



INTERNATIONAL SYMPOSIUM
**PRESERVATION OF
MONUMENTS
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SEPTEMBER 2026 | ATHENS, GREECE

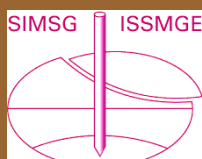


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ΕΤΑΙΡΕΙΑ
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ
& ΓΕΩΤΕΧΝΙΚΗΣ
ΜΗΧΑΝΙΚΗΣ

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Αρ. 213 – ΙΟΥΝΙΟΣ 2026



4TH INTERNATIONAL SYMPOSIUM
**PRESERVATION OF
MONUMENTS &
HISTORIC SITES**



16 Σεπτεμβρίου 2026
Ξενάγηση & δεξίωση στο
Εθνικό Αρχαιολογικό Μουσείο



16-17 Σεπτεμβρίου 2026
📍 Ωδείο Αθηνών

18 Σεπτεμβρίου 2026
📍 Μουσείο Ακρόπολης



18 Σεπτεμβρίου 2026
Ξενάγηση στην Ακρόπολη



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Urgent questions for engineering education in the age of genAI: knowledge, teaching & assessment

Jenni Case, Virginia Tech

Recent rapid developments in generative AI have brought with them a raft of urgent pronouncements urging the re-thinking of education at all levels. Part of this breathlessness is likely associated with the business imperative: there is potentially significant money to be made, for example, if paid licenses for these tools become a necessary part of all education institutions globally (Singer, 2025). But profit is not the only driver at play. It's undeniable that this (currently) freely available technology, on everyone's laptop and phone, raises significant questions for education. There's already substantial research showing that students are most definitely using these tools (Mulford, 2025). Some faculty are using them too, and students are not always happy about this (Hill, 2025). And engineers are also incorporating these tools into their work (Johri et al., 2025).

In engaging with this moment, one finds oneself drawn to adopting a position between the poles of enthusiastic adoption and anxious resistance. The enthusiastic tech adopters at their most enthusiastic envision (yet again) a utopian vision of teacher-proof and cheap (not actually) education. The anxious resisters envision all hell breaking loose if we don't batten down the hatches. I want to suggest that this false dichotomy is not only of limited use but also ultimately uninteresting (Ganesh, 2025). Far more productive will be doing what good educators always do: engage deeply in the present context with all its constraints and opportunities, but stay full centred on what it is we are really trying to achieve in our educational programmes and endeavours.

So I do think that this is an important moment for a renewed and urgent engagement with the core issues at the heart of engineering education. The questions I want to focus on here are perhaps not the questions that currently catch the headlines. This is a tech disruption, and not the first in our times -- we are still in the long digital revolution that started in the 1960s, arguably not a "fourth industrial revolution" (Cooper, 2021). Every time we hit a new phase of this revolution, we have many educators and innovators exploring these new IT based tools. This is all fine and good, and certainly one should be joining in this conversation (for an excellent overview, check Johri, 2025). But the key thing is that the core educational questions can't be found within an examination of the features of the tools themselves (Hodges & Kirschner, 2024).

To answer educational questions, we need to think about educational foundations. Some of these questions may seem familiar. Some of the answers may be the same ones we've always had. Some of the answers might need to change. We need to reconsider these questions and maybe ask some new ones. So here are the questions I want to focus on in this article:

1. What do students need to know, as well as what do they need to do, and who do they need to become?
2. How do we create educational environments in which such learning can occur? What is the role of the teacher?
3. How can we be sure that learning has happened?

I'll acknowledge that going down this road isn't always popular. People might accuse you of being conservative or insufficiently enthusiastic about new shiny technology. But if we don't ground ourselves in some basics, I believe we run serious risks in our educational endeavours.

The Knowledge Question

What do students need to know? This question is prominent in the age of GenAI, where not only is information widely available through the internet, but we have tools that can quickly produce seemingly humanlike outputs. What is knowledge? What does it mean to be knowledgeable? Is there a difference between knowledge and information? Ironically, these are times where knowledge is easily dismissed but arguably more important than ever.

Being able to access information is not the same as understanding it. Knowledge is all about understanding. And professionals need to make critical judgments that are grounded in a deep understanding of the specialized knowledge basis for their field. In engineering education, we tend to get misled on these matters when we (quite correctly) research what engineers actually do in the workplace and how this relates to their formal education. Asking this question, one tends to obtain answers that are centred on skills like problem-solving (for example, Jonassen et al., 2006). You will also hear many professionals say that they only use a tiny part of what was in their university courses. But the kind of professional skills we need to build cannot be learnt in isolation to knowledge. There is limited value in a generic skills course focusing on "problem solving" or "critical thinking", etc. This is most probably one of the most serious and consequential misadventures in the whole of progressive educational thinking in the late 20th century and only slowly being rectified now (Surma et al., 2025).

While the engineering curriculum must therefore be oriented toward what engineers need to be able to do in the workplace, there is no simple reverse engineering from practice to curriculum. Formal education has its own internal logic, and outcomes are emergent and not fully determined from inputs. In this way education differs fundamentally from on-the-job training. Education is its own structured phenomenon. It requires specific forms and logic to build students' understanding coherently over time. There is no content-free critical thinking or lifelong learning. Crucially, a professional will always be defined by the knowledge they are able to recruit to address complex real-world problems.

There is no simple reverse engineering from practice to curriculum.

Our very challenging task as engineering educators is to create environments in which students can master the core knowledge in their discipline and be able to apply it. Which brings us to the next question:

The Teaching Question

The core challenge for engineering educators is this: Learning scientific concepts is hard. A major finding of the then emerging field of Science Education research back in the 1980s, was that students can even pass difficult exams, but not necessarily understand the key concepts in the discipline. In my own PhD in the late 1990s, I followed a set of students through a second-year chemical engineering course to understand why they struggled to grasp key concepts, even though the course had a sophisticated and explicit focus on concepts. What helped me make sense of this was the idea of approaches to learning, demonstrating the central challenge of creating a course environment that fosters a focus on understanding (Case & Gunstone, 2002). Not only is learning concepts hard, for a student to change their approach to learning to focus on concepts while in a packed

engineering curriculum is really hard. And this is where teaching comes in. And why sitting in front of a computer, even with a sophisticated chatbot, is less likely to foster that change. The key to unlocking all of this is the relational dimension of teaching. But this leaves us with a real challenge: if a lecturer stands at the front of a theater mumbling away, not doing much more than what a video or ChatGPT can do (Flenady & Sparrow, 2025), then why should students pay all this money to attend those classes? We really have to make lectures and in-person classes into valuable opportunities.

Students can even pass difficult exams,
but not necessarily understand
the key concepts in the discipline.

This led me to a more recent study, also with second-year chemical engineering students (Case et al., 2024). This study looked across different institutions. We wanted to respond to the popular idea that lectures are bad, and that we should get rid of them all and move everything into small group work. But through interviews with students, we found strong support for the value of lectures. Three things came up. First, unsurprisingly, students valued clear explanations of difficult concepts. Second, they appreciated being able to interact with the lecturer. Even if the bar was low, they still wanted the chance to ask questions. And they valued lecturers who incorporated active learning strategies. Third, somewhat surprisingly, they talked about lectures as a kind of bridge into their own private study. What they valued was the curation of resources: the direction and support that helped them navigate what to focus on and how.

Finally, to address the question that is getting most of the educational headlines: the potential for cheating with the help of GenAI tools. Some people are focused on AI detection but again this might more productively be a moment for critically looking at some of our approaches to assessment that have always been problematic.

The Assessment Question

How can we be sure that learning has happened, now that so many homework assignments and take-home exams can be easily answered by AI? The main point I want to make here is that this isn't entirely new. Students have always had ways to bypass real learning in order to pass. When I was a student, there were past exam "archives" with worked solutions that would get passed around the student residences. Later, there were online tools like Chegg. Now it's ChatGPT. But I do acknowledge that these current AI tools have supercharged those possibilities for bypassing real learning.

We're going to see more in-person assessments. More oral assessments. These come with resource and time challenges, for sure. This also pushes us to think harder about the distinction between summative and formative assessment. Summative assessment must indicate whether a student has met the learning outcomes. But formative assessment, testing and developing understanding during the course, remains crucial. And what we do in the classroom to support that also remains crucial. Thus, back to the teaching question again!

Concluding Thoughts

Why does all of this matter? I like this point made by McKenna and Tshuma (2025):

If students haven't developed their own knowledge foundations, they'll be increasingly marginalized in a world that, paradoxically, values human expertise more, not less, as AI advances.

In conclusion then I want to acknowledge that these are questions that do not have simple answers, and that context

always matters. Here I think there is an important role for scholarly work done by academics who care.

Engineering Education Research (EER) has a crucial role to play in addressing these questions. Importantly, we must move beyond research focused solely on "what works". The questions we now face require a deep engagement with the purposes of engineering education and the core values that underpin it. A focus on knowledge requires that we identify the core concepts needed for each engineering discipline and formulate the pedagogical content knowledge that teachers will need to deploy to enable students to master difficult concepts. Much of the current discussion around generative AI has of course been focused on the validity of assessment given the ubiquity of new tools that can allow for the bypassing of actual learning and mastery. It also seems unavoidable that we must seriously rethink our methods of assessment to be able to be confident that we are producing engineering graduates equal to the challenges that they will face in their future careers.

There is a key role here to be played by those who are focused on Engineering Education Research, but there is also a big space for academics whose primary research is in technical disciplines, but who still want to engage with educational practice. They might pursue scholarly teaching, drawing on scholarship to inform their teaching. And honestly, one could argue that every university academic should be a scholar in their teaching. Then there's the scholarship of teaching and learning (SoTL), a newer idea (see Hutchings & Shulman, 1999). It's a practice-based, scholarly activity, but it doesn't require a lab or postgraduate students. It's something any educator can take up in their own classroom.

The scholarship of teaching and learning doesn't require a lab or postgraduate students ... It's something any educator can take up in their own classroom.

Let's abandon the tired either/or polarities on genAI and use this opportunity to push for engineering curricula and classrooms that are focused squarely on what students need to know and getting them there. This is also work that demands creative and contextualized scholarship and research.

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6th International Conference on Geotechnical Engineering Education 2025 (GEE 2025), July 2-4, Nancy, France

Marina Pantazidou, TC306 chair 2017-2025

The conference "Geotechnical Engineering Education 2025 (GEE 2025): Charting the path toward the future" took place on July 2-4, in Nancy, France, and was chaired by Professor Farimah Masrouri of Université de Lorraine. GEE 2025 was organized under the auspices of the French Soil Mechanics Committee (CFMS) and the University of Lorraine, with support by academic and professional French organizations and major French geotechnical engineering companies. The ISSMGE provided additional funding in response to a proposal by TC306 to the Technical Oversight Committee requesting support for the invited Engineering Education Expert Speaker.



GEE 2025 Chair, Farimah Masrouri

In terms of numbers, with 46 papers and 119 authors, the 6th GEE started looking like a full-fledged technical conference! Compared with GEE 2020, GEE 2025 saw twice as many papers and two-and-a-half times as many authors. More than 20% of the GEE 2020 authors returned to GEE 2025. The papers were made available through the [ISSMGE Online Library](#) a week prior to the conference and were visible in Scopus a few months later. The videos of the plenary lectures are available through the [ISSMGE Virtual University](#), together with the accompanying slides, while the videos of all the presentations are available through the [TC306 YouTube Channel](#).



GEE 2025, First day of the conference

The Scopus-indexed GEE conference series is organized by TC306, the [Technical Committee on Geo-engineering Education](#). The GEE conferences balance the perennial themes of Curricula and Coursework, with emerging, forward-looking topics, such as Open Resource Educational Material, Applications of ICT Tools, and Links to Research on Learning and on Engineering Education. Each conference also features priority themes aligned with evolving needs and opportunities, frequently developed in partnership with other TCs. For GEE 2025, the priority themes were "Teaching of Unsaturated Soils", in collaboration with TC106, and "Use of Numerical Modeling to Support Teaching", in collaboration with TC103. Priority themes were complemented by the invited lectures "[Undergraduate teaching of Unsaturated Soil Mechanics: building on fundamental physical mechanisms to pave the way to geotechnical analysis](#)", by Alessandro Tarantino and Alessia Amabile, and "[Teaching numerical methods or teaching with numerical methods?](#)", by Francesca Ceccato. The conference included two more invited lectures. Jean Sulem discussed the topic of "[New challenges in rock mechanics: Building new skills in engineering education](#)" and Nicolas Utter addressed the question "[What role should software play in geotechnical education?](#)", enriching further the numerical modeling priority theme.



Alessandro Tarantino
and Michele Calvello



Francesca Ceccato



Jean Sulem



Nicolas Utter

The conference included two keynote lectures—one focused on Engineering Education and the other on Geotechnical Engineering Education. GEE 2025 opened with the keynote lecture on Engineering Education by Jennifer Case, who discussed "[Urgent questions for engineering education in the age of genAI: Revisiting approaches to knowledge, teaching & assessment](#)" (see also accompanying article in this issue). Next, Jorge Zornberg delivered the geotechnical keynote lecture "[Geosynthetics in the classroom: Educating future engi-](#)

neers and their instructors". The GEE conference series is the home of the ISSMGE-TC306 John Burland Honor Lecture. The 3rd Burland Lecture was delivered by Marina Pantazidou, who talked on "[Changing attitudes, organization and scale in engineering education: The teacher as a go-between and TC306 as a knowledge broker](#)".



Jennifer Case



Jorge Zornberg



Marina Pantazidou and David Airey

All this unfolded within just two full days, fostering the camaraderie that energized the event—though some participants admitted they would have welcomed a more relaxed pace and even a third day. Many attendees expressed their delight for the combined luxury of devoting two days to discuss geotechnical engineering education and experiencing exceptional hospitality. Noteworthy was the sentiment expressed by two geotechnical engineering consultants who discovered in the conference a place where their educational questions could be explored.



Valia Xenaki



Hilary Shields

The University of Loraine provided an excellent venue and the city of Nancy charmed all visitors. Nancy's central square, Place Stanislas, is a sight to behold! It is a paradigmatic example of 18th-century French classical/neoclassical urban design, enriched with ornate ironwork and decorative flourishes typical of its era. What is more, the conference banquet took place at the City Hall, on the square, and was followed by a dazzling light show on the buildings surrounding the square. To top it off, GEE 2025 organizers offered a walking tour of Nancy's many architectural gems on July 4. We left with heartfelt appreciation for our GEE 2025 hosts, who made Nancy a truly remarkable destination for us.



GEE 2025 banquet, Nancy City Hall



Our view of Place Stanislas from the City Hall!



Walking tour with hosts Farimah Masrouri (top left) and Adel Abdallah (top right)

This record of the GEE 2025 elements and attributes gives genuine optimism for GEE 2029! TC306 has plans to announce the GEE 2029 location within 2026, so that colleagues start thinking early about their paper and make plans to attend.

Design of Bridge Pier Deep Foundations

Bridge foundations must safely transfer structural loads to the ground while maintaining stability under complex loading and environmental conditions. Since bridges vary significantly in geometry, location, and loading demands, their foundation systems must be designed to address both structural and geotechnical challenges.

When shallow foundations are not feasible, bridge piers are commonly supported on deep foundations connected through reinforced concrete pile caps. These systems are required to resist axial, lateral, overturning, and sometimes torsional loading under both static and dynamic conditions.

Typical Loading Conditions

Bridge foundations may be subjected to a wide range of loading conditions, including:

- Dead load of the bridge structure and pavement
- Vehicle and impact loading
- Wind loading on the structure and vehicles
- Water, ice, and debris flow forces
- Earthquake loading, liquefaction, and lateral spreading
- Scour around foundations in rivers or coastal environments

Scour is particularly critical for bridge foundations located within water bodies, as erosion around the foundation can significantly reduce lateral and axial resistance.

Geotechnical Design Considerations

Bridge deep foundations must be designed for both axial and lateral loading conditions.

Axial pile capacity is commonly estimated using empirical or semi-empirical methods based on SPT, CPT, or laboratory data, although load testing is often required for final verification. Pile group interaction effects should also be considered, particularly for closely spaced foundations subjected to combined axial and lateral loading.

For laterally loaded bridge foundations, cyclic loading effects are especially important. Repeated traffic, wind, wave, or seismic loading can reduce lateral soil resistance over time and influence long-term pile performance.

Downdrag and Volume-Changing Soils

When surrounding soils settle more than the pile, negative skin friction or downdrag can develop along the pile shaft, increasing axial loading demands below the pile head.

Similarly, expansive soils or frost-related ground movements may induce uplift forces on piles. Seasonal shrinkage can also reduce lateral confinement and increase the unsupported pile length.

Structural Pile and Pile Cap Design

Bridge piles are typically subjected to combined axial and lateral loading, requiring careful structural evaluation.

In reinforced concrete piles, axial compression may increase bending resistance up to a certain limit, while tension loading generally reduces flexural capacity. Steel piles may also require buckling checks, particularly where unsupported lengths are present.

Pile caps must be designed for:

- Flexure
- One-way shear
- Two-way shear
- Punching shear

Reinforcement detailing must also account for congestion around pile connections and constructability requirements.

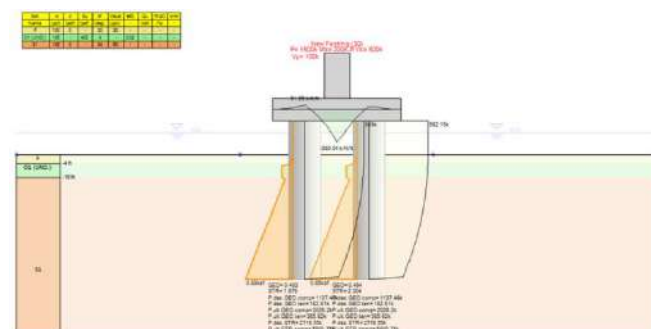


Figure 1: Mobilized axial load and shaft resistance in DeepFND

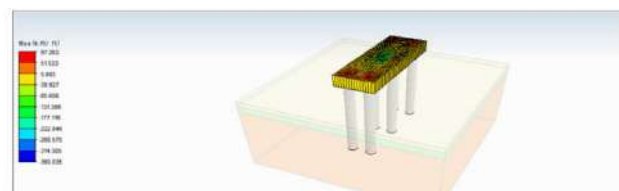


Figure 2: Sample pile cap bending moments in DeepFND

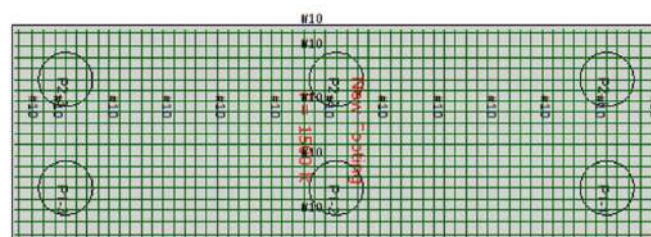


Figure 3: Pile cap reinforcement detailing in DeepFND

Modeling Recommendations

Reliable bridge foundation analysis requires realistic representation of soil behavior, pile-soil interaction and staged loading conditions.

Key modeling recommendations include:

- Define realistic soil stratigraphy and groundwater conditions
- Consider pile group interaction effects under axial and lateral loading
- Model cyclic lateral loading where applicable
- Evaluate scour effects and potential loss of soil support
- Include downdrag, liquefaction, or lateral spreading where relevant
- Check both structural capacity and serviceability performance
- Validate numerical predictions using load tests or field instrumentation whenever possible

For advanced bridge foundation projects, numerical tools such as the DeepFND platform can integrate axial, lateral, and structural pile analysis within a unified workflow.

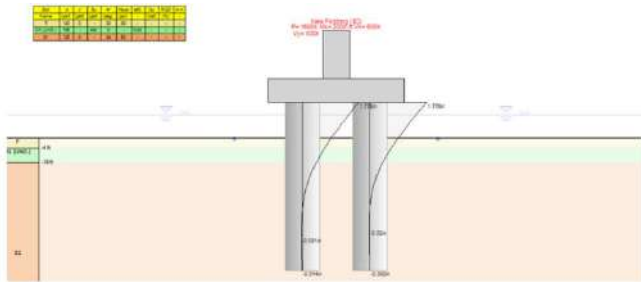


Figure 4: Lateral pile deflections in DeepFND

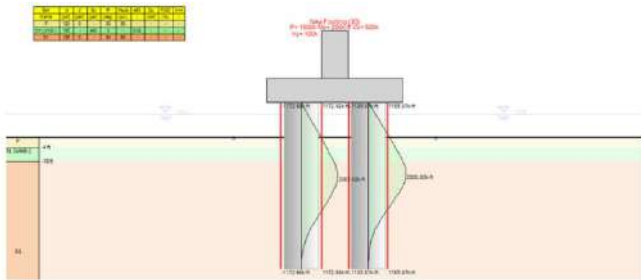


Figure 5: Pile bending moments exceeding structural capacity

Conclusion

Bridge pier deep foundations must safely resist complex combinations of axial, lateral, cyclic, hydraulic, and seismic loading throughout the life of the structure. Their design requires careful evaluation of both geotechnical and structural behavior, including pile-soil interaction, scour, downdrag, cyclic degradation, and combined loading effects.

Accurate modeling, proper detailing, and thorough verification are essential for achieving safe, durable, and reliable bridge foundation systems.

(https://www.deepexcavation.com/post/design-of-bridge-pier-deep-foundations?utm_campaign=6fa20315-229d-4c5e-9715-4376690218b5)

What is this rock?

John MacDonald

Not natural, not quite unnatural, the strange new rocks of the Anthropocene stretch the boundaries of geology



Workington in Cumbria, England. Photo provided by the author

I'm standing on a beach at Workington, on the western edge of the Lake District in England. Here I find myself contemplating a very unnatural object, while pondering a pretty fundamental question: *what, exactly, is a rock?* For a geologist like me, this should be easy to answer, but what I'm looking at has made me think otherwise.

At Workington, all seems natural – the sounds of the waves lapping the shore, the call of seabirds, the smell of the ocean, the sight of the stony beach and high cliffs. At first glance, the beach is made largely of a rock platform, which is not a particularly unusual phenomenon – many coastal areas are 'rock coasts' made of sandstone, basalt or granite. These rocks are ancient in human years – often millions or even billions of years old – and have been sculpted into their current cliff or platform shapes over hundreds to thousands of years.

Yet among the waves is an object that shouldn't be there: a wheel and tyre, embedded in the rock that makes up the shore. It's not stuck in a crevice – the rock has actually formed around it. How can this have happened? The wheel and tyre are of a mid-20th century style, but rocks are ancient, often millions of years old. Aren't they?

Closer inspection of this hard rock platform shows it is what geologists call *conglomerate*: a sedimentary rock made of rounded pebbles and cobbles deposited on the Earth surface. Over thousands to millions of years, this material is buried and heated causing minerals to form and fill in the gaps between the pebbles and cobbles, fusing them together into a hard rock mass. At Workington though, this can't have happened: as well as the tyre, my colleagues and I found several other human-made objects, under 100 years old. The pebbles and cobbles in the conglomerate aren't natural either: they are all made of slag, a solid by-product of the iron- and steel-making process.

