Association of Environmental & Engineering Geologists San Francisco Bay Area Chapter & San Francisco Geo-Institute

Announcing our **October 11, 2022,** Meeting

Dimitrios Zekkos, PhD, PE

Professor, Department of Civil and Environmental Engineering
UC Berkeley

"Development of Regional Co-seismic Landslide Inventories and Predictive Models: The Example of the 2015 Lefkada, Greece, Earthquake"

MEETING DETAILS

Meeting Place
Drake's Dealership
(Indoors)

2325 Broadway,
Oakland, CA 94612

Date and Time

TUESDAY, October 11, 2022

6:00 PM – Doors open
7:00 PM – Dinner
7:30 PM – Presentation

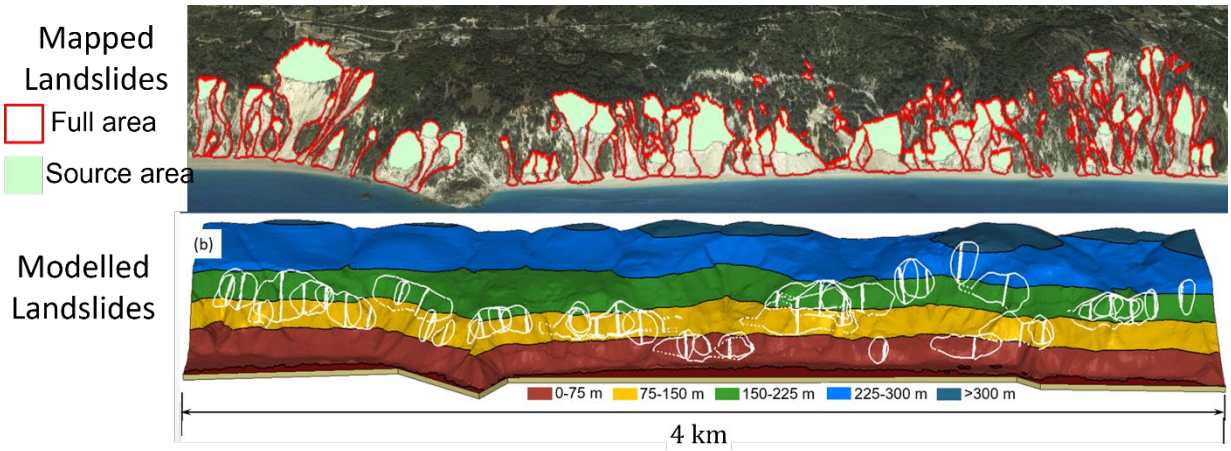
Cost:
$60 for members
$70 for nonmembers
$20 for students
$20 for emeritus members

Reservations:
Spaces are limited to 40, RSVP in advance!
Please fill out the online form by **12 PM, MONDAY October 10, 2022.**

Thank you for your RSVP! See you on Tuesday, October 11, 2022!

Development of Regional Co-seismic Landslide Inventories and Predictive Models: The Example of the 2015 Lefkada, Greece, Earthquake

Landslides represent a distributed hazard that has significant consequences on infrastructure and communities. They occur due to a range of environmental “stressors” such as precipitation events, earthquakes, and human activities. Despite our established ability to reliably back-analyze landslides following their occurrence, our ability to predict the occurrence of landslides remains limited. However, this predictive ability is key for our communities to become resilient against landslides. Our predictive abilities have been limited due to the lack of regional computational models with reliable, spatially-resolved input parameters. Advances in multi-scale monitoring approaches using satellites, Unmanned Aerial Vehicles and on-the-ground deployments can be leveraged to generate this input that can be used to calibrate such models. In this presentation, an application of such regional co-seismic landslide resiliency frameworks will be presented with a focus on the landslides that occurred during the November 17th 2015, Mw 6.5 earthquake in the island of Lefkada, Greece. The earthquake resulted in 700+ landslides particularly along the west coast of the island that was subjected to peak ground accelerations of 0.2-0.4g. Following the earthquake, the coastline was mapped using satellite imagery and Unmanned Aerial Vehicles (UAV). Using the satellite and UAV-based imagery, three-dimensional models of the coastline and of the co-seismic landslides at high resolution were created. The satellite and UAV imagery was also complemented with on-the-ground, in situ characterization of the rock mass and measurements of the shear wave velocity of the subsurface. The collected data is introduced in regional 1D and 3D slope stability analyses using the pre-earthquake coastline topography. Current results of the 3D regional stability analyses were compared to the mapped landslides following the earthquake and were used to derive site-specific and regional strength estimates and assess the most critical uncertainties associated with accurate landslide prediction. The results show that 3D topography used in stability analyses is of paramount importance and significantly influences the critical regions for a range of material properties. However, the assumed material properties and their spatial variation have a significant influence on the calculated factors of safety, and ultimately, on the ones that failed during the earthquake.



Speaker Bio:

Dimitrios Zekkos, PhD, PE, is a Professor in the Civil and Environmental Engineering Department at the University of California at Berkeley. Dimitrios received his undergraduate degree from the University of Patras in Greece and his MSc and PhD from the University of California at Berkeley. Prior to joining Berkeley, Dimitrios worked at a consulting company in the Bay Area and was a Faculty member at the University of Michigan. His research work is at the interface of natural hazards, geotechnical engineering and informatics. He has deployed in numerous areas including the USA, Nepal, New Zealand, Japan, Dominica and Greece following natural disasters, such as earthquakes, hurricanes and monsoons. His research group devises and employs experimental and computational approaches to characterize the response of the geo-environment and infrastructure to natural hazards. His research has been recognized with several Awards by organizations such as the American Society of Civil Engineers and the International Society for Soil Mechanics and Geotechnical Engineering.