



# The British Dam Society

## EVENING MEETING

Monday 28<sup>nd</sup> April 2025 at 6:00pm

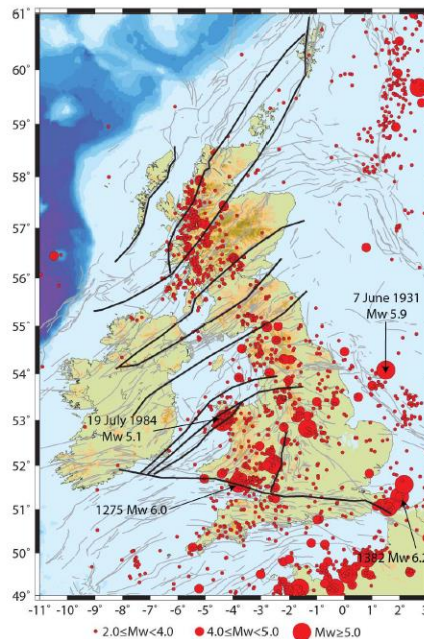
One Great George Street, London (Nearest tube: Westminster)

## Annual General Meeting followed by:

The 2020 national seismic hazard maps for the United Kingdom -  
Ilaria Mosca

The use of vibrating wire piezometers to measure pore water  
pressures in dams - Rafael Monroy

The Effect or Pretreatment of Organics in Dispersion Tests - Lis  
Bowman



For synopsis and brief presenter biography see overleaf | Admission free | Teas  
available from 5.30pm | Cash bar in the Westminster Arms after the event

This meeting will be live at the ICE in the Godfrey Mitchell Lecture Theatre and available on the  
internet. For more details, including enjoying the live stream as part of a group at one of our  
Regional Hubs around the UK, please visit the meetings page on the BDS website:

[www.britishdams.org](http://www.britishdams.org)

For more information, please contact the ICE on 020 7665 2147 or email: [bds@ice.org.uk](mailto:bds@ice.org.uk)

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## Synopsis

### **The 2020 national seismic hazard maps for the United Kingdom**

The 2020 seismic hazard maps for the United Kingdom update the previous national maps published in 2007 and are used to revise the UK National Annex for the second-generation Eurocode 8. The 2020 national seismic hazard model uses an up-to-date earthquake catalogue for the British Isles, for which the completeness periods have been reassessed. It also uses a modified version of the 2007 source model and incorporates some advances in ground motion modelling since 2007. For the first time, the national maps for the UK are provided for not only peak ground acceleration but also spectral acceleration at 0.2 s and 1.0 s for 5% damping on rock and the four return periods (i.e. 95, 475, 1100, and 2475 years). The maps confirm that seismic hazard is generally low in the UK and is slightly higher in North Wales, the England-Wales border region, and western Scotland. We have disseminated the 2020 national seismic hazard maps for the UK via a dedicated webpage, downloadable data, models and outputs, interactive mapping tools, linkages with professional bodies and industry, as well as public seminars, webcasts, and attendance in scientific conferences. This talk will present an overview of the 2020 national seismic hazard model and accompanying seismic hazard maps for the UK and will explain the general use and importance of a national hazard map to provide guidelines about designing earthquake-resistant structures.

### **The use of vibrating wire piezometers to measure pore water pressures in dams**

A knowledge of pore water pressures in embankment dams and in mining dams is essential to monitor performance. In many instances, this knowledge forms part of a critical risk control to prevent a high consequence event, such as global instability and release of containment. Yet, the field measurement of pore water pressures can be challenging, particularly if these are below atmospheric pressure. Vibrating wire piezometers are used in many instances to monitor pore water pressures in dams, both in the foundation and in the fill; yet, these instruments have not been designed to measure sub-atmospheric pressures. The presentation will touch on the challenges of interpreting data from vibrating wire piezometers installed in an unsaturated soil.

