# Special Issue

# Statistical and Machine Learning Methods for Climate Sciences: Advances, Applications and Emerging Challenges

## Message from the Guest Editors

Recent advances in statistical and machine learning (ML) methods have revolutionized how climate and hydrometeorological phenomena are investigated. This Special Issue aims to gather studies presenting innovative approaches, practical applications, and methodological developments focused on understanding, predicting, and mitigating the impacts of climate change. Submissions employing classical and modern statistical techniques, as well as ML and deep learning approaches, are welcome for applications such as extreme event detection and prediction, spatio-temporal modeling, dynamic and statistical downscaling, bias adjustment, uncertainty analysis, and integration of multiple data sources. This Special Issue also encourages research exploring teleconnections, ocean–atmosphere interactions, climate services, and scientific communication strategies on climate risk, emphasizing reproducible and open-data approaches. The goal is to foster integration between data science and climatology, highlighting methodological contributions that enhance the predictive capacity, reliability, and applicability of climate analyses across different spatial and temporal scales.

## Guest Editors

Dr. Daniele Tôrres Rodrigues
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## Deadline for manuscript submissions

30 June 2026

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# About the Journal

## 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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