INTERNATIONAL SYMPOSIUM
PRESERVATION OF MONUMENTS & HISTORIC SITES
ATHENS TC301
SEPTEMBER 2026 | ATHENS, GREECE

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

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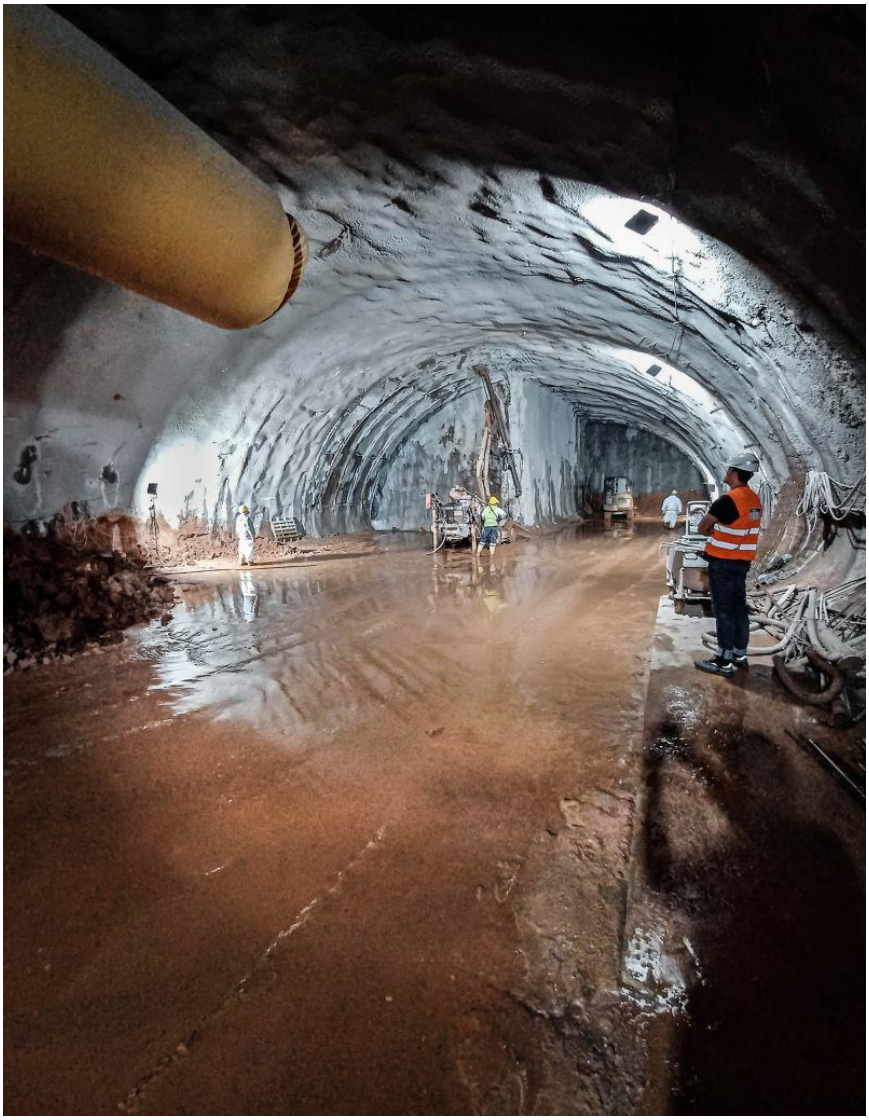
192

Αρ. 192 – ΟΚΤΩΒΡΙΟΣ 2024



Athens Metro Line4 - GNA Forestation
ΜΙΧΑΛΗΣ ΠΑΠΑΔΑΚΗΣ

SIMSG ISSMGE

ISRM

ISSN: 2732-7248

Π Ε Ρ Ι Ε Χ Ο Μ Ε Ν Α

ΑΡΘΡΑ

Formation processes and mechanisms of a fault-controlled colluvial landslide in the Qinling-Daba Mountains, China

Wenbo Zheng, Yanbo Cao, Wen Fan, Xin Liang, Shaoqing Yua, Wenwei Gao & Jikai Zhang

Abstract

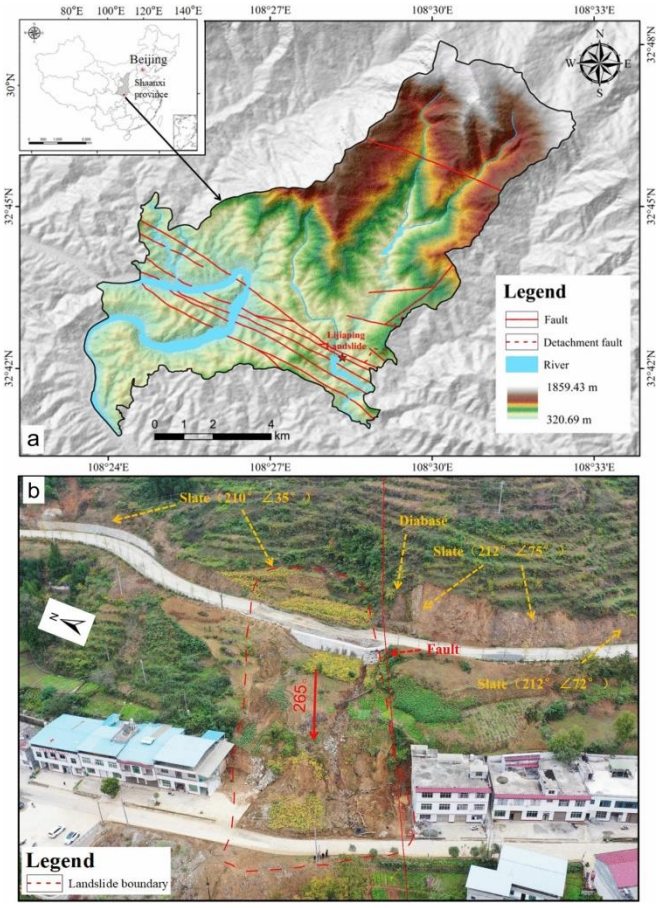
Faults play a crucial role in shaping the formation and damage patterns of landslides in the mountainous region, particularly in Qinling-Daba (Qinba) area in China. On 6 October 2022, following a 4-day rainfall event totaling 221.5 mm, a landslide occurred in Hanwang Town, Shaanxi Province. The left boundary of the landslide coincided with a fault, which influence the formation and movement development of the landslide. To further understand and quantified the formation process and damage mechanism of the landslide, a comprehensive study was conducted, incorporating field investigations, local rainfall data, and various methods including unmanned aerial vehicles (UAVs), numerical simulations, and laboratory test. The results indicate that fault dictate the formation of the Lijiaping landslide by influencing the mechanical strength of the rock mass and the catchment topography in the landslide area. Due to fault, the rock mass in the landslide area is high fragmentation, with a softening coefficient of about 0.52. Weathering resulted in numerous residual and slope sediments in the landslide area, providing ample material for the landslide. Meanwhile, the fault activity led to a wedge-shaped topography in the landslide area, with an average Terrain Wetness Index (TWI) of 3.43, significantly higher than the Hanwang Township average of 1.47. This creates a hydrogeological structure favorable for landslides. Numerical simulations revealed that the maximum velocity of the landslide reached 5.05 m/s and the maximum displacement was 53.18 m, both occurring in the central part of the landslide. These findings offer crucial scientific insights for understanding and preventing similar geological hazards.

Introduction

Landslides, a common type of geological disaster, have caused significant impacts including heavy casualties, property losses, and ecological damage[1,2]. Landform changes play a crucial role in the formation of landslides, often influenced by fault activities[3–5]. In fault zones, crustal dynamism is more pronounced and can significantly impact the terrain, geomorphology, and stratigraphic formations[6,7]. This variability can directly or indirectly trigger landslides in surrounding areas. Fault displacement may cause uneven settling or lifting of strata, leading to varied erosion levels and altering surface topography[8–10]. Topographic changes typically involve alterations in surface elevation, slope gradient, aspect, and catchment area, which influence the effects of gravity and hydrodynamic forces on soil movement and sliding[11–13]. In this context, there is a close association between terrain changes caused by fault activity and the occurrence of residual colluvial layer landslides. Therefore, it is highly necessary to study such landslides from the perspective of faults.

Increasing evidence suggests that faults are crucial in the initiation and occurrence of landslide hazards[14–18]. For instance, the 9 October 2019 landslide in Sataun, India, was primarily due to a fault traversing the area, resulting in the deterioration of rock mass properties[19]. These studies mainly focus on the impact of faults on rock landslides. However, there is still a significant gap in existing research regarding how faults alter the terrain and subsequently control colluvial layer landslides, especially concerning the effects on the thickness of residual colluvial layers and hydrological boundaries. Residual colluvial layers differ from rocks; they are characterized by loose, unconsolidated materials, and their behavior under stress conditions differs from that of solid rockmasses[20,21]. They are more susceptible to geological disasters influenced by terrain and water accumulation. Long-term, understanding the formation and failure patterns of colluvial layer landslides in fault scenarios is crucial. This knowledge is vital for devising effective prevention and control strategies to reduce the risks associated with these disasters. The Lijaping landslide in the Qinba Mountains serves as a typical example of this.

…



Location of study area. (**a**) Location of the Hanwang Town, Shannxi Province, China. and Elevation and Fault Distribution of Hanwang Town. (**b**) Image of Lijiaping landslide.

Nature Scientific Reports | (2024) 14:19167 | https://doi.org/10.1038/s41598-024-69835, www.nature.com/scientificreports

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

15η Αθηναϊκή Διάλεξη Γεωτεχνικής Μηχανικής

Ο Kerry Rowe στην παρουσίαση της διάλεξης

Την επομένη ημέρα της διάλεξης, Παρασκευή 25 Οκτωβρίου 2024, έγινε συζήτηση επ' αυτής στο Ορυκτολογικό Μουσείο γαιο-ΟΡΑΜΑ της Σχολή Μεταλλειολόγων-Μεταλλουργών Μηχανικών ΕΜΠ.

Ο Kerry Rowe στην συζήτηση επί της διάλεξης

Τμήμα του ακροατηρίου κατά την συζήτηση επί της διάλεξης

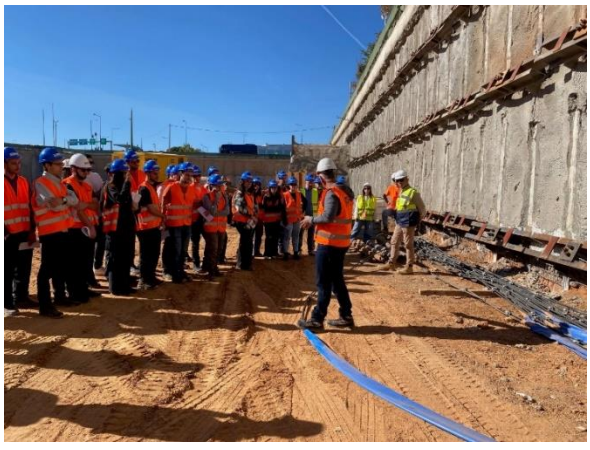
ΤΜΗΜΑ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ

Εκπαιδευτική Εκδρομή στην Αθήνα

Το Εργαστήριο Γεωτεχνικής Μηχανικής και το Εργαστήριο Γεωδαισίας και Γεωδαιτικών Εφαρμογών του τμήματος Πολιτικών Μηχανικών του Πανεπιστημίου Πατρών οργάνωσαν για τους φοιτητές του 5ου έτους της κατεύθυνσης εμβάθυνσης «Γεωτεχνική μηχανική- Έργα υποδομής» ημερήσια εκπαιδευτική εκδρομή, την Πέμπτη 24 Οκτωβρίου στην Αθήνα.

Η μέρα ξεκίνησε με επίσκεψη στο εργοτάξιο του μετρό στο φρέαρ του άλσους Βεΐκου, οπού οι φοιτητές/τριες ενημερώθηκαν από τους κ. Λεουτσάκο, Στούμπο και Νικολόπουλο για τα έργα διάνοιξης της γραμμής 4 του μετρό, αλλά είχαν και τη μοναδική εμπειρία να δουν από κοντά τον μετροπόντικα σε λειτουργία. Στη συνέχεια ξεναγήθηκαν σε εργοτάξιο προσωρινής αντιστήριξης (τύπου Βερολίνου) για τη θεμελίωση κτιριακού έργου στο Μαρούσι όπου ο κ. Χάρης Λάμαρης και οι συνεργάτες του παρουσίασαν τα στάδια κατασκευής του έργου. Η μέρα ολοκληρώθηκε αργά το απόγευμα με την παρακολούθηση τους εξαιρετικής διάλεξης του Prof. R. Kerry Rowe για τη 15η Αθηναϊκή διάλεξη που διοργάνωσε η ΕΕΕΕΓΜ.

