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ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

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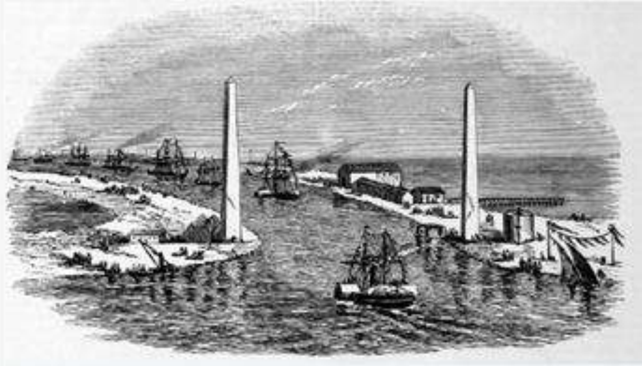
ΑΡΘΡΑ

December 1869: The Suez canal opens



140 years after its construction, the Suez canal remains one of the most impressive and important thoroughfares on the planet. And The Engineer announced its opening in a suitably triumphant tone. "The Suez Canal has been blessed; the Suez Canal has been opened; the Suez Canal is a constructive success."

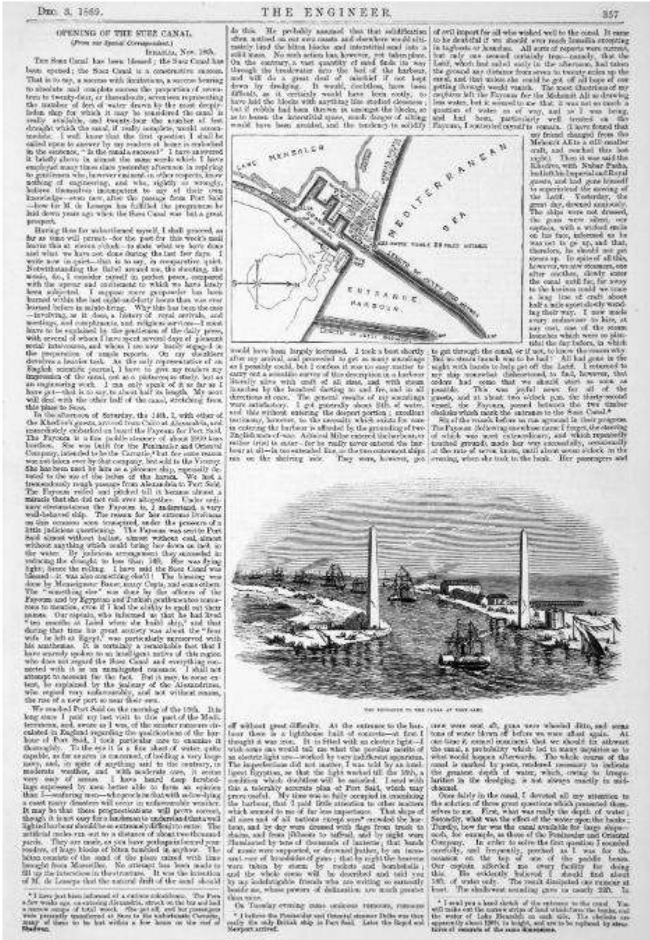
"I write now in quiet, that is to say comparative quiet," wrote our correspondent. "Notwithstanding the Babel around me, the shouting, the music, etc, I consider myself in perfect peace, compared with the uproar and excitement to which we have lately been subjected. I suppose more gunpowder has been burned within the last eight and 40 hours than was ever burned before in salute-firing."

Verily engineers can work wonders with this little earth of ours!

The hullabaloo soon gave way to nervousness as the first ships entered the canal. "The great day dawned anxiously," the article continued, "we saw steamers, one after another, slowly enter the canal until far, far away to the horizon we could trace a long line of craft slowly wending their way…'

The opening of the canal was not without teething problems and a number of ships ran aground, but this didn't dampen *The Engineer*'s enthusiasm for the project. 'As I conclude this letter,' wrote the magazine's correspondent, 'I am looking upon the waters of Lake Timseh, in the midst of the land of Goshen. A few months ago it was dry… now it forms a magnificent sheet of salt water — an inland sea. And on its calm bosom lies over 40 ships… 40 ships in the midst of the desert — in the barren and dry land where no water was! Verily engineers can work wonders with this little earth of ours!"

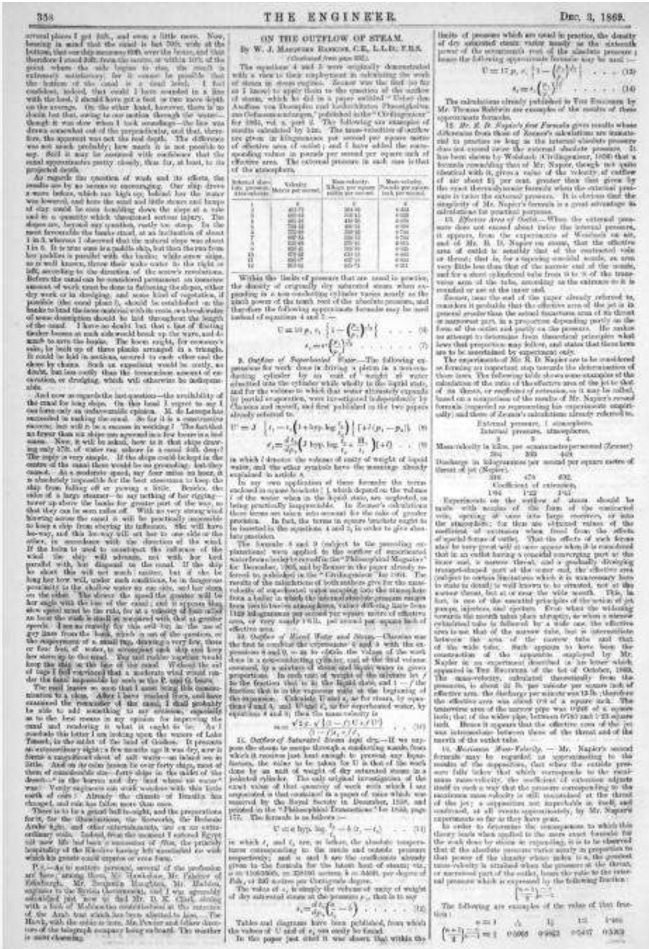
(Jon Excell / THE ENGINEER, 07 Dec 2009, https://www.theengineer.co.uk/content/archive/december-1869-the-suez-canal-opens)



Dec. 3, 1869. THE ENGINEER. 357

OPENING OF THE SUEZ CANAL.

(From our Special Correspondent.)



358 THE ENGINEER. Dec. 3, 1869.

ON THE OUTFLOW OF STEAM.

How we uncover the mysteries of expansive soils

Maria Konstantinou | Harry van Essen

Tens of thousands of homeowners living on expansive clay soil are at risk of foundation damage. This clay swells when it rains and shrinks considerably during droughts, causing serious damage to houses and foundations. By investigating the properties of this clay and mapping the locations, Deltares is laying the foundation for a risk assessment system.

Houses with a foundation on natural ground ('fundering op staal' in Dutch) that are at risk due to the swelling and shrinking of the clay in the subsoil are located in various places in the Netherlands, from Groningen to Limburg and from Utrecht to the river area. Since the extremely dry summer of 2018, the number of reports of foundation damage from these areas has increased by 25 per cent. The actual number of damage cases is probably much higher.

The risk assessment system Deltares works on clearly identifies areas where foundations are most vulnerable and which precautions can be implemented to prevent damage. These precautions include measures for homeowners. Additionally, by supporting the development of national or European standards, engineers and authorities can make informed decisions to prevent costly damage.

Enormous force

At Deltares, various experts have been researching the relationship between the subsoil and foundation damage for a long time. This year, expansive clay from the above-mentioned areas was subjected to a series of tests in the Deltares geotechnical laboratory. Experts want to determine which types of clay are susceptible to swelling, to what extent and to access how drying and wetting cycles impact the soil's properties such as permeability and strength.

Harry van Essen and project engineer Nina Hellebrekers inspect an expansive clay sample following testing in the pressure plate extractor. Photography Guus Schoonewille

Laboratory tests showed that the clay can swell between eight and ten per cent and shrink between 25 and 30 per cent. These differences depend amongst others, on the thickness of the clay layer and the properties of the clay. Furthermore, swelling pressures as high as 1200 kPa are measured in the laboratory. "It is clear that the force of swelling clay can be enormous, the force we measured is comparable to the weight of a 24-storey apartment building," says Harry van Essen, physical geographer at Deltares.

The effect of shrinkage and swelling is also described as a slowly progressing earthquake

Harry van Essen, physical geographer at Deltares

More frequent droughts

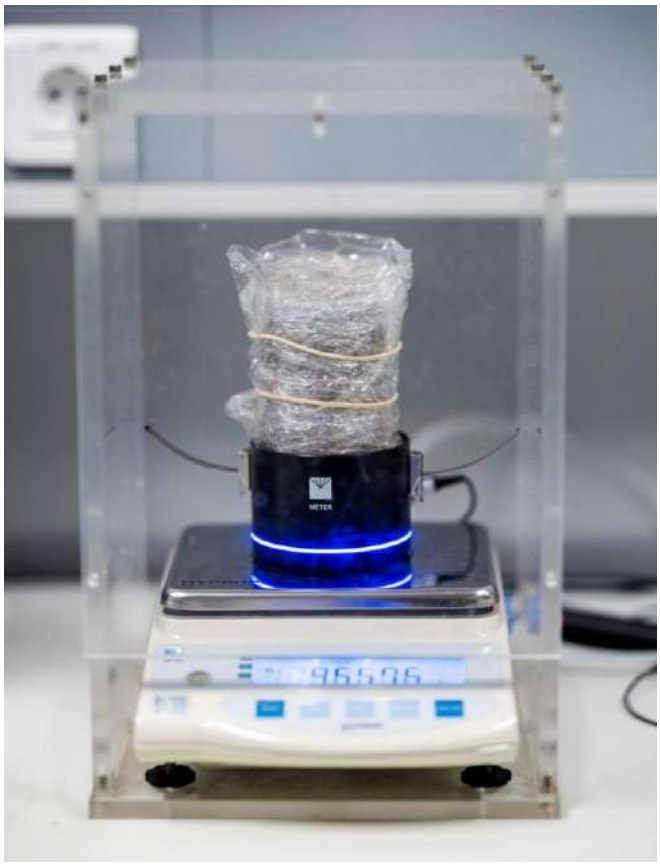
Changes in (ground)water management or other human activities can influence the shrinkage and expansion of these types of clay. Also the presence of vegetation like trees is an important factor in the behaviour of sensitive clays. As a result of climate change, the effects of swelling and shrinking clay will increase further, according to Harry. "In the Netherlands, we have long lived in a temperate climate, which means that the properties of this clay soil went unnoticed. Now that we are experiencing increasingly extreme periods of drought and heavy rainfall due to climate change, that clay is suddenly reacting."

This has consequences for the built environment and the road and dyke network. Buildings in these areas not only show cracks in walls, but sometimes houses are even declared uninhabitable. Many recent damage reports come from homeowners in the river area (Duiven, Zevenaar), but damage cases are also known outside this area, such as in Rekken in Gelderland and Roden in Drenthe. Harry: "The independent geologist Peter van der Gaag already recognised in 2004 that swelling clay in Groningen was one of the causes of foundation damage, which we confirmed in a study financed by the NAM and Deltares."

Lab research

Deltares is conducting research into the clay soil at most of these locations. This includes taking clay samples, which are

then examined in the laboratory to determine their properties. Deltares is also setting up measuring points to monitor the behaviour of the clay in response to changes in the groundwater level and soil moisture, which in turn are influenced by changes in climatic conditions.



The laboratory research consists of measuring the volume changes of drying clay samples, defining the relation between soil suction and water content, and performing different types of swelling tests.

This fieldwork is part of Deltares' self-funded research into expansive clays, that also is funded by the Ministry of Housing and Spatial Planning. "A fascinating material," says Harry, "about which we need to know much more. Which minerals cause the volume change, and which types of clay are most susceptible to it? How does shrinkage and swelling develop during successive periods of drought? Could future wet periods cause damage due to swelling? And could a rise in the groundwater level, for example due to soil subsidence, increase the risk of swelling damage?"

Investing in knowledge

The extent to which clay swells or shrinks varies from place to place. Since 2000, Harry and his colleagues Henk Kooi and Otto Levelt have been investigating the locations where foundation damage caused by clay has been reported , but already in 2019, they mapped out the situation for the first time for the report 'Shrinkage and swelling of clay and consequences for foundations' for the Kennis Centrum Aanpak Funderingsproblematiek (KCAF, Knowledge Centre for Foundation Problems).

Following the publication, attention to the problems associated with expansive soils in The Netherlands began to increase, leading to the allocation of the first internal research budget on this subject by Deltares in 2020. "On the KCAF site, a map is constantly updated with all the reported damages to buildings", says Harry. "There are many similarities between our map of clay thicknesses and the KCAF's Damage Register on the site."

Shrinkage and expansion of clay beneath foundations on natural ground are increasingly causing damage to houses and buildings. More knowledge about this clay is needed in order to develop effective measures

Harry van Essen, physical geographer at Deltares

"What we want to achieve with our research is to reduce stress among homeowners and residents in the Netherlands as a result of the risk of foundation damage," says Harry. "This can be addressed, for example, by providing information and solutions to contractors to repair or prevent damage to foundations."

The research of Deltares focusses on three subjects:

- Laboratory research to gain insight into the relationship between soil characteristics – such as clay content and clay type - and the swelling and shrinking characteristics
- Developing a risk map to identify the location of expansive clays in The Netherlands
- Developing a computer model to calculate the relationship between environmental factors such as vegetation, rainfall and temperature, and soil response based on the results of laboratory experiments

Remco van den Berg, project engineer, is measuring volumetric changes of a clay sample through 3D scanning.

"Identifying whether a house is built on expansive clay is not straightforward. While there are correlations between standard geotechnical laboratory tests and sensitivity to shrink and swell, a mineralogical analysis is required. If we can scale up the monitoring of shrink-swell clay, we will gain clarity more quickly about risk factors and the effectiveness of measures."

How does clay behave?

Soils in nature are subjected to climate change and undergo periodic wetting and drying cycles, which can alter their hydromechanical behaviour and damage earth structures. These environmental impacts on soil behaviour were investigated in the Deltares laboratory by a team led by Maria Konstantinou, a senior geotechnical engineer.

"Expansive clay samples from the Zevenaar location in the Netherlands underwent controlled cycles of wetting and drying. Meanwhile, we performed tests in the laboratory to investigate how the successive drying and wetting cycles affect swelling potential, while we used a 3D scanner to observe

changes in volume. We do this to investigate the soil behaviour under varying water content conditions to better predict field performance", says Maria.

To examine the strength profile of the clay under dynamic water content conditions, mini-CPT tests were also performed. Is dry clay stronger and how does repeated drying and wetting affect the shear strength? Micro-CT scans were taken at Delft University of Technology to examine changes on pore evolution and pore structure of the clay during wetting and drying. "How does the pore size distribution and the formation of cracks looks like? This can change as the clay dries out and swells more often," explains Maria.

During these laboratory tests, we worked with our 'feet in the clay'. It was very educational, because you can immediately see how the material behaves and reacts, which helps you identify problems earlier and interpret the results more accurately

Maria Konstantinou, senior geotechnical engineer at Deltares

Maria Konstantinou performs a swell test to determine the swelling characteristics of expansive clay.

Clays consist of plate-like minerals with a very large active surface, explains Harry. "In this context 'active' means that water from the pores is absorbed or drained between the plates based on the surrounding conditions and the characteristics of the clay minerals. This behaviour forms the basis for swelling or shrinkage of clay. For the most sensitive clay mineral (montmorillonite), the total surface area of the minerals in just one gram, if spread side by side, can be as large as a football field."

Solutions

The results of the laboratory tests help us understand how the subsurface behaves, says Maria. This understanding is necessary to determine which measures against foundation damage are effective. "In a house in Rekken, a plastic screen has been placed around the house underground to isolate the soil beneath the house from the surrounding soil to stabilise the moisture balance under the house," adds Harry. "This is one of the possible solutions we are monitoring. Over the past two years, measurements have shown that the house is no longer moving up and down."

There is no miracle cure; foundation damage caused by swelling and shrinking clay is a difficult problem to combat. Harry: "This is because the groundwater under the house is not always evenly distributed. So the clay swells on one side of a building, but not or less on the other. This can cause severe damages to houses. In addition to cracks in walls and floors, the foundation can also be harmed."