As a geologist, I have studied various types of natural rocks, but recently I have become interested in 'anthropogenic geomaterials' – things like industrial slag – and how they become entwined in geological and environmental processes. I came to Workington originally to look at the slag, because I was interested in its potential to scrub-capture carbon dioxide out of the atmosphere. However, when encountering the rock platform with the wheel in it, I was drawn by its incongruity.

After studying the geomaterials of Workington more closely – with my colleagues Amanda Owen and David Brown, we believe that this little-known section of the English coastline represents a tangible and potentially long-lasting signature of the impact humans are having on the planet.

Unlike many industrial landscapes, nature here has mostly returned, so it would be easy to miss that the beach is composed of human materials. Here a process that normally takes millennia or aeons has happened in a matter of decades. And it's not the only example: new forms of anthropogenic geology are emerging around the world. These new materials are blurring the borderline between the natural and unnatural. They are also raising a rather fundamental question for geology: what actually *is* a rock?

From an early age, we become familiar with the concept of a rock as something hard – maybe due to a grazed knee from a fall as a child. Rock is then one of those things that the vast majority of adults don't really think about. It's just there, making up the Earth – as cliffs, pebbles on the beach, maybe carved into the stone that makes up your house. The dictionary definitions of the word *rock* reflect this: 'the dry solid part of the Earth's surface, or any large piece of this that sticks up out of the ground or the sea' (Cambridge) or 'rock is the hard substance which the Earth is made of' (Collins).

The Oxford English Dictionary (OED) offers a slightly more detailed summary – 'a large rugged mass of hard mineral material or stone forming a cliff, crag, or other natural feature on land or in the sea'. This brings in the fact that rocks are made of *minerals*: ie, solid substances with well-defined chemical compositions. Minerals can form through purely geophysical processes – such as crystallisation in cooling magma or hydrothermal water – but they can also be biogenic. Limestone, for instance, is typically formed from the accumulated calcium carbonate remains of marine organisms.

Everyday materials created by humans such as pottery, concrete, bricks are made of minerals. Are they rocks?

For geologists who study rock day in day out, it's such a foundational concept that we rarely stop to ask what's the actual definition of a rock. So I quizzed a few, in a non-statistical, non-exhaustive informal survey of geological friends and colleagues. When asked, hardness featured heavily in people's definitions, and most agreed that a rock is a substance made of minerals. There was less agreement with the dictionary when it came to size though – the OED and Cambridge definitions point to rock being a large mass or even the whole Earth, but some geologists would argue that a grain of sand could be considered a rock. It is, after all, hard and made of minerals, like quartz or feldspar.

Perhaps the most debated part of the definition, and the one most relevant to this essay, is whether a rock must be natural. The overwhelming majority of rocks on Earth form through natural geological processes such as solidification of molten lava flows, or compression and compaction deep within the Earth. However, everyday materials created by humans such as pottery, concrete or bricks are made of minerals. Are these rocks? Many would say not. Perhaps that's because these materials are processed, manufactured, and more often found in the built environment rather than in wild landscapes. As we discovered at Workington, though, the border between natural and human is more difficult to draw.

If you were to tell anybody about a pile of thousands of tonnes of industrial waste, most people's reaction would probably be to recoil in disgust. In many cases this holds true, such as when old landfills of municipal waste are exposed through coastal erosion, resulting in old rags, sanitary products and medical waste leaking onto coastlines. There's something about a wet muddy bit of fabric on the beach that

just gives you the 'ick'. However, the vast majority of visitors to a place such as Workington would be none the wiser that they were in the proximity of a huge volume of industrial waste.

At Workington, the cliffs behind the beach look natural but they are actually the eroded remnants of a slag bank. This slag is the byproduct of iron and steel making. Iron doesn't (often) exist in a pure form in nature, therefore we have to smelt rocks rich in iron in a furnace to separate the iron from the other elements it's chemically bound to. The slag is made up of all those other elements. An iron-smelting furnace operates at more than 1,200 degrees Celsius, and so the slag is initially lava-like in its form when it emerges from the furnace.

This slag cliff is in no way natural – the material is created and poured by humans in its current position

Human beings have created slag for thousands of years, ever since people started working with metals. While in the past it was simply dumped, today the material is often reused in other settings, such as cement production, road construction, agriculture, or along railway lines as ballast. Occasionally, it even becomes jewellery. In the Harz mountains of Germany, copper smelting as long ago as the 10th-14th centuries produced a type of slag now marketed by gemstone sellers as 'sieber agate'. It's not a true agate, but is prized for its glassy, bright blue colour and layering.



Black industrial slag from Leicestershire, England (left) and blue slag from copper smelting in Harz, Germany (right).
Photos by Richard Fisher



Iron and steel works in Workington, Cumbria. Undated.
Courtesy [Cockermouth History](#)

At Workington, the furnaces of the Moss Bay Company and the Derwent Iron and Steel Works (among others) produced millions of tonnes of molten slag throughout the 19th and 20th centuries, which was tipped out into a heap where it cooled and solidified into a hard grey material. This created cliffs a bit like a sequence of lava flows, which solidified and built up.

This slag cliff is in no way natural – the material is created and poured by humans in its current position. If somebody really wanted to argue this wasn't a rock because it's all human, I could be persuaded.



Slag cliffs at Workington. Photos provided by the author

When we come to the shore though, the mix of natural and human processes is confounding. Once the slag that makes the cliff was poured and solidified, human involvement in the story ends. Workington is quite an exposed coast, with storms rolling in over the Irish Sea. The waves crashing against the slag cliffs causes them to erode – just like natural coastal cliffs – chipping off small, angular pebble-sized pieces. The wave and tide action then rounds off the corners. We statistically assessed the roundness of 1,300 of these pebbles and were able to categorise them as 'sub-rounded'. This confirms they have been subject to natural erosion in water, and were not originally deposited by humans in this way.



Conglomerate beach at Workington. Photo provided by the author

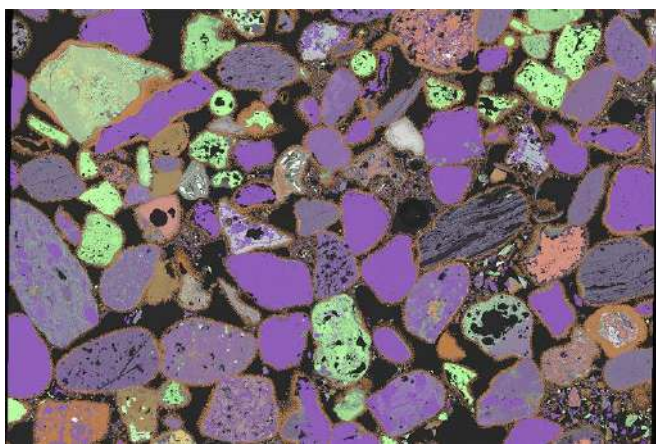
Erosion of cliffs and subsequent rapid rounding of pebbles is not unusual. What is really unusual is the rapidity of these pebbles being fused together into a rock. In a wholly natural conglomerate rock, fusing the round pebbles together would require burial deep within the Earth, compression and heating, to form new minerals that fill in the gaps. This would typically take at least tens of thousands of years. At Workington however, the slag was deposited in the 19th and 20th centuries, ending in 1982. The pace of this is underlined by the presence of dateable objects fused into the rock – the wheel that we encountered, but also a coin, and an aluminium can tab of a design that first came into circulation in 1989. This means that our 'rock' can be no older than that. How did this happen?

We found answers under the microscope. Slag is rich in the element calcium and it also reacts with water easily, resulting in chemical breakdown. We were able to use a high-powered electron microscope to see that calcium had been dissolved out of the edges of the pebbles. This calcium then reacted with carbon dioxide to grow new crystals of calcium car-

bonate (known as calcite) in between the pebbles, fusing them together. This process can happen in years, not millennia. By many definitions then – hardness, mineralisation, and the role of a natural process – this could indeed be considered a rock. It's just that the original material came from us.



An aluminium can tab (left) and a coin (right) embedded in the rock at Workington. Photos provided by the author



Slag conglomerate under the microscope. Image provided by the author

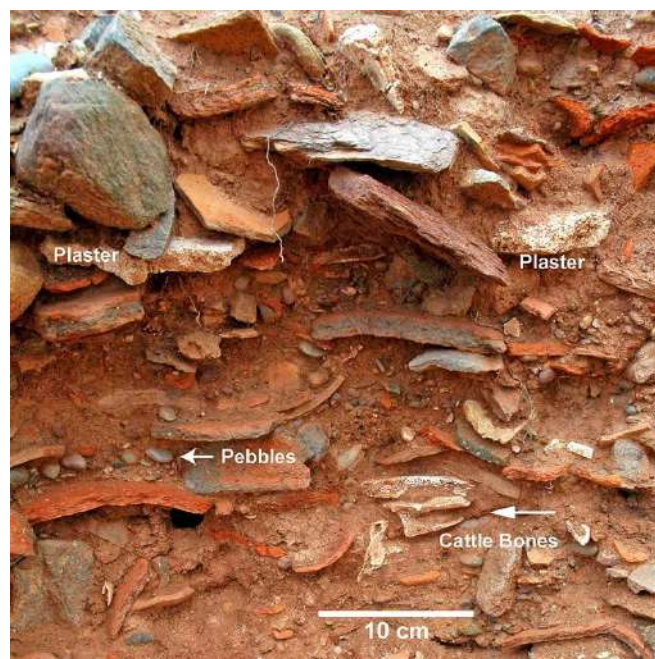
Anthropogenic rock formation is a frontier research area with relatively few examples documented. However, once we understood what was going on at Workington, we were able to identify the same process occurring in other places where iron and steel slag had been dumped historically, with examples in northern England and southwest Scotland. We also started to find evidence of 'rocks' forming from other human-made materials, or where human processes had been key. This included waste cement clinker (gravel-sized particles of cement) on the site of a former cement works from the mid-20th century in southwest Scotland, which had fused into a larger rock-like mass. In central Scotland, we found 19th- and 20th-century paper mill waste (a grey alkaline powder dumped in heaps near papermaking mills) breaking down and causing natural sediments in a stream to be fused together into rock. Further afield, several examples have been documented of mine tailings – slurry ponds of the powdery remains of rocks processed to extract metals – reacting with carbon dioxide and water to form solid layers of 'rock' at former asbestos and nickel mines.

On the beach, 22 per cent of the coarse sand was anthropogenic geomaterial, particularly weathered brick

These examples of anthropogenic rocks all meet the core components of the definition of a rock that we discussed earlier, apart from being 'natural'. There are other candidates

that may have the size and texture of a rock, but are made of a significant component of non-mineral material. The best-known of these would be 'plastiglomerates' – pebbles of mixed materials often found on coastlines, held together by melted and resolidified plastic. Plastic, however, is an organic-derived substance (from hydrocarbons), not a mineral, and so one could argue plastiglomerate fails the rock definition.

It's also important to remember that we're talking about rocks – big hard masses of stuff – as opposed to sediment, ie loose grains and pebbles. Anthropogenic sediment is very common, for example demolition rubble. Plenty of beaches are not 100 per cent natural either. A recent analysis of six beaches in the Firth of Forth in Scotland that I co-authored found that, on average, 22 per cent of the coarse sand was anthropogenic geomaterial, particularly weathered brick. And the beaches of Normandy in France are known to still contain fragments of shrapnel from the Second World War. Elsewhere, in places like Crete and Santorini in Greece, researchers have found coastal geo-archaeological formations of accumulated material containing shards of pots, wall plaster and other human detritus, washed up in ancient tsunami deposits centuries ago. None of these are rocks yet, but if they are mineralised and lithified, perhaps they might be one day.



Tsunami deposit, Palaikastro, Crete. Courtesy Bruins, H J, MacGillivray, J A, Synolakis, C E, Benjamini, C, Keller, J, Kisch, H J, Klügel, A, Van der Plicht, J, 'Geoarchaeological Tsunami Deposits at Palaikastro (Crete) and the Late Minoan IA Eruption of Santorini' (2008). *Journal of Archaeological Science* 35(1): 191-212

While the formation of anthropogenic rocks may just seem like a curiosity, it actually has importance for real-world processes, particularly at the coast. Unlike a natural pebbly beach where wave energy dissipates, pebbles that have been fused together into a large rock-like mass may exacerbate coastal erosion. On the other hand, the hardness of the new anthropogenic rock may also limit erosion. We're currently unsure how this balance will play out.

Geologists are also learning that the more 'solid' examples of industrial waste can actually bring many benefits. Slag has carbon dioxide mineralising properties – essentially scrubbing CO₂ out of the atmosphere, giving it the opportunity to help us in our fight against anthropogenic climate change. Additionally, old slag banks are known to be havens for rare species of plants and invertebrates – their gravelly and alkaline

nature makes them an unusual habitat. However, if the gravely slag has fused together into a rock, it may be *more* difficult for ecological colonisation. The study of such anthropogenic materials is a frontier area of research and there remain many unknowns.

In our discipline, we geologists are used to looking back into the distant past, perhaps to learn lessons about what our geological future might look like. With these anthropogenic rocks it is difficult to do this, as no ancient analogues exist. One might argue that anthropogenic rocks are merely an interesting philosophical and intellectual concept, but my colleagues and I believe they represent a broader point about the impact of the human age. We can consider these Anthropogenic rocks as potential markers of an Anthropocene. While abandoned as a formal period of geological time, the Anthropocene as a cultural concept helps show just how fundamentally humans are impacting Earth processes. Debates around formal acceptance of the Anthropocene as a geological period focused on chemical signatures and how human structures might survive into a future geological record. But the geological record of Earth's past is defined by layers of rock – so perhaps it is these modern-day layers of anthropogenic rock that will be the most long-lived, tangible markers of this period of time: a record of our human imprint on the planet many millions to billions of years into the future of Earth.

Earlier, we considered how different people might define the word 'rock'. Thinking about the geological future, what might geologists thousands to millions of years from now consider a rock? Since the birth of geology as a discipline and the Enlightenment, geologists have looked at layers of rocks, and clues within them, to piece together what Earth was like in the past. Palaeontologists have also used ancient organisms, such as the shells used as homes by soft-bodied molluscs, to understand aspects of their life millions of years ago. Perhaps future geologists will do the same, looking at the Workington slag and concluding it must have been formed by an advanced civilisation capable of metal processing. Looking closer, they may well discover the man-made items that we found, such as the wheel and tyre. If they do, they might consider those as fossils of our time, and use them to deduce how we lived in the early 21st century. By then, the question over whether this slag conglomerate is a rock or not would be long forgotten. To them, what would actually matter most is what this unusual material says about us.

John MacDonald is senior lecturer in anthropogenic geomaterials, in the School of Geographical and Earth Sciences at the University of Glasgow in Scotland, UK. His research focuses on how solid waste materials from human activities enter the environment and interact with environmental and geological processes.

(aeon / 16 June 2026, <https://aeon.co/essays/the-strange-rocks-that-wouldnt-exist-without-us>)

Tunnel Vision

As part of a recent series on Practical AI, the Royal Academy of Engineering hosted an in-depth discussion on the use of robots to help maintain the Thames Tideway Tunnel. Andrew Wade reports.

The UK's ageing Victorian infrastructure has been a point of concern for engineers going back decades. Early industrialisation and steady population growth have accrued a debt, with rail lines, bridges, tunnels and sewers all showing cracks under ever increasing pressure. Throw in Britain's infamous weather – with heavier rainfall predicted as climate change ramps up – and the structural foundations of the country appear even more vulnerable.

"Even a small London rainstorm can overwhelm our Victorian sewers, causing about 59 million tonnes of raw sewage to spill into the Thames every year," said Royal Academy of Engineering President Sir John Lazar CBE FREng, during a discussion on the Thames Tideway Tunnel (TTT) project.



"Tideway is a so called 'super sewer', designed to change that. It's 25 kilometres long and it has around 1.5 billion litres of storage capacity that, once fully operational, is expected to cut sewage overflow by about 95 per cent." Sir John was speaking as host of a series of events the Academy recently held titled Practical AI, which explored how the technology is being applied in tangible ways by engineers for public benefit. Other instalments examined AI's role in road safety, as well as adult care in the home. While those case studies neatly illustrated how AI and sensors can improve people's daily lives, the TTT project showcased the role AI and robotics could play in reshaping civil engineering.

Running 25km from Acton in the west to Abbey Mills in the east, the tunnel broke ground in 2016 and opened in 2025. While the £5bn final cost was more than double the original estimate, the TTT build is roundly viewed as a significant engineering success. The 7.2m diameter tunnel is set to dra-

matically improve the water quality of the tidal Thames by minimising the combined sewer overflows (CSOs) that enter the river. Having constructed this giant asset, attention has now shifted to maintaining it over the course of its 120-year operational lifetime.

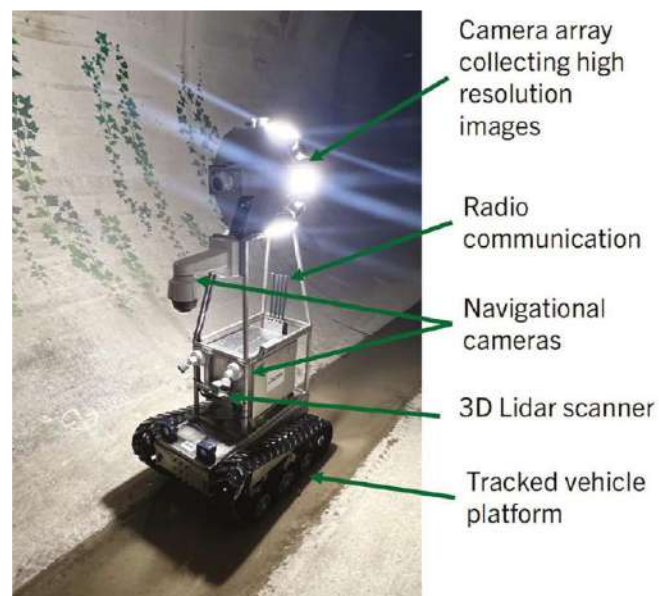
"We need to make sure that over that 120 years it's still properly functioning," explained Roger Bailey, Chief Technical Officer at Tideway, the company tasked with building, maintaining and operating the tunnel.

"It's a single sort of system. So unlike a railway or some other facility where you can shut bits of it...if we shut any of this, it's basically out of action."

When the tunnel was first conceived of, manual human inspections were assumed. But placing workers inside the tunnels would require a considerable interruption to operations, leaving the river more vulnerable to CSOs. Robotic inspection had emerged as a live option over the course of the build and, as the project neared completion, Tideway began working with engineering services firm Amentum to trial an AI-powered robotics solution.

"It was very early on when Tideway decided to put robots into the sewer instead of people," said James Kell, Robotics Technical Director at Amentum. "I think that is worth celebrating, because I don't see that very much in the infrastructure world. It's often an afterthought, and I'd like that to become business as usual really."

In development since 2022, the robotic solution for main tunnel inspection involves a crawler robot equipped with a camera array and Lidar package. After being lowered in a cage from an access shaft, the bot either travels through the tunnel to another cage at a different access point or returns to its original cage. These cages are equipped with radio antennas, acting as relay points between the robot and control stations on the surface.



The crawler robot uses a suite of sensors to build a picture of the tunnel, aided by yellow markers on the super sewer's walls

As the robot progresses through the tunnel, yellow markers help identify different parts of the structure. These markers allow an AI programme to rapidly sift through images and other data collected by the crawlers, helping the bots localise as they journey deep beneath the Thames.

"We have these markers at a known distance from each other," explained Juliette Livet, a robotics engineer at Amenum involved in the project since early prototyping. "If we use AI to reliably and quickly identify these markers within the big pool of data... then we can identify the timestamp of each picture.

"We also used AI for crack detection. Crack detection would have taken so much longer and (been) prone to errors without the use of AI...at the moment, it's mostly for post processing, but we can imagine in the future to have this for real-time detection autonomous driving as well."

Trials of the system have been successful but took place in empty tunnels before the super sewer had begun carrying wastewater. The final design, set to be decided in the coming months, will no doubt face a more challenging environment. When remote inspection gets fully underway in 2027, the tunnel will have been operational for about two years. Conditions for the robots will be different, but exactly how different is hard to predict, according to Tideway's Bailey.

"We've done the trials, and they were pretty good, but the reality is that the tunnel wasn't in service," he said. "So we need to do a live trial so that when we get to that point, we're pretty certain that it's going to work.

"The tunnel will be empty (during inspection), it will be pumped out dry. There won't be any liquid in the tunnel. What there may be is silt in various forms of hardness, softness, wetness in some portions of the tunnel...so the robot has to be able to get through something. But until we have a little bit more understanding of how the system works, it's difficult to know quite what."

While it's expected the robot system will be more than able to deal with whatever conditions it encounters in 2027, Tideway is considering other potential solutions, including a combination of robots and drones. Technology for the latter is advancing particularly rapidly, and UAV inspection has become relatively commonplace for surface infrastructure. TTT's huge diameter could make it an ideal testbed for sub-surface drone or hybrid drone/robot deployment.

Regardless of what technology is used for inspection, Tideway is hoping to avoid remediation works for the near future, with the tunnel designed to last well into the next century. But Bailey acknowledged that the reality may be different.

"The key risks are, in time, hydrogen sulphide, because of the gases in the tunnel, causing corrosion, particularly in the tops of the shafts," he said. "The tunnel is designed for that, there's sacrificial thicknesses, but are we burning through that quicker or less than what we should?"

Alongside corrosion, the robotic system could also help monitor damage from less predictable sources. London's subterranean world is a jumble of utilities, with various agencies and organisations requiring access across the city. It's not inconceivable that the tunnel could be breached by a careless bit of digging, particularly where it travels closer to the surface.

"In the shallower parts of the tunnel, in the East and the Greenwich connection tunnel...the main risk is somebody not doing their surveying properly and...putting a piling rig through one of our tunnel sections," said Bailey.

If such an incident did occur – and over the course of 120 years it's certainly possible – the robotic platform would allow for a much more rapid damage assessment than sending workers down for a manual inspection. Indeed, that flexibility should be a key factor in ensuring the tunnel continues to perform across its lifespan.

"The very original proposal was that every 10 years there'd be an inspection," said Bailey. "Well, as an asset owner, I quite like to see my asset more than once every 10 years.

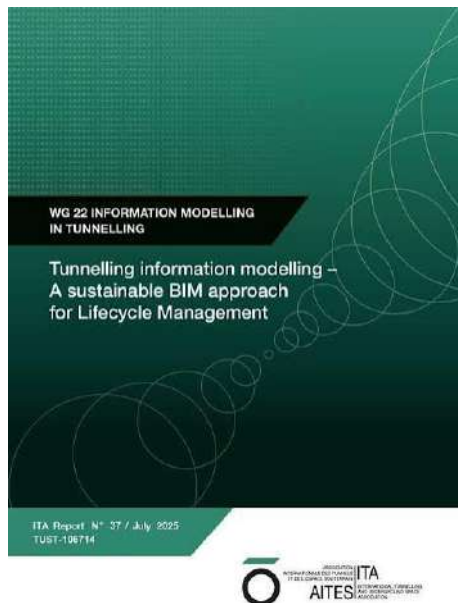
"And if somebody did suddenly hit the top of our tunnel and say, 'Oh, I'm terribly sorry I got my survey point wrong', we could actually quickly come along, go in and at least see inside whether there's any evidence of that and have a look at it within literally hours, potentially."