Ευχαριστούμε θερμά τους εταιρείες ΑΤΤΙΚΟ METRO, AVAX GROUP, Haris Lamaris, TERNA S.A., DIMAND S.A., AKSM, για τη φιλοξενία στα υπό κατασκευή έργα τους.



Ελληνικός Σύνδεσμος Γεωσυνθετικών

Educate the Educators

Ο Ελληνικός Σύνδεσμος Γεωσυνθετικών Υλικών (hgs) διοργάνωσε, για πρώτη φορά στην Ελλάδα, μεταξύ 18-19 Οκτωβρίου 2024 στην Ξάνθη, το σεμινάριο Educate the Educators (ETE).

Το σεμινάριο είχε σκοπό να παρουσιάσει σε διδάσκοντες Πολυτεχνικών Σχολών καλές πρακτικές ενσωμάτωσης, στο πρόγραμμα σπουδών προπτυχιακών φοιτητών, βασικών αρχών λειτουργίας και εφαρμογής γεωσυνθετικών υλικών στα τεχνικά έργα.

Το πρόγραμμα IGS Educate the Educators (ETE) στοχεύει να προσφέρει εκπαιδευτικό υλικό τους διδάσκοντες έτσι ώστε οι φοιτητές τους να είναι ενήμεροι και για τα πλεονεκτήματα που μπορεί να προσφέρει η χρήση γεωσυνθετικών υλικών.

Περισσότερα για το IGS Educate the Educators (ETE) εδώ

Σχετική ανακοίνωση στο LinkedIn:

IGS Greece would like to thank everyone who made the 2024 EtE Geosynthetics Program, held in Xanthi, Greece, a success!!

We extend our gratitude to all participants who helped make this event truly memorable, and more specifically, to our key instructors Jorge Zornberg, Maria Patricia Guerra Escobar, Ivan P. Damians, to the IGS Greece organizing committee Ioannis Markou, Apostolis Ritsos, Nikos Tsatsos, Christos Stratakos, Ioannis Fikiris, Giannis Psimis, Konstantinos Samaras, Alexandros Droudakis, to our sponsors International Geosynthetics Society (IGS), Thrace Group, HUESKER Group, Maccaferri, GeoChem, GEOGNOSI s.a., Edafomichaniki S.A., EDAFOS Engineering Consultants S.A., @NAMALAB and of course to all participants.

We will meet again in a future event.

You are all welcome to join IGS Greece and become members. https://www.igs-greece.gr/

Αναμνηστική φωτογραφία των συμμετασχόντων στο σεμινάριο

Technical Annals: Ανακοίνωση - Πρόσκληση για Υποβολή Άρθρων σε 6 Θεματικές στο Διεθνές Επιστημονικό Περιοδικό του ΤΕΕ

Ανοιχτή πρόσκληση για υποβολή νέων άρθρων στο Διεθνές Επιστημονικό Περιοδικό του ΤΕΕ "Technical Annals"– International Scientific Journal in Advances in Engineering

Στην πλατφόρμα του Επιστημονικού Περιοδικού του ΤΕΕ έχει αναρτηθεί ανακοίνωση – πρόσκληση για υποβολή άρθρων σε 6 επόμενα τεύχη με συγκεκριμένη θεματολογία (https://ejournals.epublishing.ekt.gr/index.php/ta/announcement/view/433).

Η θεματολογία είναι η εξής:

1. Design and Management of Port Coastal Offshore Infrastructure in a Changing Climate. Έχει δοθεί άτυπη παράταση για την υποβολή άρθρων.
2. Maritime Decarbonisation. Η καταληκτική ημερομηνία υποβολής άρθρων είναι η 15.10.2024. Έχει δοθεί άτυπη παράταση για την υποβολή άρθρων.
3. Risk assessment and Preservation of Civil Infrastructure in the Climate Crisis era. Η καταληκτική ημερομηνία υποβολής άρθρων είναι η12.2024
4. Urban and Spatial Planning. Η καταληκτική ημερομηνία υποβολής άρθρων είναι η 15.03.2025
5. Planning local sustainable development. Η καταληκτική ημερομηνία υποβολής άρθρων είναι η 25.05.2025
6. Transdisciplinary Modelling and Cooperation for the Preservation of Cultural Heritage. Η καταληκτική ημερομηνία υποβολής άρθρων είναι η 20.09.2025

Υπενθυμίζεται ότι το Τεχνικό Επιμελητήριο Ελλάδας προχώρησε στην έκδοση διεθνούς επιστημονικού περιοδικού για την πρόοδο στις επιστήμες των μηχανικών. Πρόκειται για μια εκδοτική προσπάθεια που το ΤΕΕ ανέλαβε ξανά τα τελευταία χρόνια, βασισμένο στην παράδοση που είχαν καθιερώσει παλαιότερα οι εκδόσεις των Τεχνικών Χρονικών, της επιστημονικής έκδοσης του ΤΕΕ με ιστορία δεκαετιών. Η έκδοση είναι πλέον αποκλειστικά ηλεκτρονική, σε συνεργασία με το Εθνικό Κέντρο Τεκμηρίωσης και φιλοδοξεί να αποτελέσει βήμα γόνιμου επιστημονικού διαλόγου και διάχυσης της επιστημονικής προόδου. Η σελίδα του περιοδικού είναι: https://ejournals.epublishing.ekt.gr/index.php/ta

(NEWSLETTER, Τεύχος 2894, 30 Οκτωβρίου 2024, https://portal.tee.gr/portal/page/portal/INFO_TEE/INFO_2024/10_24/NEWSLETTER20241030.pdf)

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE News
www.issmge.org/news

TC202 Executive Group member, Dist. Prof. Buddhima Indraratna, receives Australia's Sir John Holland Civil Engineer of the Year 2024!

ISSMGE Secretariat / TC202 / 01-10-2024

TC202 is proud to share that Executive Group member, Dist. Prof. Buddhima Indraratna, received Australia's Sir John Holland Civil Engineer of the Year 2024!

Prof. Indraratna was honoured with this highest accolade in Australian civil engineering in September 2024; the first full-time geotechnical academic to win. The Sir John Holland Award is presented to a civil engineer who has made signifycant contributions to the profession, commemorating the legacy of Sir John Holland, the renowned civil engineer and founder of the John Holland Construction group.

Prof. Indraratna is also Chair of TC202's 5th International Conference on Transportation Conference, to be held 20-22 November 2024 at the Sydney Masonic Centre, Australia.

ECPMG 2024 proceedings are now available

ISSMGE IT Administrator / General / 02-10-2024

The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of Dr. Miguel Angel Cabrera, and Dr. Suzanne van Eekelen, the 98 papers from the proceedings of the 5th European Conference on Physical Modelling in Geotechnics (ECPMG 2024) are available in the ISSMGE online library. The abstracts and papers from the ECPMG 2024 were reviewed through ISSMGEs Conference Review Platform. More information can be found at: https://www.issmge.org/publications/online-library?database=53&conference=125

The ECPMG 2024 was held between October 2 to 4, 2024, in Delft, the Netherlands. The ECPMG 2024 is organised by the Technical Committee on Physical Modelling (TC104) of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), and in cooperation with the EU-funded GEOLAB project.

TC 212 Workshop at the PANAMGEO CHILE 2024

ISSMGE Secretariat / TC212 / 09-10-2024

TC212 will be organizing a Workshop at the 17th Pan-American Conference on Soil Mechanics and Geotechnical Engineering, to be held in La Serena (Chile) from November 12 to 16, 2024. Details are available in the flyer at the link: https://eventual-latam.com/archivos/W4.pdf

One week left – Submit your abstract to the 6th International Conference on Geotechnical Engineering Education 2025 (GEE2025)

ISSMGE Secretariat / TC306 / 08-10-2024

There is still one week to submit your abstract to GEE 2025 until October 15, 2024.

Please note that the paper submission deadline will remain February 5, 2025 - there will be no extension for the papers.

The Conference is organized by the Technical Committee TC306 for Geo-engineering Education of the ISSMGE, under the auspices of the French Society for Soil Mechanics and Geotechnical Engineering (Comité Français de Mécanique des Sols et de Géotechnique - CFMS) and the Ecole Nationale Supérieure de Géologie, Université de Lorraine, France.

TC307 Meeting - August 25th, 2024

Nuno Cristelo / TC307 / 08-10-2024

Meeting agenda for the TC307 second 2024 meeting, held in Lisbon, during the ECSMGE24 conference.

Update of ICSE-12 website

Shinji Sassa / TC213 / 10-10-2024

The 12th International Conference on Scour and Erosion (ICSE-12) website has been updated at The 12th International Conference on Scour and Erosion(ICSE-12) (cqjtu.edu.cn).

ISSMGE Interactive Technical Talk Episode 20: Scour and Erosion (TC213)

ISSMGE IT Administrator / TC213 / 14-10-2024

The twentieth episode of International Interactive Technical Talk has just been launched and is supported by TC213. Shinji Sassa, Cathy Avila, Tiago Fazeres Ferradosa and Mabel Chedid are discussing with Marc Ballouz about Scour and Erosion.

Watch ISSMGE Interactive Technical Talks

Geotechnical Engineering Education 2025 (GEE2025) Conference: Extended Abstract Deadline Is Tomorrow!

ISSMGE Secretariat / TC306 / 14-10-2024

You still have one day to submit your abstract to GEE 2025 until tomorrow, October 15, 2024!

Please note that the paper submission deadline will remain February 5, 2025 - there will be no extension for the papers.

The Conference is organized by the Technical Committee TC306 for Geo-engineering Education of the ISSMGE, under the auspices of the French Society for Soil Mechanics and Geotechnical Engineering (Comité Français de Mécanique des Sols et de Géotechnique - CFMS) and the Ecole Nationale Supérieure de Géologie, Université de Lorraine, France.

Vol 18, Issue 3, September 2024

ISSMGE IT Administrator / ISSMGE Bulletin / 17-10-2024

https://www.issmge.org/publications/issmge-bulletin/vol-18-issue-3-september-2024

Opening of Paper Submission to ICSE-12

Shinji Sassa / TC213 / 30-10-2024

The Full Paper Submission for the 12th International Conference on Scour and Erosion (ICSE-12) is now open at Paper Submission-The 12th International Conference on Scour and Erosion(ICSE-12).

ISRM International Society for Rock Mechanics and Rock Engineering

News

https://www.isrm.net

Next ISRM Young Members' Seminar Series on 23rd October 2024-10-02

The next Young Members' Seminar will be held on 23rd October at 3 PM GMT and will feature presentations from researchers from the Netherlands, Spain, France, and Norway.

- Probabilistic Analysis of a Rock Salt Cavern with Application to Energy Storage Systems - Elham Mahmoudi (Deltares, The Netherlands)
- Size effects on strength and deformability of intact and artificially-jointed hard rock samples - Manuel A. González Fernández (University of Vigo, Spain)
- Using Synthetic Rock Mass and Discrete Fracture Network approaches to study rock mass strength properties - Etienne Lavoine (Itasca Consultants S.A.S., France)
- A hybrid approach for adequate rock support design in hard rock tunnelling - Jorge Terron-Almenara (Norwegian University of Science and Technology, NTNU, Norway)

Follow the link to register at the ISRM Young Members Seminar series page.

More spots for the 6th European Rock Mechanics Debate on 16 October 2024-10-13

Due to higher-than-expected demand, we've made additional spots available for our upcoming European debate.

The debate's title is "Failure criteria: Mohr-Coulomb vs Hoek&Brown," and the speakers are **Joseph Labuz** from the University of Minnesota, USA, and **Ming Cai** from Laurentian University, Canada. **Philippe Vaskou**, from France, will moderate the debate.

For complete information, please download the flyer or register directly here.

All ISRM European Debates are available at the ISRM Youtube channel.

Videos of the 2024 ISRM Awards available 2024-10-18

The video presentation of the winners of the 2024 ISRM Science and Technology Awards - category Science Achievement Award and of the Young Rock Engineer Award are availabe here https://isrm.net/page/show/137?tab=287

ITA AITES ASSOCIATION INTERNATIONALE DES TUNNELS ET DE L'ESPACE SOUTERRAIN INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION

News

https://about.ita-aites.org/news

Introducing the new ITA-AITES Executive Director!

After an international search, the ITA is thrilled to welcome Helen Roth as its new Executive Director to steer the ITA's vital work and its programmes.

Roth will take the helm as ITA Executive Director on 1 January 2025.