Major impact

"Many homeowners are unaware that they are at risk," says Harry. Foundation damage is often invisible, but can manifest itself in wider cracks in the exterior walls, interior walls and floors, sticking windows and doors, sloping or crooked floors and differences in height between the house and the pavement. The effect of shrinkage and swelling is also described as a slowly progressing earthquake."

Harry van Essen and Maria Konstantinou examine the results of the HYPROP tests, which measure the relationship between water content and suction tension. This allows them to analyse the soil water retention curve of the tested clay sample.

More and more Dutch homeowners are facing foundation problems. The impact is significant: in addition to high costs, people experience stress, uncertainty and sometimes even a feeling of insecurity in their own homes. Foundation problems are therefore a growing and urgent social challenge.

Expectation

In 2024, Deltares and TNO calculated that approximately 425,000 buildings will suffer foundation damage in the short term. This analysis was part of the Rli advisory report "Well-founded: advice on achieving a national approach to foundation problems". Deltares contributed its knowledge of the subsoil and foundations, and TNO contributed its knowledge of the superstructure, i.e. the building on the foundation.

One of the recommendations from the joint analysis is that more specific information and knowledge about the subsoil is needed. Over the next few years, Deltares will focus on expanding the soil types investigated in the laboratory, setting up monitoring sites across the Netherlands in collaboration with TNO, and improving both the computer model and national risk-map. A key are of focus at present is understanding how water content varies beneath and around building foundations.

Want to know more? Contact us

(Deltares, 18 December 2025, https://www.deltares.nl/en/stories/how-we-uncover-the-mysteries-of-expansive-soils)

Creep Versus Consolidation in Tunnelling Through Squeezing Ground

Alexandros N. Nordas, Thomas Leone, Georgios Anagnostou

The effects of creep and consolidation on shield tunnelling in rock are discussed in two summarised, complementary papers (Parts A and B) which consider Basic Time Effects and Transferability of Experience, respectively.

Although squeezing ground may undergo rapid convergences following tunnel excavation, its behaviour is often markedly time dependent due to creep or consolidation. The effects of creep (a purely mechanical rheological process) and consolidation (a coupled hydromechanical process) on shield tunnelling are discussed, with the aim of demonstrating their qualitative similarities and distinctive features.

Part A: Basic Time Effects

The first paper investigates the basic time effects. looking at the time development of ground deformations and the complex interaction between ground, the TBM and tunnel support during both excavation and construction standstills.

Numerical simulations indicate several qualitative similarities between the two mechanisms of time dependency, such as: time development of rock deformation and shield loading during advance and increased shield loading with increasing advance rate under certain conditions in creep and consolidation. However, the investigation herein also underscores two prominent differences and these result from the fundamentally different nature of creep and consolidation:

- First, consistently more extensive plastic yielding in consolidating ground, which is partially associated with the seepage forces exerted by the pore water on the solid rock constituents;
- Second, the role of seepage forces as a potential destabilising agent, particularly for the tunnel face, which does not happen in the case of creep and may be critical for shield and cutterhead jamming.

Part B: Transferability of Experience

The second paper builds upon the comparison of creep and consolidation on shield tunnelling, considering the practical transferability of experiences from existing tunnels as a reference for the required thrust force at tunnels of different diameters or to adjacent tunnels.

First, the effect of the tunnel diameter on the risk of shield jamming is examined. The paper demonstrates that larger-diameter tunnels are more favourable in poor-quality ground, while the opposite holds in better- quality ground, as well as where there is pronounced time-dependent ground behaviour.

Second, the effect of a tunnel on the required thrust force in a neighbouring tunnel built later is examined. The paper shows that this interaction effect is particularly important in water-bearing ground of low permeability: the drainage action of the first tunnel induces pore pressure relief and ground consolidation in an extensive area, leading to a substantial reduction of the thrust force in the second tunnel.

Conversely, in the case of creep the interaction is negligible even under extremely squeezing conditions, even for extreme conditions and large overcuts, due to the fundamentally different nature of the purely mechanical rheological processes.

The investigations into transferability are valuable for tunnelling practice, in cases of twin tunnels as well as where a smaller-diameter tunnel is built first (e.g., a pilot tunnel, advance drainage or ground improvement), or also the opposite (e.g., upgrade of a road tunnel by adding a safety tunnel with a smaller diameter).

(TUNNELS & TUNNELLING INTERNATIONAL, December 2025, pp. 10-20, https://content.yudu.com/web/442ay/0A444ia/Tunnels1225-Pros/html/index.html?page=4&origin=reader)

Creep Versus Consolidation in Tunnelling Through Squeezing Ground - Part A: Basic Time Effects

Alexandros N. Nordas, Thomas Leone, Georgios Anagnostou

Abstract

Although squeezing ground may undergo rapid convergences following tunnel excavation, its behaviour is often markedly time dependent due to creep or consolidation. The effects of creep and consolidation on shield tunnelling are comparatively evaluated in two companion papers, with the aim of demonstrating their qualitative similarities and distinctive features. The present, first paper investigates the basic time effects, placing focus on the time development of ground deformations and the complex interaction between ground, tunnel boring machine (TBM) and tunnel support during excavation and during construction standstills. The presented numerical simulations indicate several qualitative similarities between the two mechanisms of time dependency, in respect of the time development of ground deformations, the counter-intuitive behaviour of increasing shield loading with increasing rate of advance under certain conditions, as well as the thoroughly adverse effect of the additional time-dependent deformations taking place during construction standstills on the shield loading. However, they also underscore two prominent differences resulting from the fundamentally different nature of creep (a purely mechanical rheological process) and consolidation (a coupled hydromechanical process): first, the consistently more extensive plastic yielding in consolidating ground, which is partially associated with the seepage forces exerted by the pore water on the solid rock constituents. Second, the role of seepage forces as a potential destabilising agent, particularly for the tunnel face, which does not happen in the case of creep and may be critical for shield and cutterhead jamming. Building upon these investigations, the companion paper compares creep and consolidation with respect to the transferability of experiences about the required thrust force to tunnels of different diameter or to adjacent tunnels.

Highlights

- Analysis of similarities and differences between the effects of creep and consolidation on mechanised shield tunnelling through squeezing ground.
- Similar time development of rock deformations and shield loading during advance and during standstills in creep and consolidation.
- Similar counter-intuitive behaviour of increasing shield loading with increasing advance rate under certain conditions in creep and consolidation.
- More extensive ground plastification in consolidation than in creep, partially due to the effect of seepage forces on the solid rock constituents.
- Potential instability due to seepage forces may induce excessive convergences or face extrusion and render shield or cutterhead jamming critical.

Leone, T., Nordas, A.N. & Anagnostou, G. Creep Versus Consolidation in Tunnelling Through Squeezing Ground—Part A: Basic Time Effects. *Rock Mech Rock Eng* **57**, 5519–5536 (2024). https://doi.org/10.1007/s00603-023-03720-6

https://link.springer.com/article/10.1007/s00603-023-03720-6#citeas

Creep Versus Consolidation in Tunnelling through Squeezing Ground - Part B: Transferability of Experience

Alexandros N. Nordas, Thomas Leone, Georgios Anagnostou

Abstract

This paper investigates potential differences between creep and consolidation in mechanised tunnelling through squeezing ground, placing focus on the practical question of using experiences gained from existing tunnels about the required thrust force as a reference for tunnels of different diameter or adjacent tunnels. The investigations focus on two aspects. First, the effect of the tunnel diameter on the risk of shield jamming is examined. The paper demonstrates that larger-diameter tunnels are more favourable in poor-quality ground, while the opposite holds in better-quality ground, as well as in the case of pronouncedly time-dependent ground behaviour due to consolidation or creep. Second, the effect of a tunnel on the required thrust force in a neighbouring tunnel built later is examined. The paper shows that this interaction effect is particularly important in water-bearing ground of low permeability, where the drainage action of the first tunnel induces pore pressure relief and ground consolidation in an extensive area, leading to a remarkable reduction of the thrust force in the second tunnel. Conversely, in the case of creep the interaction is negligible even under extremely squeezing conditions, due to the fundamentally different nature of the purely mechanical rheological processes from coupled hydromechanical processes. The presented investigations into the transferability of experiences are valuable for tunnelling practice, in cases of twin tunnels as well as in□situations where a smaller-diameter tunnel is constructed prior to the main tunnel (e.g. a pilot tunnel for exploration, advance drainage or ground improvement), or also the opposite (e.g. upgrade of a road tunnel by later construction of a safety tunnel with a smaller diameter).

Highlights

- The rate of ground deformations is independent of diameter in the case of creep, but extremely increases with decreasing diameter in the case of consolidation.
- The risk of shield jamming is lower in larger-diameter tunnels crossing poor-quality ground without pronounced time-dependent behaviour.
- The risk of shield jamming is lower in smaller-diameter tunnels crossing ground of higher quality or exhibiting pronounced time-dependent behaviour.
- The effect of adjacent tunnel on shield jamming risk is generally minor in the case of creep, even for extreme squeezing conditions and large overcuts.
- The effect of adjacent tunnel on shield jamming risk is remarkable in the case of consolidation, leading to a substantial reduction of the thrust force.

Leone, T., Nordas, A.N. & Anagnostou, G. Creep Versus Consolidation in Tunnelling Through Squeezing Ground—Part A: Transferability of Experience. *Rock Mech Rock Eng* **57**, 5537–5555 (2024). https://doi.org/10.1007/s00603-024-03968-6

https://www.researchgate.net/publication/382109971_Creep_Versus_Consolidation_in_Tunnelling_through_Squeezing_Ground-Part_B_Transferability_of_Experience

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

16η Αθηναϊκή Διάλεξη Γεωτεχνικής Μηχανικής Δρ. Χρήστος Τσατσανίφος

Η 16η Αθηναϊκή Διάλεξη Γεωτεχνικής Μηχανικής με τίτλο:

«Η συμβολή της Γεωτεχνικής Μηχανικής στην προστασία των μνημείων»

παρουσιάσθηκε από τον Δρα Χρήστο Τσατσανίφο την Παρασκευή 19 Δεκεμβρίου 2025 στο Συνεδριακό Κέντρο Πανεπιστημιούπολης Αθηνών «Γιάννης Κυριόπουλος» του Πανεπιστημίου Δυτικής Αττικής (Λεωφόρος Αλεξάνδρας 196, πλησίον Σταθμού Μετρό Αμπελόκηποι).

Συγχαρητήρια στον φετινό μας ομιλητή και θερμές ευχαριστίες σε όσους παρευρέθησαν στο Συνεδριακό Κέντρο και παρακολούθησαν ζωντανά την Διάλεξη και όσους επίσης την παρακολούθησαν από τον υπολογιστή τους κατά την ζωντανή της μετάδοση.

Φυσικά, τις ευχαριστίες μας και στο Τεχνικό Προσωπικό του Συνεδριακού Κέντρου και ειδικά τον κ. Στέλιο Δαμίγο, αλλά και τον συνάδελφό μας Δημήτρη Τσούτσα που επιμελείται του καναλιού της ΕΕΕΕΓΜ στο youtube.

Μπορείτε να δείτε την διάλεξη στον σύνδεσμο https://www.youtube.com/watch?v=C3nifvVEc_A.

Περίληψη Διάλεξης

Η γεωτεχνική μηχανική αποτελεί έναν από τους βασικότερους κλάδους της επιστήμης του πολιτικού μηχανικού. Η συμβολή της είναι καθοριστική σε κάθε είδος κατασκευής που εδράζεται ή έρχεται σε επαφή με το έδαφος. Ακόμη και οι πρώτες κατασκευές του ανθρώπου είχαν έντονη γεωτεχνική διάσταση, χωρίς να υπάρχει η επιστήμη της γεωτεχνικής μηχανικής με τη σημερινή της μορφή.

Στην σύγχρονη εποχή, η γεωτεχνική μηχανική διαδραματίζει καθοριστικό ρόλο στην διατήρηση και προστασία των μνημείων της πολιτιστικής κληρονομιάς. Μέσω εξειδικευμένων ερευνών αξιολογείται η κατάσταση του εδάφους θεμελίωσης και των ίδιων των θεμελίων των μνημείων, εντοπίζονται φαινόμενα καθίζησης, αστάθειας ή υγρασίας και εφαρμόζονται κατάλληλες τεχνικές ενίσχυσης και αποστράγγισης. Παράλληλα, η γεωτεχνική μελέτη συμβάλλει στην αντισεισμική προστασία και στην αποτροπή κατολισθητικών φαινομένων, εξασφαλίζοντας τη σταθερότητα και τη μακροχρόνια ανθεκτικότητά τους. Με αυτόν τον τρόπο, η γεωτεχνική μηχανική συνεισφέρει ουσιαστικά στη διατήρηση, αποκατάσταση και ανάδειξη της πολιτιστικής μας κληρονομιάς.

Η διατήρηση, αποκατάσταση ή ανακαίνιση μιας μνημειακής κατασκευής παρουσιάζει από μόνη της πλήθος γεωτεχνικών προκλήσεων, οι οποίες καλούνται να επιλυθούν από τον γεωτεχνικό μηχανικό. Στην περίπτωση όπου τα αρχαία ευρήματα διατηρούνται επισκέψιμα κάτω από νέα κτίρια, ο ρόλος των γεωτεχνικών μηχανικών είναι ιδιαίτερα σημαντικός, καθώς απαιτείται ο σχεδιασμός θεμελιώσεων που δεν θα καταστρέψουν τα αρχαία μνημεία ή την άμεση ανωδομή, επιτρέποντας παράλληλα την καλαίσθητη ανάδειξή τους. Αντίστοιχα, η ανέγερση ενός νέου κτιρίου δίπλα σε μνημείο ή ιστορικό κτίσμα προϋποθέτει προσεκτικό γεωτεχνικό σχεδιασμό, ώστε να αποφευχθούν τυχόν βλάβες στο μνημείο.

Οι γεωτεχνικές επεμβάσεις για την προστασία μνημείων κυμαίνονται από απλά μέτρα, όπως η επιμελής κατάχωση των αρχαιοτήτων (όπου αυτό επιτρέπεται), έως ιδιαίτερα σύνθετες εφαρμογές, όπως η χρήση μικροπασσάλων, δοκών προποδισμού κάτω από τα αρχαία ευρήματα ή ο έλεγχος των μετακινήσεων του εδάφους μέσω υδραυλικών γρύλων για την επαναφορά τοιχίων αντιστήριξης κ.ά.

Στη διάλεξη αυτή θα παρουσιαστούν συνοπτικά οι γενικές αρχές των επεμβάσεων σε αρχαίες κατασκευές, θα γίνει σύντομη ανασκόπηση των μεθόδων γεωτεχνικής παρέμβασης σε μνημεία, καθώς και παραδείγματα της συμβολής της γεωτεχνικής μηχανικής στην επίλυση προβλημάτων που σχετίζονται με τη διατήρηση, αποκατάσταση και ανακαίνιση μνημείων και ιστορικών κτιρίων, ορισμένα από την προσωπική μου εμπειρία και άλλα από τη σχετική βιβλιογραφία.

Τα ιστορικά μνημεία των διαδοχικών γενεών παραμένουν έως σήμερα ως ζωντανοί μάρτυρες των πανάρχαιων παραδόσεών τους. Οι άνθρωποι συνειδητοποιούν ολοένα και περισσότερο την ενότητα των ανθρώπινων αξιών και θεωρούν τα αρχαία μνημεία ως κοινή κληρονομιά. Η κοινή ευθύνη για τη διαφύλαξή τους προς όφελος των μελλοντικών γενεών αναγνωρίζεται ευρέως. Είναι καθήκον μας να τα παραδώσουμε ακέραια, διατηρώντας πλήρως τον πλούτο και την αυθεντικότητά τους.

Σύντομο βιογραφικό Δρος Χρήστου Τσατσανίφου

Γεννήθηκε στον Πειραιά το 1951.

Είναι απόφοιτος της Βαρβακείου Προτύπου Σχολής, Διπλωματούχος Πολιτικός Μηχανικός του ΕΜΠ με μεταπτυχιακές σπουδές στην Εδαφομηχανική και Διδακτορικό Δίπλωμα στην Εδαφοδυναμική και στην Τεχνική Σεισμολογία από το Imperial College του Λονδίνου.

Έτυχε υποτροφιών και επαίνων από την Ελληνική Μαθηματική Εταιρεία / Εταιρεία PHILIPS, το Ίδρυμα Κρατικών Υποτροφιών και το Ίδρυμα Ωνάση.