THE ENGINEER, June 2026, pp. 46-49 / www.theengineer.co.uk

Bim Boosts Life Cycles

A Working Group report last year issued by ITA-AITES focuses on how using Building Information Modelling (BIM) can boost sustainable life cycle management for underground infrastructure assets.

How Building information Modelling (BIM) can help deliver better sustainability performance for life cycle management of tunnels was discussed in an excellent guideline issued last year by the international Tunnelling and Underground Space Association (ITA-AITES). The report is the outcome of studies by Working Group 22 and takes forward tunneling information management.



WG22 says that infrastructure projects, particularly tunnels, have significant environmental impacts due to extensive resource use and exposure to natural hazards and, as such, there needs to be an effective way to address the challenges, one that, advisably, integrates environmental, economic, and social dimensions into the development of an underground asset. Such a framework is proposed in the report -Tunnelling information modelling: A BiM approach for a sustainable life cycle management.

The BiM-based framework, aligned with UN Sustainable Development Goals (SDGs), outlines how sustainable practices can be embedded early in project development flowing into design, construction, and asset management. It considers setting requirements during strategic planning, designing and constructing with low-carbon materials, real-time monitoring of sustainability Key Performance Indicators (KPIs) during construction, and transitioning from Project Information Models (PIM) to Asset Information Models (AIM) for sustainable operation and maintenance using digital twins.

The framework does not focus on one type of tunnel or only on entirely new tunnel construction projects. As WG22 says, the guideline aims to support all stakeholders on all projects, whether new build or renovation of existing underground infrastructure, and however excavations may take place, such as conventional or mechanical.

To achieve this objective, the guideline draws upon a BIM methodology to address best practices during the whole lifecycle of a tunnel by

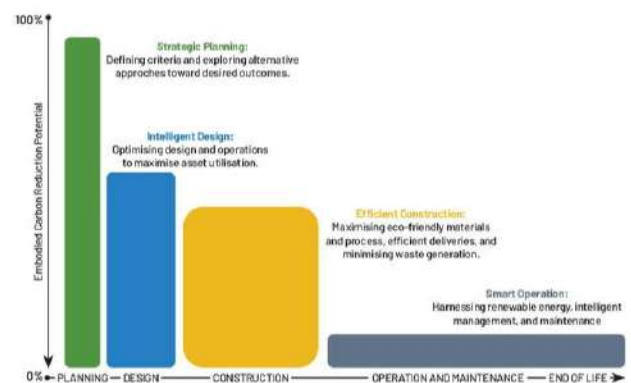
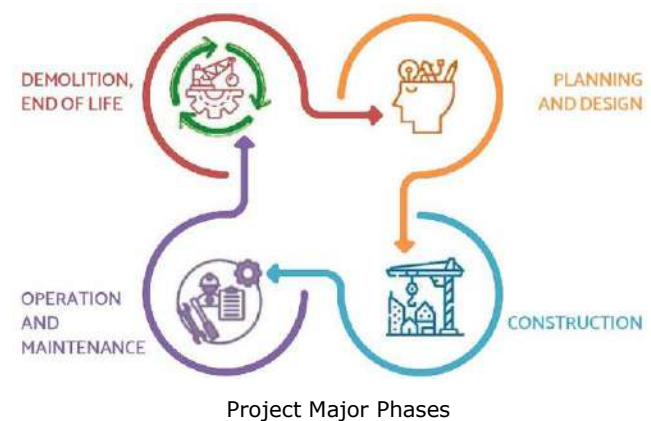
- identifying how BIM and digital tools can support stakeholders in making informed decisions about the tunnel lifecycle;

- facilitating a comprehensive journey of new digital solutions available throughout the lifecycle.
- providing a pragmatic framework to demonstrate the delivery of sustainability goals and define relevant BIM use cases;
- enabling a data-driven dynamic environmental impact assessment; and,
- promoting material reuse, energy efficiency and mitigating overall carbon footprint.

Additionally, the guideline stresses the importance of interoperability. Doing so will help provide a sound and robust basis to apply BIM in further use cases and to implement other technologies, such as Artificial Intelligence (AI) and Internet of Things (IoT) to help pursue delivery of better sustainability outcomes in tunnelling projects.

GUIDELINE STRUCTURE

The contents of the guideline is, as said, excellent. The map it lays out is valuable, and the steer given. The format of the guideline, though, is styled as a journal paper, as was first carried in TUST and is repeated.



Project phase and embodied carbon reduction potential.

So, the publication is not as a report would be there is no Contents section to usefully, and practically, detail the structure of what is to come. While there is an abstract, as for a journal paper, there is no Foreword as would open a report and discuss more. Neither is there an Index but that is the case for most reports in fact, and unfortunately, which hinders readiness of thumbing through, back and forward, in early reading and immersion, and familiarisation, and then rapid ease of reference for later times, when reaching for the document or its digital equivalent. Perhaps, in the latter, word search is the short-cut. There is a list of References. and the journal-style publication is plus Appendices.

Usefully, there is a glossary highly beneficial as a ready reckoner in the BIM, information and environmental sustainability worlds that are abundant with acronyms.

In brief, the guideline is presented as 42-page long journal paper with front and back covers. It is very well and helpfully, and practically, illustrated primarily graphics and tables, though, as is much of the way with BIM. Portraying ways of managing information, in different models and networks, dominates this area.

The guideline has nine sections, as follows:

1. Introduction
2. Intersection of BIM and LCA (Life Cycle Assessment)
3. A BIM approach for sustainability during the strategic phase
4. ...during the design phase
5. ...the construction phase
6. ...Operating & Maintenance (O&M) phase
7. Data management systems (Incl IoT, AI)
8. Risk management in tunnelling information modelling
9. Information integration and taxonomies

The three appendices are as follows:

- A) Sustainability LCA protocols
- B) Resolution of the use case in section 9
- C) Taxonomy and data management roadmap

CONCLUSION

The guideline says that leveraging BIM allows for the early sustainability investigations to help design decisions without needing to wait for finalised tunnel geometry and associated information. It emphasizes the use of BIM to integrate sustainability considerations throughout a tunnel's lifecycle by: identifying how BIM and digital tools empower decisions: facilitating a holistic circular approach with digital solutions available throughout the entire lifecycle; establishing a robust framework to integrate sustainability goals with BIM applications; and, enhancing decision-making. stakeholder collaboration, and data driven environmental impact assessments.

The full report was published previously in a special issue entitled 'ITA-AITES Reports' in Tunneling and Underground Space Technology (TUST), from Elsevier, on an open access basis under a Creative Commons licence (cc By - <http://creativecommons.org/licenses/by/4.0/>). It is available in full there, at <https://doi.org/10.1016/j.tust.2025.106711>, as well as the ITA-AITES website.

MOVING FROM FEDERATED TO UNIFIED MODELS

Section 9 discusses information integration, and upfront emphasises as with any shift - in anything - first you need buy-in, then have it actually done. Whatever it is. Dealing with sustainability, which many can perceive to have a fuzziness about its outlines and then how to get to grips with it, those are important makes. And, of course, is an aim of the guideline - while also dealing with BIM - which has a different seat, one that can seem blurred too, in the minds of engineers and others.

Or, in the works of the guideline: "We briefly outline some fundamental strategic choices concerning the application of digital technologies that should be made at the very beginning of a tunneling project. The goal is twofold: first, to ensure optimal support for the implementation any sustain -

ability measures as part of BIM, and second, to achieve sustainability in the application of the digital technologies themselves".

Then, Appendix C - Taxonomy and data management roadmap - takes the discussion further, related to the federated model approach and how such can move, or transition, in a step-by-step process, to be more integrated and come to adopt unified features: to be more of a unified model.

Four points, or steps, are discussed:

- * Communication protocols: moving away general purpose to domain-specific on one or multiple taxonomies;
- * Model management: moving away from separate models to a single distributed model;
- * Interfaces: moving from technology-based Application Programming Interfaces (APIs) e.g., AutoCAD to BIMk Collab, towards those that are taxonomy-based; and;
- * Roles within a project and/or organization: from BIM manager to (sub)domain manager.

All that considered, briefly, in the guideline, back in Section 9, and to round off the main body of the report, WG22 discusses how efforts and systems aiming at somewhat greater integration have implications in risk management - ones that are positive, it is argued.

(TUNNELS & TUNNELING INTERNATIONAL, -June 2026, pp. 35-36, <https://content.yudu.com/web/442ay/0A444ia/Tunnels0626-SM/html/index.html?page=22&origin=reader>)

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ



ΕΛΛΗΝΙΚΗ
ΕΠΙΣΤΗΜΟΝΙΚΗ
ΕΤΑΙΡΕΙΑ
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ
& ΓΕΩΤΕΧΝΙΚΗΣ
ΜΗΧΑΝΙΚΗΣ

Συμμετοχή Νέων Ελλήνων Γεωτεχνικών Μηχανικών στο 8^ο Παγκόσμιο Συνέδριο Νέων Γεωτεχνικών Μηχανικών στο Graz Αυστρίας

Η ΕΕΕΕΓΜ συμμετείχε με δύο εκπροσώπους της στο 8^ο Παγκόσμιο Συνέδριο Νέων Γεωτεχνικών Μηχανικών, που διεξήχθη στο Graz της Αυστρίας από 11 έως 14/6/2026. Αυτοί ήταν ο Χρήστος Δημόπουλος, υποψήφιος διδάκτορας στη Σχολή Πολιτικών Μηχανικών του Πανεπιστημίου Θεσσαλίας, και ο Δημήτρης Κοκοβιάδης, υποψήφιος διδάκτορας στη Σχολή Πολιτικών Μηχανικών του Πανεπιστημίου Δυτικής Αττικής και εργαζόμενος στην ΕΔΑΦΟΣ Σύμβουλοι Μηχανικοί Α.Ε.

Ο Χρήστος Δημόπουλος παρουσίασε το άρθρο του «On the numerical simulation of CFR dam during construction and impoundment» (μπορείτε να διαβάσετε το άρθρο εδώ: <https://repository.tugraz.at/publications/zeijt-4rf84>) και ο Δημήτρης Κοκοβιάδης το άρθρο του «The installation and its operation during a hydrological year of the unsaturated variables UNIWA station» (μπορείτε να διαβάσετε το άρθρο εδώ: <https://repository.tugraz.at/publications/88fgz-bxd30>).



Ο Χρήστος Δημόπουλος κατά την παρουσίασή του.

Τα συνέδρια Νέων Γεωτεχνικών Μηχανικών αποτελούν εξαιρετικές ευκαιρίες για την απόκτηση εμπειρίας από νέους συναδέλφους και την δικτύωσή τους από μικρή ηλικία με συνομηλίκους τους γεωτεχνικούς μηχανικούς από άλλες χώρες. Η

ΕΕΕΕΓΜ προσπαθεί συστηματικά να ενισχύει νέους συναδέλφους για τη συμμετοχή τους στο μέτρο των οικονομικών της δυνατοτήτων. Με αφορμή και την πρόσφατη εκδήλωση στη μνήμη του Ανδρέα Αναγνωστόπουλου, κατά την οποία είχαμε την ευκαιρία να θυμηθούμε διάφορες παλιές δράσεις της ΕΕΕΕΓΜ, υπενθυμίζεται ότι η Επιστημονική μας Εταιρεία είχε διοργανώσει το 13^ο Πανευρωπαϊκό Συνέδριο το 1999 στην Σαντορίνη.

Μιχάλης Μπαρδάνης
Πρόεδρος Εκτελεστικής Επιτροπής



**International Society for Soil Mechanics and
Geotechnical Engineering**

ISSMGE News

www.issmge.org/news

**Professor Lyesse Laloui elected as new ISSMGE
President 2026-2030**



ISSMGE is delighted to announce that, at the Council Meeting held in Vienna on 14 June 2026, Prof. Dr Lyesse Laloui was elected as the next President of the Society for the period 2026-2030.

Prof. Laloui, Chair Professor at EPFL Lausanne, has served as Vice-President Europe since 2022 and brings over three decades of experience in geotechnical research and education to the role.

The Society also extends its thanks to outgoing President Dr Marc Ballouz and the 2022-2026 Board for their leadership over the past term.

On his election, Prof. Laloui said: "It is an honour to take on this role, and I'm looking forward to working with our Member Societies so that ISSMGE gives every one of us, large society or small, real leverage as a global community."

Joining Prof. Laloui on the new Board are:

Africa: Engr. Sebastian Ozoamalu
 Asia: Dr Anil Joseph
 Australasia: Professor Rolando Orense
 Europe: Professor Loretta Batali
 North America: Professor J. David Frost
 South America: Daniela Pollak Aguiló
 Appointed Board Member: Daniele Cazzuffi
 Appointed Board Member: Professor Denis Kalumba
 Appointed Board Member: Professor Dietmar Adam

Council also confirmed that the next quadrennial conference, XXII ICSMGE, will be held in Shanghai, China in November 2029, and that the next Council Meeting will take place in Istanbul, Türkiye, from 20-25 August 2028, alongside the XIX European Regional Conference.

A full message from the new President is available here:

Dear colleagues,

Today, at the Council Meeting in Vienna, you elected me as the next President of ISSMGE for the period 2026-2030. I am honoured, and I want this message, my first as President, to go directly to all 21,000 of you.

First, my thanks to Dr Marc Ballouz and the outgoing Board for their dedication to this Society over the past four years.

Now, to the work ahead. Every one of us belongs to a national society, and that society is where our professional identity is rooted. What I want ISSMGE to be, for every one of those societies, large or small, is leverage: the connections, the platforms and the opportunities that come from standing together as a global community. That is the idea I will be working towards every day of this term, and I look forward to doing it with you.

I am looking forward to meeting many of you, in person and online, in the months ahead, and to introducing the new Board alongside me in the announcement from the Secretariat.

Lyesse Laloui
 President, ISSMGE

ISSMGE Announces 2026 International Lifetime Achievement Medal Winners

ISSMGE Secretariat / General / 07-06-2026

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) is proud to announce the recipients of the 2026 International Lifetime Achievement Medal (ILAM): Professor Samuel Ejezie (Nigeria), Professor Heinz Brandl (Austria) and Professor Chun Fai Leung (Singapore).



The prestigious ILAM award recognizes individuals who have made outstanding contributions to the field of geotechnical

engineering throughout their careers. This year's winners were selected by the ISSMGE Board in two stages following a rigorous review process conducted by the ISSMGE Awards Committee (AWAC). A total of 9 candidates from all ISSMGE regions were nominated and evaluated based on strict criteria reflecting excellence and global impact.

According to the rules, the medals will be delivered by the President or Vice-President of ISSMGE.



TC223 Launch Meeting

Grainne El Mountassir / [TC223](#) / 08-06-2026

We are delighted to announce the launch of a new Technical Committee, [TC223 in Bio-Geotechnical Engineering](#). The overall goal of the Bio-Geotechnical Engineering Technical Committee is to support the global geotechnical community in translating sustainable and innovative biologically based approaches towards practically deployable industrial technologies and engineering design solutions. This TC will bring together a global community of geotechnical engineers working on all aspects of Bio-geotechnical engineering (e.g. harnessing biology in the form of vegetation, fungi, biofilms, biocemented soils, bioinspired geotechnics, deployment of biological products) to share knowledge, disseminate best-practice, develop guidelines, initiate and strengthen collaborations and promote innovation.

We held the launch meeting of TC223 on 19th May 2026 with >35 participants attending this first meeting, with lots of ideas discussed for upcoming activities. We will keep you updated on those soon.

If you missed the meeting, you can find the minutes and slides on our webpage under TC223 meetings.

If you want to find out more about TC223 activities, please sign up to our mailing list [here](#).

TC223 Meeting at ICSMGE 2026 in Vienna

Grainne El Mountassir / [TC223](#) / 08-06-2026

The next TC223 meeting will take place during the 21st International Conference on Soil Mechanics and Geotechnical Engineering in Vienna on **Tuesday 16th June at 13:00 - 13:45 (UTC+2)**. The meeting will be in hybrid format.

In-person attendance:

Level 1, Room 1.16 (Capacity 50) 21st ICSMGE, Vienna

Online attendance:

Join: <https://teams.microsoft.com/join/359692724350329?p=88xujBbM2HFR0L1hyY>

Meeting ID: 359 692 724 350 329

Passcode: 2qC7ms6X

The meeting is open to non-members.

First In-Person Liaison Meeting to Be Held Ahead of the 8th iYGEC in Graz

Max Barbosa / Young Members / 08-06-2026



Ahead of the **8th International Young Geotechnical Engineers Conference (8th iYGEC)** in Graz, Austria, the **ISSMGE Young Members Presidential Group (YMPG)** will hold its **first-ever in-person liaison meeting**, creating an opportunity for Young Member representatives to meet and connect outside the Society's usual online setting.

The meeting will take place on **11 June 2026 at 2:00 PM** at **Kaisers Smoked BBQ, Kaiser Franz Josef Platz, Graz**.

This first in-person meeting is intended to be relatively informal and will provide a valuable opportunity for liaisons to get to know one another, exchange experiences, and discuss the activities and development of their respective **Young Members Groups / Young Professional Groups**.

Bringing representatives together in person for the first time marks an important step in strengthening communication and collaboration across the international Young Members network. It will also serve as a useful opportunity to connect ahead of the technical and social activities of the **8th iYGEC**.

Young Member representatives are encouraged to check the meeting details and, if possible, confirm their participation through the calendar invitation available here:

Calendar invitation and meeting details:

<https://calendar.app.google/nTQsVMqWhyUmAxibA>

The **YMPG** would be very pleased to see as many representatives as possible joining this first in-person gathering and taking the opportunity to connect with colleagues from other member societies.

If a liaison is unable to attend, they are encouraged to see whether another representative from their country may be able to participate in their place.

TC207 Committee Meeting in Vienna 17th June 2026

Victor C.W. Ong / [TC207](#) / 09-06-2026

The next TC207 meeting will be held on **17 June 2026, from 13:45 to 15:45** in hybrid format.

In-person attendance

Room 1.33 Level 1 21st ISSMGE Conference, Vienna

Online attendance

Join: <https://us06web.zoom.us/j/4193035943?pwd=mPT-nWJcaDbjVTMii1qzV291vipHAQ9.1&omn=85842858450>

The meeting is open to non-members

Victor Ong
Chairman, TC207

TC201 Meeting at ICSMGE 2026 in Vienna

Alessandro Tarantino / [TC201](#) / 10-06-2026

The next TC201 meeting will be held on **17 June 2026, from 13:00 to 13:45**, in hybrid format.

In-person attendance

Room 1.33 Level 1
21st ISSMGE Conference, Vienna

Online attendance

Join: <https://teams.microsoft.com/join/364427975733968?p=WBzSiO4suBY78B5eN9>

Meeting ID: 364 427 975 733 968

Passcode: 6v3rP3hx

The meeting is open to non-members

TC103 meeting in presence in Vienna (ICSME2026)

Francesca Ceccato / [TC103](#) / 11-06-2026

Dear TC103 Numerical Methods supporters,

We would like to remind you that the TC103 Numerical Methods in Geomechanics meeting will take place in person during the ICSMGE 2026 conference in Vienna.

Date and time: Monday, 15 June 2026, 15:00-16:00 CEST

Venue: Room 1.33, Level 1, Conference Centre, Austria Center Vienna

We warmly encourage all TC103 members and interested participants attending the conference to join us. We look forward to discussing ongoing activities, future initiatives, and opportunities for collaboration.

We hope to see you there!

Best regards,
TC103 Numerical Methods in Geomechanics

Join the Corporate Associates Presidential Group (CAPG) Panel Session

ISSMGE IT Administrator / Corporate Associates / 11-06-2026

ICSMGE 2026 Vienna
17 June 2026 | 10:45 - 11:20 AM | Room A



Hear from leading geotechnical experts as they discuss key challenges, emerging trends, and sustainable innovations shaping our industry.

- Network globally
- Gain expert insights
- Explore sustainable solutions

Looking forward to an inspiring exchange with the ISSMGEs Corporate Associates in Vienna!

**#ICSMGE2026 #GeotechnicalEngineering #CAPG
#ISSMGE #Engineering #Geotechnics #Vienna
#KnowledgeSharing #ProfessionalDevelopment
#CivilEngineering #Research #Innovation**

TC201 - Call for Ideas

ISSMGE IT Administrator / [TC201](#) / 11-06-2026

To TC201 Members and TC201 Wider Community

Please, help us shape the activities of TC201 by completing this 5-min questionnaire.

<https://forms.office.com/e/4ecSPrQGtz?origin=lprLink>



The TC310 Space Geotechnics kick-off workshop

Zili Li / [TC310](#) / 11-06-2026

We are excited to invite you to the TC310 Workshop on Space Geotechnics!

Join us for this hybrid event as we explore the future of geotechnical engineering beyond Earth.

Date: Monday, June 15, 2026 Time: 13:15 14:00 CET

Location: Austria Center Vienna (Room 1.33, Level 1), Vienna, Austria

as part of the 21st International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE) or via Microsoft Teams.

<https://teams.microsoft.com/join/378972055505614?p=R0LL97r5hLeWiGjP0e>

We look forward to seeing you there!



From Footprints to Foundations:
Review of Lunar Geotechnics

Prof. Zili Li,
University College Cork, Ireland
Moderator



Physics and Mechanical
Properties: 3D Printability, and
Recyclability of Bio-Inspired
Amended Lunar and Martian
Concretes

Prof. Maria Miliute
San Diego State University, San
Diego, USA,
Communication Manager



Micro CT/CTA visualization of
the Chang'e-5 Lunar Regolith
Samples

Prof. Qi Zhao
The Hong Kong Polytechnic
University, Hong Kong, China
Secretary



Geotechnical properties of
Lunar Regoliths

Prof. Ebrahim Baghouri
Polytechnique Montreal, Canada
Vice Chair

Proceedings from 21st International Conference on Soil Mechanics and Geotechnical Engineering (Vienna) available in open access

ISSMGE IT Administrator / General / 15-06-2026



The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of Professors Pistor, Adam & Schweiger, the 1,257 papers from the proceedings of the 21st International Conference on Soil Mechanics and Geotechnical Engineering (Vienna) are available in the ISSMGE Online Library:

<https://www.issmge.org/publications/online-library?data-base=1&conference=141>

The conference will be held in Vienna, Austria, from June 14 to 19, 2026.

Detailed acknowledgements for ICSMGE2026 can be found in the [Acknowledgements](#) section of the ISSMGE Online Library.

TC207 Committee Meeting in Vienna 17th June 2026

Victor C.W. Ong / [TC207](#) / 16-06-2026

The next TC207 meeting will be held on 17 June 2026, from 13:45 to 15:45 in hybrid format.

