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## ReStructure 2.0 Webinar Series

**Sala Stampa - Aula Magna – Convention Center Università della Calabria**

2:30pm May 22, 2023 (Time Zone: Europe/Rome)

### **SEISMIC RISK ASSESSMENT FOR EARTH SLOPES AND DAMS**

Abstract: Seismic risk assessments for earth slopes and dams are based on evaluating the permanent displacements induced by earthquake shaking and more recently probabilistic approaches have been proposed to incorporate uncertainties into the analysis. This presentation will describe newly developed predictive models for earthquake-induced slope displacements based on finite element simulations. The models are developed using both classical regression techniques and artificial neural networks (ANN), and models for both the median displacement and its variability are provided. A missing part of most seismic risk assessments for slopes and dams is the translation of a displacement level into a damage state. This presentation will also outline a seismic fragility framework for earth dams and slopes that is modeled after the approaches used for other types of infrastructure, such as bridges. The framework uses an engineering demand model to predict the permanent displacement as a function of ground motion intensity, and a seismic capacity model to predict the probability of a damage state given the permanent settlement.



Presenter Bio-Sketch: Dr. Ellen M. Rathje is the Janet S. Cockrell Centennial Chair in Engineering in the Department of Civil, Architectural, and Environmental Engineering at the University of Texas at Austin (UT), and Senior Research Scientist at the UT Bureau of Economic Geology. She has expertise in the areas of geotechnical earthquake engineering, engineering seismology, induced seismicity, field reconnaissance after earthquakes, and remote sensing. Dr. Rathje is the Principal Investigator for the DesignSafe-ci.org cyberinfrastructure for the NSF-funded Natural Hazards Engineering Research Infrastructure (NHERI). She has been honored with various research awards, including the 2018 William B. Joyner Lecture Award from the Seismological Society of America and the 2010 Huber Research Prize from the American Society of Civil Engineers. She was elected Fellow of the American Society of Civil Engineers in 2016.

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