Διετέλεσε καθηγητής στην Σχολή Ικάρων – Τμήμα Μηχανικών / Αεροπορικών Εγκαταστάσεων (1984-1998), συνεπιβλέπων Διπλωματικών Εργασιών στο ΕΜΠ, Ειδικός Επιστήμων στο Διατμηματικό Πρόγραμμα Μεταπτυχιακών Σπουδών του Εθνικού Μετσοβίου Πολυτεχνείου «Σχεδιασμός και Κατασκευή Υπογείων Έργων», Επισκέπτης Καθηγητής Γεωτεχνικής Μηχανικής στο Τμήμα Design of Buildings and Constructions της Σχολής Architecture and Construction του L. N. Gumilyov Eurasian National University στην Astana, Kazakhstan, ενώ συμμετέσχε σε ερευνητικά προγράμματα σε συνεργασία με το Εθνικό Μετσόβιο Πολυτεχνείο και τις Πολυτεχνικές Σχολές του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης και του Πανεπιστημίου Θεσσαλίας.

Είναι συνεκδότης δύο βιβλίων πρακτικών συνεδρίων και έχει συγγράψει περισσότερα από 100 άρθρα για επιστημονικά περιοδικά και πρακτικά συνεδρίων. Έχει συμμετάσχει σε πληθώρα συνεδρίων, συμποσίων κ.λπ. στην Ελλάδα και στο εξωτερικό και ήταν προσκεκλημένος ομιλητής σε 8 συνέδρια στην

Ελλάδα, στο Ιράκ, στην Ισπανία, στο Καζακστάν (2), στην Σλοβακία και στην Τσεχία (2). Είναι εκδότης του ηλεκτρονικού περιοδικού της Ελληνικής Επιστημονικής Εταιρείας Εδαφομηχανικής και Γεωτεχνικής Μηχανικής από τον Αύγουστο 2005 μέχρι σήμερα.

Δραστηριοποιείται στον τομέα της εκπόνησης μελετών δημοσίων και ιδιωτικών έργων από το 1982 με την εταιρεία ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ ΙΚΕ (ιδρυτής) στην Ελλάδα και στο εξωτερικό, καθώς και ως σύμβουλος δημοσίων φορέων και μελετητικών και κατασκευαστικών εταιρειών σε θέματα γεωμηχανικής, σηράγγων, φραγμάτων κ.λπ. Από το 2015 έως 2019 διετέλεσε Tunnel and Geotechnical Expert στην Qatar Rail για την κατασκευή του Μετρό της Doha.

Είναι μέλος πολλών επιστημονικών και επαγγελματικών εταιρειών και ενώσεων στην Ελλάδα και στο εξωτερικό. Διετέλεσε μέλος του Διοικητικού Συμβουλίου και Γενικός Γραμματέας του Συνδέσμου Ελληνικών Γραφείων Μελετών, μέλος του Διοικητικού Συμβουλίου και Γενικός Γραμματέας της Ένωσης Ελλήνων Γεωτεχνικών Μηχανικών, μέλος του Διοικητικού Συμβουλίου της Ελληνικής Επιτροπής Σηράγγων και Υπογείων Έργων, μέλος του Διοικητικού Συμβουλίου, Αντιπρόεδρος και Πρόεδρος της Ελληνικής Επιστημονικής Εταιρείας Εδαφομηχανικής και Γεωτεχνικής Μηχανικής, Chairman της Technical Committee 19 "Preservation of Historic Sites" της International Society for Soil Mechanics and Geotechnical Engineering, εκπρόσωπος της Ελλάδος / Τεχνικού Επιμελητηρίου στην Ευρωπαϊκή Ένωση Ακαδημιών Μηχανικής και Τεχνολογίας κ.ά.

Είναι επίσης μέλος κοινωνικών και πολιτιστικών συλλόγων, όπως του Συλλόγου Αποφοίτων Imperial College (τέως Πρόεδρος), του Συλλόγου Αποφοίτων Βαρβακείου Προτύπου Σχολής, του Συλλόγου Υποτρόφων Κοινωφελούς Ιδρύματος «Αλέξανδρος Σ. Ωνάσης», του Συλλόγου Φίλων Αγγλικής Αρχαιολογικής Σχολής στην Αθήνα, του Συλλόγου Φίλων του Ελληνικού Ινστιτούτου Βυζαντινών και Μεταβυζαντινών Σπουδών Βενετίας, Μέλος του Συλλόγου Αποφοίτων Βρετανικών Πανεπιστημίων, ενώ διετέλεσε μέλος των Επιτροπών Νέων Τεχνολογιών και Αντισφαίρισης του Δήμου Ψυχικού.

ΕΛΛΗΝΙΚΗ ΕΠΙΤΡΟΠΗ ΣΗΡΑΓΓΩΝ ΚΑΙ ΥΠΟΓΕΙΩΝ ΕΡΓΩΝ

GREEK TUNNELLING SOCIETY YOUNG MEMBERS

10 Χρόνια Ομάδα Νέων ΕΕΣΥΕ

Η επετειακή εκδήλωση «10 Χρόνια Ομάδα Νέων ΕΕΣΥΕ» πραγματοποιήθηκε υπό την αιγίδα της Ελληνικής Εταιρείας Σηράγγων και Υπόγειων Έργων (ΕΕΣΥΕ), την Τετάρτη 4 Δεκεμβρίου, στην Αίθουσα Αγαλμάτων της Ιστορικής Πρυτανείας του Εθνικού Μετσόβιου Πολυτεχνείου.

Η δράση συνδυάστηκε με τον εορτασμό της Αγίας Βαρβάρας, προστάτιδας των εργαζομένων στα υπόγεια έργα, αποτελώντας μια διπλή γιορτή που τίμησε τόσο την παράδοση και την ιστορία του κλάδου όσο και τη συμπλήρωση 10 (+1) ετών συνεχούς δράσης της Ομάδας Νέων της ΕΕΣΥΕ.

Όσοι δεν είχατε τη δυνατότητα να παρευρεθείτε, μπορείτε πλέον να παρακολουθήσετε ολόκληρη την εκδήλωση στο επίσημο κανάλι μας στο YouTube.

Δείτε την εκδήλωση εδώ: **https://lnkd.in/qFBHNWzu**

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE News
www.issmge.org/news

Geotechnical Challenge 2025 for Young Chilean Geotechnical Engineers Sets Attendance Record

Max Barbosa / Young Members / 01-12-2025

On November 21, the 2025 Geotechnical Challenge took place, organized by the Chilean Geotechnical Society (SOCHIGE) and the Pontificia Universidad Católica de Chile (PUC). The event, now a well-established tradition within the Chilean geotechnical community, reached a historic level of participation, reflecting the growing enthusiasm of younger generations for applied geotechnical engineering and its real-world challenges.

The competition is aimed at university students and involves building a Mechanically Stabilized Earth Wall inside a wooden box, using sand and paper strips as reinforcement. Once the structure is completed, teams must apply a 500 N load, with the goal of ensuring the wall withstands it while using the least amount of reinforcement (paper) possible.

The exercise represents a genuine technical challenge. Teams must combine manual skills, planning, and engineering judgement. To support this, the organizing committee provides information about the materials and even sand samples for preliminary testing, allowing teams to design their solutions ahead of time and face a task that mirrors real professional scenarios.

The 2025 edition brought together over 40 teams and more than 100 participants from various regions across Chile. For the first time, the competition also welcomed an international team, which traveled from Peru specifically to compete, an unprecedented aspect that gave the event a new international dimension. "*The presence of an international team shows that this challenge has the potential to grow beyond our borders. I truly hope it continues expanding in that direction*" says Rafael Iglesias, SOCHIGEs Vice President and one of the organizers of the 2025 Geotechnical Challenge.

Awards and Complementary Activities

The winning teams received cash prizes and spots to attend the upcoming XII Chilean Geotechnical Congress, a valuable opportunity to engage with the professional community. The event also featured three technical talks delivered by sponsoring companies, as well as lunch and networking spaces that allowed students to meet one another, share experiences, and begin building connections within the field.

For many participants, this was their first practical encounter with geotechnical design. The chance to test, build, and then watch a structure respond under load provided a meaningful experience and an excellent complement to the concepts learned in the classroom.

Commitment to the Next Generation

The organizers highlighted the enthusiasm of the participants and the growing relevance of the Challenge as a key space for integrating students and young professionals into the geotechnical community. "*We are very pleased with the turnout and, above all, with the commitment shown by each team. It's essential to create spaces where students can experiment and put their ideas to the test*", adds Professor Juan Carlos Tiznado, from PUC.

The Geotechnical Challenge is part of a broader range of initiatives led by SOCHIGE in recent years, including technical seminars and outreach activities aimed particularly at students and young professionals. These efforts also focus on strengthening the role of women in our profession, highlighting the society's commitment to integrating both new generations and women early into Chiles geotechnical community.

Get Involved!

This initiative is part of the broader YMPG News campaign,

showcasing activities from young geotechnical professionals around the world.

Check out other recent YMPG highlights:

- **Inspiring Global Pursuits: Indonesia Launches the SOIL Webinar Series**
  https://www.issmge.org/news/inspiring-global-pursuits-indonesia-launches-the-soil-webinar-series

- **Bridging Generations in Geotechnics: Macedonian YMPG at EyGEC 2025 and Looking Ahead to Eurock 2026**
  https://www.issmge.org/news/bridging-generations-in-geotechnics-macedonian-ympg-at-eygec-2025-and-looking-ahead-to-eurock-2026

We would love to hear from your YMPG group too! To contribute an update or video from your country's Young Members Group, please write to: **ympg.issmge@gmail.com**

Let's keep sharing and learning together across borders!

Proceedings from 4th Pan-American Conference on Unsaturated Soils (PanAm UNSAT 2025) available in open access

ISSMGE IT Administrator / TC106 / 15-12-2025

The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of Professors Mehdi Pouragha, Sai Vanapalli, Paul Simms and the TC106 - Technical Committee on Unsaturated Soils, the 77 papers from the proceedings of the 4th Pan-American Conference on Unsaturated Soils (PanAm UNSAT 2025) are available in the ISSMGE Online Library:

https://www.issmge.org/publications/online-library

The conference was held in Ottawa, Canada, from June 22nd to 25th, 2025.

Detailed acknowledgements for PanAm UNSAT 2025 can be found in the Acknowledgements section of the ISSMGE Online Library.

ISSMGE Interactive Technical Talk Episode 27: Site Characterization (TC102)

ISSMGE IT Administrator / TC102 / 17-12-2025

The twenty-seventh episode of International Interactive Technical Talk has just been launched and is supported by TC102. Jason DeJong, José Estaire, Henry Asamany and Julia Sorgatz are discussing with Marc Ballouz about "Site Characterization".

https://www.issmge.org/education/interactive-technical-talks

Finnish Young Members: Research Excellence and Growing Engagement Across the Country

Max Barbosa / Young Members / 17-12-2025

Finland's young geotechnical community continues to strengthen its presence through a combination of student-led initiatives, academic excellence, and a vibrant research ecosystem that spans the country's leading universities. While 2025 has not yet brought large public events, the ongoing work of Finland's student societies and research groups reflects a sustained commitment to innovation, collaboration, and the professional development of young engineers.

Two long-standing student societies *Maa- ja kalliorakentajat ry* and *Seula ry* remain central spaces for student engagement. Through technical visits, collaborations with partner companies, and the traditional Finnish blend of learning and networking during sauna evenings, these groups help integrate students into the broader geotechnical community and provide early, valuable exposure to industry practice.

Equally significant is the depth and diversity of research led by young geotechnical engineers across Finland. Each major university contributes to distinct areas of national and international relevance:

- Aalto University advances soft soil engineering, low-emission and carbon-neutral soil improvement, carbon sequestration, laboratory and in-situ testing, mine tailings reuse, numerical modelling (including freezing, landslides, avalanches, and dynamics), and development of guidelines, best practices, and software tools.

- Tampere University leads in in-situ testing (with emphasis on CPTU and Nuclear Magnetic Resonance), soil sampling, soft soil engineering, numerical modelling of geostructures, offshore geotechnics, AI applications in geotechnical design, and reliability-based approaches.

- Oulu University anchors research on cold-climate geotechnics, including dam engineering, soil frost behavior, geoenvironmental engineering, geotechnical modelling, and the increasing use of remote sensing and drone-based techniques.

Looking ahead, the Finnish Geotechnical Society (SGY) will continue to host national events, most notably the annual Geotechnical Day, where the best masters thesis is recognized. This tradition provides an important platform to celebrate young talent and connect emerging professionals with the wider geotechnical community.

Finland's young members demonstrate that progress is not only achieved through large events, but also through the steady, meaningful contributions made every day in research labs, field testing programs, and student society activities reinforcing Finland's role as a dynamic contributor to global geotechnical development.

Get Involved!

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Explore recent highlights:

Geotechnical Challenge 2025: Young Chilean Engineers Set Attendance Record
https://www.issmge.org/news/geotechnical-challenge-2025-for-young-chilean-geotechnical-engineers-sets-attendance-record

Inspiring Global Pursuits: Indonesia Launches the SOIL Webinar Series
https://www.issmge.org/news/inspiring-global-pursuits-indonesia-launches-the-soil-webinar-series

We would love to hear from your Young Members Group too!

To contribute an update or video from your country's Young Members Group, please write to: ympg.issmge@gmail.com

Let's keep sharing and learning together across borders!

Call for Papers for Special Issue on "Geo-Hazards: Lessons from the Ground"

ISSMGE IT Administrator / General / 19-12-2025

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), through its International Journal of Geoengineering Case Histories (IJGCH), invites submissions for a Special Issue on Geo-Hazards: Lessons from the Ground - Case Histories in Earthquake, Landslide, Tsunami, Subsidence, and Flood Risk.

This special issue aims to showcase detailed, well-documented case histories that capture real-world experiences, analyses, and lessons from major geo-hazard events. With the increasing frequency and intensity of natural hazards worldwide, there is a pressing need for field-based insights that connect scientific understanding, engineering practice, and community resilience.

We invite contributions that present comprehensive documentation of geo-hazard phenomena, including site characterization, event documentation, response actions, and performance assessments. Submissions highlighting multidisciplinary approaches and lessons learned for risk reduction, planning, and policy development are particularly encouraged.

Scope of the Special Issue

Case histories may relate (but are not limited) to:

- Earthquake-induced ground failures and soil-structure interaction
- Landslide occurrence, mechanisms, and stabilization measures
- Tsunami impacts, modelling, and coastal defense responses
- Ground subsidence due to natural or anthropogenic factors
- Flood risk assessment and mitigation

- Multi-hazard interactions and cascading disaster effects
- Post-disaster assessment and reconstruction case studies
- Integration of field data, remote sensing, and numerical modelling
- Community-based risk reduction and resilience-building efforts

Submission Details

Interested authors are invited to submit a 300-word abstract outlining their proposed case history by **28 February 2026** to **Prof. Neelima Satyam** (Indian Institute of Technology Indore, India; *neelima.satyam@iiti.ac.in*) and **Prof. Gonghui Wang** (Kyoto University, Japan; *wang.gonghui.3r@kyoto-u.ac.jp*)

Authors will be notified of abstract acceptance shortly thereafter. Full manuscripts should be submitted by **30 May 2026**. Please consult the Journals submission guidelines at: http://casehistories.geoengineer.org/submission.html before submitting your manuscript. All papers will undergo rigorous peer review following the journals standard process.

The publication of this Special Issue is expected in December 2026.

Guest Editors

- Prof. Neelima Satyam, Indian Institute of Technology Indore, India
- Prof. Gonghui Wang, Kyoto University, Japan

BGA Early Career Group: 2025 Highlights

Max Barbosa / Young Members / 29-12-2025

Throughout 2025, the **British Geotechnical Association (BGA) Early Career Group (ECG)** delivered a dynamic and wide-ranging programme of activities aimed at strengthening technical development, professional engagement, and inclusivity within the UK geotechnical community. The year highlighted the ECGs continued commitment to supporting early-career engineers through both technical initiatives and community-building events.

The year began with the ECGs involvement in the **56th Cooling Prize Competition**, hosted by the ICE Yorkshire Geotechnical Group (YGG). The ECG supported promotion of the competition and facilitated the first-stage judging process, reinforcing its role in encouraging technical excellence and student participation within the profession.

Community engagement remained a strong focus. The ECG hosted a well-attended social networking event following the **Rankine Lecture**, creating space for informal exchange between early-career professionals, academics, and senior practitioners. In June, the ECG presented at the **BGA Annual General Meeting**, introducing its new committee and formally recognising the contributions of outgoing members. Particular acknowledgment was given to the team behind the successful *Manual of Geotechnical Engineering (MOGE)* discussion series, which had run over the previous two years.

The newly appointed committee quickly established momentum, delivering a **summer social event** as their first initiative, followed by the flagship **Annual Networking and Welcome Event** in October. This event attracted strong participation from both industry and academia, reinforcing the ECGs role as a key entry point for young professionals engaging with the BGA.

Beyond standalone events, the ECG actively supported the wider geotechnical community through promotion of BGA conferences, lectures, and seminars via the website, newsletters, and LinkedIn outreach. This sustained communication effort helped maintain strong visibility and engagement across career stages.

