



sustainability



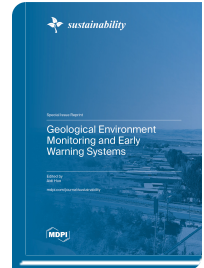
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Geological Environment Monitoring and Early Warning Systems

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Geological environment monitoring and providing early warnings for disasters are key issues of global concern. Soil erosion is one of the most important causes of geological disasters. Soil erosion causes the soil to be unable to absorb rainwater effectively, increasing the vulnerability of the surface and exacerbating surface runoff, which provides a prerequisite for the occurrence of geological disasters such as landslides and debris flows. Soil erosion occurs naturally in all climates and on all continents. Human activities are one of the main causes of soil erosion. With the growth of the global population and economic development, the intensity of human exploitation and utilization of land resources has increased, changing the natural state of the land and destroying the soil structure, thereby increasing the risk of soil erosion and posing a serious threat to global water resources, the environment, and even food security. To explore the risk of soil erosion, numerical simulations combined with hydrological models play a key role in studying the relationship between soil erosion and human activities. By simulating and analyzing hydrological processes (such as rainfall, runoff, and evaporation) within watersheds, the impact of human activities on soil erosion can be quantitatively assessed, guiding appropriate land planning and agricultural production layout. By simulating hydrological processes, important hydrological information support can be provided to ensure early warnings for geological environment disasters, thereby reducing their negative impact on the global environment and human society.



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