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Investigation of Possible Slump Slide Formations using SRT and ERT along the Mississippi Levee.

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Earthen embankments make up 97% of all the levees in the USACE Levee Safety Program^(a). These levees are crucial in reducing risk to the public and property from catastrophic floods caused by the rising of rivers during heavy rain and coastal storm events. Slump slides can be caused by unstable slope conditions which weaken the levees and increase the probability of failure during floods. Due to the large amount of levees, more than 100,000 miles in the US^(b), investigations must combine rapid large scale methods to focus efforts using more detailed time intensive methods. In this study, multiple locations along the Mississippi River levee with possible slump slides are selected based on Polarimetric Synthetic Aperture Radar (polSAR) imagery. Locations with increased surface roughness on polSAR imagery are postulated to be associated with slump slides. Two ground based geophysical methods, seismic refraction tomography (SRT) and electrical resistivity tomography (ERT), were used to further investigate slump slide formations. Guided with the polSAR imagery results, multiple SRT and ERT measurements are conducted on the waterside slope of slide affected and unaffected (safe) locations. The geophysical anomalies that are associated with possible slump slide formations will be discussed. [This research was funded by the National Science Foundation Award #OISE - 1243539/400512.]

(a) ASCE 2017 Infrastructure Report Card

(b) <https://www.usace.army.mil/National-Levee-Safety/About-Levees/> (access date: 11/16/2018)

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