

## CEE 595F – Geotechnical Seminar – ONLINE

Friday, January 29, 2021 | 11:00am Central Time on Zoom



### Reconnaissance and Evaluation of the Flowslides Triggered by the 2018 Palu-Donggala Earthquake

**Jack Montgomery, Ph.D.,**  
*Auburn University*

**Abstract:** The 2018 MW 7.5 Palu-Donggala, Indonesia earthquake initiated a series of catastrophic flowslides that claimed the lives of several thousand people, making it the deadliest natural disaster of 2018. Post-earthquake field reconnaissance, subsurface investigation, eyewitness interviews, and geomechanical analyses indicate that the failure sequence began when the earthquake shaking triggered liquefaction in the saturated interbedded alluvial sediments. The flowslides were not coseismic but instead occurred several minutes after earthquake shaking ended. The flowslides were then initiated as gravitational driving stresses began to exceed the residual strength of the liquefied soil. An adjacent unlined agricultural canal played a critical role in the failure sequence by artificially raising the groundwater level, thereby increasing the susceptibility to liquefaction and attendant strength loss. This presentation will discuss findings of the GEER reconnaissance mission completed by a team of researchers from the US and Indonesia. Results from follow-up studies to map displacements of affected structures and numerical analyses of one of the Flowslides will be presented. Implications of these findings for future analyses and research will be discussed.

**Speaker Bio:** Dr. Jack Montgomery is an Assistant Professor at Auburn University, where he focuses his research and teaching on geotechnical earthquake engineering, landslides, dam engineering, and advanced site characterization. He received his bachelor's degree in Civil Engineering from California Polytechnic State University, San Luis Obispo and his master's and Ph.D. in Civil Engineering from the University of California, Davis. Some of his recent research projects include modeling the effects of spatial variability on liquefaction, using geophysics to investigate sinkholes and landslides, and evaluating cyclic softening of clays. His work is supported by the Alabama Department of Transportation, the Federal Highway Administration, and the National Science Foundation.