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Nota di contenuto	Part I The Anthropocene -- Part II Hydro-climatic extremes -- 2 Hydro-climatic extremes -- Part III Water resources -- 3 How much freshwater is available? -- 4 Satellite hydrology -- 5 Can the wells run dry? -- 6 Multi-satellite systems in environmental monitoring -- Part IV Machine learning -- 7 Novel machine learning applications -- Part V Hydro-climatic extremes -- 8 Drought characterization and links to global climate -- 9 Measuring impacts of drought from space -- 10 Changes in hydro-meteorological conditions -- 11 Modelling impacts of climate change on freshwater.
Sommario/riassunto	This book explores how human civilization has contributed to changes in the Anthropocene, an era that marks a fundamental change in the way mankind has interacted with the Earth system. It examines the 21st century in the context of human development of water infrastructures, climate change impacts on freshwater resources, groundwater depletion, rising population, land use change, extreme events

(droughts, floods, and wildfires). The implications of climate change impacts on environmental assets and the global water cycle are also highlighted. The book takes a pragmatically trans-disciplinary and holistic approach to the discussion of these issues, and the Earth system in the Anthropocene, drawing from a plethora of case studies. The capabilities of machine learning tools in satellite hydrology applications have been demonstrated as well as the feasibility of remote sensing data and innovative geospatial tools in environmental assessment. The book further showcases the multiple strengths and potential of new multi-disciplinary satellite radar programmes and geodetic missions, to measure and characterize extreme events, and their links to global climate, as well as in remote sensing of the environment. The aim is to provide innovative tools and a scientific framework that underpin our fundamental understanding of environmental systems, and the complexities of socio-hydrological systems in the Anthropocene. Policy issues have also been raised as an important aspect that can strengthen the management and administration of water resources, particularly in emerging economies where observational data is often lacking, limited, or difficult to access. It also highlights the lessons learned from freshwater hotspots (e.g., Lake Chad and Lake Urmia) where prolonged droughts and human activities have led to a permanent loss of surface water. It identifies the role of institutions and stakeholders in driving policies that underpins water management and climate change adaptation. The book articulates the novel applications of remote sensing tools as part of a monitoring framework that can alert stakeholders and the public sector to the dangers of mismanagement of freshwater in these hotspots and help facilitate water governance approaches. The book fills a critical gap in the multi-disciplinary aspect of planetary science, particularly in understanding the impacts of climate change and human actions on freshwater resources, as well as the stability of the Earth system.
