



ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

# Τα Νέα της Ε Ε Ε Ε Γ Μ

170

Αρ. 170 – ΔΕΚΕΜΒΡΙΟΣ 2022



ISSN: 2732-7248

ΟΡΓΑΝΩΣΗ:  
ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

**90**  
**ΠΑΝΕΛΛΗΝΙΟ  
ΣΥΝΕΔΡΙΟ  
ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ**

Συνεδριακό Κέντρο  
του Πανεπιστημίου  
Δυτικής Αττικής στην  
Πανεπιστημιούπολη  
Αρχαίου Ελαιώνα  
**Αιγάλεω, Αθήνα**

**4-6 Οκτωβρίου 2023** [www.9hcge2023.gr](http://www.9hcge2023.gr)

ERASMUS  
Conferences & Events

## Π Ε Ρ Ι Ε Χ Ο Μ Ε Ν Α

9ο Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής	3
Άρθρα	4
- Sustainability and Geotechnics	4
- Energy Foundations - An Answer to Delivering Efficient Electrification and Low Carbon Buildings	6
- Landslide risk remains years after even a weak earthquake	8
- Are Drones the Future of Dam Safety?	9
- Best practice guidelines released for use of engineering geological models	12
Νέα από τις Ελληνικές και Διεθνείς Γεωτεχνικές Ενώσεις	13
- 2 <sup>η</sup> Διαδικτυακή Ημερίδα του ΓΡΑΔΙΜ του Πολυτεχνείου Κρήτης: Εναρκτήρια ομιλία "Η «τυρόπιτα» της εκπαίδευσης: (Διαγνωστικές) ερωτήσεις κατανόησης"	13
- International Society for Soil Mechanics and Geotechnical Engineering	13
ISSMGE News & Information Circular October 2021	13
ISSMGE Interactive Technical Talk Episode 3: Energy Geostuctures & Storage of Thermal Energy in the Ground (TC308)	14
1st Scott Sloan Lecture	15
TC219 1ST Webinar on Resilience Evaluation in Geotechnical Engineering	15
ISSMGE Interactive Technical Talk Episode 4: Environmental Geotechnics (TC215)	15
Second Generation of Eurocode 7 - Basis of Design and how the influence of Groundwater is incorporated in the new code	15
- International Society for Rock Mechanics and Rock Engineering	15
News	15
40th ISRM online Lecture by Dr. José Delgado Rodrigues on 15 December	15
- International Tunnelling Association	16
Scooped by ITA-AITES #81, 6 December 2022	16
Scooped by ITA-AITES #82, 20 December 2022	16
- British Tunnelling Society	17
Thames Tideway Tunnel Update – 2022	17
- International Geosynthetics Society	16
Holiday Message From The IGS President	16
- Διακρίσεις Ελλήνων Γεωτεχνικών Μηχανικών	19
Sera Lazaridou is the new president of EuroClub of ICOLD International Commission on Large Dam	19
Εκλογή του κ. Γ. Δούλκα ως Προέδρου της Ομάδας Νέων της British Tunnelling Society BTS-YG (Νοέμβριος 2022)	19
Προσεχείς Γεωτεχνικές Εκδηλώσεις:	20
- 3 <sup>rd</sup> ISRM European Rock Mechanics Debate (Eurock Debate 3) Different approaches for tunnelling: empirical, observational, modelling	20
- 2 <sup>nd</sup> International Workshop on Complex Formations	20
- NGS2023 10 <sup>th</sup> Nordic Grouting Symposium	21
- ATC 2023 - 18th Australasian Tunnelling Conference Trends and Transitions in Tunnelling	22

- 1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development - an ISRM Specialized Conference	23
Ενδιαφέροντα Γεωτεχνικά Νέα	26
- Numerical simulations of water waves generated by subaerial granular and solid-block landslides: Validation, comparison, and predictive equations	26
- Save The Hills: raising awareness on impact of landslides on rural communities	26
- Palos Verdes Estates: a coastal cliff landslide captured on video	27
Ενδιαφέροντα - Γεωλογία	29
- Ο Άρης παραμένει γεωλογικά ιδιαίτερα ενεργός	29
Geophysical evidence for an active mantle plume underneath Elysium Planitia on Mars	29
Ενδιαφέροντα - Περιβάλλον	30
- Το Αδριάνειο Υδραγωγείο θα προσφέρει και πάλι το νερό του στον δήμο Χαλανδρίου, μετά από 19 αιώνες	30
- How much does a cloud weigh?	31
- Stunning 'ice pancakes' swirl on the surface of Scottish river	31
- The 'Sleeping Giant Of Energy Storage' Is Waking Up	32
Ενδιαφέροντα - Λοιπά	34
- Brachistochrone curve. Fastest route	34
Νέες Εκδόσεις στις Γεωτεχνικές Επιστήμες	35
Ηλεκτρονικά Περιοδικά	38



Bridge Load Tests!

## 9ο Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής

Η Ελληνική Επιστημονική Εταιρεία Εδαφομηχανικής και Γεωτεχνικής Μηχανικής (Ε.Ε.Ε.Γ.Μ.) διοργανώνει το 9ο Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής μεταξύ 4 και 6 Οκτωβρίου 2023 στο Συνεδριακό Κέντρο του Πανεπιστημίου Δυτικής Αττικής στην Πανεπιστημιούπολη Αρχαίου Ελαιώνα στην Αθήνα. Κατά τη διάρκεια του συνεδρίου θα γίνουν παράλληλα δύο συνεδρίες και θα διεξαχθεί και τεχνική έκθεση.

Στόχος του συνεδρίου πάντα είναι να καταγράψει τις προόδους της γεωτεχνικής μηχανικής στην Ελλάδα και στην Κύπρο, όπως αντικατοπτρίζονται στα σημαντικά γεωτεχνικά έργα που έχουν μελετηθεί και κατασκευαστεί, καθώς και στα αποτελέσματα της ερευνητικής δραστηριότητας των Πολυτεχνείων και Πολυτεχνικών Σχολών της Ελλάδας και της Κύπρου. Επιδίωξη είναι οι εργασίες του συνεδρίου να αναδεικνύουν πρωτότυπα στοιχεία συμβολής της γεωτεχνικής μηχανικής στα τεχνικά έργα αλλά και να προβάλλουν θεωρητικές και πειραματικές έρευνες σε εδαφικά, βραχώδη και ημιβραχώδη υλικά που έχουν βρει ή μπορούν να βρουν εφαρμογή στην πράξη.

Πρόσθετα όμως, το χρονικό διάστημα από το προηγούμενο Πανελλήνιο Συνέδριο είδαμε πολύ μεγάλη αύξηση των μελετώμενων και κατασκευαζόμενων τεχνικών έργων στη χώρα με σημαντική συνεισφορά της γεωτεχνικής μηχανικής και των γεωτεχνικών μηχανικών στον σχεδιασμό τους και την επιτυχή ολοκλήρωσή τους. Η αύξηση αυτή μεταφράστηκε σε σημαντική ζήτηση για γεωτεχνικούς μηχανικούς δίνοντας μια νέα προοπτική στο επάγγελμά μας, την οποία αναμένουμε να δούμε να γίνεται αυξημένο ενδιαφέρον των φοιτητών για εξειδίκευση στη γεωτεχνική μηχανική στα Πολυτεχνεία και στις Πολυτεχνικές Σχολές και αντίστοιχη αύξηση της ήδη μεγάλης ερευνητικής δραστηριότητας στο αντικείμενο.

Σε αυτό το πλαίσιο, το 9ο Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής φιλοδοξεί να αποτελέσει το σημείο συνάντησης των γεωτεχνικών μηχανικών της χώρας και τη μεγαλύτερη εκδήλωση προβολής της επαγγελματικής και ερευνητικής δραστηριότητας στο αντικείμενο της γεωτεχνικής μηχανικής, μέσω της καταγραφής της εμπειρίας από αυτήν την αυξημένη δραστηριότητα των τελευταίων ετών και της διατύπωσης των αναγκών του αντικειμένου μας για το μέλλον.

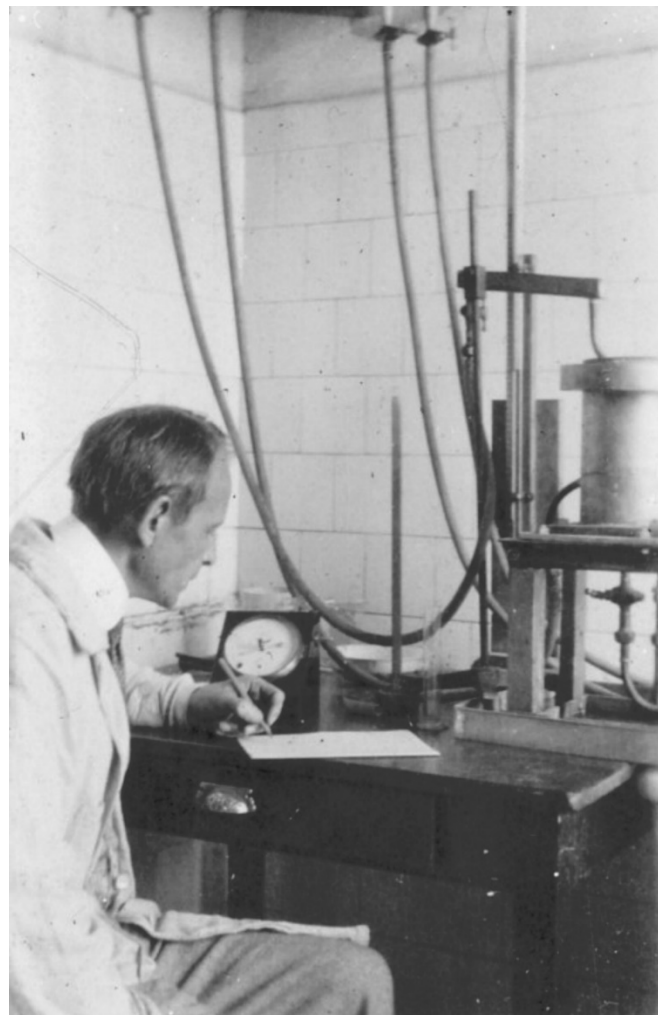
### Οι θεματικές ενότητες του συνεδρίου θα είναι:

- Συμπεριφορά Εδαφών: Έρευνες Υπαίθρου και Εργαστηρίου
- Συμπεριφορά Εδαφών: Προσομοιώματα
- Επιφανειακές και Βαθείς Θεμελιώσεις
- Αλληλεπίδραση εδάφους-κατασκευής
- Βαθείς εκσκαφές-Αντιστηρίξεις
- Πρανή-Κατολισθήσεις
- Σήραγγες και Υπόγεια Έργα
- Βραχομηχανική
- Βελτιώσεις εδαφών
- Φράγματα – Άοπλα επιχώματα
- Οπλισμένα επιχώματα
- Εφαρμογές γεωσυνθετικών υλικών

- Γεωτεχνική μηχανική και σχεδιασμός οδοστρωμάτων
- Ευρωκώδικες
- Εδαφοδυναμική – Τεχνική Σεισμολογία
- Υποσκαφές και άλλες πλημμυρικές επιπτώσεις
- Μη κορεσμένα εδάφη
- Αβεβαιότητα, αξιοπιστία, και διακινδύνευση στη γεωτεχνική
- Περιβαλλοντική γεωτεχνική
- Ενεργειακή γεωτεχνική
- Θέματα γεωτεχνικής μηχανικής στην Κύπρο
- Πολιτιστική κληρονομιά και γεωτεχνική μηχανική
- Διδασκαλία και μάθηση γεωτεχνικής μηχανικής

### Γραμματεία Συνεδρίου

Erasmus Conferences & Events S.A.  
+30 210 7414700 | +30 210 7257532  
[info@9hcqe2023.gr](mailto:info@9hcqe2023.gr) | [www.erasmus.gr](http://www.erasmus.gr)



Karl Terzaghi himself in this undated photo that appeared in a 2008 issue of the Journal of Geotechnical and Geoenvironmental Engineering. Article here: <https://ascelibrary.org/doi/abs/10.106>

## Sustainability and Geotechnics

Melissa Beauregard and Karsten Beckhaus

It is critical in the world today that our engineering solutions are developed with consideration for economic, social and environmental impacts. As a society, we can no longer afford to continue quickly depleting our finite resources. As an industry, we cannot sustain if we continue implementing design and construction practices that negatively affect our ability to continue growing our industry for future generations.

Having become a buzzword of sorts in recent years, sustainability is often associated with the environmental impact of a product or process. While environmental considerations are important, this can be a problematic view since it may give the impression that economic or social considerations are secondary. A truly sustainable solution would meet the demands of all three, commonly referred together as the Triple Bottom Line (TBL). The TBL framework is important because it states clearly what we already know to be true: a solution that is great for the environment but is not economically viable is not a solution. Similarly, a solution that is economically viable but causes irreparable harm to the local community and or environment is also not a solution.

### Sustainable Development Goals

Another convenient framework useful to approach sustainable design is the United Nations' 17 Sustainable Development Goals (SDGs). The goals were developed as a 2030 target for sustainable growth and include targets, indicators and annual reports on progress for each of the goals (<https://sdgs.un.org/goals>). A feature of the SDGs is that they highlight the interdependency of each element in the TBL, with many goals requiring economic and social growth while maintaining a healthy environment.

Not all 17 SDGs are directly or indirectly related to geotechnical engineering. For example, Goal 16 - Peace, Justice and Strong Institutions could be difficult to implement in foundation design at any step in the process. However, there are some SDGs that are a natural fit for our industry. We've identified three particular goals and their associated tasks that are directly related to geotechnical engineering, along with a description of potential actionable items for the geotechnical and foundation industries. Consideration of these goals could help us develop standards, products and processes that better serve our industry and communities, and efforts can begin in planning stages and scale down to even on-site procedures.

### Quantifying Sustainability

While taking steps towards sustainability is important, it is equally important to have a method for quantifying the efficacy of those efforts. Existing methods have been developed and are often referred to as green rating systems. One such system that is widely known and largely applicable to architectural design elements is the LEED system, though a more recent system called Envision was developed to cover a more varied range of projects. One benefit of the Envision system is that, even if no specific rating is achieved, the overall program can be used as a project management tool to incorporate sustainable thinking in each step of project development and execution. Additionally, points can be

earned in the Envision systems for activities related to community involvement and outreach, so both environmental and social sustainability of a project are considered.

Steps taken toward reducing environmental impact may also have a natural positive affect on economic costs. Reducing energy usage on a project would reduce the environmental impact and may also reduce the overall project cost. Like-wise, reducing material quantities is a win for both profit and planet. As an example, soil mixing may be a more favorable solution compared with replacing soil with concrete for some projects and ground conditions. Instead of replacing the soil with concrete (aggregate, cement, water) only the necessary cement is added. Transporting soil and material on/off site is minimized or may be omitted completely. Both positive effects on costs and greenhouse gas emissions can be calculated reliably.

### Selected Sustainable Development Goals and how they may relate to the geotechnical and foundation industries

	<b>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</b> <ul style="list-style-type: none"> <li>• Job creation</li> <li>• Grow skilled labor force</li> </ul>
	<b>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</b> <ul style="list-style-type: none"> <li>• New building materials</li> <li>• Design and build for changing climate conditions</li> </ul>
	<b>Take urgent action to combat climate change and its impacts</b> <ul style="list-style-type: none"> <li>• Implement carbon calculator tools</li> <li>• Reduce carbon and other greenhouse gas emissions with innovative design and construction practices</li> </ul>

### Current Trends and Tools

Efforts to develop more sustainable options in foundation engineering grow year after year. Reducing material usage and reducing greenhouse gas emissions are two important efforts that could be implemented on a project today. Particularly, efficient construction methods or precise quality-control systems to reduce geometric margins can contribute greatly to the sustainability of a project.

One way to reduce material usage is to reuse existing foundations. This of course creates new engineering problems to solve, such as how to quantify engineering properties with limited project information and how to incorporate risk and uncertainty into those calculations. New practices for logging and sharing relevant site data are the basis for continued growth in reusing foundations, as well as new technical solutions to determine reliable in-site foundation and soil conditions.

***As an industry, we cannot sustain if we continue implementing design and construction practices that negatively affect our ability to continue growing our industry for future generations.***

As outlined above, for targeting reduced greenhouse gas emissions, we must first understand the cost of current practices and procedures. One tool that can be used is a carbon calculator. The European Federation of Foundation Contractors (EFFC) teamed with DFI to develop this tool, which can be downloaded and used to compare competing internal design options or even external proposals.

## Conclusion

To achieve a more sustainable future for foundation engineering, we must understand the economic, social and environmental impacts of our design choices. We must consider not only the geotechnical design of our systems, but also the way we approach a project from start to finish. While we wait for development of new systems and procedures, we must also look at current practice to make decisions today that better prepare us for the future.

Cooperation based on partnership also affects sustainability. If the persons involved in construction succeed in working together more effectively and unobstructed, then it is also possible to construct a sustainable structure, e.g., with a much smaller carbon footprint.

*Karsten Beckhaus is a civil engineer with a Ph.D. from the Technical University in Munich. At Bauer, Beckhaus is a member of the management board and head of the business services division, assisting projects worldwide in specialist technical consulting, design, logistics and equipment tasks.*

*Melissa Beauregard works as a professional geotechnical engineer and has research and design experience with traditional and sustainable geotechnical systems. She currently works at Exponent in Denver as a senior engineer where she provides technical analysis in support of civil litigation.*

DEEP FOUNDATIONS • NOV/DEC 2022, pp. 113-114

<https://www.nxtbook.com/dfi/DEEP-FOUNDATIONS/november-december-2022/index.php#/p/113>

## Energy Foundations - An Answer to Delivering Efficient Electrification and Low Carbon Buildings

Tony Amis



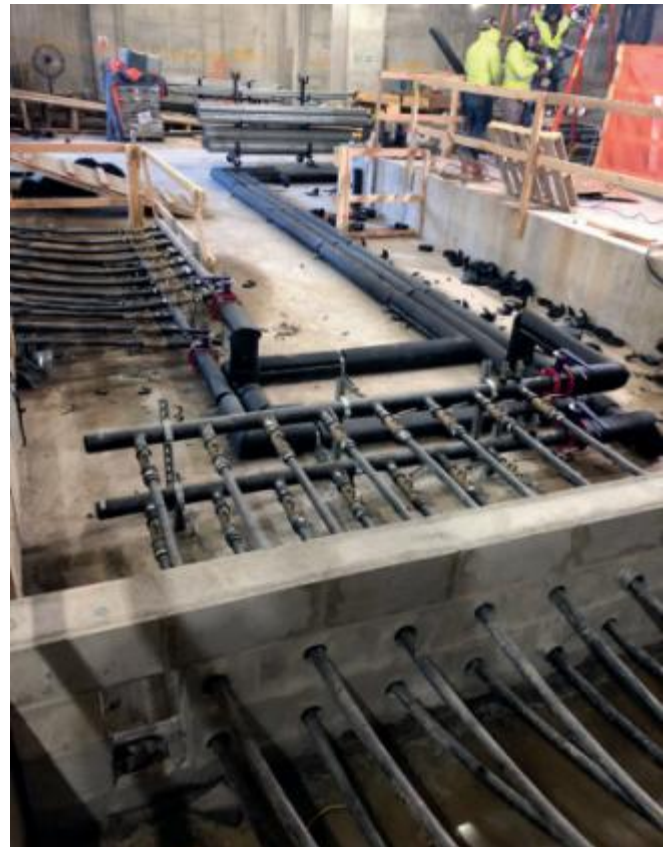
Geothermal loop installation in a pile

We are constantly being bombarded with news that cities around the world are breaking records for hottest temperatures, alongside terrifying reports of millions of acres of wild-fires, flooding and other extreme weather events. In September, the *New York Times* reported that "The State of California set a record for electricity demand, driven by the use of air-conditioning, and Sacramento hit a new high of 116°F [46°C]."

A 2018 International Energy Agency (IEA) report titled "The Future of Cooling: Opportunities for energy efficient air conditioning" advised that the world faces a looming "cold crunch." Air conditioners and electric fans account for nearly 20% of the total electricity used in buildings around the world today. This trend is set to continue as the world's economic and demographic growth becomes more focused in hotter countries. As incomes and standards of living increase, more people will naturally want to buy and use air conditioners to keep cool. Wider access to cooling is necessary, bringing benefits to human development, health, well-being and economic productivity. But it will have a significant impact on countries' overall energy demand, putting pressure on electricity grids and driving up local and global emissions. The report goes on to say that "energy demand from air conditioners will more than triple by 2050, equal to China's electricity demand today" and the "answer lies first and foremost in improving the efficiency of air conditioners, which can quickly slow down the growth in cooling-related electricity demand."