A central theme of 2025 was **equity, diversity, and inclusion (EDI)**. The ECG supported multiple EDI Working Groups addressing cultural diversity, women in engineering, faith, and the needs of carers, parents, and guardians. These initiatives contributed to fostering a more inclusive and representative professional environment within the geotechnical sector.

Collaboration also featured prominently. Participation in the **BGA Annual Dinner and Invited Lecturer event** strengthened links with the wider association, while joint activities expanded through partnership with the **British Tunnelling Society Young Members (BTSYM)**. This collabo-ration included the first joint Christmas Social and a shared focus on advancing sustainability capability within the profession.

Together, the ECG and BTSYM delivered **three dedicated sustainability training sessions**, addressing sustainability considerations across the full project life-cycle-from concept and outline design through detailed design and end-of-life stages. These sessions reflected the growing importance of sustainability in geotechnical practice and the proactive role of early-career groups in shaping future standards.

As it looks ahead to the 2026 calendar of events, the BGA ECG remains committed to expanding its network, strengthening links with **ISSMGE** and ICE specialist knowledge societies, and continuing to support the next generation of geotechnical professionals in the UK and beyond.

Get Involved!

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Explore recent highlights:

Geotechnical Challenge 2025: Young Chilean Engineers Set Attendance Record
https://www.issmge.org/news/geotechnical-challenge-2025-for-young-chilean-geotechnical-engineers-sets-attendance-record

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ISSMGE Interactive Technical Talk Episode 28: Forensic Geotechnical Engineering (TC302)

ISSMGE IT Administrator / TC302 / 30-12-2025

The twenty-eighth episode of International Interactive Technical Talk has just been launched and is supported by TC302. David Frost, Jeanine Engelbrecht, Prashanth Vangla and Wei F. Lee are discussing with Marc Ballouz about "Forensic Geotechnical Engineering".

https://www.issmge.org/education/interactive-technical-talks

TC211: Technical Committee - Ground Improvement

Ground Improvement Techniques Photo Competition

Objective:

Capture and share innovative or informative ground improvement techniques in action. Showcase your best or interesting work in the field of ground improvement, and include a brief story associated with the photo.

Prizes:

- **First Place** 1000 Australian dollars
- **Second Place** 500 Australian dollars
- **Third Place** 250 Australian dollars
- **All Participants:** Once finalized, all participants will receive a digital copy of the booklet featuring selected entries.

Submission Deadline:

- All entries must be received by 31 May 2026, 11:59 PM GMT.

Eligibility:

- Open to all, with the conditions that participants agree to:
  - Winners will prepare a short write up, around 500 words, for the ISSMGE Bulletin (a brief "story behind the photograph," plus any relevant reflections).
  - Grant ISSMGE the right to use and disseminate their photographs without restriction. The names and affiliations of the providers will be acknowledged.
- Participants must have been directly involved in the project depicted in the submitted photo. Please note that images generated using Artificial Intelligence (AI) tools are not eligible for submission.

Photo Submission Criteria:

- Photos must clearly depict a ground improvement technique (e.g., surface compaction, deep compaction, grouting, earth reinforcement, deep soil mixing, vertical drains, vacuum preloading, stone columns, rigid inclusion, chemical modification, bio-cementation soil stabilization, ground freezing, thermal treatment, geosynthetic reinforcement, cut-off walls and permeable trenches, relevant laboratory testing or similar projects).
- High-resolution images only (minimum 300 dpi).
- Each photo must be accompanied by a description of up to 150 words explaining the technique shown, its significance, location, and the impact or outcome of the project.

How to Enter:

- Submit your technical photo and accompanying description (name, affiliation, contact details) via email to TC211 Secretary, Ms Fanny Maucotel at fanny.maucotel@menard-mail.com
- File format: JPEG or PNG for photos; PDF or Word document for the description.
- Include your full name, position, professional affiliation (institution, organisation, company or university), and contact information in the email.

Judging Criteria:

- Relevance and clarity of the ground improvement technique depicted.
- Visual impact and quality of the photo.
- Creativity and insight in the accompanying description.

Announcement of Winners:

Winners will be announced on 30 July 2026 via ISSMGE website and email notification.

Contact:

For any questions or further information, kindly contact: Ms Fanny Maucotel at fanny.maucotel@menard-mail.com

https://issmge-e.eu

https://issmge-e.eu/winter-2025

Thank You for the Journey

Dear colleagues,

As winter settles in and we bring this year to a close, this edition of the ISSMGE Europe newsletter carries particular significance for me. It is the final one I write as Vice President for Europe, with my mandate concluding in a few months when a new Vice President will be elected. Moments of transition naturally invite reflection, but they also invite appreciation, and it is this sense of gratitude that accompanies me now.

Looking back, what remains most vivid are not the organisational details or the formal duties, but the human dimension of these years. I think of the conversations shared across Europe, around meeting tables, at conferences, in hallways, over meals, and during our National Assemblies. Each encounter carried

its own perspective, shaped by local contexts yet connected by a shared commitment to our field. These exchanges, large and small, created the sense of community that has guided my work throughout this mandate.

It has also been a pleasure to watch this newsletter grow into a familiar space where societies can share their activities and successes with one another. Your contributions, including reports, photographs, reflections and invitations, turned it into something living and genuinely European. I am grateful to all who have taken the time to prepare content and to ensure that the voices of our region continue to be heard.

Travelling across Europe to meet many of you has been one of the great privileges of this role. Each society has its own character, history and priorities, yet everywhere I encountered the same dedication to advancing geotechnical engineering and supporting the next generation. The energy and openness of young engineers in particular has left a strong impression on me, and I am confident that the future of our field is in good hands.

As this chapter comes to a close, I would like to express my sincere thanks for your hospitality, collaboration and friendship over these years. Serving as your Vice President has been an honour. I extend my warmest wishes to the incoming Vice President, who will undoubtedly bring new ideas and momentum to the region.

To all of you, I wish a peaceful end to the year and a successful one ahead. May the spirit of exchange, collegiality and cooperation continue to strengthen our European community.

With my sincere thanks,
Professor Lyesse Laloui
Vice President for Europe, ISSMGE

ISSMGE EUROPE NEWS

Portuguese Geotechnical Society: XLII Manuel Rocha Lecture and First SPG Gala

Sociedade Portuguesa de Geotecnia

The Portuguese Geotechnical Society (SPG), together with the Association of Geotechnical Alumni of Universidade Nova de Lisboa and the National Laboratory for Civil Engineering (LNEC), organised the XLII Manuel Rocha Lecture on 20 October at the Calouste Gulbenkian Foundation in Lisbon.

The lecture was delivered by Prof. Jean Hutchinson, distinguished member of the IAEG Advisory Board, who presented "Considering Engineering Geology in Optimizing Rock Slope Stability Risk Assessment." Her talk highlighted the essential role of engineering geology in evaluating rock slope stability and demonstrated innovative methodologies that contribute to safer and more resilient infrastructure.

Following the lecture, the first SPG Gala took place at the Hotel Myriad in Lisbon. The event brought together professionals from across the Geotechnical community for an evening celebrating excellence and service. Several major awards were presented, including the Manuel Rocha Prize, the Young Geotechnical Award, the SPG Sustainability Award for innovative and sustainable geotechnical projects, and the SPG Research Award for the best international journal paper of the biennium. Long-standing individual and corporate members were also recognized for 25 and 50 years of continuous affiliation.

Prof. Jean Hutchinson (XLII Manuel Rocha Lecture)

The Gala additionally honoured the editorial boards of *Geotecnia* and *Soils and Rocks*, the outgoing SPG Executive Committee, and the organising committees of recent flagship events. These included ECSMGE 2024 and the 12th Luso-Brazilian Geotechnics Congress with the 8th Luso-Spanish Geotechnics Journeys. Their contributions were acknowledged for strengthening the visibility and impact of Portuguese geotechnical engineering.

Special invited guests included Prof. Jean Hutchinson and Prof. Lyesse Laloui, Vice President for Europe of ISSMGE, who delivered a lecture on "The significance of scientific research in advancing geotechnical engineering."

Prof. Paulo da Venda Oliveira – president for SPG (opening Ceremony)

Prof. Lyesse Laloui – Vice-President for ISSMGE (special Lecture)

The evening concluded with the presentation of the SPG Career Award to three eminent figures of Portuguese and international geotechnics: Prof. António Correia Mineiro, Prof. Emanuel Maranha das Neves and Prof. Ricardo Oliveira. The award recognised their remarkable lifetime achievements and enduring contributions to research, practice and education in the field.



Prof. António Correia Mineiro (SPG Career Award)

Prof. Emanuel Maranha das Neves (SPG Career Award)

Prof. Ricardo Oliveira (SPG Career Award)

10th Geotechnical Symposium Held in Kocaeli, Türkiye

ZEMİN MEKANİĞİ VE GEOTEKNİK MÜHENDİSLİĞİ DERNEĞİ

The 10th Geotechnical Symposium took place on 7–8 November 2025 at the Kocaeli International Congress Center. The event was organised on behalf of the Chamber of Civil Engineers (TMMOB İMO) Kocaeli, Ankara and Sakarya Branches, in collaboration with the Turkish Society for Soil Mechanics and Geotechnical Engineering (ZMGM).


The symposium programme featured 90 papers, including two keynote lectures, presented across 19 technical sessions. About 400 participants attended the event.

The first keynote lecture was delivered by Prof. Dr. Kubilay Keleşoğlu of Istanbul University–Cerrahpaşa, Civil Engineering Department, titled "Excavation Support Systems Regulation (2022): Past Practice, Current Implementation, and Key Changes." The second keynote lecture was given by Assoc. Prof. Nejan Huvaj of Middle East Technical University (METU), Civil Engineering Department, titled "From Offshore Wind Turbines to Oil Platforms and Pipelines: Offshore Geotechnical Engineering."

Opening session on 7 November 2025 (Prof. Berna Unutmaz, Conference Chair; Mr. Nusret Suna, Chairman of the Chamber of Civil Engineers; Dr. Rasin Düzceer, Chairman of ZMGM)

The organisers expressed their sincere gratitude to the Chamber of Civil Engineers Chairman, Mr. Nusret Suna, the branch executives, the Kocaeli Metropolitan Municipality, the Organizing, Advisory and Executive Committees, as well as all sponsors, supporting institutions, industry partners, researchers and attendees whose contributions ensured the success of the symposium.

Keynote speakers Prof. Kubilay Keleşoğlu and Prof. Nejan Huvaj

Conference photograph

ISSMGE EUROPE CONFERENCES & EVENTS

XVIII DECGE

XVIII DECGE BUDAPEST 2027 9–12 JUNE

Following the successful 17th Danube-European Conference on Geotechnical Engineering held in Bucharest in 2023, we

are pleased to announce that the 18th edition will be organized by the Hungarian Geotechnical Society in June 2027 at the ELTE Lágymányos Campus in Budapest.

On behalf of the Hungarian Geotechnical Society, we warmly invite you to submit papers and share your work with the geotechnical community at the 2027 event in Budapest. Authors are invited to submit abstracts to the conference through the conference management system by the deadline of January 15, 2026. The XVIII DECGE will focus on "Geotechnical Engineering for Resilience and Sustainability." The conference will address both long-standing issues and emerging priorities, extending the discussion beyond classical geotechnical topics to the pressing challenges of our time.

We look forward to your participation and to your contribution to advancing the geotechnical community.

For more details, please visit the conference website: http://www.18decge.hu

19th ECSMGE

Organizing Committee Begins Preparations for the 19th ECSMGE in Istanbul Save the Date: 21–25 August 2028

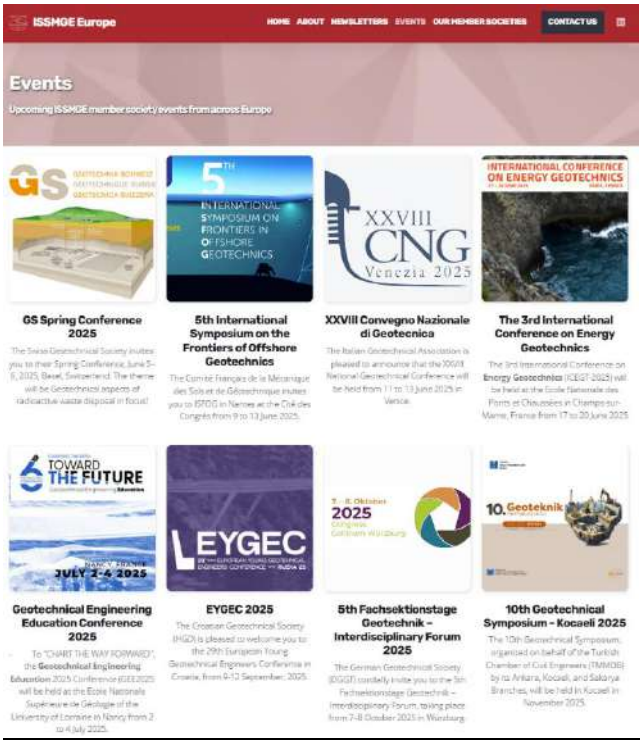
The Turkish Society for Soil Mechanics and Geotechnical Engineering (ZMGM) is proud to host the 19th European Conference on Soil Mechanics and Geotechnical Engineering (19th ECSMGE) in Istanbul. The conference will take place on 21–25 August 2028.

Prof. S. Feyza Çinicioğlu

The Organizing Committee has officially commenced its work under the leadership of the Conference Chair, **Prof. S. Feyza Çinicoğlu**.

Updates and further developments regarding the organization will be shared with ISSMGE in due course. Please stay tuned.

ISSMGE EUROPE COMMUNICATIONS



Don't forget to visit the **ISSMGE Europe website**, the central platform for updates across our regional community.

🔗 **www.issmge-e.eu**

There you'll find:

- A regularly updated listing of **events from national societies**
- An **archive of past newsletters**
- The latest announcements shared by our members

If your society is organising a conference, course, or other activity you'd like to highlight, we welcome your contributions.

Send details to: **vpeurope.issmge@epfl.ch**

The site and newsletters are shaped by what you share. Thank you for helping us keep the community informed.

LinkedIn Page: **ISSMGE Europe on LinkedIn** Follow us to stay updated on innovations, community highlights, and opportunities to engage across the geotechnical field in Europe.

These platforms are your gateway to the evolving landscape of geotechnical engineering in Europe.

Help us grow—share these links with your society members, students, and colleagues!

ISRM Newsletter No. 72 - Winter 2025

News

https://www.isrm.net

1st International Conference on Rock Mechanics and Rock Engineering – Mexico City, 19–20 February 2026, 2025-12-09

The Mexican Society of Geotechnical Engineering (SMIG), the Mexican Association of Tunnels and Underground Works (AMITOS), the International Society for Rock Mechanics and Rock Engineering (ISRM), and the International Tunnelling and Underground Space Association (ITA-AITES) are pleased to invite you to the 1st International Conference on Rock Mechanics and Rock Engineering, to be held on February 19–20, 2026, at the José Luis Sánchez Bribiesca Auditorium, Engineering Tower, National Autonomous University of Mexico.

For more information click here to download the conference flyer.

52nd ISRM Online Lecture is now online 2025-12-11

The 52nd ISRM Online Lecture by Mr. William Joughin from South Africa on "Design of concrete plugs for sealing of tunnels to prevent inrush of water and mud" is online.

Click to open the ISRM Online Lectures' page.

79th Conference of the Canadian Geotechnical Society - GeoQuébec 2026 2025-12-17

The Canadian Geotechnical Society is inviting you to Que-bec City, from September 12 to 16, 2026, for the 79th Ca-nadian Geotechnical Conference.

Click here for more information on the conference.

GeoEng2030 – Bringing together the global Geo-engineering community 2025-12-31

GeoEng2030 – Bringing together the global Geo-engineering community

The four FedIGS societies—ISSMGE, ISRM, IAEG, and IGS—will join forces for GeoEng2030, a landmark joint meeting to be held in 2030.

This decision builds on the precedent set by GeoEng2000, held in Melbourne, Australia, a remarkable conference that inspired closer collaboration and the coordination of efforts among the learned societies in the field of geo-engineering. That event laid the foundation for discussions initiated in 2003, which ultimately led to the formation of the Federation of International Geo-Engineering Societies (FedIGS), formally established in 2006.

Additional information, including the composition of the official program committee, submission deadlines, sponsorship opportunities, and registration arrangements, will be announced following the selection of the host.

News

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

Message from the ITA President

As I have already emphasised, the heart of all ITA's activities is our Member Nations the lifeblood of the Association and the essential link between global expertise and national decision-makers, through which knowledge and values translate into real-world outcomes.