Roth, a Norwegian national, will bring a wealth of knowledge and a proven track record in transport infrastructure and organisation administration to the position and will join the ITA at a pivotal time for the Association and the demands on the global tunnelling and underground infrastructure industry.

"Helen's leadership and experience qualities are precisely what the ITA needs to navigate the evolving growth and administration of our Association," said ITA President, Arnold

Dix. "Her proven ability to drive innovation, foster collaboration, and achieve results makes her the ideal steward for our activities and ambitions. We are thrilled to welcome her and excited to chart the way forward with her."

Fluent in English and Germany and with a knowledge of French and other languages, Roth will oversee the smooth and efficient operation of the Association's Executive Council and the services of its central Secretariat to ensure the interconnectivity of the ITA federation of 80 Member Nations, its Committees, Working Groups, and members, and its association with the United Nations and other global partners and collaborators.

"I am eager to embark on this new journey for me and the ITA," said Roth on accepting the position. "The tunnelling industry is at the forefront of solving some of the world's most pressing infrastructure challenges, and I am honoured to lead an organisation that plays such an influential role in shaping a sustainable future for the world."

Roth's transition to the ITA comes after eight successful years as CEO of the VIA, a national Norwegian transportation infrastructure network created to facilitate collaboration, entrepreneurship and innovation throughout the value chain for safe, smart and sustainable road solutions, including over bridges and through tunnels - areas that Norway has tremendous global experience and knowhow. Under her leadership, VIA has become a key player in shaping Norway's future transport infrastructure.

Roth joins the International Tunnelling and Underground Space Association (ITA) at a time of exponential growth in global urbanization and critical demand on infrastructure to meet huge global challenges including the consequences of rapid climate change, the rise of humanity on the move as refugees, and the aspirations to meet the 17 Sustainable Development Goals of the United Nations. Founded in 1974, the work of the ITA today is to support these efforts from an underground solutions perspective and to bring together industry leaders, engineers, contractors, and public agencies to address the particular challenges and advantages of the underground environment, providing expertise and knowledge-sharing platforms to benefit communities worldwide. With 80 Member Nations and members throughout the world, the ITA supports the global effort to create efficient and sustainable infrastructure for the future.

ITACET Lunchtime Lecture Series #39 08 October 2024

Join the next LLS #39!
When: 8th October, 2024

This instalment of the Lunchtime lecture series will focus on 'Practical Aspects of Segmental Tunnel Lining Design'

The episode will feature three lectures and will finish with a Q&A with all speakers. It will begin at 13:00 CET.

- Basic Principles of Tunnel Segmental Liner Analysis and Design - Verya Nasri
- Technology Challenges to Meet the Concrete Sustainability Goals of Tunnel Segmental Liner - Barzin Mobasher
- Use of Fiber for Tunnel Segment reinforcement - Benoit De Rivaz

ITACET Lunchtime Lecture Series #40 16 October 2024

The fortieth instalment of the Lunchtime Lecture Series will focus on '**Face stability issues**' in collaboration with ITA-AITES Working Group 2.

This LLS#40 will run on November 12th at 13:00 CET time

The episode will feature three lectures and will finish with a Q&A with all speakers.

- Examples of tunnel face instability on site - Elena Chiriotti
- Overview of mechanisms and methods to evaluate tunnel face stability - Nicolas Berthoz
- Case of deep tunnels in a clay medium - Thomas Pferdekamper

Sign up for free subscription: Lunchtime lecture series #40 | Itacet

Scooped by ITA-AITES #125, 2 October 2024

Gateway Development Commission executes $3.8 billion Federal-State Partnership Grant agreement with FRA for Hudson Tunnel Project | USA

New £1.8bn tunnel for trains to travel under Panama Canal

Canada could get one of the world's longest tunnels

Szczecin to have Poland's longest road tunnel

The £150m tunnel between two islands linking 1,200 people | Faroe Islands

Colombia set to have the longest tunnel in Latin America costing £108m

Mumbai-Ahmedabad High-Speed Rail's Undersea Tunnel advances with key construction milestones | India

Arrival of the first TBM for the Salerno-Reggio Calabria High-Speed Railway Project | Italy

The Brenner Base Tunnel (BBT): shifting Alpine traffic from road to rail | Austra - Italy

Melbourne's Metro Rail Tunnel budget blows out by $837 million, with state government blaming global factors | Australia

Building Sydney's Underground Metro Tunnels! | Australia

Scooped by ITA-AITES #126, 29 October 2024

Seoul gov't to bury railway tracks underground to reclaim green space | South Korea

The new £6bn mega-tunnel under the sea that would link Africa to Europe | Marocco & Spain

World's longest undersea high-speed railway tunnel begins 'journey under the sea' | China

Valley Water reaches milestone in tunnel project at Anderson Dam; planning continues for seismic retrofit project | USA

Introducing the new ITA Executive Director

Breakthrough made on Snowy 2.0 connection tunnel | Australia

The Environmental Impact of Tunnels: A comprehensive Overview

Final TBM Launched for Sydney Metro West Tunnel | Australia

[Iraq to build longest submerged tunnel in the Middle East, boosting trade routes]

[SANRAL set to open tenders for $250m Huguenot Tunnel up-grade | South Africa]

[Hampton Roads Bridge Tunnel expansion project makes major step | USA]

[Derinkuyu: World's largest underground city reveals ancient urban planning genius | Türkiye]

BTS & Concrete Society Joint Event

Coire Glas Hydro Pumped Storage - Exploratory Works

Waverley Suite, Glasgow Marriott, 500 Argyle St, Glasgow G3 8RR

Wed Nov 20 2024 20:00 In-Person Event. Free to attend, advance registration required

[Download Flyer]

SSE Renewables has invested over £100M to date in the proposed Coire Glas hydro pumped storage scheme with a significant proportion assigned to ground investigation. Coire Glas will be the largest such scheme to be developed in the UK for over 40 years and will include caverns 700m below ground level and over 12km of tunnels.

Speakers: **Andy Gregory - Project Manager SSE Renewables**, Douglas Whiteford - Sub-Agent, STRABAG UK

Speakers

Andy Gregory - Project Manager SSE Renewables Andy has been involved in all stages of the Coire Glas Hydro pumped Storage scheme from feasibility to the present day. In his current role as Project Manager for the project's site exploratory works package he will explain the scheme development to date, and describe the works executed to minimise the risk from unexpected ground conditions through collection of high-quality data to be used in Main Works design.

Douglas Whiteford - Sub-Agent, STRABAG UK Douglas will cover the execution of the project's exploratory works contract carried out by STRABAG in 2023/24. Douglas has been working on the Coire Glas Exploratory Works since 2022 and will present the logistics of establishing and servicing a site in a remote area of the Scottish Highlands including a description of the drill and blast tunnelling methodology used with a sprayed concrete lining and rock dowels for tunnel support.

Note 1: This is an in-person lecture.

Note 2: Spaces are limited to 50, please register attendance with James Halfpenny james.halfpenny@breedongroup.com 07711859151.

Note 3: Buffet will be available from 18:00

Harding Memorial Lecture 2024 - Charles Allen "What could possibly go wrong? ...greenwashing and other things

Thu Nov 21 2024 20:00

Speaker

Charles Allen – *Director, OtB Concrete Ltd.*

At the 2024 Harding Memorial Lecture, Charles will outline his 50 years in the construction industry and discuss the causes of errors and mistakes in the tunnelling sector, including a lack of engineering judgement.

With 60% to 80% of embodied carbon contained in the shaft and tunnel linings of a tunnelling project, he will focus on the urgent requirement of decarbonising concrete linings and question the current thinking that shotcrete final linings are beneficial for carbon reduction.

He will describe the often overlooked deterioration of sewer tunnel linings by biogenic corrosion and present the results of testing for this and possible concrete solutions. Finally, he will discuss developments in the field of geopolymer concrete, its use in the UK and the publication of BSI Flex 350 Code of Practice for Alternative Binder Systems for Lower Carbon Concrete.

About Charles

Charles is a leading specialist in concrete engineering and construction materials with over 50 years' experience. His experience includes the use of concrete for civil, building and tunnelling applications.

Charles is a fellow of the Concrete Society and a member of the Institute of Concrete Technology.

Charles has been involved as a consultant to a number of different organisations within the civil engineering and tunnelling sectors and has recently been advising joint venture contractors on the Deep Tunnel Sewer System, Phase 2 project in Singapore, the Central Interceptor Tunnel in Auckland, New Zealand, the Sydney Metro to West Sydney Airport railway, Australia and the Thames Tideway project.

VideoDownload Flyer

Note 1: This is an in-person lecture but will also be streamed live on Zoom.

Note 2: Tea & coffee will be served from 17:30 hrs onwards

Note 3: Post-lecture drinks and food will be served at the ICE bar. The food is sponsored by HOCHTIEF-Murphy Joint Venture; whilst, the drinks are sponsored by Master Builders Solutions.

BTSYM November Workshop

Launching and Receiving a TBM – Considerations, Design and Delivery

Thursday, 21 November 2024,
[in-person] Institution of Civil Engineers, One Great George Street, Westminster, London SW1P 3AA

Event Information:

Balfour Beatty Vinci JV (BBV) have launched four and received three TBMs (at the time of the workshop) on HS2 N1N2 contract at Long Itchington Wood and Bromford sites. The workshop will cover aspects of large diameter TBM assembly, movement and launching from the perspectives of contractor and temporary works designer (OTB Engineering). Difficulties encountered, solutions adopted, and lessons learned from the four launches and receptions will be presented.

Speakers

Robert Harding has 8 years' experience in civil engineering, specializing in tunnels and temporary works. As a designer, Robert has designed SCL tunnels and shafts, reinforced concrete structures and various temporary works on the Thames Tideway West project. Over the last 3 years, Robert has worked on the HS2 N1N2 Long Itchington Wood and Bromford Tunnels as a Temporary Works Coordinator and Manager, responsible for all temporary work across 4 sites.

Karolis Gvildys has over 10 years of experience in civil engineering design and construction specializing in the design of tunnels, shafts, deep excavations and highways. Karolis has experience working for both the contractor and designer on tunnelling projects. Karolis has significant site experience working on major infrastructure projects such as Crossrail Contract C510 and Northern Line Extension which involved significant elements of sprayed concrete lining works in Central London. Over the last six years Karolis has been involved in design of TBM launch and reception works on Northern Line Extension, Thames Tideway Central and East contracts, Hinkley Point C Intake and Cooling Tunnels, HS2 N1N2 Long Itchington Wood and Bromford tunnels.

www.geosyntheticssociety.org

News

GeoAsia8 Conference Topics Revealed October 6, 2024

Eighteen areas of geosynthetics will be explored through the lens of sustainability at the upcoming eighth Asian Regional Conference on Geosynthetics (GeoAsia8). Themed 'Geo-synthetics: pioneering **Read More »**

10 Minutes With… Sandra Pouliot October 10, 2024

Mine closure specialist Sandra Pouliot shares how geosynthetics technologies are used in her industry plus other hot topics in our latest '10 Minutes With…' video **Read More »**

Could Your Chapter Host GeoAsia 2029? October 21, 2024

Set the agenda for one of the IGS's flagship regional conferences by applying to host the 9th Asian Conference on Geosynthetics. Bidding is now open **Read More »**

Work Experience Success For Latest Job Shadowing Cohort October 23, 2024

Young Brazilian engineers got a boost to their geosynthetics education by taking part in the IGS Job Shadowing Program. IGS Brazil has been particularly active **Read More »**

Diversity Spotlight At Next EuroGeo Conference October 25, 2024

Inclusion, equity and celebrating differences in our industry will be given special focus at the forthcoming 8th European conference on geosynthetics (EuroGeo8). Guillaume Stoltz, General **Read More »**

10 Questions With… IGS India October 29, 2024

IGS India has been operating for nearly 40 years in an enviable growth market for geosynthetics. Here, IGS India President Dr. G.L. Sivakumar Babu and **Read More »**

News
https://www.britishgeotech.org/news

Finalists Announced for the 2024 Cooling Prize Competition 10.10.2024

The British Geotechnical Association (BGA) is pleased to announce the finalists for the 2024 Cooling Prize Competition to be held at the BGA's 75th Anniversary Conference in London on 15 October 2024 Read More

Yvonne Ainsworth receives the John Mitchell Award 11.10.2024

The BGA is pleased to announce that Yvonne Ainsworth has received the 2024 John Mitchell Award Read More

Title announced for the 63rd Rankine Lecture by Professor Kenichi Soga 20.10.2024

For the 63rd Rankine Lecture Professor Kenichi Soga of the University of California, Berkeley will present 'From Geo-monitor to Geo-adapt: leveraging distributed sensing and data analytics for performance-based design, construction, and maintenance' Read More

