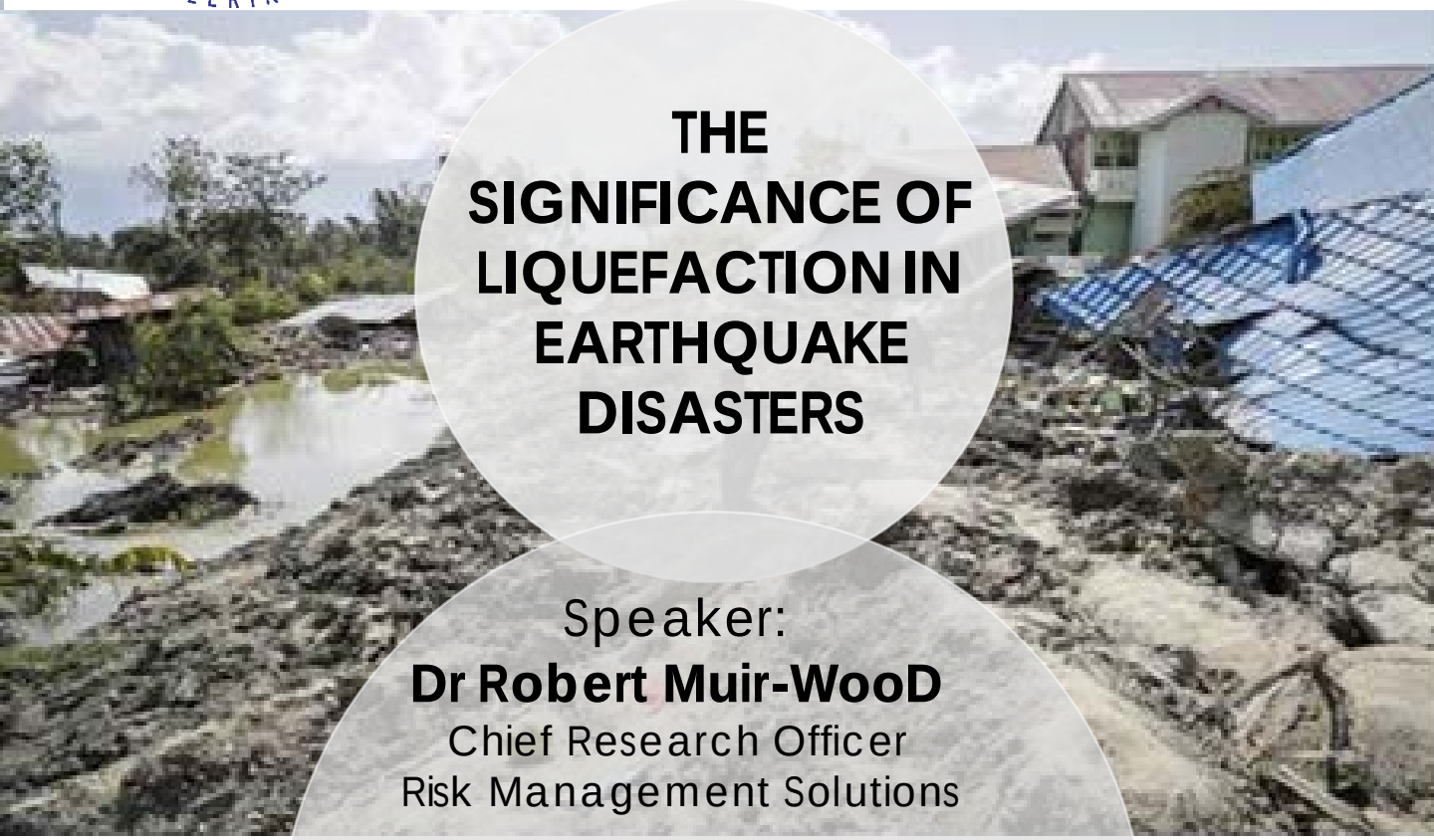
SOCIETY FOR EARTHQUAKE AND CIVIL ENGINEERING DYNAMICS



THE SIGNIFICANCE OF LIQUEFACTION IN EARTHQUAKE DISASTERS

Speaker:

Dr Robert Muir-WooD

Chief Research Officer

Risk Management Solutions

Chair:

Dr Chris Browitt

ABConsulting

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WEBINAR

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SYNOPSIS

The importance of liquefaction as a principal agent of fatalities and destruction in earthquake disasters has had to be re-considered following two recent earthquakes: the February 22nd 2011 Christchurch earthquake and the September 28th 2018 Sulawesi earthquake. In the former, more than half the damage has been attributed to the consequences of extreme liquefaction, while in the suburbs of Palu, well over half the total fatalities were the consequence of liquefaction-driven low-angle landslides. We now fully appreciate how liquefaction is a separate damage mechanism to earthquake vibration. These examples of extreme liquefaction, flooding streets and ripping buildings apart, demand their own name: 'ultra-liquefaction'. This experience opens up a series of research questions. It allows us to go back into historical accounts of earthquakes and find evidence for comparable ultra-liquefaction, swallowing up people and buildings. It also helps us understand how attempts to create earthquake intensity scales struggled to include the impacts of liquefaction. If half of the damage or fatalities can be driven by liquefaction what does that tell us around the priorities in modelling earthquake impacts? Where else can we anticipate comparable disasters and what actions can we take to highlight the risks ultra-liquefaction brings to life and property?

SPEAKER

After a first class degree in Natural Sciences and a PhD in Earth Sciences from the University of Cambridge, Robert Muir-Wood has worked on the development of methodologies for catastrophe impacts, originally focused on earthquakes. His 1993 paper (with Geof King), 'Hydrological Signatures of Earthquake Strain' has 475 citations, while his 2000 paper on 'Deglaciation Seismotectonics' has 127 citations. He has been head of research at Risk Management Solutions since 2003 with a mission to explore new applications for catastrophe modelling and develop models for new areas of risk. He has been technical lead on a number of Catastrophe risk securitizations, was Lead Author for the 2007 4th IPCC Assessment Report and for the 2011 IPCC 'Special Report on Extremes'. He has written scientific papers on earthquake, flood and windstorm perils and published more than 200 articles. His latest book, 'The Cure for Catastrophe – How we can stop manufacturing natural disasters', was published in 2016, receiving positive reviews in the New York Times, Science, and Nature. He is Chair of the OECD High Level Advisory Board of the International Network on Financial Management of Large Catastrophes, and a Visiting Professor at the Institute for Risk and Disaster Reduction, University College, London.