In-person attendance

Room 1.33 Level 1 21st ISSMGE Conference, Vienna

Online attendance

Join: <https://us06web.zoom.us/j/4193035943?pwd=mPT-nWJcaDbjVTMii1qzV291vipHAQ9.1&omn=85842858450>

The meeting is open to non-members

Programme

1. Opening address by Chairman Dr. Marc Ballouz (President of ISSMGE) and Prof. Victor Ong (Chair, TC207)
2. Sharing by Secretary Prof. Hemanta Hazarika – Geotechnical Manifestations of Soil Structure Interaction during the 2025 Myanmar Earthquake: Evidence from Field Reconnaissance
3. Prof. Askar Zhussupbekov - Interaction of smart conical foundations with undermining soil ground
4. Prof. Deepankar Choudhury Dynamic Soil-Structure Interactions on Mega Infrastructures Case Studies
5. Dr. Tingfa Liu - Introduction to the UKCRIC Soil-Foundation-Structure-Interaction Laboratory of the University of Bristol
6. Prof. Mandy Korff - Quay walls in Amsterdam
7. Prof. Kenji Watanabe - Experimental studies on degradation processes in soil structure interaction under extreme environmental loads
8. Sharing by TC 204 - Prof. Werner Bilfinger Geotechnical Aspects of Underground Construction in Soft Ground
9. Sharing By TC206 Dr. Hock Liong Liew
10. Dr. Hoe Chian Yeow 40 years of numerical modelling of SSI how far have we come?
11. Dr. Jiang Su ICE Proceeding Geotechnical Engineering, Observational Method (OM) Special issue

Victor Ong
Chairman, TC207

TC201 News - June 2026

Alessandro Tarantino / [TC201](#) / 24-06-2026

TC201 Meeting 17 June 2026

Thank you to everyone who attended the TC201 meeting. The minutes and the accompanying presentation are available here.

- [Minutes](#)
- [Presentation and Actions](#)

Conference opportunity

There is an opportunity to organise a dedicated session on Dykes and Levees within the following conferences (subject to reaching a sufficient level of interest). If you are interested in submitting an abstract, please contact Alessandro Tarantino (alessandro.tarantino@strath.ac.uk) & Norma Patricia López Acosta (NLopezA@iingen.unam.mx).

- 9th International Conference on Unsaturated Soils
June 6-9, 2027, Boston, MA, USA
Abstract deadline: 26 June 2026
- XVIII DANUBE-EUROPEAN CONFERENCE ON GEOTECHNICAL ENGINEERING
9-12 June 2027, Budapest, Hungary
Abstract Deadline: Contact ASAP Edina Koch (Conference chair) at info@18decqe.hu

TC201 - Call for Ideas

Please, help us shape the activities of TC201 by completing this 5-min questionnaire.

<https://forms.office.com/e/4ecSPrQGtz?origin=lprLink>

TC223 June News Update

Grainne El Mountassir / [TC223](#) / 29-06-2026

Thanks to everyone who attended the TC223 meeting in Vienna two weeks ago. The agenda, minutes and slides for the meeting on 16th June can now be found on the [TC223 webpage](#).

Upcoming conference opportunities

We have the opportunity to host TC223 dedicated Bio-Geotechnical focused sessions at the two conferences listed below. Please note this is subject to receiving a sufficient number of abstracts. We strongly encourage your contribution and participation in these conferences. Abstract submission deadlines are noted below.

1. The 1st International Conference on Sustainability in Geotechnical Engineering (ICSGE 2027), will take place from 28 June to 1 July 2027, at the Campus of the National Laboratory for Civil Engineering (LNEC), in Lisbon, Portugal. This is being organized by LNEC, under the auspices of the Technical Committee 307 Sustainability in Geotechnical Engineering (TC 307). **Abstract submission deadline: 15 July 2026.** Please submit your abstract(s) to cursos@lnec.pt. Please indicate on your abstract: **For TC223 Bio-Geotechnical Engineering Special Session**. For more information, please visit the [conference website](#).
2. The 9th International Symposium on Deformation Characteristics of Geomaterials, ISDCG 2027 in Ankara, Turkey, 2027 organised by TC101, with a focus on laboratory testing. **Abstract submission deadline: is 21st September 2026.** Please select the **Biogeotechnics Theme** when submitting your abstract (you can also select other themes). For more information, please visit the [conference website](#). See flyer attached.

Technical Committee TC301 Preservation of Munuments and Historic Sites

The Technical Committee TC 301 with the support of the Indian Geotechnical Society organize the **Lecture Series** on "**Conservation of Heritage Sites**".

The Lecture 3: **Engineering Geology at the Frontline of World Heritage Protection** was presented by **Prof. Claudio Margottini**, UNESCO Chair in Florence University and IAEG Italy President, on 4th June 2026.

ABOUT THE TALK

Cultural heritage represents the legacy of humankind on planet Earth and reflects millennia of human adaptation to the environment. It can be intangible, such as traditional knowledge, customs, ritual practices or beliefs, and tangible, including cultural landscapes, sacred sites, archaeological complexes, architectural monuments and historic urban centres. The most representative Cultural and Natural Heritages are included within the "UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage". These sites and remains are continuously impacted by natural and

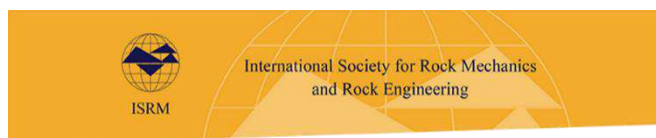
human-induced factors, including earthquakes, extreme meteorological events, erosion, climate change and conflict situations. Against this background, engineering geology, geotechnical engineering and rock mechanics play an essential role in the conservation and management of cultural properties, and their contribution is increasingly acknowledged as the need for an interdisciplinary approach combining art history, science, management and socio-economic concerns becomes more apparent. The present talk reports examples from the author's work experience in different parts of the world, demonstrating the relevance of engineering geological sciences for monuments damaged by explosions, landslides, rock falls, rising dampness, weathering and structural degradation. The presentation focuses on modern technologies for investigation and monitoring as fundamental steps for safeguarding projects that enhance traditional knowledge, sustainable practices and local co

ABOUT THE SPEAKER



Prof. Claudio Margottini is an internationally known Engineering Geologist from Italy with more than 40 years of experience in geological hazards, cultural heritage conservation and natural disaster management. He has worked with UNESCO and several international organisations on the protection of World Heritage Sites in countries such as Afghanistan, Peru, Jordan, Nepal, Ethiopia and Chile. He is a Full Professor in Engineering Geology and has contributed to many important projects related to landslides, earthquakes and monument conservation. His work combines science, engineering and heritage protection to safeguard historic sites around the world.

The youtube link to see the lecture is <https://tc301-historic-sites.com/webinars> (directly it can be access at <https://www.youtube.com/watch?v=DepzM3SIS9A>).



News

<https://www.isrm.net>

54th ISRM Online Lecture is online 2026-06-25

The 54th ISRM Online Lecture on "Rockfall Hazard Management: Integrated Monitoring, Prediction, and Mitigation Design Strategies" by Prof Anna Giacomini from the University of Newcastle, Australia is now online. [Follow the link](#) to watch it on the ISRM website.



From Montréal to Lisbon: Continuing the ONE ITA Journey



One month has passed since the successful conclusion of ITA WTC2026 in Montréal, yet the energy, enthusiasm and spirit of international collaboration generated during that week remain very much alive. As highlighted throughout this newsletter, the numbers speak for themselves: attendance, technical presentations and exhibitor participation all reached outstanding levels.

On behalf of ITA, I would once again like to express my sincere gratitude to the Tunnelling Association of Canada for delivering not only a technically outstanding Congress, but also a warm and memorable experience for our global tunnelling community.

Montréal reminded us of what makes ITA truly unique. Beyond technical excellence, publications and formal decisions, our Association is built on people from different countries, cultures and professional backgrounds coming together to share technical findings, exchange experiences and debate ideas, advancing tunnelling knowledge for the benefit of society worldwide. This spirit perfectly embodies the **ONE ITA vision**.

Our industry continues to evolve through innovation, robotics, digitalisation, artificial intelligence and more sustainable materials and equipment. These advances will support tunnelling professionals in delivering safer, more sustainable and more cost-effective underground infrastructure, helping to provide **underground solutions for a better world**.

The ITA journey now continues with the **ITA Tunnelling Awards 2026**, taking place on **4-5 November** in Lisbon and co-organised with our Portuguese Member Nation, CPT. This event will once again be an excellent opportunity to celebrate innovation, recognise outstanding achievements and further strengthen our global community.

Andrea Pigorini

ITA President (2025-2028)

ITA is Recruiting a Head of Programmes



ITA is seeking an experienced professional to join its Secretariat as **Head of Programmes**.

Working closely with the Executive Director, the successful candidate will help coordinate ITA's programmes, governance activities and strategic initiatives.

Application deadline: 9 August 2026

Interested? View the full job description and apply [here](#).

ITA WTC2026 and General Assembly: strong turnout and key decisions



More than a month after ITA WTC2026 in Montréal, the Congress continues to inspire the global tunnelling community. Bringing together 2,733 participants from 68 countries, the event delivered outstanding technical exchange, strengthened international collaboration and marked several important milestones for ITA, including the adoption of English as the Association's official language and the confirmation of Vienna as the host of ITA WTC2029.

Read the full event recap on our [website](#).

ITA Tunnelling Awards 2026



Registration is now open for the **ITA Tunnelling Awards 2026** in Lisbon, Portugal. Join the global tunnelling community for three days of networking and knowledge sharing: the first day will be dedicated to the ITA Tunnelling Awards, the second day will feature the International Conference on Tunnelling, Contribution of Underground Works to Society, celebrating the 20th Anniversary of the Portuguese Tunnelling Society (CPT), and the third day will include a series of technical visits. Sponsorship opportunities remain available, and the international jury has now been announced.

More information [here](#).

ITA Young Members at ITA WTC2026



The ITA Young Members (ITAYm) General Assembly, held during ITA WTC2026 in Montréal, marked an important milestone for the group. Members elected a new Steering Board, welcoming Aida Santos as Chair and Shenyan Yao as Vice-Chair, alongside new committee members Helle R. Østmo Nilssen and Jack Lawrence. The meeting also provided an opportunity to define ITAYm's priorities for the coming year, with a continued focus on member engagement, collaboration and initiatives that support the next generation of tunnelling professionals.

Read the full article on our [website](#).

Lunchtime lecture series#57



We are pleased to announce that the next episode of the Lunchtime Lecture Series will take place on 7 July 2026 at 13:00 CET.

- Slipform tunnelling – **Colin Eddie**
- How to reduce by 65% the cost of constructing an underground space for industrial applications; The ECO-Caverne® – **Andrew Bourget**
- Cement free segment – **Marvin Glissner**

Click here to [register](#).

ITA President and Past President Visit Grimsel and Mont Terri Rock test Laboratories



ITA President Andrea Pigorini and Past President Arnold Dix recently visited the Grimsel Test Site and the Mont Terri Rock Laboratory in Switzerland. The visit highlighted the essential role of underground engineering in supporting the safe geological disposal of radioactive materials and showcased the valuable work of the Swiss tunnelling community and international research partners.

Read more on our [website](#).

News from ITA Prime Sponsors and Supporters

CREG Completes Factory Acceptance Testing of 13.9 m TBM

ITA Prime Sponsor CREG has successfully completed the Factory Acceptance Testing (FAT) of the 13.9 m diameter Greater Bay Area Xili TBM. The machine will be deployed on the Xili Tunnel project for the Ganzhou-Shenzhen High-Speed Railway, where it will excavate through complex geological conditions using advanced intelligent technologies to enhance safety and efficiency.

Read the full story on our [website](#).

FS Engineering Begins a New Chapter

ITA Supporter FS Engineering is entering a new phase, building on more than 40 years of engineering expertise and a strong international presence. Formerly known as Italferr, the company continues to contribute to major underground infrastructure projects worldwide while advancing digital innovation and sustainable engineering solutions.

Read the full story on our [website](#).

ArcelorMittal Showcases Innovation in Large-Diameter TBM Tunnelling

ITA Supporter ArcelorMittal is helping advance the use of steel fibre reinforced concrete (SFRC) in large-diameter TBM tunnels. The Świnoujście road tunnel in Poland, the largest tunnel in Europe to use SFRC as the sole reinforcement in its segmental lining, demonstrates the material's potential to improve efficiency, safety and sustainability in underground infrastructure.

Read the full story on our [website](#).

FAMA Advances Innovation in Underground Infrastructure

ITA Supporter FAMA continues to drive innovation in the tunnelling sector through investments in automation, digitalisation and advanced research and development. From tunnel lining protection systems to AI-powered monitoring technologies, FAMA is helping deliver more durable, sustainable and intelligent underground infrastructure.

Read the full story on our [website](#).

Scooped by ITA-AITES #149, 16 June 2026

[Delhi-Mumbai Expressway: India's first 8-lane tunnel beneath a tiger reserve is set to open on June 20; everything travellers need to know](#)

[Finland's Onkalo Repository Nears Opening as World's First Permanent Nuclear Waste Facility](#)

[TBM achieves 300m monthly advance on South Korean tunnel](#)

[France: TBM Reaches New Milestone on Toulouse Metro Line C](#)

[Deep underground nuclear waste storage could be feasible in Singapore, study shows](#)

[Norway Revives World's First Ship Tunnel Project with Initial Funding](#)

[United Kingdom: Innovative Upgrade Completed in the Severn Tunnel](#)

[Auckland's Central Interceptor Tunnel Reaches Final Construction Milestone](#)

[Inside India's Zojila Tunnel: Mega Project Set to Transform Srinagar-Leh Connectivity](#)

[Growing Grid Strategy: Undergrounding Power Lines to Withstand Weather](#)



News

BTS and Pipe Jacking Association Joint Meeting June 2026 - Engineering Cleaner Rivers: Shrewsbury Jun 06

Thursday 16th June 2026 at 18:00 hrs [UTC] In-Person at Institution of Civil Engineers, 1 Great George Street, London SW1P 3AA Joint BTS/ Pipe Jacking Association Meeting Engineering Cleaner Rivers: Shrewsbury Optioneering & [Read more](#)

Obituary - Maurice Gooderham Jun 18

Maurice Gooderham, CEng, MICE 1933-2026 It is with sadness that the Gooderham family announces that Maurice Gooderham, a founding member and long-term supporter of the British Tunnelling Society (BTS), died peacefully at his home on 26 [Read more](#)

BTS and Pipe Jacking Association Joint Meeting June 2026 - Engineering Cleaner Rivers: Shrewsbury

Thursday 16th June 2026 at 18:00 hrs [UTC]
In-Person at Institution of Civil Engineers, 1 Great George Street, London SW1P 3AA

Engineering Cleaner Rivers: Shrewsbury Optioneering & Pipe Jacking Solutions



Speakers:

Matthew Donnachie – Principal Engineer, COWI UK Limited

Max Hepburn - Principal Engineer, COWI UK Limited

This presentation will provide an overview of the optioneering phase undertaken for the tunnelling solutions aimed at mitigating Combined Sewer Overflow (CSO) discharges into the River Severn in Shrewsbury.

There will be an emphasis on the assessment of pipe jacking opportunities, including proposals that range from full-scale tunnel alternatives to smaller, localised interventions.

The presentation will cover key considerations, constraints and opportunities, alongside a comparative evaluation of the relative merits of each proposed solution.



June Lecture

Direct Pipe Trenchless Technology

Thursday, 11th June 2026, 18:00 - 20:00 GMT ICE,
One Great George Street, Westminster, London SW1P 3AA
www.ice.org.uk/events/previous-events/direct-pipe-trenchless-technology



Event Information

This lecture will be led by Richard Dexter – Managing Director of Herrenknecht International Ltd in the UK and Ireland.

This BTSYM lecture will cover the Direct Pipe® Trenchless Technology: An Overview of Feasibility, Engineering, and Construction. The programme will be as follows:

1. Direct Pipe® Technology Overview
2. Engineering and Design Considerations
3. Construction Methodology and Case Studies
4. Discussion and Q&A
5. Networking and close

About Richard

Richard Dexter is the Managing Director of Herrenknecht International Ltd in the UK and Ireland. He has extensive experience in trenchless technology, mechanised tunnelling,

shaft sinking, and underground construction. In his role, he leads all quotation, negotiation, and commercial activities, as well as technical and site support for Herrenknecht projects across the UK and Ireland. He is also responsible for the overall safety, quality, commercial performance, and support functions of the UK subsidiary of the global tunnelling equipment manufacturer, Herrenknecht.



www.geosyntheticssociety.org

News

June Bulletin on page 54.



News

www.britishgeotech.org/news

Ground Engineering Magazine app is Live 08.06.2026

The Ground Engineering Magazine app is live and available for both Google Play and iPhone App Store. [Read More](#)

The July 2026 issue of Ground Engineering is available online 15.06.2026

The July 2026 issue of Ground Engineering is available online. Online access to Ground Engineering (GE) is included in BGA subscriptions. [Read More](#)

2026 BGA Case Histories Award Winner announced 15.06.2026

The British Geotechnical Association (BGA) is pleased to announce that the 2025 BGA Case Histories Award has been awarded to authors Kevin Briggs, Yuderka Trinidad González, Nick Sartain, Gerrit J. Meijer, William Powrie and Simon Butler for their paper "In situ shear modulus reduction with strain in stiff fissured clays and weathered mudstones" published in Canadian Geotechnical Journal in 2025. [Read More](#)

2025 BGA Medal Winning Paper announced 15.06.2026

The British Geotechnical Association (BGA) is pleased to announce that the 2024 BGA Medal has been awarded to Sonu Kumar, Ashutosh Kumar, Tiago A.V. Gaspar and Ashraf S. Osman, for their paper "Impact of Suction and Swell-Induced Softening on Pile Behaviour in an Unsaturated Expansive Clay", published by the ASCE Journal of Geotechnical and Geoenvironmental Engineering in 2025. [Read More](#)

Winner announced of 2025 BGA Masters Prize 15.06.2026

The British Geotechnical Association (BGA) is pleased to announce that Nicholas de la Maza of Imperial College London is the winner of the 2025 BGA Masters Prize for his entry "Numerical assessment of the conversion from a conventional taili

Result of 2026 Elections to the BGA Executive Committee 15.06.2026

Result of 2026 Elections to the BGA Executive Committee
[Read More](#)

The Paul Marinos Distinguished World Lecture Tour was presented at LaRGE 2026 on April 30.

Prof. Xuanmei Fan delivered a lecture titled, "Understanding and Predicting Cascading Hazards under Earthquake and Climate Change Forcing."

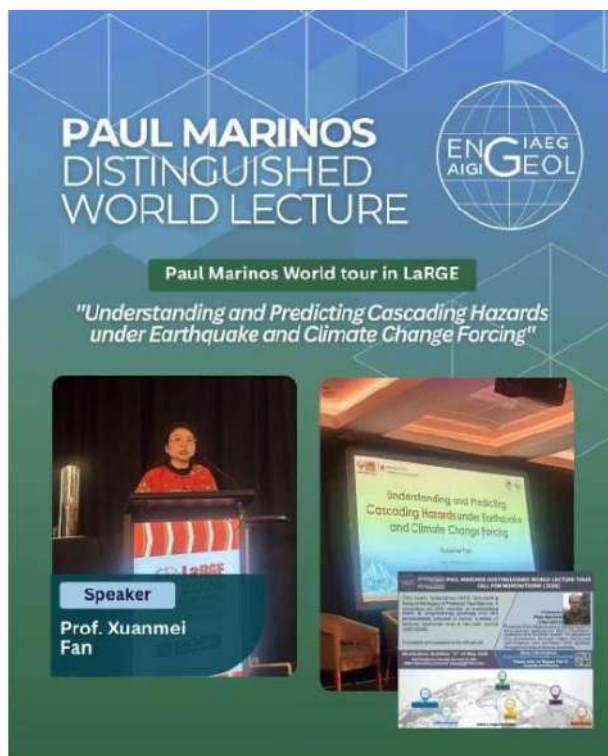
Her talk showcased the IAEG award in action — promoting scientific excellence in engineering geology while honoring the legacy of Prof. Paul Marinos.

The recording is available on [YouTube](#).

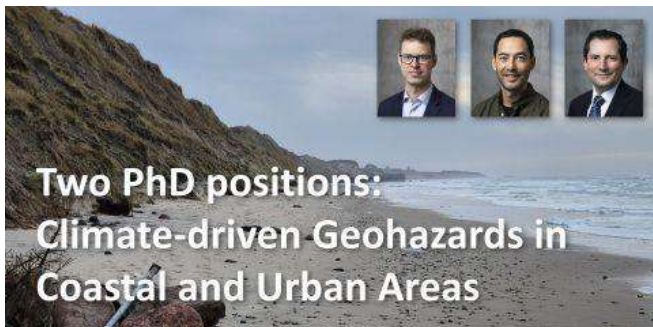
(IAEG Connector E-News, June 19, 2026, <https://www.multiple-briefs.com/briefs/iaeg/iaeg061926.php>)



Paul Marinos Distinguished World Lecture presented on April 30, at LaRGE by Prof. Fan



ΘΕΣΕΙΣ ΓΙΑ ΓΕΩΤΕΧΝΙΚΟΥΣ ΜΗΧΑΝΙΚΟΥΣ



At [Department of Civil and Architectural Engineering, Aarhus University](#), we are happy to announce two fully funded PhD positions. We invite excellent candidates in geotechnical, civil, or structural engineering to join our multi-disciplinary research team, working with Climate-driven Geohazards in Coastal and Urban Areas.

Over the next few years, [Geotechnical Group - Aarhus University](#) will investigate how climate change amplifies geohazards such as coastal erosion, rainfall-induced landslides, wetting- and drying-related ground movements, and the resulting risks to near-shore infrastructure and urban environments.

One of the PhD projects will focus on multi-physics modelling of wetting-drying induced ground movement, landslides and coastal erosion. To apply, follow this link: <https://lnkd.in/efqyWYcE>.

The other PhD project will focus on micro-to-macro behaviour and constitutive modelling of fissured high-plasticity stiff clays for landslides and climate-resilient infrastructure. You may apply here: <https://lnkd.in/esq3mRqE>.

The application deadline is 20 August 2026 at 23:59 CEST for both positions.

Our research is part of the grand 10-year programme "Civil Engineering and the Green Transition in the Built Environment" (CEBE) sponsored by Villum Fonden.