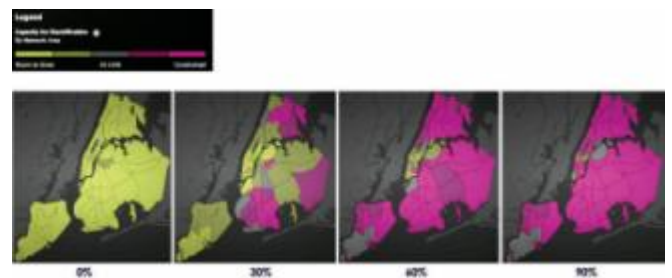
There are multiple project feasibilities underway across the state of New York, funded by the New York State Energy Research and Development Agency (NYSERDA) as part of the state's initiative for achieving its carbon reduction goals, specifically the use of district energy solutions for heating and cooling (PON4614). The developer's primary focus is to deliver minimum code compliant buildings at the lowest capital expenditure cost, rather than longer term operating expense costs when considering heating and cooling options. While ticking the electrification box, opting for the cheapest solution does not provide the most energy efficient option, especially during the coldest and hottest times of the year (peak periods). The go-to solution for heating and cooling multi family housing is seen as variable refrigerant flow system/ package terminal heat pumps with electric boilers for providing domestic hot water. Several

large-scale feasibility studies done by Endurant have shown that electrical usage drops between 44-50% when using a hybrid ground sourced heat pump solution compared to these current solutions.



A completed basement with geo loops

The growing worldwide movement towards electrification is an essential piece of the strategy to meet global carbon reduction goals; however, that transition itself creates its own complications (as seen in the recent example of California). The Urban Green Council, a New York-based nonprofit, has a grid mapping tool that highlights these wider issues. This is clearly demonstrated in New York City, for example, where the growing concern is that as more buildings become electrified, connectivity during peak periods will increasingly lead to blackouts.

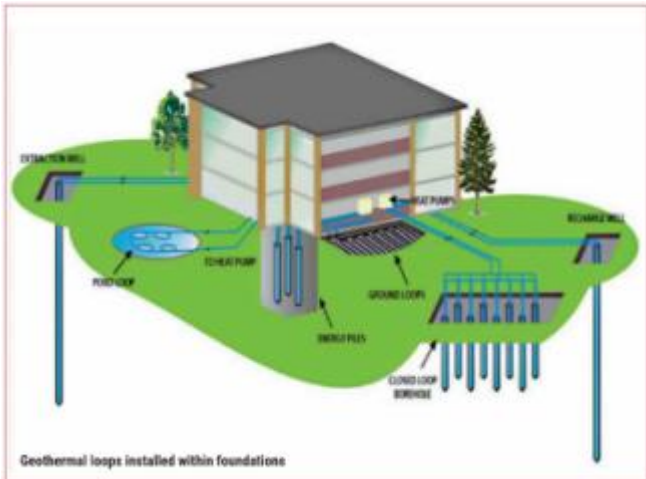


The Urban Green Council's Grid Ready Mapping Tool

Foundation contractors can help aid electrification as well as address peak connectivity issues. By utilizing geothermal loops installed within building foundations, connected to a ground sourced heat pump to deliver a heating and cooling solution to the very building they support, these systems can play an essential part in mitigating electrical demand while delivering a low carbon solution.

Delivering heating and cooling using ground sourced heat pumps has been around a long time. Traditionally they have

utilized geothermal loops installed within expensive purpose made boreholes drilled to 500 ft (150 m) or laid horizontally and located in areas surrounding the site that effectively sterilizes the site from being used for future buildings. Geothermal loops can also be installed in lakes, rivers and even in the very foundations that support a building. The latter solution provides multiple benefits. It not only makes for a lower install cost but also provides an important additional use for the foundations. Also, an energy foundation solution provides a very valuable long-term energy source that helps deliver a low to zero carbon solution and one that does not impact possible future building expansion in the way a borehole solution might.



Ground sourced heat pumps connected to geothermal loops make use of the ground's natural stable annual temperature, treating the ground like a "thermal battery." In winter, water circulating through geothermal loops is warmed from the surrounding ground and then passed through a refrigeration process that converts this low temperature to adequately meet heating and hot water needs. In the summer the system is reversed, and heat is removed from the building and transferred back into the ground, thereby providing cooling to the building and effectively recharging the ground with heat extracted in the winter. A well-designed system should adequately deliver one of the most energy efficient heating and cooling solutions year-round without affecting the long-term ground temperature and most certainly for the life of the building and beyond. Geothermal loops have a life expectancy of more than 100 years.



Modular rooftop heat pumps connected to energy foundations

A recently completed 14- floor commercial building project in lower Manhattan utilized all 63, 24-32 ft (7-10 m) diameter 120 ft (37 m) deep foundations without impacting the construction schedule. When operational in 2023, this system will deliver up to 40% of the building's heating and cooling needs. The ground sourced heat pump system combined with an air source heat pump (known as a hybrid solution), will have the ability to deliver one of the most energy efficient all electric heating and cooling solutions possible, utilizing the least amount of electricity and lowest CO<sub>2</sub> emissions.

There are many successful energy foundation projects reported around the world, especially in the U.K., Europe and the U.S., which have been installed within schools, universities, commercial buildings, hospitals and railway stations.



Installation work

Foundation contractors around the world not only need to be ready for delivering this type of solution, but more importantly should question any developer who does not utilize their building foundations in this way. It is a "no brainer." A simple, permanent energy source that has extremely low first costs and can also be installed with little or no construction schedule impact compared to all other geothermal solutions-a foundation project with no geothermal loops should be regarded as an opportunity missed.

*Tony Amis is the senior vice president for Endurant Energy (formerly GI Energy) and has more than 35 years of experience working in construction. This includes managing large foundation and civil engineering projects in the U.K., Hong Kong and Singapore, and more recently in delivering renewable energy solutions in the U.K. and U.S.*

DEEP FOUNDATIONS • NOV/DEC 2022, pp. 81-84

<https://www.nxtbook.com/dfi/DEEP-FOUNDATIONS/november-december-2022/index.php#/p/81>

## Landslide risk remains years after even a weak earthquake

### Summary

Satellite observations have revealed that weak seismic ground shaking can trigger powerful landslide acceleration - even several years after a significant earthquake.

### Full Story

Satellite observations have revealed that weak seismic ground shaking can trigger powerful landslide acceleration - even several years after a significant earthquake.

These observations help paint a comprehensive picture of landslide behaviour triggered by seismic activity and provide the tools for real-time monitoring to support rapid rescue operations.

Landslides, a natural geological hazard worldwide, cause serious human and economic losses every year. Between 1998-2017, landslides affected an estimated 4.8 million people worldwide and cause more than 18,000 deaths (estimates from WHO). Landslides can be triggered by earthquakes, volcanoes, rainfall or human activity and the recent landslide that tore across the Italian island of Ischia is an example of a landslide triggered by rainfall.

Published in the journal *Nature Communications*, the study focussed on earthquake-accelerated landslides (EALs). These types of landslides are affected by the long-term seismic effects and may maintain accelerated motion for a long time after the earthquake. EALs cause particularly serious human casualties, especially in seismically active areas.

The research was led by Professor Zhenhong Li, presently at Chang'an University (China), and Professor Utili at Newcastle University. They also worked with Professors Giovanni Crosta and Paolo Frattini at the University of Milan-Bicocca, Italy.

The scientists used satellite radar observations to detect and investigate the activation and recovery of EALs in Central Italy. Their work has led to the first ever complete EAL inventory, which has the potential to inform long-term landslide risk assessment in seismically active areas.

Professor Stefano Utili, Professor of Geotechnical Engineering at Newcastle University's School of Engineering, said: "This work is of great significance for long-term landslide risk assessment in areas where we see seismic activity. People tend to think landslides triggered by earthquakes only occur during or immediately after an earthquake, but unfortunately an awful lot of them happen several years after the seismic event in areas previously thought safe so it is not easy to make predictions. This study showcases a cost-effective and efficient methodology based on satellite imagery to identify and assess the risk posed by ground movements becoming catastrophic landslides following an earthquake in the long term. The next steps will be for civil authorities to adopt the methods."

Co-author Professor Jianbing Peng, Member of Chinese Academy of Sciences (CAS), said: "This study contributes to a comprehensive understanding of the risk of earthquake-induced landslides, including coseismic landslide failures and post-earthquake landslide dynamics, and it is of great significance for the long-term assessment and management of landslide hazards in seismically active areas."

### Journal Reference

1. Chuang Song, Chen Yu, Zhenhong Li, Stefano Utili, Paolo Frattini, Giovanni Crosta, Jianbing Peng. **Triggering and recovery of earthquake accelerated landslides in Central Italy revealed by satellite radar observations.** *Nature Communications*, 2022; 13 (1) DOI: [10.1038/s41467-022-35035-5](https://doi.org/10.1038/s41467-022-35035-5)

(Newcastle University / SCIENCE DAILY, November 30, 2022, <https://www.sciencedaily.com/releases/2022/11/221130135723.htm>)

## Are Drones the Future of Dam Safety?

**Anthony Laurita, Program Manager, National Hydropower Association**

The United States has over 94,000 dams with an average life-span of more than 53 years. These dams provide storage for water and irrigation, flood control, opportunities for recreation, improve water quality, and in instances where the dams are equipped with hydropower generation equipment, provide renewable, carbon free electricity.

Every dam has a different age, size, engineering complexities, and hazard potential. Due to the unique design of each dam, the challenges posed by climate change have exacerbated dangerous conditions. With altered rainfall patterns and extreme weather events becoming more commonplace, dams are increasingly stressed by flooding events, which can threaten spillways and cause structural failures; conversely, the effects of drought, which lower water levels, create unsustainable conditions for electricity generation.

To better understand the complexities of dam operation and evaluate the factors threatening a dam's integrity, risk assessments are conducted by engineers and owners/operators. Each dam is classified by its level of hazardous impact (low, significant, high), which correlates directly to the danger it would pose to human life if a breach were to occur. These detailed dam safety inspections are laborious, time-consuming affairs, and they can also pose safety risks to the personnel conducting the assessments due to the potentially dangerous environments (dam embankments, below water-line areas, and inside of pipes) where the inspections occur.



Engineers consult plans during a dam safety inspection.

There are multiple kinds of inspections, ranging from frequent and informal observations to detailed reviews. Dams should have an in-depth technical inspection every five years, standardized inspections after earthquakes or other natural disasters, and a yearly detailed inspection from the owner of the dam. Further inspections may also be required depending on each specific state. For example, Massachusetts dam owners are required to hire a qualified engineer to inspect dam facilities for high hazard potential every two years, conduct a significant hazard inspection every five years, and a low hazard potential inspection every ten years.

Fortunately, the benefits of modern innovation are such that once perilous tasks for humans have been reworked to utilize drones and other technology, enabling faster, safer, and more affordable solutions for owners conducting dam safety assessments – whether from the air or underwater.

By developing a deeper understanding of the range of drone-based solutions available to inspectors, owners

and operators can better identify solutions to fit the unique nature of projects.



An SCE engineer practices piloting an unmanned aerial vehicle (UAV).

### THE APPLICATION OF AERIAL DRONES IN DAM SAFETY INSPECTION

While unmanned aerial vehicles (UAV) technology has existed in various iterations since the 1800's – largely in the form of weapons of war (incendiary balloons, aerial torpedoes) – the first commercial drone applications began in 2006, which is when the Federal Aviation Administration issued its first drone permit. The technology was initially relegated to disaster relief, border surveillance, and pipeline inspections.



Photograph from drone flight during a pipeline inspection.

Fast forward to 2021, the Federal Aviation Administration reported there are nearly 900,000 drones registered in the United States and more than half of that number are for recreational use. The drone market is valued at around \$10 billion, and as the technology becomes increasingly affordable, drones are expected to fill multi-faceted roles – crop fertilization, traffic monitoring, deliveries, and surveyance of hard-to-reach areas.

With the rise of varied drone applications, dam owners and operators have taken notice. The Tennessee Valley Authority (TVA) runs a team called the TVA Unmanned Aircraft Systems (UAS), and they partnered with teams from dam safety, facilities management, and GP&FS environmental support to test the applicability of drone-based herbicide

applications in a bid to control vegetation growth on embankment dams.

Matt Huebner, the senior geologist for the dam safety team, spoke about the important work the drones perform, "Vegetation control at embankment dams is crucial, as the root systems of trees and heavy brush on and near embankment dams can create potentially hazardous dam safety issues."

Prior to the drone program, TVA employed personnel to equip heavy backpack sprayers to walk the dam's face, spraying herbicide to remove vegetation. Due to the inherent dangers posed to humans by the coarse riprap and rockfill on the embankments, stinging insects, venomous snakes, and loose rocks, the facilities personnel took several days to complete the work.

While TVA had completed hand removal of the vegetation in early FY22, the vegetation control requires periodic herbicide spray to control regrowth and prevent larger vegetation from posing a threat to operations. By utilizing the drone-based herbicide application, the pilot program was able to cover 35 acres in four days.



A TVA employee flies a drone as part of the vegetation control program.

Reflecting on the program's success, Huebner said, "In addition to alleviating the obvious dam safety concerns, drone-based herbicide application is efficient, cost effective, and will reduce risk to personnel safety. We're already thinking of where we can go next."

Beyond vegetation control, unmanned aerial vehicle drones have seen widespread utilization across the hydropower industry, largely in the form of infrastructure assessments, as the drones can be equipped with a host of sensors, cameras, acoustical equipment, infrared lenses, and the ability to physically interact with dams. The low-cost, low-skill, and immediate deployment benefits of drones have proven invaluable to an industry accustomed to relying on human operators to place themselves in potentially dangerous scenarios. Simply put, unmanned aerial vehicles represent a safer, faster, and more affordable alternative to traditional dam safety inspections.

The Diablo Dam, owned and operated by Seattle City Light, located in the North Cascade mountains of Washington state, is a 389-foot dam which provides electricity to Seattle. Taking advantage of modern drone technology, Seattle City Light augmented traditional dam safety inspections with drone surveys.

To further illustrate the effectiveness of the drone surveys, a two-hour flight collected more than 80 million data points from the arch dam, spillways, and rock abutments. Using

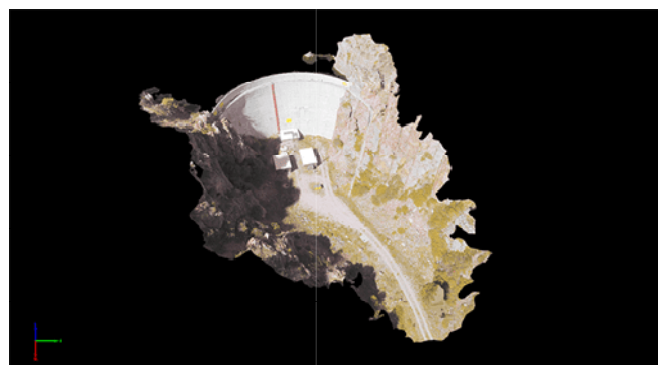
this information, a 3-D model was created to depict the drones' analysis. In addition, the drone took high-definition photographs, which documented the dam's condition to provide a baseline for future observations. The data collected by the drone formed the basis of a high-resolution virtual model of the dam, which has been used to identify potential surficial cracks. When paired with artificial intelligence and machine learning programs, the drone collected data is being utilized to 'teach' future incarnations the skill of reliably identifying concrete deterioration.



A drone operator surveys a spillway, drone in hand.

Dam owners and operators interested in applying drone technology to dam safety assessments should consider the below workflow, which lays out how to best take advantage of the drone's strengths. The following steps allow companies to create high resolution models and images of dams, as well as analyze data points to accurately define potential problems and work on solutions for safety checks.

1. Data collection
2. Data pre-processing that entails 3D modeling and orthographic projections
3. Data processing where models are checked for defects
4. Quality checks that allow for combing of false positives and negatives as well as a quality check on the resolution of 3D mapping
5. Upload and analytics that provide visualizations of all layers.



3-D generated model of a dam created from drone collected data.

#### **UNDERWATER REMOTE OPERATED VEHICLES AS PROBLEM SOLVERS**

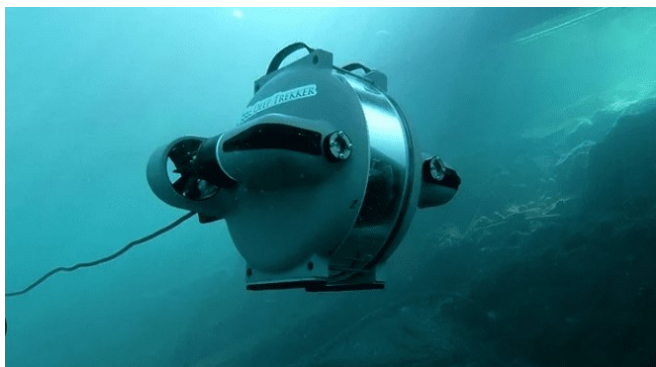
With the rise of drone technology, the hydropower industry has celebrated the utility of remote operated vehicles

(ROVs), which are user-controlled machines designed to operate underwater. While numerous models exist, most of the remote operated vehicles used in hydropower environments have internal and rechargeable power supplies, tilting cameras, ports for external attachments (grippers, sonar, lights, navigation equipment, and sensors), and can be operated with smartphone displays.

To better understand how remote operated vehicles are serving the needs of the hydro industry, Clark Public Utilities (CPU), a publicly owned utility in Vancouver, Washington, serves as an excellent example.

Clark Public Utilities operates 35 reservoirs, with the largest reservoir containing over 3 million gallons of water. Due to routine safety and maintenance inspections, Clark Public Utilities would drain its reservoirs beforehand. The continuous cost of shutting down and draining reservoirs started to add up. With draining and refilling taking up to 16 hours to complete, coupled with the expense of dumping water that could otherwise be turned into renewable electricity, Clark Public Utilities started researching alternatives, which is when they came across remote operated vehicles as a potential low-cost and time-saving solution.

The model selected came from company Deep Trekker, a manufacturer of the DTG2 ROV, which is a unit commonly used to inspect hydroelectric facilities, reservoirs, and portable water systems across the United States. Capable of operating for up to 8 hours on a 90-minute charge, the DTG ROV allowed Clark Public Utilities to keep reservoirs online and avoid any community-impacting shutdowns, as the remote operated vehicle could perform in-depth reservoir analysis without the cost and service interruptions draining incurred.



A Deep Trekker drone examining a dam embankment.

While the remote operated vehicle performed reservoir inspections, the drone operators noticed floating debris, so the decision was made to equip the ROV with a boom to push the debris to the surface, where it was removed. The ROV performed so admirably during this task that it quickly became the default tool for both inspections and debris removal, reducing costs for Clark Public Utilities while keeping rates low for customers.



Photograph of Clark Public Utilities' Deep Trekker drone assisting in the removal of underwater debris.

In addition to the application of remote operated vehicles as

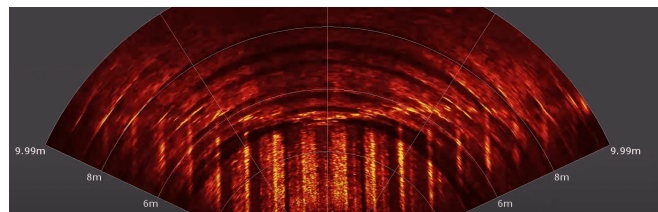
tools of inspection and debris removal, owners and operators have been outfitting ROVs with sonar technology to great effect. For instance, Dutch company H2O Drones has equipped remote operated vehicles with sonar, and the dam inspections the drones perform has proven to be invaluable.

In one instance, the H2O Drone team had been called in to examine a steel wall dam because a subsidence of pavement was apparent behind the quay. While the cause of the subsidence was unknown, the dam wall showed no visible defects, but the inspection told a different story.

After exploring the area with remote operated vehicles, the operators discovered that large sink holes – created by the propellers of moored boats – had appeared in front of the dam wall. To make matters worse, the dam wall had partially collapsed 6 meters below the water level, sagging more than 80 centimeters, which in turn had created the subsidence of pavement behind the quay.

Due to poor visibility in the water, the necessary inspections to evaluate the dam couldn't be performed up close, so sonar was selected as the ideal tool. After sending a sonar equipped remote operated vehicle to evaluate the dam, a failure in the dam wall at a depth of five meters was discovered. This discovery was possible due to three factors:

1. The remote operated vehicle
2. Drone-connected sonar
3. The drone operator's competency



Sonar readout of dam embankment wall from drone connected sonar device.

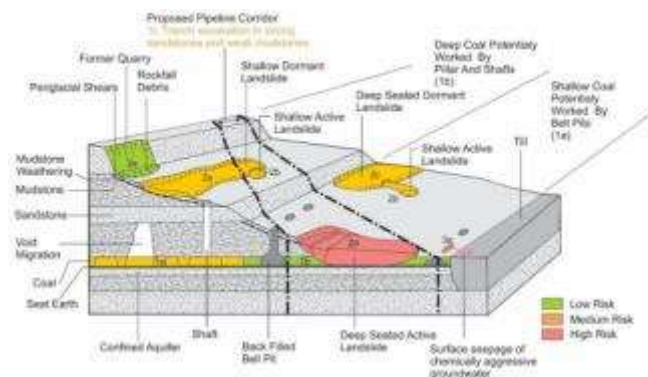
With certain remote operated vehicles capable of stationary positioning, meaning they can lock themselves in a fixed location for long durations, the operator was able to take advantage of the drone's rotating camera to scan the dam wall from one location to another. When stationed at the appropriate distance, the H2O Drone team were able to build out a complete sonar reading of the dam, enabling the discovery of the failure, which would not have been detectable other-wise.