Thomas Riccio wins 55th Cooling Prize Competition 20.10.2024

The British Geotechnical Association (BGA) is pleased to announce that the 55th Cooling Prize was awarded to Thomas Riccio of the University of Dundee for a presentation on Pile installation effects and plugging in soft rock Read More

Public consultation is open for UK National Annex to BS EN 1997-2 20.10.2024

Public consultation is open for UK National Annex to BS EN 1997-2:2024, Eurocode 7 – Geotechnical design – Part 2: Ground properties. Deadline 4th November 2024. Read More

The November 2024 issue of Ground Engineering is available on line 23.10.2024

The November 2024 issue of Ground Engineering is available on line. Online access to Ground Engineering (GE) is included in BGA subscriptions Read More

Call for entries for the 56th Cooling Prize Competition 23.10.2024

The British Geotechnical Association (BGA) is pleased to invite Early Career Geotechnical Professionals to submit posters for the 56th Cooling Prize Competition on any topic dealing with the engineering behaviour of the ground. Deadline 1 December 2024. Read More

G-I student fund endowment campaign 21 Oct 2024

The G-I Student Participation program has been selected as a primary beneficiary of the Briaud Students Fund, a $1 million endowment.

https://www.geoinstitute.org/news/g-i-student-fund-endowment-campaign

News
www.geoinstitute.org/news

ΔΙΑΚΡΙΣΕΙΣ ΕΛΛΗΝΩΝ ΓΕΩΤΕΧΝΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

Βασίλης Μαρίνος Keynote Speaker στο RIC2025

Ο Δρ. Βασίλης Μαρίνος, Επίκουρος Καθηγητής Τεχνικής Γεωλογίας στη Σχολή Πολιτικών Μηχανικών του Εθνικού Μετσοβίου Πολυτεχνείου, θα είναι ένας εκ των δύο Keynote Speakers στο Rocscience International Conference 2025 «Beyond the Surface: Uncovering the Challenges of Geotechnical Engineering», April 6-8, 2025, in Sydney, Australia. Ο τίτλος της διάλεξής του είναι «Integration of Rock Mass Classification Systems and Behavior with Geotechnical Design Tools for Tunnelling - Quantifying the Qualitative».

(https://www.rocscience.com/events/rocscience-international-conference-2025)

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

Για τις παλαιότερες καταχωρήσεις περισσότερες πληροφορίες μπορούν να αναζητηθούν στα προηγούμενα τεύχη του «περιοδικού» και στις παρατιθέμενες ιστοσελίδες.

CEES2024 1st International Conference on Civil and Environmental Engineering for Resilient, Smart and Sustainable Solutions, 3 - 5 November 2024, AL-Khobar, Saudi Arabia https://cees2024.org/

PANAMGEO CHILE 2024 17th Pan-American Conference on Soil Mechanics and Geotechnical Engineering, 12-17 November 2024, La Serena, Chile, https://panamge-ochile2024.cl

CouFrac 2024 The 4th International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application, November 13-15, 2024, Kyoto, Japan, https://www.ec-convention.com/coufrac2024/

3ο Διεθνές Συνέδριο Αρχαίας Ελληνικής και Βυζαντινής Τεχνολογία, 19-20-21 Νοεμβρίου 2024, Αθήνα, www.edabyt.gr

ICTG 2024 5th International Conference on Transportation Geotechnics 2024 "Sustainable and Evolving Technologies for Urban Transport Infrastructure", 20 – 22 November 2024, Sydney, Australia www.ictg2024.com.au

ICOMOS TheoPhilos ISC Conference Authenticity from a European Perspective: 30 Years of the Nara Document on Authenticity November 28-29, 2024, Thessaloniki, Greece, https://theophilos.icomos.org

Geotechnics for Sustainable Infrastructure, 28-29 November 2024, Kathmandu, Nepal, https://geomandu.ngeotechs.org

1st ISRM Commission Conference on Estimation of Rock Mass Strength and Deformability, 6 December 2024, Lima, Peru, www.slrmes.org

4th Asia-Pacific Conference on Physical Modelling in Geotechnics ACPMG 2024, 11 – 13 December 2024, Abu Dhabi, United Arab Emirates, https://tc104-issmge.com/acpmg-2024

The Third Vietnam Symposium on Advances in Offshore Engineering
Interdisciplinary & Integrated Solutions for Sustainable Offshore Infrastructure

11-12 December 2024, Hanoi, Vietnam
https://vsoe2024.sciencesconf.org

Building upon the achievements and insights of the previous symposia (VSOE 2018 and VSOE 2021/2022), the third Vietnam Symposium on Advances in Offshore Engineering, VSOE 2024, continues to provide an international platform where experts, practitioners, academics, policymakers, and industry leaders can come together to share their latest research, ideas, and innovations. The third VSOE is dedicated to exploring the dynamic intersection of technology, sustainability, and interdisciplinary approaches to address the complex challenges faced in offshore engineering.

This third symposium will be hosted in Hanoi, Vietnam, organized jointly by the Association of Vietnamese Scientists and Experts (AVSE Global) and the Hanoi University of Civil Engineering (HUCE). This event provides a good opportunity to discuss the specific challenges and opportunities in the Asia-Pacific region while also drawing on global expertise and experiences. Through a comprehensive program encompassing keynote speeches, technical sessions, and panel discussions, participants will have the chance to engage with cutting-edge research and practical case studies that demonstrate the latest advancements in the field.

VSOE 2024 has the following objectives:

- Foster interdisciplinary collaboration and integration among various fields related to offshore engineering.
- Showcase innovative technologies and approaches that enhance the sustainability and efficiency of offshore infrastructure.
- Provide a forum for discussing the latest research findings, industry trends, and regulatory developments.
- Encourage the exchange of ideas and best practices among participants from different regions and sectors.
- Promote the development of integrated solutions that consider environmental, economic, and societal factors.

By bringing together a diverse group of stakeholders, VSOE 2024 aspires to contribute significantly to the advancement of sustainable offshore engineering practices and pave the way for future innovations in the industry. The symposium will stimulate the generation of new ideas, foster partnerships, and advance the development of a more sustainable and resilient offshore infrastructure.

Topics

The 3rd VSOE Committees cordially invite authors to submit their manuscripts (in English) to VSOE 2024 by no later than **July 15, 2024**. The Symposium's main topics include, but are not limited to:

- **Advances in Offshore Geosciences and Geotechnics** (offshore exploration, data acquisition and processing in geosciences, integration of AI, etc.)
- **Environmental Challenges and Solutions in Offshore Engineering** (environmental aspects: carbon capture and storage, seabed hazards, impacts of seismic activities, decommissioning, marine spatial planning, etc.)
- **Foundation Engineering and Subsea Technologies** (foundation research, design, performance, etc.)
- **Infrastructure and Interaction with the Marine Environment** (pipelines, cables, and dynamic risers, near coastal geotechnical engineering, shallow water environments, reclamation, dredging, and artificial islands, etc.)

- **Offshore Wind Energy: Vietnam's Challenges and Global Trends**
  (Vietnam's potential, design challenges, policy frameworks, global case studies, lessons learned, future trends)
- **Supply Chain Innovations for Offshore Renewable Energy**
  (manufacturing, transportation, installation, maintenance, etc.)
- **Sustainability and Resilience in Offshore Engineering**
  (climate change, extraction of seabed minerals, marine energy, sustainable practices, resilience of offshore structures, etc.)

ROCSCIENCE INTERNATIONAL CONFERENCE 2025, April 6-8, 2025, Sydney, Australia, www.rocscience.com/events/rocscience-international-conference-2025

PMGEC LEBANON 2025 Pan Mediterranean Geotechnical Engineering Conference 2025, April 28 – 30, 2025, Phoenicia Beirut IHG, Lebanon https://pmgec-leb.com/

GEOTECHNICS REIMAGINED, May 21-23, 2025, Bruges, Belgium, https://dfi-events.org/dfi-effc25

World Tunnel Congress 2025 "Tunnelling into a sustainable future – methods and technologies", 9-15 May 2025, Stockholm, Sweden, www.wtc2025.se

ISFOF 2025 5th International Symposium on Frontiers in Offshore Geotechnics, June 9-13, 2025, Nantes, France, https://isfog2025.univ-gustave-eiffel.fr

GeoAsia - 8th Asian Conference on Geosynthetics, 10-13 June 2025, Brisbane, Australia, https://geoasia8.org

EGRWSE-2025 6th International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering, June 11-14, 2025, Vigo, Spain, https://egrwse2025.webs.uvigo.es/

EUROCK 2025 - ISRM European Rock Mechanics Symposium Expanding the underground space - future development of the subsurface - an ISRM Regional Symposium, 16-20 June 2025, Trondheim, Norway, https://eurock2025.com

3rd International Conference on Energy Geotechnics - Implementing the Energy Transition, 17-20 June 2025, Paris, France, Kamelia Atefi-Monfared, catefi@yorku.ca

6th International Conference GEE2025: Charting the path toward the future Geotechnical Engineering Education July 2-4 2025, Nancy, France, https://gee2025.sciences-conf.org/

5ICGE & 3ICESE
5th International Conference on Geotechnical Engineering-Iraq
& 3rd International Conference on Engineering Science & Energy
1–3 July 2025 , 3 July 2025
Komar University, Sulymaniyah, Iraq
https://icge.tech

The Fifth International Conference on Geotechnical Engineering-Iraq and **the Third International Conference on Engineering Science and Energy** will be held in Komar University, Sulymaniyah, Iraq on **July the 3rd, 2025**.

The conference is organized in collaboration between **Iraqi Scientific Geotechnical Society (ISGS)** and **the International Center for Science and Engineering (IRUCS-Engineering)**.

The conference will serve as a global platform, bringing together leading experts from around the world to discuss cutting-edge advancements in geotechnical engineering, civil engineering, energy, advanced technologies, architectural engineering, water resources engineering, environmental engineering, and oil engineering.

The event is intended to enhance international collaboration between Iraq, Russia, and other nations, fostering global partnerships in research and development.

By bringing together experts from academia and industry, the event will offer participants the opportunity to engage in productive discussions, explore technological advancements, and establish meaningful collaborations.

The conference is positioned as a key initiative to enhance research relations and promote knowledge sharing between Russia and Iraq in the fields of engineering, energy, advanced mechanics, and technological developments.

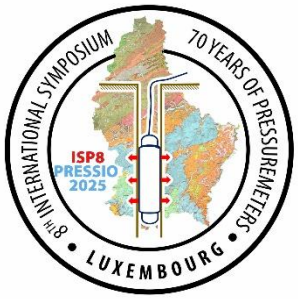
Participants will have the opportunity to exchange ideas, share the latest innovations, and engage in high-level scientific discussions, leading to solutions to complex engineering challenges.

This event plays a vital role in strengthening international cooperation in the fields of engineering sciences and energy, while promoting knowledge exchange and collaborative efforts on a global scale.

Contact Information
Issmfe.conference@gmail.com, icgee.conference@irucs.ru

Conference Coordinator
Maher M. Jebuer mmg.maher@yahoo.com

ISGSR2025 9th International Symposium for Geotechnical Safety and Risk, 24th – 27th August 2025, Oslo, Norway, www.isgsr2025.com



Symposium International pour le 70ème anniversaire du pressiomètre
International Symposium for the 70th Anniversary of the Pressuremeter
2nd to 5th of September 2025, LUXEMBOURG
https://isp8-pressio2025.com

Symposium aims

The International Symposium for the 70th Anniversary of the Pressuremeter ISP8 will offer an opportunity to exchange experience between contractors, manufacturers, geotechnicians from design offices and contractors, scientists and academics.

The technical exhibition will presents the latest methods and technologies and the most advanced testing equipments and materials.

Symposium Themes

The themes of Symposium will be devoted to the following subjects:

- Pressuremeter Testing Techniques: Advances in methods and equipment used for pressuremeter testing in geotechnical engineering.
- Soil and Rock Mechanics: Studies on the behaviour of various soil and rock types under pressuremeter testing.
- Site Investigation and Characterization: Using pressuremeter tests for site investigations to determine soil properties and support foundation design.
- Data Interpretation and Analysis: Innovative approaches to interpreting pressuremeter test data and improving the accuracy of results.
- Applications in Foundation Engineering: Using pressuremeter results to design and assess foundations for buildings, bridges, and other infrastructures.
- Load-Bearing Capacity: Assessing the load-bearing capacity of soils and rocks using pressuremeter tests.
- Case Studies and Field Applications: Real-world examples of pressuremeter testing applications and the lessons learned from these projects.
- Comparative Studies: Comparing pressuremeter test results with other geotechnical testing methods to evaluate efficiency and reliability.
- Standards and Guidelines: Updates on international standards and guidelines for conducting and interpreting pressuremeter tests.
- Technological Innovations -AI: New technologies and software developments that enhance the capabilities and applications of pressuremeter testing

The Symposium will include State of the Art lectures, sessions for oral presentations and poster sessions.