Against this backdrop, this autumn has been particularly rich in meaningful engagements for ITA and its Member Nations. The ITA Executive Council had the pleasure of co-organising and participating in the ITA Awards 2025 and the SETC Conference, successfully hosted by ITA Serbia, once again reafffirming the strength and professionalism of our Serbian colleagues.

Andrea Pigorini
President of ITA 2025-2028

Celebrate St. Barbara's Day with ITAym 04 December 2025

A Global Event to Celebrate Saint Barbara's Day: "Bespoke Tunnels, Unique Solutions"

On December 4th, in celebration of Saint Barbara's Day, an international event titled **"Bespoke Tunnels, Unique Solutions"** will be held, organized by the ITA Young Members Steering Committee. The day will highlight innovation and creativity within the tunnelling and underground construction industry.

Young professionals from **29 countries** will deliver short, dynamic presentations throughout the day, sharing tailor-made tunnelling solutions, original technical approaches and inspiring initiatives from around the world. The aim of this event is to promote knowledge-sharing, strengthen international collaboration and showcase the new generation of experts shaping the future of the sector.

Schedule: The event will run from **7:00 AM to 7:00 PM (CET)**.

The **full agenda** is available here: https://about.ita-aites.org/files/WTD_FLYER_2025.pdf

Free registration: https://events.teams.microsoft.com/event/fb398c3f-f697-41f7-9815-84c4bc330649@d4658559-61fd-485e-b463-1a2c588e2d0e

ITACET Lunchtime Lecture Series #51 09 December 2025

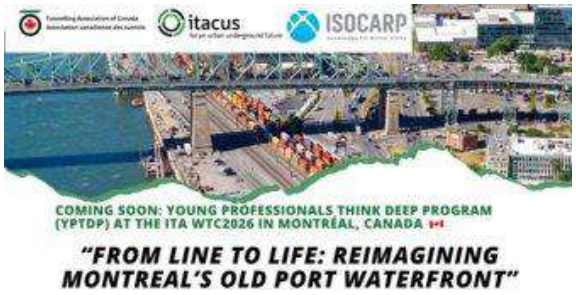
Join us for the next LLS on December 9!

This instalment of the Lunchtime lecture series will focus on '**Settlement monitoring and control in TBM tunnelling'**.

- Settlement control main issues and prediction in TBM tunnelling – **Felix Amberg**
- Settlement monitoring in TBM tunnelling – **Zhangwei Ning**
- TBM driving parameters for a good settlement control – **Gonzague Bracq**

Register here : Lunchtime lecture series#51 - ITACET

Young Professionals Think Deep Programme at ITA WTC2026 in Montréal, Canada 12 December 2025



Link: Young Planning Professionals' Workshops (YPPs) – ISOCARP

Get ready for the **Young Professionals Think Deep Programme (YPTDP)**, taking place ahead of the ITA WTC2026 Congress in Montréal, Canada.

Theme 2025: *"From Line to Life: Reimagining Montreal's Old Port Waterfront"*
Dates: May 12–15, 2025, ahead of the ITA WTC2026 Congress
Location: École de technologie supérieure (ÉTS), Montréal

This program invites both international and local Young Professionals to collaborate, explore innovative ideas, and develop forward-thinking solutions for the future of Montréal's Old Port waterfront.

Participation is by selection:

- Interested Young Professionals must submit an application for evaluation.
- A total of **24 participants** will be selected.

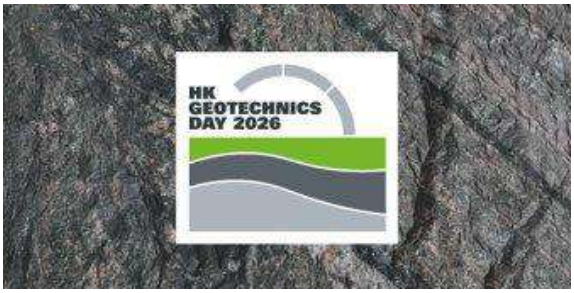
The call for applications will be released by December 12,2025, with further details to follow.

Stay tuned to the Tunnelling Association of Canada (TAC) and ISOCARP Young Planning Professionals' Workshops (YPPs) webpage for announcements and updates.

Download document

Herrenknecht's first Geotechnics Day showcases tunnelling innovation, expertise, and future-focused solutions 18 December 2025

On March 19, 2026, Herrenknecht will host its inaugural **Geotechnics Day** at the Herrenknecht Academy in our headquarter in Schwanau, Germany. This event will bring together geotechnical experts, tunnelling practitioners, consultants and researchers from around the world.



The conference in form of 12 keynote presentations will explore one of the most critical aspects of mechanized tunnelling: how ground conditions influence the design, operation, and performance of tunnel boring machines (TBMs).

Alongside theoretical insights, the program features real-world case studies illustrating how geotechnical data shapes machine design and construction strategy. A guided tour through Herrenknecht's state-of-the-art workshop will give attendees the opportunity to witness the production and assembly of TBMs up close.

The aim of the Geotechnics Day is to deepen the industry's understanding of geotechnical challenges in TBM-driven projects and to foster collaboration between machine manufacturers, academic research, and project owners.

For more information, visit **Herrenknecht's website**: Geotechnics Day

Questions? Contact: geotechnicsday@herrenknecht.de

Dramix® eyeD Inspector: Enhancing Quality Control in Fiber-Reinforced Concrete 18 December 2025

To provide additional peace of mind when managing in-situ dosage for sprayed concrete linings or precast segments, Bekaert has developed a testing device: The Dramix® eyeD Inspector. This innovative tool is designed to measure steel fiber orientation and dosage in fiber-reinforced concrete test specimens. Developed in collaboration with UPC – Polytechnic University of Catalonia, the technology behind the Dramix® eyeD Inspector is patented (patent no. ES2355344B1).

By giving you a clear view of how fibers are distributed, it helps you verify that your project meets design requirements before you commit to continuous production. With the Dramix® eyeD Inspector, you can reduce risks, optimize performance, and save time on every job.

Celebrating 50 years of Japan Tunnelling Association 18 December 2025

Japan Tunnelling Association (JTA) 50th anniversary in Tokyo united global tunnelling leaders for dialogue, innovation, and collaboration.

JTA marked its 50th anniversary in Tokyo from 4–6 December, hosting a series of events that highlighted Japan's engineering excellence and strengthened international ties.

The celebrations opened with the *International Special Lecture on Tunnel Engineering, chaired by* Nobuharu Isago, JTA and ITA Executive Council (ExCo) member. The session explored global perspectives and recent developments in tunnelling, featuring insights from ITA President Andrea Pigorini, ITA Ex-officio member Leslie Pakianathan, Governance Council Member Bill Newns, and other leading experts from PIARC and Japan's tunnelling community.

Technical visits on 5 December showcased Japan's cutting-edge infrastructure, including the **Kamariya Shodo Tunnel** and the **Trans Tokyo Bay Tunnel**, organised by NEXCO-East. These visits provided a unique opportunity for ITA ExCo and JTA members to exchange knowledge and deepen professional connections.

The celebrations concluded with a reception on 6 December, where JTA President Shigeru Kikukawa delivered a warm welcome to ITA ExCo. ITA President Andrea Pigorini expressed his appreciation:

- I extend my heartfelt thanks to President Shigeru Kikukawa and ExCo member Nobuharu Isago for their exceptional leadership and warm hospitality during JTA's 50th anniversary celebrations.

Reflecting on the broader significance of the event, Pigorini added:

- Collaboration across nations, cultures, and languages is vital for the future of tunnelling. ITA remains committed to serving as a global platform that fosters this exchange and drives innovation worldwide.

With rich discussions, technical insights, and personal connections, JTA reaffirmed its pivotal role in advancing tunnelling innovation and promoting international cooperation for a sustainable underground future.

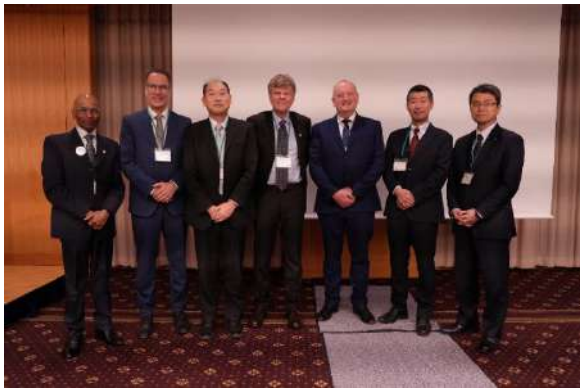


Photo credit: Helen Roth

Photo credit: JTA

World Tunnel Day 2025: A Truly Global Online Event Powered by ITAym 18 December 2025

On 4 December **—** the official date of World Tunnel Day — ITAym delivered an extraordinary online global mini-conference, bringing the international tunnelling community together for 13 hours of continuous live content. The event stood out as a powerful demonstration of collaboration, innovation and knowledge-sharing across borders — all in a fully digital format.

Key highlights:

- 36 countries represented
- 70 international presenters
- 13 hours of uninterrupted programming
- 120+ attendees online throughout the day
- 643 registered participants

This year's theme, **"Bespoke Tunnels, Unique Solutions,"** was proposed and voted on by Young Member representatives from more than 60 member nations, reflecting the vision, curiosity and priorities of the next generation of tunnel engineers.

The programme was remarkably diverse, covering topics such as:

- deep urban metro stations
- TBM excavation in mixed and challenging ground conditions
- ground freezing and frozen shaft applications
- immersive tunnel rehabilitation techniques
- low-emission waterproofing solutions
- underwater and hydropower tunnels
- emerging applications, including tunnels for salmon farming

The event was made possible by the outstanding commitment of speakers, attendees and member nation societies, who helped make this conference truly global through their active promotion and engagement.

Special recognition is due to the moderators , who worked in rotating 4-hour shifts across multiple time zones — a tremendous effort that enabled the success of this 13-hour continuous conference.

Feedback has been overwhelmingly positive, confirming this edition of #WorldTunnelDay as a powerful celebration of what young tunnellers can achieve when knowledge is shared openly and internationally.

ITA Forms Cross-Congress Coordination Team for WTC 18 December 2025

To strengthen the planning and delivery of future ITA World Tunnel Congresses, ITA has established a joint Cross-Congress Coordination Team with representatives from WTC2025–2028. The initiative aims to professionalise processes, enhance consistency and efficiency, and ensure transparent decision-making across all upcoming events.

The *ITA WTC Cross-Congress Coordination Team* brings together Thomas Dahlmalm (ITA WTC2025), Rick Lovat (ITA WTC2026), Johan Mignon (ITA WTC2027) and Leslie Pakianathan (ITA WTC2028. Under the leadership of the ITA Executive Director, Helen Roth, the team has already convened three times – in Geneva, Belgrade and most recently in Tokyo. These meetings have focused on sharing practices, address common challenges and align WTC content with ITA's strategic themes.

- Our goal is to create a more consistent and professional approach to ITA WTC planning while maintaining the unique contributions of each Host Member Nation, said the ITA Executive Director.

Several initiatives are already underway:

· **A shared conference app and web platform** will launch at ITA WTC2026, supported by ITA's ownership of ita-wtc.org and ita-wtc.com.

· **A new promotional model** for future ITA WTC proposals, replacing the traditional Member Nations and Candidates Dinner.

· **Communication strategies** across ITA WTC events will be strengthened and aligned to ensure consistency.

· **Standardised document templates** will be implemented for use across all events.

· **Long-term agreements with suppliers** are being established to enhance the continuity and efficiency.

- These steps are part of a broader effort to innovate and improve efficiency. We want to ensure that every ITA WTC reflects ITA's strategic priorities and offers a world-class experience for delegates, exhibitors and sponsors, said the Executive Director.

By fostering transparency, consistency and innovation, ITA aims to deliver a more predictable, high-quality experience fand reinforce WTC's role as the leading global platform for tunnelling and underground space knowledge.

This newly established team will operate on an ongoing basis, bringing together representatives from the previous ITA WTC, the current congress, and the next two future hosts. By maintaining this continuity, the *ITA WTC Cross-Congress Coordination Team* ensures that valuable experience and best practices are carried forward, fostering a consistent and progressive approach to the planning and delivery of future ITA World Tunnel Congresses.

ITACET Lunchtime Lecture Series #52 18 December 2025

Join us for the next LLS on January 13!

This instalment of the Lunchtime lecture series will focus on 'Construction of tunnel segments' and will finish with a Q&A session with all speakers.

- Introduction and detailed design and construction considerations – **Verya Nasri**
- Tunnel segment formwork systems – **Stefan Medel**
- Tunnel segment connections and accessories – **Christophe Delus**
- Tunnel segment sealing gaskets – **Andreas Diener**
- Latest developments in detection of fiber orientation – **Benoit De Rivaz**

Register here : Lunchtime lecture series#52 - ITACET

Two Landmark Projects, One Expertise: COWI Strengthens Infrastructure in the U.S. and Denmark 18 December 2025

COWI has been appointed lead designer by Connect Plus Partners, a joint venture between Halmar International and FCC Construction, for the Design-Build contract of the Second Avenue Subway, Phase 2: Tunneling and Structural Shell. As part of the greater Second Avenue Subway Extension Phase 2 program which will extend the Q Line from 96th Street to 125th Street, the scope of this project involves: 1.5 miles of twin running tunnels using two tunnel boring machines (TBMs); station shell construction at 116th and 125th Streets; integration of an existing 1970s tunnel segment; and development of ancillary buildings for ventilation, mechanical, electrical systems, and opportunities for community use space.

The overall Second Avenue Subway Phase 2 program will add three new ADA-accessible stations within East Harlem providing long-awaited transit options to the local community, while easing congestion on the 4-5-6 line and enhancing mobility across New York City. Recognised as one of the most significant infrastructure projects in the nation, it involves technically complex work in a challenging underground environment.

COWI brings world-class tunneling and underground design expertise, backed by 50 years of U.S. experience and a team of more than 450 tunnel design professionals. Construction is expected to begin in early 2026.

COWI to advise the Danish Road Directorate on the Third Limfjord Connection

The Danish Road Directorate has selected COWI as its client consultant for the Third Limfjord Connection. The project aims to reduce travel time and relieve the Limfjord Tunnel, the Limfjord Bridge and large parts of Aalborg during peak hours.

The project is part of the Danish Infrastructure Plan 2035 and includes a 20-kilometre-long motorway west of Aalborg via the island of Egholm. The motorway will run under the Limfjord in an immersed tunnel, over Nørredyb on a low bridge and over Østerådal on a valley bridge.

COWI are proud to contribute to this important infrastructure project, that will boost cohesion in the region and, not least, make everyday life easier for both commuters and businesses. Further, it is paramount for COWI and the client to make the construction of the Third Limfjord Connection as gentle as possible on the local nature, environment and residents.

Construction work is expected to commence in 2027 and is scheduled for completion in 2034.

The Greek Tunnelling Society Celebrates 30 Years of Excellence in Underground Engineering 18 December 2025

The Greek Tunnelling Society – GTS (Ελληνική Επιτροπή Σηράγγων και Υπογείων Έργων – ΕΕΣΥΕ) celebrated its **30th anniversary** with an inspiring event that exceeded all expectations. The celebration brought together the entire "family" of the Greek Tunnelling Society — members, partners, institutional representatives, and friends — in an evening filled with emotion, inspiration, and reflection on three decades of dedication and contribution to the advancement of underground works in Greece.

Beyond honoring its rich past, the evening also looked confidently toward the **future of the tunnelling and underground construction sector**, reaffirming the Society's role as a driving force for innovation, knowledge sharing, and collaboration.

A highlight of the event was the **Honorary Awards Ceremony**, recognizing the members of the first Executive Council of GTS for their vision and the foundations they set back in 1995:

- Dr. **Vasso Stavropoulou**, President of the 1st Board
- Prof. **Ioannis Oikonomopoulos** (†), Vice President
- Mr. **Menelaos Konstantakos**, Secretary General
- Prof. **Alexandros Sofianos**, Editor
- Mr. **Petros Laskaratos**, Treasurer
- Mr. **Nikolaos Kazilis**, First GTS Representative to ITA-AITES
- Mr. **Evangelos Kolonias** (†), Member

Through these awards, the Greek Tunnelling Society expressed its gratitude to all those who have served and continue to serve the Society with dedication, passion, and volunteer spirit over the past three decades.

The event was honored by the presence and greetings of:

- **Mr. Nikolaos Tachiaos**, Deputy Minister, Greek Ministry of Infrastructure and Transport
- **Mr. Andrea Pigorini**, President of the International Tunnelling and Underground Space Association (ITA-AITES)
- **Prof. Dimitrios Kaliampakos**, President of ACUUS and Professor at the National Technical University of Athens

The **keynote address** was delivered by **Mr. Ioannis Bakogiannis**, Mining Engineer and former GTS President, under the theme *"The View is Underground"*, highlighting the technical and social significance of underground works.

