Special Issue

Classical Environmental Process Modeling, Interpretable Machine Learning, and Their Integrative Innovations—Targeting Atmospheric, Water, and Soil

Message from the Guest Editors

In environmental science, environmental models are critical for studying pollutants. Many complex processes—such as microscopic pollutant transport in soil or hidden contaminant transformation in ecosystems—cannot be directly observed. By integrating principles from physics, chemistry, and biology, the models build mathematical frameworks. These frameworks then quantify how pollutants evolve over time. Recent advances in machine learning have opened new frontiers. Emerging techniques offer powerful capabilities, including nonlinear fitting, automated feature extraction, and self-learning. When hybridized with classical models, they significantly improve accuracy, generalization, and adaptability. This synergy is reshaping research on environmental pollutants. This Special Issue invites contributions on the following:

- Simulation of pollutant generation or transport processes in the atmosphere, soil, or water using environmental models.
- Application of environmental models in tracking and managing high-dynamic pollution events.
- Innovations in environmental modeling methodologies and synergistic paradigms integrating traditional models with machine learning.

Guest Editors

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Message from the Editor-in-Chief

Toxics (ISSN 2305-6304) is an international, peer-reviewed, open access journal which provides an advanced forum for studies related to all aspects of toxic chemicals and materials. We aim to publish high quality work that furthers our understanding of the exposure, effects, and risks of chemicals and materials in humans and the natural environment as well as approaches to assess and/or manage the toxicological and ecotoxicological risks of chemicals and materials. Please consider publishing in *Toxics* when preparing your next paper.

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