For more information, please contact:
Wissem FRIKHA
Email : direction@isp8-pressio2025.com

TKZ2025 XXI Technical Dam Control International conference, 09-12 September 2025, Chorzów, Poland https://tkz.is.pw.edu.pl/en/

EUROGEO Technical Challenges and Environmental Imperatives for the 21st Century, 15-18 September 2025, Lille, France, https://eurogeo8.org

www.transoilcold2025.org

On behalf of the Organizing Committee, I am sincerely pleased to invite you to the 7th International Symposium on Transportation Soil Engineering in Cold Regions (Transoilcold 2025), held at Songdo ConvensiA in Incheon, Korea. The International Conference is held on-site during September 17-20, 2025.

The main objective of this conference is to provide a current issue of design, construction and operation of transportation infrastructure in Arctic and cold Regions.

Moreover, the conference covers a number of topics in geotechnical engineering including geophysics, slope stability, soil dynamics, modelling, geosynthetics, foundation, geoenvironmental technology, underground construction, maintenance, and disaster prevention.

I would like to express my deepest gratitude to all the participants in this event, and special thanks to the Speakers for their commitment and dedication. I hope you to have a very pleasant and meaningful time during the event, and look forward to learning from your productive insights.

The TRANSOILCOLD 2025 conference is being held for the first time in Republic of Korea. Previously, it was held in 2013 in Xining (China), 2015 in Novosibirsk (Russia), 2017 in Guida (China), 2019 in St. Petersburg (Russia), 2021 in Zhuhai (China), and 2023 in Moscow (Russia).

Main Topics

- Design, Construction and Operation of Transportation Infrastructure in Arctic and Cold Regions
- Design, Construction and Exploitation of Subgrade
- Geophysical Techniques for Geological Survey
- Disaster Prevention in Geotechnical Structures
- Slope Stability, Landslides, Debris Flows and Avalanches
- Soil Dynamics and Earthquake Engineering
- Geotechnical Modelling of the Facilities Base
- Geosynthetics in Construction
- Earth Foundation Strengthening
- Geoenvironmental Technologies in Construction
- Geotechnical Problems of Underground Construction
- Facilities Influence on Underground Structures
- Frost Heave and Thaw Weakening of Subgrade
- Maintenance of Subgrade in Cold Regions
- Artificial Ground Freezing
- Cracking of Pavement Caused by the Natural Influences
- Construction, Reconstruction and Maintenance
- Transport Infrastructure Safety

Contact

Local Organizing Committee
Email: kgs@transoilcold2025.org
Korean Geotechnical Society (KGS)
Rm. #701, C-dong, H Business Park, 26, Beobwon-ro 9-gil, Songpa-gu, Seoul
TEL : +82-2-3474-4428, 7865 , FAX : +82-2-3474-7379, Email : kgssmfe@daum.net

3rd International Workshop on Landslides in Sensitive Clays
September 28th to October 2nd, 2025, Quebec, Canada
www.iwlsc2025.ca

The organizing committee is pleased to welcome you to Quebec City for the 3rd International Workshop on Landslides in Sensitive Clay (IWLSC 2025). The workshop will take place from September 28th to October 2nd, 2025, at the Musée de la Civilisation, in the city's picturesque Old Port. It will feature a 3-day scientific program, which will include oral presentations and poster sessions from the geotechnical communities of Quebec, Canada, Scandinavia and around the world.

The theme of IWLSC 2025 is «From landslide mechanisms to social and environmental impacts». Building on the Workshop's two previous editions, IWLSC 2025 will be an occasion for researchers and professionals from Quebec, Canada, Scandinavia and elsewhere to share knowledge and experience on various kinds of issues associated with landslides in sensitive clays.

The Workshop's technical program is spread over three days (September 29 to October 1), consisting of oral presentations and discussion periods. A benchmarking exercise will be organized in advance with Workshop participants on a voluntary basis to assess the stability of two slopes, one in Quebec and the other in Norway. The results of this comparative analysis will be discussed at a special session. There will also be an optional full-day technical visit (October 2).

A host of other activities are available to complement the technical program:

- Ice-breaker event
- Locally-inspired evening
- Activities for students and young professionals

CONFERENCE THEMES

- Case study of landslides
- Innovative in situ or laboratory methods
- Landslide monitoring using remote sensing systems
- Effect of climate changes on slope stability conditions
- Numerical modelling
- Environmental consequences of large landslides
- Risk perception and management
- Prevention and mitigation (technical, societal and environmental aspects)

Organizer

Canadian Geotechnical Society - Eastern Quebec Section

Contact Information

- Contact person: Prof. Ariane Locat
- Address: Laval University, Department of Civil and Water Engineering
- Phone: + 1 418-656-2992
- Email: ariane.locat@gci.ulaval.ca

Website http://www.iwlsc2025.ca

Email secretariat@iwlsc2025.ca

GEOTECH ASIA 2025 - GEOVADIS: The Future of Geotechnical Engineering, October 7th to 10th, 2025, Goa, India, https://www.geotechasia.org

Urban GeoEngineering

5th AsRTC6
"Urban GeoEngineering" Symposium
23rd & 24th of October 2025, Taipei, Taiwan
www.asrtc6urbangeoengineering2025.com/index.html

The committee of 5th AsRTC6 "Urban GeoEngineering" Symposium cordially invites you to participate and contribute papers to the conference. The symposium will focus on presenting academic and practical works in aspects of deep excavation, tunneling and urban regeneration so any paper related is welcome to be submitted. Members of AsRTC6 committee, under International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), include professions from academy and industry at various locations in Asia.

The AsRTC6 Symposium was hosted previously in Fukuoka, Japan (2015), Changsha, China (2017), Taipei, Taiwan (2019) and Bandung, Indonesia (2023). Now the 5th one will be held on the 23rd and 24th of October (Thursday and Friday) 2025 in Taipei, Taiwan. Tentatively, it is a whole day technical program symposium and half- day technical site visit will be arranged. It is also planned that a memorial lecture and a forum related to deep basement excavation of urban regeneration will be included in the symposium too.

Conference Topics

- Deep excavation and tunneling in the urban area
- Reuse of foundation or basement for urban regeneration
- Application of artificial intelligence, ground improvement and special investigation method for deep excavation and tunneling
- History of incidents caused by deep excavation and tunneling

Reach Us

Email geogroup@asrtc6urbangeoengineering2025.com

17th International Conference on Geotechnical Engineering
8th International Symposium on Geohazards
December 4-5, 2025, Lahore, Pakistan
https://17icge-8isg.com

This international event is being organized by Pakistan Geotechnical Engineering Society (PGES) in collaboration with Asian Region Technical Committee 3 (ARTC 3) of ISSMGE, being operated by Japanese Geotechnical Society (JGS). In addition support of Europe and Nordic regions has also been obtained.

It will be a two day event on December 4 and 5, December 2025 followed by a site seeing tour on December 6, 2025. It is estimated that up to 400 participants will attend the conference. There will be six sessions in the conference. A host of geotechnical celebrities from around the world will attend and present papers, addresses.

The theme of "Geotechnical Engineering" and "Geotechnology for Natural hazards" has been kept for 17ICGE & ISG to attract a diversity of quality papers from around the globe. The Conference will act as a platform for exchange of technical ideas between Clients, Consultants, Contractors and Manufacturers. Outstanding keynote lectures, presentations and technical discussions will afford opportunity to explore the advancements in geotechnical engineering.

Conference themes

Papers to be presented at the conference may be related to any aspect of geotechnical engineering. The Organizing Committee suggests the following main themes:

- Dams and Hydropower
- Field Investigations and Laboratory Testing
- Environmental Geotechnics
- Tunnelling and Underground Structures
- Problematic Soils
- Instrumentation and Monitoring
- Ground Improvement
- Liquefaction Potential and Mitigation
- Risk Assessment in Geotechnical Engineering
- Risk Preparedness and Early Warning Systems
- Geotechnical Earthquake Engineering and Site Response
- Natural Geo-Disasters and Resiliency
- Artificial Intelligence and Machine Learning for Geotechnics
- Information-Based Measures for Natural Disaster Mitigation
- Seismic Hazard and Risk Assessment
- Physical and Numerical Modeling
- Deep Excavations
- Geotechnical Analysis & Design
- Case Histories
- Forensic Geotechnical Engineering

CORRESPONDENCE ADDRESSES

Dr. Muhammad Umar, Conference Secretary
Email: 17icge-8isg@lhr.nu.edu.pk

21st International Conference on Soil Mechanics and Geotechnical Engineering Geotechnical Challenges in a Changing Environment, 14 – 19 June 2026, Vienna, Austria, www.icsmge2026.org/en

Eurock 2026
Risk Management in Rock Engineering - an ISRM Regional Symposium
14-19 June 2026, Skopje, Republic North Macedonia

Contact Person Name

Prof. Milorad Jovanovski

Email jovanovski@gf.ukim.edu.mk

ISFMG 2026 12th International Symposium on Field Monitoring in Geomechanics, 06 -10 August 2026, Indian Institute of Technology Indore, India, https://sites.google.com/view/isfmg2026/home

International Conference on
Advances and Innovations in Soft Soil Engineering 2026
24-26 August 2026, Delft, Netherlands

As global land development expands into coastal regions, offshore reclamation areas, and wetlands, the geotechnical challenges posed by soft soils are becoming more critical. These soils, including highly sensitive clays, marine silty clays, organic soils, peats, loose sands, and dredged soils, are known for their high compressibility, water content, and complex mechanical properties, making construction projects in such areas problematic. To address these challenges, soft soil engineering is evolving with innovative technologies and approaches.

This conference, organised under the auspices of the ISSMGE Technical Committee 214 on "Foundation Engineering for Difficult Soft Soil Conditions", will showcase the latest developments in testing, modelling, monitoring and construction and improvement techniques for soft soils. It will provide a platform for researchers, engineers, and industry professionals to exchange expertise and discuss how these innovations can be applied to address modern construction challenges in soft soil environments.

Contact Information

Contact person: Stefano Muraro, s.muraro@tudelft.nl

X Latin American Congress on Rock Mechanics
26 - 28 Aug, 2026, Brsasilia, Brazil

Contact Person: Marcos Massao Futai, Brazilian Committe of Rock Mechanics

13th International Conference on Geosynthetics (13 ICG)
13-17 September 2026, Montréal, Canada
www.13icg-montreal.org

The 13th International Conference on Geosynthetics (ICG) 2026, hosted by the North American Chapter of the International Geosynthetics Society (**IGS-NA**), is themed "Legacy, Evolution & Revolution in Geosynthetics." The theme reflects the many transitions occurring in the field, in our shared responsibility to climate and society, and in how we respond to the challenges and opportunities presented to us by these transitions.

International Symposium Preservation of Monuments & Historic Sitew, 16 – 18 September 2026, Athens, Greece https://tc301-athens.com

6th International Conference
on Information Technology in Geo-Engineering
JTC2 Conference
13-16 October 2026, Oslo, Norway

The 6th International Conference on Information Technology in Geo-Engineering (6th ICITG) will be an arena to discuss all topics related to the ongoing digital transformation in Geo-Engineering. Case studies of IT in Geo-Engineering, integration of digital systems (Scan2BIM, BIM2FEM, etc.), benchmark datasets, information modelling, monitoring technology and artificial intelligence are some of the key topics of the 6th ICITG. It is organized under the auspices of the Joint Technical Committee 2 (JTC2) on "Representation of Geo-Engineering Data" of the Federation of International Geo-Engineering Societies (FedIGS).