The evening concluded with a **high-level panel discussion** on the future of tunnelling in Greece, moderated by **Mr. Ioannis Fikiris**, CEO of EDAFOS S.A. and Vice President of ITA-AITES, featuring leading professionals of the sector:

- **Mr. Dimitris Anagnopoulos**, Secretary General, Ministry of Infrastructure
- **Mr. Anastasios Aranitis**, General Manager, Aktor Group
- **Mr. Vassilis Karagioules**, Director of Infrastructure Projects, METKA
- **Mr. Alexandros Michailidis**, Deputy CEO & General Technical Director, TERNA S.A.
- **Mr. Nikolaos Rigopoulos**, Technical Director, AVAX Group

As stated by the GTS President, **Prof. Andreas Benardos**, "The underground works sector in Greece has evolved into a pillar of sustainable infrastructure development. The Greek Tunnelling Society will continue to promote technical excellence, education, and collaboration — looking ahead with optimism to the next 30 years."

The event concluded with a networking cocktail among members and guests, celebrating three decades of shared vision, engineering achievement, and professional unity.

ITA World Tunnel Congress taking shape in Montréal 18 December 2025

The **World Tunnel Congress** (WTC) each year is the marker that kick starts the new cycle of activity and progress in the world on underground engineering. It brings together representatives of the 81 Member Nations of the International Tunnelling and Underground Space Association (ITA) and draws delegates from across the world to share knowledge and influence the industry's contribution to the future.

The WTC gathered in Stockholm in 2025 and in Shenzhen in 2024. In 2027 it will be Belgium and Singapore in 2028.

But for next year, the stage is being set for an outstanding rendezvous in Montréal, Canada.

From 15-21 May 2026, the Tunnelling Association of Canada (TAC) will host the ITA and delegates from across the world, including national government representatives and clients planning or needing underground infrastructure for the betterment of citizens and communities.

ITA WTC2026 will explore the theme ***Connecting communities through underground infrastructure*** and is preparing a **programme** to meet every interest and speciality. From the Opening Ceremony and Think Tank session to the packed exhibition hall and simultaneous tracks of technical presentations, the very latest in technology, design advances and construction knowhow will be on show and up for discussion.

Opening proceedings will be the Keynote Address, presented by the renowned Canadian urban planner **Larry Beasley,** and the ITA Muir Wood Memorial Lecture given by **Remo Grandori**, a leading specialist in the field of TBM design and excavation.

As well as the conference schedule, the programme includes the anticipated ITACET Training Course and a diary of entertaining social events starting with the Welcome Reception for all participants on Sunday evening.

Don't miss an opportunity to visit one of the most loved cities of the world, experience its underground urban connectivity and multi-cultural vibe, and join one of the most active global groups of professionals in the vital field of underground infrastructure engineering.

Register today **and** **Let's connect in Montréal**

Season's Greetings 20 December 2025

On the occasion of the year-end holidays, the International Tunnelling and Underground Space Association (ITA) extends its best wishes to all its members, partners, and stakeholders.

We wish you a New Year marked by good health, success, and continued progress in the field of tunnelling and underground space. ITA looks forward to continuing to work alongside you to advance our shared objectives in support of sustainable development and innovation.

Adapting Tunnels for Tomorrow – Building Resilience in a Changing World 8th TSO Forum

13–15 April 2026 | Tromsø, Norway | Clarion Hotel The Edge

For the first time, the National Tunnel Forum Norway and the ITA COSUF Tunnel Safety Officers Forum are joining forces to build a unique, international gathering dedicated to the future of tunnel safety.

In April 2026, the tunnel community meets in Tromsø, spectacularly located above the Arctic Circle. With its combination of dramatic landscapes and modern facilities, the city provides the perfect environment for three days of learning, inspiration, and collaboration.

Event website: https://emaileditor.provisoevent.no/website/750abede-35c3-4668-b7d7-2d1b1a0a7301/pages/home

Scooped by ITA-AITES #141, 17 December 2025

Orange Gate To Marine Drive Tunnel Project | India

Salerno-Reggio Calabria HS/HC Railway | Italy

The most beautiful station in the world is in Val-de-Marne! Find out which one it is. | France

Award given to Metro Vancouver wastewater tunnel project | Canada

CMRL begins tunnelling from Panagal Park Station to Boat Club | India

Three contractors appointed to assess Shetland tunnel feasibility | UK

TBMs emerge from the ground at Sydney's Westmead | Australia

New section of Hong Kong's Central Kowloon Bypass undergoing final checks | China

Amtrak has made real progress in East River Tunnel rehabilitation. Here's what's been accomplished | USA

HS2's longest green tunnel construction enters next stage | UK

INTERNATIONAL GEOSYNTHETICS SOCIETY

www.geosyntheticssociety.org

December 2025

Holiday Message From The IGS President

Hello,

I hope this message finds you well as we approach the end of another lively year. We've once again packed energy and activity into the last 12 months, and as ever it has been a pleasure to connect with new and existing members throughout 2025.

It is with great pride I can say 2025 has been a year of firsts for the IGS with the launch of several exciting new initiatives.

At the start of the year we introduced the **Premium Corporate Membership** (PCM) scheme, which invited our Corporate Members to deepen their involvement with us via this new membership level. Eight companies are so far on board and already reaping the benefits of this closer relationship, while all our members are benefitting from the experience and input of these industry titans to help drive our collective goals.

We saw this in action when PCM company representatives joined IGS staff at one of three non-IGS conferences this year. We attended the Environmental Services and Solutions Expo in the UK, HYDRO 2025 in Greece and Tailings & Mine Waste in Canada. This gave our PCMs a chance to engage potential customers in specific markets while the IGS was able to raise greater awareness about the Society and geosynthetics to new audiences.

We will continue this in 2026 and have already booked IGS booths at four non-IGS conferences next year. If you are a Corporate Member, now would be a great time to upgrade to take advantage of these exclusive opportunities.

I'm also delighted to say this year we released the first edition of the much-anticipated **IGS Geosynthetics Handbook**. This comprehensive reference guide takes its position alongside standard materials-related handbooks promulgated throughout academia and engineering firms. Its achievement was made possible by a generous contribution by the IGS Foundation and is the result of months of dedicated work by the editor and originating author contributors. Along the way, Technical and Education Committee reviews were performed – a truly international effort! I thank them for all the hard work that has gone into creating this essential toolkit. We've already sold 300-plus copies worldwide. You can get yours now, preferably through your IGS Chapter but also directly available from the IGS or Amazon. We are also looking into the possibility of a digital version.

Jacques Cote, Chairman of the IGS Foundation, is presented the inaugural first edition of the IGS Geosynthetics Handbook

IGS Student Interest Club at UCLB

The IGS continued to champion the next generation of engineers this year while also celebrating the legacy of our pioneers. We launched the first ever **IGS Student Club**, supporting undergraduate and graduate learning at the at the University of California at Long Beach (UCLB). With the leadership of Dr. Amr Morsy, club meetings have included workshops and guest speakers from industry. With the same theme, Dr. Ernest Olinic and colleagues held a Geosynthetics Camp attracting many new IGS student members from the Technical University of Civil Engineering in Bucharest (UTCB). The IGS also created the **Giroud Legacy Project**, a dedicated section on the IGS website featuring resources connected to JP Giroud's significant contributions to our industry.

The IGS was delighted to welcome our newest Chapter, **IGS Iraq** to the IGS family this fall. It strengthens our presence in the Middle East and offers members new opportunities for collaboration and cooperation. We were also pleased to see IGS Argentina undergo a refresh with a reinvigorated strategy and program for its members.

This year we also marked 10 years of our **Educate the Educators** program, one of the most successful initiatives training hundreds of professors around the world since its conception. We have also launched a task force to develop our new **Academic-Led Policy Steering** initiative, which aims to leverage the expertise of our IGS academic members to influence environmental and transportation officials, encouraging the adoption of policies that recognize the economic, performance, and sustainability benefits of geosynthetic-informed design.

As we enter the new year, we are launching a further **initiative to support Chapters** to grow their membership. From January 2026, when Chapters sign up a new Member, they will be able to keep the full payment they would normally pay to the IGS for that Member ($30-40). And if the new Member continues with the Chapter in 2027, the Chapter can retain 50%. Already 18 Chapters have signed up to take part, accounting for around half of our existing membership.

EuroGeo8 participants

DEI session at EuroGeo8

Plus, watch this space for more details about the launch of our IGS **Professional Development Courses** in 2026, with inaugural offerings expected to take place in Brazil, South Africa and Romania.

Meeting members in person is always a highlight and it was wonderful to see so many of you at the GeoAsia8 and EuroGeo8 conferences this year. I look forward to seeing members old and new at the upcoming **13th International Conference on Geosynthetics in Montreal** in September, next year. It promises to be an unmissable event with hundreds of presentations, five short courses and plenty of exciting keynote addresses. Importantly, this event will have a very special session including a representative from the United Nations.

Looking ahead I'm pleased to announce the IGS, along with our sister geoengineering societies, has secured the **GeoENG II 2030 Conference** agreement. It will run concurrently with the 14th International Conference on Geosynthetics in a unique collaboration, bringing together both practicing engineers and academics from around the world.

The interest and engagement in the IGS continue to flourish with our LinkedIn followers hitting 7,000-plus this year and some 100 news stories added to our website over 2025, boosting engagement and geosynthetics education. As we seek to better understand our members and stakeholders, we will soon be implementing a new **Customer Relationship Management** system. This will help us to better understand the needs of our membership and to modernize our communications. It will also make it easier for IGS Chapters to update membership records. As the new system comes into action, we will also be able to offer Chapters a dedicated space on the IGS website.

Next year the IGS membership will vote into office a new President, Vice President and several new council members. In this context, next year will be my final term in office as President of the IGS. **Nominations** have already opened to find the next person to take over this privileged role beginning in September 2026, at which time the new Officers and council members will take their positions. Accordingly, this is my last holiday message as your IGS President.

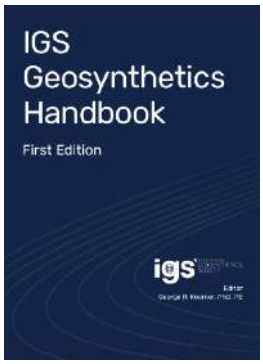
As always, I thank all of you for your dedication to the IGS and wish members, supporters and friends a safe and peaceful holiday season. See you in 2026!

Yours in service,

Samuel (Sam) Allen
IGS President
International Geosynthetics Society

IGS Geosynthetics Handbook Available To Buy Now

The long-awaited **IGS Geosynthetics Handbook** is now available to buy. A one-stop technical reference guide suitable for all levels of experience in geosynthetics. The handbook offers a concise yet comprehensive summary of the fundamental applications of geosynthetics and is an essential reference guide for student, instructor or civil engineering professional alike.



Non member price: $200 USD

Member price: $150 USD

IGS Chapters can access a bulk buy discount of 30 copies or more at $75 USD per copy, for this option only, contact igssec@geosyntheticssociety.org.

Call for Candidates: Only 2 weeks remaining

Less than two weeks left to nominate the next IGS President, Vice President and 10 Council Members.

Could you be part of the next leadership team to further the Society's mission and goals? These important positions need dedicated members looking to take the next step in their industry journey by playing a leading role in one of the most prestigious membership organizations in geosynthetics.

Nominations must be sent to IGS Secretariat Manager Elise Oatman at igssec@geosyntheticssociety.org by **December 31, 2025**. Candidates can nominate themselves – no proposer or seconder is needed – and current IGS Council members can reapply. Learn more by visiting our website.

Call for IGS Awards: Now Open!

Nominations are now open for the IGS Awards 2022–2026, recognizing outstanding contributions to geosynthetics, with awards to be presented at 13ICG in Montreal in 2026. Learn more about the application process, deadlines, and criteria on our website.

Premium Corporate Member Spotlight: Naue

This month we showcased Naue as part of the Premium Corporate Member offer. You can explore the history of Naue, an interview which covers, how geosynthetics can reduce the carbon footprint of earthworks and integrating circularity and a case study focusing on Bentofix® Green which limits surface water infiltration.

These articles are part of a Premium Corporate Member spotlight, providing all Premium Corporate Members with the opportunity to showcase their history, work and products. It does not imply IGS endorsement of any products or services.

Learn more about the benefits of becoming a Premium Corporate Member.

Naue

News

Trips, Talks And Speakers Launch CSULB's First Term December 8, 2025

The IGS's inaugural student-led in-college geosynthetics club had an energizing start to its first term. IGS at CSULB (California State University, Long Beach) kicked off **Read More »**

My Engineer Life With… Gino Sicha December 11, 2025

Pursue your passions when it comes to research topics says IGS Young Members Committee regional chair Gino Sicha, our latest young engineer to share their **Read More »**

Holiday Message From The IGS President December 15, 2025

Dear IGS Colleagues, I hope this message finds you well as we approach the end of another lively year. We've once again packed energy and **Read More »**

IGS Awards: Call for Nominations 2022 – 2026 December 16, 2025

The IGS Awards will be granted in 2026 at the 13th International Geosynthetics Conference in Montreal (13ICG) to individuals or groups of individuals who have **Read More »**

IGS Argentina Launches Rejuvenated Chapter December 17, 2025

Expect a reinvigorated IGS Argentina in 2026 after a long-awaited relaunch. The reset, officially made during the recent Argentine Geotechnical Engineering Conference, aims to energize **Read More »**

Thumbs Up For First Premium Corporate Member Collaboration December 18, 2025

Leading companies from the geosynthetics industry have been sharing the value they gained from attending three recent expos courtesy of the IGS. IGS Premium Corporate **Read More »**

Students In Spotlight At EuroGeo8 December 18, 2025

IGS Young Members from across Europe presented their latest papers at the recent EuroGeo8 conference in France. IGS Student Awards, with travel grants funded by **Read More »**

IGS Ambassadors Program Provides Keynote At Colombia Event December 19, 2025

The IGS's outreach scheme which helps Chapters develop and disseminate geosynthetics information took a lead role at a recent IGS Colombia event. Professor Fernando Portelinha, **Read More »**

Hear A Musical Tribute To Geosynthetics December 19, 2025

A rousing anthem celebrating the positive impact of geosynthetics on the world was shared at IGS Romania's recent GeoSint conference. The original song, created with **Read More »**

BGA · THE BRITISH · GEOTECHNICAL ASSOCIATION

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

Prizes & Awards 03.12.2025

2025 Fleming Award Winner Announced

The BGA is pleased to announce that the 2025 Fleming Award was won by United Utilities, Stantec, and Keller for their project presentation on The challenges of maintaining a Bateman Embankment Dam Read More

Early Career Group | Prizes & Awards 05.12.2025

Deadline extended – Call for entries for the 57th Cooling Prize Competition

The British Geotechnical Association (BGA) is pleased to invite Early Career Geotechnical Professionals to submit posters for the 57th Cooling Prize Competition on any topic dealing with the engineering behaviour of the ground. Deadline extended to 12 December 2025. Read More

Events | News 06.12.2025

BGA Partners with GE Awards 2026

The British Geotechnical Association (BGA) is pleased to continue its partnership with the prestigious GE Awards for 2026, reaffirming its commitment to recognising and celebrating excellence across the ground engineering industry Read More

International Societies | Prizes & Awards 08.12.2025

Call for Submissions for BGA Medal 2025

The BGA is calling for submissions for the BGA Medal – Deadline for Submissions is 31 January 2026. The BGA Medal is awarded annually to a paper written by a BGA member (or members) for "meritorious contributions to geotechnical science or practice". Read More

Early Career Group | Prizes & Awards 08.12.2025

Call for Entries for the BGA 2025 Masters Dissertation Prize

The BGA invites submissions for the Masters Dissertation Prize – Deadline for submissions is 31 January 2026. The Masters Dissertation Prize is a prize of £500 awarded annually by the BGA for the best Masters' degree dissertation on a geotechnical topic. Read More

Prizes & Awards 08.12.2025

Call for entries for the BGA Case Histories Award 2026

The BGA is pleased to invite submissions for the 2026 Case Histories Award – Deadline for submissions is 31 January 2026. The objective of the award is to encourage and recognise the importance of exchange of exemplary geotechnical knowledge and experience of the performance of constructed works for the benefit of the geotechnical profession Read More

Events | News 19.12.2025

The 2026 John Mitchell Lecture has been postponed

The BGA regrets to announce that due to unforeseen circumstances the 2026 John Mitchell Lecture, planned for 20 January 2026, has been postponed. Read More

TERRA

European Master in Earthen Architecture and Construction - Applications for the 1st edition

Dear Colleague,

TERRA is a new **European Master in Earthen Architecture and Construction**, offered as an Erasmus Mundus Joint Master funded by the European Union. The programme **advances scientific and professional expertise in earthen architecture and construction** and benefits from a broad international network of academic, research and industry partners.