Lars Vabbersgaard Andersen, Professor at Aarhus University

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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

Summer School on AI Tools for Structural and Earthquake Engineering, June 1st – 5th 2026. Guimarães, Portugal, sec.estrutas@civil.uminho.pt

ICPMG 2026 Physical Modelling in Geotechnics, 8–12 June 2026, ETH Zürich, Switzerland, <https://tc104-issmgc.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>

Summer School - Numerical Modelling in Geotechnical Engineering, 06 –10 July 2026, Innsbruck, Austria, www.uibk.ac.at/en/weiterbildung/numerische-modellierung

Second ISRM Commission Conference on Estimation of Rock Mass Strength and Deformability, July 10, 2026, Colombo, Sri Lanka, www.slrms.org

International Summer School "Risk Management of Monuments subjected to Geohazards and Climate Change", 20 – 24 July 2026, Karlovasi, Samos, Greece, www.edusamos.gr

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/isfm2026/home>

SB3: Slopes, Support and Stabilization, August 11–13, 2026, Charlotte, North Carolina, USA, <https://dfr-events.org/s3-26>

CAVING 2026, 11–13 August 2026, Ulaanbaatar, Mongolia, www.acgcaving.com

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/>

Ground Engineering Sustainability, 8 September 2026, London, United Kingdom, <https://sustainability.geplus.co.uk/gesu2026/en/page/home>

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

Scientific Colloquium: Large Scale Testing 2026, 14–15 September 2026, Karlsruhe, Germany, www.ibf.kit.edu/908.php

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

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 – EUROCK 2026, September 15–19, 2026, in Skopje, N. Macedonia, <https://eurock2026.com>

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

CouFrac2026 5th International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application, 20–23 September, 2026, Uppsala, Sweden, www.coufrac2026.com

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

II International Conference on Soil Mechanics and Geotechnics in High-Rise and Underground Construction named after Z.G. Ter-Martirosyan, 23–24 September 2026, Moscow, Russia, <https://mgsu-conference.org/tfsmg>

GEOTECH 2026, 01 October 2026, London, United Kingdom <https://geotech.geplus.co.uk/geotech2026/en/page/home>



3rd Annual International Geotechnical Innovation Conference (IGIC)

13 – 15 Oct 2026, Fairmont, Riyadh, Saudi Arabia
<https://geotechnicalinnovationconference.com>

The 3rd Annual International Geotechnical Innovation Conference (IGIC 2026) is MENA's leading geotechnical engineering platform, purpose-built to support the region's,

especially Saudi Arabia's, unprecedented scale of infrastructure, urban, mining, and giga-project developments. The conference brings together project owners, geotechnical contractors, consultants, technology and machinery providers shaping the future of ground engineering in MENA and the wider markets.

Across MENA, projects are increasingly confronted by hard and fractured rock, karst formations, sabkha and weak soils, high and variable groundwater pressures, geohazards, and extreme climatic conditions, all while having to deliver under compressed timelines and heightened performance requirements. From tunnelling through complex subsurface conditions and stabilizing difficult ground, to managing geohazard risks and enabling resilient foundations, **IGIC 2026** directly addresses the technical and execution challenges defining the region's most ambitious projects.

IGIC 2026 Objectives

- Support the delivery of MENA's mega and giga projects by bridging the gap between design and limitations arising from challenging ground conditions, enabling timely on-site execution
- Address core geotechnical challenges encountered across Saudi Arabia and the MENA region, focusing on real project risks, constructability, and performance under extreme ground conditions
- Share global best practices and lessons learned through case studies and insights from the world's leading geotechnical experts, practitioners, and researchers
- Showcase best-in-class technologies, machinery and equipment from across the world that are redefining ground engineering, monitoring, and construction delivery
- Foster collaboration and knowledge exchange between project owners, government entities, contractors, consultants, technology providers, and academia



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

HYDRO 2026 Adapting to change ~ Embracing opportunities, 14-16 October 2026, Bologna, Italy, www.hydropowerdams.com/hydro-2026

EWRWSE – 2026 7th International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering, 22-25 October 2026, Surat, Gujarat, India www.eqrwse2026.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

Split'26 10th Conference of the Croatian Geotechnical Society: Geotechnical Engineering in Soft Rocks and Heterogeneous Rock Masses - an ISRM Specialized Conference, 12 - 14 Nov, 2026, Split, Croatia, www.hgd-cgs.hr/?lang=en

ARMS 14 Fukuoka 2026 - 14th Asian Rock Mechanics Symposium Rock Mechanics for the Next Generation –Innovations, Sustainability, and Resilience – an ISRM Regional Sym-

posium, 22-26 November 2026, Fukuoka, Japan, www.ec-convention.com/ARMS14/

WLF7 7th World Landslide Forum, Theme: Landslide Science and Practice for Safe and Resilient Communities, 23 – 27 Nov 2026, Amrita Vishwa Vidyapeetham, Faridabad, India, <https://wlf7.org>

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

ICITG '26 6th International Conference on Information Technology in Geo-Engineering - an ISRM Specialized Conference, 2 - 4 December, 2026, Budapest, Hungary <https://icitg6.com>

5th International Conference on TRANSDISCIPLINARY MULTISPECTRAL MODELLING AND COOPERATION FOR THE PRESERVATION OF CULTURAL HERITAGE Cultural heritage at the forefront of transformation, 14-16 December, Athens, Greece, www.tmm-ch.com



III International Scientific and Practical Conference Geotechnical Engineering in Cold Regions The Basic of Infrastructure Safety in Global Changes 10-12 February 2027 Moscow, Russia <https://geocryoconf.rssmgafe.ru>

Cold regions are territories that not only offer significant opportunities for humanity, but also pose serious challenges. The development of northern regions is complicated not only by their remoteness, inaccessibility, and severe climatic conditions, but also by the sensitivity of permafrost soils to changes in external environmental factors.

Under conditions of global change, ensuring the mechanical safety of buildings and structures founded on frozen ground requires a comprehensive approach combining the use of innovative materials and technologies, the adaptation of design solutions, and the development of modern monitoring and control systems. A timely response to ongoing changes is essential for the safe operation of infrastructure throughout all stages of its life cycle.

Conference Objective:

To provide a platform for collaboration between academic and industrial sciences in order to jointly address the challenge of ensuring infrastructure safety as a crucial aspect for the sustainable development of cold regions.

Conference themes

- Engineering, geological and geophysical surveys in permafrost

- Laboratory Stress Strain Strength Testing of Geomaterials
- Ground Property Characterization from In-situ Tests
- Mechanical, Thermal, and Heave Properties of Soils
- Properties of Thawing Soils
- Ground Improvement in Permafrost Zones
- Scientific and Technical Support in Geotechnical Engineering in Permafrost Areas and Cold regions
- Design and Calculation of Foundations and Shafts on Permafrost and Thawing soils
- Geohazards in Cold Regions
- Climate Change and Thermal Modeling
- Geotechnical and Field Monitoring in Cold Regions
- Regulatory Aspects of Geotechnical Engineering in Permafrost
- Linear Structures in Cold Regions
- Hydraulic structures in Permafrost and Cold Regions
- Technical geophysics

Contact

Tel. +7 (999) 772-21-24
 Email geocryoconf@rssmgfe.ru
 Address 109428, 59 Ryazanskiy prospect, Moscow, Russia
 t.me/geocryoconf



GeoAfrica5

5th African Conference on Geosynthetics
"Growing Sustainably, Together"

1 - 5 Mar 2027, Gauteng, Johannesburg, South Africa
<https://geoafrica2027.org>

The South African chapter of the International Geosynthetic Society is proud to host the 5th African Regional Conference on Geosynthetics (GeoAfrica2027), returning again to South African soil since the successful inaugural event in 2009. We invite you to experience the warmth of African hospitality in the heart of Gauteng at the Misty Hills Hotel, Conference Centre & Spa outside Johannesburg from 1 – 5 March 2027.

The conference will provide all participants, but particularly Africans, with a global platform for affordable, meaningful, academic and professional knowledge and skills transfer, together with social and cultural experiences. It will expose Africa to safer and more cost-effective solutions to environmental preservation. GeoAfrica2027 will continue the proud legacy of covering diverse disciplines of geosynthetics from fundamentals to advanced applications, from the reinforcement of soils to the containment of waste, all with a strong emphasis on sustainability.

We look forward to welcoming all our sponsors, exhibitors, presenters and attendees to this conference which we anticipate will provide exciting opportunities for connection and collaborations regionally and internationally.

Conference Topics

- Road & Railway Applications
- Landfill and Environmental Applications
- Geosynthetics for Sustainability
- Reinforced Embankments, Walls and Slopes
- Mining Applications
- Barrier Performance
- Filtration, Drainage and Seepage Control
- Erosion Control and Reinstatement
- Research & Development
- Quality: QA, QC, Durability, Testing
- Carbon & Climate Change Solutions
- Case Studies

Contact

Conference Organiser: **Lesley Ferreira**
 Send an email to the organisers at: organiser@geoafrica2027.org
 Whatsapp: [+27 824945475](https://wa.me/27824945475)
 Newsletter sign up <https://forms.gle/ewaAt9kJthnZJqed9>



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

GeoMandu 2027, 11th AYSEC and 1st SACG Mountain Geotechnics for Infrastructure Development Redefining Geotechnics for the Mountainous Landforms, 17-19 March 2027, Kathmandu, Nepal, <https://geomandu.ngetechnics.org>

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

ROCSCIENCE INTERNATIONAL CONFERENCE 2027 Faster – Deeper – Smarter Geotechnics, Structures & Hydro in the Age of AI April 18-20, 2027, Rio de Janeiro, Brazil, www.rocscience.com/events/rocscience-international-conference-2027

ITA World Tunnel Congress 2027 - Antwerp (WTC 2027) Underground Creativity to Meet Societal Needs, 23-29 April 2027, Antwerp, Belgium, <https://wtc2027.com/>

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





**The 4th International Conference on
Press-in Engineering 2027 (ICPE2027)
Press-in Engineering for Resilient, Sustainable
and Culturally Sensitive Infrastructure
2-4 June 2027, Papendrecht, The Netherlands
<https://2027.icpe-ipa.org>**

On behalf of the International Press-in Association (IPA) and the Organizing Committee, I am honored to welcome you to the 4th ICPE (ICPE2027), the first International Conference on Press-in Engineering to be held in Europe. This event will be held in the Netherlands in June 2027, during IPA's 20th anniversary year—a milestone that reflects two decades of progress and global collaboration in advancing press-in engineering.

Press-in Engineering is an interdisciplinary academic and practical discipline that integrates research, technology, and practice through collaboration among academia, industry, and government. It combines geotechnical, environmental, and mechanical engineering with advanced construction monitoring and data technologies to address real-world challenges, enable practical implementation, and support sustainable, resilient infrastructure. Originating in Japan, press-in piling technology has evolved into a global innovation and is now rapidly being adopted in Europe for projects safeguarding waterways, coastal zones, and heritage structures.

The theme of ICPE2027, "**Press-in Engineering for Resilient, Sustainable and Culturally Sensitive Infrastructure**," reflects our shared commitment to combining technical excellence with environmental stewardship and cultural awareness. The conference will feature keynote lectures by leading experts, technical sessions on diverse topics, and a site visit or facility tour showcasing pioneering applications in the Netherlands.

ICPE2027 also embodies four core objectives:

- **Strengthen the academic foundation** of press-in engineering through research and knowledge exchange.
- **Create an international platform** integrating research, technology, and practice.
- **Promote collaboration** among academia, industry, and government to drive innovation and global standards.
- **Enhance visibility and recognition** through awards and capacity building, inspiring the next generation of engineers.

We warmly invite you to join us in the Netherlands, one of Europe's leading hubs for innovation and technology, as we look ahead to the future of press-in engineering and celebrate this important milestone in IPA's journey.

Conference Topics

1. Disaster Prevention and Climate Adaptation
2. Urban Infrastructure Development and Renewal
3. Port, Coastal and Water Management Structures
4. Preservation of Heritage and Historical Structures
5. Environmental Impact and Carbon Reduction

6. Pile Performance and Piling Mechanism
7. Automation and Digitalization in Piling Work
8. Case Histories and Project Evaluation
9. Quality Assurance and Monitoring
10. Miscellaneous

Contact us

ICPE 2027 Organizing Committee / International Press-in Association

5F, Sanwa Konan Bldg, 2-4-3 Konan, Minato-ku,
Tokyo 108-0075, Japan
Tel. +81-3-5461-1191
Fax +81-3-5461-1192
email tokyo@press-in.org



UNSAT 2027 9th International Conference on Unsaturated Soils, 6-9 June 2027, Greater Boston, MA, USA, <https://unsat2027.usnh.domains>

XVIII DECCE Danube-European Conference on Geotechnical Engineering, 9-12 June 2027, Budapest, Hungary, <https://18decce.hu/>

1st International Conference on Sustainability in Geotechnical Engineering (ICSGE 2027), Geodiversity & Resilience, 28 June to 1 July 2027, Lisbon, Portugal, <https://icsge.lnec.pt>



**Advances in Geosynthetics
Safer, Greener and Smarter with Geosynthetics:
Future Ready Mining'
6-8 July 2027, Perth, Australia
<https://geoanzconference.com.au>**

On behalf of the Organising Committee, I am pleased to invite you to partner with us for the GEOANZ 2027 Conference, taking place in Perth, Western Australia from 6-8 July 2027. This is the 3rd ANZ Conference on geosynthetics. GEOANZ has established itself as a key meeting point for professionals across the geosynthetics industry. In 2027, we look forward to bringing together leading engineers, researchers, contractors, suppliers and decision-makers from across Australia, New Zealand and beyond.

The conference theme, 'Advances in Geosynthetics – Safer, Greener and Smarter with Geosynthetics: Future Ready Mining', reflects the growing importance of geosynthetics in delivering sustainable, resilient and innovative infrastructure solutions. The program will explore key areas including min-

ing, environmental containment, coastal protection, and infrastructure reinforcement and stabilisation.

Perth, Western Australia's vibrant capital city, provides the perfect setting for this event, combining world-class conference facilities with a strong resources and infrastructure sector. We are excited to bring GEOANZ 2027 to Perth and look forward to welcoming you in July 2027.

CONFERENCE THEMES

Tailings & mine waste applications
Coastal and river protection
Durability and long-term performance
Embankment basal reinforcement
Filtration, drainage and erosion control
Hydraulic and stormwater structures
Innovative uses & new product development
Barrier systems
Railway stabilisation
Reinforced soil slopes and walls
Road and pavement stabilisation
Seismic & natural disaster resilience
Soil-geosynthetic interaction
Sustainability & green technology

Contact Us

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W: www.leishman-associates.com.au



ICSE|3 International Conference on Scour and Erosion, 1 August to 3 September 2027, Porto, Portugal, <https://icse13.org>

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, 16-23 October 2027, Seoul, Korea, <https://isrm2027.com>

10th ISSMGE International Congress on Environmental Geotechnics, 01-04 November 2027, Kyoto, Japan, <https://10iceg.org>



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



ECSMGE 2028

XIX. EUROPEAN CONFERENCE ON SOIL MECHANICS AND
GEOTECHNICAL ENGINEERING

"Connecting Continents Through Geotechnical
Innovations"

20-25 August 2028, Istanbul, Turkey

<https://zmgm.org.tr/en>

The **19th European Conference on Soil Mechanics and Geotechnical Engineering (ECSMGE 2028)** will be held in **Istanbul, Türkiye**, bringing together leading researchers, practitioners, and industry representatives from across Europe and the world. As one of the most prestigious events in the geotechnical engineering field, ECSMGE 2028 will provide a comprehensive platform for sharing state of the art research, discussing innovative engineering applications, and advancing the future of geotechnical practice. The conference dates are between 21-25 August 2028.

With its unique position bridging Europe and Asia, **Istanbul offers a rich scientific, cultural, and historical environment**, making it an exceptional host city for this major international event.

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

Contact Information

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GeoEng 2030: Bringing Together the Global Geo-Engineering Community, geoeng2030@geosyntheticssociety.org.

Japan's giant landslide defenses become unlikely tourist draws



This handout satellite picture released by Maxar Technologies on January 7, 2024, shows landslides blocking Route 249, in the city of Niemachi, Ishikawa prefecture, on January 2, 2024, after a major 7.5 magnitude earthquake struck the Noto region on New Year's Day. FILE PHOTO/Agence France-Presse

Massive underground tunnels, towering erosion control dams and other disaster prevention infrastructure are attracting growing numbers of tourists in Japan, as communities turn landslide protection projects into unlikely sightseeing destinations.

The initiatives are helping to revitalize rural communities while raising awareness about the dangers of landslides and debris flows, particularly as heavy rain disasters become increasingly frequent. Participants are also embracing the chance to explore places rarely accessible to the public.

In early April, nine visitors joined a guided tour of facilities connected to the Kamenose landslide countermeasures project in the mountains of Kashiwara, Osaka Prefecture, near the border with Nara Prefecture.

Armed with flashlights, the group walked through underground drainage tunnels and the former Osaka Railway Kamenose Tunnel, which was once buried in a landslide disaster, while listening to explanations from guides.

"If a landslide were to occur, Osaka and Nara could be flooded," a guide told participants during the tour.

The Kamenose area sits along a narrow river valley where past landslides have repeatedly affected the flow of the Yamato River. When debris from slope failures accumulates in the river channel, it can act as a temporary dam, causing water to back up and flood upstream areas in Nara Prefecture.

If such natural dams later give way, the sudden release of water can send a surge downstream toward Osaka Prefecture, increasing the risk of flooding along the river basin.

Among the visitors was a woman in her 60s from Ikaruga in Nara Prefecture, who attended with her husband and two grandchildren.

"Seeing the technology and the sheer scale of the facilities firsthand was incredible," she said. "My grandchildren also had fun exploring underground."

The Kamenose project is a large-scale landslide prevention undertaking launched by the land ministry in 1962.

An information center explaining the history and mechanisms of landslides reopened in 2024, and the tours, held six days a week, have quickly become difficult to book because of strong demand.

"The scenic natural surroundings are part of the appeal as well," a staff member at the center said.

The growing popularity of such tours comes as authorities seek new ways to highlight the role of erosion control infrastructure, known in Japan as "sabo" facilities, which are built to reduce damage from landslides, debris flows and river erosion.

In fiscal 2023, the Ministry of Land, Infrastructure, Transport and Tourism launched the "Dynamic SABO Project," an initiative promoting the use of erosion control facilities in cooperation with local governments and tourism organizations.

The project aims both to boost regional tourism and to deepen public understanding of landslide risks and disaster prevention measures.

A total of 17 regions nationwide are participating, including the Kamenose tours, and some programs are also being used for school social studies field trips.

In the village of Otari in Nagano Prefecture, tours of erosion control dams have reportedly remained fully booked for more than a decade.

"We've been able to turn the area's vulnerability to disasters into something that benefits local tourism," a representative of the Otari Village Tourism Association said.

Other regions are also finding ways to combine disaster prevention infrastructure with tourism experiences.

In Obihiro, Hokkaido, visitors can take part in rafting activities on the Tottabetsu River, where erosion control structures have been installed to stabilize the river flow and prevent bank erosion.

Meanwhile, the erosion control dams in the Tateyama Caldera in Toyama Prefecture have become a major draw because of their dramatic appearance. The group of dams spans a 108-meter elevation difference, with multiple structures cascading down the mountainside like a waterfall.

Many visitors join overnight tours in the area, contributing to the local economy.

Interest in disaster prevention has increased in recent years following a series of major rain-related disasters across Japan, including in western Japan in 2018 and in the Okunoto region in 2024.

(Kyodo News / May 26, 2026, <https://globalnation.inquirer.net/324567/japans-giant-landslide-defenses-become-unlikely-tourist-draws>)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ & ΑΝΤΙΣΕΙΣΜΙΚΗ ΜΗΧΑΝΙΚΗ

How deadly Philippines earthquake raised seabed and extended shorelines for hundreds of metres

Formerly submerged corals found exposed



The devastating magnitude 7.8 earthquake that struck the Philippines last week, killing 61 people and injuring hundreds, was so powerful that it extended the country's shoreline and lifted the sea bed, a new aerial survey reveals.

The earthquake's epicentre was about 20km off Sarangani province near the island of Mindanao, with tremors felt hundreds of kilometres away on the Indonesian island of Sulawesi.

Over 6,000 aftershocks have been recorded following the massive quake as of 11am local time, the Philippine Institute of Volcanology and Seismology (Phivolcs) said on Monday.

The tremor also triggered tsunami warnings, collapsed buildings and displaced an estimated 20,000 people.

A wave measuring nearly two metres high damaged a house and washed boats ashore, according to local news reports.

Residents reported a geological phenomenon known as "coastal uplift" after the quake, with the shoreline extending by as much as 200 metres in many places.



Coastal uplift seen in Philippines after 7.8 magnitude earthquake (Phivolcs)

During the earthquake, the Cotabato trench off the southwestern coast of Philippines "pushed part of the coastlines of

Sarangani and Davao [provinces]" and exposed the seabed that was originally submerged, Phivolcs said.

The seabed uplift has been estimated to be about 2 metres.

"Preliminary field observations indicate approximately 2 metres of coastal uplift and about 200 metres of shoreline retreat," Phivolcs said.

In several regions, "formerly submerged corals are now exposed", the agency said, adding that coastal landslides were also observed between the municipalities of Barangays Burias and Glan in Sarangani.

Images released by Phivolcs show large numbers of corals, seagrass, dead fish and other aquatic life on the exposed seafloor.

Independent analysis by experts also confirms that there has been a significant coastal uplift in the southern Philippines between 16 May and 10 June 2026.

"Indeed, it looks there is an extensive uplift that hasn't been observed previously on many dates," geospatial analyst Sergio Augusto Jardim Volkmer posted on LinkedIn along with a map comparing sea levels between the two dates.

Earthquakes are a regular occurrence in the Philippines due to its presence along the Pacific "Ring of Fire" zone of fault lines and volcanoes.

Movement of the Cotabato Trench also caused the 1976 Moro Gulf earthquake and tsunami, which killed 8,000 people.

Seismic activity along the boundaries of the Philippine Sea Plate has produced seven major earthquakes of magnitude greater than 8, and 250 large ones of over 7 magnitude, as well as a number of tsunami-generating events, according to the US Geological Survey.

(Vishwam Sankaran / INDEPENDENT, Monday 15 June 2026, <https://www.the-independent.com/news/science/philippines-earthquake-seabed-raise-shoreline-extension-b2995719.html>)



Οι δίδυμοι σεισμοί και το μάθημα για την Ελλάδα



[REUTERS/Leonardo Fernandez Vilorio]

Κώστας Συνολάκης, Αρης Ροζάκης

Οι φονικοί δίδυμοι **σεισμοί** μεγέθους περίπου 7,2 και 7,5 στη **Βενεζουέλα** υπενθυμίζουν ότι τα μεγάλα ρήγματα οριζόντιας ολίσθησης μπορούν να παράγουν εξαιρετικά καταστρο-

φικούς σεισμούς, που όμως συνήθως δεν συνοδεύονται από μεγάλα τσουνάμι.

Η περιοχή βρίσκεται στο όριο της **πλάκας της Καραϊβικής** με την **πλάκα της Νότιας Αμερικής**, όπου η συσσώρευση τεκτονικής παραμόρφωσης είχε επισημανθεί εδώ και χρόνια στη διεθνή βιβλιογραφία, με πιθανό σεισμό μεγέθους 7,2-7,5 βαθμών της κλίμακας Ρίχτερ, χωρίς όμως να είχε αναφερθεί οποιαδήποτε υπόνοια για μελλοντικό διδύμο σεισμών. Η Γη εξ-ακολουθεί να μας εκπλήσσει και διαρκώς να χρειάζεται να ερμηνεύσουμε φαινόμενα, τα οποία δεν ακολουθούν πάντοτε τα αναμενόμενα πρότυπα.