Contact: Joint Technical Committee 2 (JTC2), Norwegian Geotechnical Institute, Graz University of Technology, georg.erharter@ngi.no

ARMS14
14th Asian Rock Mechanics Symposium -
ARMS14, an ISRM Regional Symposium
22-26 November 2026, Fukuoka, Japan

Contact Person Name
Yasuhiro Mitani mitani@doc.kyushu-u.ac.jp
Telephone +81 92 8023399
Address 744, Motooka, Nishi-ku Fukuoka Japan

16th International Congress on Rock Mechanics
Rock Mechanics and Rock Engineering
Across the Borders
17-23 October 2027, Seoul, Korea

Scope

The scope of the Congress will cover both conventional and emerging topics in broadly-defined rock mechanics and rock engineering. The themes of the Congress include but not be limited to the following areas:

- Fundamental rock mechanics
- Laboratory and field testing and physical modeling of rock mass
- Analytical and numerical methods in rock mechanics and rock engineering
- Underground excavations in civil and mining engineering
- Slope stability for rock engineering
- Rock mechanics for environmental impact
- Sustainable development for energy and mineral resources
- Petroleum geomechanics
- Rock dynamics
- Coupled processes in rock mass
- Underground storage for petroleum, gas, CO2 and radioactive waste
- Rock mechanics for renewable energy resources
- Geomechanics for sustainable development of energy and mineral resources
- New frontiers & innovations of rock mechanics
- Artificial Intelligence, IoT, Big data and Mobile (AICBM) applications in rock mechanics
- Smart Mining and Digital Oil field for rock mechanics
- Rock Engineering as an appropriate technology
- Geomechanics and Rock Engineering for Official Development Assistance (ODA) program
- Rock mechanics as an interdisciplinary science and engineering
- Future of rock mechanics and geomechanics

Our motto for the congress is "Rock Mechanics and Rock Engineering Across the Borders". This logo embodies the interdisciplinary nature of rock mechanics and challenges of ISRM across all countries and generations.

ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

The evolution of slope failure in a large open pit coal mine

A Google Earth archive documents the evolution of slope failure the Fushun Wet OPM in China

I recently came across an interesting paper in the *Bulletin of Engineering Geology and Environment* (Hu *et al.* 2024) that explores the prediction of the time to failure of large slopes in an open pit coal mine in China. The paper is focused on the Fushun west open pit mine (Fushun West OPM), located in Fushun City in Liaoning Province. This is an astonishing site, the largest open pit mine in Asia, extending over a distance of 6.6 km from east to west and 2.2 km north – south. The mine is up to 420 m deep.

At the Fushun West OPM, slope failures have been a regular, and large-scale, problem. The paper features three case studies in which Hu *et al.* (2024) seek to understand the viability of time to failure prediction for the open pit wall slopes. They have documented a large number of failures, starting from 1927.

One of the interesting aspects of this site is that there is a good archive of Google Earth imagery. This provides interesting insights into the progression of failure. One landslide in particular captured my attention, located at [41.8468, 123.8840]. I first wrote about this back in 2022, but it is interesting to look at the progression of failure in more detail.

The first Google Earth image that captures this landslide, located on the northern wall of the Fushun West OPM, is in May 2014:-

Google Earth image from May 2014 showing the failure at Fushun West OPM.

At the time that this image was collected, this slope failure was about 340 m long. There is a further image in November 2014, which slows that the landslide had started to retrogress, and that the toe of the slide had extended into the pit:-

Google Earth image from November 2014 showing the failure at Fushun West OPM.

By October 2016 the situation with this slope had deteriorated considerably. The failure had extended laterally to a very significant degree, and there was considerable retrogression:-

Google Earth image from October 2016 showing the failure at Fushun West OPM.

The scale of the landslide at this point was remarkable – it was about 900 m from the crown to the toe and 600 m wide at the midslope point. The landslide had retrogressed to the top of the pit wall, and was threatening buildings and roads on around the mine.

By August 2017, the slope had retrogressed further, and was causing substantial damage to infrastructure around the mine:-

Google Earth image from August 2017 showing the failure at Fushun West OPM.

It's clear that at this point considerable engineering work was being undertaken to try to arrest the failure, and the problem did not get any worse thereafter.

This is really great case study of the way that a comparatively small initial failure can turn into a major issue if it is not addressed at an early stage.

Interestingly, Hu *et al.* (2024) note that landslide occurrence at the Fushun West OPM peaked in the period between 1980

and 2000, but has reduced since. Presumably, this is an indication that management of the slopes improved in recent years.

Reference

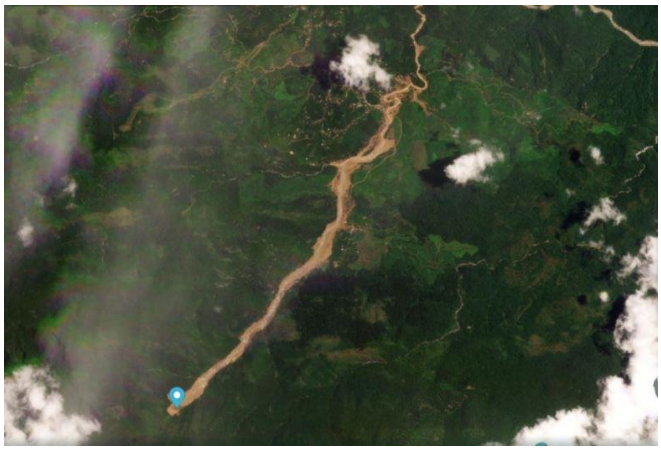
Hu, J., Sun, S., Li, Y. *et al.* 2024 Landslide failure time prediction with a new model: case studies in Fushun west open pit mine, China. *Bulletin of Engineering Geology and the Environment* **83**, 411. https://doi.org/10.1007/s10064-024-03902-8

(Dave Petley / Eos, 10 October 2024, https://eos.org/thelandslideblog/fushun-west-opm-1)

A first analysis of the 30 July 2024 Wayanad landslide

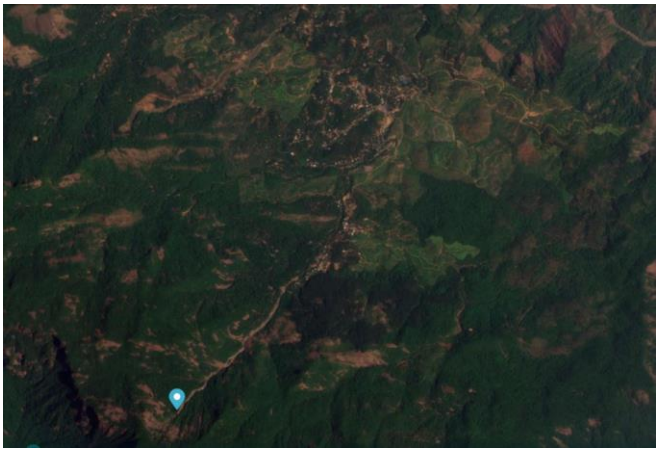
A new paper in the journal Landslides (Das 2024) provides a first analysis of the chanelised debris flow that killed at least 350 people.

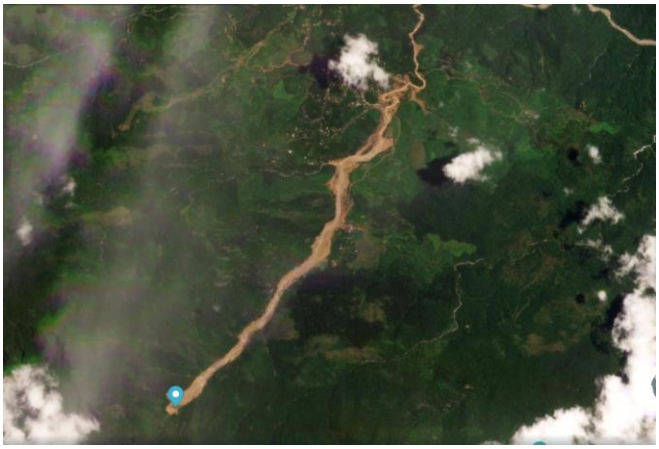
One of the most significant landslide events of 2024 to date occurred on 30 July in western India. On this date, heavy rainfall triggered multiple landslides in Kerala, of which the most significant was the so-called Wayanad landslide. Immediately after the disaster, I posted an initial report, followed by a more reflective piece and finally a Planet Labs image of the site. As a reminder, this is the Planet Labs image (the marker indicates the landslide source):-



Planet Labs image of the 30 July 2024 landslide at Wayanad in Kerala, India. Image copyright Planet Labs, used with permission, captured on 12 August 2024.

I also provided a rough image compare with another Planet Labs image, captured on 6 March 2024:-





As always, my blog posts are provisional, with the definitive reports coming from the peer reviewed literature. The journal *Landslides* has just posted a paper (Das 2024) that provides a first proper analysis of the Wayanad landslide (which is also known as the Vellarimala landslide).

Das (2024) examines the rainfall event that triggered the failure. A local rain gauge, at Thettamala, recorded 409 mm of rainfall in the 24 hours up to 8:30 am on 30 July (the landslide occurred at 2 am that day), an unusually high total even in the monsoonal area.

The resultant landslide extended 8 km, having started in a source area that had suffered previous failures. The surface area of the source zone was 86,000 m^2, comprising of shallow, weathered deposits. This initial failure transitioned into a channelised debris flow, which in places had a depth of 7.5 metres. It is unsurprising that the impact on the communities located along the channel was devastating, most notably on Chooralmala, which lay directly in the path of the flow.

Das (2024) considers the factors that played in a role in the causation of the Wayanad landslide. Key issues may have been the loss of forests, the nature of the geology and the steep topography. This requires a more detailed analysis in due course.

The paper also briefly considers the psychological impact of the landslide on the survivors:-

"Survivors, many of whom are grappling with severe physical injuries, face an even greater battle against the mental trauma that now haunts them. For those who have lost everything, including their loved ones, the path to recovery seems impossible. Sleepless nights and a crippling fear of rain will now a part of their reality. While discussions around rehabilitation are ongoing, the psychological scars of such a disaster cannot be easily mended. The Kerala Health Department deployed a 121-member team of psychiatrists, clinical psychologists, psychiatric social workers, and counselors

soon after the disaster to provide immediate and long-term mental health support."

This is a much neglected topic for disasters in general, and landslides specifically. A rainfall induced catastrophic debris flow at 2 am is a horrific prospect – it is unsurprising that the survivors will be traumatised in subsequent monsoon rainfall.

References

Das, R. 2024. Catastrophic landslide in Wayanad district of Kerala, India on July 30, 2024: A complex interplay between geology, geomorphology, and climate. *Landslides*. https://doi.org/10.1007/s10346-024-02385-8

Planet Team 2024. Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. https://www.planet.com/

(Dave Petley / Eos, 17 October 2024, https://eos.org/the-landslideblog/wayanad-4)

Mapping Landslide Risk in the United States and Puerto Rico

A new method provides highly accurate continental-scale landslide susceptibility maps that are being used in the aftermath of Hurricane Helene.

Living in a landslide-prone region means facing the dangers and damage that may occur when a slope fails. Communities that understand their risk for such events can be better prepared to save both infrastructure and lives.

Susceptibility maps help with this by showing where terrain and environmental conditions may make landslides more likely. However, current U.S. susceptibility maps focus mostly on steep, high-risk areas, offering little detail on or underestimating risk for gently sloping regions. Such regions—including parts of North Carolina that were recently devastated by Hurricane Helene—can still experience landslides and are more likely than steeper areas to host infrastructure and other development.

Using a U.S. Geological Survey (USGS) database of 613,724 landslide events, *Mirus et al.* developed a high-resolution (10-meter grid size) map to detail the landslide hazard risk throughout all 50 U.S. states and Puerto Rico. (Other U.S. territories didn't have sufficient topographic data or landslide inventories to be included.)

By combining this national data set with high-resolution topographic data, the researchers developed four threshold models—a type of model that can help determine which combinations of factors lead to a particular outcome. In this case, the models used the relationship between slope (or steepness) and relief, or the difference in elevation between an area's highest and lowest points, to determine landslide potential. They then reduced the resolution to a 90-meter grid size to account for uncertainty at larger scales and tested how well each model could differentiate susceptibility in different landslide-prone areas.

The best-performing model captured 99% of recorded landslides. The researchers then ran the model using landslide data sets from specific states, based on an additional 172,367 events. The model performed well with these data sets, too, but it showed more variability by region. Using these outcomes, the researchers created a more accurate national-scale map that highlights areas at greater risk for landslides in the future.

The new map could become a valuable tool to boost hazard mitigations, particularly in regions where stakeholders are not yet aware of their landslide risk. Already, in the wake of Hurricane Helene, USGS has combined the hazard map with rainfall data from the National Weather Service to aid ongoing search and rescue operations. (*AGU Advances*, https://doi.org/10.1029/2024AV001214, 2024)

Citation: Owen, R. (2024), Mapping landslide risk in the United States and Puerto Rico, *Eos, 105,* https://doi.org/10.1029/2024EO240462. Published on 22 October 2024.

(Rebecca Owen (Science Writer) / Eos, 22 October 2024, https://eos.org/research-spotlights/mapping-landslide-risk-in-the-united-states-and-puerto-rico)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ & ΑΝΤΙΣΕΙΣΜΙΚΗ ΜΗΧΑΝΙΚΗ

The weird way the Los Angeles basin alters earthquakes

Los Angeles sits above an enormous bowl of sediment that alters how seismic waves move under the city (Credit: Getty Images)

Southern California has been shaken by two recent earthquakes greater than magnitude 4.0. The way they were experienced in Los Angeles has a lot to do with the sediment-filled basin the city sits upon.