This **one-year degree** is jointly delivered by the University of Minho (Portugal), the Technical University of Valencia (Spain), the National School of Public Works (France) and the University of Florence (Italy).

APPLICATIONS for Call 1 of the first edition are open until **February 15, 2026**. A **significant number of SCHOLARSHIPS** is available to applicants of any nationality, ranging from 3,000 to 25,800 Euro. These scholarships are intended to support **motivated candidates** aiming to work in this expanding field.

Full details on the **programme and the online application procedure** are available at https://msc-terra.org/

We would appreciate your support in **sharing this opportunity with potential applicants.**

Thank you and kind regards,
TERRA Consortium
https://msc-terra.org/master/#partners

ΔΙΑΚΡΙΣΕΙΣ ΕΛΛΗΝΩΝ ΓΕΩΤΕΧΝΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

Απονομή Βραβείου John S. Cowan στον καθηγητή Νίκο Βλαχόπουλο

I am deeply honoured to share that I was awarded the 2025 **John S. Cowan** Prize for Excellence in Research during the Royal Military College of Canada/Collège militaire royal du Canada Spring Convocation. It was a truly meaningful moment standing alongside the Canadian Minister of the Department of National Defence/Ministère de la défense nationale, the Honourable David J. McGuinty, the Commandant of RMC, Brigadier General Pascal Godbout, MBA and Principal of RMC, Dr Jill Scott.

The Cowan Prize celebrates impactful research that advances knowledge, strengthens RMC's academic mission, and demonstrates excellence in scholarly contribution. It recognizes work that supports Canada's defence and security community while enriching scientific understanding and innovation.

I warmly invite you to consider joining the upcoming public lecture associated with the award:
Date: Thursday, January 22, 2026
Time: 7:00 pm EST
Location: Senior Staff Mess at RMC Kingston
Online attendance is available

Details are available in the poster below.

It is a tremendous privilege to receive this recognition by my peers, and I would be honoured to share the journey, ideas, professional friendships & connections and experiences behind this research, and to discuss how observation driven innovation can support resilient engineering design.

I hope to see you there in person or virtually. Thank you.

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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

HAS200 4th Unsaturated Soil, Granular Matter and Environmental Engineering Symposium In Memory of Professor G. N. Pande, 16-01-2026, Hungary , Budapest https://kti.rkk.uni-obuda.hu/4th-unsaturated-soil-granular-matter-and-environmental-engineering-symposium-in-memory-of-professor-g-n-pande/

The Fifth International Conference on Rock Dynamics and Applications (RocDyn-5), 15-17 Jan 2026, Singapore https://rocdyn.com

SEAGC-AGSSEA CONFERENCE 2026 Advancing Geotechnics for a Resilient and Sustainable Future: Mitigating Multi-hazards amidst Changing Climate, 28÷30 January 2026, Taguig City, Philippines https://seagc2026.pssmge.org

The 5th International Symposium on Slope Risk and Resilience, February 5-9, 2026, Hong Kong, China https://issrr2026.aconf.org/index.html

2nd International Symposium on Tailings Storage Facilities, March 11 to 13, 2026, Hermosilo, Sonora, Mexico, https://2sisdj-hermosillo-2026.com.mx/en/index.php

Observational Method Conference Perspectives and feedback from academics, consultants, contractors, clients, and technical committees, 17 Mar 2026, London, United Kingdom www.omconference2026.com

GEOMOS26 2nd International Scientific and Practical Conference on Soil Mechanics, Geotechnics and Foundation Engineering INTELLIGENCE ON GUARD OF MECHANICAL SAFETY, March 17-20, 2026, Moscow, Russia, https://geomos.rssmgfe.ru/en/

3rd Annual Conference on Foundation Decarbonization and Re-use, March 24-26 2026, Amsterdam, The Netherlands https://foundationreuse.com

3rd Annual Conference on Foundation Decarbonization and Re-use, March 24-26 2026, Amsterdam, The Netherlands, https://foundationreuse.com

Basements and Underground Structures Beneath the Surface, Beyond the Future, 24 March 2026, London, United Kingdom, https://baseents.geplus.co.uk/GEBA2026/en/page/home

PMGEC LEBANON 2026 Pan Mediterranean Geotechnical Engineering Conference, 25 - 28 March 2026, Phoenicia Bei-rut IHG, Lebanon https://pmgec-leb.com

Sixth International Conference on Geotechnical Engineering – Iraq (6ICGE-Iraq 2026), April 8–9, 2026, Baghdad, Iraq, https://icge-iraq.uobaghdad.edu.iq/

3rd International Conference on Advances in Rock Mechanics (TuniRock 2026), 09-12 April, 2026, www.tunirock2026.com

International Conference on Geotechnics, Civil Engineering and Structures (CIGOS) 2026 Innovation in Planning, Design and Civil Infrastructure for Resilient and Sustainable Transformation, April 16 & 17, 2026, Ho Chi Minh City, Vietnam https://cigos2026.sciencesconf.org

LANDSLIDES 2026 Landslide Geo-Education and Risk (LaGER), 27 April - 1 May 2026, Queenstown, New Zealand http://landsliderisk.nz

15th International Conference "Modern Building Materials, Structures and Techniques", May 12-15, 2026, Vilnius, Lithuania, https://vilniustech.lt/332107

ITA-AITES WTC 2026 World Tunnel Congress, May 15 to 21, 2026, in Montreal, Quebec, Canada, https://wtc2026.ca

94th Annual Meeting & International Symposium on Large Dams - Water, Energy and Society: The Evolving Role of Dams in a Changing World, May 21 to 29, 2026, Guadalajara, Mexico, www.icoldmexico2026.com

ICPMG 2026 Physical Modelling in Geotechnics, 8–12 June 2026, ETH Zürich, Switzerland, https://tc104-issmge.com/icpmg-2026

8th International Young Geotechnical Engineers Conference - 8iYGEC, 11. - 14. June 2026, Graz, Austria, www.tugraz.at/institute/ibg/events/8iygec

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

3rd International Geotechnical Innovation Conference - Shaping the World Beneath: Fostering Sustainability, Innovation and Resilience in Geotechnics, 15 - 16 June 2026, Jeddah, Saudi Arabia, https://geotechnicalinnovationconference.com Email info@creativeconnectionevents.com

ICONHIC 2026 International Conference on Natural Hazards & Infrastructure, 29 June – 2 July 2026, Chania, Greece https://iconhic.com/2026

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

Soft Soils 2026 International Conference on Advances and Innovations in Soft Soil Engineering 2026, 24-26 August 2026, Delft, Netherlands https://softsoils2026.dryfta.com

ICGE Colombo 2026 4th International Conference on Geotechnical Engineering, 24-26 August 2026, Colombo, Sri Lanka, https://icgecolombo2026.org/

X Latin American Congress on Rock Mechanics 26 - 28 Aug, 2026, Brsasilia, Brazil, https://larms2026.com

CREST 2026 3rd International Conference on Construction Resources for Environmentally Sustainable Technologies, Sep 07-08, 2026, Cambridge, England-United Kingdom https://engage-events.ifm.eng.cam.ac.uk/IC-CREST2026#/

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

ECEE2026 18th European Conference on Earthquake Engineering Shaping the Future of Earthquake Engineering, 14 – 18 September 2026, Berlin, Germany, https://ecee2026.eu

ISRM Regional Symposium – EU-ROCK 2026, September 15–19, 2026, in Skopje, N. Macedonia, https://eurock2026.com

Eurock 2026 Risk Management in Rock Engineering - an ISRM Regional Symposium, 15-19 September 2026, Skopje, Republic North Macedonia, https://eurock2026.com

4th International Symposium Preservation of Monuments & Historic Sites, 16 – 18 September 2026, Athens, Greece https://tc301-athens.com

CouFrac2026

The 5th International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application - an ISRM Specialized Conference
20-23 September, 2026, Uppsala, Sweden
https://www.coufrac2026.com/

Coupled thermal-hydro-mechanical-chemical (THMC) processes in fractured geological media are fundamental to understanding the Earth's evolution and essential to a wide range of near-surface and subsurface applications. These include, but are not limited to, carbon sequestration, geothermal energy, nuclear waste disposal, underground energy storage, hydrocarbon recovery, civil infrastructure development, groundwater management, and deep mining of critical minerals. To advance both scientific understanding and engineering practice, it is vital to integrate insights from numerical modelling, laboratory experiments, field observations, and increasingly, data-driven approaches such as machine learning. The interplay of THMC processes across scales continues to be a vibrant and growing area of interdisciplinary research, with broad implications for environmental stewardship, resource management, and hazard mitigation.

The 5th International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application (CouFrac2026) will be held in Uppsala, Sweden, on 20-23 September 2026. Following successful editions in Wuhan (2018), Seoul (2020), Berkeley (2022), and Kyoto (2024), CouFrac2026 will provide a dynamic platform for researchers, engineers, and practitioners to share recent advances, exchange ideas, and foster collaborations, in all areas of coupled processes associated with fractured geological media. The conference will cover a wide spectrum of topics, including fundamental process understanding, computational methods, in-situ testing, laboratory studies, and practical applications across geological environments ranging from the near-surface to the deep subsurface. The conference will be held in a face-to-face format only. We look forward to your participation!

Session Topics

1. Fracture propagation modeling in porous media (Convener: Keita Yoshioka, Wenzhuo Cao, and Chenxi Zhao)
2. Coupled processes in CO2 and H2 storage: from lab to field scale (Convener: Víctor Vilarrasa, Nicolas Espinoza, Roman Makhnenko, and Antonio Pio Rinaldi)
3. Coupled Processes in Deep Geothermal Energy Resource Exploration and Extraction (Convener: Ingrid Tomac, Inga Berre, Mohammadreza Jalali, and Ayman Abed)
4. Conditioning the Complexity: Data-Constrained, Statistically Coherent Fracture Modelling (Convener: Raymond Munier)
5. THM processes leading to deformation and fracturing of bedrock (Convener: Diego Mas Ivars)
6. Coupled THM hard rock fracture behaviour – laboratory experiments and numerical modelling (Convener: Diego Mas Ivars)
7. Coupled THM field experiments for the characterization of fractured hard rock (Convener: Diego Mas Ivars)
8. Coupled THMC behavior of multi-barrier systems for deep geological repositories (Convener: Ju Wang, Zhihong Zhao, and Xingguang Zhao)
9. Coupled Hydraulic-Mechanical-Chemical (HMC) Processes in Rock Fractures (Convener: Liangchao Zou, Jan-Olof Selroos, Diego Mas Ivars, Paolo Trinchero, and Bo Li)
10. Faults, Fluids, and Fractures: Coupled Processes in Mineral and Energy Systems (Convener: Thomas Poulet, Manolis Veveakis, Peter Kang, Jinhyun Choo, and Yinlin Ji)
11. Induced Seismicity in Geothermal Energy: From Surface to Source (Convener: Chongyuan Zhang, Ki-Bok Min, Fengshou Zhang, and Yusuke Mukuhira)
12. Coupled Processes in Clay-Rich Fractured Media (Convener: Christophe Tournassat)
13. Damage-induced coupled processes within fractured/porous rocks (Convener: Sho Ogata, Kazuhei Aoyagi, and Kazuki Sawayama)
14. Shear behavior of rock discontinuities under coupled THM processes (Convener: Li Zhuang and Lei Wang)
15. Chemo-Mechanical Processes in Fractured Rock (Convener: Carl Steefel)
16. Challenges in numerical modeling of coupled processes in Discrete Fracture Network (Convener: Maria Klepikova, Jeffrey Hyman, Bruno Figueiredo, and Silvia De Simone)
17. Coupled thermo-hydro-mechanical (THM) processes in fractured rocks (Convener: Maria Klepikova, Jeffrey Hyman, Bruno Figueiredo, and Silvia De Simone)
18. Development and evolution of flow paths in rock salt (Convener: Laura Blanco-Martín and Kyung Won Chang)
19. Linking Laboratory Insights to Field-Scale Predictions of Coupled HMC Processes in Fractured Media (Convener: Xiaoguang Wang and Chuanyin Jiang)
20. Reactive Transport Processes: Incorporating Pore-Scale Understanding into Field-Scale Applications (Convener: Sergi Molins and Cyprien Soulaine)
21. Coupled THMC-B processes in Underground Hydrogen Storage (Convener: Chaojie Cheng, Xianda Shen, Chaozhong Qin, and Fengshou Zhang)
22. Seismo–Hydro–Mechanical Coupling in Faulted Rocks: Advanced Laboratory and In Situ Experimental Insights (Convener: Rui Wu, Paul Antony Selvadurai, and Antonio Pio Rinaldi)
23. AI and Robotics Technologies for Geomechanics Exploration in Deep Earth and Deep Space (Convener: Xuhai Tang, Pengzhi Pan, Xiaoguang Wang, and Jiangmei Qiao)
24. Mechanisms, Modeling, and Engineering Optimization of CO2 Geological Sequestration (Convener: Mengyi Li, Mengli Li, Zhijun Wu, and Fengshou Zhang)
25. Coupled processes in fractured rock under glacial cycles (Convener: Andrew Frampton, Jan-Olof Selroos, and Jens-Ove Näslund)
26. Evolving pore-fracture structure and fluid transport during in-situ modification of unconventional resource reservoirs (Convener: Weiguo Liang and Yuedu Chen)
27. Modeling of Strongly Coupled Flow and Geomechanics in Reservoir Engineering Problems: From Formulation to Field-Scale Simulation (Convener: Jihoon Kim, Baehyun Min, and Hyun Chul Yoon)
28. From Test to Analysis: In-situ Experiments and Numerical Modeling in Underground Rock Laboratories (Convener: Iman Vaezi, Andrés Alcolea, Mohammadreza Jalali, and Åsa Fransson)

Support

Abstract management for CouFrac 2026 is handled through the **Invajo** system.

For questions or technical support related to abstract submission, please contact: abstracts+coufrac2026@invajo.com

Contact us

Local Organising Committee of CouFrac 2026
Qinghua Lei - Local Chair
Chuanyin Jiang - Secretary General
Iman Vaezi - Secretary General

Conference Secretariat
Academic Conferences
Email: coufrac2026@akademikonferens.se
Phone: +46 18 67 14 62 or +46 18 67 10 03

2nd International Conference on Insitu Measurement of Soil Properties and Case Histories INSITU 2026, September 21 - 23, 2026, Bali, Indonesia https://www.insitu2026.com/

6th International Conference on Information Technology in Geo-Engineering JTC2 Conference, 13-16 October 2026, Graz, Austria, www.icitg2026.com

Adapting to change ~ Embracing opportunities
14-16 October 2026, Bologna, Italy

We are pleased to announce that the HYDRO 2026 conference and exhibition will take place in Bologna, Italy from 14 to 16 October 2026, with the overall theme 'Adapting to change ~ Embracing opportunities'.

The Call for Papers brochure can be found on our website here. We welcome abstracts on any of the topics listed in the brochure, or related topics, as soon as possible and by 16 March 2026 at the latest. Please make sure to follow the guidelines on the final page of the brochure when submitting an abstract - thank you.

A brief initial report of the previous event in this series, HYDRO 2025, held recently in Thessaloniki, Greece is available on our website here. A more detailed report will be published soon in Hydropower & Dams journal.

For any enquiries about the HYDRO 2026 conference programme, please contact us at: Hydro2026@hydropower-dams.com

For enquiries about the HYDRO 2026 Exhibition, please contact: Sales@hydropower-dams.com

More information about HYDRO 2026 will be uploaded to a dedicated part of our website soon, and then this micro-site will be regularly updated in the coming months. Meanwhile, please mark the dates in your calendar for next year, and we hope to welcome you in Bologna.

EWRWSE – 2026 7th International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering, 22-25 October 2026, Surat, Gujarat, India www.egrwse2026.com

SLOPE STABILITY 2026 Slope for Safety Performance an ISRM Specialized Conference, 26 – 29 October 2026, Lima, Peru www.slopestability2026.com/en

PBD-V Chile International Conference on Performance-Based Design in Earthquake Geotechnical Engineering, November 4th to 6th, 2026, Puerto Varas, Chile www.pbd-v-chile.com

ARMS 14 Fukuoka 2026 - 14th Asian Rock Mechanics Symposium Rock Mechanics for the Next Generation –Innovations, Sustainability, and Resilience – an ISRM Regional Symposium, 22-26 November 2026, Fukuoka, Japan, www.ec-convention.com/ARMS14/

GEOTEC HANOI 2026, The 6th International Conference on Geotechnics for Sustainable Infrastructure Development, November 26 - 27, 2026, Hanoi, Vietnam, https://geotechn.vn/

7th International Conference on Grouting and Deep Mixing, March 17 - 19, 2027 | Florence, Italy, https://dfi-events.org/grout27/index.html

IS-GI LYON 2026 International Symposium on Ground Improvement, April 12 to 14, 2027, Lyon, France, www.menard-group.com/isgi-lyon2027

ITA World Tunnel Congress 2027 - Antwerp (WTC 2027)
Underground Creativity to Meet Societal Needs
23-29 April 2027, Antwerp, Belgium

The World Tunnel Congress 2027, scheduled to take place in Antwerp from the 23rd to the 29th of April 2027, is a leading event in the field of tunnel construction, underground building, and technology. Professionals from around the world gather to exchange knowledge, present innovations, and discuss the future of the tunnel industry. The event attracts ex-

perts, researchers, policymakers, and companies from various sectors, including civil engineering, construction, transportation, and infrastructure.