#### FOR MORE INFORMATION

The possibilities of drone applications are limitless. Compared to in-person dam safety inspections, drones are faster, safer, more accurate, predictive, and allow for a repeatable inspection process. Drones are also a financial and time-saving investment, and they can perform highly detailed work quickly while accessing difficult to reach locations, enabling owners and operators to keep operations online while the drones perform assessments. The future of remote operated vehicles and drone mapping for dam safety remains bright, as the technology helps owners and operators maintain infrastructure integrity.

(National Hydropower Association / Powerhouse / December 12, 2022, <https://www.hydro.org/powerhouse/article/are-drones-the-future-of-dam-safety>)

## Best practice guidelines released for use of engineering geological models



Visualisation of the conceptual component of an EGM for a pipeline crossing unstable ground affected by mining and landslides (from Baynes et al, 2020).

The International Association for Engineering Geology and the Environment's Commission 25 has published its "Guidelines for the development and application of engineering geological models on projects".

The purpose of the new document is to establish best practice based on the application of engineering geological models (EGMs) on actual projects.

The International Association for Engineering Geology and the Environment's (IAEG's) Commission 25 (C25) has been working on the guidance, with the aim of providing succinct, practical, accessible and authoritative advice on the effective use of the technique. This covers a wide range of appli-

cations, including civil engineering, mining, geohazard studies, offshore studies, land-use planning and environmental assessments.

The central premise is that an EGM is not simply a 2D or 3D visualisation of a data set. Instead the guidelines define an EGM as "a comprehensive knowledge framework that supports the interpretation and assessment of the engineering geological conditions and allows the interaction of these conditions with the proposed project to be evaluated, so that appropriate engineering decisions can be made throughout the life cycle of the project from inception to decommissioning".

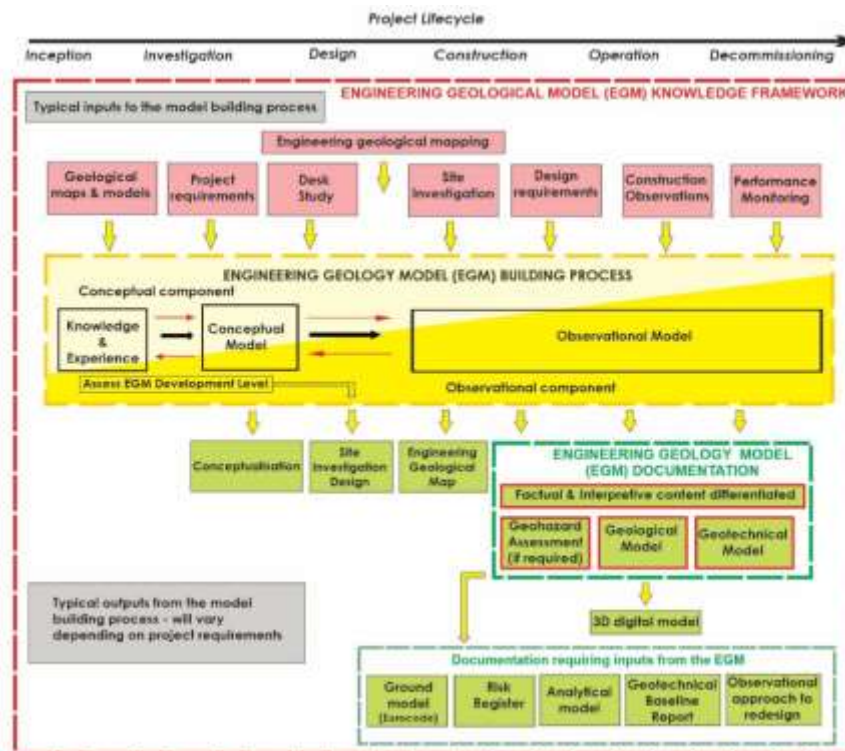
The guidelines are intended for stakeholders from around the world that are working on projects of all scales that interact with or require an understanding of the ground.

The document is divided into three parts:

- **Advisory clauses for the development of EGMs (Part 1), which indicate how an appropriate EGM should be developed for any project that interacts with the ground.**
- **Commentary on the advisory clauses (Part 2), which provides additional supporting information.**
- **Examples of EGM applications (Part 3), which provide overviews of the application of EGMs to a variety of project types.**

The guidelines incorporate the contributions of 57 individuals from 15 countries and represent the consensus views of the working group as to what they consider to be good practice. Two draft versions of the document have been reviewed and revised over the last two years.

The "Guidelines for the development and application of engineering geological models on projects" are now freely downloadable from the [IAEG's website](https://www.iaeg.org/).



A schematic visualisation of the EGM through the project life cycle

(Nia Kajastie / GROUND ENGINEERING, 20 December, 2022, <https://www.geplus.co.uk/news/best-practice-guidelines-released-for-use-of-engineering-geological-models-20-12-2022>)

# ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ



ΠΟΛΥΤΕΧΝΕΙΟ ΚΡΗΤΗΣ  
TECHNICAL UNIVERSITY  
OF CRETE

**2<sup>η</sup> Διαδικτυακή Ημερίδα του ΓΡΑΔΙΜ του Πολυτεχνείου  
Κρήτης με θέμα**

**«Εκπαιδευτικές πρακτικές για την Ενεργητική  
Συμμετοχή των φοιτητών/τριών»**

**Εναρκτήρια ομιλία από την Μαρίνα Πανταζίδου με θέμα  
Η «τυρόπιτα» της εκπαίδευσης:  
(Διαγνωστικές) ερωτήσεις κατανόησης**

## Περίληψη

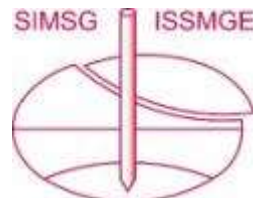
Η πρόσφατη δημιουργία Γραφείων Διδασκαλίας και Μάθησης (ΓΡΑΔΙΜ) σε κάθε ελληνικό πανεπιστήμιο έδωσε το κίνητρο για να φτιαχτεί αυτή η παρουσίαση με προτάσεις για (i) τη βοήθεια που μπορούν να προσφέρουν τα ΓΡΑΔΙΜ σε διδάσκοντες σε πανεπιστήμια και (ii) τη συστηματική συνεργασία ΓΡΑΔΙΜ-ερευνητών στην εκπαίδευση-διδασκόντων. Η παρουσίαση ξεκινάει με την διάκριση ανάμεσα σε δύο είδη καλών εκπαιδευτικών πρακτικών. Οι γενικές καλές πρακτικές είναι κατάλληλες για κάθε θεματικό πεδίο και υποστηρίζονται από αποτελέσματα έρευνας στην εκπαίδευση. Οι εξειδικευμένες εκπαιδευτικές πρακτικές έχουν αναπτυχθεί για συγκεκριμένο περιεχόμενο και υποστηρίζονται από αποτελέσματα έρευνας και στην θεματική εκπαίδευση (discipline-based education research). Για να τονιστεί η διάκριση, παρομοιάζουμε τις γενικές καλές πρακτικές με τυρί+ψωμί, δηλ. τεχνικό περιεχόμενο (ψωμί) σε επαλληλία με ευρήματα έρευνας στην εκπαίδευση (τυρί). Η «τυρόπιτα της εκπαίδευσης» είναι οι εξειδικευμένες καλές πρακτικές όπου το τεχνικό περιεχόμενο είναι «ζυμωμένο» (συζευγμένο) με ευρήματα έρευνας στην εκπαίδευση. Νέοι διδάσκοντες πιθανόν χρειάζονται περισσότερο γενικές καλές πρακτικές, ενώ σε διδάσκοντες με κάποια εμπειρία μάλλον χρησιμεύουν περισσότερο οι εξειδικευμένες καλές πρακτικές, η «τυρόπιτα». Η παρουσίαση εστιάζει στην «τυρόπιτα», και συγκεκριμένα στη σύζευξη (i) της γενικής καλής πρακτικής της χρήσης ερωτήσεων κατανόησης για διαφορετικούς εκπαιδευτικούς σκοπούς (π.χ. διαγνωστικά, ως κίνητρο ενεργητικής συμμετοχής των φοιτητών, για επανάληψη, για τις εξετάσεις) με (ii) έννοιες κυρίως από τη Γεωτεχνική Μηχανική (μιας από τις κύριες εξειδικεύσεις του πολιτικού μηχανικού) και ενδεικτικά από άλλα αντικείμενα των μηχανικών. Τα παραδείγματα συνοδεύονται από συγκεκριμένες προτάσεις για το πώς μπορούν τα ΓΡΑΔΙΜ να υποστηρίξουν τους διδάσκοντες σε πανεπιστήμια για να ενσωματώσουν στη διδασκαλία τους αυτές τις εξειδικευμένες καλές πρακτικές. Τέλος, οι προτάσεις γενικεύονται στη μεγαλύτερη κλίμακα των ερευνητικών προγραμμάτων και των συνεργασιών σε επίπεδο ιδρύματος, πανελλήνιο και διεθνές.

## Η ομιλήτρια

Η Μαρίνα Πανταζίδου είναι Αναπληρώτρια Καθηγήτρια στον

Τομέα Γεωτεχνικής της Σχολής Πολιτικών Μηχανικών ΕΜΠ. Έχει πολυετή ακαδημαϊκή και επαγγελματική εμπειρία στις Ηνωμένες Πολιτείες και στην Ελλάδα στο αντικείμενο της περιβαλλοντικής γεωτεχνικής, με ιδιαίτερη έμφαση στους τομείς χαρακτηρισμού και αποκατάστασης χώρων ρυπασμένων από επικίνδυνα απόβλητα. Τα ερευνητικά της ενδιαφέροντα περιλαμβάνουν αριθμητική και εργαστηριακή προσομοίωση της κίνησης στο υπέδαφος οργανικών ρύπων που δεν αναμειγνύονται με το νερό, βιοαποκατάσταση χλωριωμένων υδρογονανθράκων, λήψη αποφάσεων σε θέματα περιβαλλοντικής αποκατάστασης και διδακτική της επιστήμης του μηχανικού. Για τη διδασκαλία και μάθηση θεμάτων μηχανικού, κυρίως γεωτεχνικού μηχανικού, έχει συγγράψει 25 άρθρα, έχει συμμετάσχει σε τρία χρηματοδοτούμενα προγράμματα, έχει δώσει 15 προσκεκλημένες ομιλίες και έχει επιβλέψει ως guest editor δύο ειδικά τεύχη στα περιοδικά European Journal of Engineering Education και International Journal of Geotechnical Case Histories. Τα τελευταία 20 χρόνια συμμετέχει ενεργά σε επιτροπές για τη διδασκαλία θεμάτων πολιτικού μηχανικού και από το 2017 είναι πρόεδρος της Τεχνικής Επιτροπής για την Εκπαίδευση TC306 της International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), που διοργάνωσε στην Αθήνα, διαδικτυακά, το 5<sup>ο</sup> Διεθνές Συνέδριο για την Εκπαίδευση στη Γεωτεχνική Μηχανική στις 23-25 Ιουνίου 2020.

<https://tuc-gr.zoom.us/j/98980972132?pwd=bG1EaFdGQkpob0Z6dE5EdVdRL01adz09>



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

**ISSMGE News & Information Circular  
December 2022**

[www.issmge.org/news/issmge-news-and-information-circular-December-2022](http://www.issmge.org/news/issmge-news-and-information-circular-December-2022)

### 1. PRESIDENTIAL REPORT JULY 2022

The President of the ISSMGE, Dr Marc Ballouz, has prepared a short video report on his activities during July 2022, available from <https://www.youtube.com/watch?v=I8Mboa2cJLE>.

### 2. CALL FOR NOMINATION FOR THE 3rd JOHN BURLAND LECTURE

The ISSMGE and the Technical Committee TC306 on Geotechnical Engineering Education established the John Burland Lecture in recognition of Professor Burland's outstanding impact on Geotechnical Engineering Education. Nominations are now being sought for the 3rd John Burland Lecturer (to present at GEE 2025).

Nominations should be made through the TC306 members and/or National Societies to the selection committee chaired by David Airey by **December 17, 2022**. For full background and procedures, please refer to <https://www.issmge.org/news/call-for-nomination-for-the-3rd-john-burland-lecture>.

### 3. ISSMGE INTERACTIVE TECHNICAL TALKS: A NEW EDUCATIONAL INITIATIVE BY THE PRESIDENT OF ISSMGE

The President of ISSMGE Dr. Marc Ballouz has just launched a new educational initiative titled ISSMGE Interactive Technical Talks (IITT). It represents a series of technical talks to bring together geo professionals from around the world, young and renowned, from both the academia and the industry, to discuss a certain subject of geotechnical engineering.

The following episodes are now available

[ISSMGE Interactive Technical Talk Episode 1: Tailings and Mine Waste \(TC221\)](#)

[ISSMGE Interactive Technical Talk Episode 2: Geomechanics and Geotechnical Engineering for Nuclear Waste Disposal \(TC308\)](#)

[ISSMGE Interactive Technical Talk Episode 3: Energy Geostructures & Storage of Thermal Energy in the Ground \(TC308\)](#)

### 4. Proceedings from the 11th International Symposium on Field Monitoring in Geomechanics available in open access

The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of Dr. Andrew M. Ridley and the British Geotechnical Association, the 111 papers from the proceedings of the 11th International Symposium on Field Monitoring in Geomechanics (ISFMG2022 September 2022) are available in the ISSMGE Online Library here: <https://www.issmge.org/publications/online-library>.

### 5. ISSMGE BULLETIN

The latest edition of the ISSMGE Bulletin (Volume 16, Issue 5, October 2022) is available from the [website](#).

### 6. ISSMGE FOUNDATION

The next deadline for receipt of applications for awards from the ISSMGE Foundation is the 31<sup>st</sup> January 2023. Click [here](#) for further information on the ISSMGE Foundation.

### 7. CONFERENCES

Member Societies, Technical Committees, Sister Societies and related organisation may add their events directly to the ISSMGE Events database via the link +SUBMIT EVENT at the top of the EVENTS page

For a listing of all ISSMGE and ISSMGE supported conferences, and full information on all events, including deadlines, please go to the Events page at <https://www.issmge.org/events>. For updated information please refer to that specific events website.

The following are events that have been added or amended since the previous Circular:

### ISSMGE EVENTS

**GEOMANDU (AN INTERNATIONAL CONFERENCE SERIES OF NEPAL GEOTECHNICAL SOCIETY): GEOHAZARDS AND GEO-INFRA DISASTERS - 16-03-2023 - 17-03-2023** Hotel Radisson, Kathmandu, Nepal; Language: English; Organiser: Nepal Geotechnical Society; Contact person: Mandip Subedi; Address: Lalitpur-11, Chakupat; Phone: +977-9851124192; Email: [mandip.subedi@gmail.com](mailto:mandip.subedi@gmail.com); Website: <https://geomandu.ngeotechs.org/>; Email: [ngeotechs@gmail.com](mailto:ngeotechs@gmail.com)

**GEO-CONGRESS 2023 - 26-03-2023 - 29-03-2023** Los Angeles Convention Centre, United States; Language: English; Organiser: Geo-Institute of ASCE; Contact person: Brad Keelor; Email: [bkeelor@asce.org](mailto:bkeelor@asce.org); Website: <https://www.ge-ocongress.org/>; Email: [registrations@asce.org](mailto:registrations@asce.org)

**9TH CONFERENCE OF THE CROATIAN GEOTECHNICAL SOCIETY - 04-05-2023 - 06-05-2023** Sisak, Croatia, Language: English & Croatian; Organiser: Croatian Geotechnical Society; Contact person: Sonja Zlatovic; Address: Avenija Veceslava Holjevca; Phone: +38598457497; Email: [sonja.zlatovic@tvz.hr](mailto:sonja.zlatovic@tvz.hr); [webHGD@gmail.com](mailto:webHGD@gmail.com); Website: <https://www.hgd-cgs.hr/savjetovanja/sisak-2023/>; Email: [sisak2023@gmail.com](mailto:sisak2023@gmail.com)

**3RD INTERNATIONAL SYMPOSIUM ON ENERGY GEOTECHNICS SEG23, 03-10-2023 - 05-10-2023** Lijm en Cultuur Monumental Site, Delft, Netherlands; Language: English; Organiser: TC-308 in cooperation with Delft University of Technology and Eindhoven University of Technology; Contact person: Delft University of Technology; Email: [Seq23@tudelft.nl](mailto:Seq23@tudelft.nl); Website: <https://seq23.dryfta.com/>

### NON-ISSMGE EVENTS

**INTERNATIONAL CONFERENCE ON ADVANCED TOPICS IN MECHANICS OF MATERIALS, STRUCTURE AND CONSTRUCTION - 05-03-2023 - 07-03-2023** Al-Khobar, Saudi Arabia; Language: English; Organiser: Prince Moham-mad Bin Fahd University; Contact person: Richard Maranan; Address: P.O. Box 1664; Phone: +966 13 849 9345; Email: [rmaranan@pmu.edu.sa](mailto:rmaranan@pmu.edu.sa); Website: <https://pmu.edu.sa/ato-mech1-2023/>; Email: [rmaranan@pmu.edu.sa](mailto:rmaranan@pmu.edu.sa)

**XX TECHNICAL DAM CONTROL INTERNATIONAL CONFERENCE - 12-09-2023 - 15-09-2023** Hotel Diament Arsenal Palace, Chorzów, Poland; Language: English; Organiser: Warsaw University of Technology; Contact person: Agnieszka Dbska; Address: Nowowiejska st., 20; Phone: +48 234 74 53; Fax: +48 22 825 29 92; Email: [tkz.ibs@pw.edu.pl](mailto:tkz.ibs@pw.edu.pl); Website: <http://www.tkz.is.pw.edu.pl>; Email: [tkz.ibs@pw.edu.pl](mailto:tkz.ibs@pw.edu.pl)

### ISSMGE Interactive Technical Talk Episode 3: Energy Geostructures & Storage of Thermal Energy in the Ground (TC308)

ISSMGE IT Administrator / [TC308](#) / 12-12-2022

The 3rd episode of International Interactive Technical Talk has just been launched and is supported by TC308. Prof. Guillermo Narsilio (TC308 Chair), Kamelia Atefi and Iulia-Consuela Prodan are discussing with Dr. Marc Ballouz about "Energy Geostructures & Storage of Thermal Energy in the Ground"



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

### 1st Scott Sloan Lecture

Francesca Ceccato / [TC103](#) / 13-12-2022

We are pleased to announce that TC103 elected Prof. David Potts to give the 1st Honour Lecture in honour of Prof. Scott Sloan.

The honour lecture is scheduled during the NUMGE conference that will be held at Imperial College (London) on June 26-28<sup>th</sup> 2023.

### TC219 1ST Webinar on Resilience Evaluation in Geotechnical Engineering

Wei Guo / [TC219](#) / 20-12-2022

The executive committee of TC219 is hosting a series of webinars on resilient evaluation in Geotechnical Engineering. The topics of the webinar series will include but not be limited to the frontiers of resilience evaluation and design, or development and termination mechanisms of the progressive failure in all areas of geotechnical engineering due to natural or human-induced serious disasters. The details of the 1<sup>st</sup> seminar of the series are provided below:

ISSMGE International Society for Soil Mechanics and Geotechnical Engineering  
TC 219 System Performance of Geotechnical Structures

天津大学  
Tianjin University

地震工程综合模拟学科创新引智基地·专题研讨会  
TC219 第一届岩土工程韧性评估线上研讨会  
TC219 1<sup>ST</sup> WEBINAR ON RESILIENCE EVALUATION IN GEOTECHNICAL ENGINEERING

Beijing Time: Dec 28, 2022, Wed  
Zoom Meeting ID: 676 831 2100 / Passcode: 1895

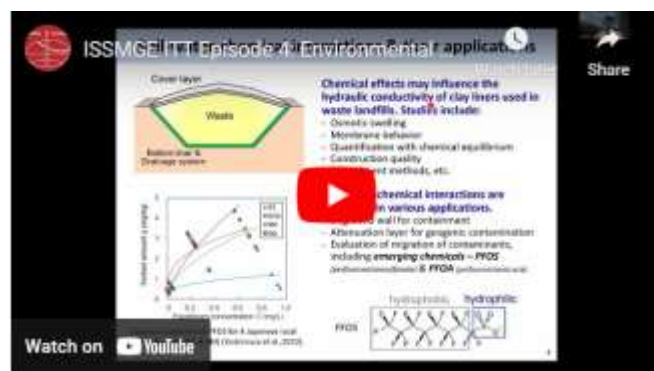
报告议程及报告信息

09:00 - 09:05	● Opening Remarks & Welcome Speech / TC219 主席致开幕词 Prof. ZHENG Gang, Chair of TC219, Vice president of Tianjin University, China 郑刚教授, TC219主席, 天津大学副校长
09:05 - 09:40	● Design for chemical stabilisation that is resilient to spatial variation in in-situ soil properties Prof. LEE Fook Hui, Fellow of the Singapore Academy of Engineering, Nominal Member of TC219, National University of Singapore 李福海教授, 新加坡工研院院士, TC219委员, 新加坡国立大学土木与环境学院
09:40 - 10:15	● Enhancing Infrastructure Resilience with Geosynthetics Prof. HAN Jie, Nominal Member of TC219, The University of Kansas, USA 韩杰教授, TC219委员, 美国堪萨斯大学土木建筑与环境学院
10:15 - 10:50	● Earthquake and Flood Resilience of Urban Underground Infrastructure Prof. ZHANG Dongmei, Nominal Member of TC219, Tongji University, China 张冬梅教授, TC219委员, 同济大学土木工程学院
10:50 - 10:55	● Closing Ceremony / 闭幕式

### ISSMGE Interactive Technical Talk Episode 4: Environmental Geotechnics (TC215)

ISSMGE IT Administrator / [TC215](#) / 21-12-2022

The fourth episode of International Interactive Technical Talk has just been launched and is supported by TC215. Prof. Takeshi Katsumi, Dr. Nikolo Guarena and Dr. Susmita Sharma are discussing with Dr. Marc Ballouz about "Environmental Geotechnics"



<https://www.youtube.com/watch?v=9rCKq-zZckw>

### Second Generation of Eurocode 7 - Basis of Design and how the influence of Groundwater is incorporated in the new code

Witold Bogusz / [ERTC10](#) / 21-12-2022

Our 4th Webinar organised jointly by ISSMGE ERTC10, CEN TC250 SC7 and NEN is now open for registration:

## **Second Generation of Eurocode 7 - Basis of Design and how the influence of Groundwater is incorporated in the new code**

Time: Wednesday, **22.02.2023, 15:00-17:00 CET**

Cost: None! Just a bit of your time.