A little over an hour after sunset on 6 August 2024, a sparsely populated belt of farmland near Bakersfield, Southern California, was shaken from a restful evening. A magnitude 5.2 earthquake, followed by hundreds of smaller aftershocks, shuddered through the area as a fault near the southern end of the Central Valley ruptured.

It wasn't a terribly unusual event, by California's standards. The state is the second-most seismically active in the United States behind Alaska, with Southern California experiencing an earthquake on average every three minutes. While most are too small to be felt, around 15-20 events exceed magnitude 4.0 each year.

This latest magnitude 5.2 earthquake is the largest to hit Southern California in three years. The epicenter was about 17 miles (27km) south of Bakersfield, California, and people reported shaking nearly 90 miles (145km) away in portions of Los Angeles and as far away as San Diego. Then, a few days later, another jolt rattled the Los Angeles area due to a rupture on a small section of the dangerous Puente Hills fault system. The resulting magnitude 4.4 earthquake had its epicentre just four miles northeast of the city's downtown area.

Although there was minimal damage caused by both quakes, they have highlighted just how the geology under California's largest city can alter the effects of fault movements in the area. The relatively shallow depth of the 6 August earthquake appeared to create more intense or prolonged shaking in some parts of the city, while others felt almost nothing at all.

While there are various reasons for why this might be – including what people were doing at the time of the earthquake – the enormous five-mile-deep (8km), sediment-filled basin that LA is built upon plays a surprising role in the effects felt above ground.

The travelling earthquake

While the ground feels steadfast at the surface, deeply buried bedrock can resemble a shattered window pane. These cracks, or faults, are where earthquakes occur. Faults are put under tremendous stress by the slow and steady movement of the Earth's tectonic plates.

In California, the North American plate and the Pacific Plate are grinding past each other along the infamous San Andreas fault, averaging about 30-50 millimeters (1-2 inches) every year. The movement is anything but fluid. Cracked rocks are rough and wedge against each other, sometimes staying stuck for thousands of years. Over time, stress created by the slow marching tectonic plates builds – when the fault reaches its stress limit, it "slips" and ruptures, causing an earthquake.

A rupture begins at one location and travels in one direction along the fault, stretching up to hundreds of kilometers. The longest rupture ever recorded was a 994 mile (1,600km) portion of a fault that caused the Great Sumatra-Andaman earthquake and resulting tsunami on Boxing Day 2004. "The farther it goes, the longer [the earthquake] lasts, and the more energy that's released. So the longer the fault, the bigger the earthquake," explains seismologist Lucy Jones, a researcher at the California Institute of Technology and former seismologist with the US Geological Survey.

During an earthquake, the stored energy saved within the sticky fault is released suddenly. Seismic waves radiate out from the rupture like the ripples created by throwing a rock into a pond, spreading in all directions through the surrounding rock and earth.

The magnitude of an earthquake tells scientists about the length of the ruptured fault as well as the duration of shaking, says Jones. But the intensity of an earthquake – the ground motions we feel at a location – is shaped by how close we are to the epicenter, which direction the fault ruptured, and the geological layers under our feet.

Geology-induced complications

Los Angeles is located south of a giant a bend in the San Andreas fault where the plate boundary clearly changes direction. "If you see it from the air, it's amazing," says Jones. "It's so bizarre – you can look down and see the fault valley and then it just turns."

Around the turn, the region is chock full of faults. Over millions of years, the faults churned and pushed slabs of bedrock into multiple mountain ranges and deep basins. Gravity, water and wind act like sandpaper, wearing down the mountains, and carrying the debris into the basins. Over time, the basins have been filled with sediment.

The bowl-shaped basin of rock under Los Angeles is up to five miles (8km) deep, filled with a mixture of gravel, sand and clay. The contrast between the hard rock and softer sediment are big factors that cause some seismic weirdness for cities like Los Angeles.

During an earthquake, seismic waves are modulated by geology, says John Vidale, professor of seismology at University of Southern California. "The primary factor is just how hard is the ground and how deep is the structure that has soft [material] near the surface," he says. Seismic waves will move faster in denser material like rock, versus softer and less dense sediment.

As seismic waves travel through the basin, their behaviour changes when they encounter the loose sediment. "[The wave] is now having to travel at a much slower speed, but it still has to carry the same amount of energy per unit time,"

said Jones. As the wave slogs through the sediment, the amplitude, or wave height, gets bigger.

Put another way, imagine the Los Angeles basin as a giant bowl of jelly – the dense rocky mountains and underlying rock make up the bowl, while the sediment fill is represented by the gelatinous mixture. "If you shake the bottom [of the bowl] a little bit, the top flops back and forth quite a bit," says Vidale. And atop this quivering mass of jelly is the megacity of Los Angeles.

The San Andreas fault between the Pacific and North American tectonic plates is clearly visible from the air in places (Credit: Getty Images)

This means the amplitude of the waves within a basin can be significantly bigger than those moving through rock. In one study, researchers using earthquake measurements in the Los Angeles region from the 1992 Landers earthquake found that seismic waves inside the Los Angeles basin were three to four times larger than sites outside the basin.

In addition to amplification, seismic waves can also reverberate within a sediment-filled basin. Think back to that shaking bowl of jelly and how the flopping top bounces off the sides of the bowl. Scientists from the Statewide California Earthquake Center simulated earthquakes in the Los Angeles region and found that the basin can trap seismic wave energy in a similar way. This reverberation can mean shaking can often go on for longer than the duration of the fault rupture itself, increasing the hazard for the city built on top.

As if that wasn't enough for Los Angeles, the close proximity of the San Bernadino and San Gabriel Basins to the Los Angeles Basins can create a funneling effect, directing seismic waves towards Los Angeles.

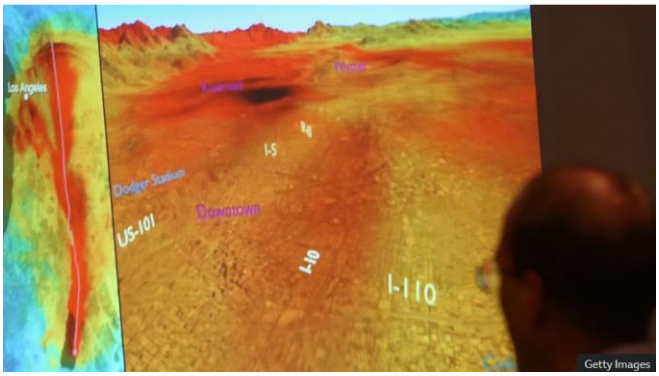
Even within a basin, there can be differences in how the sediment interacts with seismic waves. "There's variability in the shaking… there's variations in the geology," says Vidale. Sediment in the upper 330ft (100m) of the basin tends to be looser and less dense than the deeper, compacted sediment below. Sediment changes can also happen quickly at the surface. "Old stream channels, for example, can be filled with a kind of wet, soft material," Vidale says. "So, if you happen to be in an old stream channel, you'll get hit a lot harder than somebody even a quarter mile away that's on firmer ground."

Even those in the same house can have different experiences, especially if the earthquake is on the smaller side. "I'm in Pasadena, on the sediment in the San Gabriel Valley," say Jones. Despite both being in the house, she and her husband had different experiences of the earthquake on 6 August. "I felt it, my husband didn't," she says.

Basins, basins everywhere

While the city of Los Angeles ticks a lot of seismic hazard boxes, it is not the only urban center that needs to worry. Throughout human history, people have tended to build cities on flat ground near water bodies.

It just so happens that these sites tend to form above geologic basins and sometimes near faults.



Scientists are trying to better understand how large earthquakes will propagate through the LA basin to assess where the risk of damage is greatest (Credit: Getty Images)

While the US has a few famous cities built on basins – Seattle, Portland, and Salt Lake City – there are many others around the world that experience amplified seismic waves due to where they are situated. After the European settlers drained Lake Texcoco in the 1500s, Mexico City was built on the flat, old lake bottom. In 1985 and 2017, the city experienced significant damage from earthquakes that shook the basin sediments.

The desert megacity of Tehran in Iran also sits atop a geologic basin filled with river sediments, and there is growing concern about the risk of a major earthquake in the area.

Understanding the earthquake risk is the first step in bolstering protection for a city against significant shaking. Enacting robust building codes can be another way to protect people and infrastructure, but it often takes a major event for stricter regulations to be implemented. After the devastating earthquake in 1985, for example, Mexico City enacted stringent building codes, and retrofitted older buildings.

"The very first earthquake codes [in California] went in after the 1933 Long Beach earthquake," adds Jones. At that time, schools were built out of firesafe, unreinforced brick. "Seventy schools were completely destroyed – luckily, it was at six o'clock at night," says Jones. The horror of collapsing schools spurred regulation, but initial codes were meagre. "They basically just said, 'don't build unreinforced masonry in California'. That was sort of the first basic code."

Today, assessing earthquake risks is a lot more nuanced.

In the US, a team of seismologists, geoscientists, and geophysicists have created a seismic hazard map, showing the chances of a damaging earthquake shaking in the next 100 years. In their latest version of the report, the team found that that nearly 75% of the US could experience damaging shaking. To help policymakers and engineers, the team included information on the implications for building and structural designs.

While building codes can protect lives, scientists like Jones want building codes to go further. Designing buildings so they can be more easily repaired rather than needing to be demolished would cost an extra 1% in the construction phase, Jones estimates. "We're calling it 'functional recovery'," she says.

"We are trying to say that 'just not killing you' is an insufficient standard. The reality is, if your building's badly damaged and now has to be torn down after the earthquake, you've hurt your tenants, you've hurt your neighbors, you've hurt the local economy."

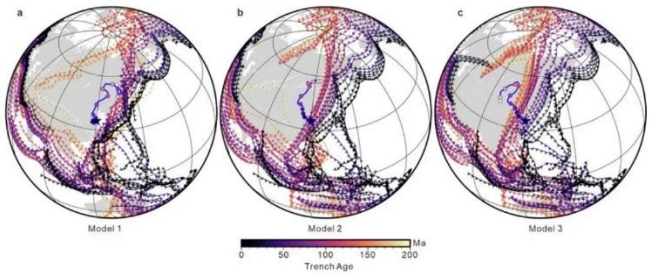
Fortunately, the buildings of Los Angeles rode out the latest quakes to rattle Southern California pretty well. But at some point, the city won't be so lucky.

(Sarah Derouin / BBC, 18 August 2024, https://www.bbc.com/future/article/20240816-california-earthquakes-why-the-los-angeles-basin-is-like-a-bowl-of-jelly)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΓΕΩΛΟΓΙΑ

Ancient Earth's crust breaking down, altering the planet's geological history

Earth's oldest continental crust, once believed to be geologically stable, has been gradually eroding over the past 200 million years due to tectonic shifts and mantle processes. Research led by Professor Shaofeng Liu of the China University of Geosciences into the North China Craton suggests that similar tectonic forces may have impacted other cratons worldwide, including those in North and South America. The gradual disintegration of these ancient cratons could alter Earth's geological stability and potentially affect long-term environmental conditions.



The global plate reconstructions used in this study.
Image credit: Liu, S., Zhang, B., Ma, P. et al.

- This discovery challenges the previously accepted notion that the Earth's earliest crust has remained largely unchanged throughout its history.

- The team used four-dimensional mantle flow models, seismic tomography, and geochemical analysis to track lithospheric deformation and subduction-driven erosion of the NCC.

Scientists discovered evidence that the Earth's oldest continental crust is progressively eroding. These ancient structures were previously assumed to be geologically stable and resistant to alteration.

Subduction and mantle plumes have been proposed as potential causes for the disintegration of Earth's ancient crust, though the exact mechanisms remain elusive.

Subduction occurs when a denser tectonic plate is forced beneath another, melting in the mantle, while mantle plumes rise from deeper layers to erode the crust thermally.

A thorough analysis was conducted by the team in the North China Craton (NCC), examining its disintegration over the last 200 million years with advanced four-dimensional mantle flow models.

The researchers investigated how surface topography, lithospheric deformation, and seismic tomography have changed since the middle Mesozoic (around 168 million years ago).

They found two critical stages in the NCC's distortion. The first entailed the subduction of the oceanic Izanagi plate, which forced the crust of the overriding Eurasian plate to thicken, resulting in topographic highs such as the Taihang Mountains.

The second stage was distinguished by the rollback of the subducting plate, which resulted in lithospheric weakening and, eventually, craton breakup. This rollback allowed for lithospheric extension, which resulted in a 26% thinner crust.