International Symposium
Cone Penetration Testing CPT '27
May 12 - 14 2027, Vancouver, Canada
www.cpt27.org

CPT'27, an International Symposium on Cone Penetration Testing will be held in Vancouver, Canada in 2027. Organized under the auspices of ISSMGE TC102, we hope to bring together industry leaders in industry, practice and research to share their knowledge and experience in cone testing across the globe.

XVIII DECGE Danube-European Conference on Geotechnical Engineering, 9–12 June 2027, Budapest, Hungary, https://18decge.hu/

11th European Conference on Numerical Methods in Geotechnical Engineering, 21 – 24 September 2027, Graz, Austria, www.tugraz.at/events/numge2027/home

16th International Congress on Rock Mechanics Innovations in Rock Mechanics and Rock Engineering for a Sustainable Future, 17-23 October 2027, Seoul, Korea, https://isrm2027.com

Eurock2028 -
Advances in rock mechanics and rock engineering to cope with increasingly extreme conditions - an ISRM Regional Symposium
25 - 30 Jun, 2028, Aix-en-Provence, France

"Connecting Continents Through Geotechnical Innovations"
04-08 September 2028, Istanbul, Turkey
https://zmgm.org.tr/en

Conference Topics

01 Modelling and Experimental Assessment of Geomaterials
02 Geohazards, Earthquakes and Risk Mitigation
03 Development of Resilient and Sustainable Geosystems
04 Geotechnical Construction and Soil Improvement
05 Geotechnical Engineering of Multiscale Observations, Sensors and Monitoring
06 Energy Geotechnologies
07 Technological Innovation
08 Geo Education, Standards And Codes

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ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

Dam failure triggers flooding in Ponte Alta do Bom Jesus, Tocantins, Brazil

A dam in Ponte Alta do Bom Jesus, southeast of Tocantins, Brazil, suffered a partial failure on the morning of December 19, 2025.

(credit: Mischa von Jadczak)

Heavy rainfall in Ponte Alta do Bom Jesus, southeast of Tocantins, caused breach in a privately owned dam on December 19, triggering widespread flooding in the area. The failed around 08:50 local time, during work to close the spillway, affecting around two meters of the crest of the structure.

Much of the surrounding area was submerged by the large volume of water damaging homes, trees, and other structures in the region.

Firefighters from the 6th Independent Military Fire Company immediately rushed to the scene to carry out preliminary rescue and monitoring work, reported CPG.

(Rishav Kothari / THE WATCHERS, Friday, December 19, 2025, https://watchers.news/2025/12/19/dam-failure-triggers-flooding-in-ponte-alta-do-bom-jesus-tocantins-brazil)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ & ΑΝΤΙΣΕΙΣΜΙΚΗ ΜΗΧΑΝΙΚΗ

Seafloor telecom cable transformed into giant earthquake detector

Dense seismic array more than 4000 kilometers long promises new views of Earth's interior

More than 1 million kilometers of fiber-optic cables criss-cross the ocean floor. A breakthrough may allow nearly all of them to serve as seismic sensors. REUTERS/Rogan Ward

Seismic listening posts are sparse on the vast, remote ocean floor. Their scarcity means researchers often can't detect the first shakings of tsunami-causing earthquakes or the seismic waves that penetrate Earth's deep interior like x-rays, carrying information that illuminates structures in the mantle and core. But the abyss is home to another kind of technology: the fiber-optic cables that shuttle internet data around the world.

In recent years, researchers have sought to use those cables to supplement ocean-bottom seismometers by watching for shifts in the light coursing through the fibers. Now, a team led by researchers at Nokia Bell Labs has advanced that technique to its ultimate realization, turning a 4400-kilometer telecom cable linking Hawaii to California into the equivalent of 44,000 seismic stations, spaced 100 meters apart.

The breakthrough, presented today at the annual meeting of the American Geophysical Union, has the potential to usher in a new age of imaging the planet's interior and monitoring the sea floor and the ocean above it. "It's the instrument we've all been waiting for," says Vala Hjörleifsdóttir, a geophysicist at Reykjavik University who has collaborated with Bell Labs on its early data.

During testing earlier this year the Pacific Ocean cable picked up both the signal of a magnitude 8.8 earthquake that struck the Kamchatka Peninsula in late July and the faint signature of an ensuing tsunami wave as it passed through the ocean and subtly deformed the sea floor. "We've seen numerous events," says Mikael Mazur, an optical-sensing engineer at Bell Labs who led the project, which detailed its early detections in a preprint uploaded to arXiv in September.

The new technique builds off methods developed by Giuseppe Marra, a metrologist at the United Kingdom's National Physical Laboratory, who earlier this decade devised a way for laser pulses to coexist with internet traffic. Still, questions remain about just how sensitive the approach will be, and whether it will yield usable data, says Andreas Fichtner, a seismologist at ETH Zürich. "It's not enough to record something," he says. "This is high-precision science."

The method depends on a fiber-optic technique called distributed acoustic sensing (DAS), which scientists have used on land to detect the rumblings of volcanoes and glaciers, and even the footfalls of college marching bands. As light travels down glass fibers, it reflects off randomly oriented defects. When an acoustic or pressure wave—whether from a whale song or an earthquake—crosses the fiber, it stretches and squeezes the defects, causing a phase shift in the light they reflect back to the cable's source. Measuring those shifts can turn the fibers into a dense array of strain meters. So far, so good—but seafloor cables are interrupted by repeaters, spaced every 75 kilometers or so. The repeaters amplify light for its long journey across the ocean, but dampen the faint back-reflections along that fiber.

Mazur's team realized these relays didn't have to be showstoppers. The bundles of fibers in each cable resemble divided highways: Light travels out on some fibers and returns on others. But at each repeater there is a "loop-back," designed to monitor fiber health, that allows light to jump the median, as it were, and travel back on one of the return fibers. Mazur's team realized these built-in bypasses enabled researchers to send defect reflections from each stretch back along return fibers, where they would be amplified by repeaters rather than blocked by outgoing ones. With some sophisticated computing, the researchers showed, they could recover reflections even from the farthest sections of the cable—creating, in effect, a dense 2D array of transoceanic seismometers.

Scientists eager for the data wouldn't need their own dedicated fiber—only a laser that piggybacks on the commercial cable, at higher frequencies than the internet traffic. "The beauty of this tech is that it can run on legacy cables," says Martin Karrenbach, a co-author and geoscientist at Seismics Unusual who has been one of the main figures behind the growth of DAS. "You don't have to spend hundreds of millions of dollars."

Fichtner worries rolling out the technology to scientists won't be so simple. The military might object because the fiber sensors could pick up submarine traffic. Telecom companies might hesitate to tell scientists exactly where their cables are for security reasons. If researchers have to sign nondisclosure agreements to know their locations, other scientists will have no easy way to reproduce their findings. "Those logistical and political problems may be bigger than the technological," he says.

Still, the potential for a high-resolution view of areas long ignored is enticing, says Verónica Rodríguez Tribaldos, a geophysicist at the GFZ Helmholtz Centre for Geosciences. Such sensors could track whales and monitor ocean currents. They could provide views of tectonic plates as they pull apart in the ocean, or refine how rising plumes of magma in ocean hot spots connect to the base of the mantle. The sensors are there, ready, Hjörleifsdóttir says. "They're waiting for us to ask what they see."

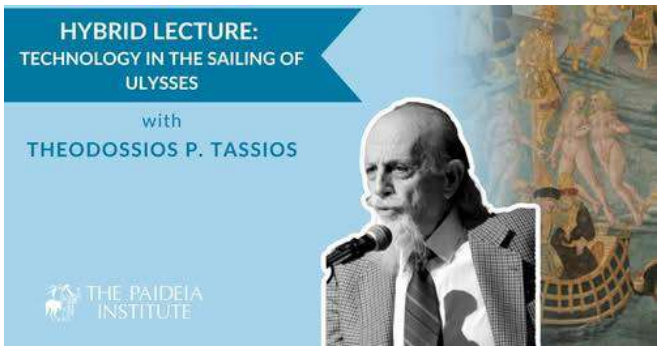
(Paul Voosen / SCIENCE, 15 Dec 2025, https://www.science.org/content/article/seafloor-telecom-cable-transformed-giant-earthquake-detector)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΛΟΙΠΑ

Θεοδόσης Τάσιος:

Technology in the Sailing of Ulysses

While T.P. Tassios' first volume of his multi-volume companion to Ancient Greek Technology is just out, and dedicated to "Ancient Military Technology" (Crete University Press / **Πανεπιστημιακές Εκδόσεις Κρήτης**, 2025), here's a video of a lecture in English about technological aspects of Ulysses' travels, given for **The Paideia Institute** in 2024:



https://www.youtube.com/watch?v=toDu155nN1Y

Theodossios P. Tassios | Technology in the Sailing of Ulysses | Paideia Institute Hybrid Lecture

Why Cities are Built on top of Each Other

https://www.facebook.com/share/v/1ANmodKGwr/?mibextid=wwXIfr

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

GEO-TRENDS REVIEW

Issue #33 - November 2025
www.mygeoworld.com/geotrends/issues/33-november-2025

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Special Issue on Environmental Geotechnics by ISSMGE TC215
International Journal of Geoengineering Case Histories **Journal** 31 Oct 2025 Read More

1st Geotech Asia conference in Goa, India
Dimitrios Zekkos, 13 Oct 2025
Just returned from the 1st Geotech Asia conference in Goa, India where I was invited to give a keynote lecture Read More

ISSMGE Bulletin Vol 19, Issue 3, September 2025 has just been published
ISSMGE **Bulletin** 03 Nov 2025 Read More

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John Steven Metzger **Monitoring** 20 Nov 2025 Read More

Proceedings of ICSE-12 published in the Online Library of ISSMGE
ISSMGE **news** 05 Nov 2025 Read More

Beginning From Mohr's Circles to AI-Driven Innovation
Rezaul Haque **Soil Behavior Modeling** 14 Sep 2025
The evolution from Mohr's circles to Cambridges stress invariants to today's AIis marked by layers of abstraction that simplify complexity while expanding predictive capability. Read More

Augercast piles (CFA)
Geoengineer.org **Pile Foundations** 28 Nov 2025
Augercast (CFA) piles combine continuous-flight drilling with simultaneous grout placement to create deep foundations with minimal noise and vibration. Our recently updated educational resource describes the installation sequence, the role of the hollow-stem auger, typical soil conditions where the technique is effective, and key design and construction considerations. Read More

Expansive soils characterization: Cc/Cs ratio method
Mounir Bouassida 10 Oct 2025
It is our pleasure, I and Dr Sergio Manigniavy, to announce the publication of paper titled "Expansive soils characterization: Cc/Cs ratio method" in Geodata & AI Elsevier journal. Read More

Central Java landslides highlight severe slope instability
Geoengineer.org **news** 20 Nov 2025
Heavy rainfall across Indonesia's Central Java region has triggered multiple landslides, resulting in significant loss of life and widespread damage. Read More

CAPG Unveils a New Logo!
ISSMGE **CAPG** 06 Nov 2025
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GeoMap Just Got Better: Discover Photos Shared by Geo-Professionals!
GeoWorld Corner **GeoMap** 28 Nov 2025
Our goal is to create a unique, global map filled with geo-photos contributed by professionals everywhere. Your participation makes this possible. Take a look at the updated GeoMap and explore the new Photo Layer. Read More

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Bentley Systems **PLAXIS** 03 Nov 2025
The latest PLAXIS release features a new database for calculation inputs and results. This upgrade offers faster output, improved data accessibility, and more consistent results, enabling users to push modelling boundaries. Read More

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Bentley Systems **OpenGround** 03 Nov 2025
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Newly completed Hongqi Bridge suffers landslide-induced failure months after opening in Sichuan
Geoengineer.org **news** 13 Nov 2025
A major geotechnical incident occurred in southwest China when the newly completed Hongqi Bridge, a 758-meter-long structure in Maerkang city, Sichuan province, partially collapsed following signs of slope instability and landslide activity. The collapse happened in early November 2025, just months after the bridge was opened to traffic. Read More

Nice sedimentary beds exposures in road cuts of the Great Valley complex per USGS map
Dimitrios Zekkos 05 Oct 2025
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Nalut Mountain Road in Libya
Aboalgasem Alakhdar 27 Sep 2025
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ISSMGE **ITT26** 24 Sep 2025
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Analytical Method for Checking Stability in Deep Soil Pile Block under Static and Earthquake loading in Soil Strata
Mrigendra Nath Ray **Deep Foundations** 14 Nov 2025
In this paper, the author has tried to investigate how the Deep Soil pile block is transferring the imposed load to a deeper subsoil layer while interacting with the boundary soil medium which is present all around the pile block with a gradual increase of compressive strength of the C-S Pile block from 2Mpa to 15Mpa. Read More

Inspiring Global Pursuits: Indonesia Launches the SOIL Webinar Series
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GEOMECHANICAL UNDERGROUND THESIS
Mitterand KALALA NGOIE **Underground Structures** 25 Sep 2025
GEOMECHANICAL CLASSIFICATION FOR MINING AND TUNNELING PURPOSES: A CASE STUDY OF UNDERGROUND EXCAVATION IN KAMOTO UNDERGROUND ZONE4 ORE BODY INFERIOR AND REVERSE ORE BODY FOR KAMOTO COPPER COMPAGNY KCC, DRC Read More

2025 GeoSymposium
UC Berkeley Geosystems Group **Geosymposium** 25 Nov 2025
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Investigation underway after water seepage accident hits Ningnan Tunnel project in Sichuan
Geoengineer.org **news** 14 Nov 2025
A flash flood accident occurred at the Ningnan Tunnel, part of the Liangshan Riverside Expressway project in Sichuan Province, on the evening of November 10, 2025, prompting the rapid evacuation of construction workers. Read More

Geosynthetics International
www.icevirtuallibrary.com/toc/jgein/32/7

Κυκλοφόρησε το τεύχος Volume 32, Issue 7, December, 2025 του Geosynthetics International της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

Research Articles

Small-strain dynamic characteristics of multilayered rubber-sand composites, W. Liang; M. Wu; F. Liu; K. Zheng; J. He

Experimental study on impact of geocell on pavement performance under multi-stage loading, S. Banerjee; B. Manna; J. T. Shahu

Theoretical analysis of vacuum preloading combined with short and long PVDs, Y. Zhou; W. Guo; Y. Ren

Characterisation of graphene-based geotextiles for moisture detection in pavements, H. Senadheera; R. Deo; A. Bouazza; J. Kodikara

Geotextile thickness effect on slope failure stress of encased column: 3D numerical study, M. Hajiazizi; M. Nasiri; M. Aminpour; A. Hajiazizi; S. Khosravi

Influence of geosynthetic on load transfer and settlement in pile-supported embankments, L. Briançon; A. Pantet; J. Racinais; C. Terqueux; K. Varain

Biaxial tensile test and joint strength modeling of HDPE geocells, B. Zhang; J. Liu; F. Song

Bearing characteristics of recycled concrete aggregate encased column composite ground, Z. Wang; L. Li; S. Duan; X. He; H. Li; Y. Zhang

Application and research of flexible mesh in tunnel protection system, Z. Zhang; W. Yang; M. Wang; X. Song; Y. Bai; E. Zhang; L. Jin

Discussion Papers

Discussion: Uniaxial compression test of cement-solidified dredged slurry columns encased with geogrid, A. Cherif Taiba; Y. Mahmoudi; M. Belkhatir

Response to discussion: Uniaxial compression test of cement-solidified dredged slurry columns encased with geogrid, C. C. Qiu; G. Z. Xu; G. Q. Gu; W. Z. Song; D. H. Cao

Erratum

Erratum

Publisher's Note

Publisher's note

Geotextiles and Geomembranes
www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/53/issue/6

Κυκλοφόρησε το τεύχος Volume 53, Issue 6, December, 2025 του Geotextiles and Geomembranes της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

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