### **The Effect or Pretreatment of Organics in Dispersion Tests**

Internal erosion in clayey soils is associated to the identification of dispersion as this can be a major contributing factor in piping failure of earth embankment dams. For dams constructed without filters and of poor construction, it is critical to understand the nature of dispersive soils so they can be treated or appropriate remedial measures applied. This paper describes tests carried out using the Double Hydrometer Test, a type of physical dispersion test, on a representative core sample from a Pennine-type dam in Yorkshire. The determined potential for dispersion is compared for the soil tested with pretreatment using hydrogen peroxide to remove organic matter and without pretreatment. As well as highlighting the importance of pretreatment in determining the potential for dispersion, the



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results demonstrate that the amount of soil used in the hydrometer test should be carefully considered to avoid both hindered settling (using too much soil) at one extreme and poor hydrometer response (using too little soil) at the other.

## Presenter's Biographies

**Ilaria Mosca** | Ilaria is a seismic hazard researcher at the British Geological Society. She holds a Ph.D. in seismology from the University of Utrecht (the Netherlands) and has been working for BGS since 2013 after a PDRA in seismic tomography in Germany. Her work is focused on seismic hazard analysis at regional and local scales, including catalogue analysis, simulation of strong ground motions, and assessment of realistic uncertainties for different components of the hazard analysis. Dr Mosca has worked on numerous scientific and commercially funded seismic hazard projects in the UK and worldwide, and she has led the commercial and scientific seismic hazard projects in BGS since 2020. She represents the BGS in the British-Standards-National Committee B/525/8 for Seismic Regions and is an ExeCom member of the European Seismological Committee.

**Rafael Monroy** | Rafael a Senior Geotechnical Engineer at Klohn Crippen Berger in York. He has over 20 years of professional experience working as a civil and geotechnical engineer in consultancy and in academia. His work has focused primarily on tailings storage facilities, embankment dams, hydropower developments, foundations, and offshore geotechnics. Rafael is registered as a professional civil engineer in Spain (I.C.C.P.) in the U.K. (C.Eng., M.I.C.E.) and in the U.S.A. (P.E.). He is a Supervising Engineer under the Reservoirs Act 1975. Until recently, Rafael was the Engineer of Record for several inactive tailings storage facilities under active care.

**Lis, Bowman** | Dr Bowman, CEng MICE, School of Mechanical, Aerospace and Civil Engineering, University of Sheffield. Lis is Reader in Geomechanics in the School of Mechanical, Aerospace and Civil Engineering at the University of Sheffield. She undertook her PhD on soil-pile interaction and Royal Academy of Engineering postdoctoral fellowship on landslide mechanics at the University of Cambridge. She worked in civil engineering practice in the UK and as an academic in New Zealand before joining Sheffield in 2013. With an emphasis on particulate mechanics and laboratory testing / modelling, her research focuses on soil-water-structure problems such as internal erosion in dams and flood embankments, utility pipe failures, and the mitigation of complex geohazards like rapid landslides. She is currently the geotechnical lead on the Reservoir Safety Research Advisory Group of the BDS and is a Chartered Member of the ICE, UK.



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## REGIONAL HUBS

**WARRINGTON | LEEDS | GLASGOW**

The Regional Hubs allow the live stream of BDS evening meetings in London to be enjoyed as part of a group elsewhere in the UK.

Refreshments are provided from 17:30 in conjunction with watching the live streaming of the evening meeting - anyone is welcome to attend!

We would be grateful if you could register your intention to attend with the relevant Regional Hub host - details below.

**WARRINGTON HUB | Nathan Freeman | [nathan.freeman@uuplc.co.uk](mailto:nathan.freeman@uuplc.co.uk) |**

United Utilities, Lingley Mere, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

**LEEDS HUB | Victoria Walker | [victoria.walker@mottmac.com](mailto:victoria.walker@mottmac.com) | 01135 249250**

Mott Macdonald, 26 Whitehall Road, Leeds, LS12 1BE

**GLASGOW HUB | Chukwuemeka Agbo | [Michael.agbo@mottmac.com](mailto:Michael.agbo@mottmac.com) | 01412223770**

Mott Macdonald, 319 St Vincent St, Glasgow, G2 5LD

For general queries regarding the Regional Hubs please contact:  
Stephen Cavanagh | [cavanaghsp@binnies.com](mailto:cavanaghsp@binnies.com) | 01244 304 125