### Agenda:

1. *Introduction* - Hoe-Chian Yeow
2. *prEN 1990: 202x – Eurocode: Basis of Structural and Geotechnical Design* - Andrew Bond
3. *Additional aspects of basis of design in prEN 1997-1: 202x – Eurocode 7 – General rules* - Gunilla Franzén
4. *Groundwater in prEN 1997-1: 202x* - Adriaan van Seters
5. *Groundwater-related limit states – Examples* - Joaquin Perez-Romero
6. Q&A

Information about the event and the registration form can be found here:

<https://webinar-eurocode7-groundwater.nen-evenementen.nl/>



### **News**

<https://www.isrm.net>

#### **40th ISRM online Lecture by Dr. José Delgado Rodrigues on 15 December 2022-12-11**

The 40th ISRM online lecture will be delivered by **Dr. José Delgado Rodrigues**, from Lisbon Portugal. The title of the lecture is: **"Stone in Cultural Heritage - From the rock mass to the stone piece"**. It will be broadcasted on 15 December 2022, 10 A.M. GMT at [www.isrm.net](https://www.isrm.net).

Dr. José Delgado Rodrigues graduated in Geology from Coimbra University. In 1967 he started his career at LNEC (National Laboratory of Civil Engineering), where he got the "Specialist" degree in 1976 and Principal Research Officer in 1985. He served as President of the Scientific Council and Head of the Geotechnical Department, in this same institution.



He served as President of the Portuguese Association of Geologists, President of the Portuguese Geotechnical Society, and ISRM Secretary General. He was one of the pioneers of the introduction of Engineering Geology studies in Portugal.

Dr. Delgado Rodrigues served as member of the International Per-

manent Committee for the Organisation of Congresses in Stone Conservation, member of several RILEM and ICOMOS working groups, member of the Scientific Commission of the Association World Monuments Fund-Portugal, and member of the governing bodies of the Portuguese Organisation of Scientific Workers.

He was lecturer at the ICCROM courses in Stone Conservation, invited professor in New University of Lisbon, and delivered presentations and short courses on stone conservation at over 15 universities and 10 countries around the World. He was supervisor or co-supervisor in more than a dozen doctoral and master theses.

Dr. Delgado Rodrigues is author or co-author of about 170 LNEC internal reports and of around 200 papers published in scientific journals and in proceedings of scientific events. He has been a permanent or ad hoc peer reviewer for over a dozen of scientific journals. He was mentor for and guest scholar of The Getty Conservation Institute (LA, USA), and delivered the XV Manuel Rocha lecture for the Portuguese Geotechnical Society. He is a Fellow of the International Society of Rock Mechanics and Engineering.

The lecture will remain online so that those unable to attend at this time will be able to do it later. As usual, the attendees will be able to ask questions to the lecturer by e-mail during the subsequent five days. [All online lectures are available from this page.](https://www.isrm.net/page/show/1663)

#### **40th ISRM online Lecture is online 2022-12-15**

The 40th ISRM online lecture delivered by Dr. José Delgado Rodrigues "Stone in Cultural Heritage - From the rock mass to the stone piece" is online at <https://isrm.net/page/show/1663>.



#### **Scooped by ITA-AITES #81, 6 December 2022**

[Calling Suppliers: Norway Needs Tech for World's First Ship Tunnel | Norway](#)

[Milan's M4 Metro Line Opens to Passengers | Italy](#)

[Sydney Metro awards \\$A 1.6bn Sydney Metro West tunneling contract | Australia](#)

[Feds give VTA green light to apply for funds to build \\$9.3B BART extension under San Jose | United States of America](#)

[Northern B.C. aluminum smelter completes 16km hydroelectric tunnel | Canada](#)

[Yangtze River tunnel for China-Russia natural gas pipeline completed | China](#)

[Turkey's Yapi Merkezi completes tunnel breakthrough in Slovenia](#)

[Watercare completes tunnelling under Manukau Harbour | New Zealand](#)

[TfL vows to develop Crossrail 2 plans and extensions to Bakerloo line and DLR | UK](#)

[ITA Awards 2022 goes live tomorrow](#)

## Scooped by ITA-AITES #82, 20 December 2022

[A big tunnel is being dug underneath Alexandria. Here's why | United States of America](#)

[India's longest escape tunnel constructed in J&K: 5 things to know | India](#)

[Asbestos found during Gotthard road tunnel works | Switzerland](#)

[Société de transport de Montréal launching call for tenders for Blue Line tunnel | Canada](#)

[Mega undersea tunnel under construction in China's Greater Bay Area](#)

[Exploratory works under way for Coire Glas pumped hydro scheme | UK](#)

[Tunnel construction begins for Anderson Dam in California | United States of America](#)

[Surface depression monitored above Snowy 2.0 headrace | Australia](#)

[9 Tbms at it: 70% of city's longest tunnel work over | India](#)

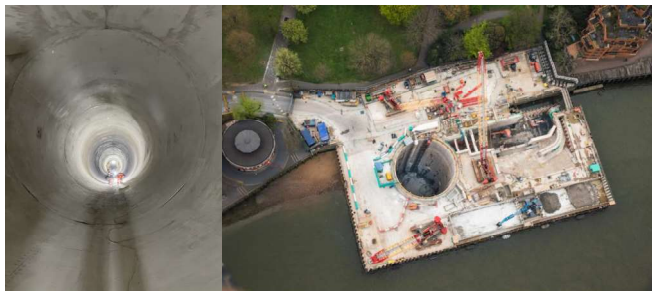
[Long-distance microtunnelling projects exemplified in New Zealand](#)



## Thames Tideway Tunnel Update – 2022

**Speaker: Dominic Barlow**

Thursday 8th December 2022 at 18:00 hrs [UTC+1]



This 2022 update from Thames Tideway Tunnel's Client, Project Manager and Main Works Contractor teams will provide an overview of specific challenges across project areas

(West, Central and East), and the solutions implemented for their resolution.

The topics that will be covered, along with associated speakers, is as follows:

- **Introduction and Tideway progress during 2022** *Jim Avant (Delivery Director, Tideway)*
- **West Area Secondary Lining** *Alexei Bond (BMB) and Ryan Moor (Tideway / Jacobs)*
- **King Edward Memorial Park, challenges and solutions** *Ania Gonzalez (Tideway / Jacobs) and Jo Kujovic (CVB)*
- **Planning for Systems Commissioning** *Phil Robinson (Systems Commissioning Manager, Tideway)*
- **Plan for 2023** *James Smith (Deputy Programme Director, Tideway)*

**Note 1: This is an in-person lecture** will also be streamed live at <https://youtu.be/ncm747a2RBI>



## Holiday Message from The IGS President

Dear IGS Colleagues,

It is a great honor to be delivering my first holiday message to members as the new President of the IGS. I am excited to be leading the IGS over the next four years with the support of my colleagues on the IGS Council.



Last year, the world cautiously emerged from the shadow of the pandemic, with 2022 offering an opportunity for renewal and the first real chance to plan for the future. After the challenges we have all experienced, the IGS is excited for the opportunities that lie ahead for our industry. Indeed, our 2023 operational plan and financial budget, just approved by Council

in early December, embraces the future with new initiatives while leveraging traditional programs in new and exciting ways.

Our year began with the rejuvenation of our website. Our

new site makes it easier for members to access and manage their accounts online, and for our community as well as the wider world to find a wealth of resources and educational materials quickly and easily.

This was soon followed by a refresh of our logo, part of our drive to improve our communications offering. We also ensured every chapter, committee and IGS-related group had a tailored logo to help promote their activities in a unified way. Regular news content on our website and social channels has also helped drive follower numbers on our LinkedIn page.

We also continued to ensure our internal initiatives were fulfilling our strategic aims with education a top priority. This included the launch of the IGS Job Shadowing Program, supported by a grant from the IGS Foundation. The scheme offers engineering students an opportunity to get on-the-job training and for employers to benefit from fresh, new talent. We also created a digital version of the 'Introduction to Geo-synthetics' lecture, part of the IGS Educate the Educators program traditionally delivered in-person, so it can be accessed anywhere at any time.

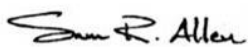
Interaction, collaboration and networking experienced a resurgence as travel restrictions loosened. In-person meetings grew steadily with hybrid alternatives still popular. The IGS Officers, previous and new, were incredibly proud to attend the 7<sup>th</sup> European Conference on Geosynthetics in Warsaw, Poland, in September this year, and meet so many of you face-to-face. The event was an example of the resilience of our chapters, with hosts IGS Poland staging such a successful event despite multiple postponements and uncertainty due to the pandemic.

Addressing members at this event as the new President, I vowed to put sustainability and education center stage for the IGS moving forward, broadening understanding about their many positive benefits to the environment and infrastructure development. Our efforts here are ongoing with initiatives such as the *Did You Know...?* series, our new Sustainability Case Study resource soon to launch, and developing our Sustainability Benefits Calculator. And significantly, I will be working closely with our Technical Committees to develop key educational curriculums that will feed the new IGS Handbook and IGS certification programs.

We also look forward to putting greener construction in the spotlight at the much-anticipated 12<sup>th</sup> International Conference on Geosynthetics in September, next year, which is themed '*Geosynthetics: leading the way to a resilient planet*'. I hope to see you there!

Lastly, I want to thank again the outgoing IGS President Chungsik Yoo and his dedicated IGS Officer team for their leadership, support, encouragement and advice over the years. I know they will continue to be key voices in our expanded IGS community for years to come.

There is much to look forward to next year and I greatly anticipate meeting many of you in person in 2023 and beyond. As we renew our hope for the promise of peace on earth, I wish you and your loved ones a wonderful holiday season and every blessing in 2023.



**Sam Allen**  
IGS PRESIDENT  
INTERNATIONAL GEOSYNTHETICS SOCIETY

**Εκλογή του κ. Γ. Δούλκα ως Προέδρου της Ομάδας Νέων της British Tunnelling Society BTS-YG (Νοέμβριος 2022)**



**Sera Lazaridou is the new president of EuroClub of ICOLD International Commission on Large Dams**



Meeting of the Board of the European Club of National Committees of ICOLD  
Online, 1st December 2022  
President Election for the Period 2023-2025

## MINUTES

### 1. President election for the period 2023-2025

#### 1.3. Presentation of the candidates

The candidates were presented by a representative of their respective nominating committees and explained their vision for the next presidency.

- First, Anne-Marit Ruud (NNCOLD) introduce Juha Laasonen (FINCOLD) and he explained his vision for the next three years.

- Then, Robert Boes (SwissCOD) introduce Sera Lazaridou (GCOLD) and she presented her thoughts for the 2022-2025 period.

#### 1.4. Ballot and counting

The result of the ballot was:

- Juha LAASONEN, 8 votes.
- Sera LAZARIDOU, 9 votes.

In consequence, **Ms. Sera Lazaridou was appointed to be the President of the ICOLD European Club for the period: 1st January 2023 – 31st December 2025.**



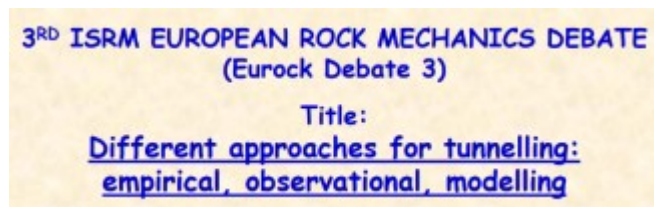
Ο κ. Γιώργος Δούλκας, Γραμματέας της Ομάδας Νέων της ΕΕ-ΣΥΕ, εκλέχθηκε πρόεδρος (chair) της αντίστοιχης Ομάδας Νέων της British Tunnelling Society (BTS-YG). Ο Γιώργος είναι διπλωματούχος Πολιτικός Μηχανικός (ΑΠΘ) με μεταπτυχιακές σπουδές στον Σχεδιασμό και την Κατασκευή Υπογείων Έργων (ΕΜΠ). Έχει ποικίλη εργασιακή εμπειρία τόσο σε έργα πολιτικού μηχανικού, όσο και σε υπόγεια έργα και σήραγγες. Αυτή την περίοδο, ο Γιώργος εργάζεται ως project manager για την STRABAG UK Ltd., και έχει έδρα το Λονδίνο. Συγκεκριμένα εργάζεται στο έργο "High Speed 2" (HS2), το μεγαλύτερο έργο υποδομής της χώρας. Ο ρόλος του περιλαμβάνει τον συντονισμό του σχεδιασμού μιας διδύμης σήραγγας TBM μήκους 23,5 χιλιομέτρων. Μέσω της ενεργής του συμμετοχής στο έργο, έχει δημοσιεύσει αρκετά papers με θέμα την ασφάλεια, την διαχείριση και ηγεσία ομάδας, τον πρωτοποριακό σχεδιασμό τμημάτων κελύφους της σήραγγας, καθώς και άλλα γεωτεχνικού ενδιαφέροντος.

Τα τελευταία χρόνια δρατηριοποιείται ενεργά με την Ομάδα Νέων της ΕΕΣΥΕ, καθώς και με το αντίστοιχο γκρουπ στο Ηνωμένο Βασίλειο (British Tunnelling Society Young Members) του οποίου και προεδρεύει πλέον, με στόχο την συγκέντρωση και ελεύθερη διάχυση γνώσης συνεισφέροντας έτσι με κάθε πρόσφορο τρόπο στην πρόσβαση των νέων μηχανικών στον κλάδο.

(Το Δελτίο των Σηράγγων, Δεκέμβριος 2022)

# ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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



**25 January 2023**

Following the positive opinions received from the two previous editions, with over 100 attendants, the third European Rock Mechanics Debate on "Different approaches for tunnelling: empirical, observational, modelling" will take place online on 25 January 2023 and will be streamed to the [ISRM YouTube channel](#), where it can be watched.

The debate is chaired by Philippe Vaskou from France and features the participation of Nick Barton from Norway and Brazil, talking about "Empirical Methods in Tunnelling including Site Characterization, Day-to-Day solutions, and input for Numerical Discontinuum Modelling" and Yossef H. Hatzor from Israel, talking about "Empirical vs. Analytical Approaches for predicting Rock Response to Tunnelling based on Case Studies from across the World". [A flyer with the contents and indicative rules of these debates can be downloaded here](#). Other debates will follow and will be announced on the ISRM website.

The link to follow the debate will soon be announced on the ISRM website.

Leandro R. Alejano  
ISRM VP for Europe



ATA GEOSYNTHETICS CONFERENCE, Feb. 5-8, 2023, Kansas City, MO USA, <https://geosyntheticsconference.com>

4th African Regional Conference on Geosynthetics – Geosynthetics in Sustainable Infrastructures and Mega Projects, 20-23 February 2023, Cairo, Egypt, [www.geoafrica2023.org](http://www.geoafrica2023.org)

International Conference on Advances in Structural and Geotechnical Engineering (ICASGE'23), 6 - 9 March 2023, Hurgada, Egypt, <https://icasge.conferences.ekb.eg>

ASIA 2023, 14 - 16 March 2023, Kuala Lumpur, Malaysia, [www.hydropower-dams.com/asia-2023](http://www.hydropower-dams.com/asia-2023)

3rd International Conference TMM\_CH "Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage: Recapturing the World in Conflict through Culture, promoting mutual understanding and Peace", 20-23 March 2023, Athens, Greece, [www.tmm-ch.com](http://www.tmm-ch.com)

Conference on Foundation Decarbonization and Re-use, March 21-23, 2023, Amsterdam, Netherlands, [www.dfi.org/2023-conference-on-foundation-decarbonization-reuse](http://www.dfi.org/2023-conference-on-foundation-decarbonization-reuse)

88<sup>th</sup> ICOLD Annual Meeting & Symposium on Sustainable Development of Dams and River Basins, April 2023, New Delhi, India, <https://www.icold2020.org>

Rocscience International Conference 2023 Synergy in Geotechnical Engineering, April 24-26, 2023, Toronto, Canada, [www.rocscience.com/events/rocscience-international-conference-2023](http://www.rocscience.com/events/rocscience-international-conference-2023)

UNSAT 2023 - 8<sup>th</sup> International Conference on Unsaturated Soils, 2-5 May 2023, Milos island, Greece, [www.unsat2023.org](http://www.unsat2023.org)

World Tunnel Congress 2023 Expanding Underground Knowledge & Passion to Make a Positive Impact on the World, 12 - 18 May 2023, Athens, Greece, <https://wtc2023.gr>



## **2<sup>nd</sup> International Workshop on Complex Formations** **9<sup>th</sup> May 2023, Torino, Italy**

Different shades of chaos: geological insights on complex formations - *Dr. K.Ogata*

Practical classification of complex formations: linking geology and geotechnics - *Prof. A.Festa and Eng. M.L.Napoli*

Some certainties and doubts about characterizations of in-situ bimrocks and bimsoils - *Dr. E.Medley*

Colombian block-in-matrix soils: observations, hypotheses, and approaches to understand slope-stability - *Prof. L.O.Suarez-Burgos*

Suggestions for the numerical modelling of heterogeneous block-in-matrix rockmasses - *Eng. M.L.Napoli*

A 3D DEM modelling approach for investigating the mechanical behavior of bimsoils - *Prof. D.Boldini and Dr. H.Zhang*

30 years later: BimPapa reflections on the evolution of bimrocks - *Dr. E.Medley*

For registration please fill in the registration form and send it to: [aqi@associazionegeotecnica.it](mailto:aqi@associazionegeotecnica.it).



