Special Issue

Exploring Hydro-Climatic Systems Through Data Analysis, Numerical Modeling, and Machine Learning

Message from the Guest Editor

Hydroclimatic data are generally collected through ground-based gauges and satellite observations. Recent advancements in remote sensing technologies have improved our ability to monitor hydroclimatic variables. The high spatial and temporal resolution of these products is a notable achievement and has been applied across various disciplines. However, these estimates can still contain both systematic and random biases. Therefore, evaluating their accuracy and performance is crucial before using them for hydrological and water resource planning or decision-making.Integrating remotely sensed estimates with ground-based measurements and reanalysis data can improve our understanding of hydroclimatic patterns, especially in data-scarce regions. Techniques such as downscaling and bias correction are also essential for acquiring localized information. Furthermore, advancements in artificial intelligence (AI) and machine learning (ML) are playing an increasingly important role in analyzing hydroclimatic data. we encourage contributions that explore both the opportunities and challenges of using hydroclimatic data, with a focus on numerical models and machine learning techniques

Guest Editor

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Deadline for manuscript submissions

closed (31 March 2025)

Atmosphere

an Open Access Journal by MDPI

Impact Factor 2.3
CiteScore 4.9

mdpi.com/si/217610

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Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

Editor-in-Chief

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