Ιδιαίτερο επιστημονικό ενδιαφέρον παρουσιάζει η διερεύνηση του κατά πόσον η διάρρηξη εξελίχθηκε με υπερδιατμητική ταχύτητα (supershear), καθώς αναλύσεις όπως αυτές που έχουμε αναπτύξει για τον σεισμό του Σουλαβέζι της Ινδονησίας το 2018 μπορούν να εξηγήσουν την κατανομή των μεγάλων επιταχύνσεων και, κατ' επέκταση, των ζημιών.

Στην **Ελλάδα** υπάρχουν **τρεις κύριες ζώνες ενεργών ρηγμάτων οριζόντιας μετατόπισης** που μπορούν να δώσουν σεισμούς έως ίσως μέγεθος περίπου 7: το **ρήγμα Μετασχηματισμού της Κεφαλονιάς** (Kefalonia Transform Fault), η **Τάφρος του Βορείου Αιγαίου**, που αποτελεί τη δυτική συνέχεια του ρήγματος της Βόρειας Ανατολίας, και η **ζώνη διάτμησης της Θράκης και του βορειοανατολικού Αιγαίου**. Ωστόσο, οι περισσότεροι μεγάλοι ελληνικοί σεισμοί δεν σχετίζονται με ρήγματα οριζόντιας μετατόπισης. Προέρχονται είτε από κανονικά ρήγματα, όπως στον **Κορινθιακό** και στην **κεντρική Ελλάδα**, είτε από ανάστροφα (ωστικά) ρήγματα κατά μήκος του **Ελληνικού Τόξου, νότια της Πελοποννήσου και της Κρήτης**, όπου έχουν σημειωθεί οι μεγαλύτεροι ιστορικοί σεισμοί που έχουν φτάσει μεγέθη 8,2-8,7 Ρίχτερ. Ο πιο πρόσφατος ήταν το 1303 μ.Χ. Τέτοιοι σεισμοί συνήθως προκαλούν και μεγάλα τσουνάμι.

Υπάρχει μεγάλο επιστημονικό ενδιαφέρον για το διδύμο της Βενεζουέλας. Χρειάζεται διερεύνηση του κατά πόσον η διάρρηξη εξελίχθηκε με **υπερδιατμητική ταχύτητα (supershear)**. Αναλύσεις του είδους που έχουν αναπτύξει δύο μέλη της Ακαδημίας Αθηνών, ο **Αρης Ροζάκης** για τους υπερδιατμητικούς σεισμούς –όπου η ρήξη διαδίδεται ταχύτερα από τα διατμητικά κύματα– και ο **Κώστας Συνολάκης** για τα αντίστοιχα τσουνάμι των υποθαλάσσιων σεισμών, θα μπορούσαν να βοηθήσουν ουσιαστικά στην ερμηνεία της έκτασης των ζημιών στη Βενεζουέλα, και τους θανάτους που ελπίζουμε να μη φτάσουν σε πολλές χιλιάδες.

Σε περιπτώσεις supershear, η ενέργεια δεν διαχέεται ομοιόμορφα. Δημιουργούνται κατευθυντικά φαινόμενα, σαν σεισμικά «κρουστικά κύματα», τα οποία μπορούν να ενισχύσουν σημαντικά τις επιταχύνσεις σε ορισμένες περιοχές οι οποίες μπορεί να βρίσκονται κοντά στο ρήγμα καθώς η διάρρηξη περνάει δίπλα τους σαν ένα «σεισμικό» υπερηχητικό αεροπλάνο. Επομένως, η ερώτηση δεν είναι μόνο ποιο ήταν **το μέγεθος του σεισμού**, αλλά πώς διαδόθηκε η διάρρηξη, προς τις κατεύθυνση, με ποια ταχύτητα και με ποιες συνέπειες για τις πόλεις.

Για την Ελλάδα, το δίδαγμα από τη **Βενεζουέλα** είναι άμεσο. Είμαστε μία από τις πλέον σεισμογενείς χώρες της Ευρώπης, με μεγάλο απόθεμα παλαιών κτιρίων, ιδίως πολυκατοικιών που κατασκευάστηκαν πριν από τους σύγχρονους αντισεισμικούς κανονισμούς. Ο πρωτοβάθμιος έλεγχος που πραγματοποιεί ο **ΟΑΣΠ** είναι χρήσιμος και αναγκαίος, αλλά δεν αρκεί πάντοτε για να εντοπίσει με ακρίβεια όλα τα ευάλωτα κτίρια· άλλωστε αφορά μόνο τα δημόσια. Απαιτούνται λεπτομερέστεροι έλεγχοι, τεχνική τεκμηρίωση και, όπου χρειάζεται, ουσιαστικές παρεμβάσεις ενίσχυσης. Η τεχνολογία υπάρχει για την ποσοτική αξιολόγηση της κατάστασης του φέροντος οργανισμού και την ανίχνευση οπλισμού κτιρίων, που πάντα πρέπει να συνοδεύεται από έλεγχο της οικοδομικής άδειας και της εφαρμογής της.

Στη χώρα μας, έχουμε ήδη καταλάβει ότι η **ενεργειακή αναβάθμιση των κτιρίων** αποτελεί δημόσιο αγαθό και γι' αυτό επιδοτείται από το υπουργείο Περιβάλλοντος. Με την ίδια λογική, και ακόμη μεγαλύτερη επείγουσα ανάγκη, πρέπει να υπάρξουν εθνικά προγράμματα επιδότησης για την ποσοτική αξιολόγηση και σεισμική αναβάθμιση παλαιών κτιρίων. Η **αντισεισμική θωράκιση** δεν είναι ιδιωτική πολυτέλεια· μας αφορά όλους, γιατί όλοι μπορούμε να βρεθούμε σε δυνατό σεισμό σε κτίριο με μεγάλη τρωτότητα, χωρίς να το γνωρίζουμε.

Ιδιαίτερη προσοχή χρειάζονται οι παλιές πολυκατοικίες. Οι «πάνκεικ» καταρρεύσεις, δηλαδή όταν οι όροφοι πέφτουν ο ένας πάνω στον άλλον σαν αμερικανικές τηγανίτες, οδηγούν σε μαζικές απώλειες ζωής, και δυστυχώς, αυτό παρακολουθούμε με απόγνωση στις εικόνες από τη Βενεζουέλα. Το είδαμε το 2023, στην **Τουρκία** και στη **Συρία**, με τον υπερδιατμητικό σεισμό που ισοπέδωσε μεταξύ άλλων την αρχαία Αντιόχεια. Δεν πρέπει να περιμένουμε να δούμε αντίστοιχες εικόνες και στην Ελλάδα για να δράσουμε.

Οι σεισμοί δεν προβλέπονται. Οι καταστροφές όμως μπορούν να ελαχιστοποιηθούν. Με γνώση, με προληπτικούς ελέγχους, με επιδοτήσεις, με ενίσχυση των ευάλωτων κτιρίων και με πολιτική βούληση, με νέες ιδέες και πραγματικούς τεχνοκράτες σε θέσεις ευθύνης μπορούμε να μετατρέψουμε τον επόμενο μεγάλο σεισμό από εθνική τραγωδία σε δοκιμασία που η κοινωνία μας θα αντέξει.

** Οι καθηγητές Κώστας Συνολάκης και Αρης Ροζάκης είναι τακτικά μέλη της Ακαδημίας Αθηνών, στις έδρες Γεωεπιστημών και Αντοχής της Υλικών αντιστοιχώς.*

(Κώστας Συνολάκης, Αρης Ροζάκης / Η ΚΑΘΗΜΕΡΙΝΗ, 26.06.2026, <https://www.kathimerini.gr/world/564308113/oi-didymoi-seismoi-kai-to-mathima-qia-tin-ellada>)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

Δήλος: Βυθίζεται κατά ένα εκατοστό τον χρόνο

Νέα στοιχεία από το «Κλιματικό Παρατηρητήριο» για την άνοδο της υδάτινης στάθμης και τη γεωλογική καθίζηση του νησιού



Η Αγορά του Θεοφράστου είναι ένα από τα μνημεία της Δήλου που επηρεάζονται από την άνοδο της θαλάσσιας στάθμης λόγω της κλιματικής αλλαγής και από τη γεωλογική καθίζηση του νησιού. Ο συνδυασμός των δύο φαινομένων έχει ως αποτέλεσμα η Δήλος να «βυθίζεται» περίπου κατά ένα εκατοστό ετησίως, σύμφωνα με το «Κλιματικό Παρατηρητήριο». [ΕΦΑ ΚΥΚΛΑΔΩΝ]

Οφείλεται βέβαια στην **κλιματική αλλαγή** και επηρεάζει ολόκληρο το **Αιγαίο**. Καθώς όμως τα θαλάσσια ρεύματα ποικίλλουν, όπως και το εκάστοτε ανάγλυφο των νησιών, η **άνοδος της στάθμης της θάλασσας** δεν επηρεάζει ομοίως όλες τις ακτογραμμές. Ειδικά στην περίπτωση της **Δήλου**, τα πράγματα είναι πιο σύνθετα, καθώς το **ιερό νησί του Απόλλωνα**

–και **μνημείο Παγκόσμιας Κληρονομιάς της UNESCO**– καταβυθίζεται ελαφρώς και για γεωλογικούς λόγους. Τα επισημονικά στοιχεία που συλλέχθηκαν πρόσφατα δεν αφήνουν πολλά περιθώρια: εξαιτίας της ανόδου της στάθμης των νερών, που συνδυάζεται με τη γεωλογική της καθίζηση, η Δήλος «βουλιάζει» κατά ένα περίπου εκατοστό κάθε χρόνο.

Η ακτογραμμή μπροστά από την αρχαία πόλη της Δήλου θα υποχωρήσει προς την ενδοχώρα και οι μερικώς βυθισμένες αρχαίες λιμενικές κατασκευές θα βυθιστούν πλήρως.

Τα στοιχεία παρουσιάστηκαν χθες σε **ημερίδα της Ακαδημίας Αθηνών**, η οποία, σε συνεργασία με το **Εθνικό Αστεροσκοπείο** και την **Εφορεία Αρχαιοτήτων Κυκλάδων** (και με τη στήριξη της «**Πρωτοβουλίας 21**»), έχει εγκαταστήσει στη Δήλο, εδώ και δύο χρόνια, ένα ολοκληρωμένο σύστημα παρακολούθησης των επιπτώσεων της κλιματικής αλλαγής, σχεδιασμένο από το Κέντρον Ερεύνης Φυσικής της Ατμοσφαιρας και Κλιματολογίας (ΚΕΦΑΚ) της Ακαδημίας. Το «Κλιματικό Παρατηρητήριο», όπως ονομάζεται, μελέτησε συνδυαστικά, για ένα έτος, τον ρυθμό βύθισης της Δήλου και την παράλληλη άνοδο της στάθμης της θάλασσας, καταλήγοντας –αφού λήφθηκαν υπόψη ιστορικά δεδομένα, αρχαιολογικοί δείκτες κ.λπ.– στο συμπέρασμα της ετήσιας υποχώρησης της ακτογραμμής του νησιού κατά ένα σχεδόν εκατοστό.

Όπως επισήμανε ο ακαδημαϊκός **Κωνσταντίνος Συνολάκης**, καθηγητής Φυσικών Καταστροφών του Πανεπιστημίου της Νότιας Καλιφόρνιας, τα σενάρια για τη μελλοντική άνοδο της «σχετικής στάθμης της θάλασσας» (ΣΣΘ) στη Δήλο, δηλαδή για το συνδυαστικό αποτέλεσμα της ανόδου των υδάτων και της παράλληλης γεωλογικής βύθισης, δείχνουν ότι μια τέτοια εξέλιξη έχει «κλειδώσει», λόγω της υψηλής «θερμοχωρητικότητας» της θάλασσας, η οποία δεν θα μειωθεί, ακόμα και αν περιορίσουμε άμεσα το φαινόμενο του θερμοκηπίου. Ειδικότερα, το «καλό» σενάριο για το 2050 θέλει τη «ΣΣΘ» να ανεβαίνει στη Δήλο κατά 21 εκ. (με απόκλιση $\pm 12,9$ εκ.), ενώ σύμφωνα με το «κακό» σενάριο για την ίδια χρονιά, η άνοδος υπολογίζεται στα 28 εκ. (με απόκλιση $\pm 18,2$ εκ.). Σύμφωνα με το «καλό» σενάριο για το 2100, η θαλάσσια στάθμη θα ανέβει κατά 48 εκ. (με απόκλιση $\pm 13,4$ εκ.), ενώ σύμφωνα με την «κακή» εκτίμηση, η άνοδος θα αγγίξει τα 87 εκ. (με απόκλιση $\pm 18,7$ εκ.).



Σύμφωνα με τις διευκρινίσεις που έδωσε ο κ. Συνολάκης, θα χρειαστούν περαιτέρω μετρήσεις, για περισσότερα χρόνια, ώστε να προσδιοριστεί ποιο κομμάτι της «σχετικής στάθμης της θάλασσας» οφείλεται στην άνοδο της θαλάσσιας στάθμης και ποιο στη γεωλογική βύθιση της Δήλου. Σε κάθε περίπτωση, οι μακροπρόθεσμες συνέπειες θα είναι μεγάλες: η ακτογραμμή μπροστά από την αρχαία πόλη της Δήλου θα υποχωρήσει προς την ενδοχώρα και ο υγρότοπος που βρίσκεται πίσω από το λιμάνι θα επεκταθεί, οι μερικώς βυθισμένες αρχαίες λιμενικές κατασκευές θα βυθιστούν πλήρως, τμήματα προσβάσιμα από τους επισκέπτες θα πλημμυρίζουν εποχικά ή και μόνιμα κ.λπ.

Ανάμεσα στους πιθανούς ή ήδη εφαρμοζόμενους τρόπους περιορισμού των επιπτώσεων του φαινομένου, ο **Δημήτρης Αθανασούλης**, προϊστάμενος της ΕΦΑ Κυκλάδων, υπογράμμισε, στο περιθώριο της εκδήλωσης, την εκπόνηση μελετών ακτομηχανικής, τη δημιουργία τεχνητών υφάλων και την ανάπτυξη των ποσειδωνιών (για τη μείωση των κυματισμών), τις καταχωρήσεις ή στερεώσεις μνημείων στην περιοχή νοτίως του λιμανιού κ.ά., ενώ ο κ. Συνολάκης σημείωσε και το ενδεχόμενο κατασκευής τοιχείου στην ακτογραμμή της Δήλου.

Ο κ. Αθανασούλης αναφέρθηκε στην ομιλία του και στο ευρωπαϊκό πρόγραμμα Argus, το οποίο συμπληρώνεται από

το «Κλιματικό Παρατηρητήριο», ενώ τόνισε ότι πρώτη φορά καταγράφονται οι σεισμοί στη Δήλο. Η σεισμική δραστηριότητα του νησιού, σημείωσε ο Νικόλαος Μελής, διευθυντής ερευνών του Γεωδυναμικού Ινστιτούτου του Εθνικού Αστεροσκοπείου Αθηνών, δεν προκαλεί ανησυχία, αν και ένας μεγάλος σεισμός δεν αποκλείεται, ενώ σημαντική ως προς τις συνέπειές του θα είναι και η κατάσταση του εδάφους της Δήλου, που επηρεάζεται από την κλιματική αλλαγή.



Αποψη του ιερού νησιού του Απόλλωνα φωτογραφημένου από τη θάλασσα. Το «Κλιματικό Παρατηρητήριο», σχεδιασμένο από το Κέντρον Ερεύνης Φυσικής της Ατμοσφαιρας και Κλιματολογίας (ΚΕΦΑΚ), παρουσίασε τα στοιχεία για τη Δήλο χθες σε ημερίδα της Ακαδημίας Αθηνών.
[shutterstock]



Δήλος: Νέα όψη για το «Μουσείον»

Η λειτουργία του «Κλιματικού Παρατηρητηρίου» ήταν το αντικείμενο της παρουσίασης του επιστημονικού υπεύθυνου του έργου (και απόντος λόγω ασθενείας) **Χρήστου Ζερεφού**, που αναφέρθηκε στη Δήλο ως σταυροδρόμι αέριων ρύπων από Σμύρνη, Κωνσταντινούπολη και Πειραιά, ενώ η συνέχιση της συνεργασίας της Ακαδημίας και της ΕΦΑ Κυκλάδων εξασφαλίστηκε με μνημόνιο που υπέγραψαν ο γενικός γραμματέας του ιδρύματος Αντώνιος Ρεγκάκος και ο κ. Αθανασούλης.

(Νικόλαος Ζώης/ Η ΚΑΘΗΜΕΡΙΝΗ, 03.06.2026,
<https://www.kathimerini.gr/culture/564261670/dilos-vythizetai-kata-ena-ekatosto-ton-chrono/>)



'They are trying to tame nature': China is building the world's biggest dam in an earthquake-prone region of Tibet

China is building a dam system that will generate more hydroelectric power than the U.S. generates yearly. But the project comes with huge risks for people downstream.



The Yarlung Tsangpo is the world's highest altitude river and runs 1,800 miles through the world's two most populous countries, as well as Bangladesh.

(Image credit: China News Service via Getty Images)

Taming Nature: Inside China's efforts to control the region's water

China is facing water scarcity that affects millions of people, so the country is embarking on water projects on a scale the planet has never seen. This [three-part series](#) investigates three elements of this effort: the world's biggest dam, a doomed effort to create a "river in the sky," and a colossal water transfer project.

Towering 14,800 feet (4,500 meters) above sea level, the Tibetan Plateau, with its frigid temperatures and glacier-covered mountains, is the source of most of Asia's major rivers — the Yellow, Yangtze, Yarlung Tsangpo (Brahmaputra) and Lancang (Mekong) — which supply almost 2 billion people downstream, including the two most populous countries on Earth: China and India.

For that reason, the Tibetan Plateau is often called the roof of the world, the third pole and Asia's water tower.

But in recent years, the region has also earned a new moniker: Asia's power tower, thanks to its huge, untapped potential for generating hydropower.

Faced with water scarcity in densely populated, industrialized and irrigated regions of China; an insatiable need for energy; and a drive to eliminate fossil fuel use, Chinese authorities are pursuing a number of hydropower projects in the region. Together, they will not only tap the region's vast power potential but also attain unprecedented levels of control over vital water sources its neighbors rely on.

The government's flagship project is the Motuo (also called Medog) megadam project on the Yarlung Tsangpo River. The project officially started construction in July 2025, and its costs are staggering — estimated at up to \$168 billion.

The megadam is slated to be completed in less than a decade and will dwarf all other hydroelectric projects in the world with its estimated 300 terawatts of annual power output — three times the output of the Three Gorges Dam on the Yangtze, the world's current largest dam, and more than the entire U.S. produced in net hydropower in 2024.

The dam is just part of a bigger Chinese initiative to trans-

form its environment.

"You have a modern, powerful China who is in a way very, very confident of taming nature," said Tenzin Norgay, a researcher at the International Campaign for Tibet (ICT), a nongovernmental organization that works to promote human rights and democratic freedoms for the people of Tibet. The ICT is closely monitoring dam building in the region. "That's literally what they are trying to do, right?" Norgay told Live Science. "They are trying to tame nature."

But the massive project comes with huge risks for both people in Tibet and the hundreds of millions of people in countries downstream, including those in India and Bangladesh, experts told Live Science.

"Controlling [the] nature of the water or the river itself is a danger for the entire Himalayan belt particularly for countries like India, Bangladesh and to some extent also Nepal," said Jagannath Panda, head of the Stockholm Center for South Asian and Indo-Pacific Affairs at the Institute for Security and Development Policy, told Live Science.

Project of the century

China is the world leader in dam building. The government has constructed around 98,000 dams and reservoirs across China, including 40% of the world's largest dams, and numerous dams outside the country as part of its Belt and Road Initiative. But this new project is different.

"There's nothing on this scale, and nothing close to it," Brian Eyler, director of the Southeast Asia and energy, water and sustainability programs at the Stimson Center think tank in Washington, D.C., told Live Science.

The project will utilize Tibet's unique geography to full effect. In the project area, the Yarlung Tsangpo River (known as the Brahmaputra in India and Jamuna in Bangladesh) flows through the world's deepest canyon, called the Yarlung Tsangpo Grand Canyon, and rapidly drops around the horse-shoe-shaped "Great Bend," before continuing to flow down and into India and, eventually, Bangladesh.



The route will cut through the mountainside, dropping 6,600 feet and passing through several hydropower stations within the tunnels, before rejoining the river farther downstream, Eyler explained. (Image credit: © 2026 Google, Map Data provided by Landsat / Copernicus)

The project will dam the upper section of the river and divert the water through a series of tunnels that will be cut through the 25,500-foot-tall (7,800 m) Mount Namcha Barwa, before returning the water to a lower section of the river, circumventing the Great Bend. The project will likely have five dams in total, with hydropower stations inside the tunnels. The water will drop 6,500 feet (2,000 m) within 30 miles (50 kilometers) of tunnels, thereby generating a huge amount of hydroelectric power.

"It's really incredible that this type of project can be built," Eyler added.

The cascading dam system will require huge amounts of water to run effectively, meaning there will likely be a reservoir at the beginning, and so during the dry season the Great Bend will effectively run dry, Eyler said.

Mega project, mega challenges

Building such a large project in this region is fraught with risk, experts noted.

The Tibetan Plateau is one of the most seismically active regions in the world, driven by the ongoing collision between the Indian and Eurasian plates. The region has recently been rocked by several major earthquakes, including the 7.1 magnitude Dingri quake in January 2025, which damaged five dams in the region, and the 7.8 magnitude Nepal earthquake in 2015 that damaged a fifth of the country's hydropower capacity.

Parts of the Himalayas are unsuitable for dam construction due to the high risk of seismicity and its effects, researchers have warned, noting that dams are particularly vulnerable to earthquake-induced landslides.

In addition to naturally caused earthquakes, large-scale projects involving land excavation, tunneling and water redirection have the potential to trigger seismic activity, while the creation of reservoirs has been strongly linked with earthquakes in China.

Other natural disasters could endanger people beyond Tibet.

Glacial lakes — bodies of water created by melting glaciers and permafrost — can pose a problem to people downstream if they suddenly release their water and overwhelm dams. This scenario happened in northeastern India in 2023, causing a large, newly built dam to catastrophically fail, killing at least 46 people and impacting 88,000 more.

Climate change is accelerating glacial melt, meaning the threat will only increase as the region's glaciers are further destabilized, experts have warned.

Climate change could also render the dam obsolete sooner than anticipated. Dams typically function for around 70 to 100 years, experts told Live Science. Water levels in the Yarlung Tsangpo are expected to peak in 2060, so when water levels start to fall after that, the whole dam could become useless during dry periods because the water level will be too low to produce hydropower — a status known as minimum pool elevation. Water levels could even drop so low that they can't pass through a dam. This situation, known as "dead pool," is already an issue for some dams on the Colorado River.

The project will also affect Tibetans. "From our viewpoint, displacement of people around that and submergence of cultural sites" are the biggest issues, Norgay told Live Science.