NROCK2022 - The IV Nordic Symposium on Rock Mechanics and Rock Engineering, 24 – 25 May 2023, Reykjavic, Iceland, [www.nrock2023.com](http://www.nrock2023.com)

Underground Construction Prague 2023, May 29 – 31, 2023, Prague, Czech Republic, [www.ucprague.com](http://www.ucprague.com)

17DECGE Danube – European Conference on Geotechnical Engineering, 7-9 June 2023, Bucharest, Romania, <https://17decge.ro>

SuperPile'23 Piling Design & Construction Conference, June 7-9, 2023, Atlanta, USA, [www.dfi.org/superpile2023](http://www.dfi.org/superpile2023)

3rd JTC1 Workshop on "Impact of global changes on landslide risk", 7 – 10 June 2023, Oslo, Norway, <https://itc1-2023.com>

ICOLD Annual Meeting 2023, 12<sup>th</sup> to 15<sup>th</sup> June 2023 Gothenburg, Sweden, <https://icold-ciqb2023.se>

9th International Congress on Environmental Geotechnics Highlighting the role of Environmental Geotechnics in Addressing Global Grand Challenges, 25-28 June 2023, Chania, Crete island, Greece, [www.iceg2022.org](http://www.iceg2022.org)

DFHM8 TORINO 2023 8th International Conference on Debris Flow Hazard Mitigation, 26-29 June 2023, Torino, Italy, <http://dfhm8.polito.it>

NUMGE 2023 - Numerical Methods in Geotechnical Engineering 2023, 26 - 28 June 2023 Imperial College London, UK, [www.imperial.ac.uk/numerical-methods-in-geotechnical-engineering](http://www.imperial.ac.uk/numerical-methods-in-geotechnical-engineering)

AFRICA 2023 - The Fourth International Conference and Exhibition on Water Storage and Hydropower Development for Africa, 10-12 July 2023, Lake Victoria, Uganda, [www.hydropower-dams.com](http://www.hydropower-dams.com)

S3: Slopes, Support and Stabilization Conference, August 8-10, 2023, Boston, USA, [www.dfi.org/s32023](http://www.dfi.org/s32023)

17ARC 17th Asian Regional Geotechnical Engineering Conference, 14-18 August 2023, Nur-Sultan, Kazakhstan, <https://17arc.org>

ISMLG 2023 – 4<sup>th</sup> International Symposium on Machine Learning & Big Data in Geoscience, 29 August - 1 September 2023, University College Cork, Ireland, [www.ismlg2023.com](http://www.ismlg2023.com)

IS-PORTO 2023 8th International Symposium on Deformation Characteristics of Geomaterials, 3rd - 6th September 2023, Porto, Portugal, [www.fe.up.pt/is-porto2023](http://www.fe.up.pt/is-porto2023)

12th ICOLD European Club Symposium "Role of dams and reservoirs in a successful energy transition", 5 to 8 September 2023, Interlakes, Switzerland, [www.ecsymposium2023.ch](http://www.ecsymposium2023.ch)



# NGS 2023

10th Nordic Grouting Symposium

11 - 13 September, 2023, Stockholm, Sweden

[www.ngs2023.se](http://www.ngs2023.se)

## Symposium Themes

### 1. Concepts and design for grouting

- Grouting Strategy
- Theory in relation to practice
- Novel methods for grouting execution
- Aspects that govern grouting – grouting difficulty
- Completion criteria for grouting
- Investigations of steering parameters for grouting
- Concepts with environmental aspects

### 2. Grouting materials

- Grout components
- Grout mixing
- Grout characteristics
- Environmental aspects – greener grouting

### 3. Requirements and verifications

- Measuring the grouting result
- Observational method
- Hydrogeology
- Hydraulic tests
- Environmental permit

### 4. Grouting equipment

- Development of grouting equipment
- Possibilities and limitations of current equipment
- Health and safety

### 5. Grouting of soil-rock-concrete interfaces

- Sealing the zone between soil and rock
- Grouting with low rock coverage
- Sealing around tunnel portals and plugs
- Sealing under artesian circumstances

### 6. Contracts and compensation

- Time studies of grouting work
- Grouting compensation and adjustment of time
- Grouting education – Licence to Grout
- Estimation of grout quantities

### 7. Case studies

- Execution of grouting and results

## Contact info

### Swedish Rock Engineering Association

Box 5501, 114 85 Stockholm, Sweden

+46 (0) 70 554 94 04

[info@svbergteknik.se](mailto:info@svbergteknik.se)

[www.svbergteknik.se](http://www.svbergteknik.se)



SUT OSIG 9<sup>th</sup> International Conference "Innovative Geotechnologies for Energy Transition", 12-14 September 2023, London, UK, [www.osig2023.com](http://www.osig2023.com), [www.sut.org](http://www.sut.org)

SAHC 2023 13<sup>th</sup> International Conference on Structural Analysis of Historical Constructions "Heritage conservation across boundaries", 12-15 September 2023, Kyoto, Japan, <https://sahc2023.org/>

XII ICG - 12th International Conference on Geosynthetics, September 17 - 21, 2023, Rome, Italy, [www.12icg-roma.org](http://www.12icg-roma.org)

Charles-Augustin COULOMB : A geotechnical tribute, 25 - 26 September 2023, Paris, France, [www.cfms-sols.org/organisees-par-le-cfms/charles-augustin-coulomb-geotechnical-tribute](http://www.cfms-sols.org/organisees-par-le-cfms/charles-augustin-coulomb-geotechnical-tribute)

SEG23 Symposium on Energy Geotechnics, 3-5 October 2023, Delft, The Netherlands, <https://seg23.dryfta.com>



### **28th European Young Geotechnical Engineers Conference and Geogames 04 - 07 October 2023, Moscow, Russia**

Organiser: Russian Society for Soil Mechanics, Geotechnics and Foundation Engineering

Contact person: PhD Ivan Luzin  
Address: NR MSUCE, 26 Yaroslavskoye shosse  
Phone: +7-495-287-4914 (2384)  
Email: [youngburo@gmail.com](mailto:youngburo@gmail.com)



2023 15<sup>th</sup> ISRM Congress, International Congress in Rock Mechanics Challenges in Rock Mechanics and Rock Engineering, 9-14 October 2023, Salzburg, Austria, <https://www.isrm2023.info/en/>

HYDRO 2023 New Ideas for Proven Resources, 16-18 October 2023, Edinburgh, Scotland, [www.hydropower-dams.com/hydro-2023](http://www.hydropower-dams.com/hydro-2023)

ACUUS SINGAPORE 2023 18<sup>th</sup> Conference of the Associated Research Centers for the Urban Underground Space "Underground Space - the Next Frontier", 1 - 4 Nov 2023, Singapore, [www.acuus2023.com](http://www.acuus2023.com)



### **18th Australasian Tunnelling Conference Trends and Transitions in Tunnelling 5-8 November, 2023, Auckland, Aotearoa New Zealand <https://atc2023.com>**

#### **About**

**Join tunnelling leaders, engineers and experts to share best practice ideas in all things tunnelling.**

The Conference has played a major role in the development of the tunnelling industry in the region for more than 50 years.

Organised by the New Zealand Tunnelling and the Australasian Tunnelling Societies, it is once again set to be a major national, regional and international event.

#### **Objectives**

Bring together a cross-section of the tunnelling community

Deliver the best international conference for clients, consultants contractors and suppliers. Provide a platform for industry leaders to identify 'areas of concern'

Organise industry action and advocacy on key 'areas of improvement'

Showcase Aotearoa New Zealand

#### **Themes**

The Conference Themes are best expressed through tikanga Māori. Tikanga is part of New Zealand's identity and sets guidelines for living and how we interact with each other.

- Resilience: well-being, infrastructure, economics.
- Relationships: industry, stakeholders and future generations.
- Guardianship: sustainability and legacy. Re-purposing and enhancing existing infrastructure, decarbonisation
- Future(s): what kind of infrastructure is needed?

#### **Technical Agenda**

- Metros and Mass Transit
- Digital Engineering,
- Instrumentation and
- Monitoring
- Hydropower and Utility
- Tunnels
- Mechanised Tunnelling
- Conventional
- Tunnelling/SEM/Caverns
- Tunnel Operations, Asset Management
- Repurposing and Rehabilitation
- Ventilation and Fire Life Safety
- Underground Architecture and Space Development
- Grouting, ground modifications and hydrogeology
- Sprayed concrete and tunnel linings
- Automation and technological advances
- Transition Engineering, Sustainability and Economic Growth
- Shafts

- Geotechnical Characterisation, Seismicity and Difficult Ground
- Risk Management, Collaboration, and Contracting
- Human Factors: Users, Resourcing, Training, Competency and Education, Diversity
- Safety and Occupational Safety

#### Contact

Bill Newns, Conference Chair  
E: [billnewns@novoconsult.co.nz](mailto:billnewns@novoconsult.co.nz)  
M: +64 21 476 581  
Holly Adams, Conference Manager  
E: [ha@theconferencecompany.com](mailto:ha@theconferencecompany.com)  
M: +64 21 0221 4096



6th World Landslide Forum "Landslides Science for sustainable development", 14 to 17 November 2023, Florence, Italy, <https://wlf6.org>

CREST 2023 – 2<sup>nd</sup> Construction Resources for Environmentally Sustainable Technologies, November 20-22, 2023, Fukuoka, Japan, <https://www.ic-crest.com>



#### **1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development - an ISRM Specialized Conference** Colombo, Sri Lanka, December 2 -7, 2023 [www.slrmes.org](http://www.slrmes.org)

The Sri Lankan Rock Mechanics and Engineering Society (SLRMES) invites you to participate in the 1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development to be held in Colombo, Sri Lanka during December 2-7, 2023. The first two days (Dec. 2 & 3) are allocated for the short courses and workshops. The plenary and technical lectures of the conference are planned for the next two days (Dec. 4 & 5) and the last two days (Dec. 6 & 7) are allocated for the technical and sightseeing tours.

The conference will cover advances in all areas of rock mechanics and rock engineering encompassing the fields of mining, civil, geological, and petroleum engineering, and geophysics and Hydrogeology focusing on the theme "Rock Mechanics for Infrastructure and Geo-Resources Development". Three keynotes are expected to be delivered to cover the state-of-the-art on several important topics. Each session is expected to start with a Session Lead Lecture given by an expert on the session topic. The plenary and technical lectures, short courses, workshops, technical tours, and trade exhibition programs are organized to provide conference supporters maximum exposure and interaction with participants from universities, industry, government, and exhibitors. Visits are also planned to tourist attractions in Sri Lanka.

#### Topics Covered in the Conference

The conference includes all aspects of rock mechanics and rock engineering associated with mining, civil, petroleum and geological engineering, and hydrogeological field. We are planning to sort out the technical papers under the topics listed below covering the five major themes given below. Please note that the conference topics are not limited only to the topics listed below. We plan to include new topics as necessity arises.

#### **Major Theme # 1: General topics common to all disciplines**

##### Topical Areas:

Rock mass fracture system characterization and modeling  
Rock joint and mass mechanical properties  
Rock joint and mass hydraulic properties  
Rock joint and mass coupled properties-thermo / hydro / mechanical / biological  
In-situ stress measurement and estimation  
Rock fracture mechanics and monitoring  
Rock mechanics and energy  
Advances in constitutive modeling  
Advances in numerical modeling  
Advances in uncertainty and probabilistic modeling

#### **Major Theme # 2: Mining engineering**

##### Topical Areas:

Underground mine stability  
Open pit mine stability  
Coal mining  
Metal mining  
Non-metal mining  
Mining methods  
Mining induced surface subsidence  
Mine backfilling  
Fluid flow in mines  
Rock support/ground control in mining  
Rock blasting  
Field rock mass monitoring in mines  
Innovative laboratory and field testing  
Advances in mining geomechanics  
Seismic response, rock-burst evaluation  
Numerical modeling in mining  
Risk assessment and hazard mitigation in mining  
Prominent challenging projects in mining engineering

#### **Major Theme # 3: Civil engineering**

##### Topical Areas:

Slope stability, dams, foundations  
Civil engineering tunnels  
Fluid flow in civil geotechnical engineering  
Hydro-power chambers  
Innovative laboratory and field testing  
Rock support/ground control in civil engineering  
Field rock mass monitoring in civil engineering  
Advances in civil rock mechanics  
Risk assessment and hazard mitigation in civil geotechnical engineering  
Numerical modeling in civil geotechnical engineering  
Prominent challenging projects in civil rock engineering

## Major Theme # 4: Petroleum engineering

### Topical Areas:

Rock testing for petroleum engineering  
Rock characterization for petroleum engineering  
Hydraulic fracturing: experimental and modeling  
Reservoir geomechanics: characterization and modeling  
Constitutive models for petroleum engineering  
Numerical modeling in petroleum engineering  
Injection geomechanics  
Sand in petroleum engineering  
Drilling geomechanics: drilling bits, wellbore stability, casing and cementing  
Geomechanics of un-conventionals  
Risk assessment and hazard mitigation in petroleum engineering

## Major Theme # 5: Geology, geophysics, and geo-hydrology

### Topical Areas:

Geomechanics in geothermal processes  
Imaging technologies for geomechanics  
Induced seismicity and microseismic monitoring - field and lab testing  
Multi-scale rock mechanics: pore, micro-, and nano-scales  
Hydrothermal and biological rock mechanics  
Gas hydrate  
Coal bed methane  
CO2 sequestration

### Contact

Prof. Pinnaduwa H.S.W. Kulatilake  
Emeritus Professor  
Department of Mining & Geological Engineering  
University of Arizona, Tucson, AZ, USA.  
Conference Chair and President, SLRMES  
Email addresses: [kulatilaka@u.arizona.edu](mailto:kulatilaka@u.arizona.edu)



GEOTEC HANOI 2023 The 5<sup>th</sup> International Conference on Geotechnics for Sustainable Infrastructure Development, December 14-15, 2023 - Hanoi, Vietnam, <https://geotechn.vn>

9th International Symposium on RCC Dams and CMDs December, 2023, Guangzhou, China, [www.chincold-smart.com/meetings/rcc2023](http://www.chincold-smart.com/meetings/rcc2023)

World Tunnel Congress 2024 19 to 25, April, 2024, Shenzhen China, [www.wtc2024.cn](http://www.wtc2024.cn)

8th International Conference on Earthquake Geotechnical Engineering (8ICEGE), 7-10 May, 2024 Osaka, Japan, <https://confit.atlas.jp/guide/event/icege8/top?lang=en>

EUROCK 2024 ISRM European Rock Mechanics Symposium New challenges in rock mechanics and rock engineering July 15-19, 2024, Alicante, Spain, [www.eurock2024.com](http://www.eurock2024.com)

ECSMGE 24 XVIII European Conference on Soil Mechanics and Geotechnical Engineering, 26-30 August 2024, Lisbon, Portugal, [www.ecsmge-2024.com](http://www.ecsmge-2024.com)



## 2024 ISRM International Symposium 24-28 September, New Delhi, India

Contact Person Name

Dr. Mahendra Singh or Mr. A.K. Dinkar

Email [sunil@cbip.org](mailto:sunil@cbip.org); [secretary@cbip.org](mailto:secretary@cbip.org);  
[msingh.civil@gmail.com](mailto:msingh.civil@gmail.com)

Telephone +91 11 26115984 or +91 11 26116567

Address Plot No. 4, Institutional Area CBIP Building Malcha Marg, Chanakyapuri New Delhi - 110021 India



PANAMGEO CHILE 2024 17<sup>th</sup> Pan-American Conference on Soil Mechanics and Geotechnical Engineering, 12-17 November 2024, La Serena, Chile, <https://panamgeo-chile2024.cl>



## Eurock 2025 ISRM European Rock Mechanics Symposium Expanding the underground space - future development of the subsurface - an ISRM Regional Symposium 16-20 June 2025, Trondheim, Norway

Contact Person: Henki Ødegaard

Email [henki.oedegaard@multiconsult.no](mailto:henki.oedegaard@multiconsult.no)

Telephone +47 22 94 75 00

Address C/O Fredrik Stray, TEKNA, PO box 2312 Solli, Oslo, Norway



## 21st International Conference on Soil Mechanics and Geotechnical Engineering 14 – 19 June 2026, Vienna, Austria

Organisers:

Austrian Geotechnical Society and Austrian Society for Geomechanics

Contact Person: Prof. Helmut F. Schweiger

Email: [helmut.schweiger@tugraz.at](mailto:helmut.schweiger@tugraz.at)



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

**Scope**

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

- Fundamental rock mechanics
- Laboratory and field testing and physical modeling of rock mass
- Analytical and numerical methods in rock mechanics and rock engineering
- Underground excavations in civil and mining engineering
- Slope stability for rock engineering
- Rock mechanics for environmental impact
- Sustainable development for energy and mineral resources
- Petroleum geomechanics
- Rock dynamics
- Coupled processes in rock mass
- Underground storage for petroleum, gas, CO<sub>2</sub> and radioactive waste
- Rock mechanics for renewable energy resources
- Geomechanics for sustainable development of energy and mineral resources
- New frontiers & innovations of rock mechanics
- Artificial Intelligence, IoT, Big data and Mobile (AICBM) applications in rock mechanics
- Smart Mining and Digital Oil field for rock mechanics
- Rock Engineering as an appropriate technology
- Geomechanics and Rock Engineering for Official Development Assistance (ODA) program
- Rock mechanics as an interdisciplinary science and engineering
- Future of rock mechanics and geomechanics

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

Website <http://eng.ksrm.or.kr/html/>

## Numerical simulations of water waves generated by subaerial granular and solid-block landslides: Validation, comparison, and predictive equations

Ramtin Sabeti and Mohammad Heidarzadeh

### Highlights

- Maximum amplitudes of subaerial solid-block slides were 107% larger than granular.
- A critical slope angle of  $60^\circ$  was obtained for granular slides.
- Wave periods remain unchanged as water depth and slide volume vary for both slides.
- Wave period increases as the slope angle decreases for solid-block slides.
- Water particle speed for solid-block slides was nearly twice that of granular.

### Abstract

We compare waves generated by subaerial solid-block and granular landslides and propose equations for predicting their maximum initial wave amplitudes. The recent Anak Krakatau subaerial landslide tsunami in December 2018, which resulted in more than 450 deaths, demonstrated the knowledge gap on this subject and motivated this study. Here, we make numerical models using the numerical package FLOW3D-Hydro for solid-block and granular landslides and validate them using physical experiments. Results indicate that the maximum initial wave amplitudes generated by solid-block landslides are 107% larger than those generated by granular landslides in our experiments. The relationship between maximum initial wave amplitude and slope angle is inverse for solid-block slides whereas, it is direct for granular slides. However, a critical angle of  $60^\circ$  is achieved for granular slides, and for slope angles more than this critical value, the maximum wave amplitudes start to decrease. Regarding wave period, our results show that it remains nearly unchanged for both types of landslides as water depth and slide volume vary. The period generated by solid-block slides increases as the slope angle decreases; however, it remains unchanged for granular slides. The predictive equations are applied to real landslide tsunamis and resulted in satisfactory performances.

<https://doi.org/10.1016/j.oceaneng.2022.112853>

<https://www.sciencedirect.com/science/article/abs/pii/S0029801822021369?via%3Dihub>



**Save The Hills: raising awareness on impact of landslides on rural communities**

Long time readers of this blog will be aware of my admiration of a wonderful NGO, Save The Hills, which is a group of concerned citizens who seek to raise awareness of landslides in the Darjeeling-Sikkim Himalaya. I have been privileged to be in regular contact for many years with the founder, Praful Rao, and many other landslide experts have worked with the group too. They run a wonderful blog about landslides in this region. This is grass roots activism as its very finest.

As part of their efforts to raise awareness of landslides, Save The Hills has produced two short but powerful documentaries about the impact of landslides in a remote village, Pathing. The first video was made in November 2022, highlighting the way in which the large Gaguney Landslide is steadily and systematically destroying the lives of this rural community. The video combines testimony from the local people with stunning drone footage:-



<https://www.youtube.com/watch?v=-9uxcI3NRXE>

Whilst this landslide has been active for two decades or more, in recent months it has become more active, spalling rocks almost continually. The debris has inundated land and blocked roads, as well as representing a major hazard for the local residents. The still from the video below shows the scale of the problem at Pathing:-



The landslide at Pathing in northern India.

Tragically, Save The Hills visited the site a week later to find that the situation had deteriorated desperately. The footage was collected at the end of November, when the landslide had become much more active. The government ordered evacuation of the village.

The issue appears to be that the crown of the landslide has expanded, putting many more houses at risk. The second video provides a graphic and powerful account of the scale of the problem:-



<https://www.youtube.com/watch?v=q6vldjLEB0>

One key element of this second video is that it highlights the desperate plight of people being forced from their homes. Relocation is rarely simple, trading one problem for many others.

This image shows the scale of the new landslide source area, where the rock mass is clearly undergoing extensive raveling:-



The crown of the landslide at Pathing in northern India.

Save The Hills also has a blog post online that highlights the challenges at Pathing, illustrated by multiple photographs. Pathing is at 27.295, 88.392, and is well captured on Google Earth.

Pathing is of course not alone in this problem, which is repli-cated in many other locations across the Himalayas. In Nepal for example, Khabar featured another example on Saturday, this time the village of Maya in Pachaljarana Rural Municipality-8 in Kalikot district.

(Dave Petley / THE LANDSLIDE BLOG, 12 December 2022, <https://blogs.agu.org/landslideblog/2022/12/12/save-the-hills-pathing-1>)



### Palos Verdes Estates: a coastal cliff landslide captured on video

On Friday 9 December 2022 a landslide occurred on a coastal cliff at Palos Verdes Estates in California. Thanks to loyal readers Ernie Roumelis and Ken for highlighting this

one – it is particularly interesting because it was caught on video from a helicopter. A Fox 11 helicopter was in the area, and succeeded in capturing the runout of the failure:-



<https://www.youtube.com/watch?v=mfwSR9NPXLk&t=130s>

There is also another video, taken from further along the coast, which also captures the failure well:-



<https://www.youtube.com/watch?v=5u1698JgSvQ>

The Daily Breeze has a couple of images of the aftermath of the landslide, including this good image of the source area:-



The landslide at Palos Verdes Estates.

The image suggests that the failure was a structurally controlled wedge failure that turned into a dry debris avalanche. It is fortunate that the landslide occurred when the beach was largely unoccupied. Meanwhile CNN has a good image of the debris and the (fortunately unoccupied) pickup truck that was struck by the landslide:-



The debris from the landslide at Palos Verdes Estates.

