

Title: Examining the impact of projected future rainfalls on the stability of legacy embankments using fragility curves.

Expected Difficulty: Medium

Project Description: The majority of landslides worldwide are a direct result of prolonged and or intense rainfall. While rainfall can induce a wide variety of different landslide types, the failure mechanism normally witnessed on road and rail networks, across Europe, are shallow translational landslides. Embankments ordinarily exist in an unsaturated state as their construction atop existing ground level ensures they reside above the natural water table. As a result, they possess negative pore water pressures (suctions), which steep “legacy” era embankments depend on for stability. Unfortunately, suction magnitude is directly connected to soil moisture content, as soil moisture content increases, such as during a rainfall event, soil suction decreases. This results in a decrease in the shear strength of the soil, which in turn increases the likelihood of failure. This project aims to determine the impact projected future rainfall levels will have on aged transport embankments. This will be accomplished by examining current and projected rainfall intensity-duration-frequency curves in combination with a probabilistic finite element slope stability model. Outputs from the project should be a family of fragility curves depicting how embankment stability changes during environmental loading for a range of common soil types and material properties.

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