However, the area is sparsely populated, and the reservoirs needed will almost certainly not be as big or as deep as reservoirs of other megadams. So although there will be an impact, it won't be on the scale of the 1.3 million people displaced by the Three Gorges Dam, Eyler noted.

Downstream impacts

Even without a climate-driven reduction in water, the river's flow will be transformed. To ensure a continuous, controlled flow of water through the dam, authorities typically fill reservoirs during the wet season and release water during the dry season. While this ensures that the hydroelectric dam can

function, it inevitably impacts the river's natural flow and has knock-on effects for communities downstream. The filling-and-releasing process also raises the possibility of the up-stream country — namely, China — "turning off the taps" to benefit the dam at the expense of other downstream water users.



The Three Gorges dam in Hubei province, central China, is currently the world's biggest hydroelectric dam. But the new Motuo dam will generate three times as much power when it comes online around 2033.

(Image credit: NurPhoto via Getty Images)

"If a dam operator has an opportunity to take water during a time of drought, they're going to take at the expense of downstream users," Eyler said. "We've seen this happen in the Mekong, where the downstream was suffering drought, but China still filled its reservoirs," worsening drought in 2019 in Thailand, Cambodia and Vietnam.

In the case of the Motuo megadam, any change in water flow will affect India and Bangladesh. The Brahmaputra flows for about 1,800 miles (2,900 km), eventually joining with the massive Ganges River, and is a vital source of water and natural fertilizer for more than 130 million people. It provides India with 30% of its freshwater reserves, while Bangladesh is heavily dependent on the river to support its irrigated agriculture.



The Great Bend is a vital source of sediment for farmers in Bangladesh. (Image credit: Shibu bhattacharjee via Getty Images)

"The greatest ecological and environmental impact will be related to sediment flow. The Great Bend itself is a rich provider of sediment to the downstream [countries]," Eyler said. "Sediment is important for agricultural production. It's a very inexpensive natural fertilizer."

Sediment from the Brahmaputra is integral to building up the Ganges-Brahmaputra delta, helping the low-lying region stay above rapidly rising sea levels. The delta is home to nearly 200 million people — including in the megacity of Kolkata — and is considered one of the places most at risk from sea

level rise. The Yarlung Tsangpo in Chinese-controlled territory provides up to 50% of the river's downstream sediment flow.

"River deltas are built by sediment flows pushing land out into the ocean year after year," Eyler said. "And either the dams themselves or the lack of flow within the Great Bend will cause a great reduction in the amount of sediment coming down."

The potential reduction in sediment could threaten food security in the downstream countries.

"Millions of people's lives are dependent on this river," Nor-gay noted.

India also plans to build major dams on the waterway, Nor-gay added, which could itself have negative impacts downstream.

Not true "green power"

The Motuo megaproject is just one of several new dams planned or under construction in Tibet; the ICT counts at least 193 dams in the region that have been planned or built since 2000, when China embarked on a policy of expanding infrastructure projects in the region.



The region's rugged terrain, seismicity and remoteness could make building such large-scale infrastructure projects a challenge. (Image credit: Feng Wei Photography via Getty Images)

The surge in hydropower projects is intended to help China move away from fossil fuels, experts told Live Science.

"It is part of a more widespread strategic vision where China is trying to become more sustainable," said Tom Harper, a lecturer in international relations at the University of East London who specializes in China.

One key to China's strategic vision is phasing out coal.

"This dam has been described as the coal killer. There are numerous coal plants that can be taken offline as a result of this and retired permanently," Eyler said. "When you bring in China's carbon emissions reduction goals, through 2050, the dam makes a lot of sense."

However, hydropower is not as sustainable as it's often portrayed, and it has environmental impacts. Large dams can cause severe environmental damage to river ecosystems. The creation of reservoirs can also release greenhouse gases as trees and plants are covered with water and subsequently rot, though this is less of an issue in cold places like the Tibetan Plateau, Darrin Magee, a hydropower expert at Western Washington University, told Live Science.

Typically, the larger the project, the greater the impacts, and this is the largest dam system ever created.

Brian Eyler

Though the authorities claim there will be no significant environmental impact from the dam, that's hard to believe, Eyler said. "Typically, the larger the project, the greater the impacts, and this is the largest dam system ever created."

Scientists also question the necessity of using hydropower to meet sustainability goals, when the Tibetan Plateau has huge, untapped wind and solar power potential.

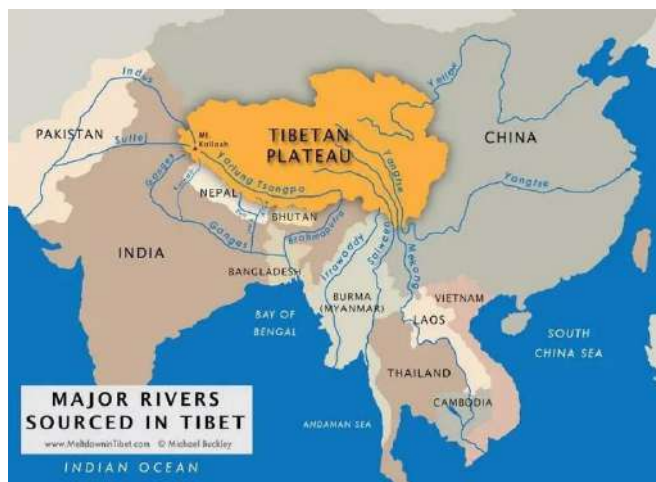
Experts had different theories of what China would do with such a vast amount of energy generated in such a remote and sparsely populated area.

"There's certainly no need for it, right now or in the foreseeable future in the area where Motuo Dam is sited," Magee said. "But China solves that problem by building ultra-high voltage DC transmission lines at, at a rate that no one in the world is matching." These high-voltage lines transport energy from the west to east, bypassing local grid networks, he added.

Norgay and Panda both think Tibetans are unlikely to benefit.

The power will likely be moved east to power Chinese industry, they said, and it could also align with the political goal of further integrating Tibet into China, Panda added.

Eyler, meanwhile, thinks it will be used to power data centers in Tibet, "which can be built around the super dam, in a naturally cool and cold environment."



(Image credit: Ternes et al (2024), [Creative Commons Attribution 4.0 International](#))

Better cooperation needed

There is little official information about the megadam for Chinese authorities, Eyler noted, and the lack of transparency is fueling fears. For example, Indian politicians have expressed concern that the megadam will give China full control of the river, and that China could potentially weaponize the river by deliberately reducing the flow of water or by releasing large amounts of water in one go, thereby devastating downstream communities. Some researchers have called this possibility a "water bomb."

Eyler, however, said that this risk is low, and that the dam system's design means it cannot hold back enough water to cut off supplies downstream.

"I don't think that there's some type of nefarious plot out there from Beijing to bring these countries to heel by controlling the upstream of the rivers," he said. "China's top priority is to develop its economy, bring stability to the country, and building large dams on rivers is one way to do that."

The expansion of hydropower is a key aim for China in the next few years, as the country embarks on the 15th five-year plan from 2026. With shared water resources in short supply, better cooperation among neighboring countries is vital, experts said. Yet China and India share only limited data, Panda noted.

Some of the concerns from neighbors could be mitigated by better communication between stakeholders, Magee said. "Be more transparent with the data, bring more voices into the conversation, have some realistic assessment of both need for the project and the impacts."

But even with better communication, the megadam and other upcoming dams means China will still largely control the region's water resources due to its upstream position.

"This is a dam project which actually gives China the upper hand," Panda said.

(James Price / LIVESCIENCE, 15 June 2026, <https://www.livescience.com/planet-earth/they-are-trying-to-tame-nature-china-is-building-the-worlds-biggest-dam-in-an-earthquake-prone-region-of-tibet>)



'If there's any country that will do it, it's China': Why is China diverting some of the world's mightiest rivers thousands of miles?

People in China's northern megacities have 74 times less fresh water than the average American — so the Chinese government has built the world's largest water diversion project, with the most ambitious and dangerous route still to come.



(Image credit: Xinmei Liu for Live Science)

Taming Nature: Inside China's efforts to control the region's water

China is facing water scarcity that affects millions of people, so the country is embarking on water projects on a scale the planet has never seen. This [three-part series](#) investigates three elements of this effort: the world's biggest dam, a doomed effort to create a "river in the sky," and a colossal water transfer project.

China controls some of the largest rivers in Asia, experiences heavy rain and has vast stores of water locked in glaciers in the west. But despite these abundant resources, China has a water problem. While central and southern regions are quenched by massive rivers like the Yangtze, the northeastern megacities like Beijing and Tianjin have endured serious

water scarcity as agriculture, industry and population size rapidly increased.

To address the imbalance, China has undertaken one of the biggest engineering projects in the world: rerouting the flow of one of the world's mightiest rivers and its tributary, and ferrying the water thousands of miles from the center and south of the country to the thirsty north.

Called the South-to-North Water Transfer Project (SNWTP), the vast system of canals, pipes, dams, reservoirs and pumps moves staggering amounts of water via two routes through central and eastern China.



The Hongze Station on the eastern route of the South-North Water Transfer Project in Huai'an City, China.
(Image credit: CFOTO via Getty Images)

"It binds into a single network four major river basins, six provinces, three megacities, myriad bureaucracies, and more than 700 million people," Michael Webber, a professor emeritus in the School of Geography, Earth and Atmospheric Sciences at the University of Melbourne who specializes in regional economic development in China, wrote in a 2023 journal article.

But even this is not enough to satisfy the water needs in the North: China is currently expanding these routes and is planning a third, western route for the project, which would snake through the Tibetan Plateau before feeding the water-parched north and east. The route is attractive to Chinese officials because the river-and-glacier-threaded plateau, dubbed the Water Tower of Asia, has abundant water resources and is the source of numerous major rivers.

However, experts say the routes could worsen conditions in parts farther south that provide the water. What's more, the Tibetan portion of the project has stoked fears and suspicion in neighbors, as unofficial plans swirl suggesting major trans-boundary rivers could be diverted away from other countries and further into China.

The huge plan is "unbelievable," Mark Wang, a professor of human geography at the University of Melbourne, told Live Science. "The proposals [have] underestimated the negative impacts — environmental, earthquakes, evaporation and economic cost," as well as the international impacts, Wang added.

Water imbalance

Construction of the SNWTP [began in 2002](#). The eastern route has operated since 2013 and transports water from the mighty Yangtze from Yangzhou, near Shanghai, to the megacity Tianjin, which has a population of 15 million people. The central route, which goes from Danjiangkou to Beijing and Tianjin, began flowing the following year, carrying water from the Han River, or Hanjiang. Together, they have moved 21 cubic miles (88 cubic kilometers) of water more than 1,800

miles (2,900 kilometers) since they began operating, according to the Chinese government — more than double the maximum amount of water held in Lake Mead.



The Danjiangkou reservoir was expanded to supply the Central route, which flows to Beijing.
(Image credit: silkwayrain via Getty Images)

The motivation for this project is obvious: China must support nearly 20% of the world's population with just 6% of its freshwater reserves. And this water is not distributed evenly across the country. Northern China has nearly half of the country's population and more than half of its agriculture but just one-fifth of the country's freshwater reserves.

In some places, the imbalance is even more dramatic. Tibet, in the west, has 4.8 million cubic feet (136,800 cubic meters) of water per person, while Tianjin, in the Northeast, has just 3,990 cubic feet (113 cubic m) per person. The United Nations considers less than 1,000 cubic m (35,000 cubic feet) of fresh water available per person water scarcity and less than 500 cubic meters (18,000 cubic feet) per person as "absolute water scarcity." The average in the U.S. is 314,300 cubic feet (8,900 cubic m).

Water transfer

China has a long history of rerouting water to serve its needs. Parts of the eastern route, for instance, use the Grand Canal, which was first built in the fifth century B.C.

And the broad concept of transferring water from the south to the north was first laid out by Mao Zedong, China's first communist leader, in 1952.

"Control of water has been a key theme in Chinese history and mythology," Tom Harper, a lecturer at the University of East London specializing in Chinese foreign policy and international relations, told Live Science.

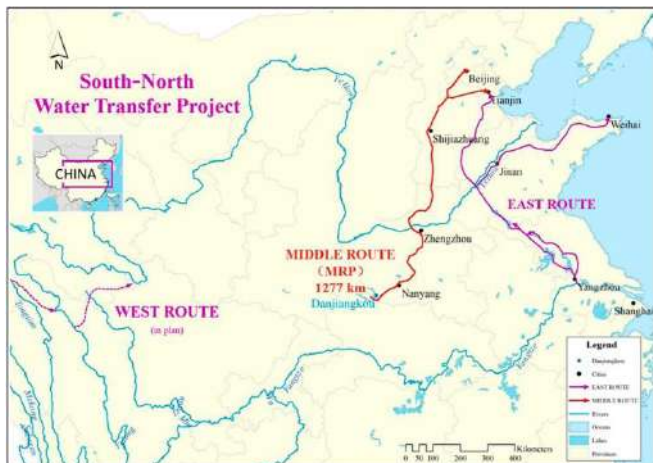
Currently, the eastern route, which stretches 715 miles (1,150 km) from the Yangtze River to eventually reach Tianjin, transfers around 4 cubic miles (15 cubic km) of water per year.

This water needs to travel 213 feet (65 m) uphill, meaning pumping stations have to raise the water along the route.

The central route, meanwhile, relies on gravity to channel around 3 cubic miles (13 cubic km) of water 790 miles (1,270 km) from Danjiangkou Reservoir, on the Han River in Hubei province, to eventually reach Tianjin.

The Danjiangkou Reservoir already existed before the commencement of the project, but it was significantly expanded to raise the water level — and required 350,000 people to be relocated as a result.

The routes are now key to providing water to Beijing and Tianjin. For example, around 70% of Beijing's water comes from the route, experts told Live Science.



Map showing the two completed routes and the official plan for the western route.

(Image credit: Zhang et al. (2022): [CC BY 4.0](#))

Fixing the fixes

The Chinese government and many Chinese scientists have boasted that the project has increased the water supply to people in northern China, raised the groundwater table in northern regions, and increased economic activity and agriculture in the region.

A major part of the project also focused on improving water quality: Freshwater supplies in China are heavily polluted, which reduces the amount of drinkable water.

"These were reservoirs, these were rivers, these were groundwater resources that had severe pollution impacts," Darrin Magee, a dam expert at Western Washington University, told Live Science. "So in the south where we had abundant water resources, the quality tended to be very bad in some areas."

Danjiangkou Reservoir



Source: [USGS/NASA/ Landsat 5/ Landsat 9](#) • In these false-color images, the reservoir pictured in 1987 (left), and in 2023 (right) after the dam was expanded to supply the SNWTP. 300,000 were forced to relocate when the reservoir's dam was extended.

To rectify this, the SNWTP installed water-cleaning stations along the route and the government implemented measures to reduce water pollution, including shutting down or relocating hundreds of manufacturing businesses that dumped their waste into waterways along the routes.

Along the eastern route, "pollution was terrible," Wang noted. "The central government put in a lot of effort... and they have control of the pollution again in a short period of time," he noted, adding that the water quality has significantly improved along the routes.

However, experts have said that the massive project has damaged ecosystems, displaced hundreds of thousands of people and fueled saltwater intrusion into underground reserves in water-providing areas, as the Yangtze River's freshwater flow is reduced.

"When the South-North Water Transfer was being proposed, many, many Chinese scientists were also against it because you just create lots and lots of new problems, whatever you fix," Emily Yeh, a professor of geography at the University of Colorado Boulder who specializes in Tibet, told Live Science. "Why not conserve water instead?"

Other experts agreed. "The water problem in China, it's not just physical water scarcity, it's the structural problem," Wang said. The biggest driver of water consumption is farming irrigation, which is water-intensive and leads to significant water loss. Conserving that water would go a long way to alleviating water scarcity, Wang added.

If China's "first priority is conservation, you won't need a large-scale, world's largest mega project," Wang said. Chinese authorities seem to be realizing this. They're also attempting large-scale water conservation policies, Wang said.

But the country is forging ahead with engineering projects.

The SNWTP's sources, particularly along the Han River, have less water per capita than the world's average, so siphoning off large amounts of the river's water could severely strain local areas. This has become such a problem that Chinese authorities are now undertaking even more engineering projects to alleviate the problem caused by the SNWTP. For instance, a new, smaller diversion is being added near the Danjiangkou reservoir, because people downstream are not getting sufficient water, Wang said.

The central route is further being extended to improve Danjiangkou's water levels. The central route relies on gravity, so a high water level is required for the route and the reservoir's dam to function. If water levels dip too low, as happened in 2011 during droughts, the dam stops working. So, engineers are connecting the Danjiangkou reservoir to the Three Gorges Dam, the world's largest dam, on the Yangtze, to increase the water supply.

The project is "a fix to fix the fix to fix the fix," environmental researcher Stevan Harrell wrote in the *Made in China Journal* — emphasizing the ever-growing number of engineering projects to deal with poor water governance.

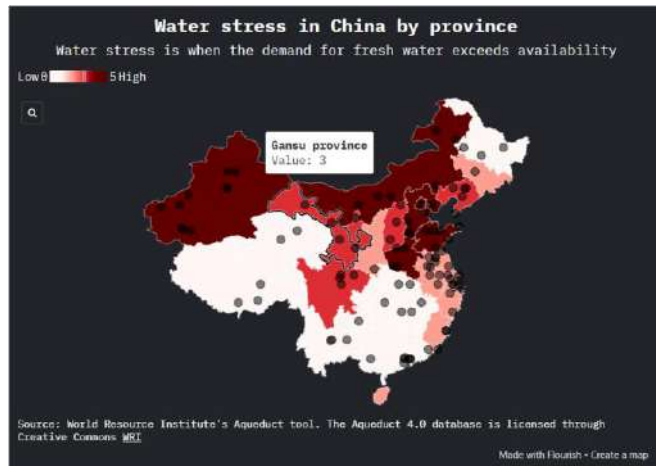
Western route

Even though the two existing routes provide vast amounts of water to the North, and other water-conservation measures are being rolled out, Chinese authorities say the supply to the North is still not enough to meet demand, and that more water diversion is necessary.

The SNWTP's planned western route through the Tibetan Plateau won't start operations until at least 2050, but since its earliest planning stages, it has been mired in controversy.

The western route's official path would take 4 cubic miles (17 cubic km) of water per year from the Tongtian, Yalong and Dadu rivers — all tributaries that eventually feed into the Yangtze. The route would cross about 190 miles (300 km) of the Tibetan Plateau to the Yellow River, which then flows to

the water-scarce north and east. The government has commissioned more feasibility studies for this route as part of the country's newly announced five-year plan.



The construction of such a massive project is fraught with difficulty. The Tibetan Plateau rises 10,000 to 15,000 feet (3,000 to 4,500 m) above sea level. These high altitudes present several problems, such as challenges in construction and maintenance, and difficulties in preventing water from freezing.



The Tibetan Plateau's high, rugged and earthquake-prone landscape creates numerous challenges to potential infrastructure projects

(Image credit: primeimages via Getty Images)

To transfer water across the plateau, the route would require pumping stations, along with a series of 300- to 1,000-foot-tall (100 to 300 m) dams, which would rank among the tallest dams in the world. The project would also require cutting 200 miles (300 km) of tunnels through the mountains, including the Bayan Har Mountains, which separate the upper Yangtze and Yellow River drainage basins.

The Tibetan Plateau is very seismically active, meaning earthquakes could lead to collapses or landslides, potentially damaging the vast infrastructure.

In 2018, Chinese scientists attempted to overcome the difficult terrain by transferring water through the air. But the "Sky River," or Tianhe project, ultimately proved unfeasible and has been effectively cancelled.

But China has not been deterred by these obstacles. The ongoing construction of the Dianzhong Water Diversion Project, in Yunnan province in southwest China, provides a test case for transferring water across mountainous, earthquake-prone landscapes. The damless design relies on a 380-mile-long (610 km) series of 58 tunnels, as well as pumps, to carry water through the mountainous and seismically active terrain. It is the "the world's longest water tunnel that could fit two high speed trains" and is "seen as a pilot demonstration

project that will inspire and inform the design for the Western Routes," according to the Hong Kong-based think tank CWR. The first stage of the Dianzhong project is due for completion later this year, with a second phase recently announced.

Red flag

While the official western route has yet to break ground, alternative proposals have caused serious concern in neighboring countries. One unofficial plan developed in the 1990s, which politicians and academics subsequently considered completely unworkable, suggested funneling 48 cubic miles (200 cubic km) of water (four times the flow of the Yellow River) away from the Brahmaputra River, which flows into India and Bangladesh, and diverting the water toward the Yellow River basin, which serves the North and East of China.

A second controversial proposal, known as the Red Flag River project, suggests diverting 14 cubic miles (60 cubic km) of water 3,700 miles (6,000 km) from the Lancang, Nu and Yarlung Tsangpo rivers (called the Mekong, Salween and Brahmaputra rivers when they leave China) across the Tibetan Plateau to the northern Xinjiang region, which has high water stress and is facing desertification. Officials suggested the plan could turn Xinjiang into China's "California." The diverted water could also potentially be rerouted toward Beijing, experts told Live Science.

Some experts have called these "semi-official" proposals, as they have no official government backing but have been discussed openly by researchers with heavy government backing and support in China, which the government wouldn't allow if these people were truly speaking out of turn, Wang said.

Despite no official government backing, the plans have worried neighboring countries, particularly India, due to fears that any water diversions on international rivers could significantly reduce vital downstream supplies. Massive water engineering projects are already being built in Tibet, such as the upcoming Motuo megadam on the Yarlung Tsangpo — close to the proposed starting point for the Red Flag River project.

"There's a lot of concern that there might be water diversion, because China has been talking about this for many, many years," Tenzin Norgay, a researcher at the nonprofit organization International Campaign for Tibet, told Live Science. "If it happens, it's going to be a huge risk to downstream countries."

Researchers have calculated that the Red Flag project would likely siphon around 20% of the rivers' upstream flows, though the overall water loss for the whole of each river is less than that. Regardless of the actual amount of diversion, the lack of international consultations and transparency is exacerbating suspicions, experts told Live Science.

A changing climate

While China is forging ahead with attempts to redistribute China's water and reduce water scarcity via the SNWTP, climate change could scramble those plans. An increased risk of droughts over the coming decades could compromise the SNWTP's ability to move water.

The Tibetan Plateau, which is a source of water for almost 2 billion people, is particularly at risk. The world's "Third Pole" is rapidly warming, leading its numerous glaciers to melt. This could lead to sudden flooding, followed decades later by reduced river flow as the glaciers disappear. Desertification, meanwhile, is also impacting the Tibetan Plateau.

"Short to medium term, [we'll] see an increase in runoff as melting begins earlier each year," Magee said. "But over the

long term, decreased snowpack means less secure water resources for most of China."

Taming nature

The government is really imagining Tibet as a source of ecological service for the rest of the country

Emily Yeh, professor of geography at the University of Colorado Boulder

China's water management approaches include vast dam-building projects, cloud seeding, monumental tree-planting schemes and water-transfer projects, all of which rely on technological and engineering solutions to control the natural world, experts told Live Science.