The location of the landslide at Palos Verdes Estates is 33.804, -118.394. This is a section of coast, in common with many other locations in California, is no stranger to landslides. It is interesting that the event occurred in dry weather, ahead of the major rainstorm that affected this region over the weekend. Coastal cliff failures often seem to occur in dry weather (this is an area of active research across multiple groups at the moment). It should also be noted that artificial irrigation is common in this area, although I have no evidence of the likely cause in this case.

For those who are interested in the underlying geology, and the associated landslides, Ernie has highlighted a really interesting map produced by the California Geological Survey. Almost every cliff along this coast is likely to have experienced landslides of one form or another over time.

California remains remarkably prone to landslides of multiple types, both on the coast and inland, resulting from the combination of geology, climate, seismicity and the actions of people.

(Dave Petley / THE LANDSLIDE BLOG, 14 December 2022, <https://blogs.agu.org/landslideblog/2022/12/14/palos-verdes-estates-1>)

## Ο Άρης παραμένει γεωλογικά ιδιαίτερα ενεργός

Επιστήμονες στις ΗΠΑ ανακάλυψαν βάσιμες ενδείξεις ότι γιγάντια ενεργή στήλη μάγματος, με διάμετρο περίπου 4.000 χιλιομέτρων, πιθανότατα βρίσκεται στον μανδύα κάτω από τις βόρειες πεδιάδες του Άρη, ωθώντας προς τα πάνω τον φλοιό του γειτονικού πλανήτη και μεταφέροντας καυτό μάγμα προς την επιφάνειά του.

Η ανακάλυψη ανατρέπει την έως τώρα κυρίαρχη αντίληψη περί στάσιμης γεωδυναμικής εξέλιξης του Άρη κατά τα τελευταία τρία δισεκατομμύρια χρόνια, δείχνοντας ότι ο «κόκκινος» πλανήτης είναι πιο ενεργός από ό,τι είχε θεωρηθεί μέχρι σήμερα. Η απατηλά ήσυχη αρειανή επιφάνεια φαίνεται πως κρύβει ένα πολύ πιο ανήσυχο εσωτερικό.

Η τεράστια μαγματική στήλη, που βρίσκεται στην περιοχή Elysium Planitia κοντά στον αρειανό ισημερινό (τη μοναδική στον πλανήτη όπου έχουν λάβει χώρα μεγάλες ηφαιστειακές εκρήξεις κατά τα τελευταία 200 εκατομμύρια χρόνια), μπορεί να εξηγήσει την παρατηρούμενη ηφαιστειακή και σεισμική δραστηριότητα στον Άρη.

Ο πλανήτης είχε αρχικά θεωρηθεί ένας γεωλογικά αδρανής κόσμος λόγω της απουσίας συγκρουόμενων τεκτονικών πλακών και προφανών ενδείξεων για σύγχρονη τεκτονική δραστηριότητα και ηφαιστειακές εκρήξεις.

Όμως πρόσφατα το ρομποτικό γεωλογικό εργαστήριο InSight της Αμερικανικής Διαστημικής Υπηρεσίας (NASA), το οποίο βρίσκεται στον Άρη από το 2018, ανίχνευσε χαμηλή αλλά συνεχή σεισμική δραστηριότητα. Οι σεισμοί πιθανότατα προέρχονται σχεδόν εξ ολοκλήρου από την περιοχή Cerberus Fossae, που είναι γεμάτη επιφανειακές ρωγμές που εκτείνονται για περισσότερα από 1.000 χιλιόμετρα και η οποία είναι επίσης η τοποθεσία της πιο πρόσφατης γνωστής αρειανής ηφαιστειακής εκρήξης πριν περίπου 53.000 χρόνια.

Οι ερευνητές, με επικεφαλής τον δρ Αντριάν Μπροκέ του Σεληνιακού και Πλανητικού Εργαστηρίου του Πανεπιστημίου της Αριζόνα, οι οποίοι έκαναν τη σχετική δημοσίευση στο περιοδικό αστρονομίας "Nature Astronomy", ανέλυσαν την τοπογραφία, τη βαρύτητα και τη γεωλογία της ευρύτερης περιοχής Elysium Planitia, όπου βρίσκονται τόσο το InSight όσο και η Cerberus Fossae. Χρησιμοποιώντας γεωφυσικά μοντέλα, βρήκαν ενδείξεις ότι όλη η περιοχή "κάθεται" πάνω σε μια τεράστια στήλη του μανδύα που περιέχει καυτό μαγματικό υλικό. Το κέντρο της στήλης εντοπίζεται ακριβώς κάτω από την περιοχή Cerberus Fossae.

"Νομίζαμε ότι το InSight είχε προσεδαφιστεί σε μια από τις πιο βαρετές γεωλογικά περιοχές του Άρη, σε μια ωραία επίπεδη επιφάνεια. Αντίθετα, η μελέτη μας δείχνει ότι το InSight κατέβηκε ακριβώς πάνω από μια ενεργή μαγματική στήλη", δήλωσε ο Μπροκέ, με άλλα λόγια σε μια περιοχή κάθε άλλο παρά αδιάφορη.

Όπως συμβαίνει και στη Γη, η ύπαρξη μιας ενεργούς τέτοιας στήλης προκαλεί συνεχή τοπική γεωλογική δραστηριότητα, μεταξύ άλλων σεισμούς όπως αυτούς που έχει ανιχνεύσει το InSight, ενώ παράλληλα προκαλεί την αργή διάνοση του φλοιού κάτω από την Cerberus Fossae. Εφόσον αυτά τα ευρήματα επιβεβαιωθούν, τότε ο Άρης είναι το τρίτο σώμα του ηλιακού μας συστήματος, μετά τη Γη και την Αφροδίτη, που έχει σήμερα ενεργές στήλες μάγματος.

"Έχουμε ισχυρές ενδείξεις για στήλες μάγματος ενεργές στη Γη και στην Αφροδίτη, αλλά δεν αναμενόταν κάτι τέτοιο σε έναν μικρό και υποτίθεται κρύο κόσμο όπως ο Άρης. Ο πλανήτης αυτός ήταν ιδιαίτερα ενεργός πριν τρία έως τέσσερα δισεκατομμύρια χρόνια και η επικρατούσα άποψη είναι ότι ουσιαστικά είναι νεκρός σήμερα", δήλωσε ο αναπληρωτής καθηγητής πλανητικής επιστήμης Τζεφ Άντριους-Χάνα του Πανεπιστημίου της Αριζόνα.

«Μια τρομερή σε ένταση και διάρκεια ηφαιστειακή δραστηριότητα στην πρώιμη ιστορία του πλανήτη δημιούργησε τα υψηλότερα ηφαιστεια στο ηλιακό μας σύστημα και σκέπασε το μεγαλύτερο μέρος του βορείου ημισφαιρίου με ηφαιστειακές εναποθέσεις. Η λιγοστή συγκριτικά δραστηριότητα στην πρόσφατη ιστορία του Άρη αποδιδόταν έως τώρα σε παθητικές διαδικασίες ενός αργά ψυχόμενου πλανήτη» και όχι σε ενεργή σήμερα μαγματική στήλη, σύμφωνα με τον Μπροκέ.

Στη Γη οι ηφαιστειακές εκρήξεις και οι σεισμοί σχετίζονται με την τεκτονική των πλακών είτε με τις μαγματικές στήλες. «Γνωρίζουμε ότι ο Άρης δεν έχει τεκτονική πλακών, συνεπώς ερευνήσαμε να δούμε αν η περιοχή Cerberus Fossae μπορεί να έχει προκύψει ως αποτέλεσμα μιας μαγματικής στήλης» και αυτό ακριβώς φαίνεται πως συμβαίνει, όπως είπε ο Μπροκέ.

Γενικότερα η ευρύτερη περιοχή Elysium Planitia φαίνεται να έχει ανυψωθεί κατά τουλάχιστον ενάμισι χιλιόμετρο, προφανώς λόγω της κάτωθεν πίεσης από το ανυψούμενο μάγμα. Σύμφωνα με τις εκτιμήσεις των ερευνητών, «η μαγματική στήλη έχει επηρεάσει μια περιοχή του Άρη περίπου ανάλογη των ΗΠΑ». «Είμαστε πεπεισμένοι ότι το μέλλον θα μας επιφυλάξει και άλλες εκπλήξεις», πρόσθεσε ο Άντριους-Χάνα.

(05/12/2022, <https://www.liberal.gr/tehnologia/o-aris-paramenei-geologika-idiaitera-energoss>)

## Geophysical evidence for an active mantle plume underneath Elysium Planitia on Mars

A. Broquet & J. C. Andrews-Hanna

### Abstract

Although the majority of volcanic and tectonic activity on Mars occurred during the first 1.5 billion years of its geological history, recent volcanism, tectonism and active seismicity in Elysium Planitia reveal ongoing activity. However, this recent pulse in volcanism and tectonics is unexpected on a cooling Mars. Here we present observational evidence and geophysical models demonstrating that Elysium Planitia is underlain by an ~4,000-km-diameter active mantle plume head. Plume activity provides an explanation for the regional gravity and topography highs, recent volcanism, transition from compressional to extensional tectonics and ongoing seismicity. The inferred plume head characteristics are comparable to terrestrial plumes that are linked to the formation of large igneous provinces. Our results demonstrate that the interior of Mars is geodynamically active today, and imply that volcanism has been driven by mantle plumes from the formation of the Hesperian volcanic provinces and Tharsis in the past to Elysium Planitia today.

Broquet, A., Andrews-Hanna, J.C. Geophysical evidence for an active mantle plume underneath Elysium Planitia on Mars. *Nat Astron* **7**, 160–169 (2023). <https://doi.org/10.1038/s41550-022-01836-3>

<https://www.nature.com/articles/s41550-022-01836-3#citeas>

# ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

**Το Αδριάνειο Υδραγωγείο θα προσφέρει και πάλι το νερό του στον δήμο Χαλανδρίου, μετά από 19 αιώνες**

**Είχε κατασκευαστεί από τον Ρωμαίο Αυτοκράτορα Αδριανό, με στόχο την ύδρευση της Αθήνας από τα βρόχινα νερά της Πεντέλης και της Πάρνηθας**



Μετά από 19 αιώνες το Αδριάνειο Υδραγωγείο «ζωντανεύει» στον δήμο Χαλανδρίου ως νέο αρδευτικό δίκτυο - μη πόσιμου νερού.

Είχε κατασκευαστεί τον 2ο μ.Χ. αιώνα από τον Ρωμαίο αυτοκράτορα Αδριανό, με στόχο την ύδρευση της πόλης των Αθηνών από τα βρόχινα νερά της Πεντέλης και της Πάρνηθας σε άλλα σημεία του λεκανοπεδίου.

Μέσω του ευρωπαϊκού προγράμματος Cultural Hidrant τίθεται πάλι σε λειτουργία το αρχαίο υδραγωγείο για επαναχρησιμοποίησή του, με σημαντικά περιβαλλοντικά αποτελέσματα, καθώς θα υπάρχει μεγάλο όφελος εξοικονόμησης υδάτων.



Για την υλοποίηση αυτού του στόχου, ο δήμος Χαλανδρίου και η ΕΥΔΑΠ δημιουργούν το πρώτο δίκτυο συνολικού μήκους 4 χιλιομέτρων, που θα κάνει προσβάσιμο στους κατοίκους το νερό του Αδριάνειου.

Το δίκτυο θα αξιοποιήσει το ανεκμετάλλευτο νερό του υδραγωγείου, το οποίο προέρχεται από υδρομάστευση και θα το

θέσει σε χρήση για ποτιστικές και άλλες ανάγκες. Οι κάτοικοι του Χαλανδρίου θα μπορούν να προμηθευτούν το νερό, είτε με απευθείας σύνδεση με το υπόγειο δίκτυο, είτε μέσω των υδροφόρων του δήμου, στις γειτονιές της πόλης που δεν βρίσκονται κοντά στο δίκτυο νερού.



Την ερχόμενη Τετάρτη, στην αίθουσα του Δημοτικού Συμβουλίου η ομάδα έργου και ο Σύλλογος Προστασίας Ρεματιάς, θα παρουσιάσουν σε κοινή εκδήλωση-συζήτηση, τα οφέλη από τη συμμετοχή στην κοινότητα νερού του Αδριάνειου Υδραγωγείου.



(LIFO, 6 Δεκεμβρίου 2022, <https://www.lifo.gr/now/greece/adrianeio-ydragogeio-tha-prosferei-kai-pali-nero-toy-ston-dimo-halandrioy-meta-apo-19>)



## How much does a cloud weigh?

**Clouds look light and fluffy, but they're surprisingly heavy**



A cumulonimbus cloud near Loy Island, an offshore island of Si Racha, Chonburi, Thailand (Image credit: Nobythai via Getty Images)

When you're flying in an airplane above a blanket of clouds, the pillars of white and gray look soft, fluffy and lighter than air. But don't be fooled — those bouncy-looking clouds are much, much heavier than they appear.

So just how much does a cloud weigh? And how do you weigh a cloud? We asked the experts to find out.

Clouds are composed mainly of air and millions of tiny water droplets, which form when water condenses around a "seed" particle. Seed particles can be anything from nitric acid to vapors released by trees, but they are generally very tiny.

There are a couple of ways to measure the weight of a cloud. The first is to weigh the water vapor that composes it — and to do that, "you need to know something about the dimensions of the cloud," Armin Sorooshian (opens in new tab), a hydrologist at the University of Arizona, told Live Science. You also have to know how densely packed the droplets are.

Several years ago, Margaret LeMone (opens in new tab), an atmospheric scientist at the National Center for Atmospheric Research in Boulder, Colorado, wondered about the weight of the water in an average cumulus cloud. So she did the math. First, she measured the size of a cloud's shadow and estimated its height, assuming a roughly cubic shape. Clouds are not typically cube shaped, but cumulus clouds are frequently about as tall as they are wide, so this assumption helped streamline the volume calculation. Then, based on prior re-search, she estimated the density of water droplets at around 1/2 gram per cubic meter. "I came up with around 550 tons [499 metric tons] of water," LeMone said.

That's approximately the weight of 100 elephants suspended above your head. "It's really impressive," Sorooshian said.

Of course, different types of clouds have different weights. For example, "cirrus clouds are much lighter, because they have far less water per unit volume," LeMone told Live Science. And cumulonimbus clouds (the dark thunderheads you see just before a storm) tend to be much heavier.

However, "the entire volume of the cloud is not just the droplets; there's air, too," Sorooshian said. If someone

wanted to take LeMone's calculations a step further, they could factor in the weight of the air between each droplet.

But if clouds are so heavy, why don't they fall down? For one thing, "the droplets are so small that they don't fall very fast," LeMone said. The average water droplet in a cloud is roughly 1 million times smaller than a raindrop — about the size ratio of Earth to the sun. High-altitude wind currents blow these tiny droplets along, keeping them in the air for much longer than if they were static.

Heat convection also helps keep the drops aloft. "A cloud is actually less dense than the air directly below it," Sorooshian said. As warm air (and warm water) rises, it becomes more buoyant than the cold air (and cold water) beneath it, like a layer of foam on top of a latte.

Of course, clouds can be said to "fall" in the form of rain. When cloud droplets cool and condense into one another, they grow, eventually becoming so heavy that they plummet to Earth. Although a raindrop is much bigger than a cloud droplet, each raindrop is still only 0.08 inch (2 millimeters) in diameter, according to the University Center for Atmospheric Research (opens in new tab). Those small drops spread out the weight enough that 550 tons of water doesn't crash down on your head all at once.

So, the next time you see a happy little cloud passing overhead, just remember: 100 elephants. And thank your lucky stars for heat convection.

(Joanna Thompson / Live Science Contributor, 11 December 2022, <https://www.livescience.com/how-much-does-a-cloud-weigh>)



## Stunning 'ice pancakes' swirl on the surface of Scottish river

Wildlife experts recently captured footage of frozen discs, known as "ice pancakes," on the surface of a river in Scotland after an unusual cold snap.



Unusual discs of frozen slush, known as "ice pancakes," were recently spotted on the River Bladnoch in Scotland. The rare structures were created by unusually cold temperatures in the U.K.

Dozens of eerily perfect circles of slushy ice, known as "ice pancakes," have been floating on the surface of a Scottish river after temperatures in the U.K. unexpectedly plummeted.

Callum Sinclair, project manager for the Scottish Invasive Species Initiative (SISI), spotted the stunning circular sheets of ice Dec. 9 on the River Bladnoch in Wigtownshire, Scotland. Pictures of the peculiar pancakes taken by Sinclair were shared on the SISI Twitter (opens in new tab) page on Dec. 13, along with a short [video](#) of the icy discs bumping into one another and being washed down-stream by fast-moving currents.

"I've seen ice pancakes occasionally before," Sinclair told Live Science in an email. "But these were particularly interesting" because of their perfect shape, he added.

Photos shared in the comments of the SISI post also revealed that ice pancakes have formed on the River Kelvin near Glasgow and the River Esk in the Lake District in northwest England in recent days.

Ice pancakes are relatively rare structures that tend to form in very cold oceans, lakes and rivers, according to the U.K. Met Office.

On rivers, the pancakes form when frozen foam on the water's surface gets trapped in a spiraling current known as an eddy. As other bits of frozen foam and ice hit these forming discs, the debris joins onto the nascent pancakes, which causes them to grow, according to the Met Office.



Ice pancakes sitting along the bank of the River Bladnoch.



The ice pancakes are dragged downriver.



Ice pancakes are a rare sight on U.K. rivers.

On open water, the pancakes form when surface ice gets broken up and rounded out as currents and waves cause the icy chunks to bash into one another, according to the Met Office.

Ice pancakes can grow to between 8 and 79 inches (20 and 200 centimeters) across, and although they look like solid discs, they are often quite slushy and easily break apart when lifted up, according to the Met Office.

Although the icy discs dot the Great Lakes of North America and the oceans surrounding Antarctica, where temperatures often fall well below freezing, ice pancakes are much rarer in U.K. rivers.

However, an unusually cold snap, caused by an area of low pressure that got trapped by surrounding areas of high pressure over Russia and Greenland, has caused temperatures across the U.K. to fall below freezing for more than a week, according to the [BBC](#) (opens in new tab).

The lowest temperature recorded during the cold snap so far was 0.8 degrees Fahrenheit (-17.3 degrees Celsius) in Aberdeenshire, Scotland on Dec. 12, according to the BBC.

([Harry Baker](#) / Live Science, 16 December 2022, <https://www.livescience.com/ice-pancakes-scotland>)



## The 'Sleeping Giant Of Energy Storage' Is Waking Up



A closed-loop pumped storage system promises to store large amounts of long-duration energy without ... [+]

A venerable energy-storage technology is getting a new lease on life thanks to a clever redesign and an agreement between the power industry and environmentalists.

"Pumped storage is getting a second look. The sleeping giant is waking up for several reasons," said Dan Reicher, a senior research scholar at Stanford University and a former U.S. assistant secretary of energy.

The stumbling block for hydropower has long been opposition from environmentalists, because hydropower has relied on dams that damage river ecosystems.

But pumped-storage systems are now being designed as closed-loop systems, far from rivers. When solar and wind production is high, they pump water from a reservoir at a low elevation to one at a high elevation. When power is needed, the water is released back down to the lower reservoir, spinning turbines that generate electricity.

"I've been involved for a long time with investors in pumped storage," said Jay Precourt, an investor, supporter of energy initiatives and founder of Stanford's Precourt Institute for Energy.

"It is a fantastic project business-wise," he says in [video](#) released by Stanford this month. "In the past the hold up has been the environmentalists. There was pushback in a lot of states from the environmental community. I know an investor right now who's got deep pockets and a lot of experience that would be dying to do some projects in California."

There is much less opposition to the closed-loop system, Reicher said, because they're not built on rivers, they don't require dams, and because environmentalists "basically put their names on a document which says they're going to give much stronger support."

That document is a 2020 [Joint Statement of Collaboration](#) signed by American Rivers, the World Wildlife Fund, the Union of Concerned Scientists, and nine hydropower industry organizations. In addition to promoting closed-loop pumped storage, the agreement calls for removing dams "that no longer provide benefits to society, have safety issues that cannot be cost-effectively mitigated, or have adverse environmental impacts that cannot be effectively addressed."

It also calls for adding power generation to some dams that currently lack it. "It turns out only three percent of U.S. dams make electricity," Reicher said.

Nonetheless, legacy pumped storage projects provide 90 percent of U.S. energy storage capacity, Reicher said: 22,000 megawatts or 550,000 megawatt hours. Many of those existing projects were built in the 1970s and 80s to capture excess nuclear energy at night. Now they are often pumping water uphill in the afternoon when solar energy is at its peak.

"Pumped storage provides large quantities of long-duration storage measured in days or weeks, with the capacity of individual plants generally measured in the hundreds or thousands of megawatts," Reicher said. "The largest current pumped storage project is over 3,000 megawatts and is a facility in the state of Virginia."

The [Bath County Pumped Storage Station](#) in Virginia has been called "the largest battery in the world." Dominion Energy claims it powers 750,000 homes. Built in 1977, it pulls water from a dammed river.

Fong Wan, a senior vice president for Pacific Gas & Electric Company, said he loves pumped storage, but he wouldn't put PG&E's money behind it.

