

Vulnerability measures and proxy indicators for transportation assets under flood events

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The damage to the bridges during flood events is due to a host of events such as scour, debris impact and accumulation, water pressure, and superstructure uplift. In the scenario of a flood event, one or all of the mentioned cases may contribute to the damage to the bridge creating a multi-hazard scenario. The result of the combined effect could cause complete bridge failure leading to transportation network dysfunction creating short term and long term impacts on the communities relying on the network. Resilience is an indicator of the preparedness and adaptability of a transportation infrastructure; it is useful to a range of management teams such as policy makers, engineers and emergency service workers. Transportation network resilience can be improved after assessing its current using risk assessment methodologies, thereby reducing the vulnerability of civil infrastructure networks to disruptions and extreme events, allowing plans for possible failures, flexibility during probable disruptions, and post-event response and recovery activities (. The risk assessment of the bridges in a networks allows to establish a link between the bridges (as the components of the network) and the resilience of the network. This study aims to better understand the risk that these hazards pose using a series of models which investigates physical attributes of the bridge that lead to a higher vulnerability from each hazard.

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