When it comes to megaprojects, "If there's any country that will do it, it's China," Magee said. "The People's Republic of Engineers."

Other experts agreed. "It is part of this idea that you can engineer your way out of these problems, even if it's with trees rather than with machines," Yeh said. "A large-scale engineering approach to the natural world has been a characteristic of Chinese approaches to perceived or real environmental problems."

This is particularly true for the Tibetan Plateau. "The government is really imagining Tibet as a source of ecological service for the rest of the country," Yeh said.

Other experts agreed that Chinese authorities typically take an engineering approach to attempt to manage nature.

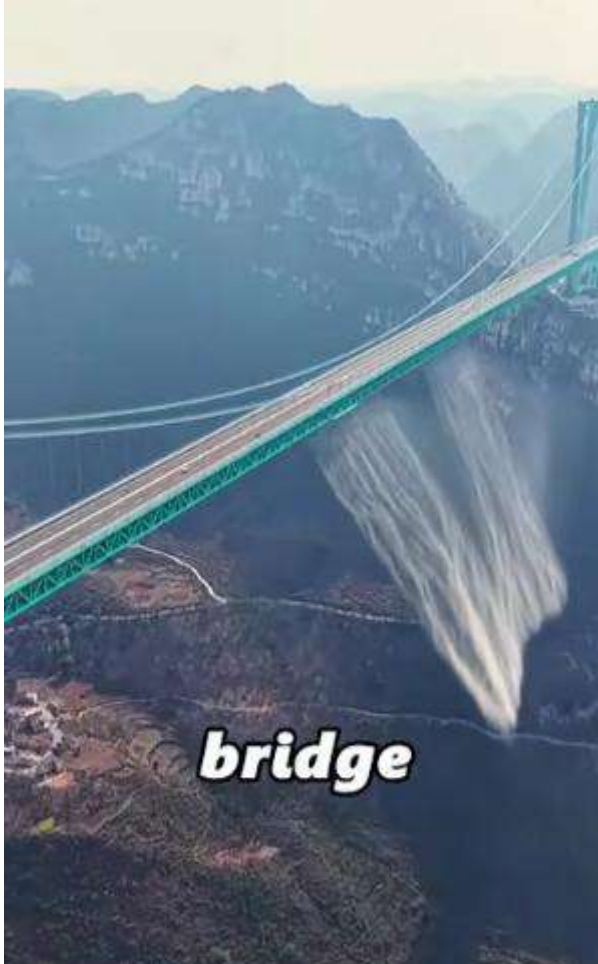
But Wang noted that China faces big pressures, which is why its government is looking for big solutions.

"If you understand China's energy issues, you understand why China is doing this. If you understand the water and food security issues, you understand so many things China has done," Wang said.

(James Price / LIVESCIENCE, 23.06.2026,
<https://www.livescience.com/planet-earth/if-theres-any-country-that-will-do-it-its-china-why-is-china-diverting-some-of-the-worlds-mightiest-rivers-thousands-of-miles>)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΛΟΙΠΑ

Huajiang Grand Canyon Bridge (Guizhou, China) A bridge with a waterfall



<https://www.youtube.com/watch?v=nXwZJnFdX68>

Location: Southwest Guizhou, China

Details: Soaring 625 meters above the Beipan River, this structure is the highest bridge in the world. It features an artificial water-curtain system that creates a massive, sky-high waterfall effect from the bridge deck.

Travel Time: The bridge reduces mountain travel time, connecting the mountainous regions of Liuzhi and Anlong.



How did the Romans build such straight roads?

The Romans have a reputation for building straight roads — but how did they do it?



The remarkably straight Stane Street in southern England was built by the Romans.
(Image credit: Tim Stocker Photography via Getty Images)

Ancient Roman transportation engineers built a vast network of roads that stretched across Europe, North Africa and parts of the Middle East. This complex road system was a key to travel and trade in the Roman Empire, and many of the centuries-old streets had a reputation for being extremely straight, although not all of them were.

For instance, Via Appia (Appian Way), which connected Rome to the port of Brundisium in southern Italy, was more than 300 miles (500 kilometers) long, and sizable parts of it were straight. Another Roman road, Stane Street in southern England, was built to connect London to Chichester. Much of the road, which stretches roughly 57 miles (92 km), is straight. The Middle East also had straight Roman roads, including a coastal avenue from Antioch, Turkey, to what is now Gaza.

A recent mapping project was able to map about 186,400 miles (300,000 km) of roads and more are probably undiscovered. But how did the Romans avoid unnecessary twists and turns to ensure straight streets? The answer may lie in three surveying instruments the Romans used.

Surveying roads

In some instances, the Romans built on top of older roads that existed before they conquered an area. Their "road network incorporated older roads from a broad range of different societies and polities," Marion Kruse, an associate professor of classics at the University of Cincinnati, told Live Science in an email.

But when the Romans built new roads, they used a few different tools to help plan them.

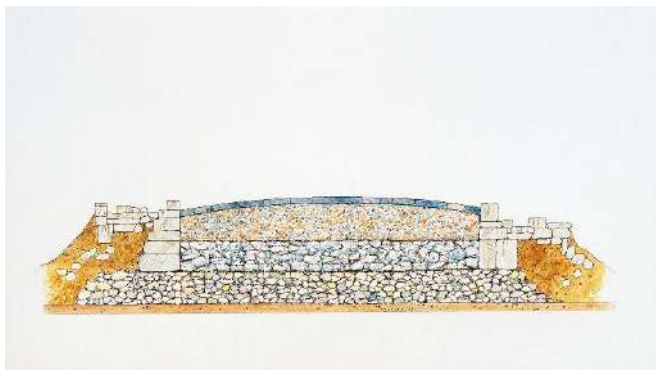
"Three instruments were used consistently by Roman road builders: the dioptra, the groma, and the chorobatus [or chorobates]," Adriana Panaite, a researcher at the Vasile Pârvan Institute of Archaeology in Romania who has studied Roman roads extensively, told Live Science in an email.

While the dioptra is known from ancient texts, no example of it has ever been found in an archaeological dig, according to M.J.T. Lewis, who was a historian at the University of Hull in the U.K. In his book "Surveying Instruments of Greece and Rome" (Cambridge University Press, 2001), Lewis noted that the design of the dioptra varied considerably. The different designs tended to include a stand and a disc-shaped base with a tube-shaped sighting instrument attached. An ancient surveyor could look through the tube and see a distant object without extraneous light interfering, allowing for a better view.

The chorobatus was used to measure horizontal planes. Around 20 feet (6 meters) long, the chorobatus was a beam of wood on legs and looked like a small table, Lewis wrote. It likely had small weights hanging from it to show that the

beam was level. No ancient example of the chorobatus has survived, and the exact design and way it was used are unclear. Ancient texts indicate that it acted as a builder's level that could help set up level points and determine elevations.

But the most important tool Roman surveyors used was the groma, [Joseph Lewis](#), an archaeologist at the University of Cambridge who has conducted extensive research on Roman roads, told Live Science in an email. The "groma was the principal tool of the mensor — the land surveyor — when planning long, straight alignments," he noted. "These alignments were then often used when constructing roads across gentle terrain."



A cross section of a Roman road.
(Image credit: DEA PICTURE LIBRARY via Getty Images)

The groma, also called a gruma or croma, consisted of a vertical pole with a horizontal X-shaped cross on top and four small weights hanging down from strings at the ends of the crossbeams, Lewis said. The groma was most useful for establishing right angles.

Multiple Roman surveyors could use the weights on their poles to ensure any road they were building was going in the right direction.

"A surveyor at one end will direct other surveyors to move their poles until they are in line with one another," Lewis explained. "Once the direction had been established, Roman surveyors observed the landscape and adjusted the course of a road to accommodate/avoid obstacles such as steep sections which would have posed difficulties for wheeled vehicles, locations to ford rivers, or to connect pre-existing settlements."

However, the techniques used to build roads throughout the Roman Empire probably varied somewhat, meaning experts "should be cautious about assuming that there was a single 'Roman' technique for road building," Kruse said. He noted that the Roman Empire covered a vast area and lasted for a long period of time.

"It seems safe to assume that practices varied across time and space," Kruse explained.

Not all roads were straight

One reason for the variation in Roman roads was likely the diversity of the laborers who built them. "In all likelihood, road-building work was done by a mix of soldiers, slaves — especially prisoners — and free locals called upon to help as part of a 'corvee' obligation imposed by their local community on Rome's instructions," Richard Talbert, a professor emeritus of history at the University of North Carolina at Chapel Hill, told Live Science in an email. But paid laborers were probably used for some skilled tasks, such as building bridges, Talbert said.

While Roman roads have a reputation for being precisely laid out and straight, not all of them were.

"It is commonly mentioned that Roman roads were exceptionally straight. This is partially true: The Romans had engineers and a large labor force that in some cases managed to modify the landscape to enable straight roads," Tom Brughmans, a classical archaeologist at Aarhus University in Denmark who is part of a team that helped create an updated map of the Roman road system, told Live Science in an email.

"We believe that the Romans preferred relatively straight roads in places where there was very little friction offered by the topography," such as flatland areas, Brughmans said. But in areas with more difficult terrain, such as mountainous regions, the roads would often not run straight.

Brughmans said he expects "future research will show that, in general, [Roman roads] are less straight than modern roads, given the need for motorized vehicles to avoid sharp turns when driving at speed."

(Owen Jarus / LIVESCIENCE, 27.06.2026,
<https://www.livescience.com/archaeology/romans/how-did-the-romans-build-such-straight-roads>)

ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ



Design Considerations for Bonded Micropile-to-Structure Connections

This report focuses on developing the basis for a design or verification method for bonded micropile-to-existing concrete footing connections using simple design steps. The

method allows designers to assess the available capacity of a proposed micropile-to-existing footing connection constructed by direct bonding of the micropile to the footing. This effort was funded through DFI's Committee Project Fund and endorsed by the joint DFI-ADSC Micropile Committee.

(DFI, Publication Date: 04/01/2026)

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ



**International Society for Soil Mechanics and
Geotechnical Engineering**

ISSMGE Bulletin

Vol 20, Issue 1, June 2026

www.issmge.org/publications/issmge-bulletin/vol-20-issue-1-june-2026



Κυκλοφόρησε το τεύχος Vol 20, Issue 1, June 2026 του ISSMGE Bulletin με τα ακόλουθα περιεχόμενα:

- **Message from the Editor:** Prof. Mona Badr, Editor-in-Chief, PI Committee Chairperson
- **From the President`s desk:**
Report #9 From January 2026 to May 2026 by the President
Summary of ISSMGE Term 2022-2026
- **Vice President Report:**
ISSMGE North America Region. Dr. Walter I. Paniagua. Report of activities 2022-2026
ISSMGE Europe Region. Prof. Lyesse Laloui. Our Journey Together: ISSMGE Europe, 2022-2026
ISSMGE Asia Region. Keh-Jian Shou. Asian Activity Report of ISSMGE of 2022-2026
ISSMGE South America and Caribbean Region. Andre P. Assis. ISSMGE Activities in South America and the Caribbeans 2022-2026
- **From the Board:**
The new Geo-Engineers without Borders Committee (GeoWB) Volunteer Missions in the Face of Geo-Disasters
ISSMGE HERITAGE TIME CAPSULE (HTC) PROJECT, 2020 – 2026. A Call to Action
- **ISSMGE Highlights**
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- **Corporate Associates Corner**
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TC306 GEO-ENGINEERING EDUCATION Geotechnical Engineering Education 2025 (GEE 2025)
TC308 ICEGT 2025: the 3rd International Conference on Energy Geotechnics in Paris
TC308 Mapping Energy Geotechnics Around the World
TC307 Meeting and Mini Workshop on Sustainability Practices for Smart Geotechnics Held at Geotech Asia 2025 • Goa, India • 9 October 2025
TC 304 and TC 309 TBM Motion Prediction Challenge
- **In Memory**
Prof. Dr. Carlos Quadros
- **Upcoming Events**
1st International Conference on Sustainability in Geotechnical Engineering (ICSGE 2027) Geodiversity & Resilience — 28 June to 1 July 2027 — LNEC, Lisbon, Portugal
International Conference on Advances and Innovations in Soft Soil Engineering 2026 Delft University of Technology, Delft, Netherlands, 24-26 August 2026



An official journal of the International Society for Soil Mechanics and Geotechnical Engineering

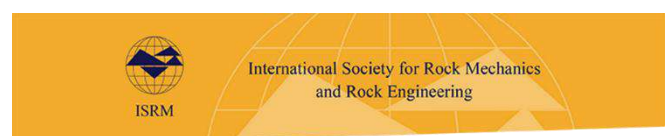
Volume 8, Issue 4

www.geocasehistoriesjournal.org/issues/volume-8

[Editorial](#)

[Pressure on Walls Retaining Swelling Soils: Numerical Simulations, Case Histories and Design Suggestions](#) Jean-Louis Briaud, Erick Cruz, Yichi Du, Marcelo Sanchez

[Deep Foundation Capacity in Intermediate Geomaterials: A Database Study](#) Jean-Louis Briaud, Ali Doostvandi



ISRM Newsletter No. 74 - Summer 2026

<https://isrm.net/newsletter/show/279>

Κυκλοφόρησε το Τεύχος Αρ. 74 – Καλοκαίρι 2026 του ISRM Newsletter με τα ακόλουθα περιεχόμενα:

- [2026 ISRM International Symposium, ARMS14 – Fukuoka, Japan, 22–27 November 2026](#)
- [54th ISRM Online Lecture by Anna Giacomini broadcast on 25 June 2026](#)
- [ISRM Regional Symposium EUROCK 2026 – Skopje, N. Macedonia, 15–19 September 2026](#)
- [10th Latin American Rock Mechanics Symposium \(LARMS 2026\) – Brasilia, Brazil, 26–28 August 2026](#)
- [ISRM2027, the 16th ISRM International Congress, Seoul, October 2027 – Call for abstracts now open](#)
- [Professor T. Ramamurthy passed away](#)
- [New ISRM Commission on Resilient and Sustainable Rock Engineering](#)
- [New "ISRM Suggested Method for Achieving Full Water Saturation of Rock" was published](#)
- [CouFrac 2026 – Uppsala, Sweden, 20–23 September 2026](#)
- [Slope Stability 2026, Slope for Safety Performance – Lima, Peru, 26–29 October 2026](#)
- [6th ICITG – Budapest, Hungary, 2–4 December 2026](#)
- [SPLIT 2026 – Geotechnical Engineering in Soft Rocks and Heterogeneous Rock Masses – Split, Croatia, 12–14 November 2026](#)
- [1st International Conference on Sustainability in Geotechnical Engineering \(ICSGE 2027\), Lisbon, Portugal, 28 June–1 July 2027](#)
- [The 6th "Short-term Predication of Rock Failure" Competition – Hong Kong, China, 7–10 August](#)
- [ISRM Rocha Medal 2028 – nominations to be received by 31 December 2026](#)
- [ISRM Sponsored Conferences](#)



June 2026

Helping the world understand the value and appropriate use of geosynthetics.

IGS News

Industry Professionals Come Together for Successful IGS Geosynthetic Reinforced Soil Structures Course



Congratulations to all participants who took part in the recent IGS Professional Development Course on Geosynthetic Reinforced Soil Structures held in Sao Paulo, Brazil. The course was a great success, bringing together industry professionals, academics, and practitioners for three days of technical learning, discussion, and knowledge sharing.

Read the full article [here](#).

Angelo Ricciuti Re-Elected as IGS Corporate Committee Chair



The IGS is pleased to announce the re-election of **Angelo Ricciuti** as Chair of the IGS Corporate Committee for the **2026–2030** term. Having successfully led the Committee during the previous term, Angelo will continue to strengthen engagement with Corporate Members, foster industry collaboration, and support the continued growth of the global geosynthetics community.

The IGS congratulates Angelo on his re-election and thanks all candidates and Corporate Members who participated in this year's election process. [Read the full announcement](#) to learn more about Angelo's vision for the next four years.

Maccaferri Wins Regional Case Study Competition



Congratulations to **Maccaferri** and presenter **Jayakrishnan Puthiya Veettil (Jay)** for winning the **2026 IGS Corporate Member Case Study Competition – Africa and Middle East Region**.

The team will now represent the region at the **13th International Conference on Geosynthetics (13ICG)** in Montreal, Canada. [Read the full article](#) to learn more.

The IGS at the 21st International Conference on Soil Mechanics and Geotechnical Engineering

The IGS team had a fantastic week at the ICSMGE in Vienna, connecting with members, industry professionals, researchers, and new faces from around the world.



A special thank you to everyone who visited the IGS stand—we enjoyed meeting you and sharing more about the Society, our initiatives, and upcoming activities.

Courses & Workshops:

Last Chance to Register for the 5th IGS TC-Reinforcement Workshop



Limited places remain for the 5th Workshop of IGS TC-Reinforcement (TC-R), in collaboration with ISSMGE TC-218, taking place **7–9 July 2026** in **Reggio Calabria, Italy**.

You can find out more information and **register for the workshop** [here](#).

Join the Next IGS Professional Development Course

Enhance your expertise with our next **in-person course** on **Sustainable Design with Geosynthetics - Roads, Railways & Airfields**. 📅 **22nd - 24th July**

Delivered by our IGS Romania Chapter, this three-day course will explore the use of geosynthetics in transportation infrastructure, covering key topics including design principles,

performance, construction practices, and real-world applications.



To register for this course or to find out more information, please email the organizer [here](#).

Machine Learning Course – 13ICG



Explore how artificial intelligence is shaping the future of geosynthetics at this hands-on course during the 13th International Conference on Geosynthetics. Designed for beginners, the session introduces practical tools and real-world applications of machine learning in geotechnical engineering.

IGS Young Members can attend for just \$50 — don't miss this opportunity to build new skills and stay ahead in the industry. More details on the course can be found [here](#).

IGS Diversity Committee Seminar - 13ICG



Join the IGS on **17th September at the 13ICG in Montreal** for our dedicated diversity session, led by the Diversity Committee, focusing on attracting and supporting talent across the geosynthetics and geotechnical sectors. Don't miss the opportunity to be part of this important conversation—and while you're there, come and meet the team to learn more about our work and connect with others across the industry.

For more information and to register, please visit the [13ICG website](#), or learn more about our diversity session [here](#). For info on other Diversity activities, follow the IGS Diversity group on LinkedIn [here](#).

Get Involved:

Help Shape a More Inclusive Future for Geosynthetics



The IGS Diversity Committee is working to build a more inclusive, representative, and welcoming global geosynthetics community through mentorship, professional development, and industry engagement.

To strengthen its impact, the Committee is seeking representatives from **every IGS Chapter** to help share ideas, support local initiatives, and ensure diverse perspectives are represented across our global network. If you're passionate about making a difference, we'd love to hear from you. [Read the full article](#) to learn more and discover how to get involved.



Geosynthetics International www.emerald.com/jgein/issue/33/3

Κυκλοφόρησε το τεύχος Volume 33, Issue 3, June, 2026 του Geosynthetics International της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

[Experimental studies on geogrid efficiency against moderate to highly expansive subgrades](#), S. Srivastava; U. Balunaini

[Performance of geosynthetic-encased stone column groups in soft clay: field tests and numerical study](#), N. Rahman; M. Rokonuzzaman; A. Rahman; T. Sakai

[Design of geomembrane specimen for biaxial tensile testing](#), H.-M. Wu; W.-S. Wang; Z. Zhang; F. Y. H. Fan; H.-H. Zheng

[Expanded polystyrene inclusion behind yielding wall: numerical study and cost analysis](#), D. Bishnoi; S. M. Dasaka

[In-situ evaluation of geosynthetic-reinforced pavement on variable subgrade conditions](#), L. Xiao; J. Xue; Y. Chen; C. Gallage; J. Zhong

[Experimental study on rubber-sand geobags for protecting buried pipes against rockfall](#), M. Kavandi; Gh. Tavakoli Mehrjardi

[Framework for designing optimized next-generation geogrids](#), C. Oner; J. D. Frost

[A testing framework for estimating the contribution of geogrid to base course performance](#), E. Akmaz; B. F. Tanyu; E. Guler; O. Detert

[Experimental and numerical study on flexural behaviour of geogrid-reinforced beams](#), M. A. Shokr; M. Mequid; S. Bhat; D. Malomo

[Plastic shakedown and creep limit of geocell-reinforced sand: experiments and modeling](#), S. Yang; J. Xie; X. Shen; L. Wang; Q. Li

[Sustainable and resilient reinforced soil structures: insights into interface mechanics](#), G. Cardile



Geotextiles and Geomembranes www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/54/issue/3

Κυκλοφόρησε το τεύχος Volume 54, Issue 3, June 2026 του Geotextiles and Geomembranes της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

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[View PDF](#)

1. Regular Articles

[Impact of installation damage on the MIF of multi-layered geogrid-reinforced granular and subgrade layers](#), Sireesh Saride, Shubham Jain, Vipul Arora, Pages 414-429

[Consolidation model for soft ground under airlift-assisted vacuum preloading](#), Xinbei Lin, Zhen Huang, Li Shi, Yu-anqiang Cai, Pages 430-442

[Erosion control performance of geomats on silty soil slopes under simulated rainfall](#), Rui Zhang, Xiwei Zhang, Kang Chen, Yipeng Guo, ... Huanhua Cai, Pages 443-459

[Finite-strain modelling of PVD-assisted consolidation in clayey soils using a novel elastic-viscoplastic model with de-structuration based on the equivalent time concept](#), Peng-Lin Li, Zhen-Yu Yin, Ze-Jian Chen, Jian-Hua Yin, Pages 460-481

[Energy analysis of geomembrane wrinkling caused by temperature rise](#), Hai Lin, Xinwen Chen, Xian He, Mengxi Huang, Pages 482-497

[Influence of geosynthetic encasement on liquefaction-induced deformations of stone column supported embankments](#), Mingchang Ji, Fuxiu Li, Zhijian Qiu, Haizuo Zhou, Yewei Zheng, Pages 498-516

[Evaluating tack coat compatibility and performance of geogrid reinforced asphalt mixtures](#), Lek haz Devulapalli, Sreelakshmi Sajikumar, Suraj Vedpathak, T.V. Sreekumar, Pages 517-530

[Reliability analysis for the progressive failure ultimate limit state design in geosynthetic-reinforced rigid pile-supported embankments](#), Xiaoxuan Yu, Gang Zheng, Haizuo Zhou, Gaolin Xie, Jiapeng Zhao, Pages 531-548

[In situ performance of wicking geotextile in seasonally frozen railway embankment](#), Hongguang Jiang, Pengju Tang, Taifeng Li, Shun Liu, ... Zhanyong Yao, Pages 549-559

2. Technical Note(s)

[Influence of chemical enhancer injection timings on electrokinetic geosynthetics-assisted vacuum preloading combined with electroosmosis for dredged sediments dewatering and heavy metal removal](#), Yang Shen, Ligao Zheng, Wencheng Qi, Chang Liu, Jianting Feng, Pages 403-413

ΕΚΤΕΛΕΣΤΙΚΗ ΕΠΙΤΡΟΠΗ ΕΕΕΕΓΜ (2023 – 2026)

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