"The issue here is actually the certainty of construction costs," Wan said. "This nation has not, as far as I know, done a new pumped storage (facility) in a long time, and the way the business world works is that if I was to sign up for a project—a big pumped storage project—I would think it's at least \$2,000 per kilowatt which will put it into billions and billions. I want to know cost certainty, just like you would if you were to buy a house, but very few sellers are willing to give me a fixed-price deal, and I cannot take that to my regulators or my customers with an unknown cost structure."

"That's the biggest problem."

According to Reicher, utilities would not be asked to put up the money. Because of the urgency for energy storage to balance solar and wind—and the promised decline in environmental opposition—investors are ready to bankroll pumped-storage projects, he said.

"I think the difference may be—and time will tell—we have a much bigger investment community out there, with a lot more money, looking at a very large problem, and I think they're pretty convinced that we've got a technology that can work. It's still got to be proven, we've still got to show that you can get big stuff like this built."

The Bipartisan Infrastructure Law provides \$2.4 billion for pumped storage. Meanwhile, Stanford's Woods Institute for the Environment, which brokered the 2020 agreement between environmentalists and industry, is working on stream-lining the federal permit process for pumped storage projects.

"I'm relatively bullish that some of these projects will get built," Reicher said. "All 80 will not, all 80,000 megawatts will not, but I think a decent number will."

*Watch the energy-storage discussion at Stanford, which also included [Form Energy's new iron-air battery](#) and [Antora Energy's design for thermal energy storage](#):*

(Jeff McMahon / FORBES, Dec 29, 2022, <https://www.forbes.com/sites/jeffmcmahon/2022/12/29/the-sleeping-giant-of-energy-storage-is-waking-up/?sh=55a8b27915f8>)

# ΕΝΔΙΑΦΕΡΟΝΤΑ - ΛΟΙΠΑ

## Brachistochrone curve. Fastest route!

A brachistochrone curve is the path that a particle will follow under the influence of gravity between two points in the shortest time possible. This path is also known as the "path of quickest descent." It is important to note that the brachistochrone curve is not necessarily the shortest distance between the two points, but rather the path that allows the particle to reach the second point in the least amount of time. This concept is often studied in the field of calculus of variations.

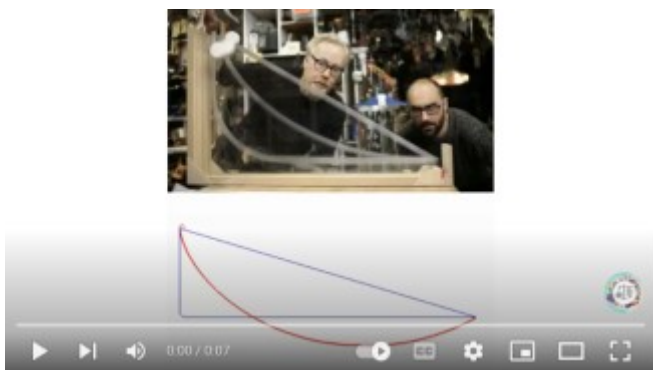
It is also a path that a particle will travel in the shortest time between two points under the influence of a uniform gravitational field. This path is a curve of constant slope, which means that the particle will travel along the curve at a constant speed. This is because the gravitational force is always perpendicular to the curve, so the particle will not experience any acceleration or deceleration along the curve. The Brachistochrone curve was first studied by Johann Bernoulli in the 17th century, and it remains an important concept in the study of classical mechanics.

Finally, the Brachistochrone curve is independent of the mass of the particle. This means that any particle, regardless of its mass, will follow the same Brachistochrone curve between points A and B. This property is a consequence of the fact that the gravitational force is independent of the mass of the particle.

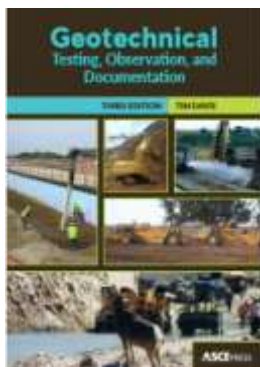
In summary, the Brachistochrone curve is a fascinating concept in classical mechanics that describes the path that a particle will travel in the shortest time between two points under the influence of a uniform gravitational field.

Mehrtash Soltani, Ph.D

<https://www.linkedin.com/feed/update/urn:li:activity:7008058535926280192>



# ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ



## **Geotechnical Testing, Observation, and Documentation, Third Edition**

**Tim Davis**

An in-depth field manual, *Geotechnical Testing, Observation, and Documentation, Third Edition*, by Tim Davis is an indispensable reference guide for soil technicians, inspectors, and geotechnical engineers. It is designed for use during the investigation, grading, and construction phases of geotechnical projects.

This new edition covers common laboratory and field tests, sampling methods, field soil classification, jobsite soil construction, geologic considerations, LID features, and standard to innovative foundations. From site investigation and field work, through documentation during construction, project management, preconstruction and preparation, site safety, to a comprehensive sample geotechnical report.

Studious test questions are provided at the end of each chapter, while three appendices with more than 500 geotechnical related terms are included. An answer key to chapter questions and an example of municipal standards is provided.

This updated edition is beneficial for training new technicians and offers a refresher course for veterans of the profession. Those considering additional certifications will find this book an essential test preparation aid.

Tim Davis's career has involved multiple phases of geotechnical construction, including investigation, lab and field testing, observation, inspection, report writing, supervision and training. Davis holds a NICET Level IV as a geotechnical engineering technology generalist and is certified as a qualified construction stormwater inspector.

(2022 / 230 pp. American Society of Civil Engineers)



## **Site-Specific Ground Motions for Seismic Design of Buildings and Other Structures**

**Praveen K. Malhotra**

Earthquake ground motions are at the interface of two disciplines -- seismologists predict them, and engineers use them. Oftentimes,

engineers do not understand the limitations of ground motion prediction, and seismologists do not understand the effect of ground motions on structures. As a result, there is significant confusion regarding ground motions for design.

*Site-Specific Ground Motions for Seismic Design of Buildings and Other Structures* provides a step-by-step approach to properly conduct site-specific Ground Motion Hazard Analysis (GMHA) and Site Response Analysis (SRA). This book also explains various resources that are available to perform GMHA and SRA. It references several standards to provide a comprehensive approach to generate ground motions for design.

Topics include

- Background of design ground motions in the United States,
- General Procedure (GP) in ASCE 7 and its limitations,
- Ground Motion Hazard Analysis,
- Site Response Analysis,
- Ground motions for the evaluation and retrofit of buildings (ASCE 41),
- Ground motions for the design of LNG tanks (ACI 376 and API 620 and 625),
- Ground motions for the design of bridges (AASHTO and Caltrans), and
- Ground motions for the performance-based design of tall buildings (PEER TBI).

This book will appeal to geotechnical and structural engineers who need ground motion parameters for liquefaction analyses and seismic design of structures. It will also be highly useful to seismologists, geologists, educators, students, and building code officials.

## **About the Author**

Dr. Praveen K. Malhotra, P.E. has worked alongside eminent geologists and seismologists for many years and founded his own consulting company, StrongMotions Inc. He is an author and presenter, as well as a trainer for seismic topics for ASCE in the United States and worldwide.

<https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/278113074>

(2022 / 136 pp. American Society of Civil Engineers)



## **Guidelines for the development and application of engineering geological models on projects**

**Main authors Fred Baynes and Steve Parry**  
**Main Editors Martin Culshaw**

**and Jim Griffiths**

The purpose of these Guidelines is to provide succinct, practical, accessible and authoritative advice on the effective

use of Engineering Geological Models in a wide range of applications including civil engineering, mining, geohazard studies, offshore studies, land-use planning and environmental assessments. The Guidelines are broad ranging, intended for use or reference by stakeholders in projects of all scales that interact with or require an understanding of the ground. They are intended to have worldwide application.

An Engineering Geological Model (EGM) is a comprehensive knowledge framework that supports the interpretation and assessment of the engineering geological conditions and allows the interaction of these conditions with the proposed project to be evaluated, so that appropriate engineering decisions can be made throughout the life cycle of the project from inception to decommissioning. In adopting this definition, the intention is to move beyond the concept that a 'model' is a simplified and static three-dimensional representation of the ground conditions and recognise that the formation and development of the EGM is an on-going process of knowledge accumulation that provides direction and control to the ground engineering throughout a project.

The Guidelines have been developed to provide guidance to practitioners on the 'EGM approach', including 3D digital modelling techniques, and to inform consultants, clients, owners, government bodies and regulators about the use of Engineering Geological Models on projects.

The Guidelines were developed by members of the IAEG C25 – Commission for the Use of Engineering Geological Models – and represent the consensus views of the contributors.

It is intended that these Guidelines will be translated into other languages for dissemination internationally within the ground engineering community. The Guidelines will be reviewed and revised after one year in response to feedback from their use in different parts of the world.

The Guidelines comprise three parts:

1. Advisory Clauses for the development of EGMs (Part 1). Advisory Clauses indicate how an appropriate EGM should be developed for any project that interacts with the ground.
2. Commentary on the Advisory Clauses (Part 2). The Commentary provides additional supporting information, where necessary, for each Advisory Clause and is structured with the same paragraph numbering to allow ease of referencing; hypertext links are provided where relevant.
3. Examples of EGM applications (Part 3). The Examples provide overviews of the application of EGMs to a variety of project types.

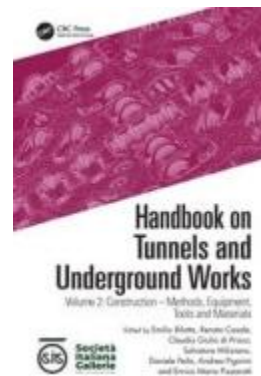
Notes:

1. The purpose of these Guidelines is to provide information and assist decision making; the Guidelines are not intended to define a standard of work.
2. The Guidelines should not be interpreted as prescribing a course of action or procedure on model building as there may be variations in approach and method to account for specific engineering geological and project needs.

### **Bibliographic reference**

Baynes, F. J. and Parry, S. 2022. Guidelines for the development and application of engineering geological models on projects. International Association for Engineering Geology and the Environment (IAEG), Commission 25 Publication

No. 1, 129 pp., Downloadable at  
<https://www.iaeg.info/C25EGMGuidelines/>



### **Handbook on Tunnels and Underground Works Volume 2: Construction – Methods, Equipment, Tools and Materials**

**Edited: Emilio Bilotta, Renato Casale, Claudio Giulio di Prisco, Salvatore Miliziano, Daniele Peila, Andrea Pigorini, Enrico Maria Pizzarotti**

This book set provides a new, global, updated, thorough, clear, and practical risk-based approach to tunnelling design and construction methods, and discusses detailed examples of solutions applied to relevant case histories. It is organized in three sequential and integrated volumes:

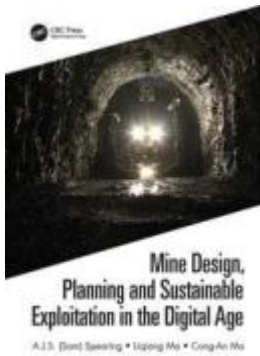
- Volume 1: Concept – Basic Principles of Design
- Volume 2: Construction – Methods, Equipment, Tools and Materials
- Volume 3: Case Histories and Best Practices

The book covers all aspects of tunnelling, giving useful and practical information about design (Vol. 1), construction (Vol. 2), and best practices (Vol. 3). It provides the following features and benefits:

- updated vision on tunnelling design, tools, materials, and construction
- balanced mix of theory, technology, and applied experience
- different and harmonized points of view from academics, professionals, and contractors
- easy consultation in the form of a handbook
- risk-oriented approach to tunnelling problems.

The tunnelling industry is amazingly widespread and increasingly important all over the world, particularly in developing countries. The possible audience of the book are engineers, geologists, designers, constructors, providers, contractors, public and private customers, and, in general, technicians involved in the tunnelling and underground works industry. It is also a suitable source of information for industry professionals, senior undergraduate and graduate students, researchers, and academics.

(Published September 19, 2022 by CRC Press)



### **Mine Design, Planning and Sustainable Exploitation in the Digital Age**

**A.J.S. (Sam) Spearing, Liqiang Ma, Cong-An Ma**

*Mine Design, Planning and Sustainable Exploitation in the Digital Age* covers mine planning, design

and exploitation taking cognizance of new developments, especially those associated with the Fourth Industrial Revolution and the positive influence that it has, and will have, on the mining industry. It refers to latest best practices with emphasis on the social license to operate and sustainable (green) mining.

The book covers surface and underground mining in some detail and addresses relevant associated aspects such as risk management, green mining and the importance of real community relations. It is organized as follows:

- Surface Mining
- Underground Soft Rock Mining
- Underground Hard Rock (Metal/Non-metal) Mining
- Green and Sustainable Mining

It has many relevant photos and figures that help the reader and includes appropriate support design and types commonly used in the various mining methods.

*Mine Design, Planning and Sustainable Exploitation in the Digital Age* is mainly aimed at mining, geological engineering and other undergraduate and postgraduates interested in the mining resources industry. It will also serve as a useful reference book for practitioners in the mining industry who want an easy-to-use book.

(September 19, 2022 by CRC Press)



### **Shield Tunneling Technology in Mixed Face Ground Conditions**

**Weibin Zhu, Shijian Ju, Hui Wang**

This book introduces shield construction risks under mixed face ground condition, analyzes the shield tunneling risks, gives defini-

tions of relevant risks and creates the theoretical system of shield tunneling technology under mixed face ground condition, that is, geology is the foundation, TBM is the key, and people (management) is the essence. The content provides numbers of targeted solutions, such as dual-mode TBM, multi-mode TBM, millisecond delay blasting for boulders, Paste HDN, auxiliary pressure balance tunneling and so on. This book can make researchers who engaged in shield tunneling to get experiences and lessons from it, so as to make the right decision during shield type selection, standardize

shield tunneling, take proper action, avoid or reduce construction risks, and minimize casualties and property losses.

- Creates the theoretical system of shield tunneling in mixed face ground condition.
- Provides innovative solutions for shield tunneling in mixed ground condition.
- Summarizes the tunneling experiences and lessons of 782.8 km and 539 TBMs during metro construction in Guangzhou

(Springer Singapore 16 September 2022)



[www.issmge.org/publications/issmge-bulletin/vol-16-issue-6-december-2022](http://www.issmge.org/publications/issmge-bulletin/vol-16-issue-6-december-2022)

Κυκλοφόρησε το Τεύχος 6, του Τόμου 16 Δεκεμβρίου 2022 του ISSMGE Bulletin με τα ακόλουθα περιεχόμενα:

## ISSMGE Heritage Time Capsule

### Conference report

- XXXII Italian National Conference on Geosynthetics
- Activity of KGS at Indian Geotechnical Conference 2022

### ISSMGE Foundation reports

### Event Diary

### Corporate Associates

### Foundation Donors



## International Journal of Geoengineering Case Histories

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

[www.geocasehistoriesjournal.org/pub/issue/view](http://www.geocasehistoriesjournal.org/pub/issue/view)

Κυκλοφόρησαν τα ακόλουθα τεύχη του International Journal of Geoengineering Case Histories με τα αντίστοιχα περιεχόμενα

Τεύχος 4 / Τόμος 6

(<https://www.geocasehistoriesjournal.org/pub/issue/view/50>):

Editorial, Andy Yat Fai Leung

Effect of Densification on the Random Field Model Parameters of Liquefiable Soil and their Use in Estimating Spatially-Distributed Liquefaction-Induced Settlement, Armin W. Stuedlein, Taeho Bong, Jack Montgomery, Jianye Ching, Kok-Kwang Phoon

Multivariate Geostatistical Analysis of CPT Readings for Reliable 3D Subsoil Modeling of Heterogeneous Alluvial Deposits in Padania Plain, Diego Di Curzio, Giovanna Vessia

Case Histories on 2D/3D Underground Stratification Using Sparse Machine Learning, Takayuki Shuku, Jianye Ching

Application of Long Short-Term Memory Neural Network and Prophet Algorithm in Slope Displacement Prediction, Libin Tang, Yanbin Ma, Lin Wang, Wengang Zhang, Lining Zheng, Haijia Wen

Reliability Assessment of Internal Stability Limit States for Two As-Built Geosynthetic MSE Walls, Richard J. Bathurst, Tony M. Allen

Case History of Risk Evaluation of Earth-Fill Dams Due to Heavy Rain, Toshifumi Shibata, Shin-ichi Nishimura, Tsubasa Tateishi, Shuichi Kuroda, Tomoo Kato, Kentaro Kuribayashi, Namihiko Tanaya

Settlement Predictions of a Trial Embankment on Ballina Clay, Shan Huang, Jinsong Huang, Richard Kelly, Cheng Zeng, Jiawei Xie

Three-Dimensional Numerical Modeling of a Propped Cutter Soil Mix Retention System in Sand, Woodie Theunissen, Owen Donald Fraser

Τεύχος 1 / Τόμος 7

(<https://www.geocasehistoriesjournal.org/pub/issue/view/51>):

Editorial, Giovanna Biscontin, Ryosuke Uzuoka, Akira Murakami

A Case Study on the Progressive Failure Mechanism of I-180 Slope Using Numerical and Field Observations, Binyam Mammo Bekele, Chung Song, Mark Lindemann

Practical Design, Numerical Analysis, and Site Monitoring for Huge Arching Effect during Massive Excavation of Undercut Slope in Open-Pit Mine, Cheowchan Leelasukseree, Thira-pong Pipatpongsa, Apipat Chaiwan, Noppadon Mungpayabal

Ex-Post Evaluation of Countermeasures Against Residual Settlement of an Ultra-Soft Peaty Ground Due to Test Embankment Loading: A Case Study in Maizuru-Wakasa Expressway in Japan, Mutsumi Tashiro, Minoru Kawaida, Motohiro Inagaki, Shotaro Yamada, Toshihiro Noda

Identification of Material Parameters by Particle Filter Using Observation Data Obtained during Construction of Rock-Fill Dam, Eiki Tanenaga, Kazunori Fujisawa, Akira Murakami

Numerical Analysis of a Top-Down Constructed Deep Basement with Diaphragm Walls in Barangaroo, Sydney - A Case Study, Ali Parsa-Pajouh, Brad Azari, Sam Mirlatif, Henk Buys, Ian Cullen

Design, Construction, and Back-Analysis of a Deep Underground Parking Garage in an Urban Environment, Seppe Creten, Hans Verbraken, Stijn François, Christophe Bauduin

Back Analyses of Two Deep Excavations in Hong Kong Using the Mohr-Coulomb Model with Linear Elasticity and the Hardening Soil Model, Charles C L Chan, Derek S M Chiu, Frankie L C Lo, Julian S H Kwan, S W Lee, Alex C O Leung

Τεύχος 2 / Τόμος 7

(<https://www.geocasehistoriesjournal.org/pub/issue/view/52>):

Editorial, Ivan P. Damians, Giulia Lugli

[The Introduction of MSE Wall Elements into the BIM Technology: The S7 Skomielna Biala – Chabowka Project of an MSE Abutment in Poland](#), Fabrizia Trovato, Giulia Lugli, Giacinto Intrevado

[The D4R7 Reinforced Soil Retaining Walls in Bratislava, Slovakia](#), Elena Gil, Carlos Serrano, Carlos Pereira, Pedro Osso, Juan Lima, Ivan P. Damians

[Drainage Reinforced Geocomposite for Marginal and Cohesive Slopes and Walls](#), Nicola Brusa, Patrick Naughton, Pietro Rimoldi

[Vertical Expansion of Residential Land Using Reinforced Earth Walls – Case Study of Cerro Artola](#), Sergi Conesa, Félix Enrique González

[Segmental Retaining Wall Reinforced with Geogrids, in New Hospital Works \(Salamanca, Spain\)](#) MarcoTomás Rodríguez Martínez, Patricia Amo Sanz

[Masonry Arch Bridges with Reinforced Soil Spandrel Walls](#), Colin JFP Jones, Chiado Doulala-Rigby

[Read More](#)

**XXXI Reunión Nacional de Ingeniería Geotécnica (RNIG)**

[Julio Cesar Chable Moreno](#) news 25 Nov 2022



[Read More](#)

**Bulletin Vol. 16, Issue 5 - October 2022 circulated**

ISSMGE 02 Nov 2022

[Read More](#)

**Geological Rock Investigation**

[Ozan Bilal](#) news 01 Nov 2022



[Read More](#)

**Bright Spark Lecture Awards at 16ICGE - Lahore, Pakistan, 7-8 December 2022**

[Ezra Yoanes Setiasabda](#) ISSMGE YMPG 23 Nov 2022

The YMPG in collaboration with the Organising Committee for the 16ICGE (16th International Conference on Geotechnical Engineering) would like to announce the winners of the Bright Spark Lecture Award...

