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[Abstract Title]

An Integrated Approach for Assessing the Impact of Future Floods on a Highway Transport System

[Abstract]

Climate change continues to escalate flood risk. The impact of floods directly and indirectly disturbs the socioeconomic development. Highway transport system is an critical infrastructure component. In this study, we propose an integrated approach which including traffic simulation, hazard simulation and function assessment modules to quantitatively assess how floods impact the functioning of a highway system. This integrated approach is tested in the Chinese highway network under future climate change scenarios. The results show that (i) for different global climate models, the associated flood damage to a highway system is not linearly correlated with the forcing levels of RCPs, or with future years;(ii) floods in different years have variable impacts on regional connectivity; and (iii) extreme flood impacts can cause huge damages in highway networks; that is, in 2030, the estimated 84.5% of routes between provinces cannot be completed when the highway system is disturbed by a future major flood. These results have critical implications for transport sector policies and can be used to guide highway design and infrastructure protection. The approach can be extended to analyze other networks with spatial vulnerability, and it is an effective quantitative tool for reducing systemic disaster risk.



[Keywords]

Flood, Climate change, Impact analysis, Highway