Seismic tomography confirmed the findings, revealing a 4 000 km (2 485 miles) wide slab deep within the mantle transition zone.

This was reinforced further by volcanic rock records that revealed recycled carbonates from the subducted slab, resulting in carbonated peridotite, a vital indicator of mantle activeities. Over millions of years, the mantle wedge formed by this rollback dissipated.

"The North American craton, South American craton, and the Yangtze craton in China may have experienced similar deformation. All of these may have experienced early flat-slab subduction. However, intense subsequent rollback subduction might have occurred in the Yangtze craton. In contrast, the North American craton underwent trench retreat following flat-slab subduction but did not exhibit significant slab rollback," Shaofeng study's lead author said.

This discovery calls into question the long-held belief that Earth's earliest crust has stayed relatively intact throughout its history.

This study is significant because the continental crust is essential for supporting life and ensuring stable environmental conditions on Earth.

Its slow collapse could have far-reaching consequences for the planet's geological stability and long-term evolution. Understanding these processes allows geologists to understand better how the Earth's surface has evolved and will continue to evolve.

The findings were published on September 6, 2024, in the journal Nature Geoscience, after years of research and analysis.

While the continental crust's disintegration process has lasted millions of years, the study focuses on proving this continuous breakdown, which is still occurring today.

The study used three global plate reconstruction models along with many other methods. Model 1 (230 Ma to the present) is based on previous rigid plate models, while Model 2 (250 Ma to the present) incorporates a deforming plate model. Model 3 extends back to 410 Ma and introduces the Mongol–Okhotsk Ocean (MOO) closure.

The CitcomS package was used for global mantle flow models, solving thermal convection problems in the mantle. These models incorporated tectonic history, subduction zones, and the evolving thermal structure of the lithosphere. Different cases were tested to explore variations in viscosity layering and subduction angles, providing insights into dynamic topography.

Stratigraphic backstripping was used to identify residual subsidence, a long-wavelength component of the basin's tectonic subsidence. This was essential in regions like the Ordos Basin and Yanshan area, where tectonic subsidence was influenced by continental thinning and thermal contraction.

The research was led by Shaofeng Liu of the State Key Laboratory of Geological Processes and Mineral Resources, Frontiers Science Center for Deep-time Digital Earth, and School of Geosciences and Resources, China University of Geosciences (Beijing), Beijing.

An international team that included academics from the China University of Geosciences (Beijing), California Institute of Technology, Pasadena, University of Tasmania, Hobart,

and the Taiyuan University of Technology, Taiyuan, collaborated in this research.

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[1] Craton deformation from flat-slab subduction and rollback – Liu, S., Zhang, B., Ma, P. *et al.* – *Nat. Geosci.* 17, 936–943 (2024) – September 6, 2024 – https://doi.org/10.1038/s41561-024-01513-2 — OPEN ACCESS

(Harsha Borah / THE WATCHERS, Thursday, October 10, 2024, https://watchers.news/2024/10/10/ancient-earths-crust-breaking-down-altering-the-planets-geological-history)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

What's the difference between a tsunami and a tidal wave?

Tsunamis and tidal waves are the powerful types of wave on Earth, but very different processes are involved in their formation.

The 2011 tsunami wave hitting the coast of Minamisoma in Fukushima prefecture. (Image credit: -/JIJI PRESS/AFP via Getty Images)

Tidal waves and tsunamis — the two most powerful types of wave on Earth— are often confused in popular discourse. While the terms are sometimes used synonymously, tidal waves and tsunamis actually have distinct causes.

"The English term tidal wave dominated until the 2004 Indian Ocean tsunami, partly because most tsunami observations until then described water phenomena that resembled fast advancing or fast-receding tides," Costas Synolakis, director of the Tsunami Research Center at the University of Southern California, told Live Science. "In 2004, we got access to several videos from the tsunami in Indonesia and Thailand, and realized that giant tsunamis do not resemble tides."

Tidal waves are caused by the gravitational interaction between Earth and the moon — and to a lesser extent, the sun. These waves are products of the tidal patterns that result in daily low and high tides in coastal areas, meaning they are generally predictable, correlating to the phases of the moon.

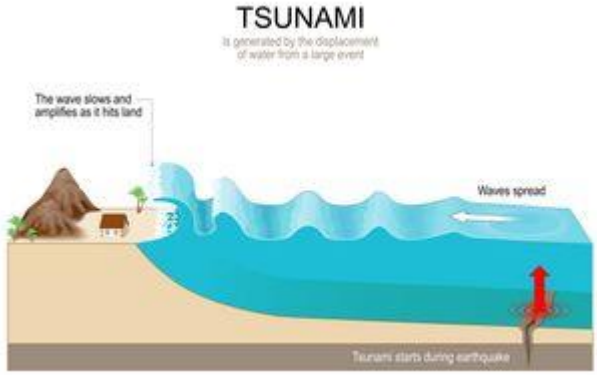
Tides are highest during the new moon — when the moon is between Earth and the sun; and the full moon, when Earth sits between the moon and the sun.

The moon's gravity exerts a greater force on the regions of Earth closest to the moon, which pulls on water there, causing the ocean to rise in a bulge. Meanwhile, oceans on the side of Earth opposite the moon also experience a bulge due to inertia — the natural tendency of a moving object to keep moving or a motionless object to remain motionless. The water moving away from the moon resists the gravitational forces that attempt to pull it in the opposite direction.

These two bulges move around Earth as our planet rotates and the moon orbits us, meaning most regions experience high tide twice every 24 hours and 50 minutes. Low tides, meanwhile, occur in the areas that are not either closest or farthest from the moon.

A tidal wave may stretch for thousands of miles. In many cases, tidal waves are small. But certain geographic features, such as narrow inlets and river mouths, can concentrate the energy of tides, creating enormous waves in some areas.

Tidal waves, however, are no match for the destructive force of tsunamis — a term meaning "harbor wave" in Japanese. Unlike tidal waves, tsunamis are largely unpredictable. They result from underwater earthquakes, landslides, volcanoes and even meteorites.



(Image credit: ttsz/Getty Images)

Underwater earthquakes at subduction zones, where one continental plate slides beneath another, frequently cause large tsunamis. Earthquakes with a magnitude of 6.5 or greater that occur at relatively shallow depths and lift Earth's crust are likely to cause tsunamis. In addition, volcanoes and landslides — either underwater or on land adjacent to the ocean — result in the movement of large amounts of magma and rocks that can trigger tsunamis. These events may be missed by early detection systems, Synolakis said.

The force from events like these displaces water, and the energy from that displacement propagates as a wave. Tsunamis can be local, regional or distant, depending on the magnitude. Tsunamis may result from events that occur close to where the wave hits the shoreline but can also occur thousands of miles away.

(Image credit: MCCAIG/Getty Images)

Tsunamis may be barely visible, raising the ocean's surface by mere inches. But they can travel at speeds of 500 mph (800 km/h). Periods range from a few minutes to two hours. While the shallower depths near coastlines slow the waves down, they increase the height because the waves following the initial wavefront catch up, adding force behind it. This phenomenon accounts for the massive walls of water that can occur as tsunamis make landfall.

Because tsunamis are largely unpredictable, people in vulnerable coastal areas may have only a few minutes of warning to get to higher ground. Some of the largest tsunamis

have created waves that inundated areas several miles inland. In the wake of the devastating 2004 Indian Ocean tsunami, which resulted in nearly 230,000 deaths, sensors were installed in at-risk regions to create an early warning system.

"Tsunamis are monitored with the Deep-ocean Assessment and Reporting of Tsunamis (DART) system. This is a network of offshore buoys which relay a signal from ocean floor pressure recorders to the ocean surface then to satellites, which in turn relate the signal to the warning centers," Synolakis said. But the system is far from perfect.

"The problem is that now about 50 DARTs cover the Pacific and Indian Oceans. About half work at any given time. We need at least 150 distributed around the world's oceans for an effective system with targeted warnings," he said.

(Richard Pallardy / LIVESCIENCE, 28 October 2024, https://www.livescience.com/planet-earth/rivers-oceans/whats-the-difference-between-a-tsunami-and-a-tidal-wave)

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

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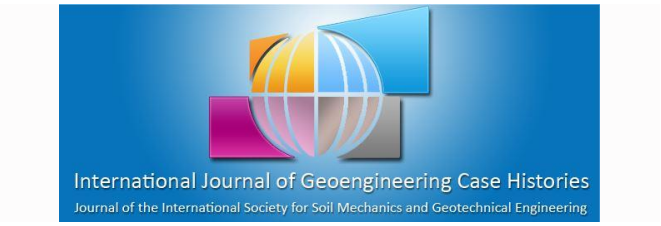

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Πρόεδρος	:	Μιχάλης ΜΠΑΡΔΑΝΗΣ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Α.Ε. mbardanis@edafos.gr, lab@edafos.gr
Α' Αντιπρόεδρος	:	Σταυρούλα ΚΟΝΤΟΕ, Δρ. Πολιτικός Μηχανικός, Αναπληρώτρια Καθηγήτρια Τμήμα Πολιτικών Μηχανικών Πανεπιστήμιο Πατρών skontoe@upatras.gr
Β' Αντιπρόεδρος	:	Νίκος ΚΛΗΜΗΣ, Δρ. Πολιτικός Μηχανικός, Καθηγητής Τμήμα Πολιτικών Μηχανικών, Πολυτεχνική Σχολή, Δημοκρίτειο Πανεπιστήμιο Θράκης nklimis@civil.duth.gr, nsklimis@gmail.com
Γενικός Γραμματέας	:	Γιώργος ΜΠΕΛΟΚΑΣ, Δρ. Πολιτικός Μηχανικός, Επίκουρος Καθηγητής Τμήμα Πολιτικών Μηχανικών Σχολή Μηχανικών Πανεπιστημίου Δυτικής Αττικής gbelokas@uniwa.gr, gbelokas@gmail.com
Ταμίας	:	Γιάννης ΖΕΥΓΩΛΗΣ, Δρ. Μηχανικός Μεταλλείων - Μεταλλουργός, Αναπληρωτής Καθηγητής Σχολή Μεταλλειολόγων - Μεταλλουργών Μηχανικών ΕΜΠ izevgolis@metal.ntua.gr
Έφορος	:	Τάσος ΑΝΑΣΤΑΣΙΑΔΗΣ, Δρ. Πολιτικός Μηχανικός, Καθηγητής Τμήμα Πολιτικών Μηχανικών Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης anas@civil.auth.gr
Μέλη	:	Γιώργος ΝΤΟΥΛΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε.- ΓΕΩΤΕΧΝΙΚΕΣ ΜΕΛΕΤΕΣ Α.Ε. gdoulis@edafomichaniki.gr Μαρίνα ΠΑΝΤΑΖΙΔΟΥ, Δρ. Πολιτικός Μηχανικός, Αναπληρώτρια Καθηγήτρια Σχολή Πολιτικών Μηχανικών Ε.Μ.Π. mpanta@central.ntua.gr Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. editor@hssmge.gr, ctsatsanifos@pangaea.gr
Αναπληρωματικά Μέλη	:	Δημήτρης ΠΙΤΙΛΑΚΗΣ, Δρ. Πολιτικός Μηχανικός, Αναπληρωτής Καθηγητής Τμήμα Πολιτικών Μηχανικών Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης dpitilakis@civil.auth.gr Χρήστος ΣΤΡΑΤΑΚΟΣ, Πολιτικός Μηχανικός, NAMALAB Α.Ε. stratakos@namalab.gr Χάρης ΛΑΜΑΡΗΣ, Πολιτικός Μηχανικός, ΧΑΡΗΣ Π. ΛΑΜΑΡΗΣ ΚΑΙ ΣΥΝΕΡΓΑΤΕΣ ΙΚΕ h.lamaris@lamaris.gr Πρόδρομος ΨΑΡΡΟΠΟΥΛΟΣ, Δρ. Πολιτικός Μηχανικός prod@central.ntua.gr
Εκδότης	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. editor@hssmge.gr, ctsatsanifos@pangaea.gr

ΕΕΕΕΓΜ

Τομέας Γεωτεχνικής
ΣΧΟΛΗ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ
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Πολυτεχνειούπολη Ζωγράφου
15780 ΖΩΓΡΑΦΟΥ

Τηλ. 210.7723434
Τοτ. 210.7723428
Ηλ-Δι. secretariat@hssmge.gr ,
geotech@central.ntua.gr
Ιστοσελίδα www.hssmge.org (υπό κατασκευή)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» Εκδότης: Χρήστος Τσατσανίφος, τηλ. 210.6929484, τοτ. 210.6928137, ηλ-δι. ctsatsanifos@pangaea.gr, editor@hssmge.gr, info@pangaea.gr

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