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Soil and Groundwater Quality and Resources Assessment, 2nd Edition

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Soil and groundwater underpin the Earth's critical zone, sustaining water supply, agriculture, ecosystems, and socio-economic development. They face escalating pressures from climate change and human activities, resulting in contamination, depletion, and degradation. The accurate assessment and sustainable management of these systems thus represent an urgent global priority.

This Special Issue addresses these challenges via diverse methods. Studies employ integrated numerical modeling of contaminant transport and geological effects, alongside hydrochemical and isotopic analyses to trace pollution and hydrogeochemical evolution. Advanced assessment tools quantify health risks and inform zoned management. Together, these works integrate physical, chemical, and data-driven approaches to decipher complex system behaviors and provide scalable management insights. The research underscores the need for interdisciplinary integration. Effective assessment requires combining mechanistic knowledge with monitoring and predictive tools that capture spatiotemporal dynamics. Future work should link groundwater models with climate–land-use scenarios, develop uncertainty-aware risk frameworks, enable cross-scale integration, and incorporate hydro-biogeochemical processes. This Special Issue aimed to foster collaboration and guide adaptive strategies to protect these vital resources.

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