff similarity; 2.2.3 Catchment grouping: exploiting the similarity concept for PUB; Transferring information from gauged to ungauged locations; 2.3 From comparative hydrology to predictions in ungauged basins
2.3.1 Statistical methods of predictions in ungauged basins2.3.2 Process-based methods of predictions in ungauged basins; 2.4 Assessment of predictions in ungauged basins; 2.4.1 Comparative assessment as a means of synthesis; 2.4.2 Performance measures; 2.4.3 Level 1 and Level 2 assessments; 2.5 Summary of key points; 3 A data acquisition framework for runoff prediction in ungauged basins; 3.1 Why do we need data?; 3.2 A hierarchy of data acquisition; 3.2.1 Assessment based on global data sets; 3.2.2 Assessment based on national hydrological network and national surveys
3.2.3 Assessment based on local field visits including reading the landscape3.2.4 Assessment based on dedicated measurements; 3.3 Runoff data; 3.3.1 What runoff data are needed for PUB?; 3.3.2 What runoff data are there?; 3.3.3 How valuable are runoff data for PUB?; 3.4 Meteorological data and water balance components; 3.4.1 What meteorological data and water balance components are needed for PUB?; 3.4.2 Precipitation; 3.4.3 Snow cover data; 3.4.4 Potential evaporation; 3.4.5 Remotely sensed data for calculating actual evaporation; 3.4.6 Remote sensing of soil moisture and basin storage
3.5 Catchment characterisation3.5.1 Topography; 3.5.2 Land cover and land use; 3.5.3 Soils and geology; 3.6 Data on anthropogenic effects; 3.7 Illustrative examples of hierarchical data acquisition; 3.7.1 Understanding process controls on runoff (Tenderfoot Creek, Montana, USA); 3.7.2 Runoff predictions using rainfall-runoff models (Chicken Creek, Germany); 3.7.3 Forensic analysis of magnitude and causes of a flood (Selska Sora, Slovenia); 3.8 Summary of key points; 4 Process realism: flow paths and storage; 4.1 Predictions: right for the right reasons
4.2 Process controls on flow paths and storage

Sommario/riassunto

Predicting water runoff in ungauged water catchment areas is vital to practical applications such as the design of drainage infrastructure and flooding defences, runoff forecasting, and for catchment management tasks such as water allocation and climate impact analysis. This full colour book offers an impressive synthesis of decades of international research, forming a holistic approach to catchment hydrology and providing a one-stop resource for hydrologists in both developed and developing countries. Topics include data for runoff regionalisation, the prediction of runoff hydrographs, flow duration curves, flow paths and residence times, annual and seasonal runoff, and floods. Illustrated with many case studies and including a final chapter on recommendations for researchers and practitioners, this book is written by expert authors involved in the prestigious IAHS PUB initiative. It is a key resource for academic researchers and professionals in the fields of hydrology, hydrogeology, ecology, geography, soil science, and environmental and civil engineering.