[Read More](#)

**The passing of Habib Fayad** ISSMGE news 07 Nov 2022

[Read More](#)

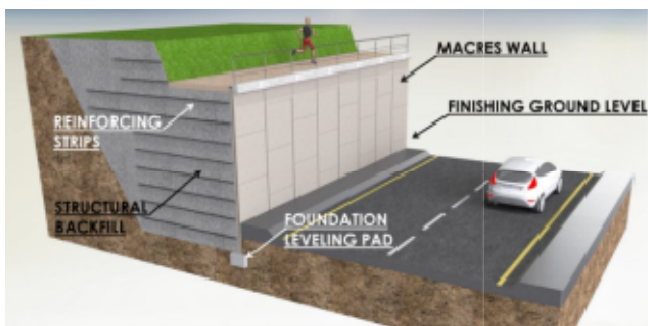


## GEO-TRENDS REVIEW

[www.mygeoworld.com/geotrends/issues/21-december-2022](http://www.mygeoworld.com/geotrends/issues/21-december-2022)

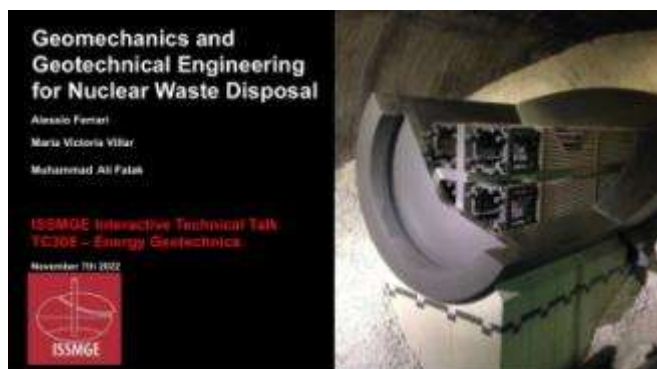
Κυκλοφόρησε το Τεύχος 21, Δεκεμβρίου 2022 με τα ακόλουθα περιεχόμενα:

**Special Issue #2 of Volume #7 [International Journal of Geoengineering Case Histories](#)** ISSMGE 20 Oct 2022



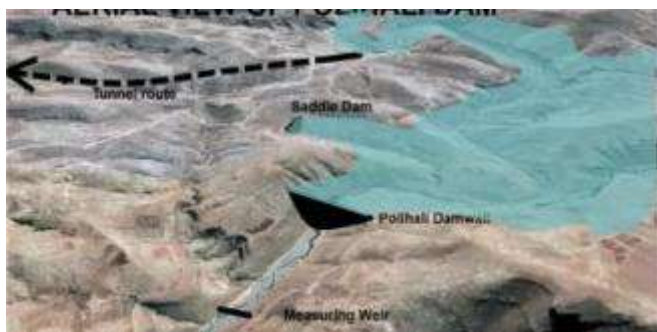
[Read More](#)

**2nd episode of International Interactive Technical Talk** ISSMGE TC308 09 Nov 2022



## Construction of Polihali Dam and Polihali Transfer Tunnel will start as contracts awarded

[Geoengineer.org](https://www.geoengineer.org) news 09 Nov 2022



[Read More](#)

## YMPG Core Team 2022-2024

[Ezra Yoanes Setiasabda](#) ISSMGE YMPG 27 Sep 2022



Were excited to announce the new YMPG Core Team for the 2022-2024 term! The YMPG includes 6 full members from different parts of the world, who are appointed by the Board. Ashe Cooper (New Zealand...

[Read More](#)

## Waldemar Coelho Hachich (1950-2022)

ISSMGE TC306 16 Sep 2022

TC306 will miss dearly Waldemar Coelho Hachich, Professor of Geotechnical and Structural Engineering (PEF) at Polytechnic School, University of São Paulo, Brazil,...

[Read More](#)

## Submit your technical photos for inclusion in the 2023 Geotechnical Business Directory!

[GeoWorld Administrator](#) news 07 Dec 2022



Until February 20th 2023, we invite you to submit photos related to geotechnical engineering that could be included in the 2023 Geotechnical Business Directory that is expected to b...

[Read More](#)

## Material Reuse through geoBIM at HS2 Phase 1 – Area North Earthworks: Winner of Bentley Systems Going Digital Awards on Geotechnical Engineering

[Bentley Systems](#) YI2022 07 Dec 2022



The 90-kilometer HS2 Phase 1 rail route has approximately 25 million cubic meters of material earmarked for excavation, which is equivalent to 10,000 Olympic swimming pools, making the volum...

[Read More](#)

## Groundwater Project Showcase at Bangladesh Cox's Bazar Refugee Camp

[Seequent, The Bentley Subsurface Company](#) news 07 Dec 2022



Jo Knight from Seequent and Geraint Burrows from Groundwater Relief, presented a very interesting groundwater project showcase at Bangladesh Cox's Bazar refugee camp on the recent...

[Read More](#)

## Izmir Metro Tunnel: How Geological Factors Can Impact Your Tunnel Construction

[Rocscience](#) Deep Excavations 07 Dec 2022



The population of the world has grown rapidly, and advanced infrastructure like metro tunnels has become a necessity to fulfill increasing transportation needs. Tunnel construction goes through many c...

[Read More](#)

## Geo-Challenge 2023 Rules Announced

[Beena Ajmera](#) Geo-Challenge 2023 18 Oct 2022

Dear all, The 2023 National Geo-Challenge Student Competitions will be organized on March 27, 2023 during Geo-Congress 2023 to be held in Los Angeles, California. The rules are posted on the...

[Read More](#)

**GEER report 2021 Western European Flooding published and available online!**

[Geoengineer.org](#) news 19 Oct 2022



[Read More](#)

**Results of the 20th International Geotechnical Conference in Sydney (Australia)**

ISSMGE TC305 01 Oct 2022



May 1-5, 2022 hosted the 20th International Geotechnical Conference in Sydney (Australia). 1338 participants took part in the work of this international scientific forum, including 5...

[Read More](#)

**News and Information Circular - November 2022**

ISSMGE 05 Dec 2022

[Read More](#)

**Realities of bridge resilience in Small Island Developing States**

[Dimitrios Zekkos](#) news 17 Oct 2022

#Bridge #Resiliency of Small Island States is the focus of the work below that has been funded by the #worldbank. Small Island States, such as many of the #Caribbean islands are facing tremendous chal...

[Read More](#)

**9th International Course on Geotechnical and Structural Monitoring (02-06 May 2023)**

ISSMGE TC220 22 Nov 2022

The ninth Edition of the International Course on Geotechnical and Structural Monitoring will feature this year a large Expo Area to showcase the newest instrumentation, and...

[Read More](#)



**2ND ISSMGE TC217 ONLINE SEMINAR SERIES: 3RD SEMINAR ON 24TH NOVEMBER 2022**

ISSMGE TC217 21 Nov 2022

Following the success of the first seminar series last year, the executive committee of TC217 is hosting a 2nd series of land reclamation online seminars. The details of the 3rd semi...

[Read More](#)

**An underground structure built entirely by robots**

[Geoengineer.org](#) news 22 Nov 2022



[Read More](#)

2ND ISSMGE TC217 ONLINE SEMINAR SERIES: 4TH SEMINAR ON 08TH DECEMBER 2022

ISSMGE TC217 21 Nov 2022

Following the success of the first seminar series last year, the executive committee of TC217 is hosting a 2nd series of land reclamation online seminars. The details of the 4th semi...

[Read More](#)

### [Application Open] ISSMGE Interactive Technical Talk

[Ezra Yoanes Setiasabda](#) ISSMGE YMPG 15 Nov 2022

Call for Participants!! The ISSMGE has rolled out a new initiative called the IITT (ISSMGE Interactive Technical Talk). This new initiative is to showcase interesting projects, in academia and indust...

[Read More](#)

### 9th International Course on Geotechnical and Structural Monitoring (02-06 May 2023)

ISSMGE TC306 22 Nov 2022

The ninth Edition of the International Course on Geotechnical and Structural Monitoring will feature this year a large Expo Area to showcase the newest instrumentation, and...

[Read More](#)

### TC218 participation to the ISSMGE Time Capsule 2022

ISSMGE TC218 11 Oct 2022

TC218 contribution to ISSMGE Time Capsule Project was decided to be a video regarding the Past, Present and future of our industry/field. A video, 11 minutes long, was prepared...

[Read More](#)

### Self-report on pieces of our work we are proud of

[Marina Pantazidou](#) ISSMGE TC306 14 Sep 2022

"If you don't praise your house, it will tumble down on you" (Greek proverb). In its last group meeting in June 2022, TC306 discussed publicity of educational materials created by the...



### ISRM Newsletter No. 60 - December 2022

Κυκλοφόρησε το Τεύχος Αρ. 60 Δεκεμβρίου 2022 της ISRM με τα ακόλουθα περιεχόμενα:

- [Message from the President](#)

- [15th International ISRM Congress, 9-14 October 2023, Salzburg, Austria](#)
- [40th ISRM Online Lecture by Dr José Delgado Rodrigues](#)
- [2022 ISRM Council, Board and Commission meetings took place in Asunción, Paraguay](#)
- [Derek Martin, from Canada, will receive the 9th Müller Award](#)
- [ISRM Award winners were announced](#)
- [16th ISRM International Congress on Rock Mechanics in 2027 to take place in Seoul, Korea](#)
- [2024 ISRM International Symposium to take place in New Delhi, India](#)
- [Third European Rock Mechanics Debate - 25 January, 12:30GMT](#)
- [ACUUS 2023 will take place in Singapore in November](#)
- [ISRM Sponsored Conferences](#)



Κυκλοφόρησε το IGS Newsletter της International Geosynthetic Society με τα ακόλουθα περιεχόμενα:

### IGS NEWSLETTER – December 2022

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

[www.geosyntheticssociety.org/newsletters](http://www.geosyntheticssociety.org/newsletters)

- Seven Spectacular Speakers Set For 4th GeoAfrica [READ MORE](#)
- IGS Poland Hails Success Of EuroGeo7 [READ MORE](#)
- IGS Awards: Call for Nominations 2018 – 2021 [READ MORE](#)
- The GeoAsia7 Corporate Case Study Competition Winners [READ MORE](#)
- Spotlight On The IGS Technical Committees: Soil Reinforcement [READ MORE](#)
- Did You Know... Geosynthetics Are Hidden Heroes? [READ MORE](#)
- Apply Now For The Young Member Spotlight At GeoAfrica 2023! [READ MORE](#)
- New 'IGS Slovenia' Chapter [READ MORE](#)
- New Translations In IGS Digital Library [READ MORE](#)
- Calendar of Events



[www.icevirtuallibrary.com/toc/jgein/29/6](http://www.icevirtuallibrary.com/toc/jgein/29/6)

Κυκλοφόρησε το Τεύχος 6 του Τόμου 29 (Δεκεμβρίου 2022) του Geosynthetics International της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

Announcement

[Best Geosynthetics International Paper for 2021, R.J. Bathurst](#), 29(6), pp. 575

Papers

[Model studies of square footings on geocell-reinforced slopes, K. Kazemi, M. R. Arvin, N. Hataf, A. Khademhosseini](#), 29(6), pp. 576–592

[Influence of facing toe condition on the bearing capacity of full-height panel MSE walls, P. Xu, K. Hatami, G. Yang, T. Li, X. Liang](#), 29(6), pp. 593–609

[Field monitoring of vertical stress distribution in GRS-IBS with full-height rigid facings, J. Zhang, W. Guo, M. Ji, J. Zhao, C. Xu, Y. Zheng](#), 29(6), pp. 610–621

[Strength and microstructure of a lignin fiber-reinforced expansive soil in cold regions, K. Fan, Q. Pei, L. Liu, Z. Han, W. Zou](#), 29(6), pp. 622–629



[www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/50/issue/6](http://www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/50/issue/6)

Κυκλοφόρησε το Τεύχος 6 του Τόμου 50 (Δεκεμβρίου 2022) του Geotextiles and Geomembranes της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

[Editorial Board](#), Page ii

[Editorial](#), Page iii

Research articles

[Performance improvement of ballasted railway tracks using three-dimensional cellular geoinclusions](#), Piyush Punetha, Sanjay Nimbalkar, Pages 1061-1082

[Pullout testing and Particle Image Velocimetry \(PIV\) analysis of geogrid reinforcement embedded in granular drainage layers](#), Hamed Mirzaeifar, Kianoosh Hatami, Mahmood Reza Abdi, Pages 1083-1109

[Evaluation of drainage coefficients for 2D and 3D-geocomposite embedded subbase layers](#), Sireesh Saride, B.K. Huchegowda, Saurabh Vyas, Pages 1110-1119

[Improved design criteria for nonwoven geotextile filters with internally stable and unstable soils](#), Shubham A. Kalore, G.L.

[Reinforcement load in geosynthetic-reinforced pile-supported model embankments](#), Chengyu Liu, Yao Shan, Binglong Wang, Shunhua Zhou, Changdan Wang, Pages 1135-1146

[Research on the protection of expansive soil slopes under heavy rainfall by anchor-reinforced vegetation systems](#), Yingzi Xu, Chao Su, Zhen Huang, Chunyan Yang, Yunhe Yang, Pages 1147-1158

[Numerical investigation on hydraulic and gas flow response of MSW landfill cover system comprising a geosynthetic clay liner under arid climatic conditions](#), Vishwajeet Khan, Suman Roy, Sathiyamoorthy Rajesh, Pages 1159-1171

[Permeability prediction in geotextile envelope after chemical clogging: a coupled model](#), Chenyao Guo, Qiang Zhao, Jingwei Wu, Hang Li, ... Zhe Wu, Pages 1172-1187

[Prediction of pullout interaction coefficient of geogrids by extreme gradient boosting model](#), Aali Pant, G.V. Ramana, Pages 1188-1198

[Pullout behavior of a bearing polymeric strap under monotonic and cyclic tensile loads](#), Sajad Razzazan, Mansour Mo-sallanezhad, Amin Keshavarz, Pages 1199-1213

[A simplified method for assessing the serviceability performance of geosynthetic reinforced and pile-supported embankment](#), Xidong Zhang, Yan Zhuang, Shunlei Hu, Xiaoqiang Dong, Pages 1214-1229

[A comparison of shear stress estimation methods for a single geobag on a rough bed](#), Kendra White, Yuntong She, Wen-ming Zhang, Pages 1230-1243

[Analyzing the influence of facing batter on reinforcement loads of reinforced soil walls under working stress conditions](#), Chunhai Wang, Lei Wang, Huabei Liu, Pages 1244-1251



## Ελληνική Επιτροπή Σηράγγων και Υπογείων Έργων



### Το Δελτίο των Σηράγγων

[www.eesyve.gr/uploads/1/2/2/2/12220305/2022\\_2\\_o\\_teyxos.pdf](http://www.eesyve.gr/uploads/1/2/2/2/12220305/2022_2_o_teyxos.pdf)

Κυκλοφόρησε το τεύχος Δεκεμβρίου 2022 της Ελληνικής Επιτροπής Σηράγγων και Υπογείων Έργων με τα ακόλουθα περιεχόμενα:

- Νέα & Εκδηλώσεις ΕΕΣΥΕ
- Νέα Σηράγγων και Υπογείων Έργων στον Ελλαδικό Χώρο
- Special Report: Μετρό Αθηνών Επέκταση Γραμμής προς Πειραιά
- Παγκόσμιο Συνέδριο Σηράγγων 2023 – Athens WTC2023
- Βιβλία – Νέες Εκδόσεις
- Επιστημονικές Συναντήσεις – Συνέδρια



## The Dams Newsletter



### International Committee on Large Dams

<https://www.icold-cigb.org/userfiles/files/NEWSLETTERS/Newsletter20-Final.pdf>

Κυκλοφόρησε το Τεύχος 20, έτους 2022 της International Committee on Large Dams με τα ακόλουθα περιεχόμενα:

- New ICOLD Planning
- Editor's letter "The time of Reunion"
- "Reflections on my Term as ICOLD President" Michael Rogers
- HYDROPOWER EUROPE Final Event: "The Important Role of Hydropower in Energy Transition"
- Levees as a Natural Expansion of ICOLD's Focus

- International Conference on "Hydropower and Dams Development for Water and Energy Security – Under Changing Climate"
- Former ICOLD Vice-President receives an important award in Canada
- ICOLD celebrates the "Decade of dams" in Pakistan
- The documentation of ICOLD
- The hydro community reunites in Strasbourg for HYDRO 2022
- Our Next Collaboration With Aqua Media "ASIA 2023 Water Resources And Renewable Energy Development In Asia"

## ΕΚΤΕΛΕΣΤΙΚΗ ΕΠΙΤΡΟΠΗ ΕΕΕΕΓΜ (2019 – 2023)

Πρόεδρος	:	Μιχάλης ΜΠΑΡΔΑΝΗΣ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Α.Ε. <a href="mailto:mbardanis@edafos.gr">mbardanis@edafos.gr</a> , <a href="mailto:lab@edafos.gr">lab@edafos.gr</a>
Α΄ Αντιπρόεδρος	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. <a href="mailto:editor@hssmge.gr">editor@hssmge.gr</a> , <a href="mailto:ctsatsanifos@pangaea.gr">ctsatsanifos@pangaea.gr</a>
Β΄ Αντιπρόεδρος	:	Μιχάλης ΠΑΧΑΚΗΣ, Πολιτικός Μηχανικός <a href="mailto:mpax46@otenet.gr">mpax46@otenet.gr</a>
Γενικός Γραμματέας:		Γιώργος ΜΠΕΛΟΚΑΣ, Δρ. Πολιτικός Μηχανικός, Επίκουρος Καθηγητής ΤΕΙ Αθήνας <a href="mailto:gbelokas@teiath.gr">gbelokas@teiath.gr</a> , <a href="mailto:gbelokas@gmail.com">gbelokas@gmail.com</a>
Ταμίας	:	Γιώργος ΝΤΟΥΛΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε.- ΓΕΩΤΕΧΝΙΚΕΣ ΜΕΛΕΤΕΣ Α.Ε. <a href="mailto:gdoulis@edafomichaniki.gr">gdoulis@edafomichaniki.gr</a>
Έφορος	:	Γεώργιος ΓΚΑΖΕΤΑΣ, Δρ. Πολιτικός Μηχανικός, Ομότιμος Καθηγητής Ε.Μ.Π. <a href="mailto:gazetas@central.ntua.gr">gazetas@central.ntua.gr</a> , <a href="mailto:gazetas50@gmail.com">gazetas50@gmail.com</a>
Μέλη	:	Ανδρέας ΑΝΑΓΝΩΣΤΟΠΟΥΛΟΣ, Δρ. Πολιτικός Μηχανικός, Ομότιμος Καθηγητής ΕΜΠ <a href="mailto:aanagn@central.ntua.gr">aanagn@central.ntua.gr</a>  Παναγιώτης ΒΕΤΤΑΣ, Πολιτικός Μηχανικός, ΟΜΙΛΟΣ ΤΕΧΝΙΚΩΝ ΜΕΛΕΤΩΝ Α.Ε. <a href="mailto:otmate@otenet.gr">otmate@otenet.gr</a>  Μαρίνα ΠΑΝΤΑΖΙΔΟΥ, Δρ. Πολιτικός Μηχανικός, Αναπληρώτρια Καθηγήτρια Ε.Μ.Π. <a href="mailto:mpanta@central.ntua.gr">mpanta@central.ntua.gr</a>
Αναπληρωματικά Μέλη	:	Χρήστος ΣΤΡΑΤΑΚΟΣ, Πολιτικός Μηχανικός, ΝΑΜΑ Α.Ε. <a href="mailto:stratakos@namalab.gr">stratakos@namalab.gr</a>  Βάλια ΞΕΝΑΚΗ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε. <a href="mailto:vxenaki@edafomichaniki.gr">vxenaki@edafomichaniki.gr</a>
Εκδότης	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. <a href="mailto:editor@hssmge.gr">editor@hssmge.gr</a> , <a href="mailto:ctsatsanifos@pangaea.gr">ctsatsanifos@pangaea.gr</a>

### ΕΕΕΕΓΜ

Τομέας Γεωτεχνικής  
ΣΧΟΛΗ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ  
ΕΘΝΙΚΟΥ ΜΕΤΣΟΒΙΟΥ ΠΟΛΥΤΕΧΝΕΙΟΥ  
Πολυτεχνειούπολη Ζωγράφου  
15780 ΖΩΓΡΑΦΟΥ

Τηλ. 210.7723434  
Τοτ. 210.7723428  
Ηλ-Δι. [secretariat@hssmge.gr](mailto:secretariat@hssmge.gr) ,  
[geotech@central.ntua.gr](mailto:geotech@central.ntua.gr)  
Ιστοσελίδα [www.hssmge.org](http://www.hssmge.org) (υπό κατασκευή)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» Εκδότης: Χρήστος Τσάτσανιφος, τηλ. 210.6929484, τοτ. 210.6928137, ηλ-δι. [ctsatsanifos@pangaea.gr](mailto:ctsatsanifos@pangaea.gr),  
[editor@hssmge.gr](mailto:editor@hssmge.gr), [info@pangaea.gr](mailto:info@pangaea.gr)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» «αναρτώνται» και στην ιστοσελίδα [www.hssmge.gr](http://www.hssmge.gr)