



Interactions of Atmosphere and Permafrost

Guest Editor:

Dr. Lin Chen

Department of Environmental
Sciences, University of California,
Riverside, CA, USA

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Message from the Guest Editor

Globally, permafrost is thawing due to the air temperature increase caused by climate change. As permafrost thaws, a positive feedback loop is created due to the increasing amount of carbon released into the atmosphere, which further warms the planet. Additionally, degrading permafrost affects the thermal, biogeochemical, ecological, and hydrological processes at both the land surface and the subsurface. Climate change also affects the performance of infrastructure and increases maintenance costs, particularly those built on warm ice-rich permafrost such as roads, oil pipelines, and building foundations. This Special Issue aims to document and synthesize frontier research on climate change and its effects on permafrost, such as changes in precipitation patterns, land–atmosphere interactions, downscaling, etc. The topic is highly relevant to northern infrastructure built on permafrost and adaptation to climate change. This topic also encompasses advances in land–atmosphere interactions in permafrost regions, such as surface energy and mass balance, atmospheric boundary layer, atmosphere–snow–land coupling, permafrost carbon feedback, etc.





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Editor-in-Chief

Prof. Dr. Ilias Kavouras

Environmental, Occupational,
and Geospatial Health Sciences,
CUNY School of Public Health,
New York, NY 10027, USA

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!

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Contact Us

Atmosphere Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

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