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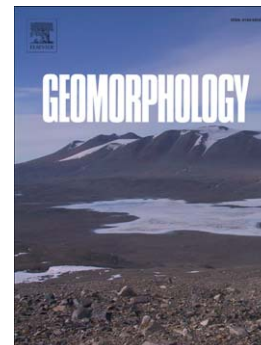
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Rainfall thresholds as a landslide indicator for engineered slopes on the Irish Rail network

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ABSTRACT: Rainfall thresholds express the minimum levels of rainfall that need to be reached or exceeded in order for landslides to occur in a particular area. They are a common tool in expressing the temporal portion of landslide hazard analysis. Numerous rainfall thresholds have been developed for different areas worldwide, however none of these are focused on landslides occurring on the engineered slopes on transport infrastructure networks. This paper uses empirical method to develop the rainfall thresholds for landslides on the Irish Rail network earthworks. For comparison, rainfall thresholds are also developed for natural terrain in Ireland. The results show that particular thresholds involving relatively low rainfall intensities are applicable for Ireland, owing to the specific climate. Furthermore, the comparison shows that rainfall thresholds for engineered slopes are lower than those for landslides occurring on the natural terrain. This has severe implications as it indicates that there is a significant risk involved when using generic weather alerts (developed largely for natural terrain) for infrastructure management, and showcases the need for developing railway and road specific rainfall thresholds for landslides.

Keywords: Rainfall Threshold; Shallow Landslides; Rail; Early Warning Systems; Earthworks; Transport

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